Idaho Department of Fish and Game
Idaho Transportation Department - District 2
Fish and Wildlife Linkage Area Project
Final Technical Report
May 12, 2008

Prepared by
Geodata Services, Inc.
Missoula, Montana

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Introduction

Geodata Services, Inc. worked with Wayne Melquist, Bill Ruediger, Greg Burak of the Idaho Department of Fish and Game, and Shawn Smith and Zach Funkhouser of the Idaho Transportation District to complete an assessment of wildlife linkage areas in the Idaho Transportation Department's District 2 (ITD2). Geodata Services, Inc. (Geodata) supported two expert workshops to identify wildlife linkage areas for ITD2 . The process involved assembly of GIS layers and imagery, and GIS analysis to develop a wildlife linkage zone model. The overall assessment area included a four mile area on either side of the state and federal highways within 5 counties in central Idaho (see Figure 1). The purpose of the assessment was to identify opportunities and needs for protecting or creating appropriate movement habitats for wildlife, identify linkage areas for wildlife, and address areas of interest along the highway segments relating to wildlife habitat, development pressure and public safety. A total of 70 wildlife linkage areas were identified in ITD2, for a total of approximately 234 miles of linear road segments (see Figure 2). The ITD2 wildlife linkage areas include 5 high priority linkage areas, 9 moderate priority linkage areas, and 56 low priority linkage areas. The process followed a rapid assessment format that has been utilized throughout Idaho and Western Montana (Ruediger, 2004).

The report is organized into four sections. Following the introduction, the second section provides a brief overview on the project results. The third section includes descriptions of the data layers used in the project and the GIS project deliverables. Section four includes a summary of the process used to derive the wildlife linkage areas and the project methodology. Appendix A includes the ITD2 wildlife linkage area index map and map tiles. Appendix B includes the detailed 3D maps, the detailed ownership maps, and the detailed data and comments on each wildlife linkage area. Appendix C includes a list of participants in the expert workshops. Appendix D includes the detailed GIS methodology, including the metadata and the linkage zone model tools. Accompanying the report is the wildlife linkage area GIS polygon layer and the ESRI grid layers representing the final linkage zone model.

Project Results

Figures 1 and 2 show an overview of the project area. See Appendix A for mid-scale maps of the wildlife linkage areas, along with an index of the map tiles and Appendix B for detailed 3D maps, detailed ownership maps, and detailed data and comments on each wildlife linkage area, along with the species of interest in each wildlife linkage area.

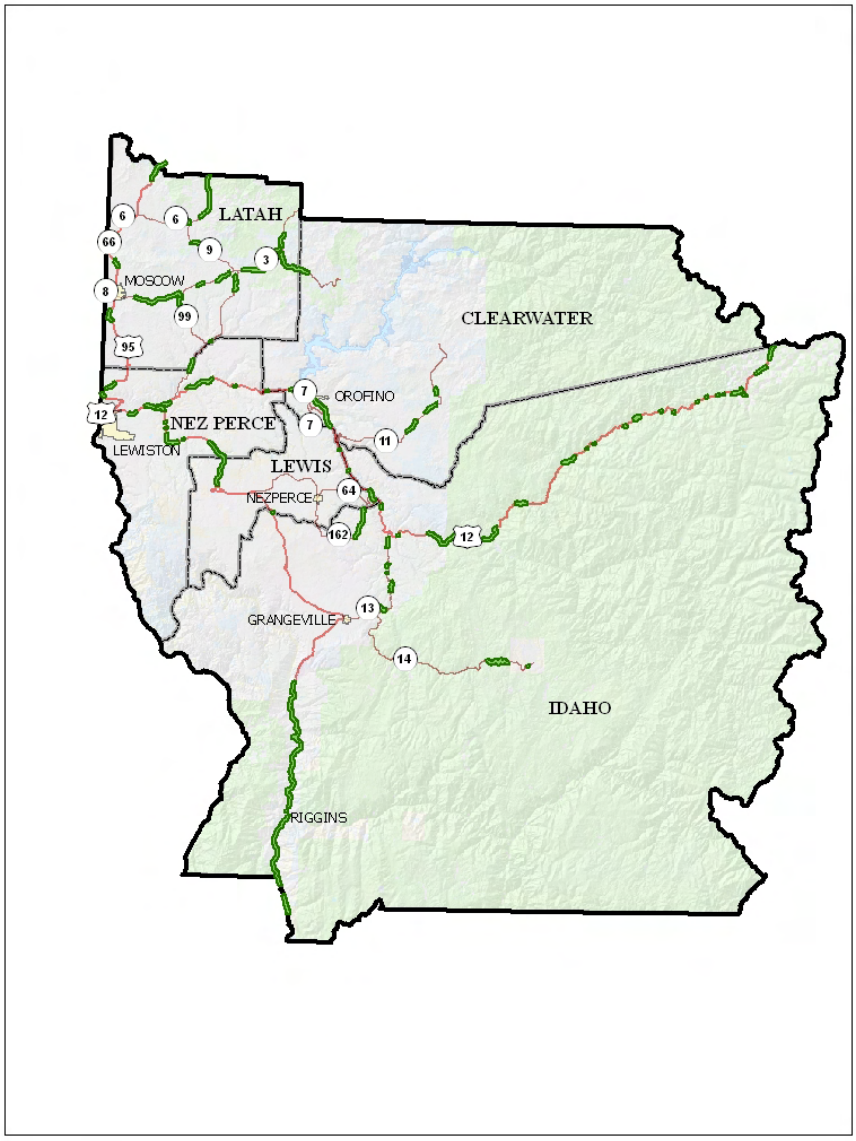
Figure 1. ITD2 Study Area

The wildlife linkage areas were usually not discreetly defined areas confined by vegetative or topographic features. More typically, they were general areas of highway or road segments identified between mileposts and mapped in the expert workshops. In some instances actual wildlife crossings of highways are at well defined locations, such

as a bridge or overpass, although they may cross laterally over a broad area or through funnel-shaped areas. To standardize the wildlife linkage areas recorded in the expert workshops, each identified road segment was buffered by 500 meters.

ITD2 includes approximately 684 miles of federal and state highways. A total of 70 wildlife linkage areas were identified in ITD2, for a total of approximately 234 miles of linear road segments (see Figure 2). The ITD2 wildlife linkage areas include 5 high priority linkage areas, 9 moderate priority linkage areas, and 56 low priority linkage areas.

Figure 2. ITD2 Wildlife Linkage Areas



Each wildlife linkage area was assigned a unique identification number along with a name, usually of a nearby geographic feature. The lowest milepost within each wildlife linkage area and the associated highway are included in Table 1.

Table 1. ITD2 Wildlife Linkage Areas

ID	NAME	MILEPOST	HIGHWAY
ID2-01	Marsh Hill	369	95
ID2-02	Crook's Hill	355	95
ID2-03	Steak House Hill	350	95
ID2-04	Thorn Creek	340	95
ID2-05	Hill's Crossing	324	95
ID2-06	Hatwai Canyon	319	95
ID2-07	Hathway Creek	308	95
ID2-08	Spalding	11	12
ID2-09	Spalding Park	302	95
ID2-10	Lapwai	300	95
ID2-11	MP 299	299	95
ID2-12	Sweet Water Creek	295	95
ID2-13	Jacques	294	95
ID2-14	Cul de Sac Canyon	280	95
ID2-15	Lawyer Canyon	267	95
ID2-16	Salmon River	198	95
ID2-17	Race Creek	197	95
ID2-18	Little Salmon	191	95
ID2-19	Hyatt Creek	177	95
ID2-20	Cottonwood Creek	19	12
ID2-21	Jack's Creek	28	12
ID2-22	Big Canyon Creek	35	12
ID2-23	Orofino	39	12
ID2-24	Five Mile Creek	54	12
ID2-25	Six Mile Creek	59	12
ID2-26	Kamiah	23	12
ID2-27	Heart of the Monster	68	12
ID2-28	Maggie Creek	77	12
ID2-29	07's	83	12
ID2-30	Lowell	95	12
ID2-31	Deadman Creek	106	12
ID2-32	Wilderness Gateway	120	12
ID2-33	Big Pond	126	12
ID2-34	Bald Mountain	128	12
ID2-35	Lost Creek	136	12

ID2-36	Indian Grave	139	12
ID2-37	Post Office Creek	144	12
ID2-38	Colgate Licks	148	12
ID2-39	Doe Creek	154	12
ID2-40	Badger Creek	156	12
ID2-41	Wendover Creek	158	12
ID2-42	Parachute Creek	159	12
ID2-43	Powell	162	12
ID2-44	Brushy Fork	168	12
ID2-45	Lolo Pass	172	12
ID2-46	White Pine Scenic Drive	12	6
ID2-47	Harvard Junction	10	6
ID2-48	Flat Creek	7	9
ID2-49	North Boville	40	3
ID2-50	Hog Meadow	28	3
ID2-51	Pine Creek	25	3
ID2-52	Little Bear	13	3
ID2-53	Julietta	6	3
ID2-54	Troy Highway	6	8
ID2-55	Spring Valley	19	8
ID2-56	Big Bear Creek	22	8
ID2-57	South Boville	37	8
ID2-58	South Troy	10	99
ID2-59	Schmidt Creek	14	11
ID2-60	Grasshopper Creek	21	11
ID2-61	Pierce Divide	26	11
ID2-62	Camas Prairie	31	11
ID2-63	7 Mile	15	162
ID2-64	Kooskia	24	13
ID2-65	Howard Creek	20	13
ID2-66	Lyon's Park	19	13
ID2-67	Sally Ann Creek	14	13
ID2-68	Harpster Grade	2	13
ID2-69	Newsome Creek	37	14
ID2-70	Red River	48	14

GIS Data Layers, GISAnalysis, and Project Deliverables

The primary GIS processing tasks required prior to conducting the expert workshops on the wildlife linkage areas were to develop the reference base layers and create the linkage zone model. Processing the base layers typically involved deriving a subset of the digital data from a larger regional or national data layer for vector based layers, labeling features for reference, and re-projecting as necessary for efficiency in display and analysis. In addition to the expert workshops, hard-copy and digital maps were prepared utilizing the GIS layers.

The data layers used in the expert workshops are described in detail in the GIS Data Layers section. The GIS Analysis methodology is described in the Project Methodology section and in Appendix D.

GIS Data Layers

State and federal highways

State and federal highways data, provided by ITD, and detailed streets from ESRI's StreetMap were used for display during the workshops. Highway bridges were not available in digital GIS format, but were noted in comments collected during the workshops. A road density map layer was derived from the road layer as part of the linkage zone model and used in a "moving circle analysis" (Servheen, 2001).

Big game

The Rocky Mountain Elk Foundation (RMEF) provided data for winter, winter crucial, summer, and summer crucial occupied elk habitat from the Measure and Prioritize Habitat™ project. Geodata has worked with RMEF and assisted in developing the elk habitat layer. Mule Deer data was provided by Utah State University and additional big game wildlife data was provided by Idaho Conservation Data Center (IDCDC). Big game data was used for display during the workshops

Amphibians and reptiles

The primary source of amphibian and reptile habitat occurrence was provided by IDCDC for display during the workshops. Species of concern include frogs, salamanders, turtles, snakes, lizards. These species generally have limited mobility and can suffer high mortality when attempting to cross highways (*see D. M. Jochimsen, C. R. Peterson, K. M. Andrews, and J. W. Gibbons. 2004. A literature review of the effects of roads on amphibians and reptiles and the measures used to minimize those effects. Final draft report to the IDFG and USFS*) .

Fisheries

Fisheries data for threatened and endangered fish species was provided by IDFG and IDCDC for display during the workshops. Excellent research and GIS layers exist in portions of Idaho for fish species, including barrier data and other ancillary

layers. A potential fish barrier layer was created by intersecting perennial streams and state highways for display during the workshops. Fish barriers and fish passage issues were also identified in the comments collected during the workshops.

Public land ownership

Public land ownership data (at a scale of 1:100,000), from the Idaho State Office of the BLM, was used for display during the workshops. Like most western states, the GIS layer of public land ownership has not been updated regularly and may not be accurate in all locations. Nonetheless, it provided a generally accurate ownership map for workshop participants.

Protected lands

The protected lands data in the University of California Santa Barbara's Managed Area database was used for display during the workshops. Protected lands that were not available in digital GIS format were not digitized, but were noted in the comments collected during the workshops.

Rivers and Streams

Perennial streams from the National Hydrography Dataset were used for display during the workshops.

Wetlands

ITD provided the available National Wetland Inventory (NWI) data as a general reference layer in the expert workshops.

Imagery

ITD provided 1-meter resolution orthophotos, based on the National Agricultural Imagery Program (NAIP). Although these are not land cover GIS layers, they provide detailed images of local vegetative patterns. Identification of hiding cover is plainly visible. The NAIP imagery was used throughout the workshops as the primary base map and reference layer.

Digital Elevation Model (DEM)

The thirty meter resolution DEMs, obtained from the USGS National Elevation Dataset (NED), was used to derive GIS layers used for display in the workshops, including a shaded relief map, or hill shade for display of terrain features.

Railroads

Railroad tracks are important because they almost always compound habitat connectivity and increase mortality. The presence of high volume railroad tracks along highways can reduce effectiveness of highway mitigation measures. IDFG provided all available digital versions of railroad tracks for display during the workshops.

Highway mileposts

ITD provided highway milepost locations for display during the workshops. Highway mileposts have been the preferred reference aid for workshop participants.

Wildlife-vehicle accidents

Comprehensive digital data for the location of wildlife-vehicle accidents was not available for ITD2, but areas of concern were identified in the comments collected at the workshops. Highway staff and wildlife biologists coded some wildlife linkage areas by category, representing the number of road-killed animals per year, using high (>20), medium (5-20), or low (< 5) for groupings of ungulates, large carnivores, and other species of interest.

Public land survey system

The Idaho 1:100,000 scale public land survey system (PLSS) from Inside Idaho was used as a reference layer for workshop participants. Townships and sections were auto-labeled to facilitate orientation.

Threatened and endangered species

IDCDC provided the location of threatened and endangered species, including wolves and grizzly bears, for display during the workshops. Additional species were identified in the comments collected during the workshops.

Additional base layers

ITD District boundaries, city limits, and county boundaries from ITD were used for display during the workshops.

Land Cover

The National Land Cover Data **(**NLCD) layer was available as a backdrop for general reference and orientation during the expert workshops. We prepared a grid of the NLCD for the project area for general reference and for use as the source for the cover/non-cover inputs for the linkage zone model.

Human Developed Sites

Large ungulate and carnivore wildlife species are influenced by the intensity of human activity around developed sites. Depending on the wildlife species involved, they may act negatively, positively or in a neutral fashion. Negative responses to avoid areas surrounding developed sites may result in habitat loss or fragmentation, and positive responses or attraction to developed sites due to the presence of foods can result in increased mortality and highway public safety concerns.

Human developed sites were used for the linkage zone model and as a resource layer for display in the workshops. For ITD2, Geodata digitized buildings

identified on the NAIP imagery within a four mille buffer of federal and state highways. The human developed site layer was composed of structure locations, public recreation sites, and city limits. Public recreation points (campgrounds, picnic areas, etc.) typically do not exist in digital form and were digitized from BLM public surface land status maps (typically at scales of approximately 1:100,000).

Project Deliverables

Project deliverables include this final technical report including maps of the wildlife linkage areas and documentation collected from biologists and other experts during the workshops. In addition to the report, the wildlife linkage area GIS layer was developed during the project. Formal metadata is included in Appendix D. The physical model used to develop the linkage zone grid layers was also a deliverable. The map layers include the linkage zone model for ITD2 and the five major subcomponents of the model, delivered in ArcInfo® grid file format.

Geodata provided support for two expert workshops to develop wildlife linkage areas for the project area and provide the content for the wildlife linkage assessment. The workshops followed a similar format and were each one day in duration. The workshops were attended by biologists and engineers from state, federal and local government agencies, and representatives of several non-governmental organizations. A list of workshop participants is provided in Appendix C.

Geodata also provided an on-line questionnaire using Survey Monkey for participants to make revisions and comments on existing wildlife linkage areas, or to provide information on new linkage areas.

Maps, data, and comments for each wildlife linkage area in Idaho, including District 2, are available at http://www.socialtext.net/idahohighwaywildlifelinkage

This site is hosted on Geodata's wiki, an editable web site that allows anyone interested to examine, download, print out or comment on a wildlife linkage area. The wiki is virtually maintenance free and can remain as an interim web site resource for the project until ITD or IDF&G develop an alternative. Geodata will host the site as long as they have a license agreement with Socialtext.net. Also, ITD and IDFG can download the pages in HTML, PDF, or MS Word format to move to another site of their choosing.

The GIS data layers developed in this project are provided in the Idaho Transverse Mercator (IDTM) projection, a single-zone system that is widely accepted for use in the State of Idaho and is the state standard. The projection parameters for this standard are as follows:

Projection Name: Idaho Transverse Mercator NAD83 (IDTM83)

Units: meters
Datum: NAD83

Vertical Datum: NAVD88
Scale factor: .99960
Central Meridian: -114 00 00
Latitude of Origin: 42 00 00
False Easting: 2500000
False Northing: 1200000

Project Process

Project Methodology

GIS Analysis Linkage Zone Modeling
The linkage zone model developed for the ITD2 expert workshop was based on methodology originally developed by Meitz (1994) and Servheen (2001). The model was targeted at large carnivores and ungulates, and identified linkage areas along highway corridors at a scale appropriate to the size of study area identified for this effort. The model included vegetation hiding cover, road density, riparian areas and human developed sites, and complemented the habitat fragmentation analysis required for other wildlife, serving as a surrogate for many other species. The model also identified areas where cooperation was necessary and where opportunities were greatest for wildlife benefits in coordination between transportation departments, public land managers, wildlife biologists, NGOs and private land owners. In addition to the final model, the derivative layers were also useful individually as reference layers in the expert workshop.

The process for the final linkage zone model combined the four input data layers (roads, human developed sites, cover conditions, riparian areas) and subsequently divided the results into four categories. In the "minimal" combined impact category, a given cell in the model had to have beneficial or neutral impact on all four individual layers or no more than one layer with a low impact value. The criteria progressed in this manner up through the low, moderate and high impact values (see description below). Details on this linkage zone model methodology are available in a report prepared by Chris Servheen, National Grizzly Bear Coordinator with the US Fish and Wildlife Service (2001) and in a thesis by Per Sandstrom (1996).

Linkage Zone Model Tools
These tools are the modules of the Identification of Potential Linkages Zones model for large carnivores and ungulates. The tools were built in ESRI Modelbuilder, a component of Arcview 9 and provided as a deliverable for this project. The toolbox for the model and associated parameters can be optionally loaded along with the grid layers to re-run or tweak parameters of the model. Impacts of human activities and beneficial features of the landscape were considered. A rating system for each type of impact and vegetation condition was used to score each model component and then the values were combined and classified into impact level categories of high, moderate, low, or minimal. The impacts and vegetation conditions considered were distance from roads, road density, human developed sites, riparian areas and hiding cover. While distance from roads was not applied directly to the final score it was used to define secure core areas which was

then used to modify the rating of road density and hiding cover.

The following sections describe the primary components of the model. Refer to Appendix D for the detailed GIS methodology implementing the model processes and flowcharts from Modelbuilder illustrating the relationships. The formal FGDC metadata, associated with each GIS layer and grid includes additional details on the model process and data layer documentation.

Hiding Cover
Extracted the cover types from the National Land Cover Data that could be considered as hiding cover. A 30 meter edge buffer was created that expanded the hiding cover areas. Finally, the hiding cover values were modified by their location either in or out of secure core areas (SCA). All areas, hiding, edge, or open were classified as hiding within secure core areas. Edge areas outside of a SCA were given an impact rating one level higher than hiding cover and open areas were given a rating of 2 levels higher than hiding cover.

Human Influence Zone
Defines Human Influence Zones around human developed sites. A high impact zone layer was generated by buffering all developed site point and polygon features. The high impact zone layer is the primary input for this tool, which then creates two additional impact zones around the high impact zone. These additional rings are then assigned medium and low impact values moving outward from the high impact zone.

Riparian
Perennial streams were extracted from the National Hydrography Dataset (NHD) layers provided by ITD. The streams and rivers were auto-labeled for orientation and quick visual location by experts in the workshops. NHD streams were used in the linkage zone model to determine riparian areas.

Secure Core Area
This tool generates the secure core areas (SCA) based on distance from selected roads and high use trails. The euclidian distance to the nearest road segment is calculated for each grid cell and then reclassified as either "In SCA" (greater than 500 meters from a road or high use trail), or "Out of SCA" (within 500 meters of a road or high use trail).

Total Motorized Access Routes
Uses a "moving window" analysis routine to calculate the road density in the one square mile (circular) area around each grid cell. The road density is then classified into 4 categories - 0 miles/sq. mile, 0.01 - 1 miles/sq mile, 1.01 - 2 miles/sq mile, and > 2 miles/sq mile. Impact values are assigned to each category and then modified based on whether they are in or out of secure core areas (SCA). Impact values for areas out of SCA are increased by one level, and areas within an SCA retain the original value.

Combined Impacts

LZ Combined Impacts adds the impact values from the component models and classifies the resultant grid into impact categories of minimal (1), low (2), moderate (3), or high (4).

MINIMAL: In general, to be considered in the "minimal" combined impact category, the pixel had to have "neutral" or beneficial" impact values for all 4 individual layers, or only one condition have a "minimal" or "low" impact value.

4 beneficial or neutral

3 beneficial or neutral and 1 minimal or low

LOW: To be considered in the "low" combined impact category, 2 conditions could be in the "minimal" or "low" category, or 1 condition in the "minimal" or "low" category and/or 1 condition in the "moderate" category while the others had to be "beneficial" or "neutral".

2 minimal or low and 2 beneficial or neutral

1 minimal or low and 1 moderate and 2 beneficial or neutral

1 moderate and 3 beneficial or neutral

MODERATE OR HIGH: To be considered in the "moderate" or "high" combined impact category, the individual impact values had to be different combinations of "low", "moderate", and "high impact values

Workshops

Two expert workshops were held in Lewistown for ITD District 2. The workshops followed a similar format and were each one day in duration. The workshops were attended by ITD biologists and engineers, and biologists from IDFG, the US Fish and Wildlife Service, Bureau of Land Management and the US Forest Service. Biologists from several non-governmental organizations also attended the workshops. A full list of participants in each workshop is provided in Appendix C.

The purpose of the workshops was to review data layers and collectively and individually identify wildlife linkage areas, review planned highway projects, and anticipate other site specific issues related to wildlife habitat, public safety and other wildlife linkage topics. Workshop attendees had access to interactive GIS services to review data layers and model results, paper wall maps and other documentation. The expert workshops included interactive mapping as a group, supplemented by completion of documentation and worksheets, and prioritizing wildlife linkage areas.

The general format for the workshops was as follows:

- General introductions of workshop participants and introduction to the process (including a PowerPoint presentation) and the data layers and maps available for the process (0.5 hrs).
- Presentation by IDFG representative on the statewide, web-based highway/ wildlife mortality database (0.5 hrs).
- Presentation by Bill Ruediger concerning the Rapid Linkage Assessment process and other wildlife/ highway issues (1.0 hrs).

- Group review and discussion of individual highway segments with mile-by-mile summary and identification of key areas of interest. Group summary discussion of key wildlife issues and opportunities. Documentation by workshop participants in identified area of interest polygons. Identification of additional research and information needs, additional contacts, and issue delineation (4 hrs).
- Separate exercises to prioritize wildlife linkage areas (1.5 hrs).
- Training and comparison workshop results with Statewide Transportation Improvement Program (STIP) plans, and discussion of linkage mitigation strategies (1 hr).

The group discussed each highway segment sequentially, reviewed pertinent maps and data layers, mapped wildlife linkage areas, and documented the linkage attributes. Geodata provided support for the group, displayed information on request, digitized wildlife linkage areas, and assisted in documentation and annotation. Geodata used the data collection form previously used to collect wildlife linkage area data in ITD Districts 3, 4, 5, and 6.

Additional wildlife linkage areas, data and comments were provided by project participants using Survey Monkey.

Post Workshop Processing

Following each workshop, Geodata standardized the wildlife linkage areas recorded in the expert workshops by placing a 500 meter buffer around each identified road segment. The database items recorded at the expert workshops were joined to each wildlife linkage area and are provided as part of the ArcView shapefile. Additional comments were provided in a document file.

Database items include:

- **ITD2_ID**: The linkage identifier number, including the district name (e.g., ID2-03).
- **AOI_NAME**: The name assigned to the linkage by workshop participants.
- **PRIORITY**: One of 3 categories (high, medium, low). These were subjective rankings assigned by workshop participants at the end of each workshop in Districts 1-2.
- **SPECIES**: The wildlife species mentioned by workshop participants or on online forms or interviews. Each species is separated by a backslash character.
- **MIG_POP**: Indication by workshop participants on whether the wildlife population was migratory, which has some bearing on the success of different wildlife crossing structures.

- **LOC_POP**: Indication by workshop participants on whether the wildlife population was local, which has some bearing on the success of different wildlife crossing structures.

- **SCALE**: The ecosystem scale of the linkage area. Those of ecosystem scale provide linkage primarily between large areas of federal lands important to wildlife. Those of local scale are important for local populations.

- **HWY_MORT**: A comment on highway wildlife vehicle accidents and highway related wildlife mortality.

- **SEASON**: A comment on the linkage area if it is primarily used by wildlife in one or more specific seasons of the year.

- **ATTRACT**: A comment on any attractants for wildlife in the area of the linkage or the immediate surroundings.

- **AGENCIES**: The agencies that are either responsible for or have primary interest in the area in or around a linkage area.

Following each workshop, Geodata prepared an index map and 8"x11" PDF maps for the wildlife linkage areas identified in the workshops. Each wildlife linkage area was assigned a unique identification number in the GIS polygon layer and the associated data and descriptive comments. The PDF maps were provided to IDFG and posted on Geodata's Idaho Highway Wildlife Linkage wiki at http://www.socialtext.net/idahohighwaywildlifelinkage

Documentation and Metadata

Geodata prepared formal FGDC compliant metadata for the wildlife linkage area polygon layer and the linkage zone model.

References

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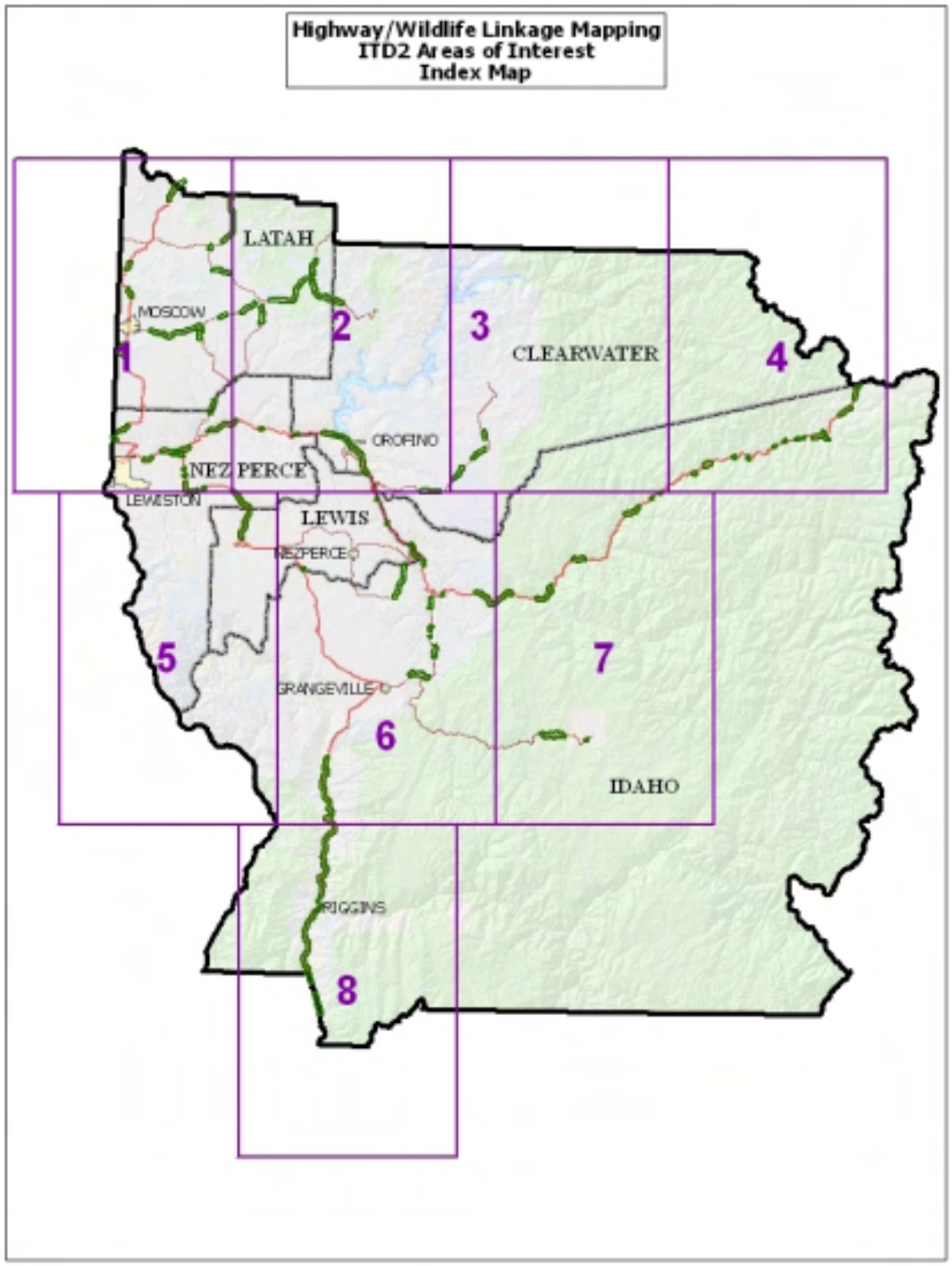
Ruediger, B and J. Lloyd. 2004. A rapid assessment process for determining potential wildlife, fish and plant linkages for Highways. Conference Presentation for ICOET, 2004.

Sandstrom, P.L. 1996. Identification of potential linkage zones for grizzly bears in the Swan-Clearwater valley using GIS. MS Thesis. University of Montana. 72 pp.

Servheen, C., J. Waller and P. Sandstrom. 2001. Identification and management of linkage zones for Grizzly Bears between large blocks of public land in the Northern Rockies. USFWS Manuscript. University of Montana.

Appendix A – Wildlife Linkage Area Index Map and Map Tiles

IDAHO TRANSPORTATION DISTRICT 2 – INDEX MAP



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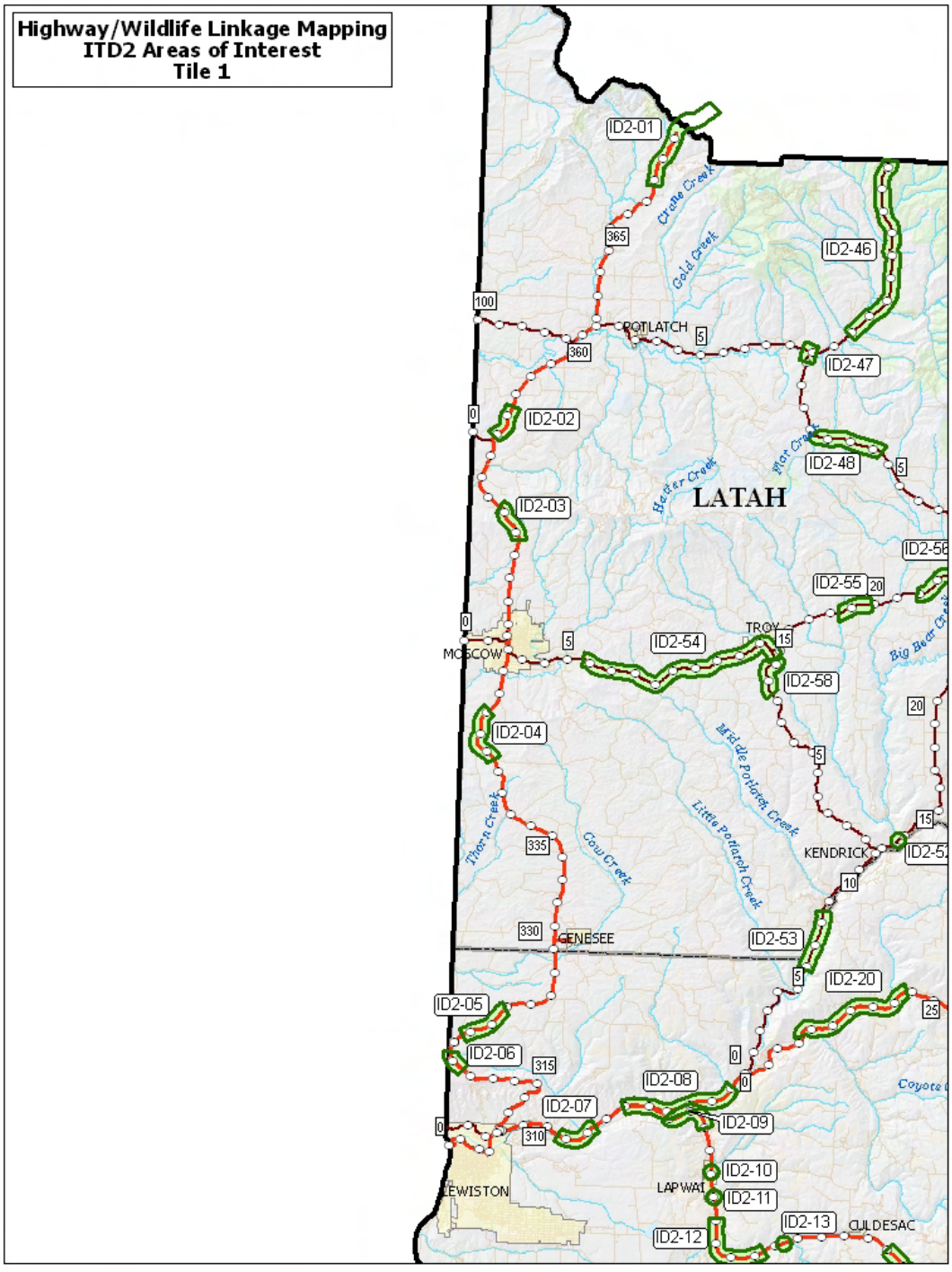

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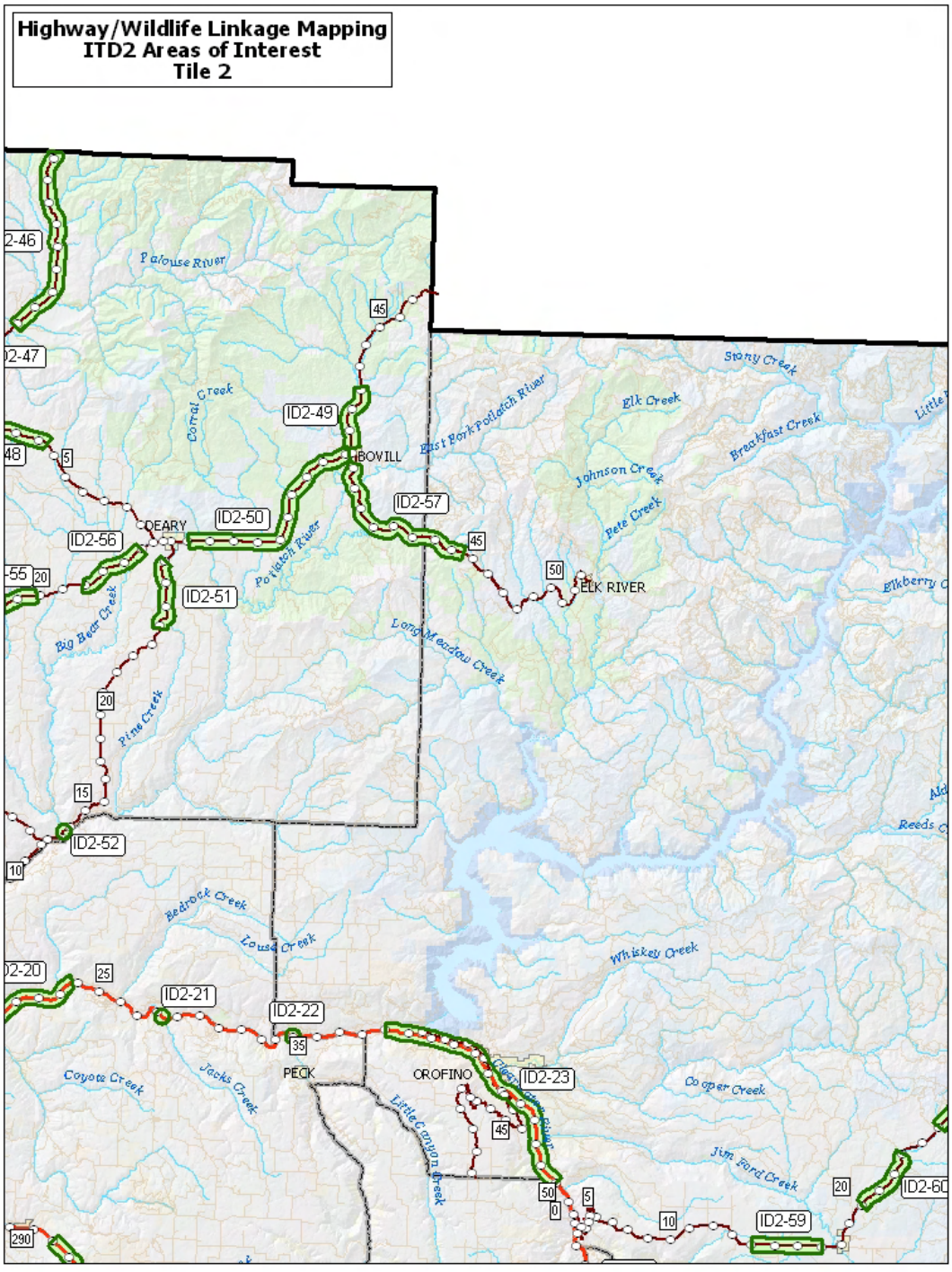

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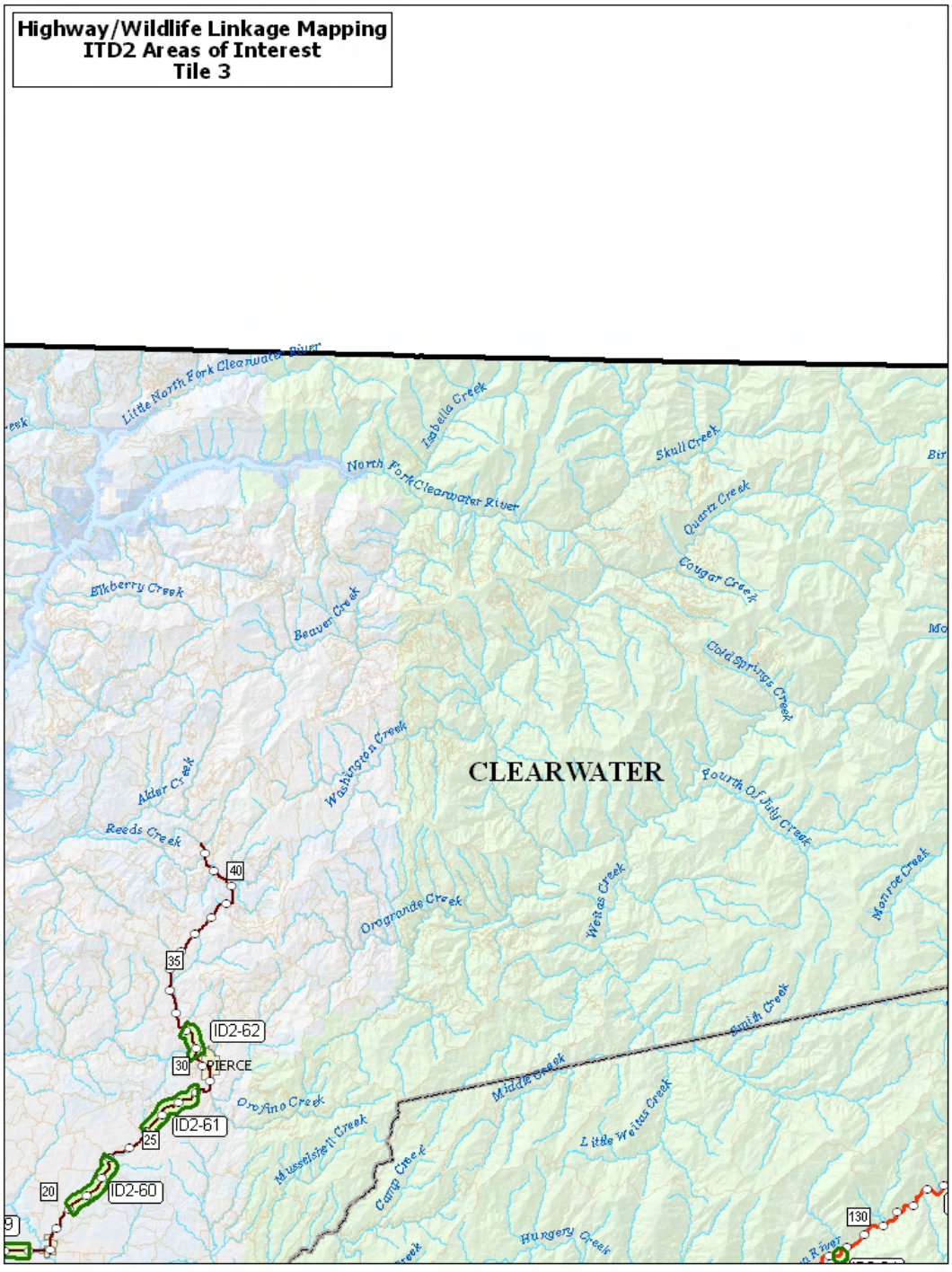

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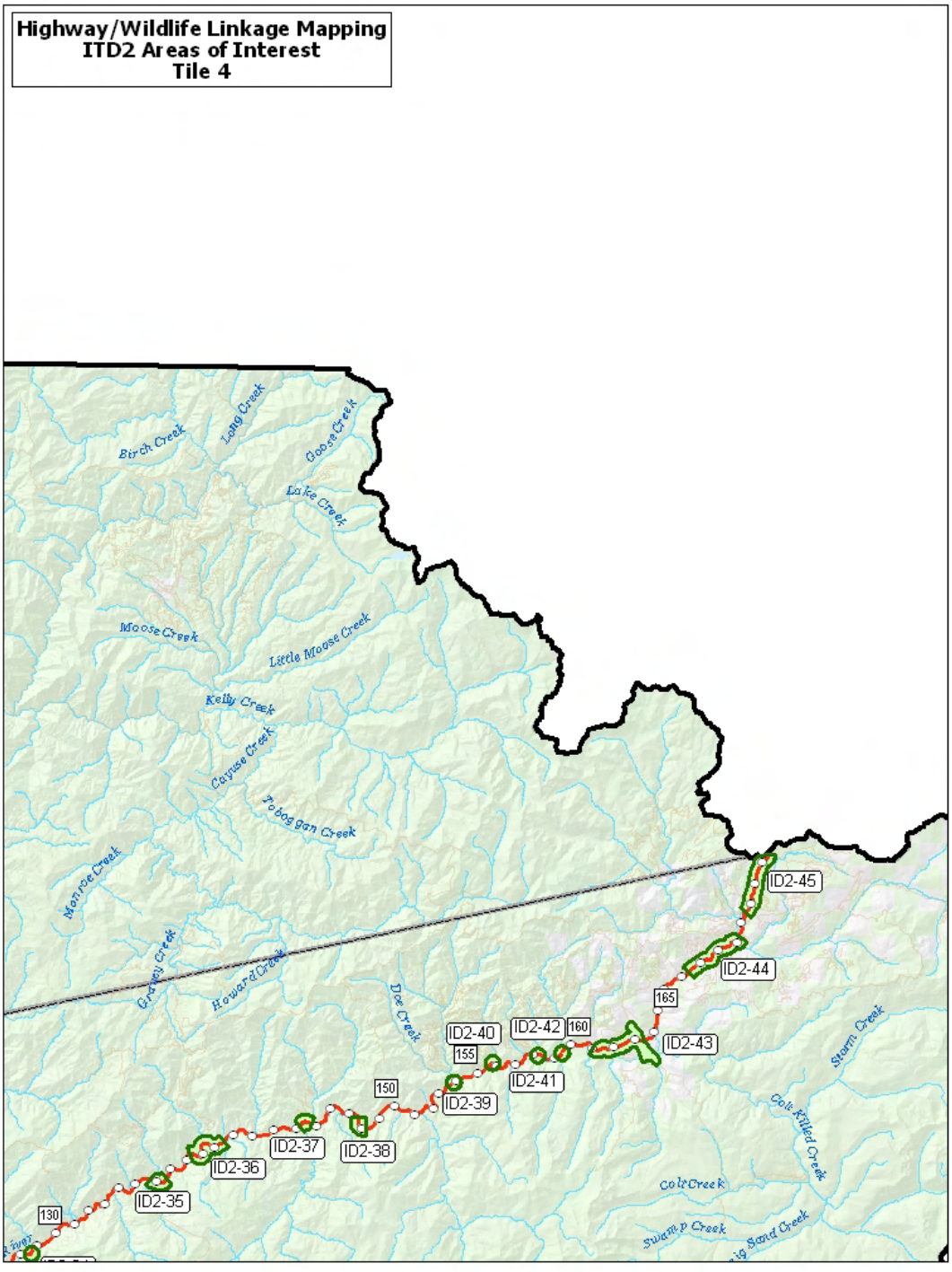

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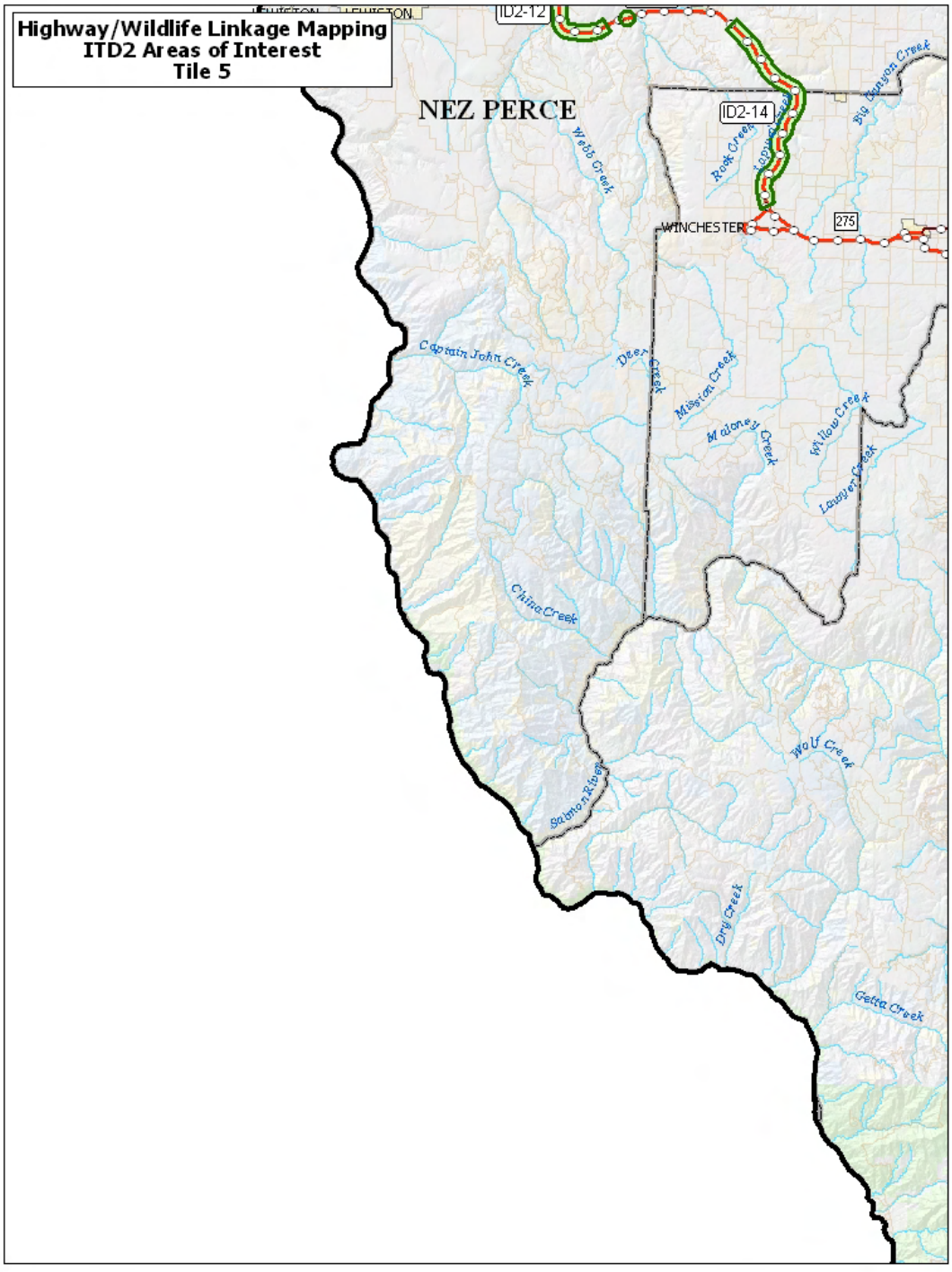

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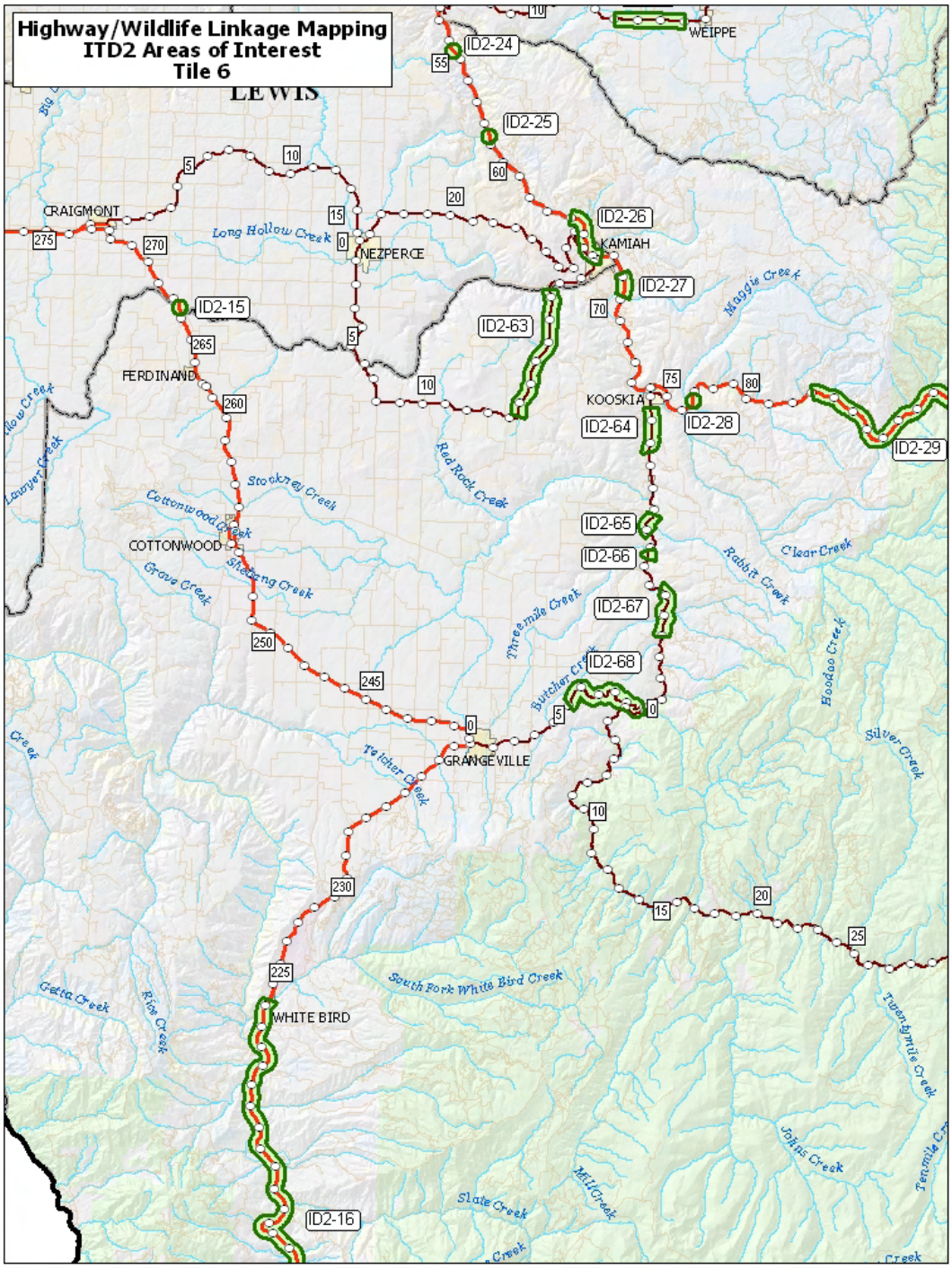

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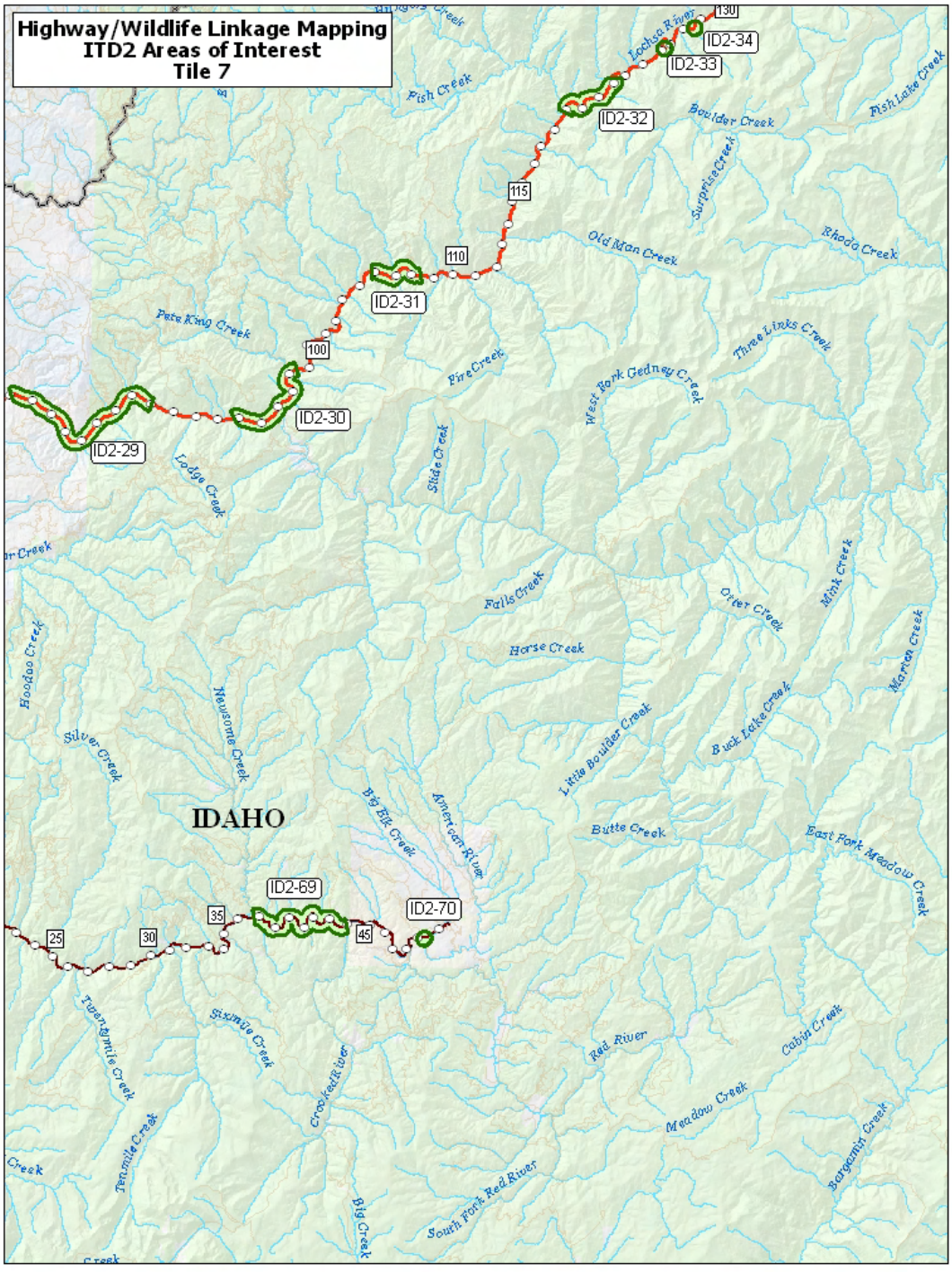

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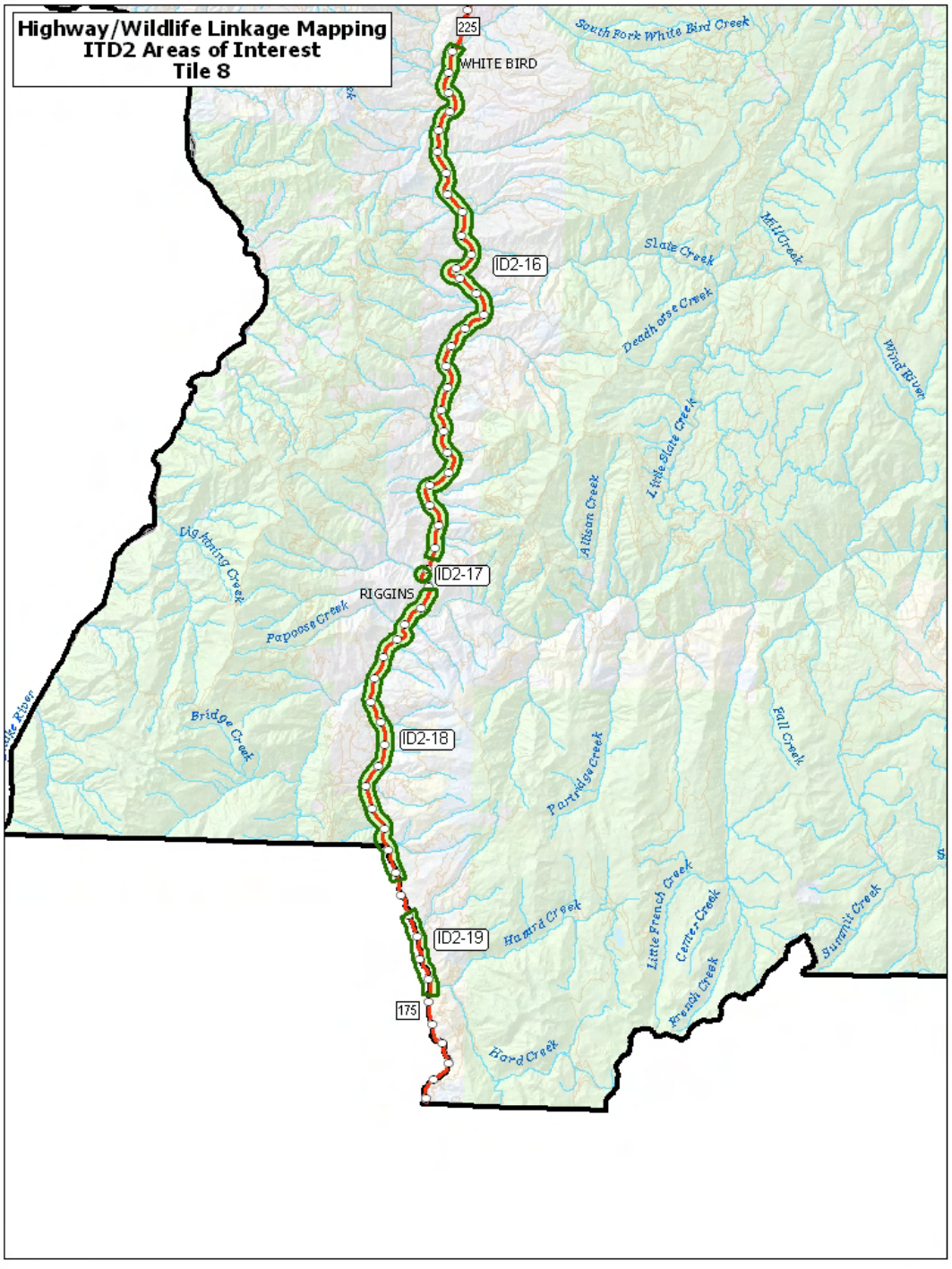
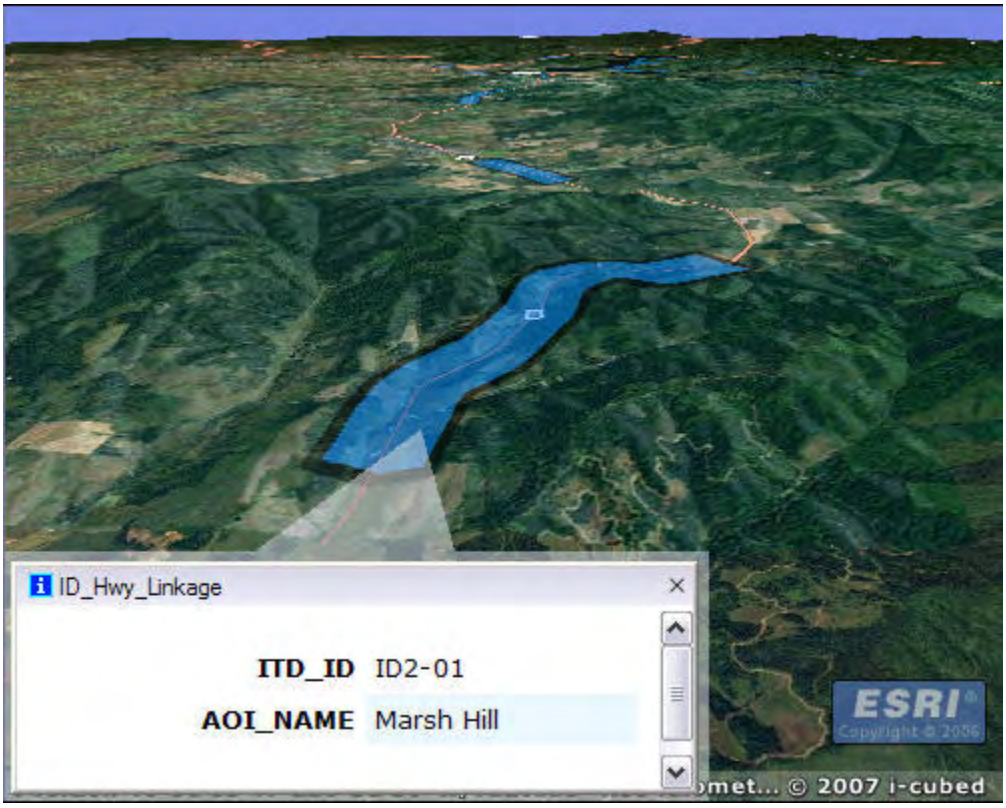
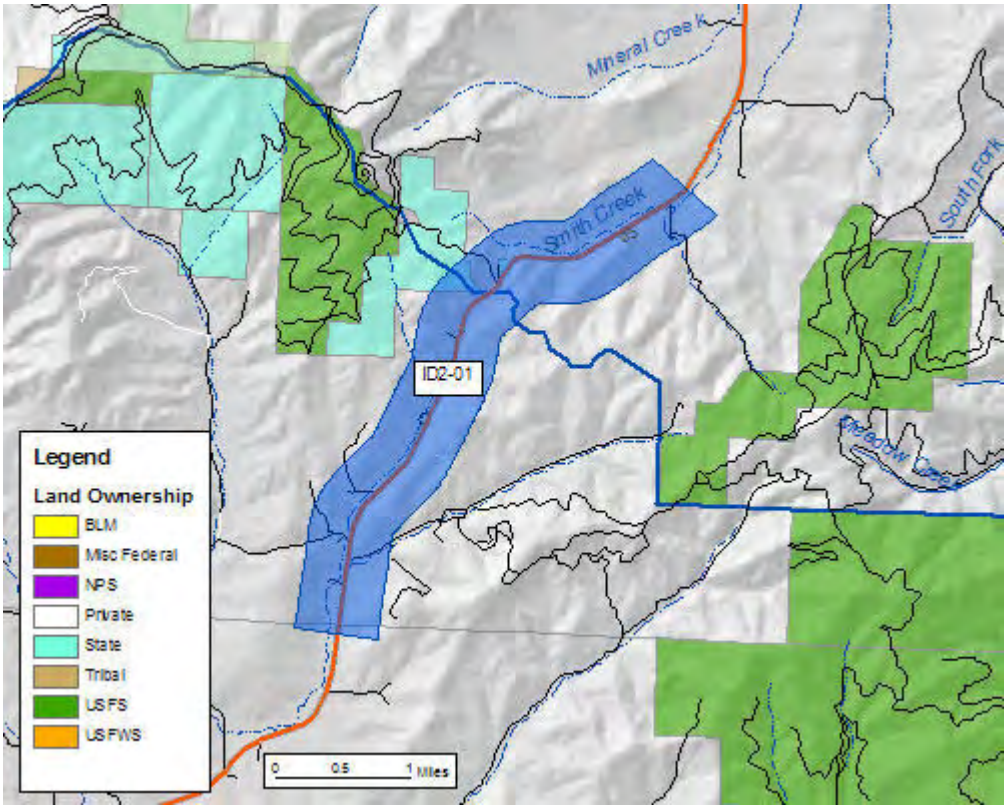


Appendix B – Detailed Wildlife Linkage Area Maps with Detailed Comments

ITD2_ID: ID2-01





ITD2_ID: ID2-01

AOI_NAME: Marsh Hill

PRIORITY: Moderate

SPECIES: mule deer/ elk/ moose/ black bear/ small mammals

MIG_POP:

LOC_POP: Yes

SCALE:

HWY_MORT:

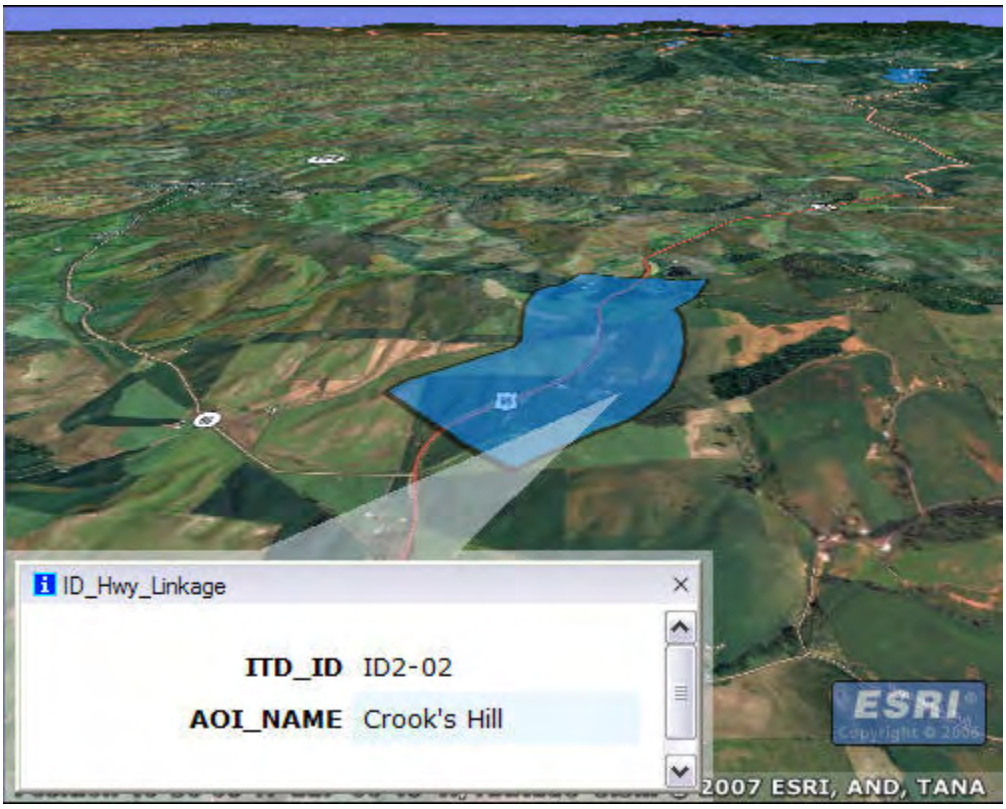
SEASON: Spring, Summer, Fall, Winter

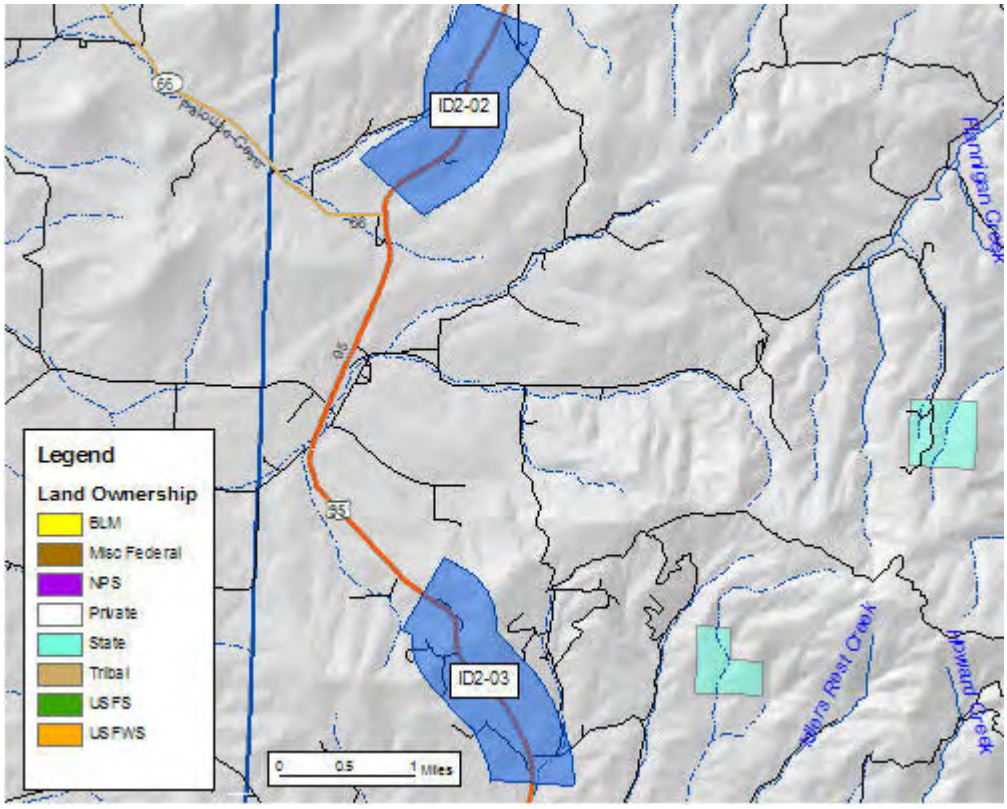
ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:
Not a high kill area. Herd of elk by rest area.

ITD2_ID: ID2-02





ITD2_ID: ID2-02

AOI_NAME: Crook's Hill

PRIORITY: Low

SPECIES: mule deer/ elk/ moose/ small mammals

MIG_POP:

LOC_POP:

SCALE:

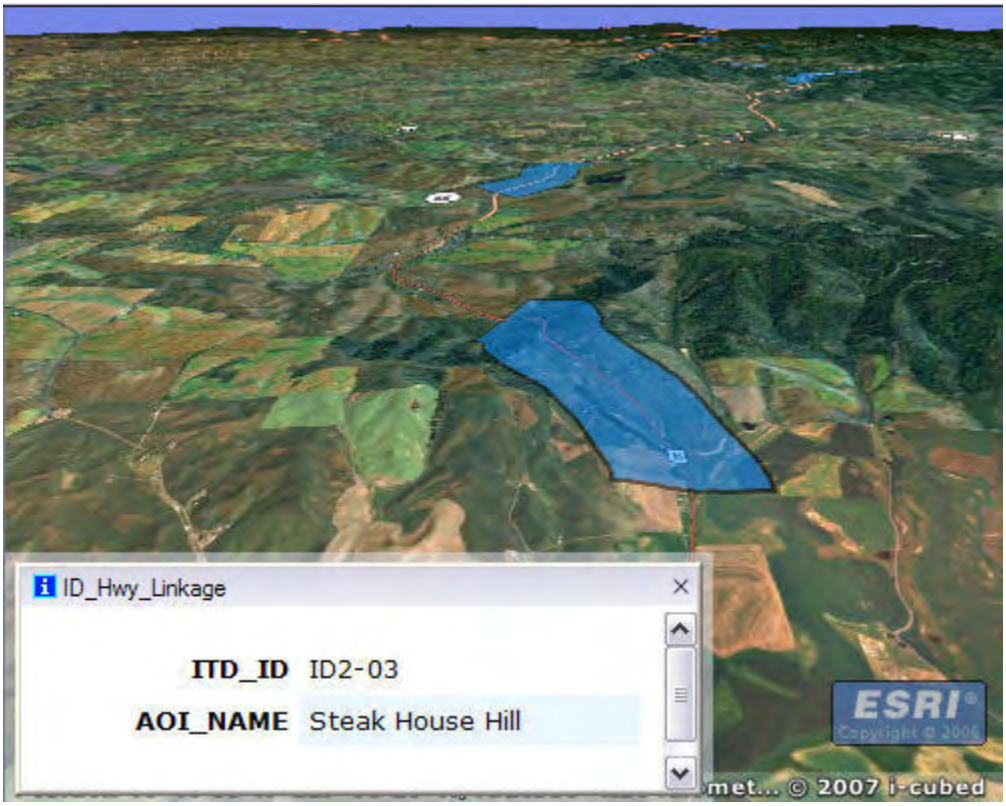
HWY_MORT:

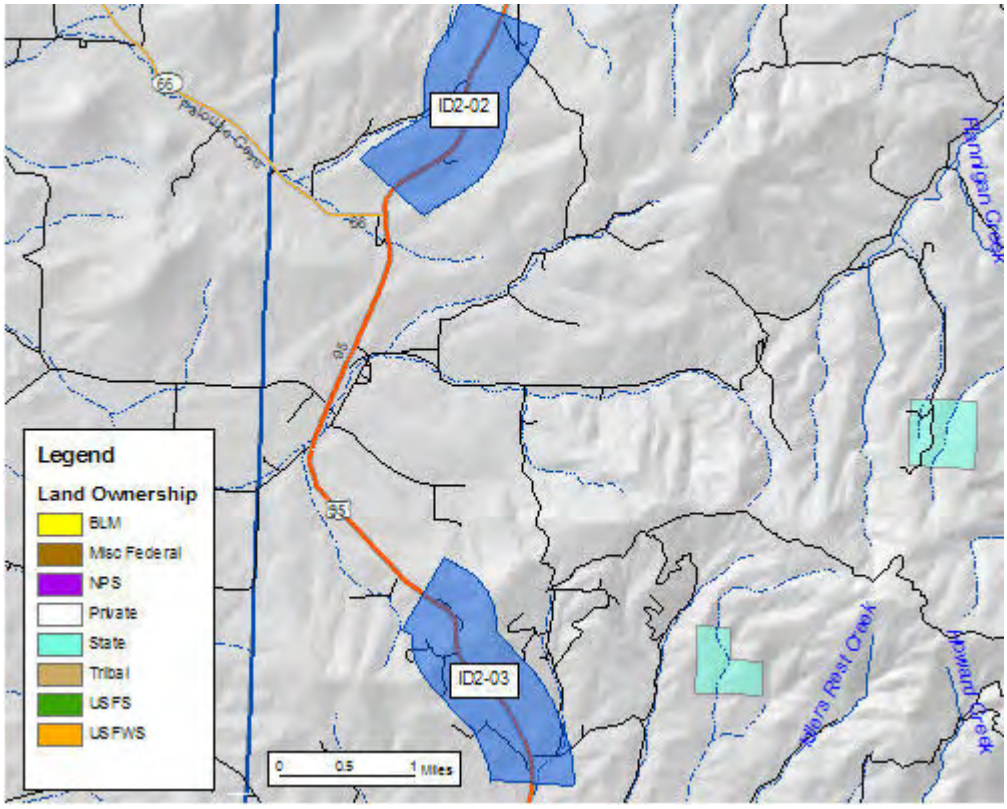
SEASON:

ATTRACT:

AGENCIES:

ITD2_ID: ID2-03





ITD2_ID: ID2-03

AOI_NAME: Steak House Hill

PRIORITY: Moderate

SPECIES: mule deer/ elk/ moose/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

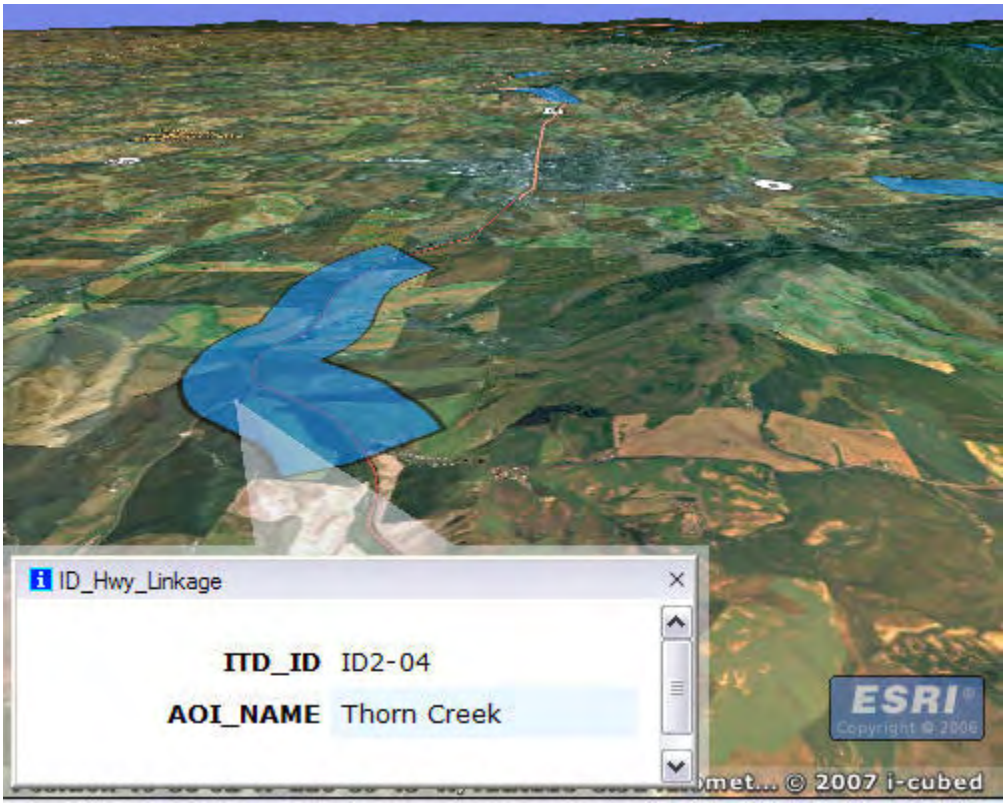
ATTRACT:

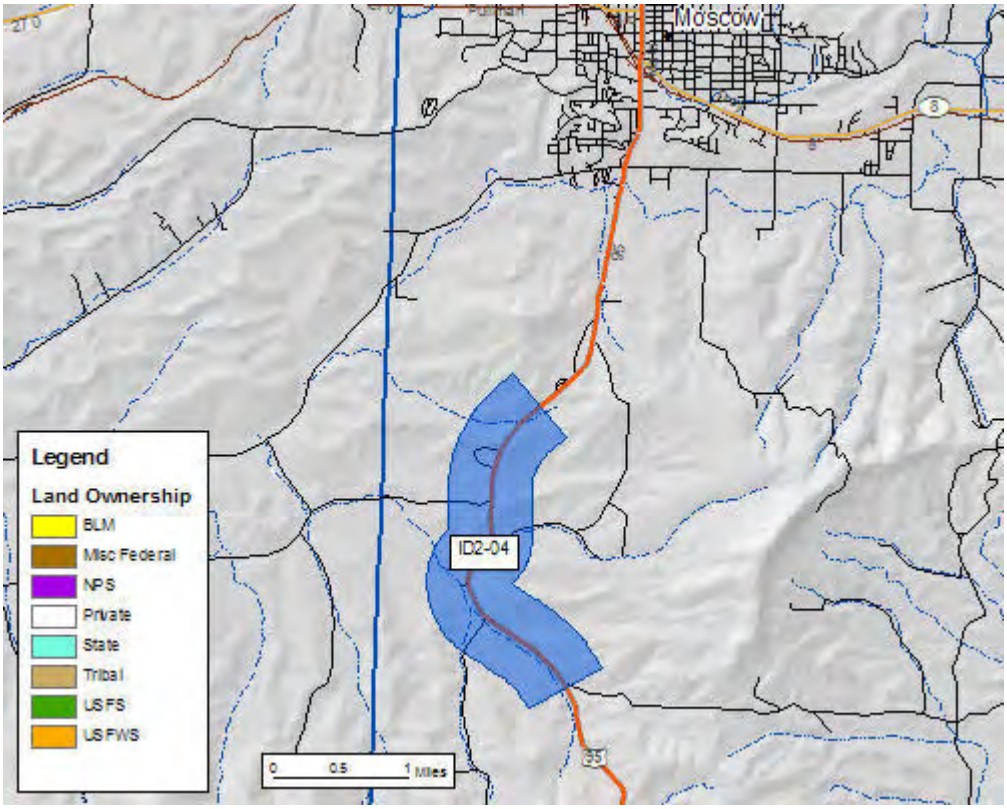
AGENCIES:

ADDITIONAL COMMENTS:

High kill area. Potential highway safety issue.

ITD2_ID: ID2-04





ITD2_ID: ID2-04

AOI_NAME: Thorn Creek

PRIORITY: Low

SPECIES: mule deer/ elk/ moose/ short-eared owls/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

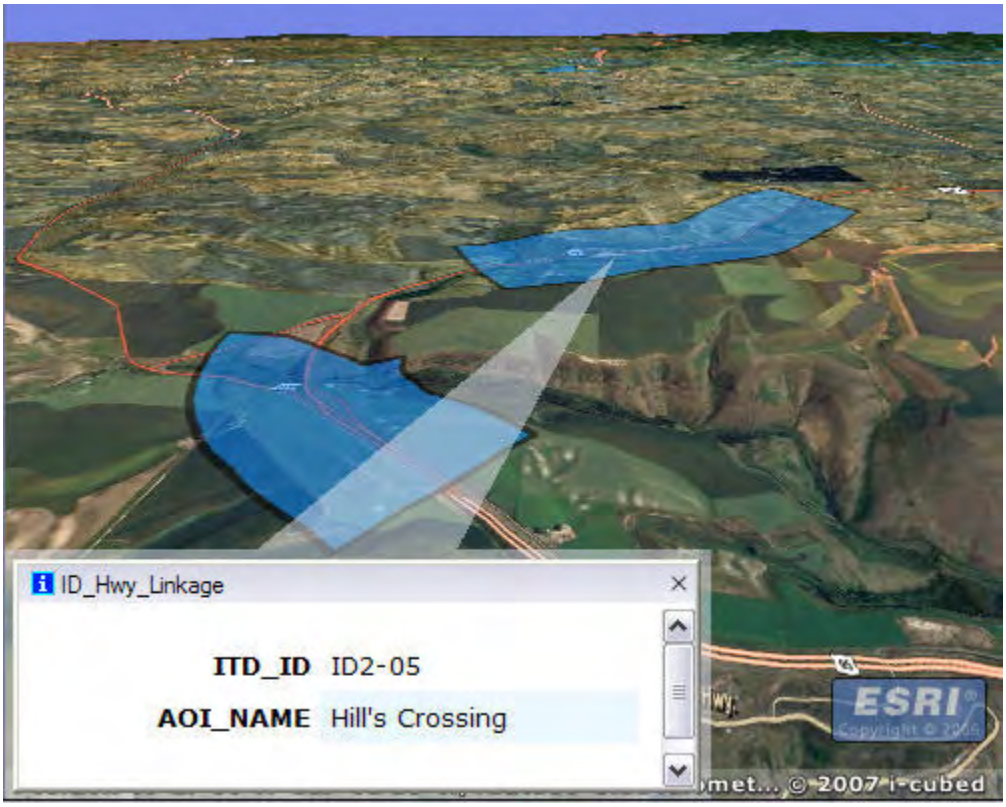
ATTRACT: water/riparian

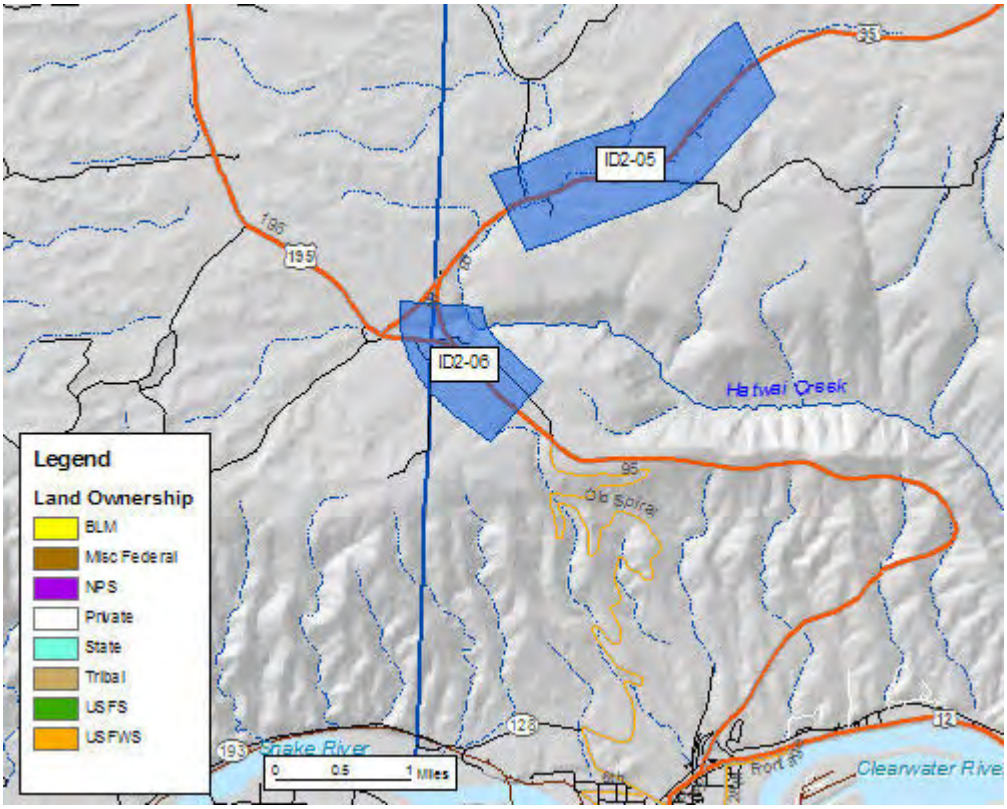
AGENCIES:

ADDITIONAL COMMENTS:

Moose population increasing in this area. Private ponds act as an attractant. Plans to make hwy wider and relocate.

ITD2_ID: ID2-05





ITD2_ID: ID2-05

AOI_NAME: Hill's Crossing

PRIORITY: Low

SPECIES: mule deer/ elk

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

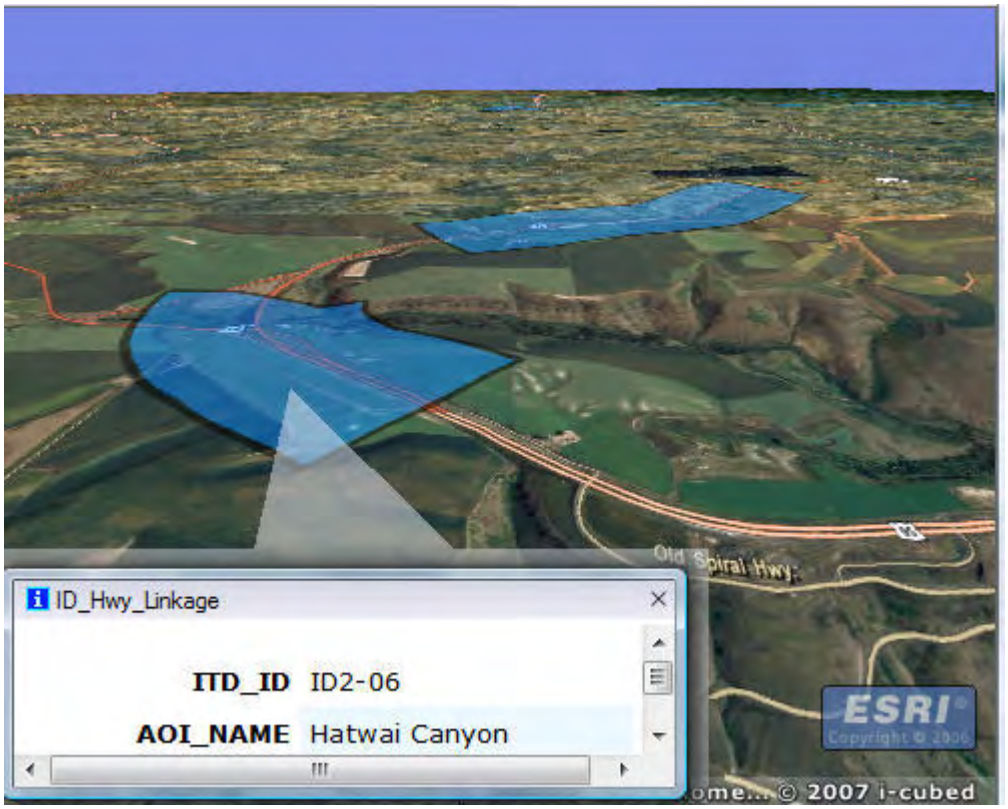
SEASON:

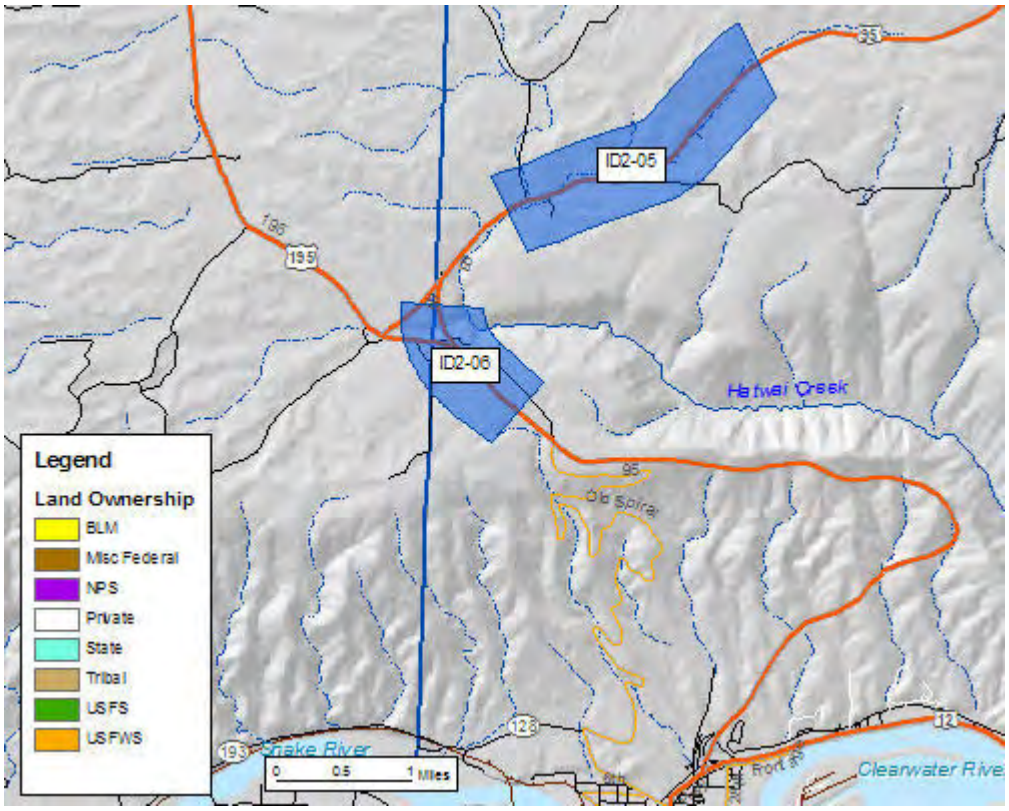
ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:
Elk herd moving to Washington.

ITD2_ID: ID2-06





ITD2_ID: ID2-06

AOI_NAME: Hatwai Canyon

PRIORITY: Low

SPECIES: mule deer/ elk

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

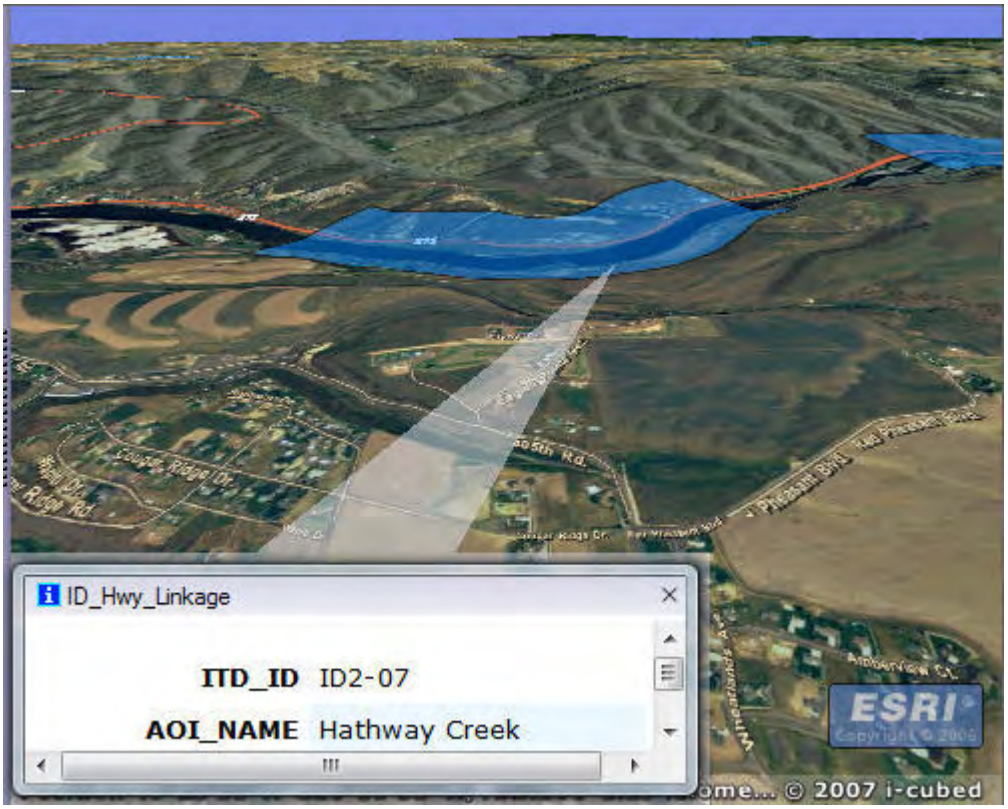
ATTRACT:

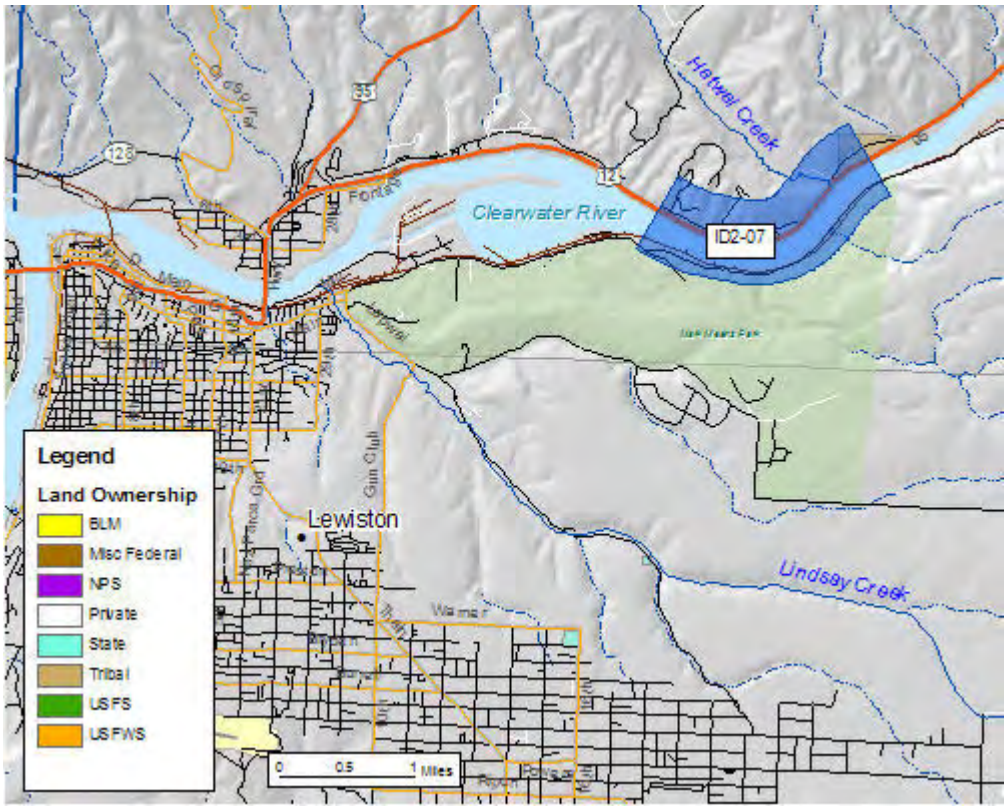
AGENCIES:

ADDITIONAL COMMENTS:

Big game (elk and deer) x-ing area.

ITD2_ID: ID2-07





ITD2_ID: ID2-07

AOI_NAME: Hathway Creek

PRIORITY: Low

SPECIES: white-tail deer/ moose/ steelhead/ reptiles/ amphibians/ geese, waterfowl, owls, small birds, bald eagle wintering area/ small mammals

MIG_POP: No

LOC_POP: Yes

SCALE: Local

HWY_MORT:

SEASON:

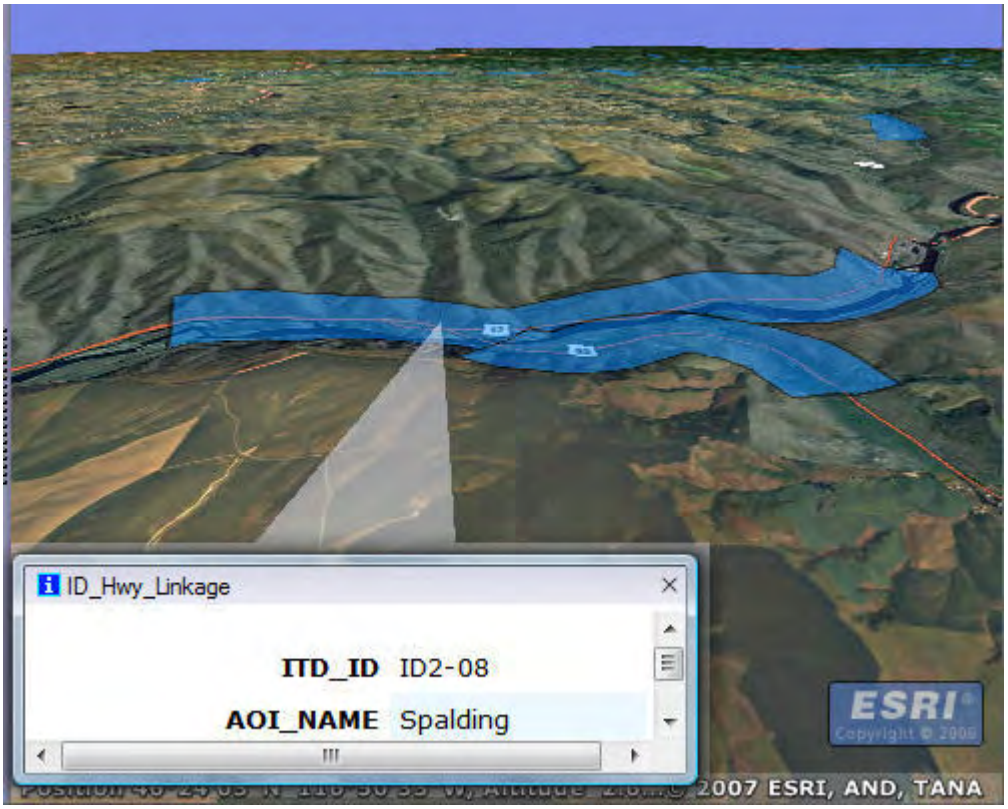
ATTRACT: water/riparian

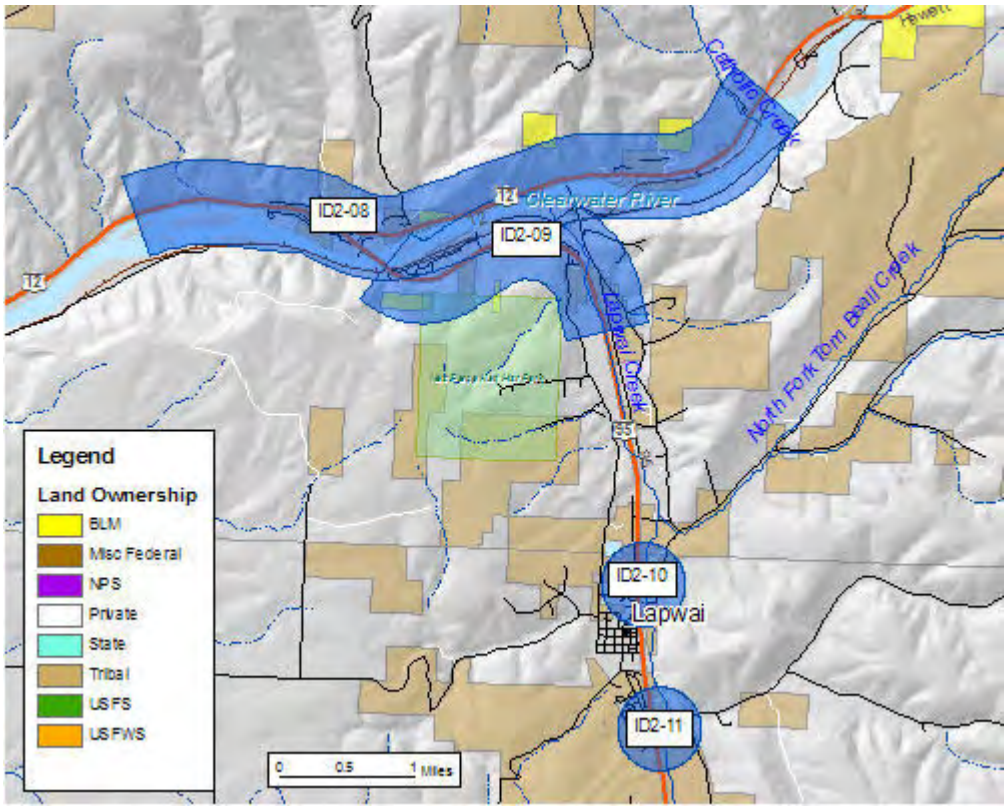
AGENCIES:

ADDITIONAL COMMENTS:

Major river corridor.Culvert.

ITD2_ID: ID2-08





ITD2_ID: ID2-08

AOI_NAME: Spalding

PRIORITY: Low

SPECIES: white-tail deer/ reptiles/ bald eagle wintering area, Heron rookery on Hog Island/ Fish passage issues

MIG_POP: No

LOC_POP: Yes

SCALE: Local

HWY_MORT:

SEASON:

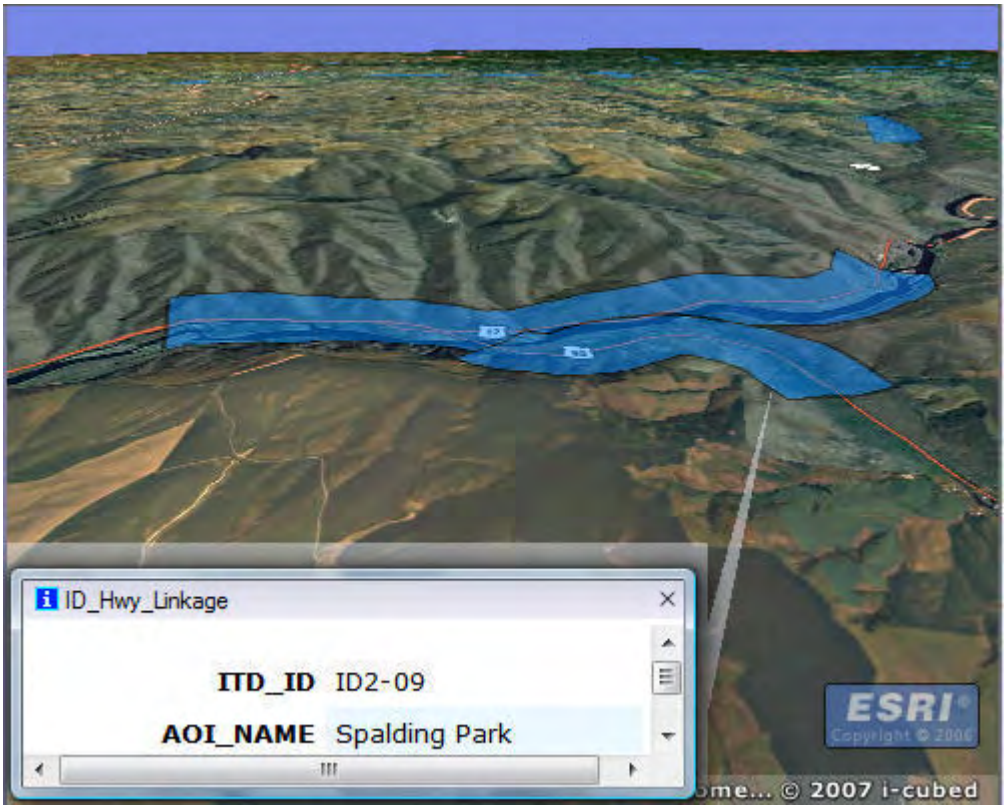
ATTRACT: water/riparian

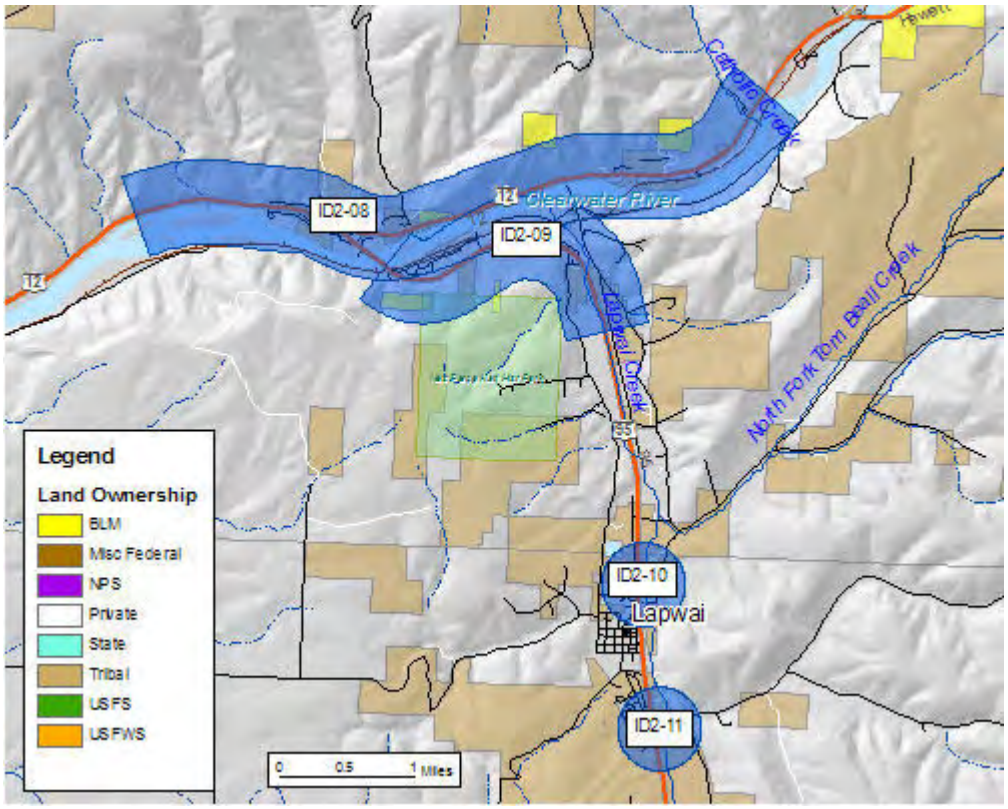
AGENCIES:

ADDITIONAL COMMENTS:

Tribe says bridge on Catholic Creek, which was a problem for fish passage, was fixed.

ITD2_ID: ID2-09





ITD2_ID: ID2-09

AOI_NAME: Spalding Park

PRIORITY: Low

SPECIES: white-tail deer/ bobcat/ songbirds, owls, bats/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

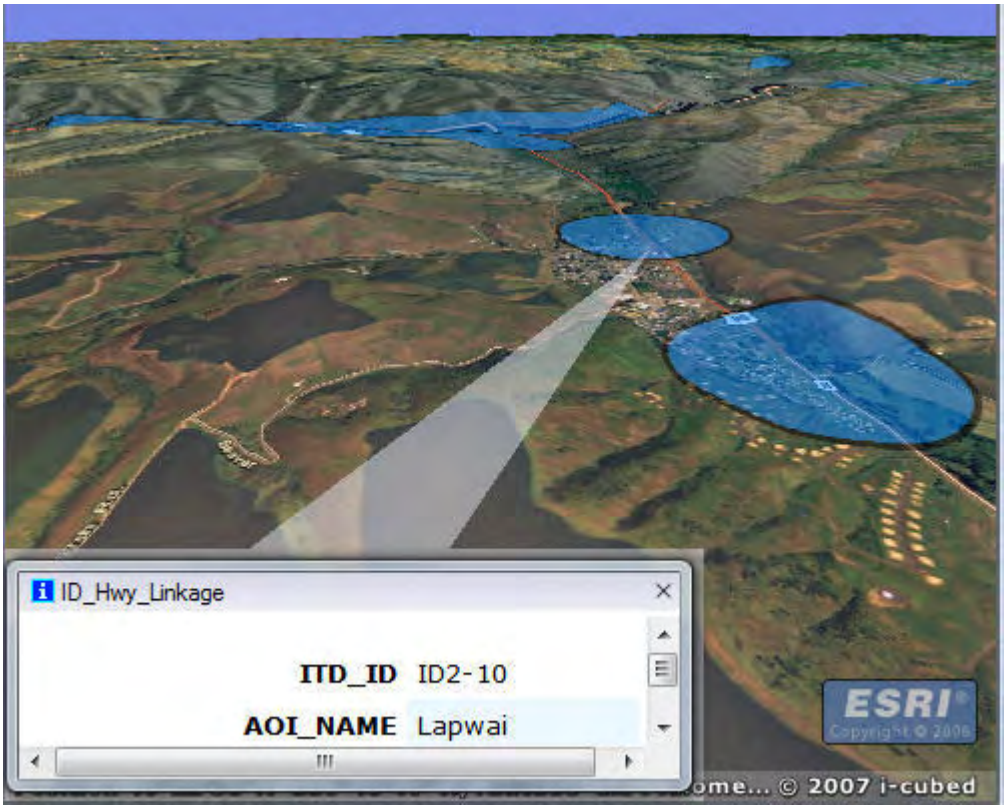
ATTRACT:

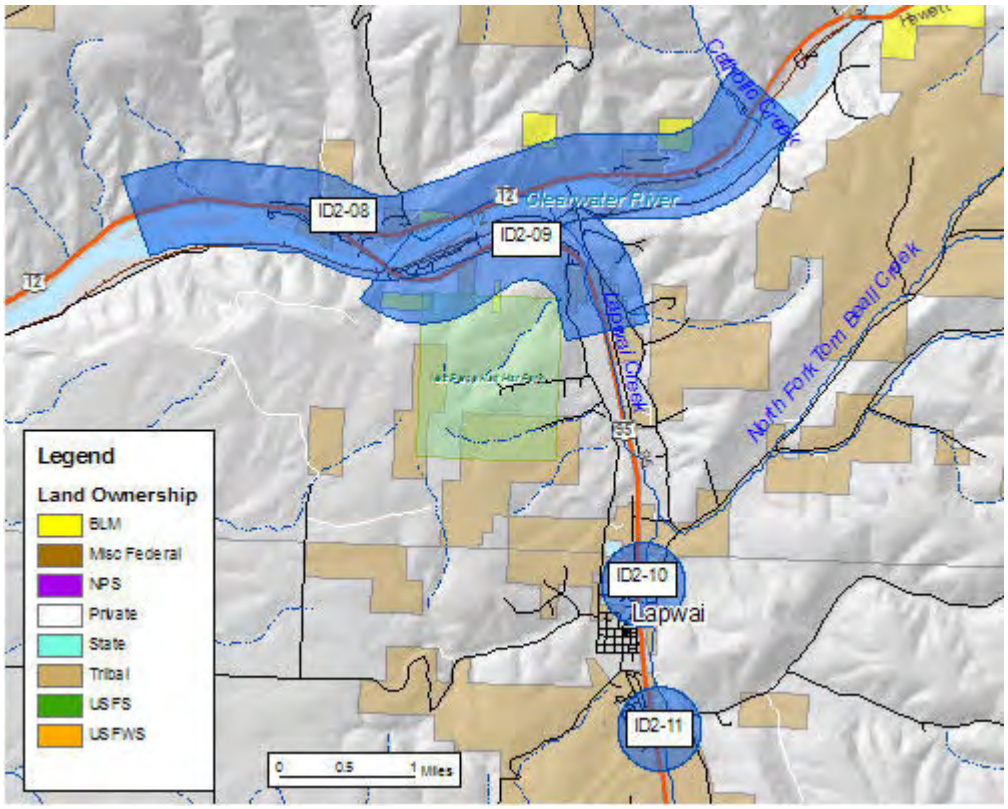
AGENCIES:

ADDITIONAL COMMENTS:

High mortality area for small mammals. Colville & state historical; mostly private.

ITD2_ID: ID2-10





ITD2_ID: ID2-10

AOI_NAME: Lapwai

PRIORITY: Low

SPECIES: fish passage issues

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

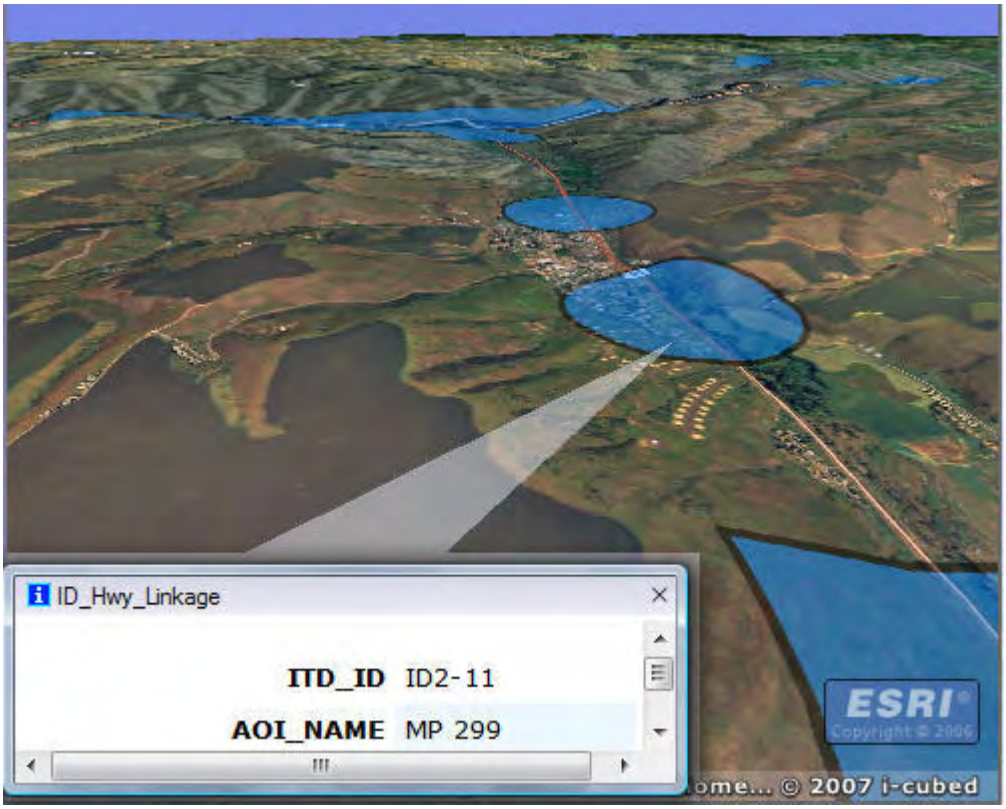
ATTRACT:

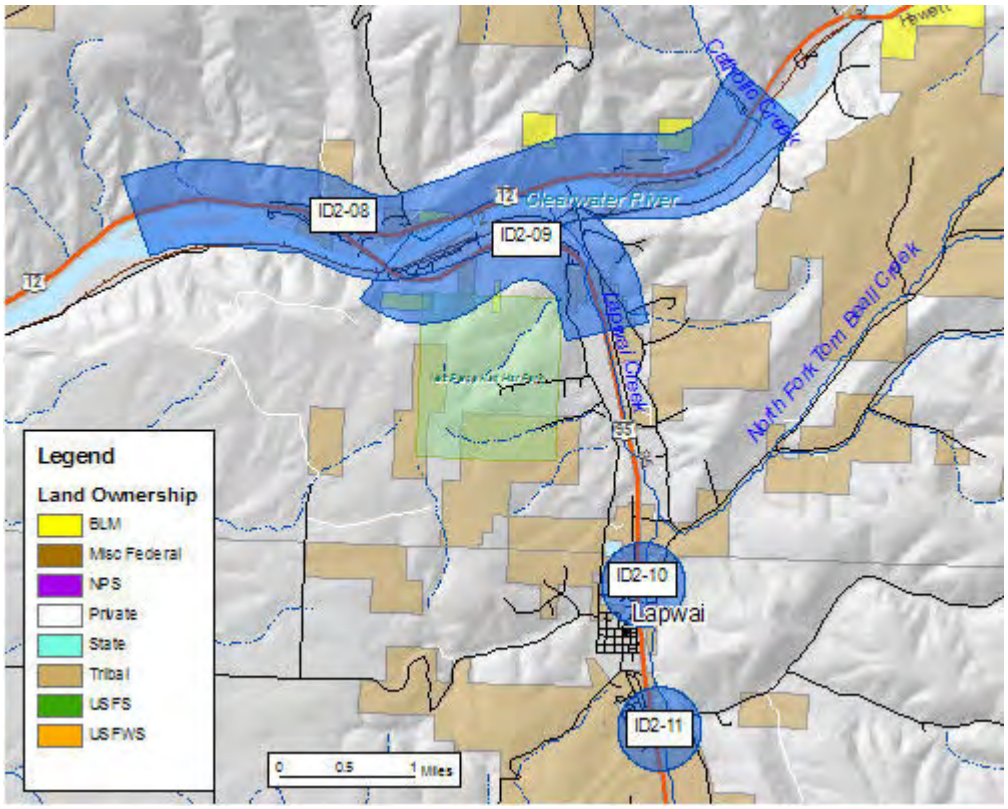
AGENCIES:

ADDITIONAL COMMENTS:

Bridge; not many ungulates along hwy; tribal assessment on Lapwai Cr; CDC Spaulding Catch Fly.

ITD2_ID: ID2-11





ITD2_ID: ID2-11

AOI_NAME: MP 299

PRIORITY: Low

SPECIES:

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

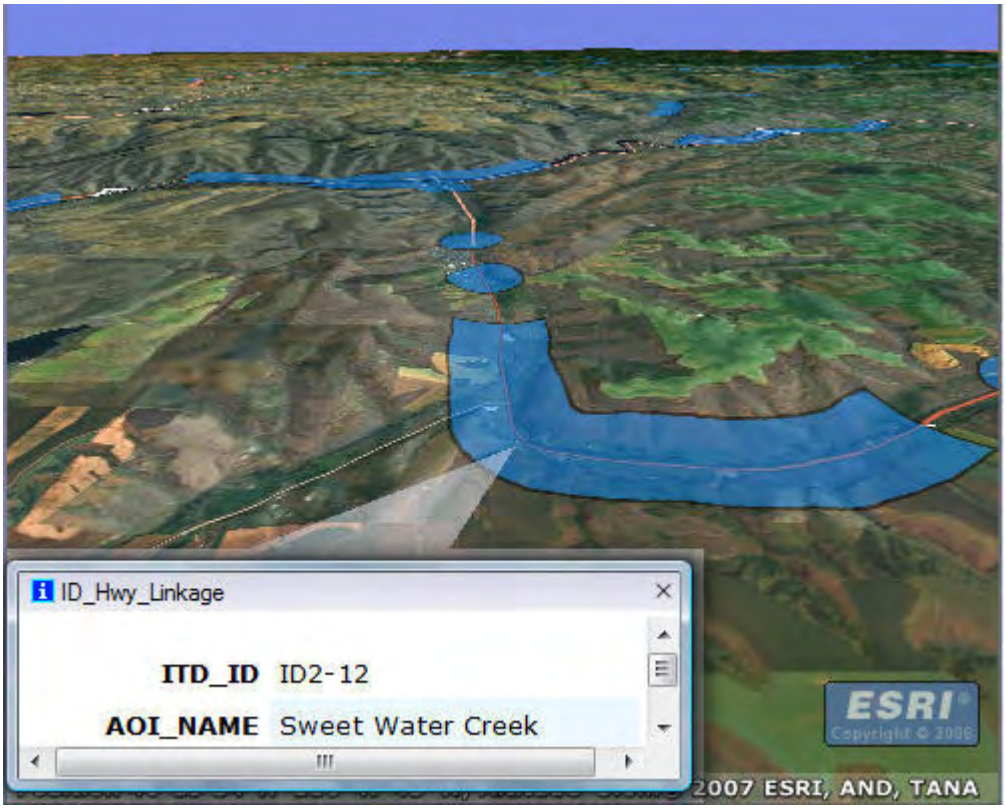
ATTRACT:

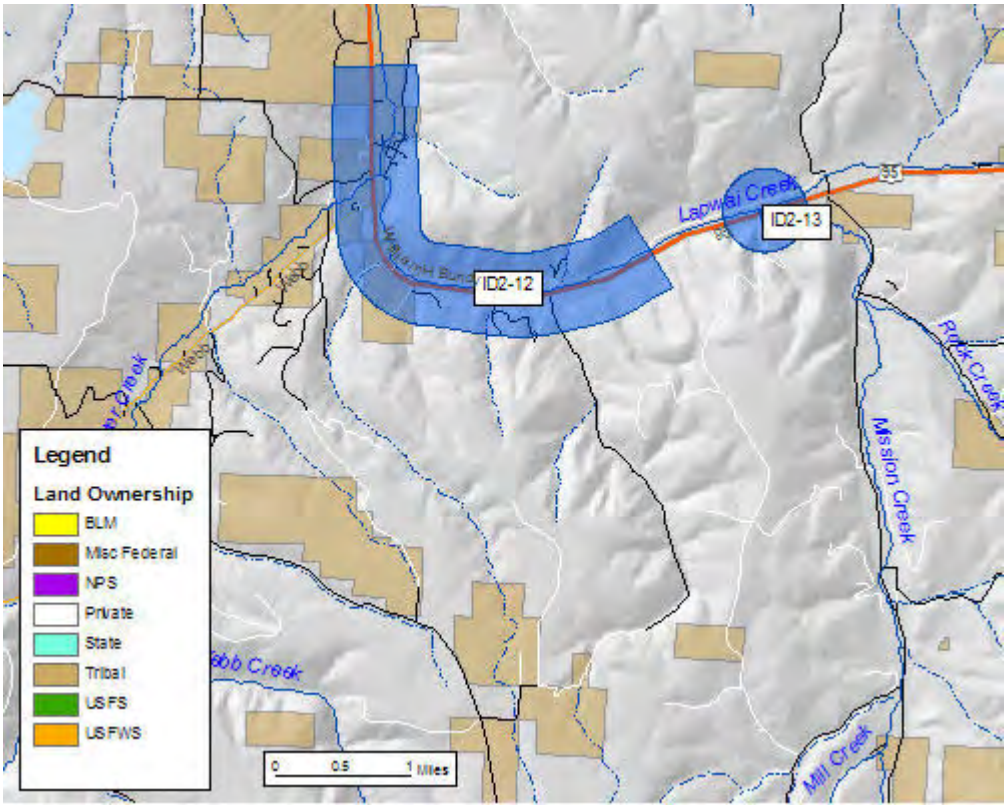
AGENCIES:

ADDITIONAL COMMENTS:

Bridge; not many ungulates along hwy; tribal assessment on Lapwai Cr; CDC Spaulding Catch Fly.

ITD2_ID: ID2-12





ITD2_ID: ID2-12

AOI_NAME: Sweet Water Creek

PRIORITY: Moderate

SPECIES: mule deer/ coyotes (2 hit on roadway in winter of 07-08)/ herons and gallinaceous birds/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

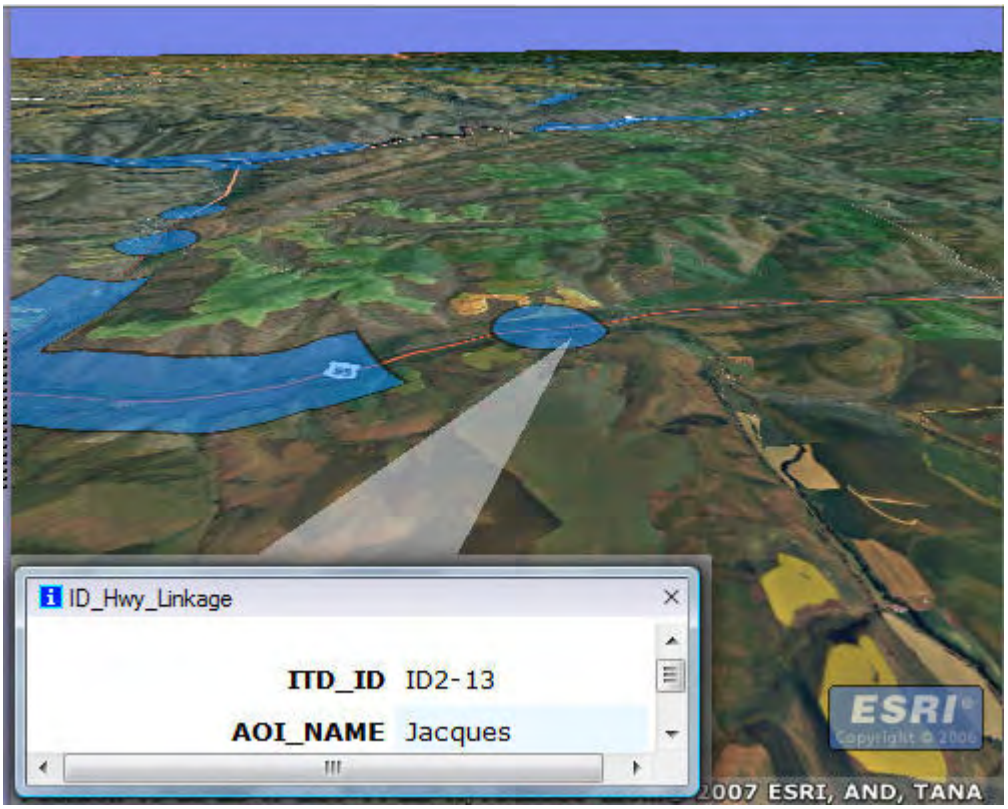
ATTRACT: water/riparian

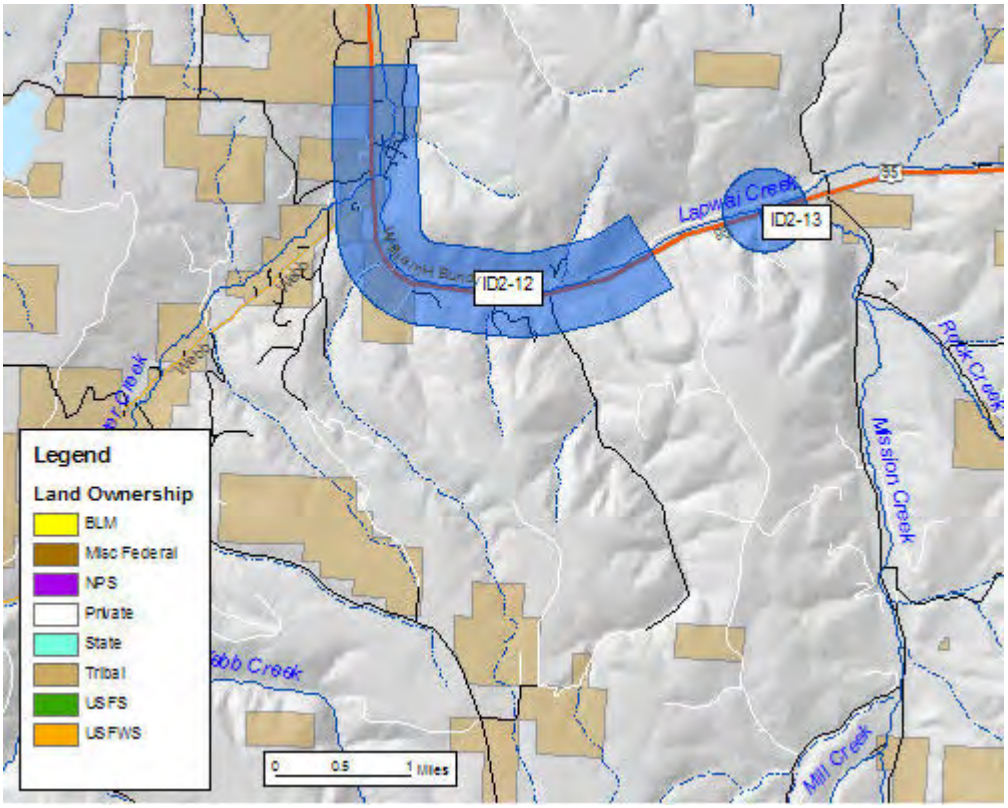
AGENCIES:

ADDITIONAL COMMENTS:

Bridge; not many ungulates along hwy; tribal assessment on Lapwai Cr; CDC Spaulding Catch Fly.

ITD2_ID: ID2-13





ITD2_ID: ID2-13

AOI_NAME: Jacques

PRIORITY: Low

SPECIES:

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

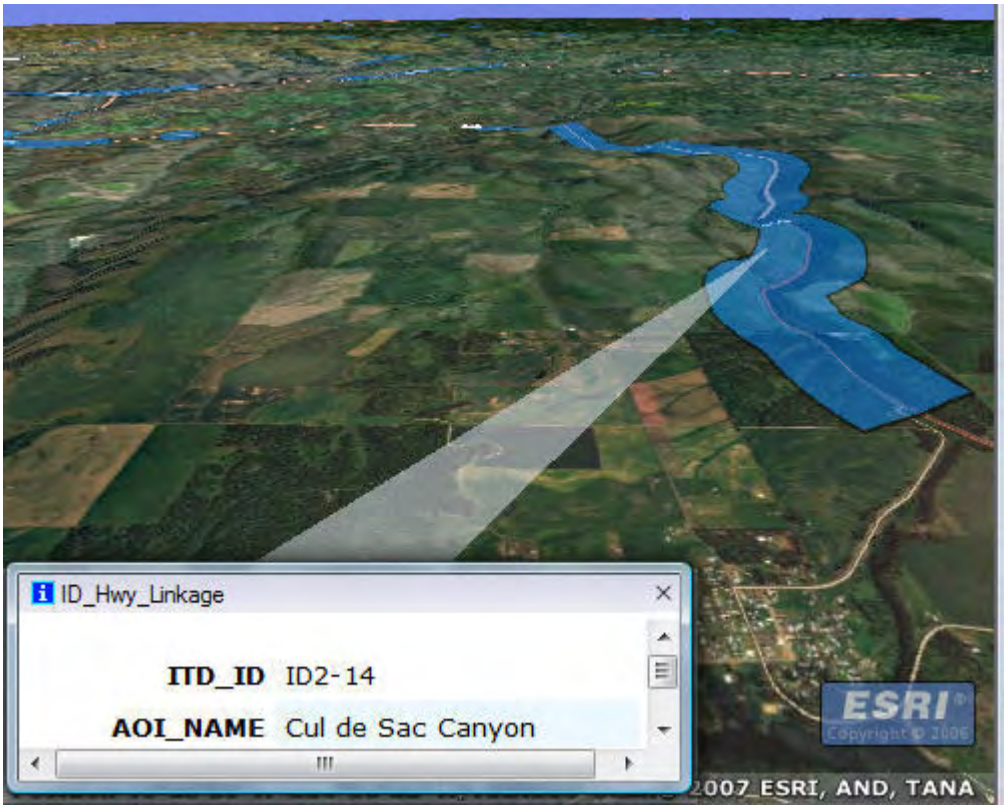
ATTRACT:

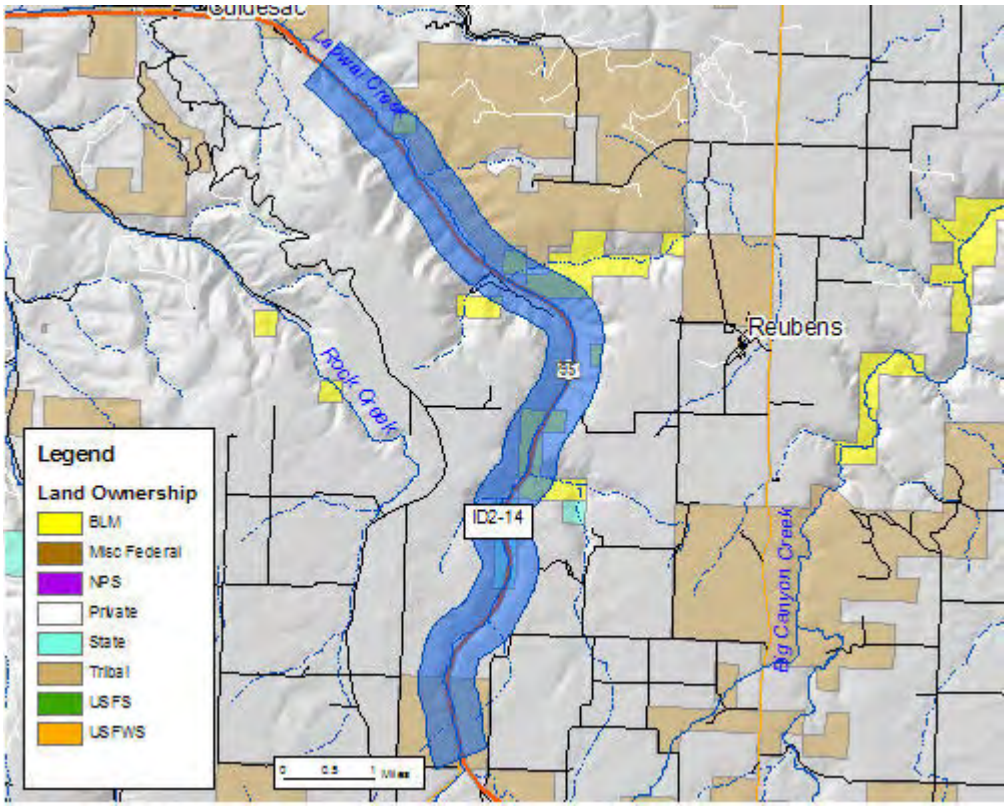
AGENCIES:

ADDITIONAL COMMENTS:

Bridge; not many ungulates along hwy; tribal assessment on Lapwai Cr; CDC Spaulding Catch Fly.

ITD2_ID: ID2-14





ITD2_ID: ID2-14

AOI_NAME: Cul de Sac Canyon

PRIORITY: High

SPECIES: mule deer/ white-tail deer/ elk/ black bear/ mountain lion/ spawning and rearing area for steelhead

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

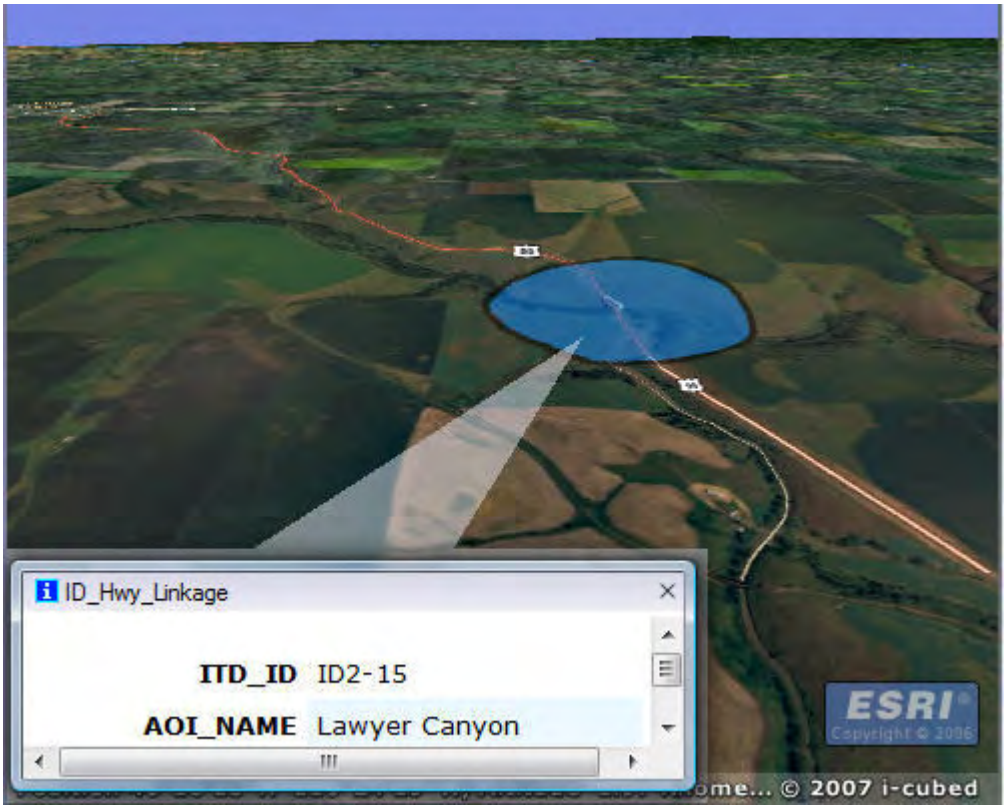
ATTRACT:

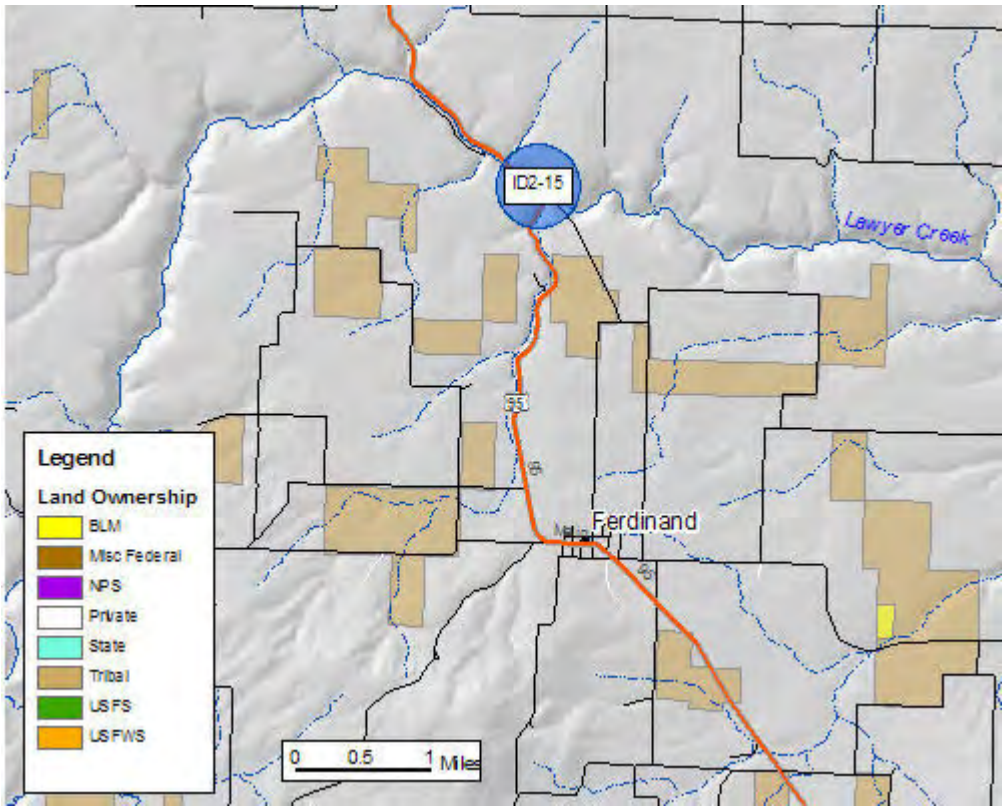
AGENCIES:

ADDITIONAL COMMENTS:

This linkage area was identified as a Pilot Project at the 4/2/08 workshop.

ITD2_ID: ID2-15





ITD2_ID: ID2-15

AOI_NAME: Lawyer Canyon

PRIORITY: Low

SPECIES:

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

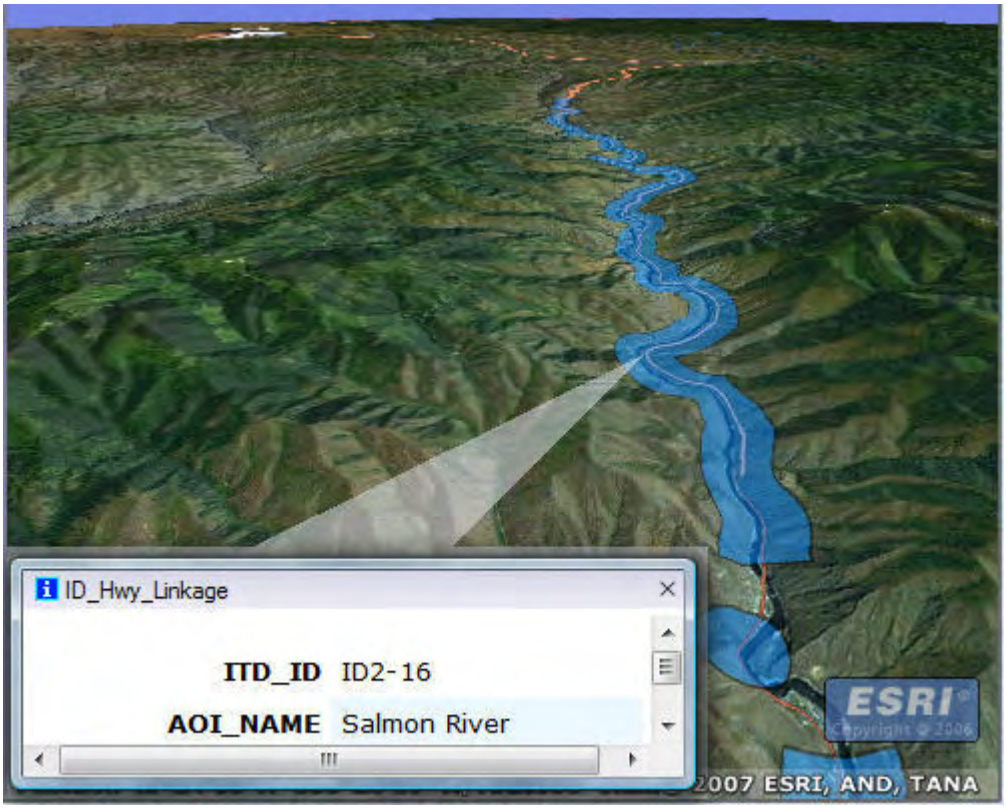
ATTRACT:

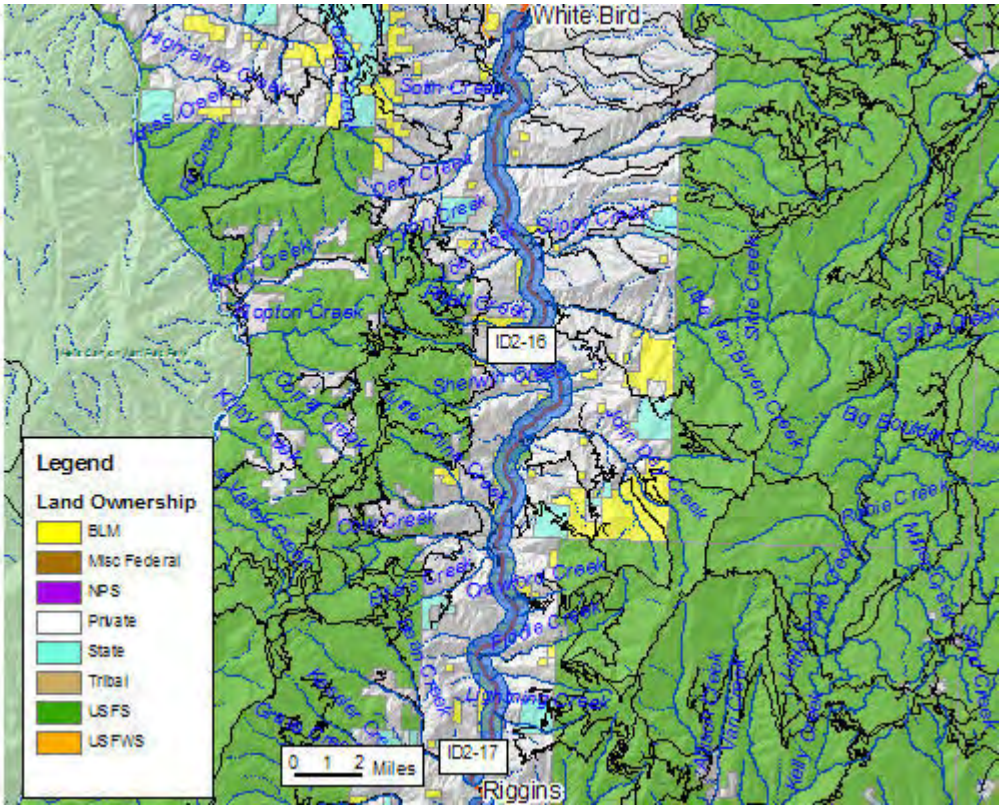
AGENCIES:

ADDITIONAL COMMENTS:

No issues identified. Major riparian corridor. High bridge.

ITD2_ID: ID2-16





ITD2_ID: ID2-16

AOI_NAME: Salmon River

PRIORITY: High

SPECIES: mule deer/white-tail deer/ elk/ black bear/ fish passage issues

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

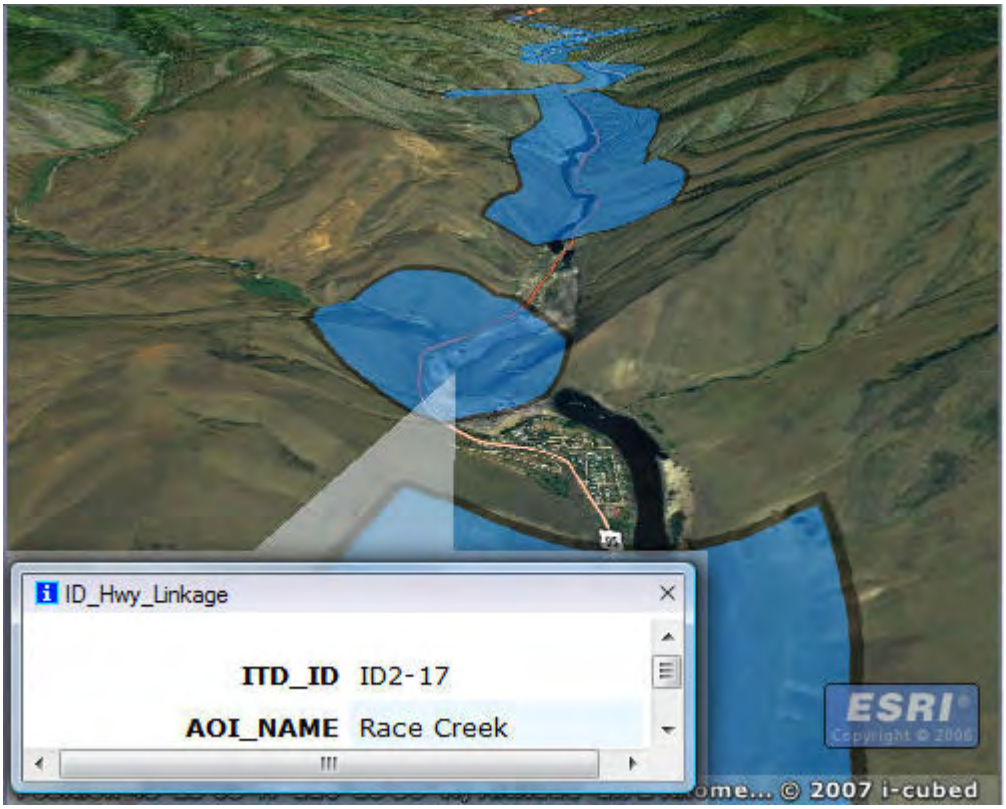
ATTRACT: water/riparian/ orchards attract black bears near John Day Creek

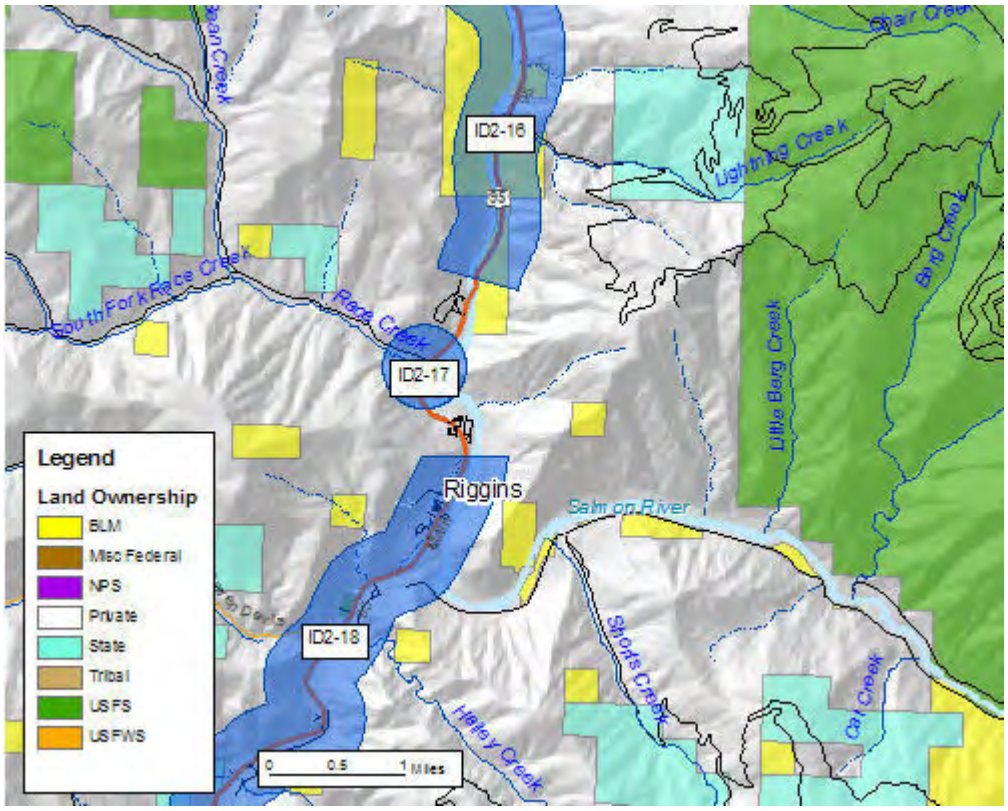
AGENCIES:

ADDITIONAL COMMENTS:

Heavy mule deer road kill area, but whitetails killed too. From 29 February to 16 April 2008, 3 whitetails and no mule deer were picked up at MP 217 by ITD road crews. Elk crossing at mp 212-216.Guzzlers could be used to keep animals from going across the roadway to access water. MP 215-220 very high mule deer road kill area. High concentration of black bears at John Day Creek. John Day creek location for bridge replacement. This linkage area was identified as a Pilot Project at the 4/2/08 workshop. Old underpass bridge. Big fisheries. Mitigation site. McFarland 4 o'clock. Skookumchuck 4 o'clock.

ITD2_ID: ID2-17





ITD2_ID: ID2-17

AOI_NAME: Race Creek

PRIORITY: Low

SPECIES:

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

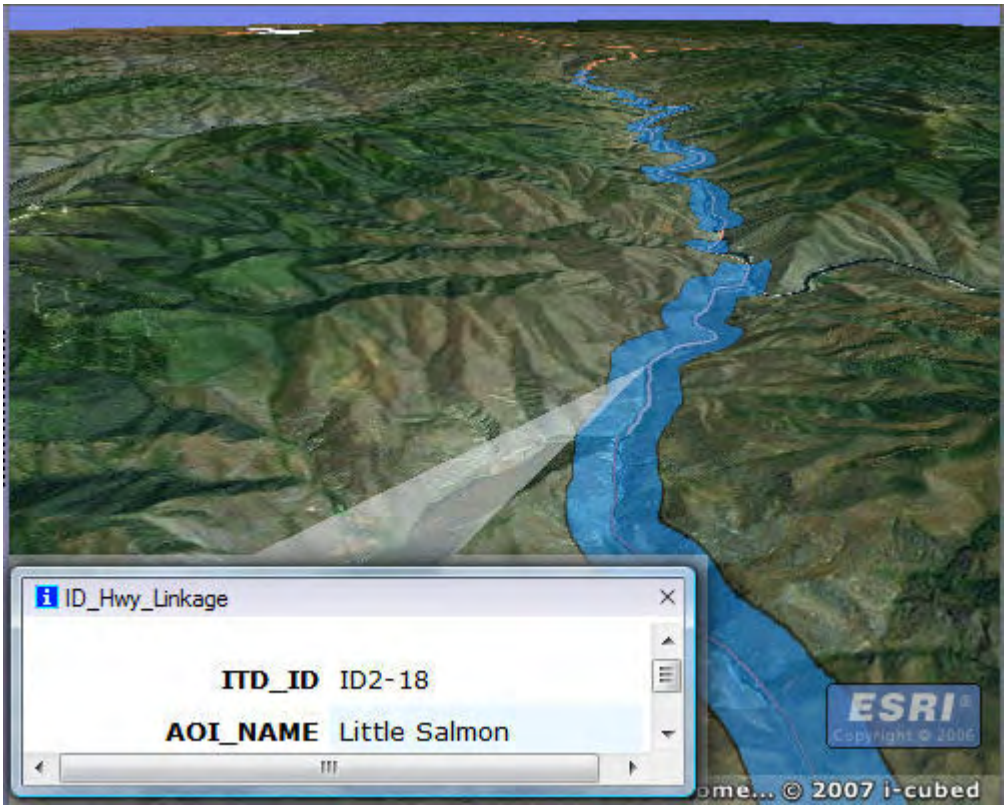
ATTRACT:

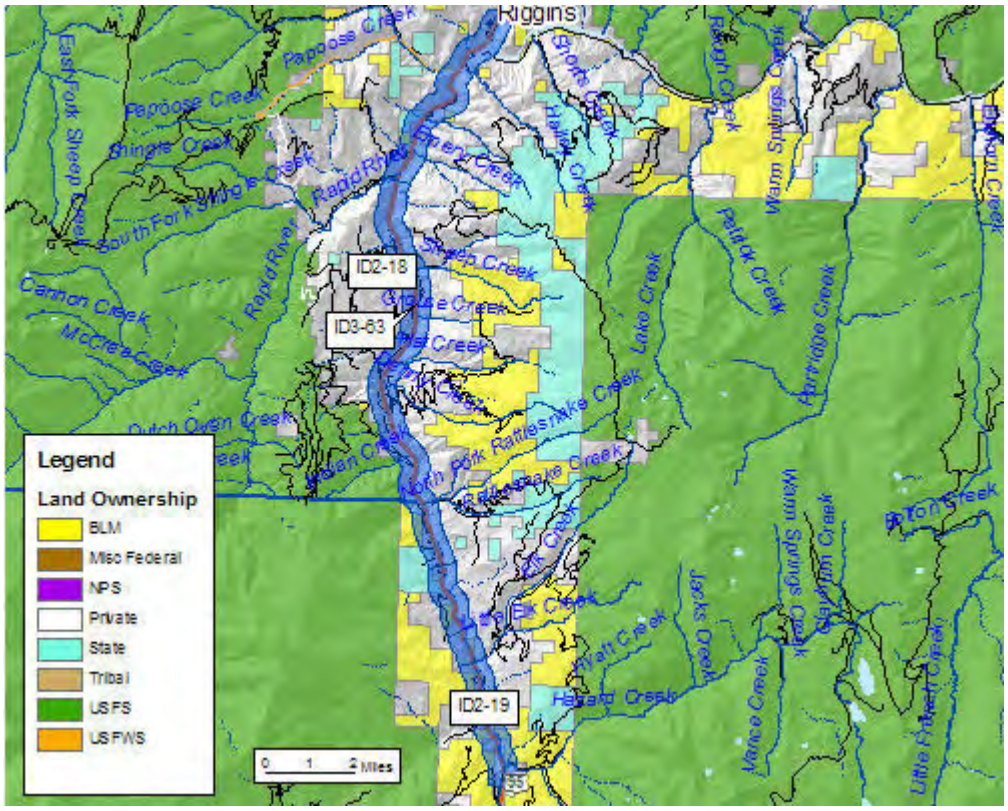
AGENCIES:

ADDITIONAL COMMENTS:

Bridge

ITD2_ID: ID2-18





ITD2_ID: ID2-18

AOI_NAME: Little Salmon

PRIORITY: High

SPECIES: mule deer/ white-tail deer/ elk/ fish passage issues/ salmon, bull trout, steelhead

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT: >20

SEASON: Spring, Summer, Fall, Winter

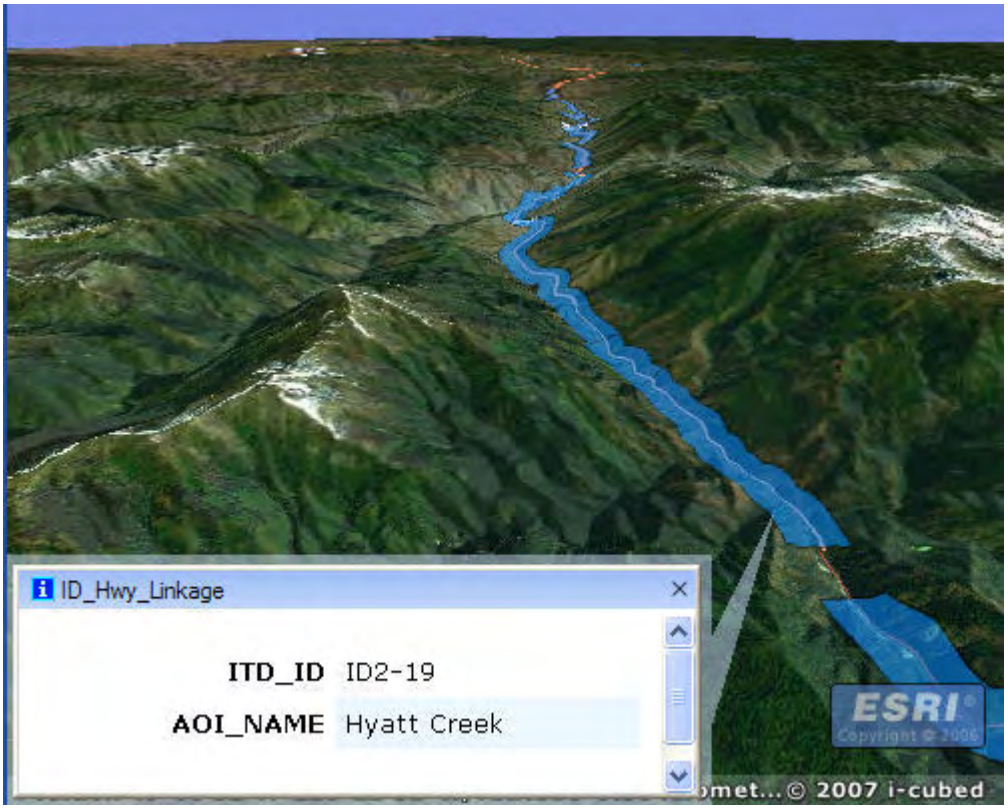
ATTRACT: water/riparian

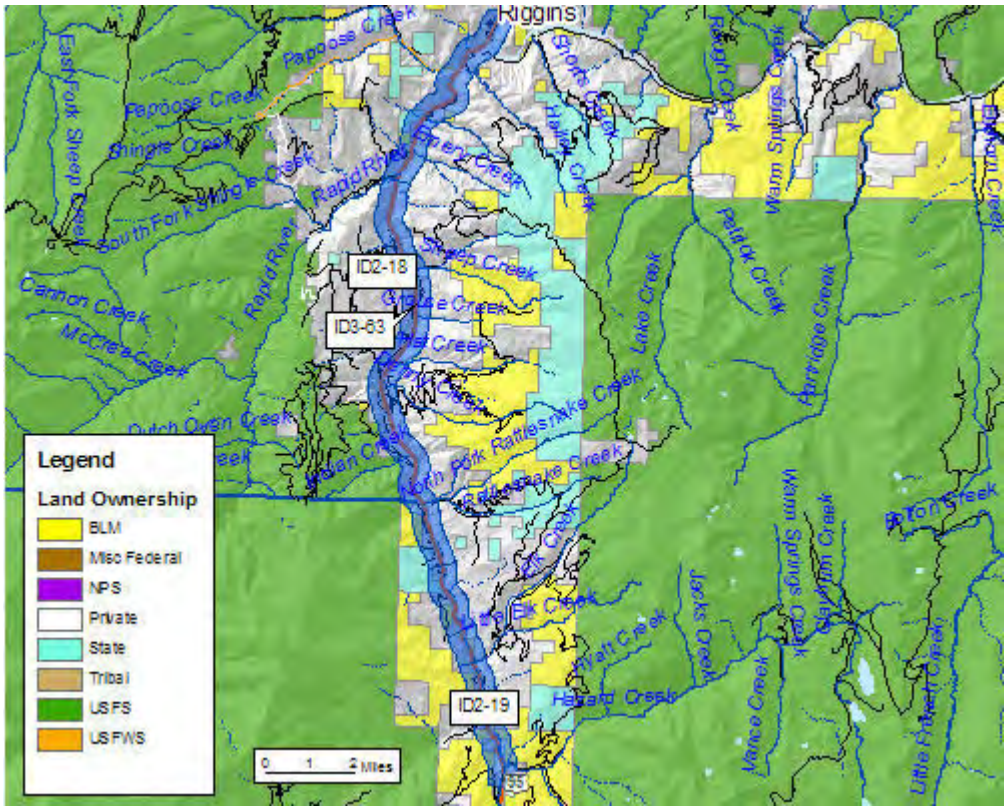
AGENCIES:

ADDITIONAL COMMENTS:

Often referred to as “blood alley.” Very high level of mule deer mortality, especially at mp 183-191, 193-196.From 29 February to 16 April 2008, 13 animals (50:50 white-tailed deer: mule deer) were picked up between MP 182-189.In winter, animals bed down on right-of-way. On 4-08-08 a wolf was road-killed at MP 188 (Bruce Bovey, ITD, has pictures).Elk crossing area at mp 192-193 (Boggan-Wick's Bridge).Mule deer are attracted to water provided by the Little Salmon River. This linkage area was identified as a Pilot Project at the 4/2/08 workshop. There is a potential highway project near Smokey Boulder. Bridge. Big box culvert, Rattlesnake Cr.

ITD2_ID: ID2-19





ITD2_ID: ID2-19

AOI_NAME: Hyatt Creek

PRIORITY: Low

SPECIES: elk/ black bear/ fish passage issues/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

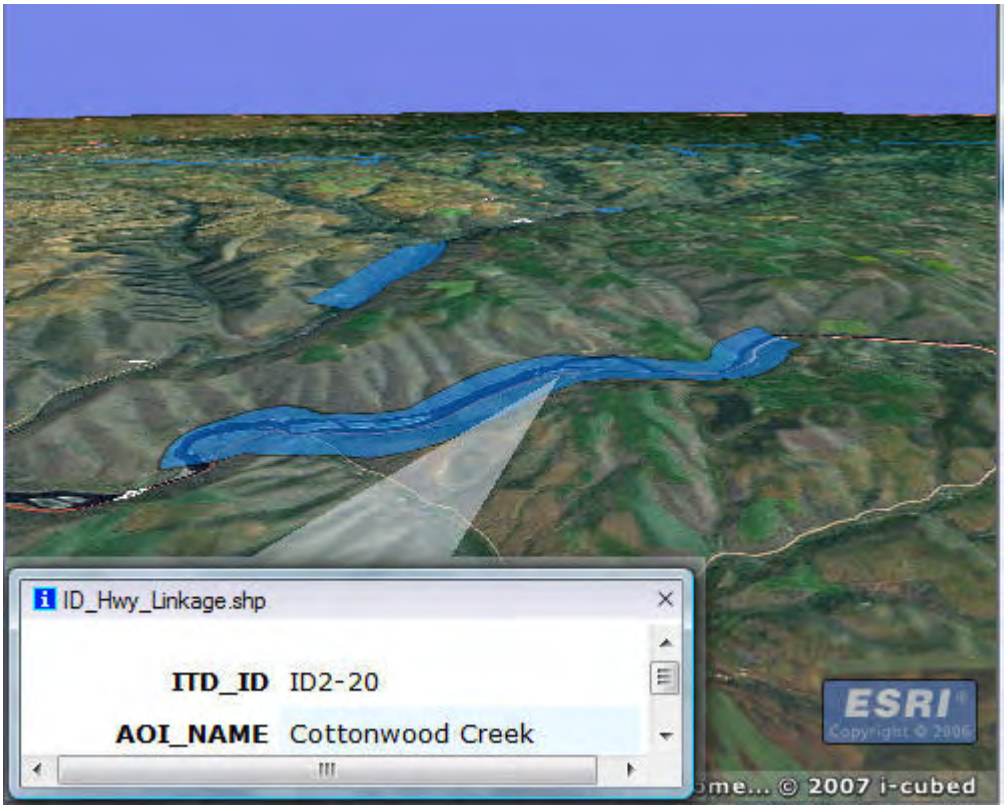
ATTRACT:

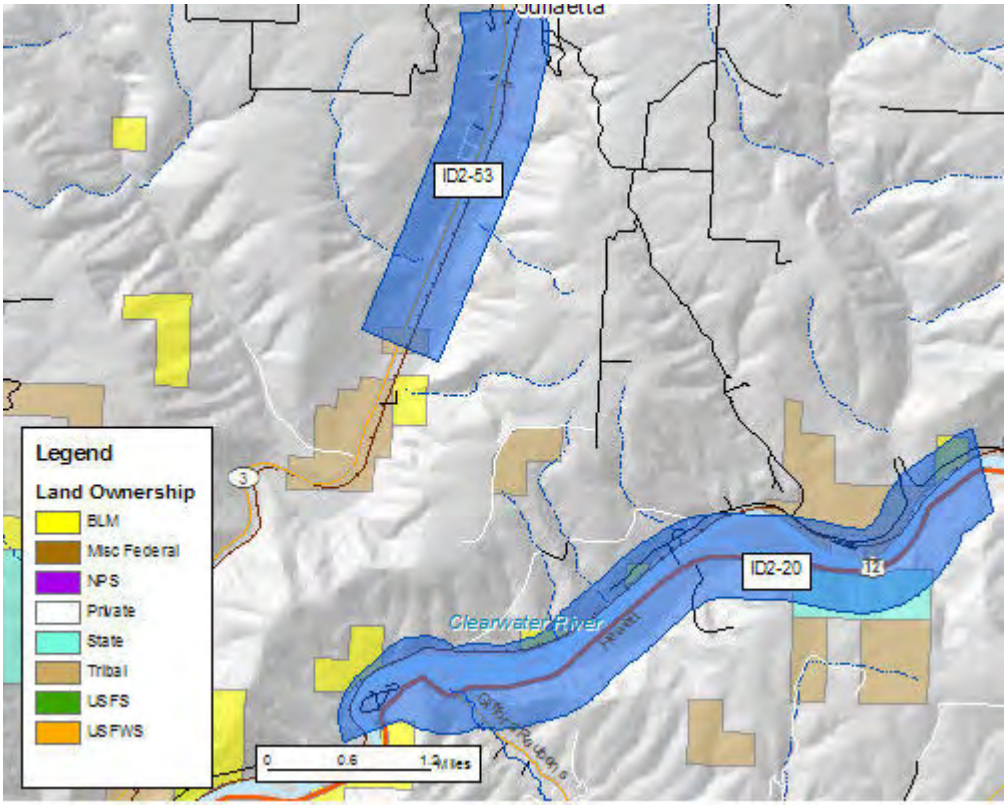
AGENCIES:

ADDITIONAL COMMENTS:

Bridge at Elk Creek has been replaced. New pipe recently installed. Fisheries; bridge; GIS map of special areas of concern; Trail Cr and Hazard Cr fisheries.

ITD2_ID: ID2-20





ITD2_ID: ID2-20

AOI_NAME: Cottonwood Creek

PRIORITY: Low

SPECIES: white-tail deer/ elk/ steelhead (in Cottonwood Creek)/ bald eagle wintering area, bald eagle nest on Fir Island, which is within this linkage area/ beaver, porcupines

MIG_POP: No

LOC_POP: Yes

SCALE: Local

HWY_MORT:

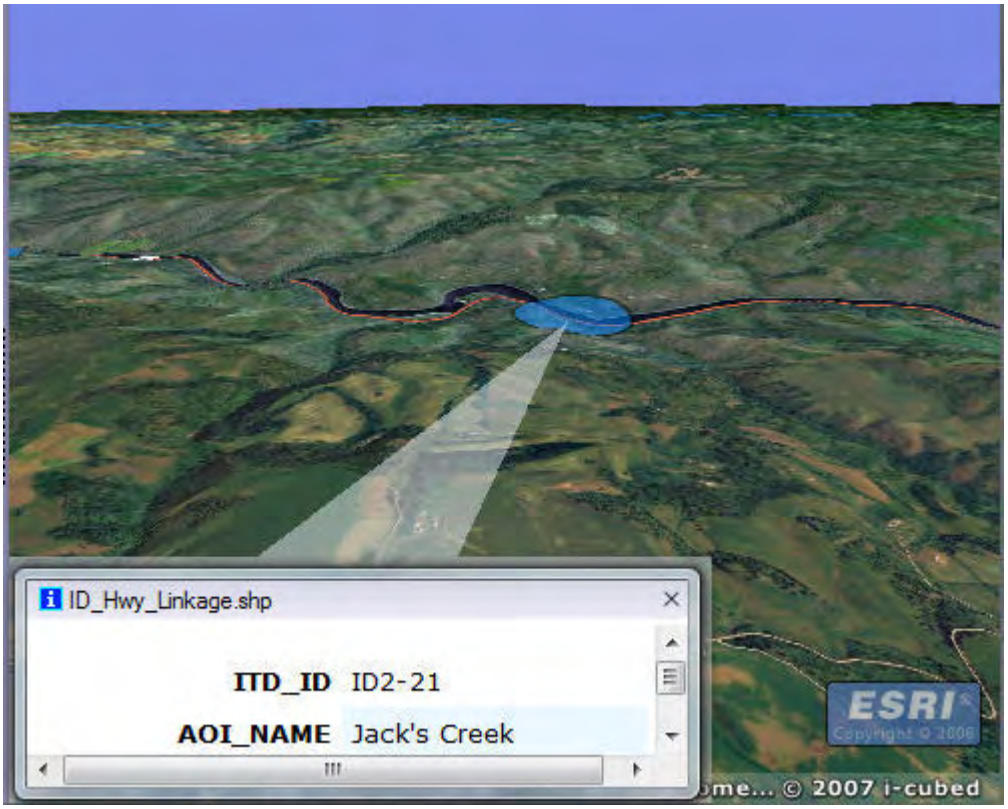
SEASON: Spring, Summer, Fall, Winter

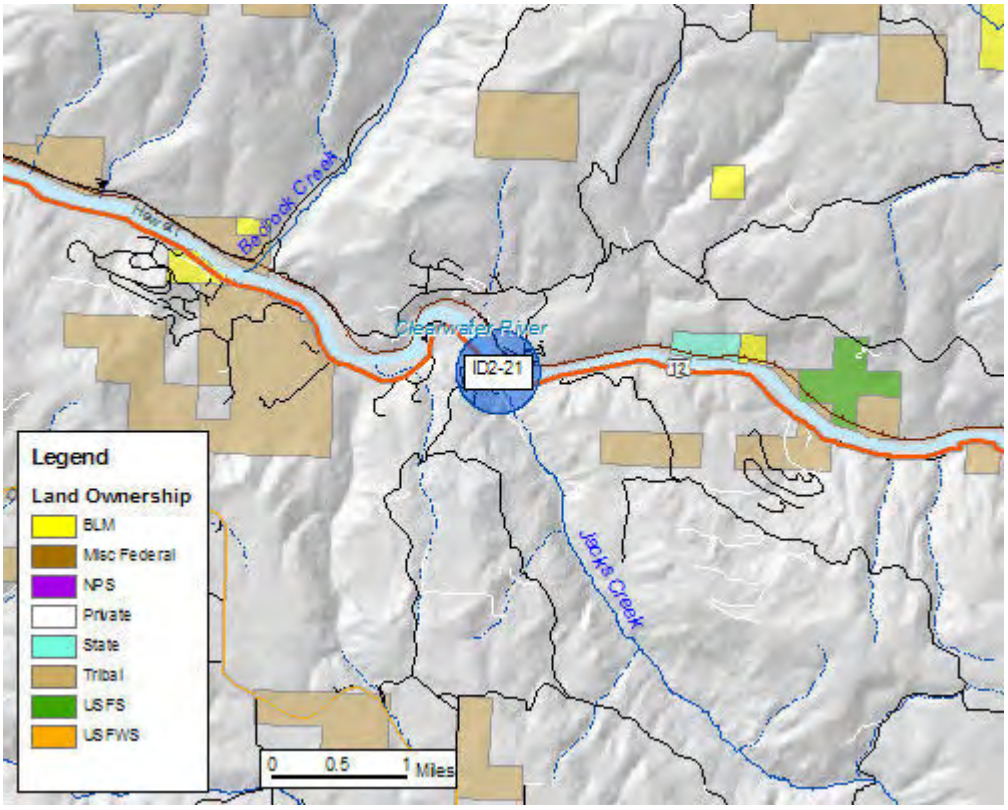
ATTRACT: water/riparian

AGENCIES:

ADDITIONAL COMMENTS:
It's questionable if there is still a fish passage issue, but there is a fish passage issue on the county road. Culvert/bridge; mp 27 small culvert

ITD2_ID: ID2-21





ITD2_ID: ID2-21

AOI_NAME: Jack's Creek

PRIORITY: Low

SPECIES: steelhead/ reptiles/ amphibians/ swallows hit on the roadway/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

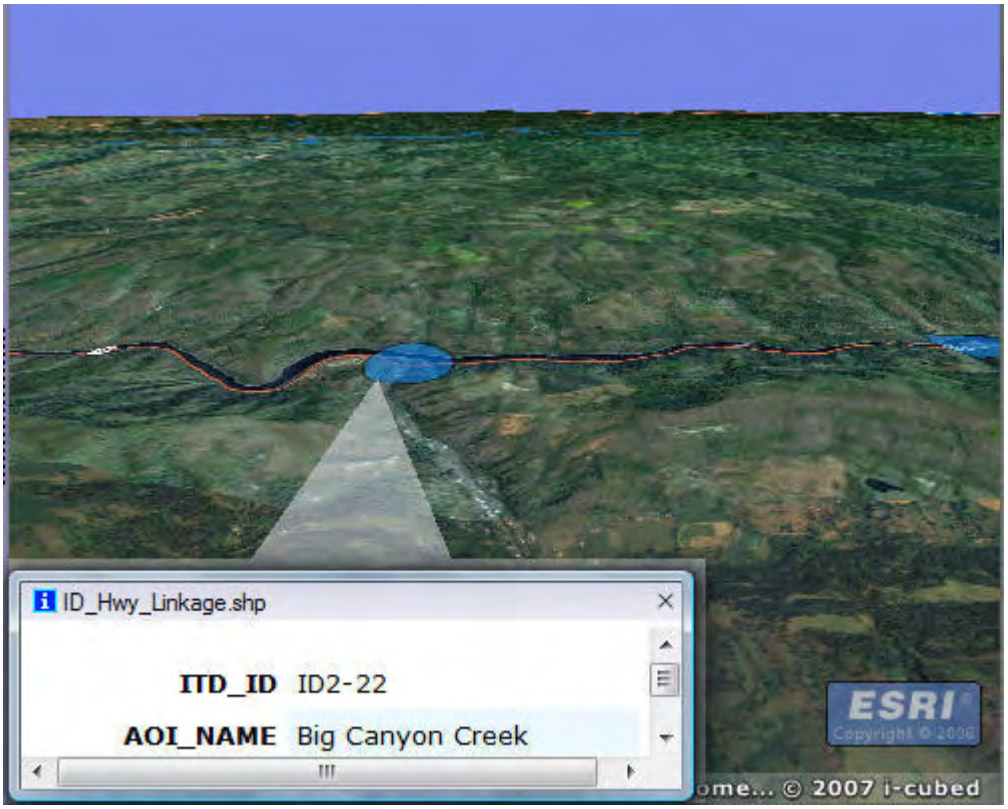
ATTRACT: water/riparian

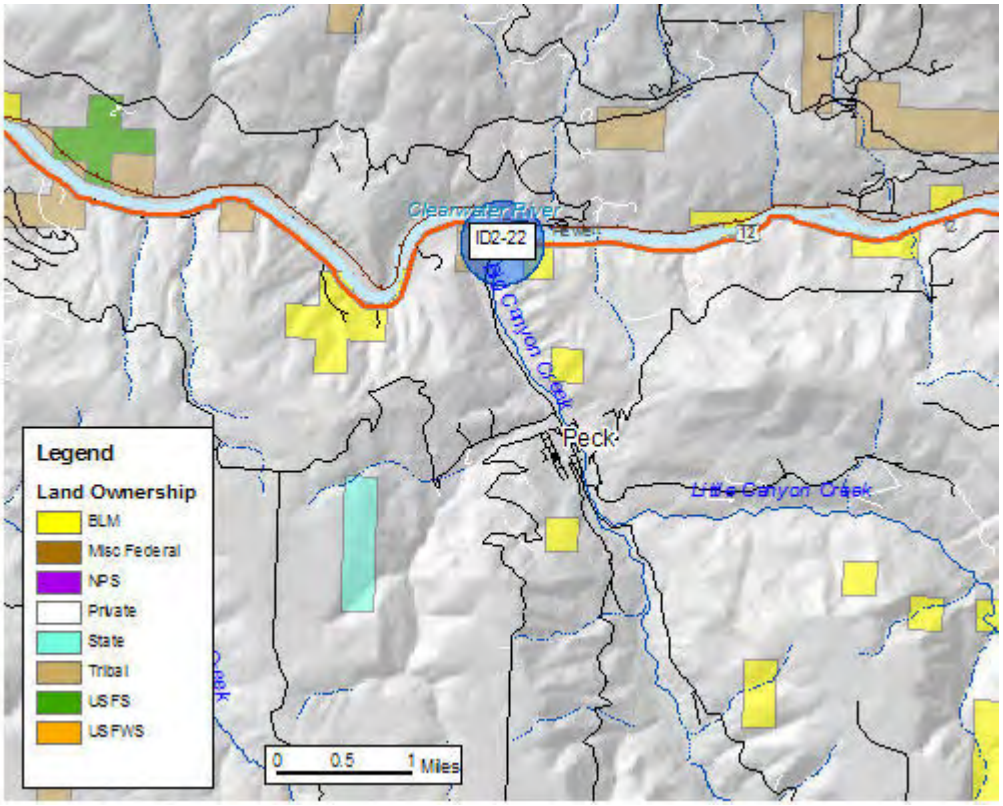
AGENCIES:

ADDITIONAL COMMENTS:

A culvert is present that may be a potential fish barrier at low water. Culvert/bridge; mp 27 small culvert.

ITD2_ID: ID2-22





ITD2_ID: ID2-22

AOI_NAME: Big Canyon Creek

PRIORITY: Low

SPECIES: white-tail deer/ reptiles/ amphibians

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

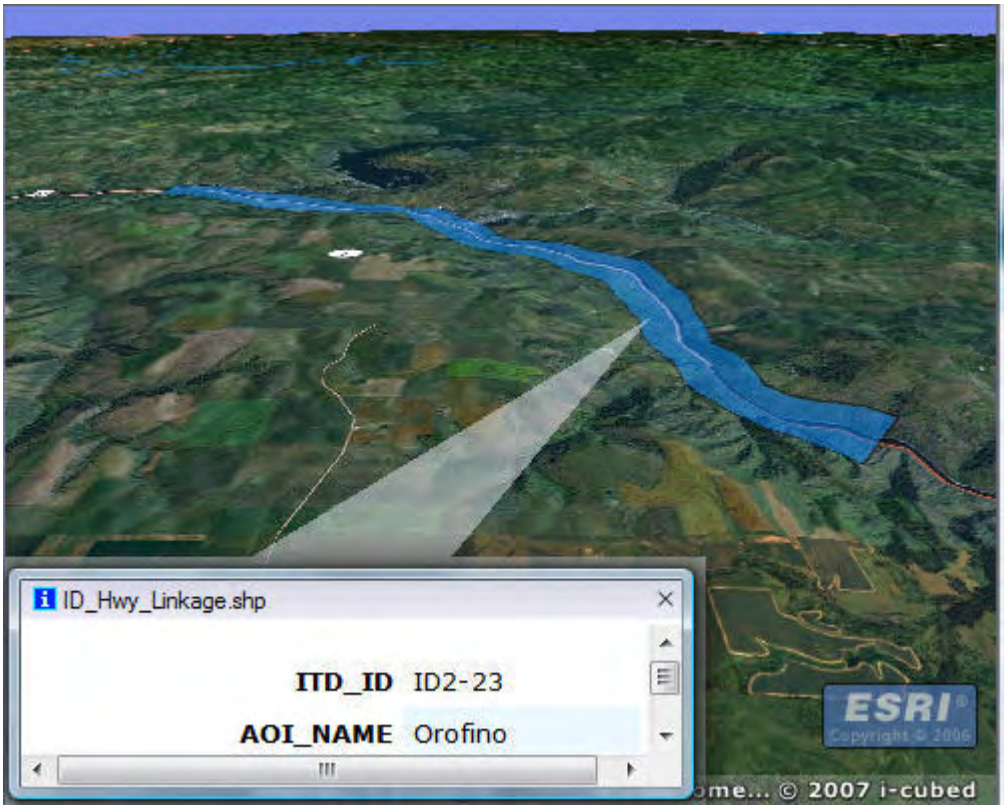
SEASON: Spring, Summer, Fall, Winter

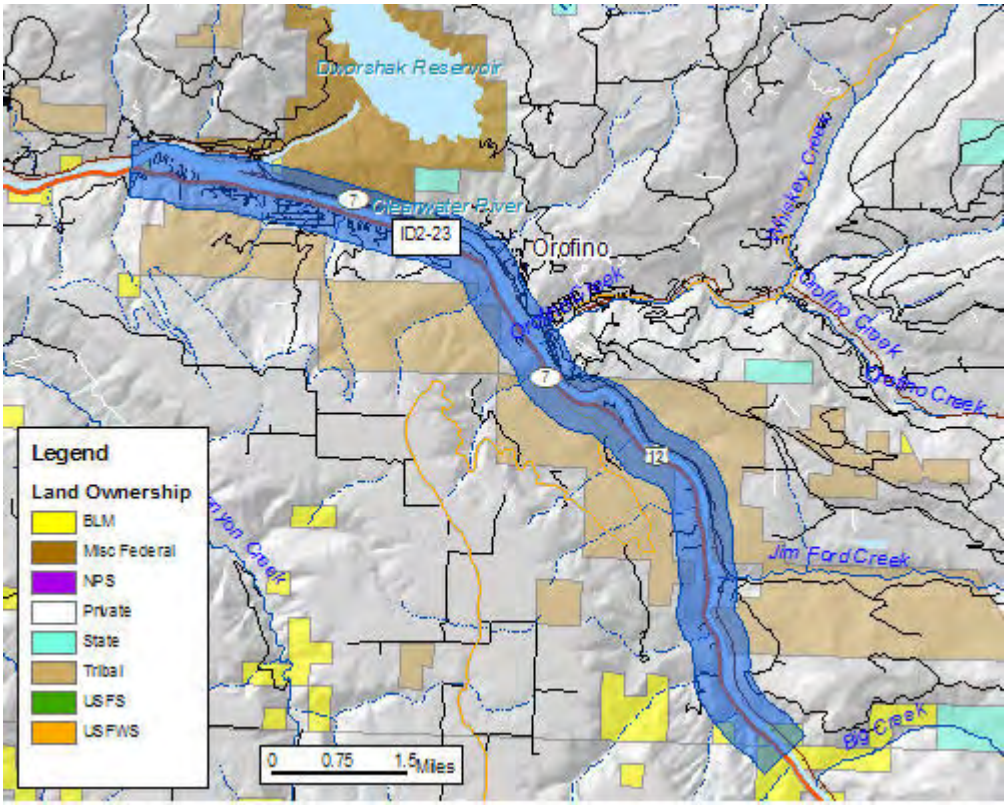
ATTRACT: Golf Course is an attractant to wildlife

AGENCIES:

ADDITIONAL COMMENTS:
Bridge

ITD2_ID: ID2-23





ITD2_ID: ID2-23

AOI_NAME: Orofino

PRIORITY: Low

SPECIES: white-tail deer/ raccoons/ skunks

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT: White-tail deer, birds, small mammals

SEASON: Deer year-round

ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:

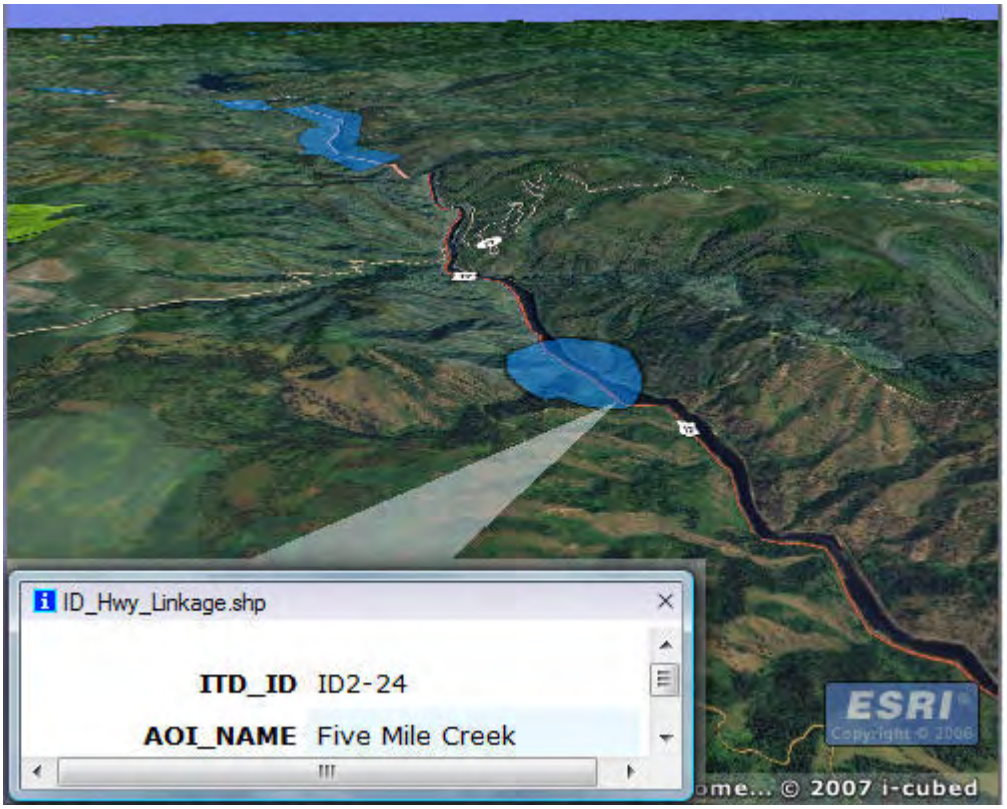
Permanent Human Presence: Residential homes.

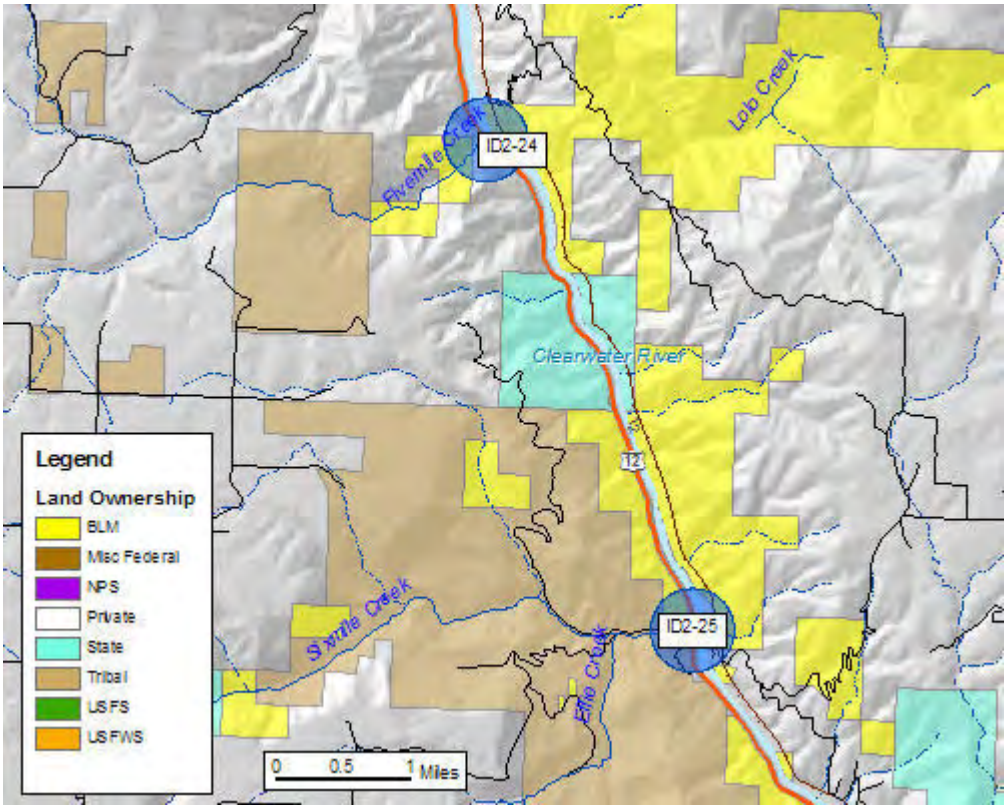
Effective functioning of linkage area: Site functions with moderate levels of wildlife mortalities.

Opportunities to improve the effectiveness of the linkage area: Probably just signage.

This is a suburban area.

ITD2_ID: ID2-24





ITD2_ID: ID2-24

AOI_NAME: Five Mile Creek

PRIORITY: Low

SPECIES: small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

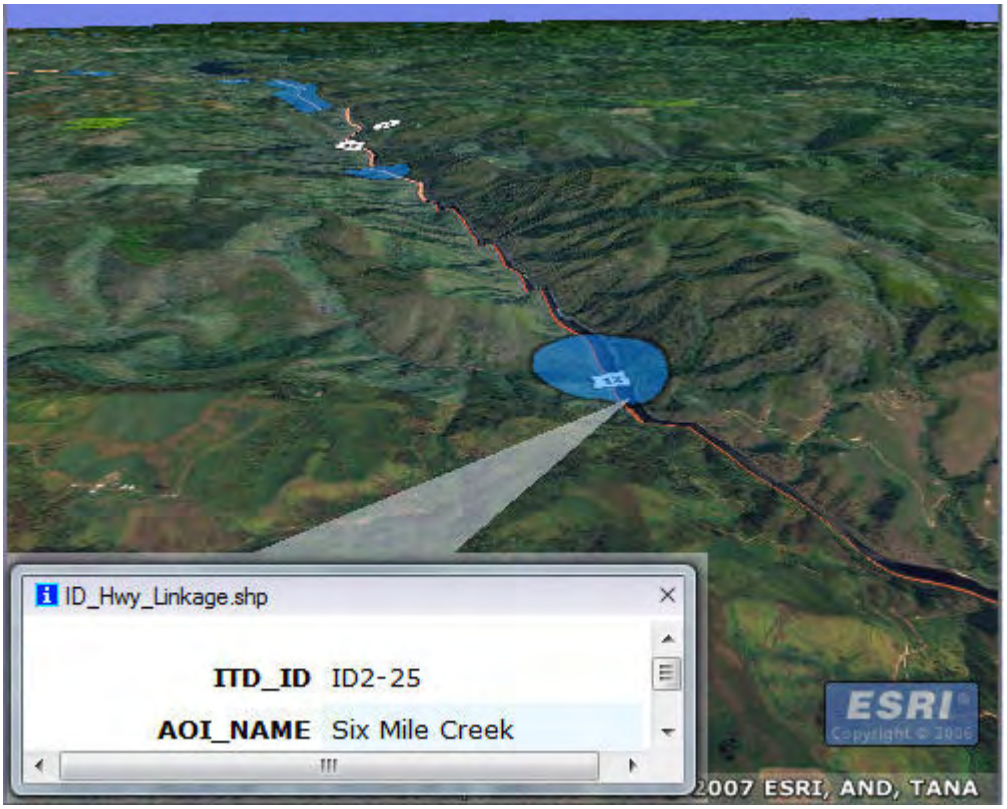
ATTRACT:

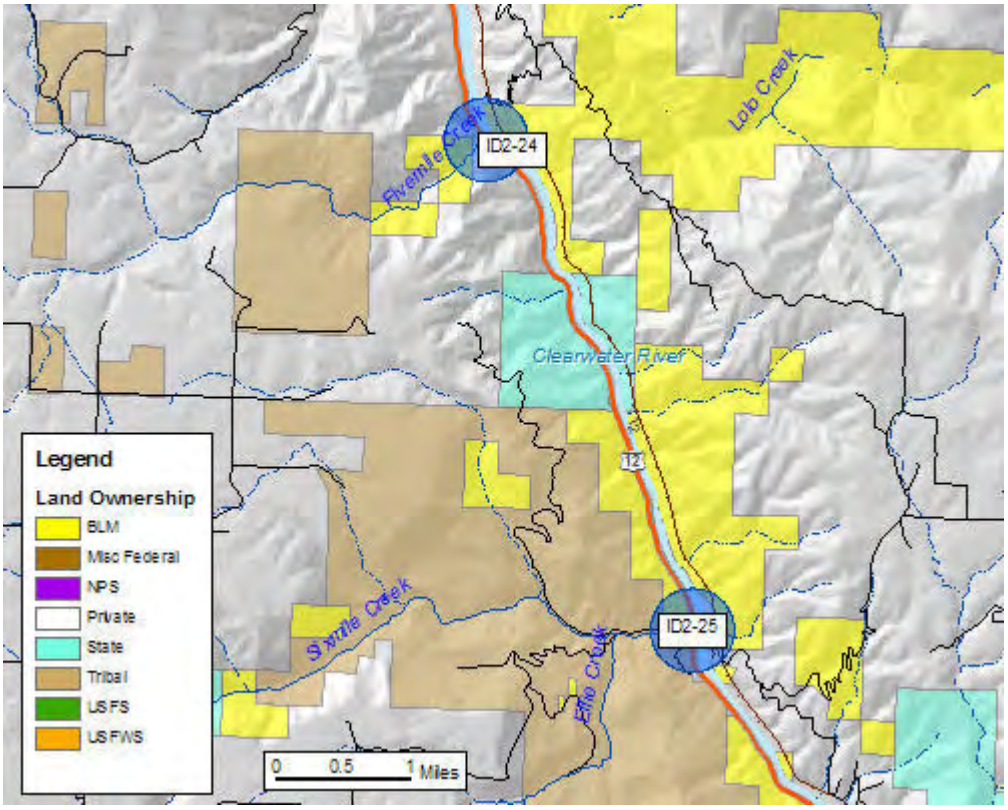
AGENCIES:

ADDITIONAL COMMENTS:

Potential fish passage issue. Large culverts; metal rail mp 56-64, riverside mp 44-52.

ITD2_ID: ID2-25





ITD2_ID: ID2-25

AOI_NAME: Six Mile Creek

PRIORITY: Low

SPECIES: white-tail deer/ black bear/ bobcat/ steelhead/ reptiles/ amphibians/ bald eagle nest

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT:

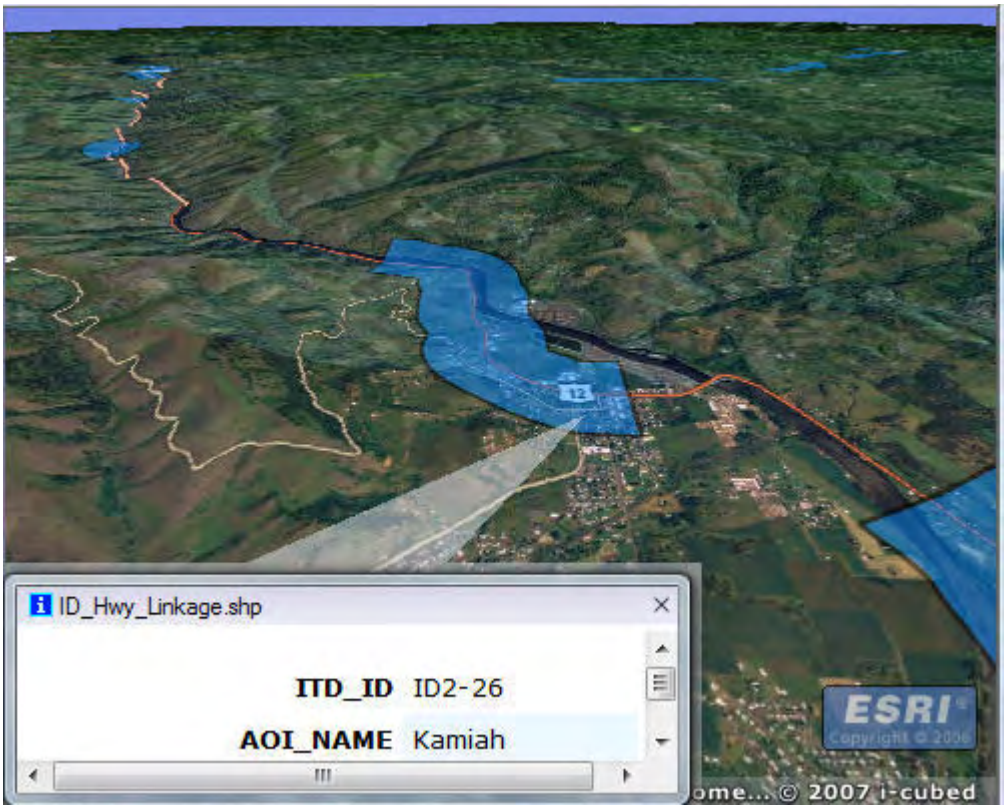
SEASON:

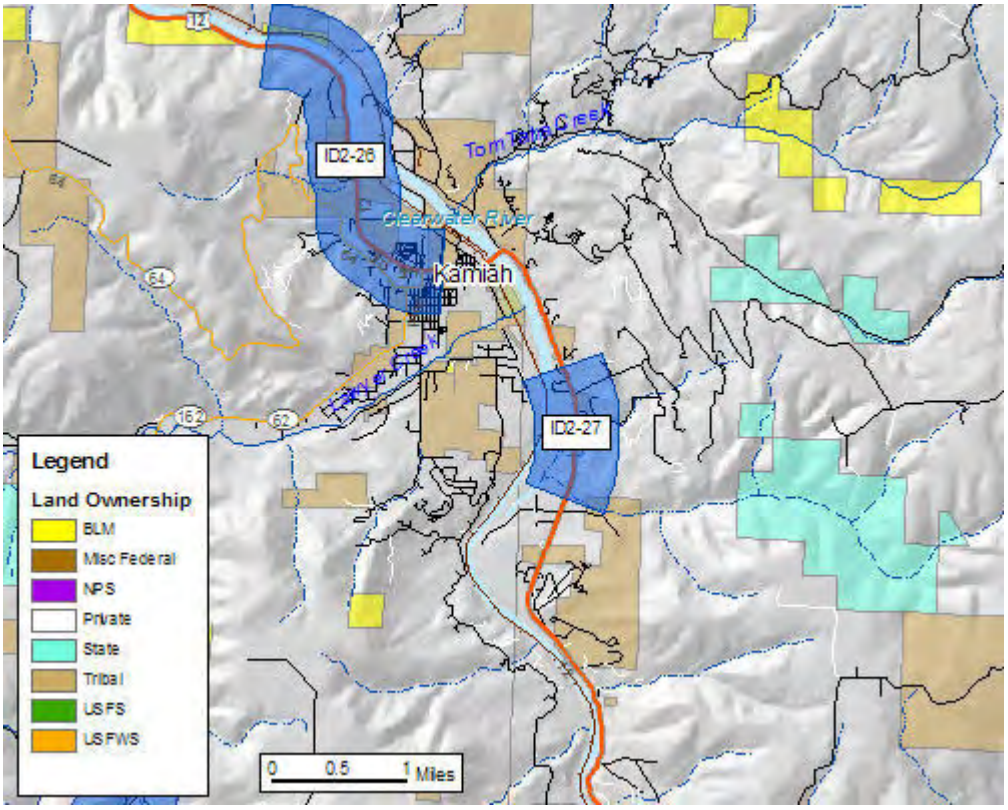
ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:
Potential fish passage issue. Large culverts.

ITD2_ID: ID2-26





ITD2_ID: ID2-26

AOI_NAME: Kamiah

PRIORITY: Moderate

SPECIES: white-tail deer/ raccoons/ osprey nest

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT: >20

SEASON:

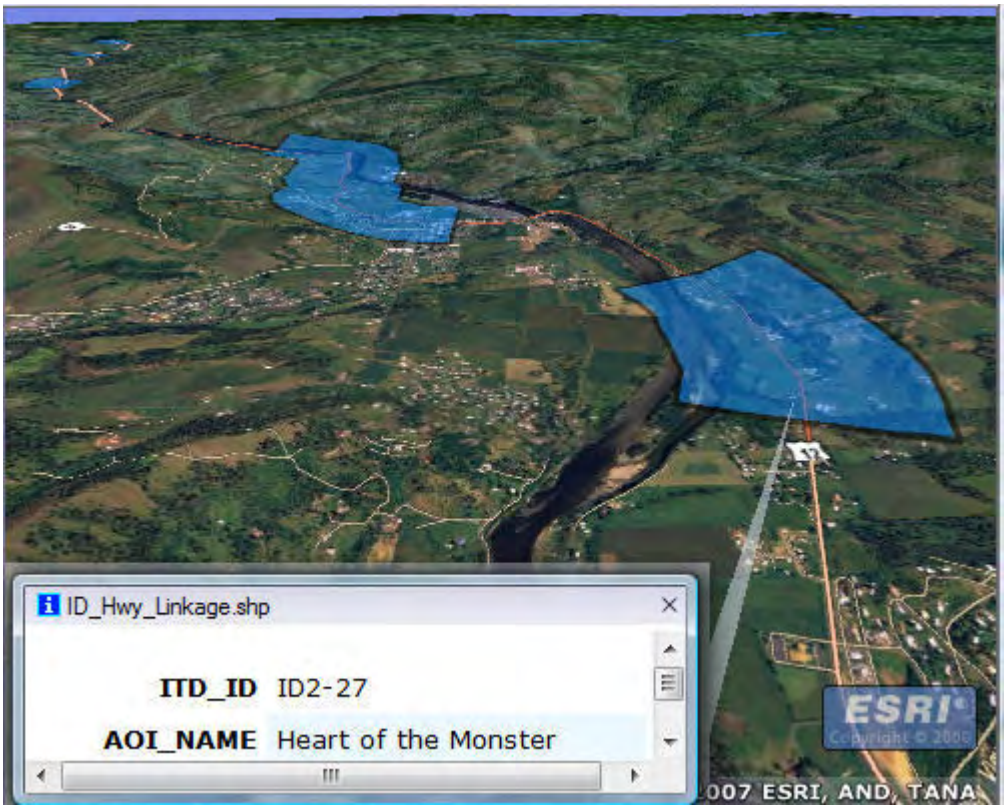
ATTRACT:

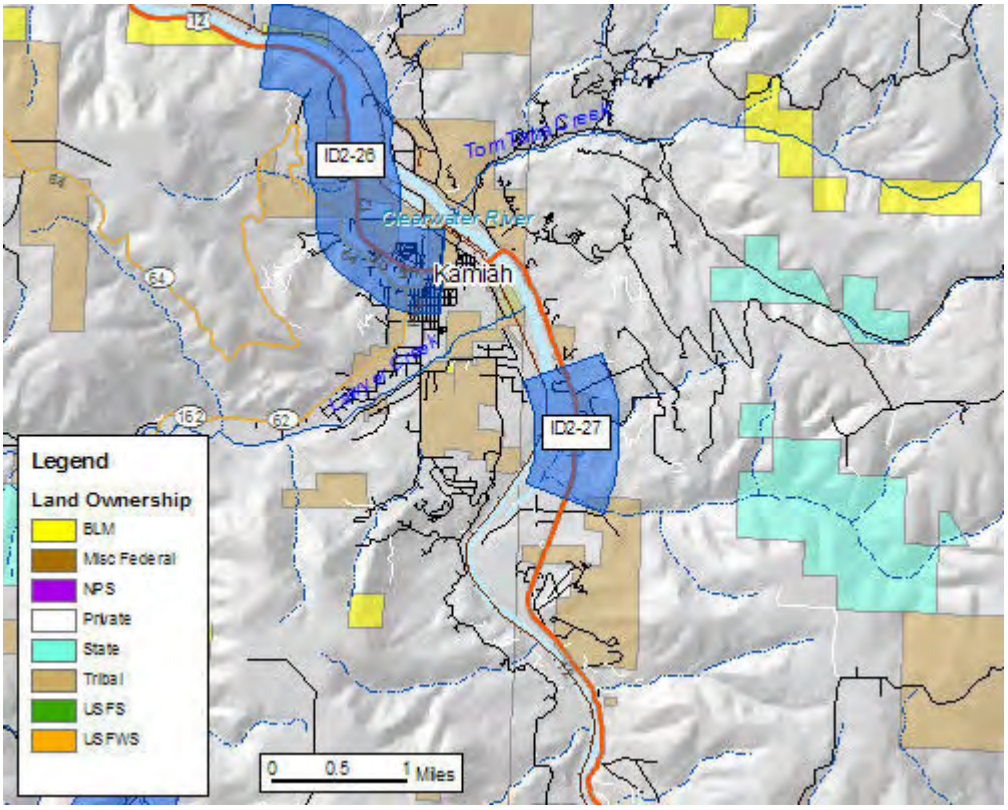
AGENCIES

ADDITIONAL COMMENTS:

There are jersey barrier issues. White-tail deer are hit primarily at mp 65.There is no eagle nest within this linkage area. Kamiah, barrier from 64-66; mp 64 osprey nest.

ITD2_ID: ID2-27





ITD2_ID: ID2-27

AOI_NAME: Heart of the Monster

PRIORITY: High

SPECIES: white-tail deer/ raccoons

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT: >20

SEASON:

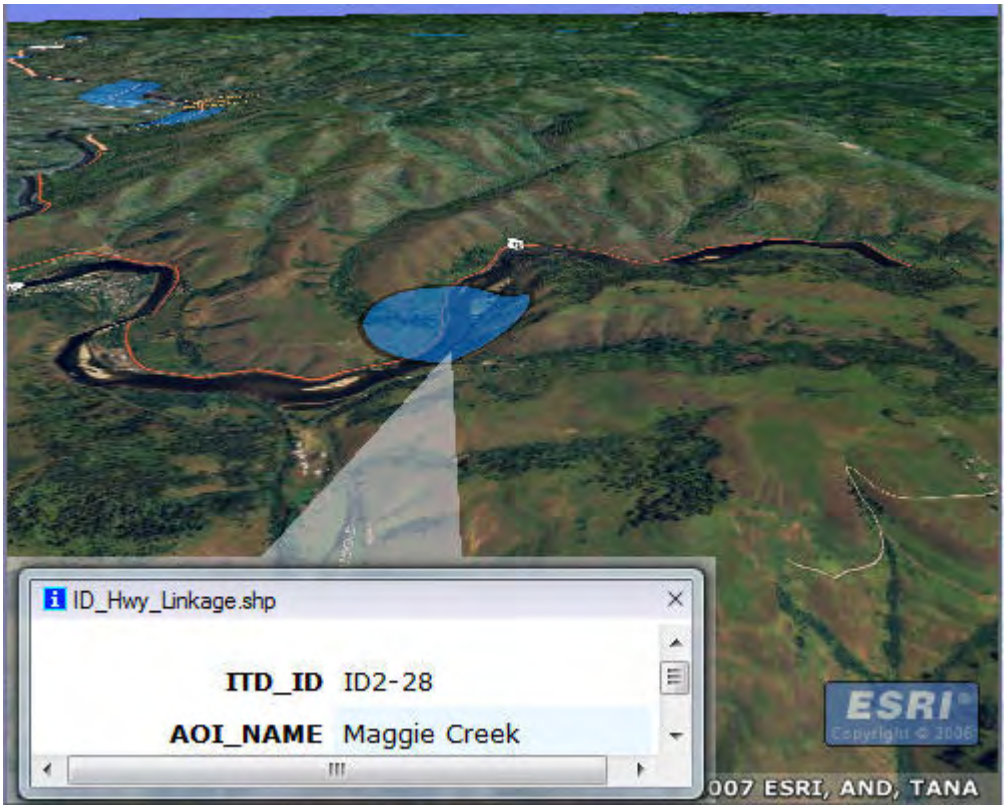
ATTRACT:

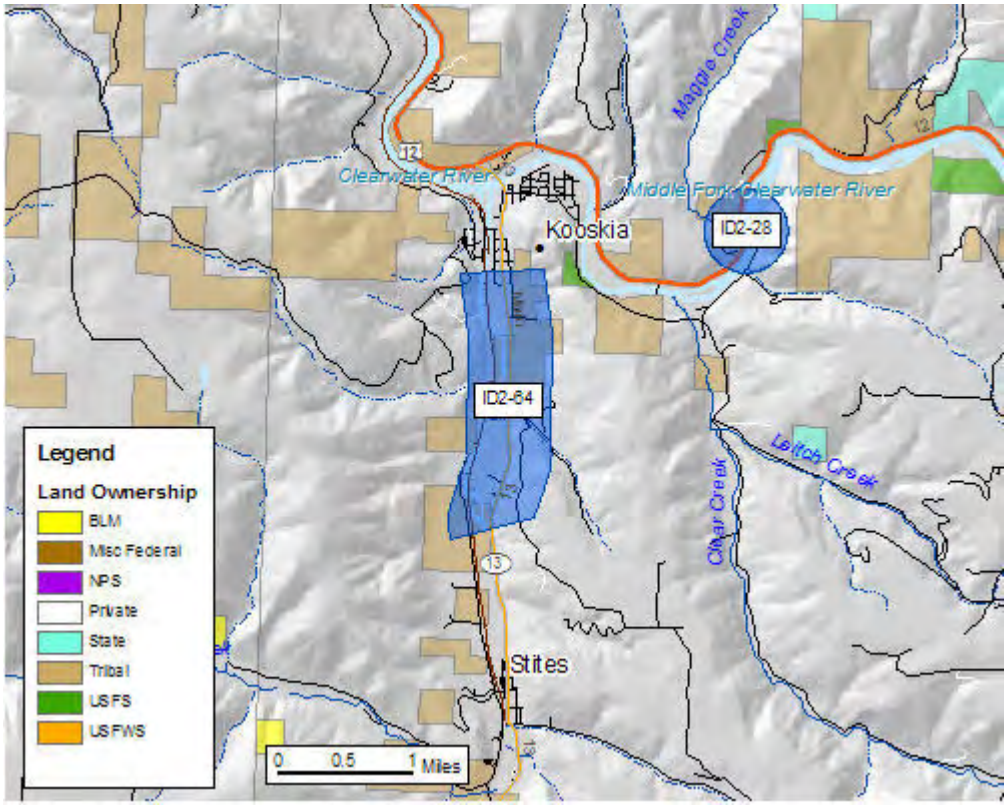
AGENCIES:

ADDITIONAL COMMENTS:

This is a high deer kill area, and is a high priority because of this.

ITD2_ID: ID2-28





ITD2_ID: ID2-28

AOI_NAME: Maggie Creek

PRIORITY: Low

SPECIES: white-tail deer

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT: >20

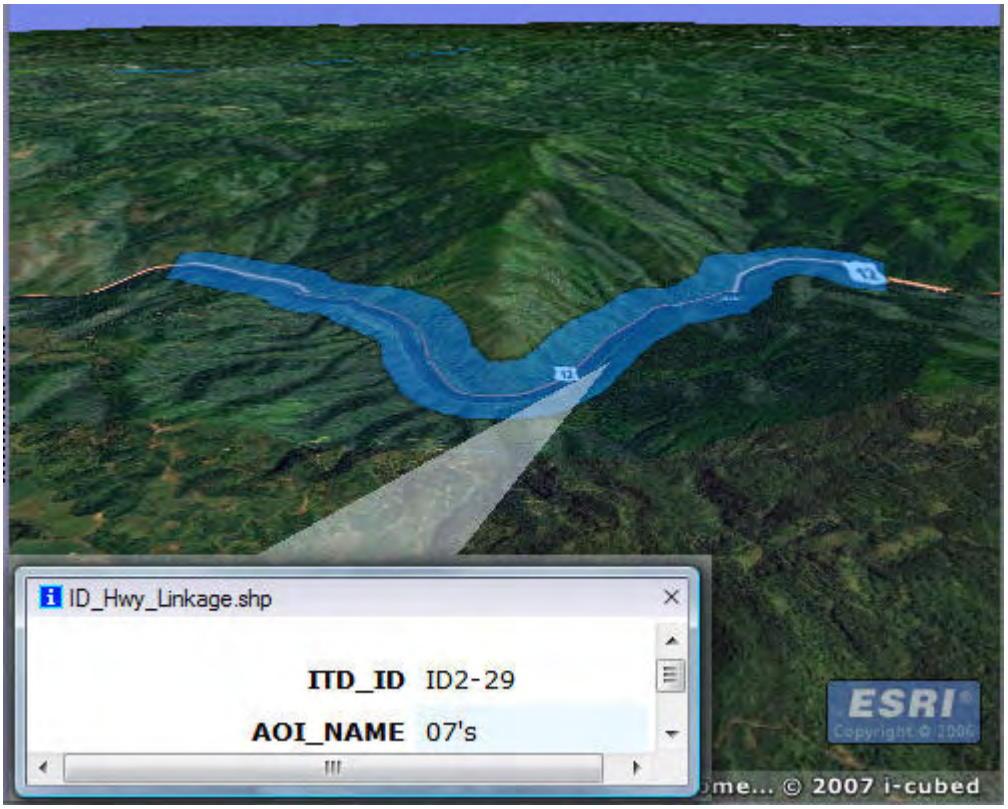
SEASON:

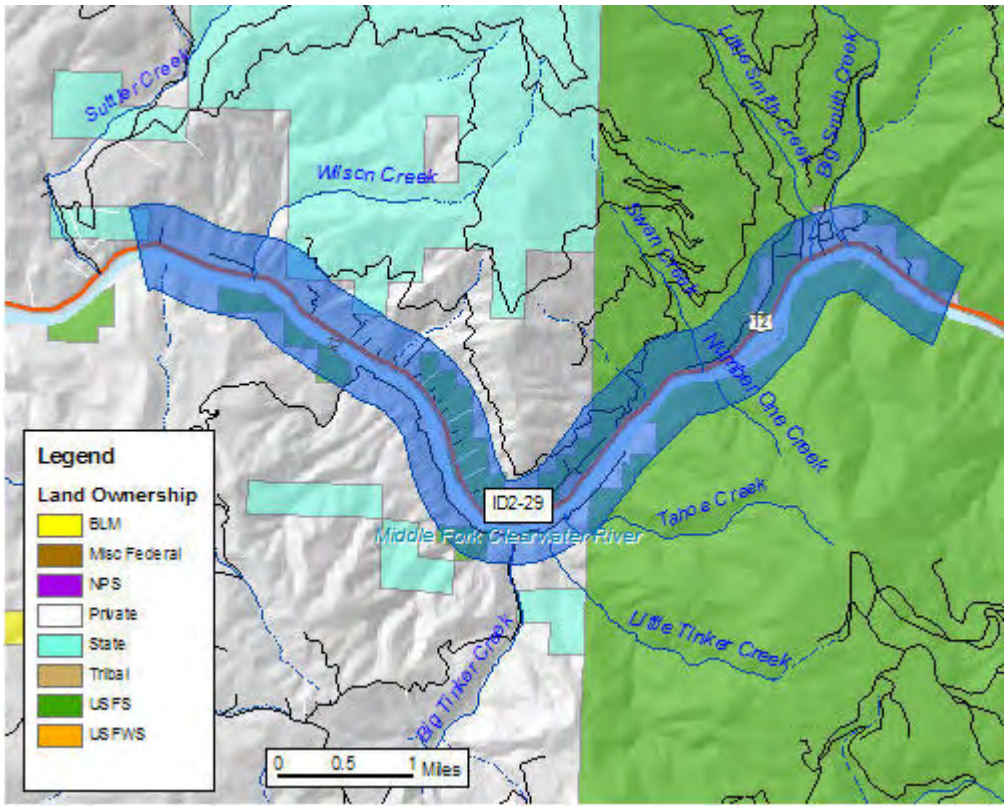
ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:
There is a large culvert present at this linkage area, not a bridge.

ITD2_ID: ID2-29





ITD2_ID: ID2-29

AOI_NAME: 07's

PRIORITY: High

SPECIES: white-tail deer/ elk/ black bear/ turkeys

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT: >20

SEASON: Winter - deer crossing area

ATTRACT: agriculture fields/ water/riparian

AGENCIES:

ADDITIONAL COMMENTS:

Important Seasons: Deer are year-round residents.

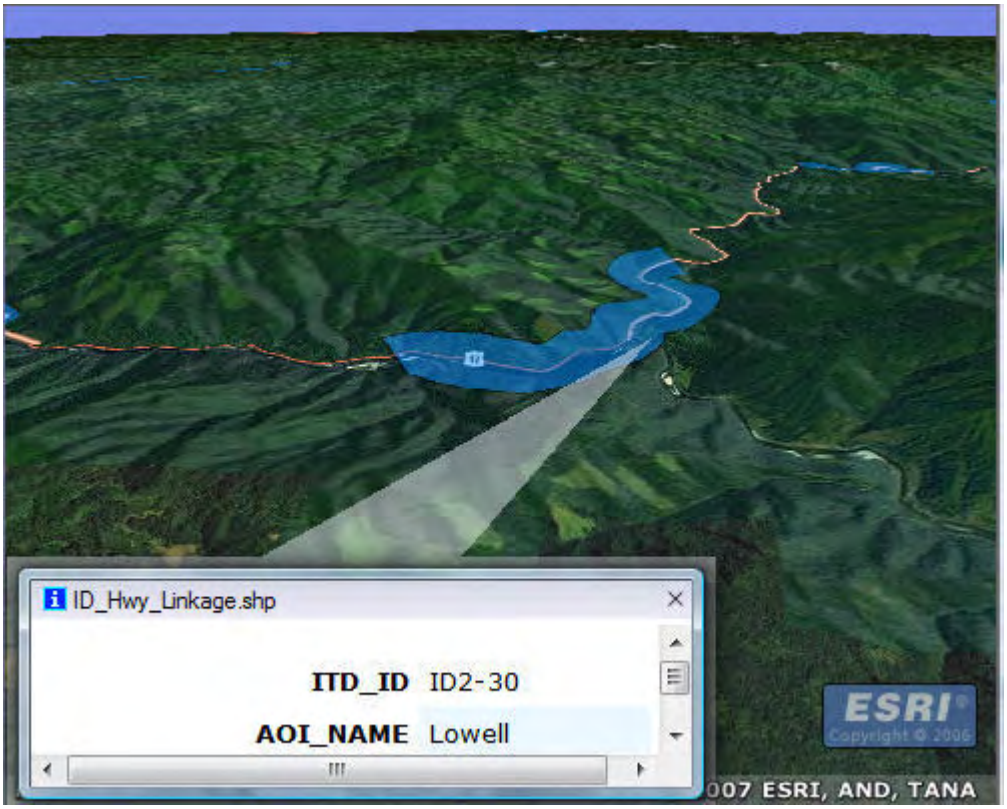
Permanent Human Presence: Residential homes

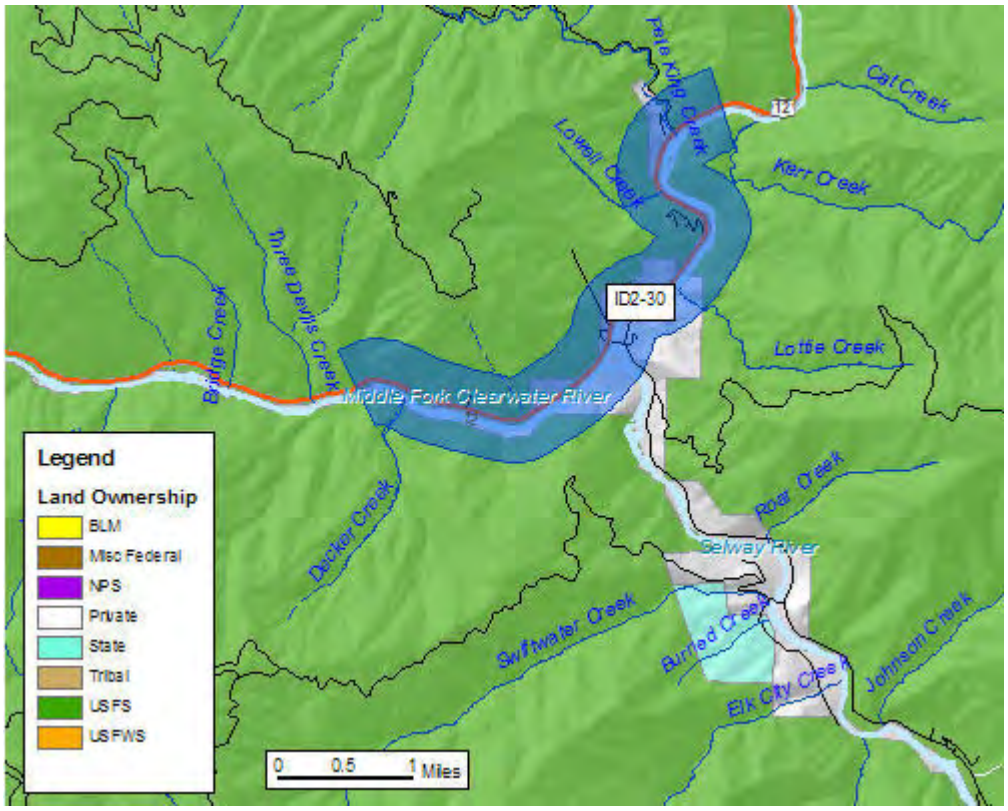
Most common species killed by vehicles: White-tailed deer

Effective functioning of linkage area: Site functions with moderate levels of wildlife mortalities.

Black bears have been hit at mp 89 and 90.High strike area for deer is mp 83.5 to 86.Elk are present, but have not been hit on the roadway. Deer movements are from the agricultural fields to the river.

ITD2_ID: ID2-30





ITD2_ID: ID2-30

AOI_NAME: Lowell

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose/ black bear/ mountain lion/ bobcat/ wolf/ otter/ salmon and steelhead/ reptiles/ amphibians/ turkeys/ beaver

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON: Winter - elk winter along the highway, mp 95-97 and 99

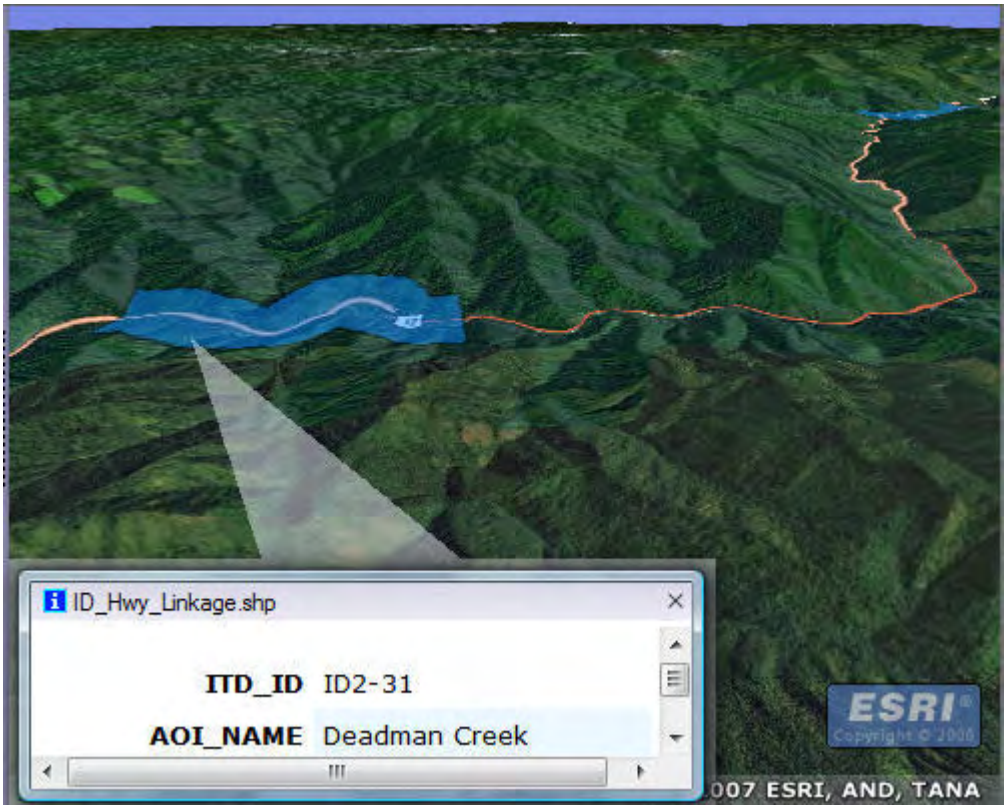
ATTRACT:

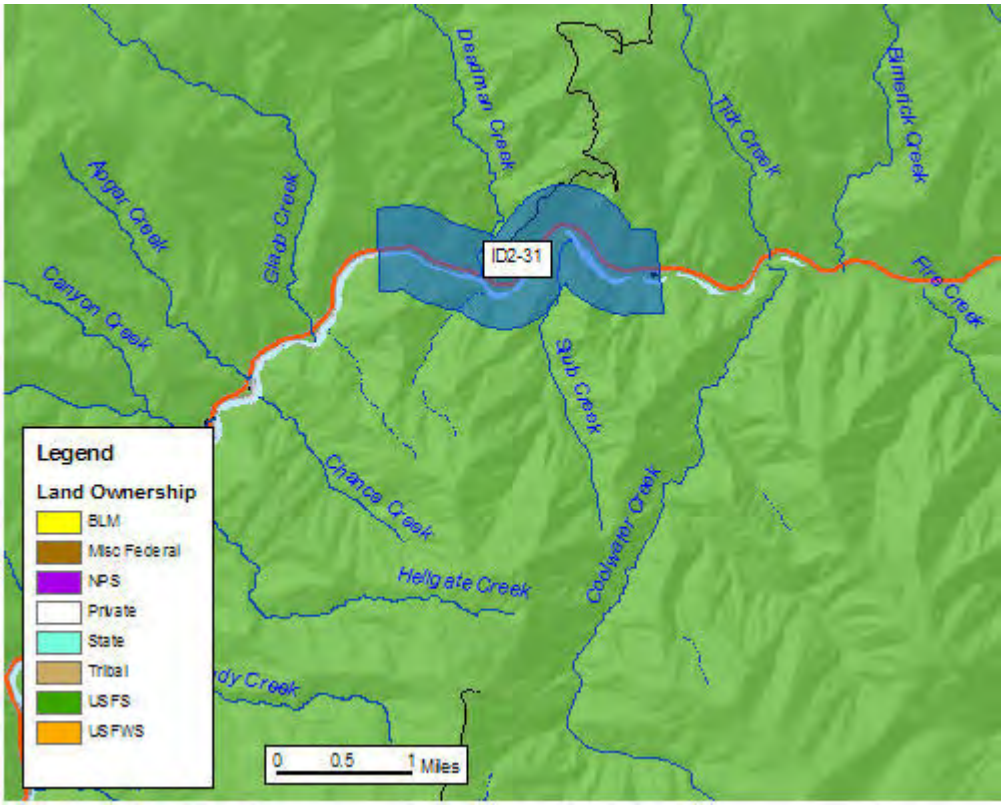
AGENCIES:

ADDITIONAL COMMENTS:

Wolf hit on highway in 1999/2000.Bridge, Tons of turkeys, people feed them.

ITD2_ID: ID2-31





ITD2_ID: ID2-31

AOI_NAME: Deadman Creek

PRIORITY: Low

SPECIES: potential fish passage issues

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

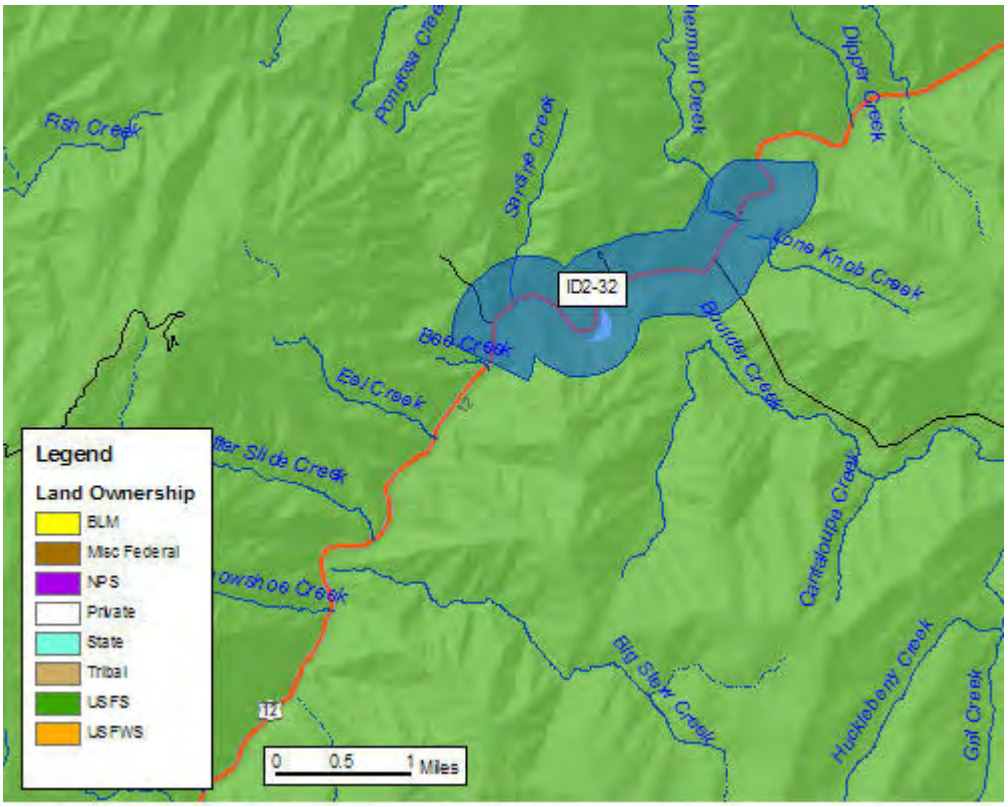
ATTRACT: Grain spill from truck crashes attract wildlife

AGENCIES:

ADDITIONAL COMMENTS:

ITD replacing three passages. High accident area; oil spill; nasty S curve; bridge at Deadman Cr.

ITD2_ID: ID2-32



ITD2_ID: ID2-32

AOI_NAME: Wilderness Gateway

PRIORITY: Low

SPECIES: white-tail deer/ elk/ wolf/ potential fish passage issues/ harlequin ducks/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

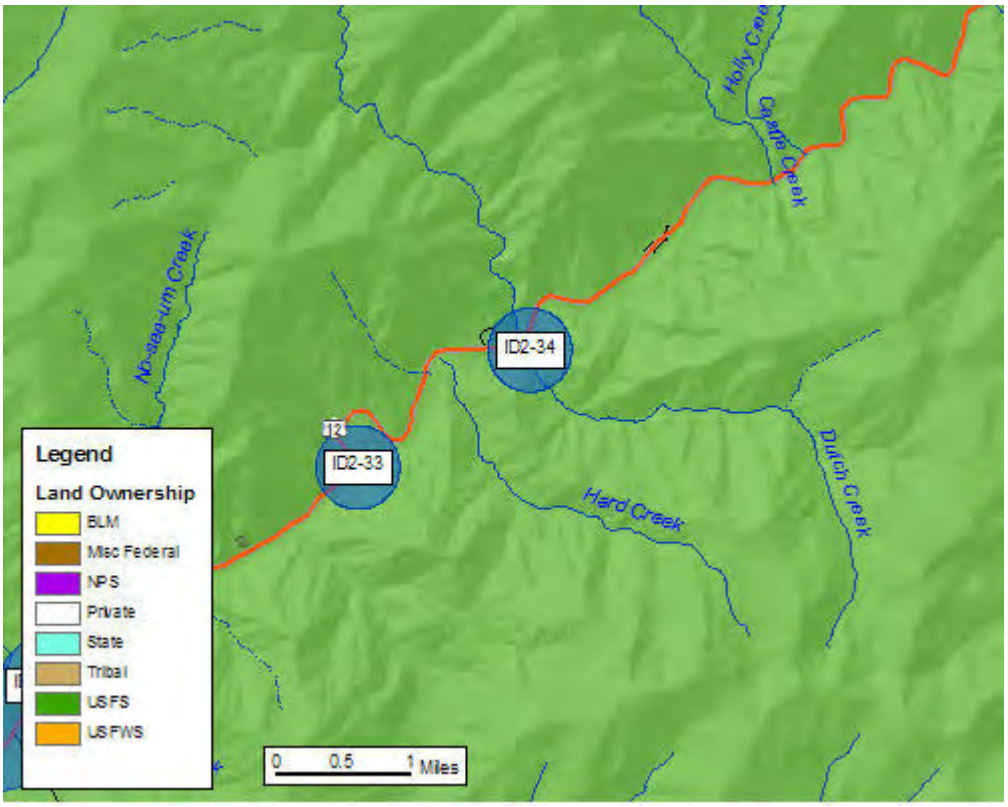
ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:

Wolf pack at mp 121-125.This linkage area encompasses the best Harlequin Duck population in the state of Idaho. Harlequin ducks present from here all the way past Powell. There is light wildlife-highway mortality for white-tail deer. Bridge; Fish Cr., south private development; box culvert, some work scheduled.

ITD2_ID: ID2-33



ITD2_ID: ID2-33

AOI_NAME: Big Pond

PRIORITY: Low

SPECIES: mule deer/ elk/ salamanders and other amphibians

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

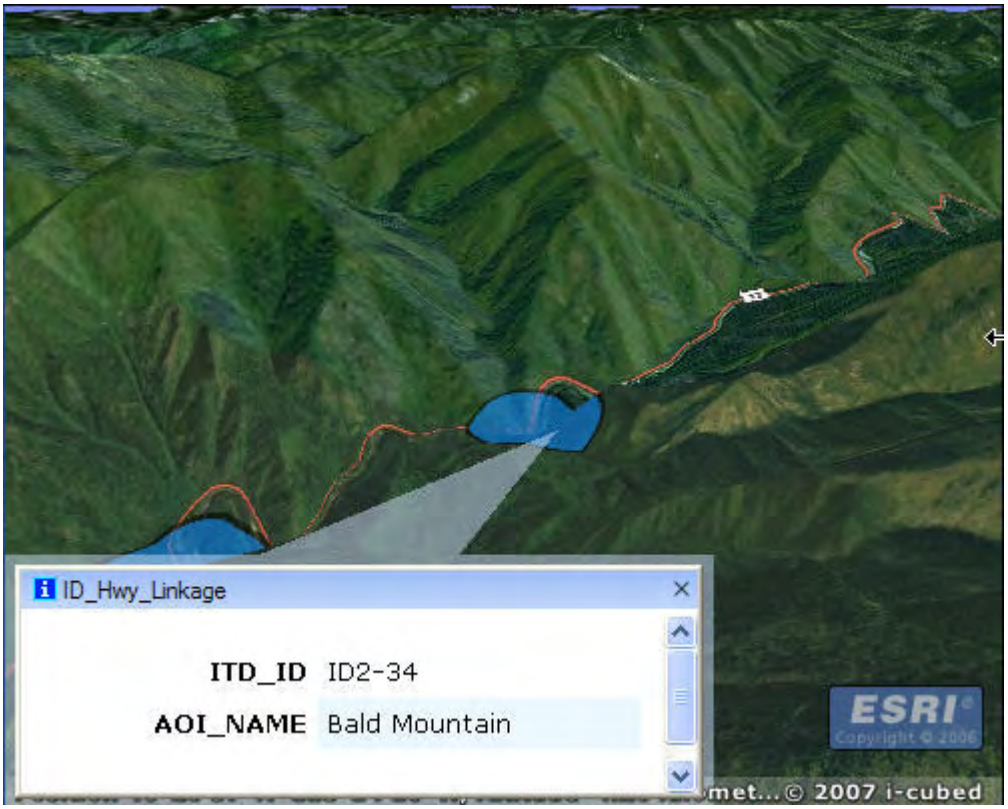
ATTRACT:

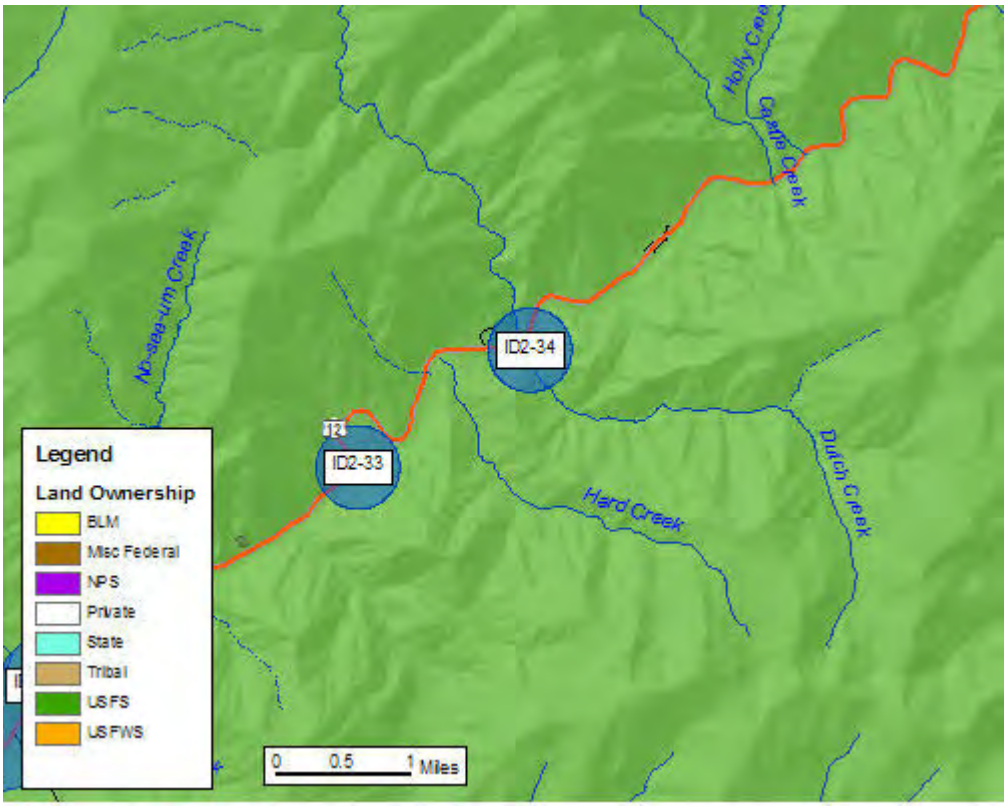
AGENCIES:

ADDITIONAL COMMENTS:

Large culvert going into the pond within the linkage area. Old ox bow; sand shed.

ITD2_ID: ID2-34





ITD2_ID: ID2-34

AOI_NAME: Bald Mountain

PRIORITY: Low

SPECIES: mule deer/ fish passage issues/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

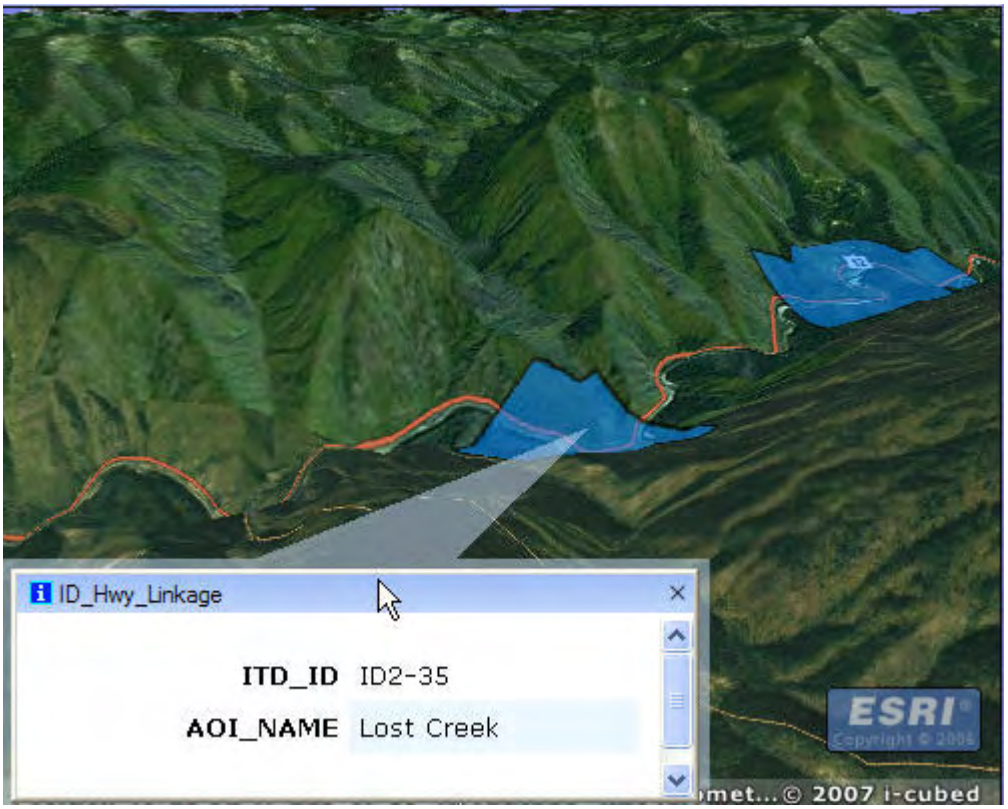
SEASON:

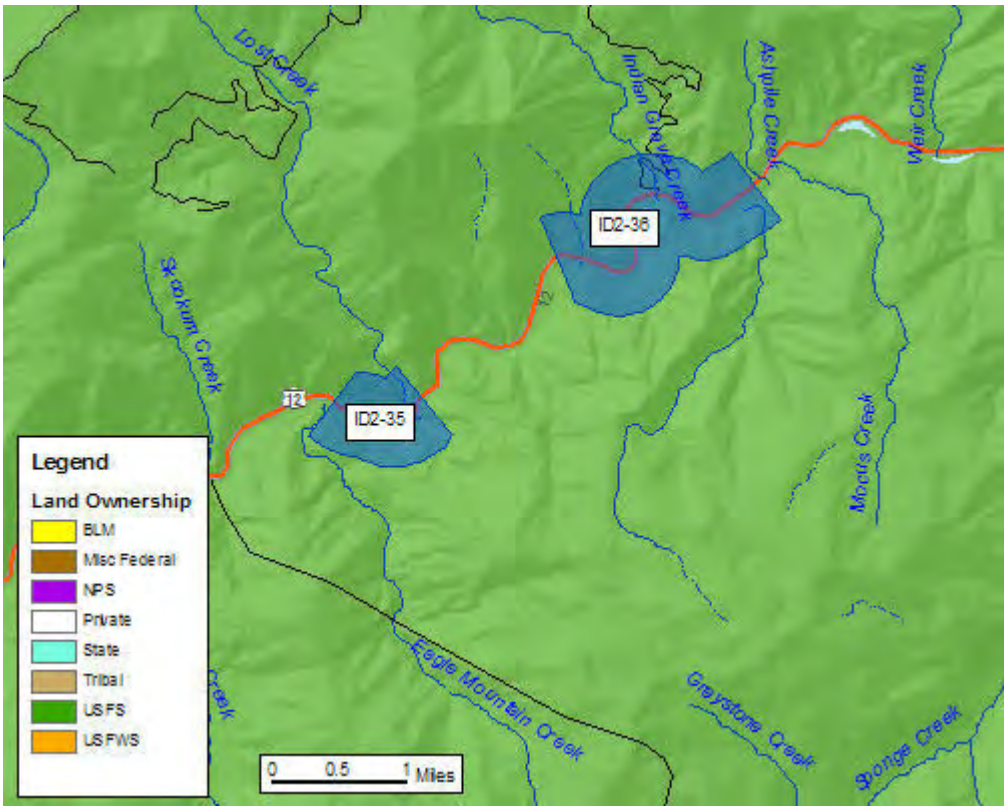
ATTRACT: Salt shed acts as an attractant to wildlife.

AGENCIES:

ADDITIONAL COMMENTS:
Bridge that is present isn't large enough to pass animals.

ITD2_ID: ID2-35





ITD2_ID: ID2-35

AOI_NAME: Lost Creek

PRIORITY: Low

SPECIES: elk/ fish passage issues/ amphibians/ bald eagles/ beavers and other aquatic mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

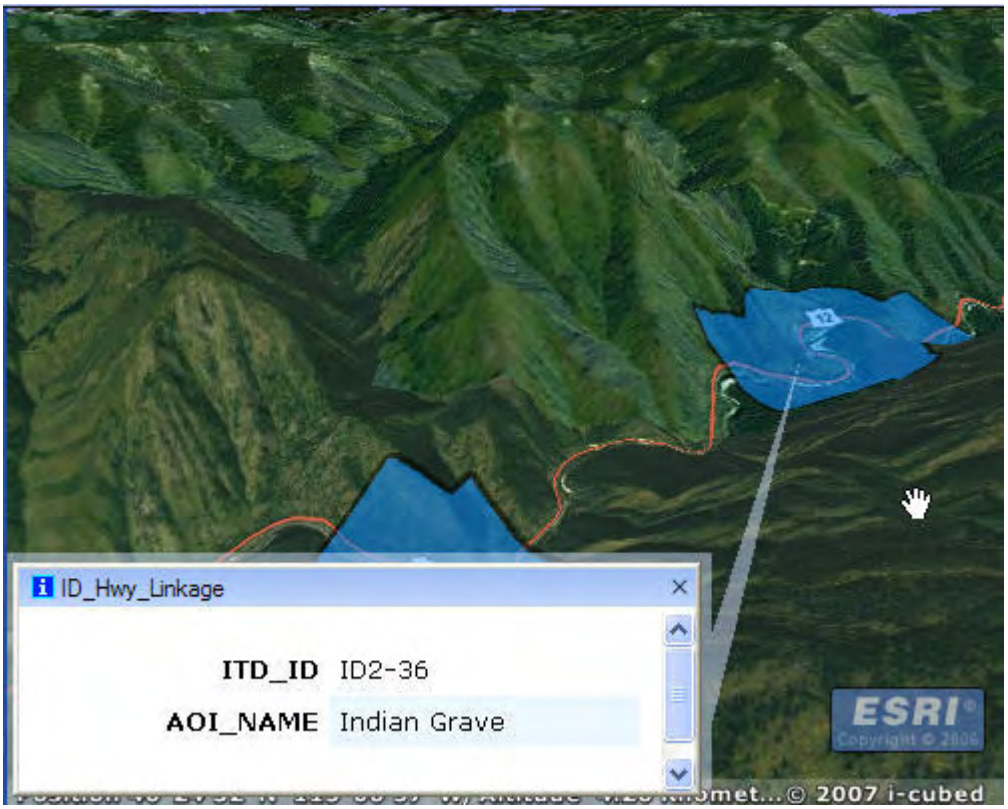
ATTRACT:

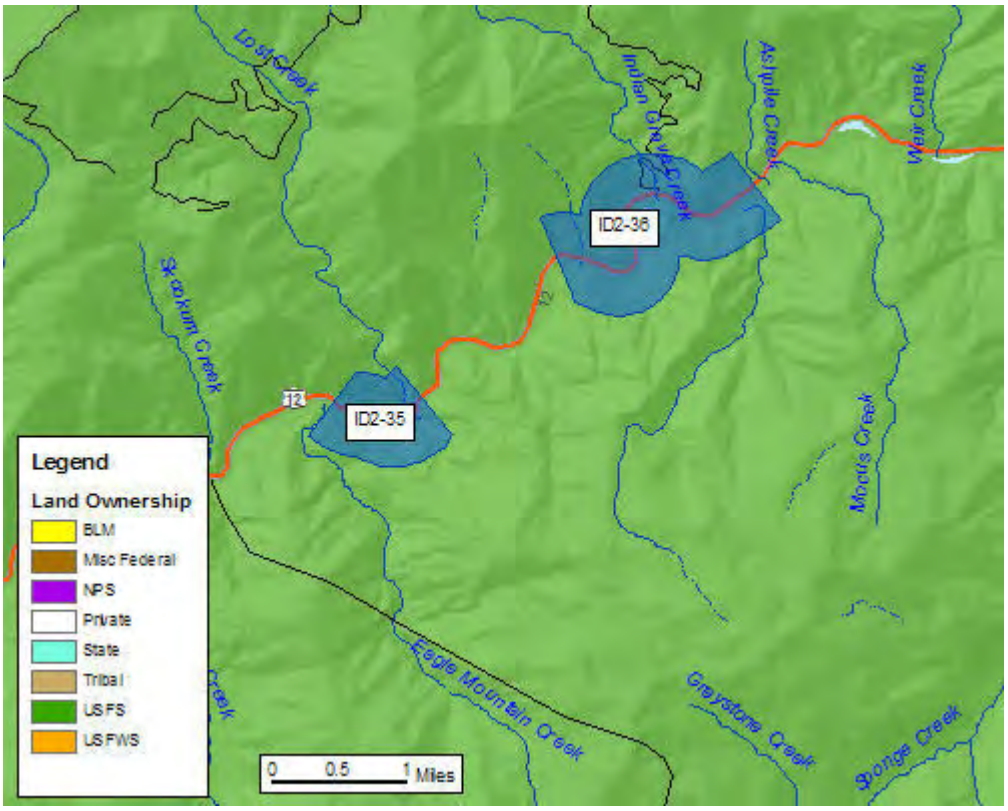
AGENCIES:

ADDITIONAL COMMENTS:

High area of use by elk, but not necessarily high road kills. Old river meander, culvert connects to river.

ITD2_ID: ID2-36





ITD2_ID: ID2-36

AOI_NAME: Indian Grave

PRIORITY: Low

SPECIES: elk/ moose/ mountain lion/ bobcat/ wolf/ fisher

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

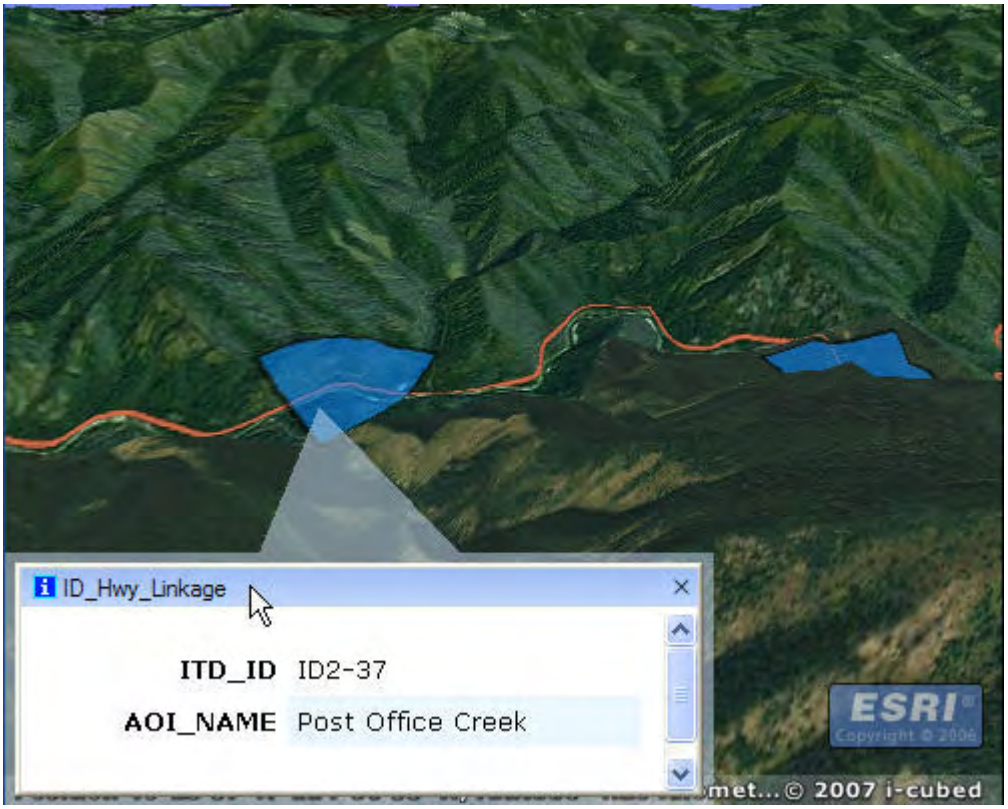
ATTRACT: water/riparian

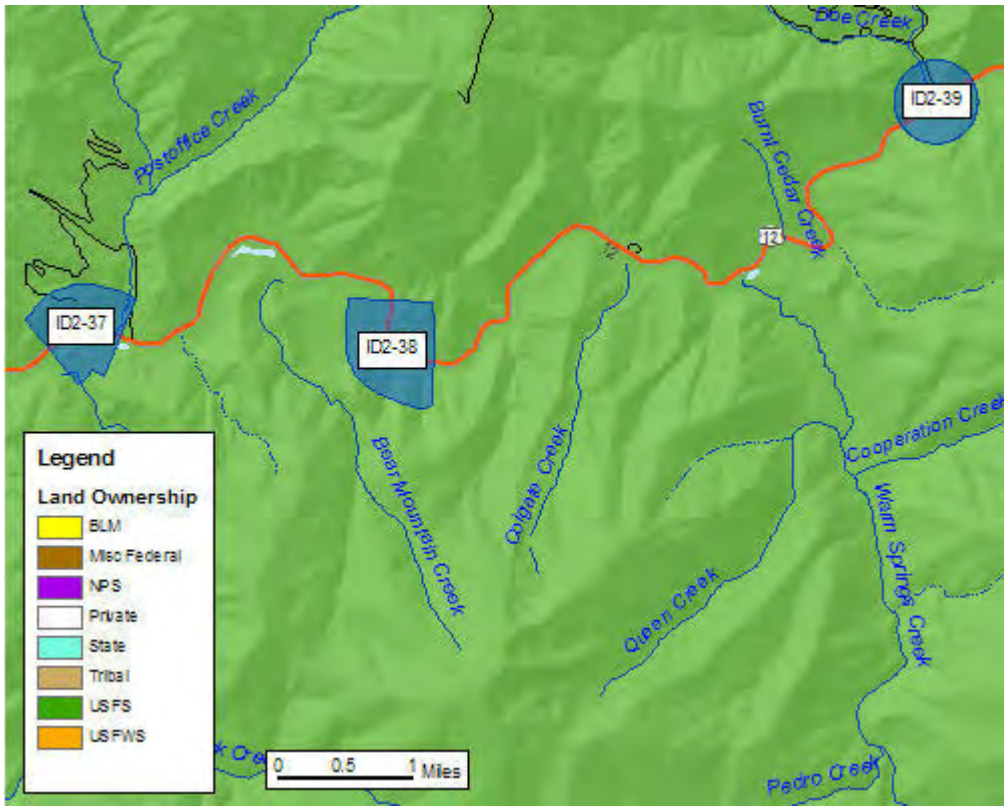
AGENCIES:

ADDITIONAL COMMENTS:

Moose attracted to the pond at mp 139.High area of use by elk, but not necessarily high road kills.

ITD2_ID: ID2-37





ITD2_ID: ID2-37

AOI_NAME: Post Office Creek

PRIORITY: Low

SPECIES: black bear/ fisher/ fish passage issues/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

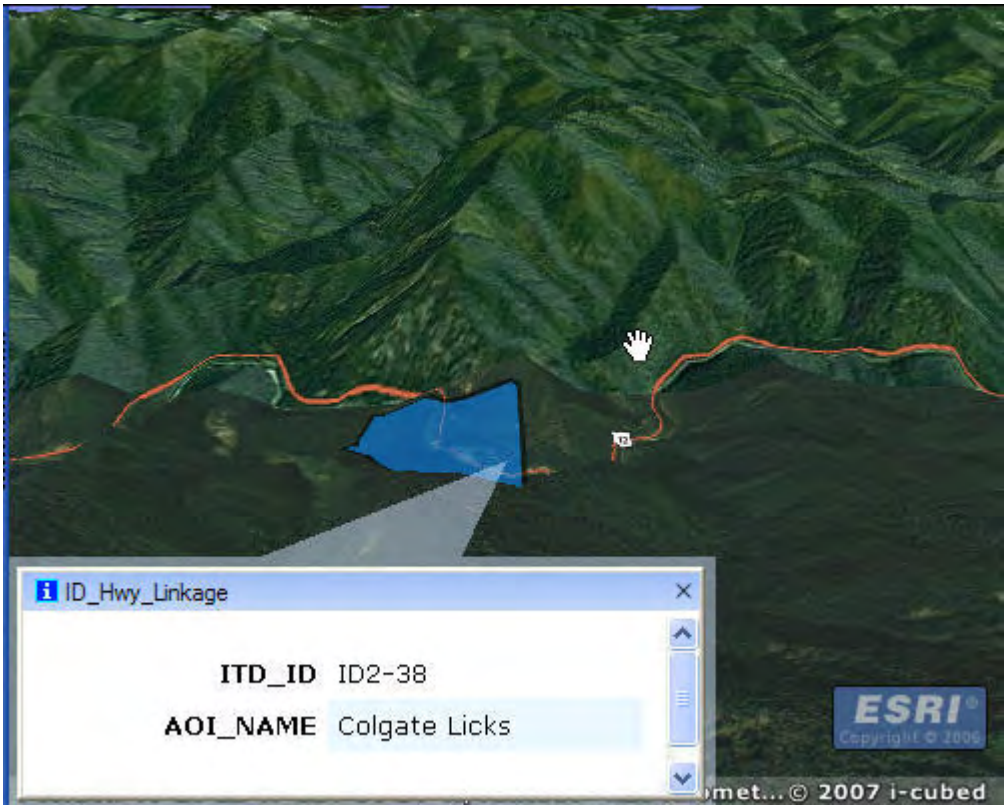
ATTRACT:

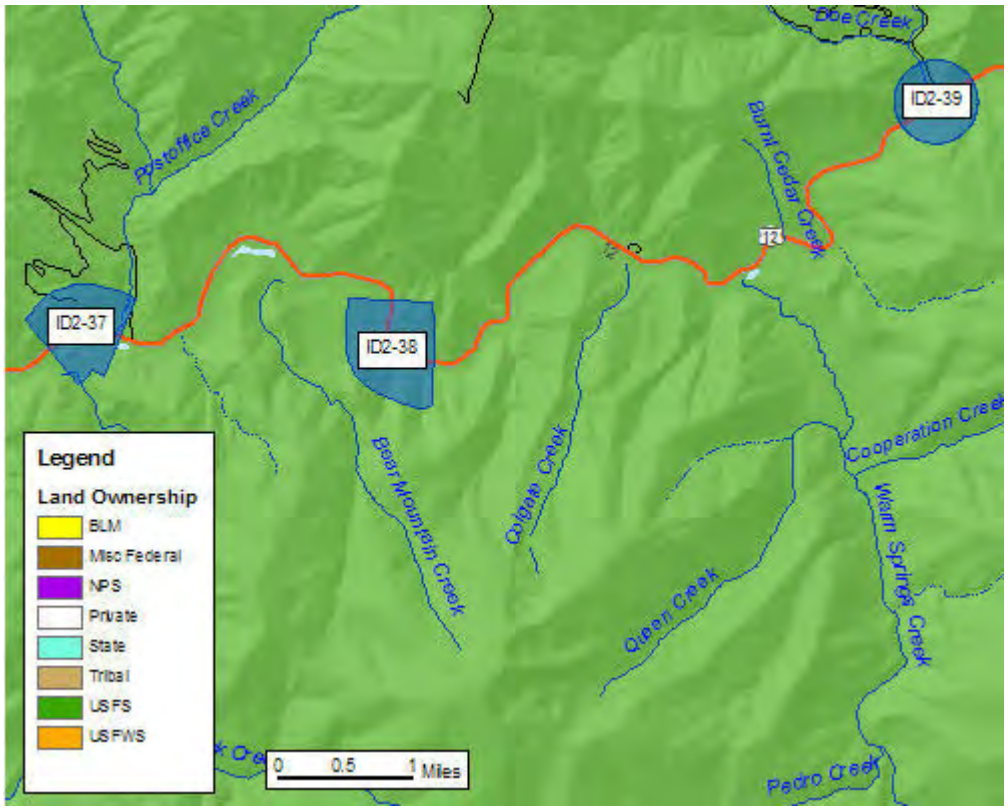
AGENCIES:

ADDITIONAL COMMENTS:

A fisher was killed by bobcat trappers at the mouth of the creek. Lots of elk; trees back passing lane

ITD2_ID: ID2-38





ITD2_ID: ID2-38

AOI_NAME: Colgate Licks

PRIORITY: Low

SPECIES: mule deer/ elk/ black bear/ wolf/ fisher

MIG_POP:

LOC_POP:

SCALE:

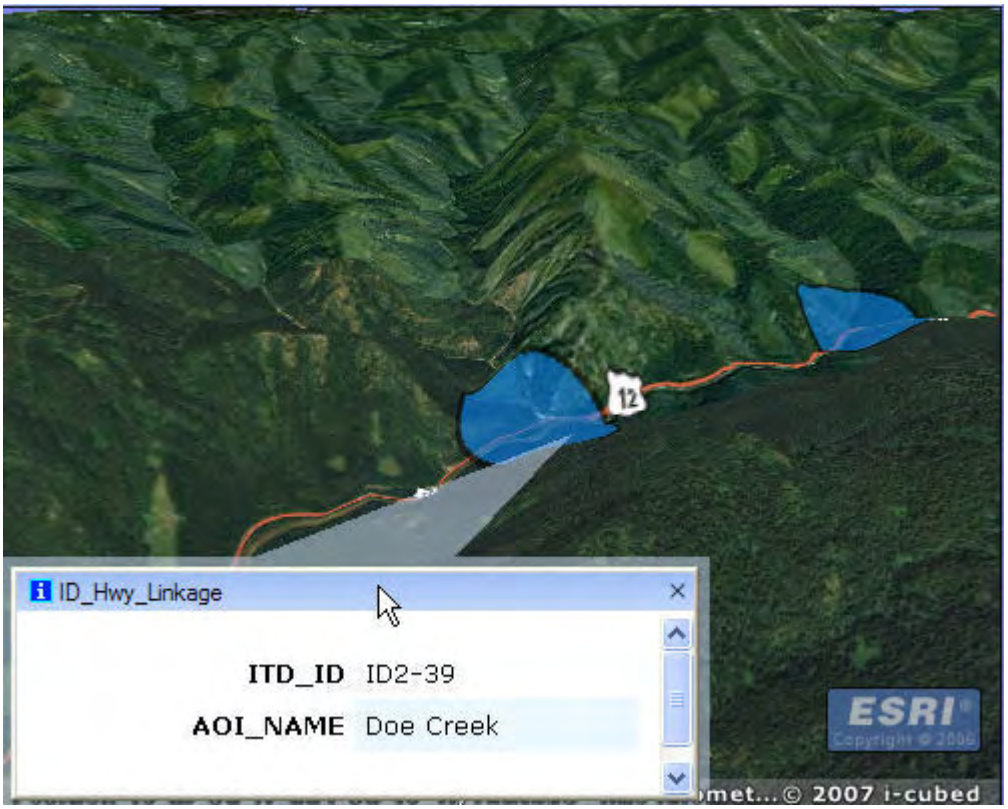
HWY_MORT:

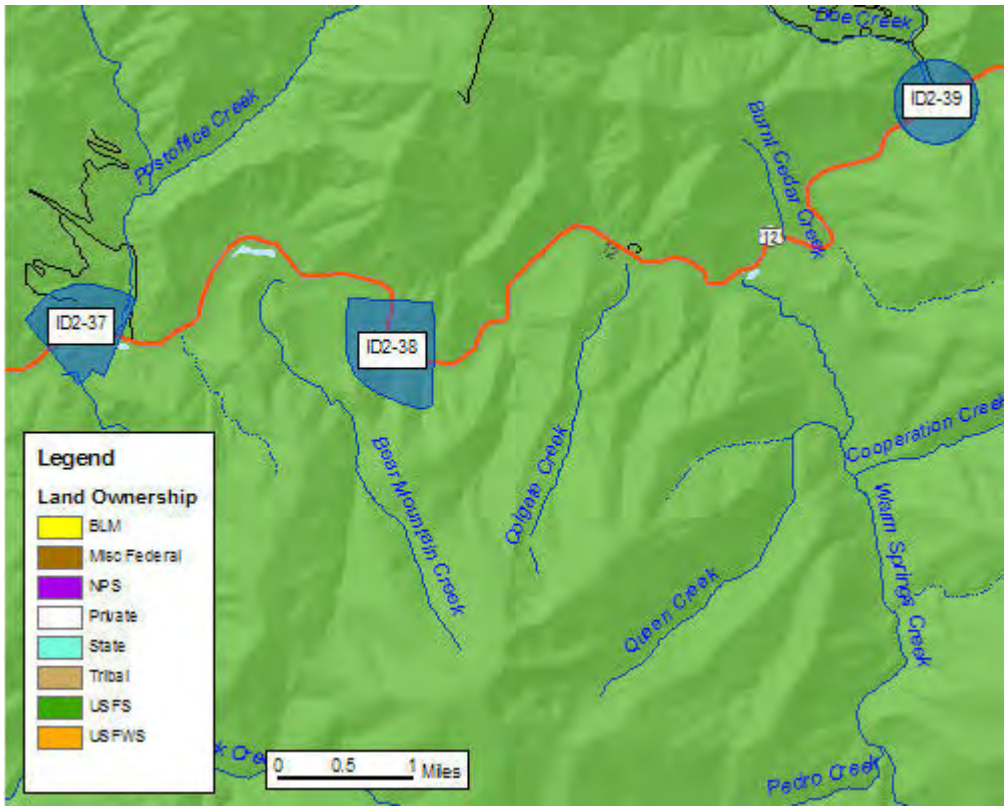
SEASON:

ATTRACT: Colgate Licks acts as an attractant to wildlife.

AGENCIES:

ITD2_ID: ID2-39





ITD2_ID: ID2-39

AOI_NAME: Doe Creek

PRIORITY: Low

SPECIES: fish passage issues/ reptiles/ amphibians

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

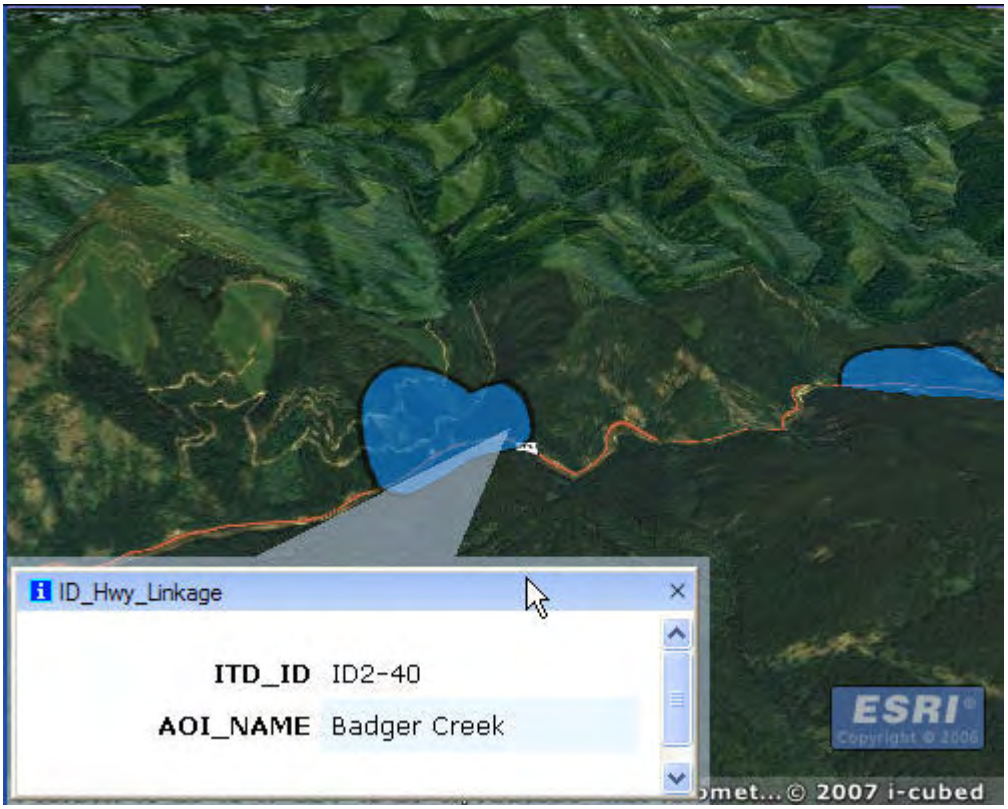
ATTRACT:

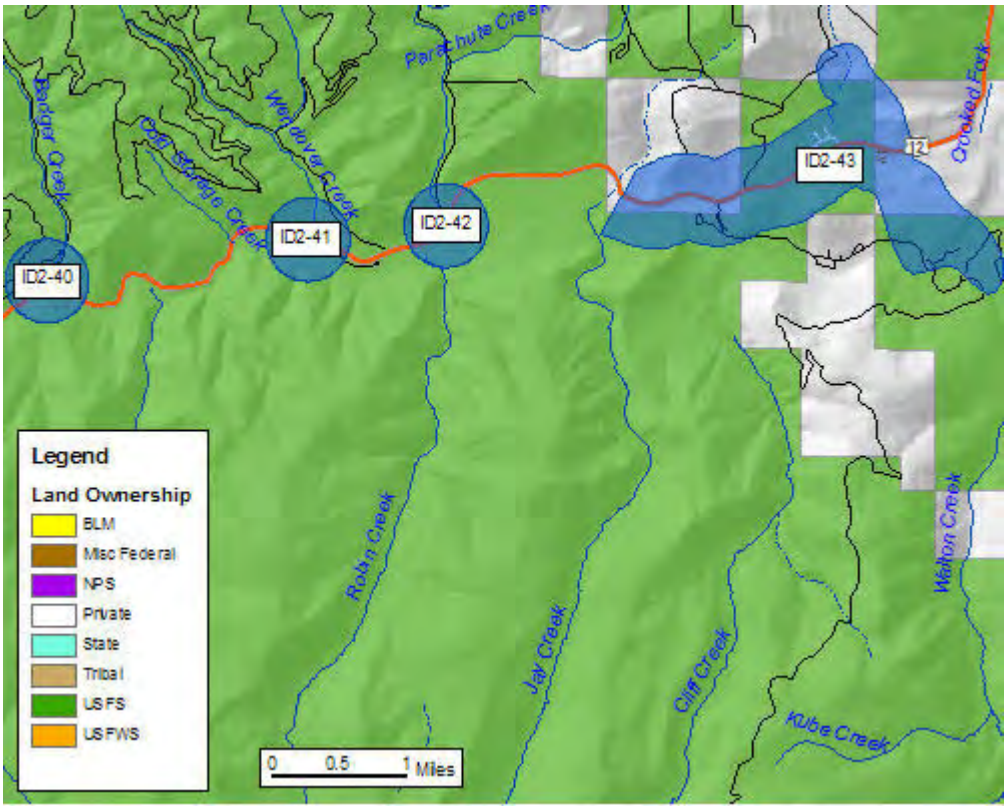
AGENCIES:

ADDITIONAL COMMENTS:

Bridge.

ITD2_ID: ID2-40





ITD2_ID: ID2-40

AOI_NAME: Badger Creek

PRIORITY: Low

SPECIES: small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

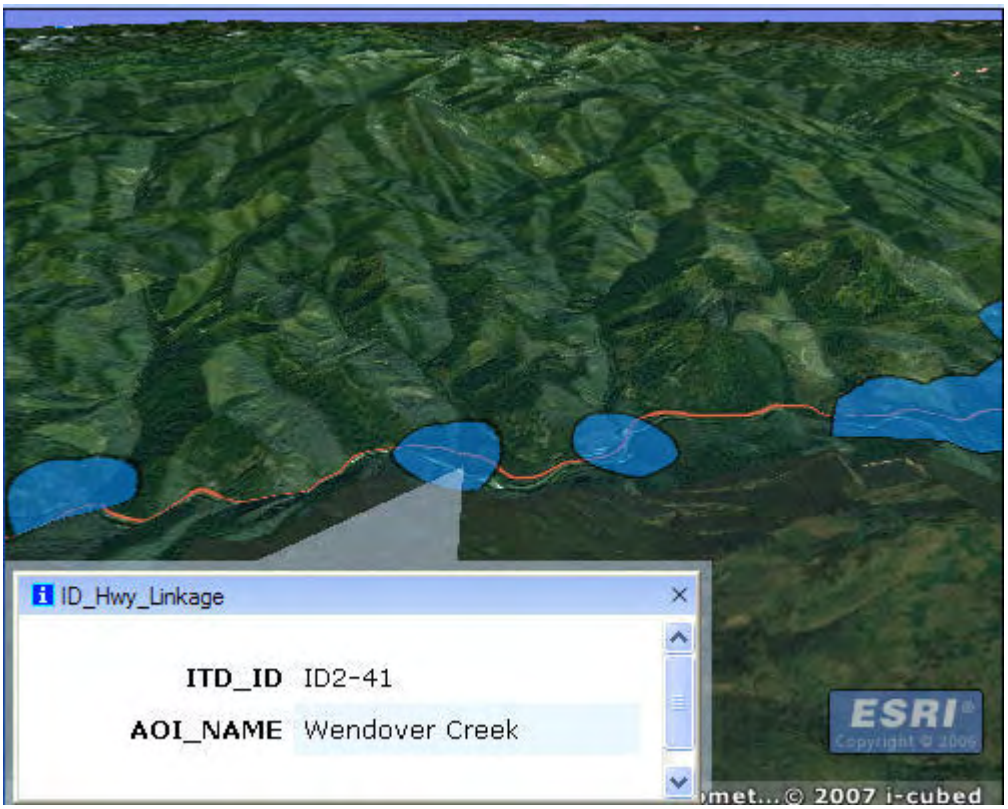
ATTRACT:

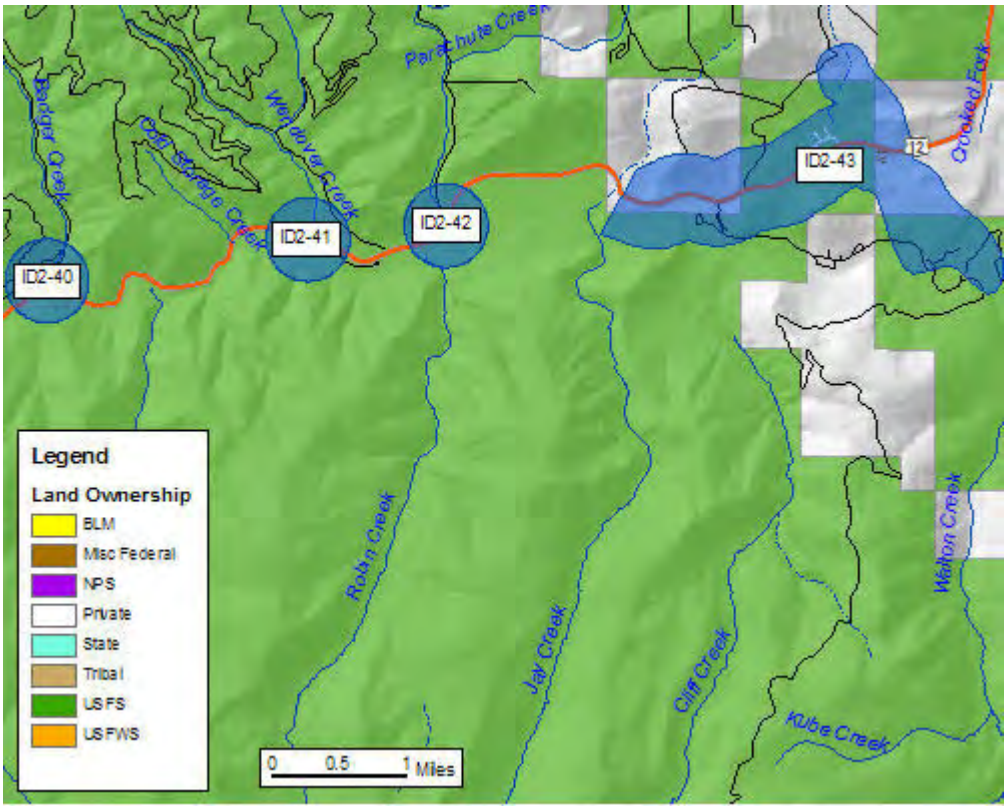
AGENCIES:

ADDITIONAL COMMENTS:

Culvert project has been completed. They have been increased.

ITD2_ID: ID2-41





ITD2_ID: ID2-41

AOI_NAME: Wendover Creek

PRIORITY: Moderate

SPECIES: moose

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

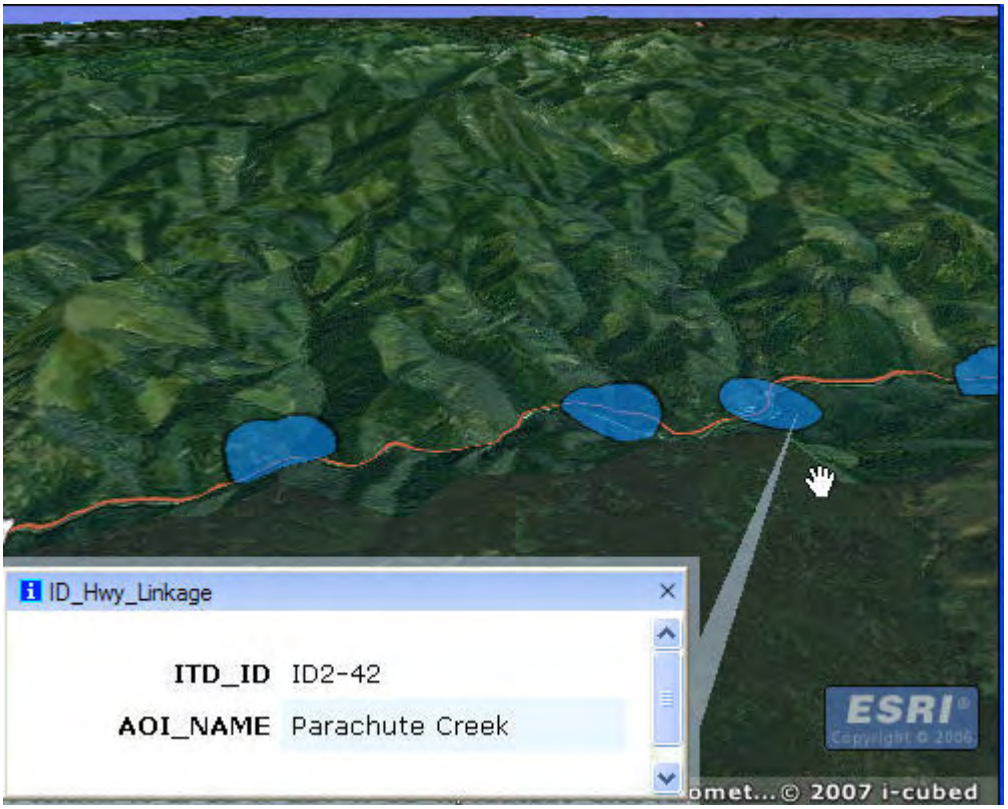
ATTRACT: water/riparian

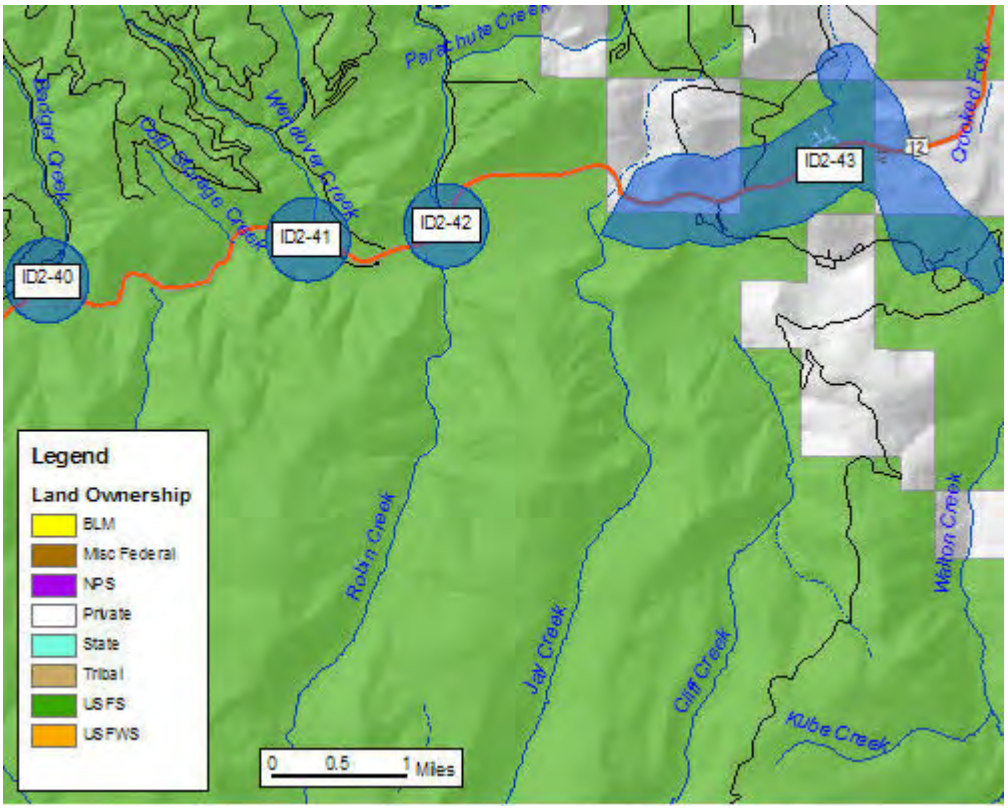
AGENCIES:

ADDITIONAL COMMENTS:

Moose are attracted to the ponds present in the linkage area. Culvert project has been completed.

ITD2_ID: ID2-42





ITD2_ID: ID2-42

AOI_NAME: Parachute Creek

PRIORITY: Low

SPECIES: fish passage issues/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

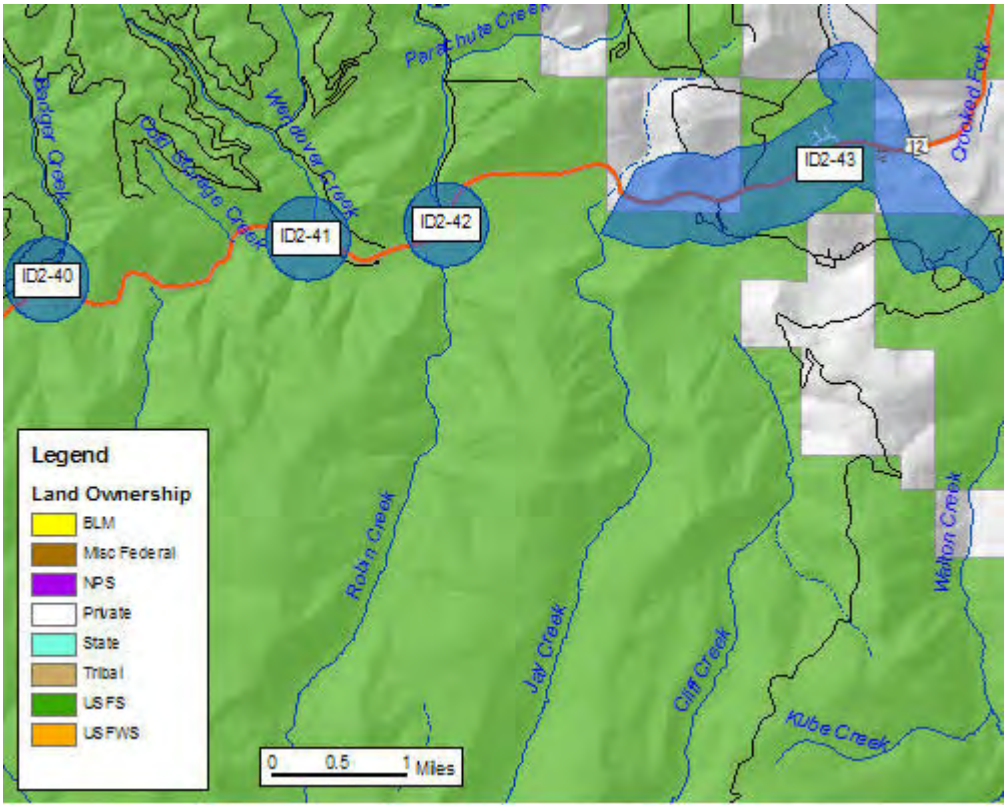
ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:

Bridge.

ITD2_ID: ID2-43



ITD2_ID: ID2-43

AOI_NAME: Powell

PRIORITY: Low

SPECIES: mule deer/ elk/ moose/ black bear/ mountain lion/ bobcat/ wolf/ marten/ fisher/ beaver

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

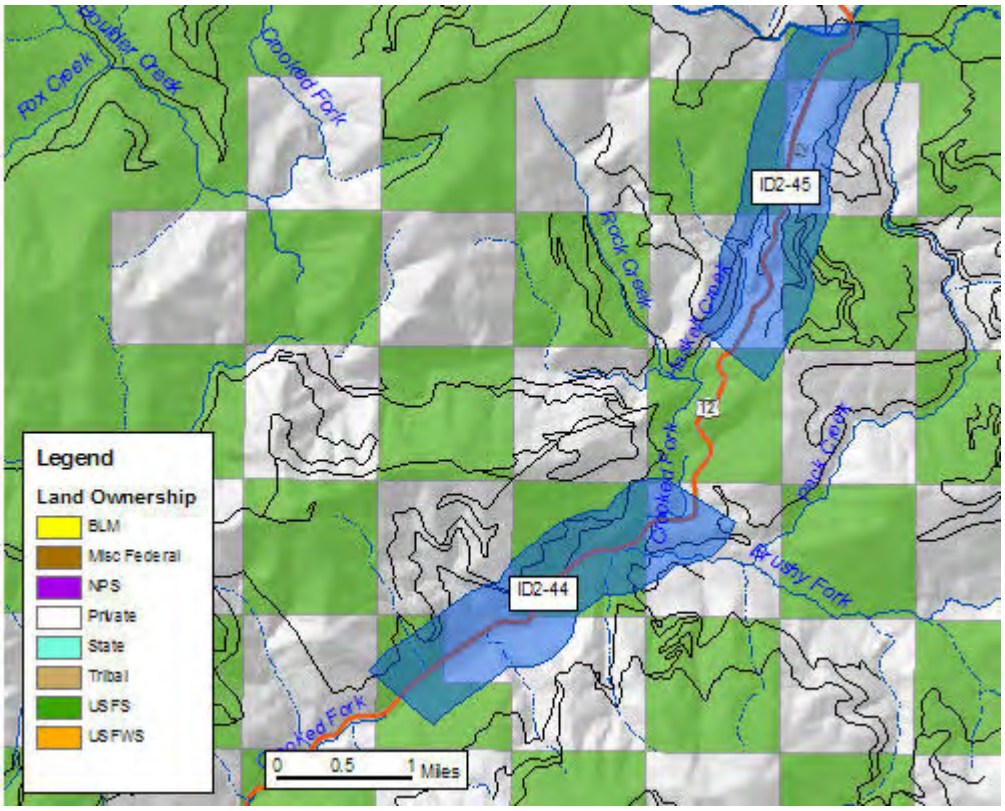
ATTRACT: Lake on the south side of the highway./ Salt attractant present.

AGENCIES:

ADDITIONAL COMMENTS:

Plugged culvert. A lot of moose present due to the lake. Not sure if the lake is caused by the plugged culvert? Sand shed with salt; wetland; Elk summit; Lolo Pass Project.

ITD2_ID: ID2-44



ITD2_ID: ID2-44

AOI_NAME: Brushy Fork

PRIORITY: Low

SPECIES: mule deer/ elk/ black bear/ wolf/ lynx/ fisher/ Harlequin ducks

MIG_POP: yes, mule deer and elk

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

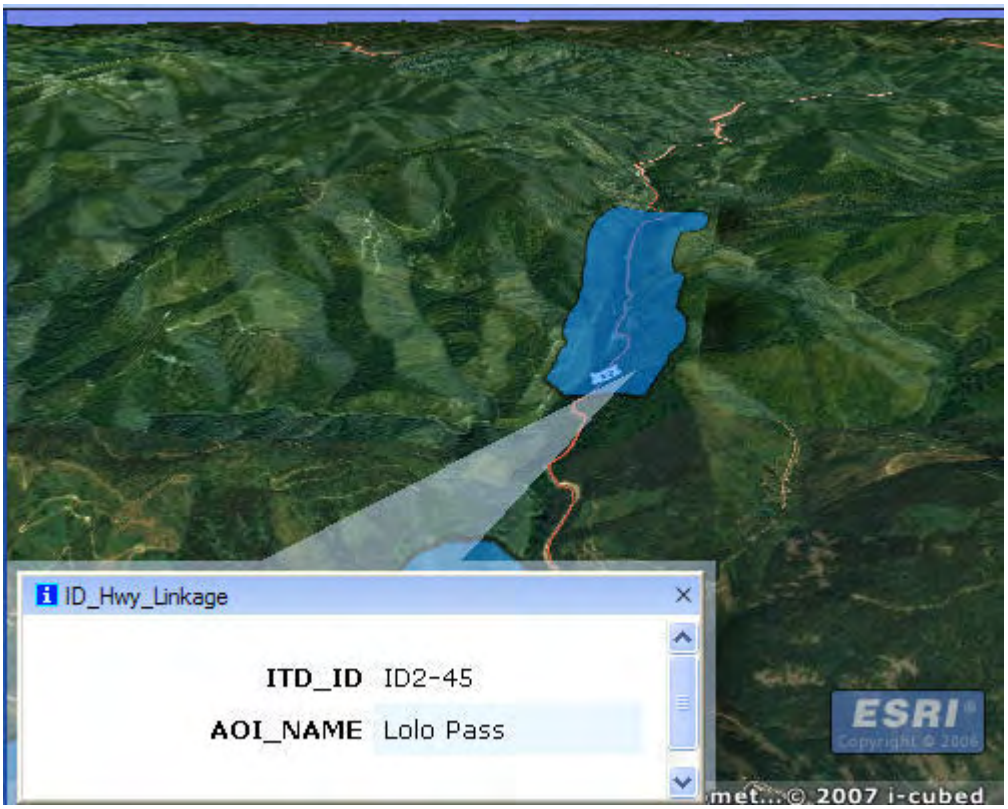
ATTRACT: Road salts act as an attractant.

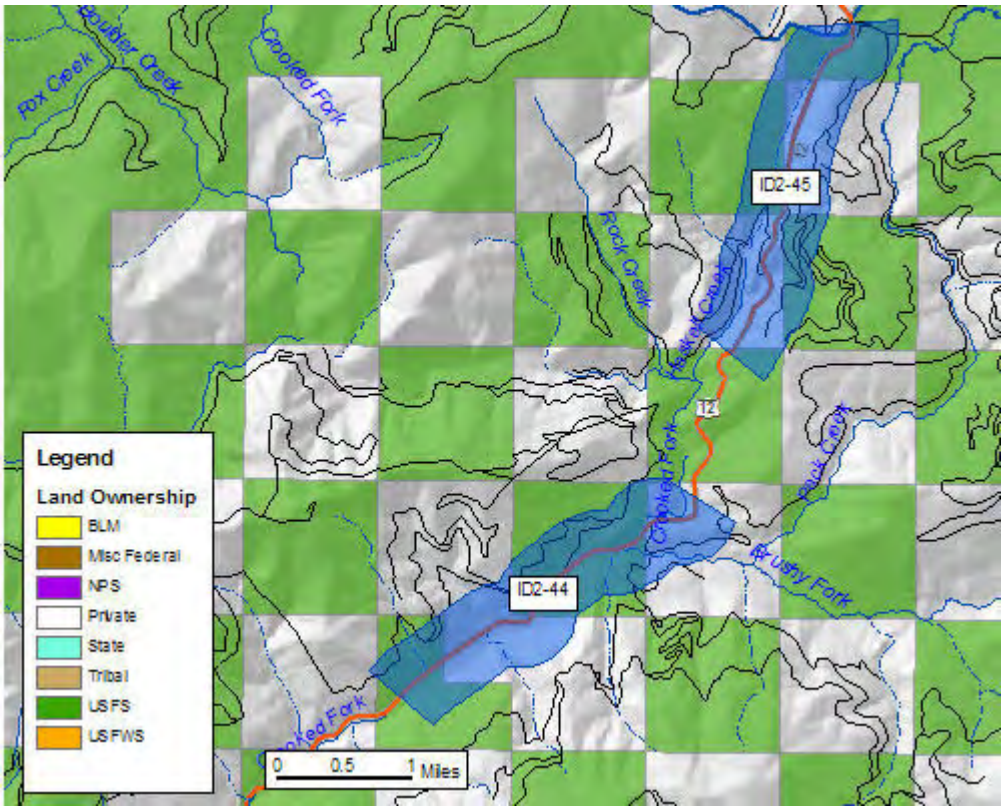
AGENCIES:

ADDITIONAL COMMENTS:

CDC Hwy 12 Harlequin ducks, Crooked Fork. Lot of moose activity; but river below.

ITD2_ID: ID2-45





ITD2_ID: ID2-45

AOI_NAME: Lolo Pass

PRIORITY: Moderate

SPECIES: mule deer/ elk/ moose/ black bear/ mountain lion/ wolf/ lynx/ fisher

MIG_POP: yes, mule deer and elk

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

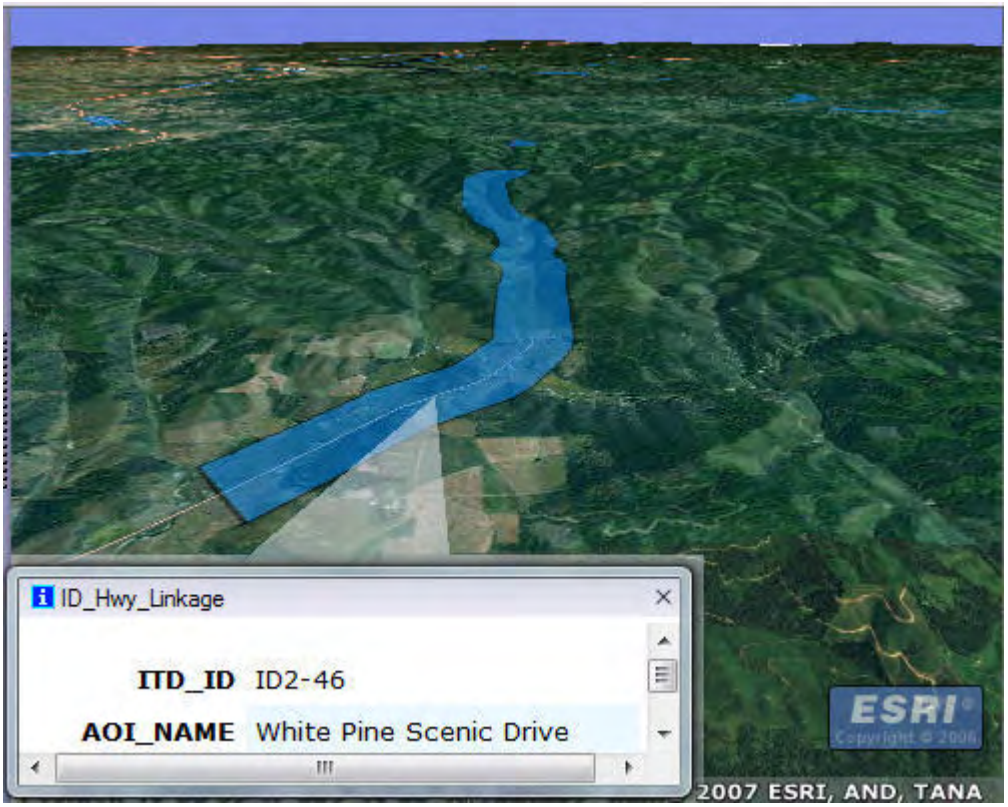
ATTRACT: Road salts act as an attractant.

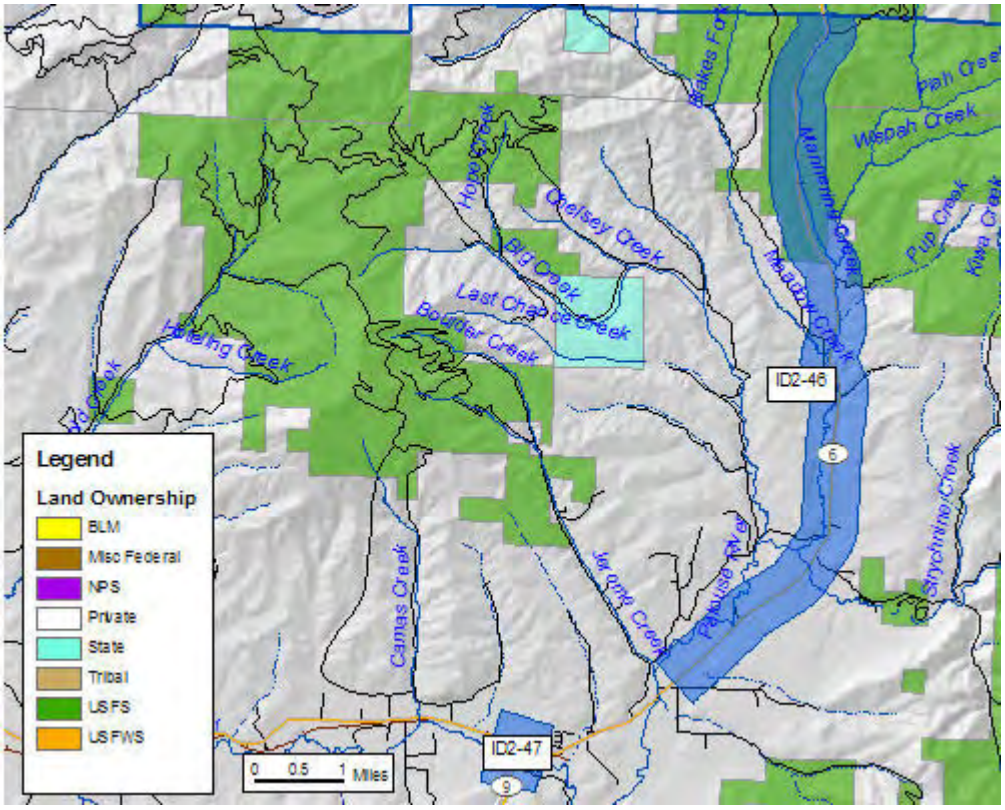
AGENCIES:

ADDITIONAL COMMENTS:

No fish passage issue.

ITD2_ID: ID2-46





ITD2_ID: ID2-46

AOI_NAME: White Pine Scenic Drive

PRIORITY: Low

SPECIES: mule deer/ white-tail deer/ elk/ moose/ black bear/ mountain lion/ wolf/
Water Howelli location at mp 12 and 13 (oxbow habitat)/ small mammals

MIG_POP:

LOC_POP:

SCALE: Ecosystem

HWY_MORT:

SEASON: Spring, Summer, Fall, Winter

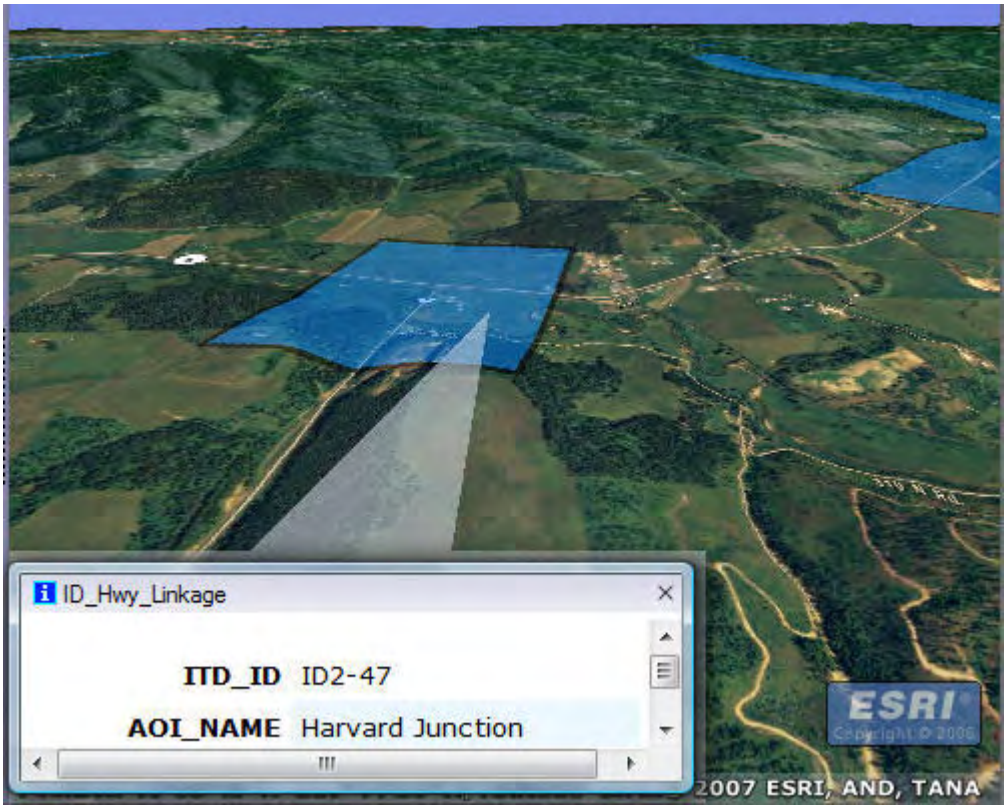
ATTRACT:

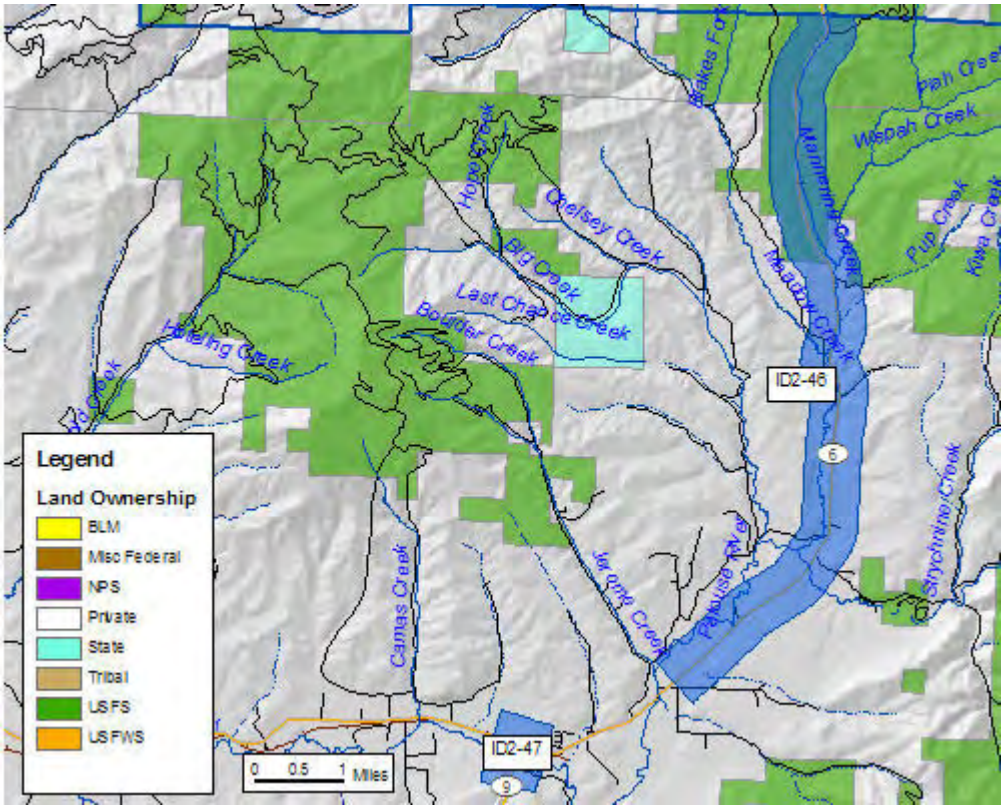
AGENCIES:

ADDITIONAL COMMENTS:

Moose are a particular problem. Underpasses in linkage zone. Palouse watershed divide is to the west. Travel corridors east and west crossing SH6.Elk, hay feeds in spring; 18-19 moose hit, larger kill site here; several overpasses, box culverts. Wolf was observed approximately 2 years ago (2006).

ITD2_ID: ID2-47





ITD2_ID: ID2-47

AOI_NAME: Harvard Junction

PRIORITY: Low

SPECIES: Water Howelli location

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

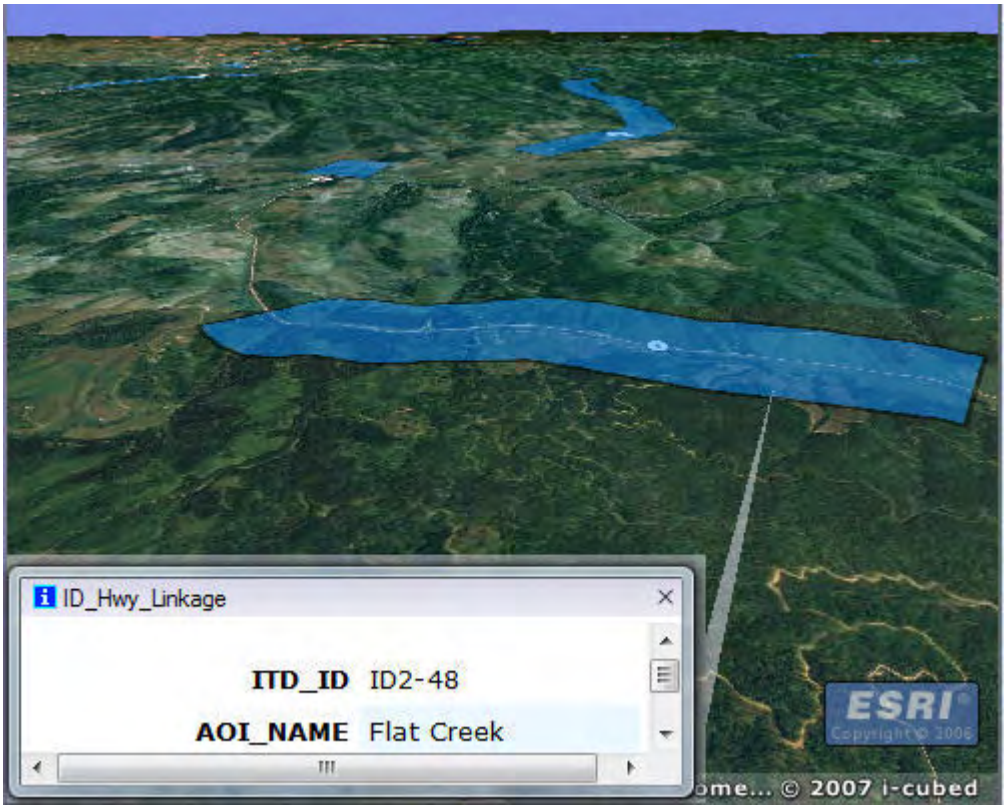
ATTRACT:

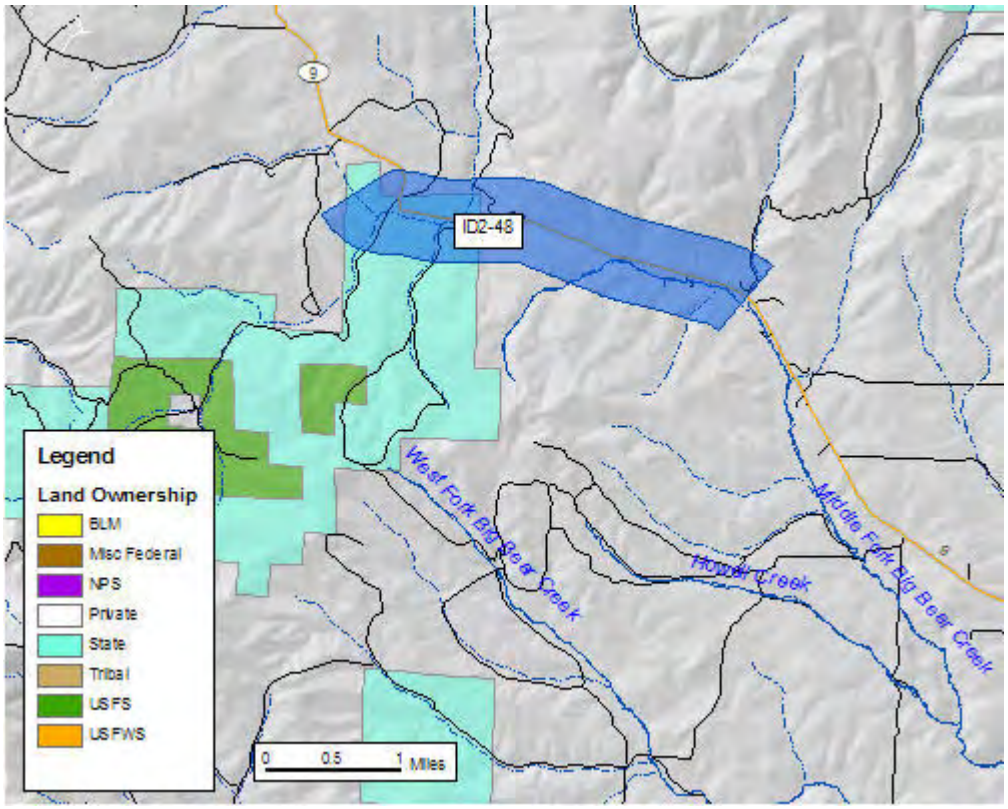
AGENCIES

ADDITIONAL COMMENTS:

Large bridge.

ITD2_ID: ID2-48





ITD2_ID: ID2-48

AOI_NAME: Flat Creek

PRIORITY: Low

SPECIES: mule deer/ white-tail deer/ elk/ moose/ wolf

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

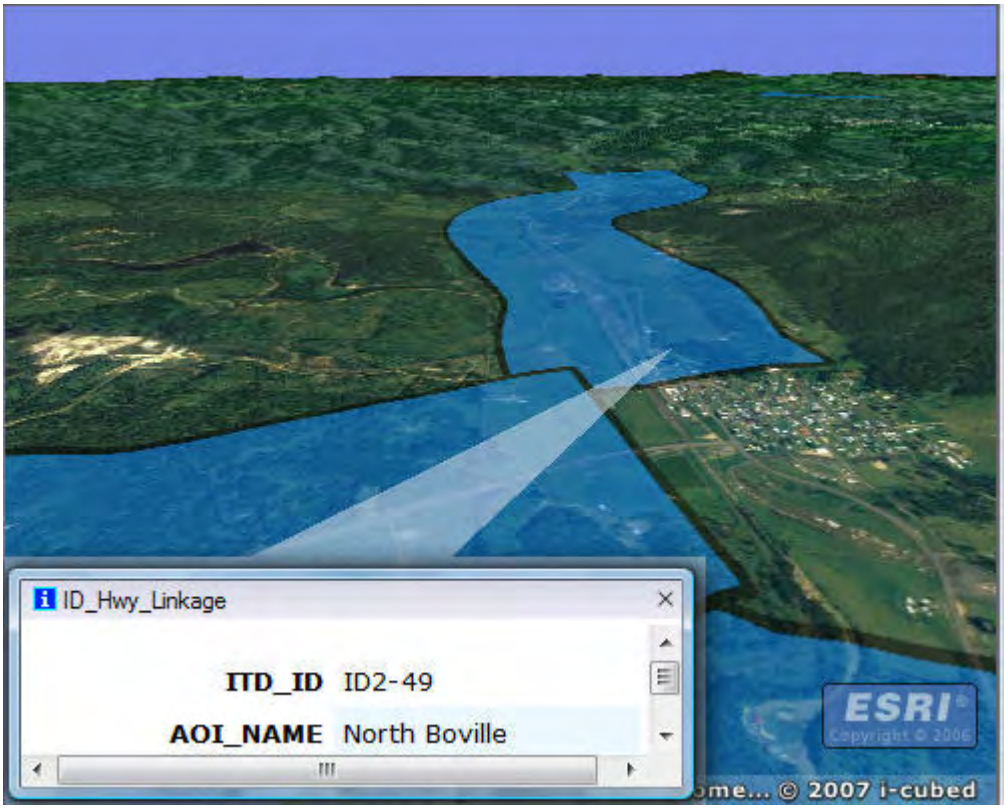
ATTRACT:

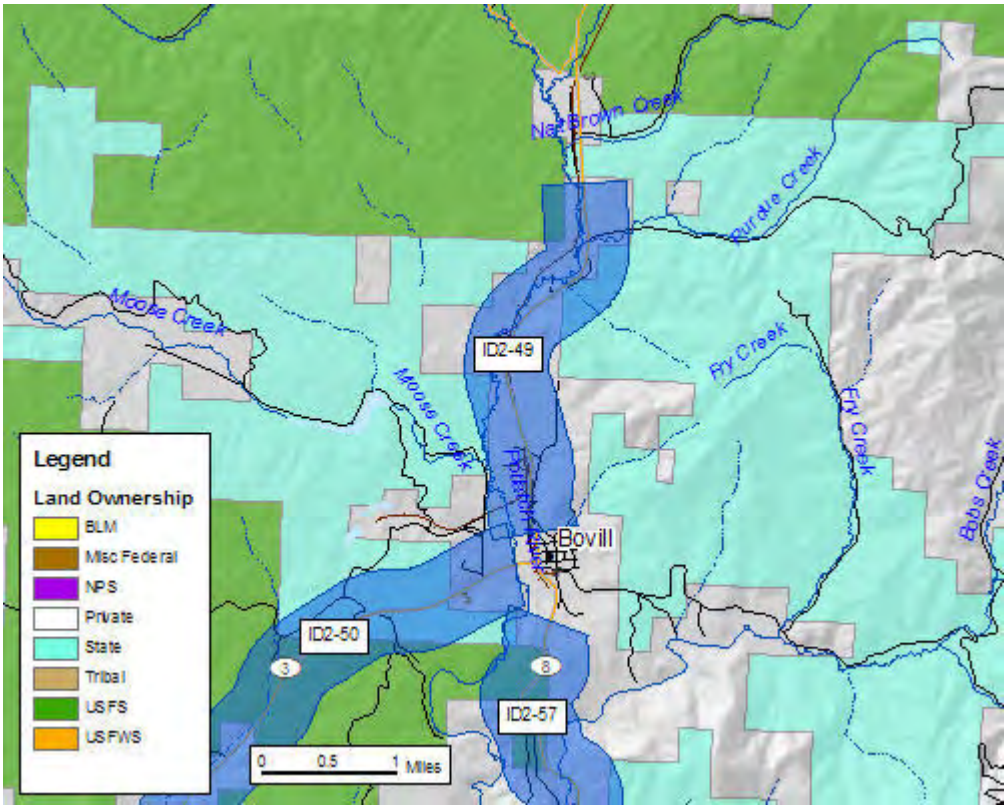
AGENCIES:

ADDITIONAL COMMENTS:

High deer and elk movement across this area. Mule deer collisions primarily occur at mp 9-10.U of I, forested; mp 9-10 abandoned RR bridge.

ITD2_ID: ID2-49





ITD2_ID: ID2-49

AOI_NAME: North Boville

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose/ black bear/ wolf/ misc. aquatic species

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

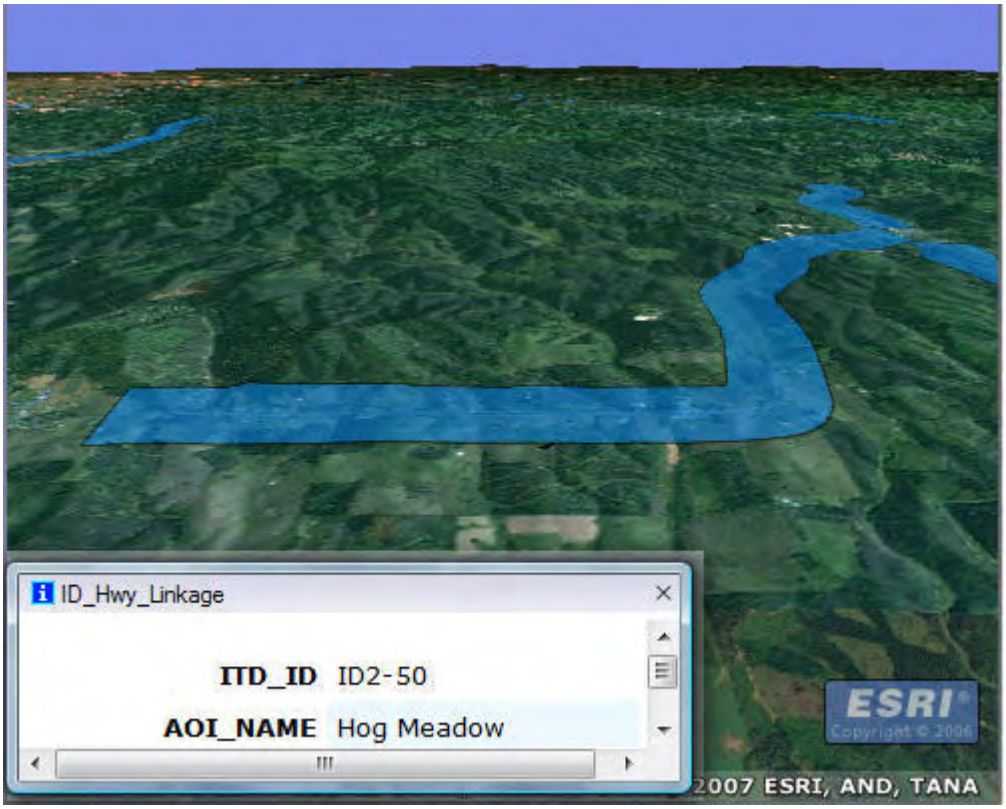
ATTRACT:

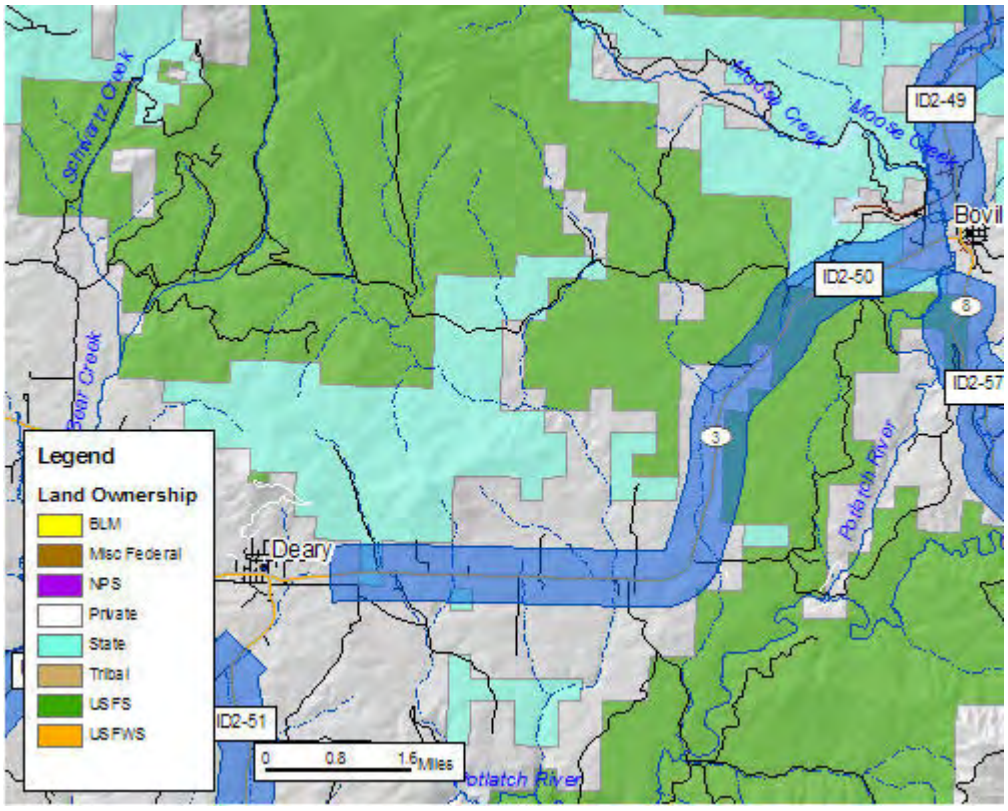
AGENCIES:

ADDITIONAL COMMENTS:

Elk primarily found in the winter. Wolves are crossing the Palouse divide in this linkage area.

ITD2_ID: ID2-50





ITD2_ID: ID2-50

AOI_NAME: Hog Meadow

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose/ wolf/ turkeys

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

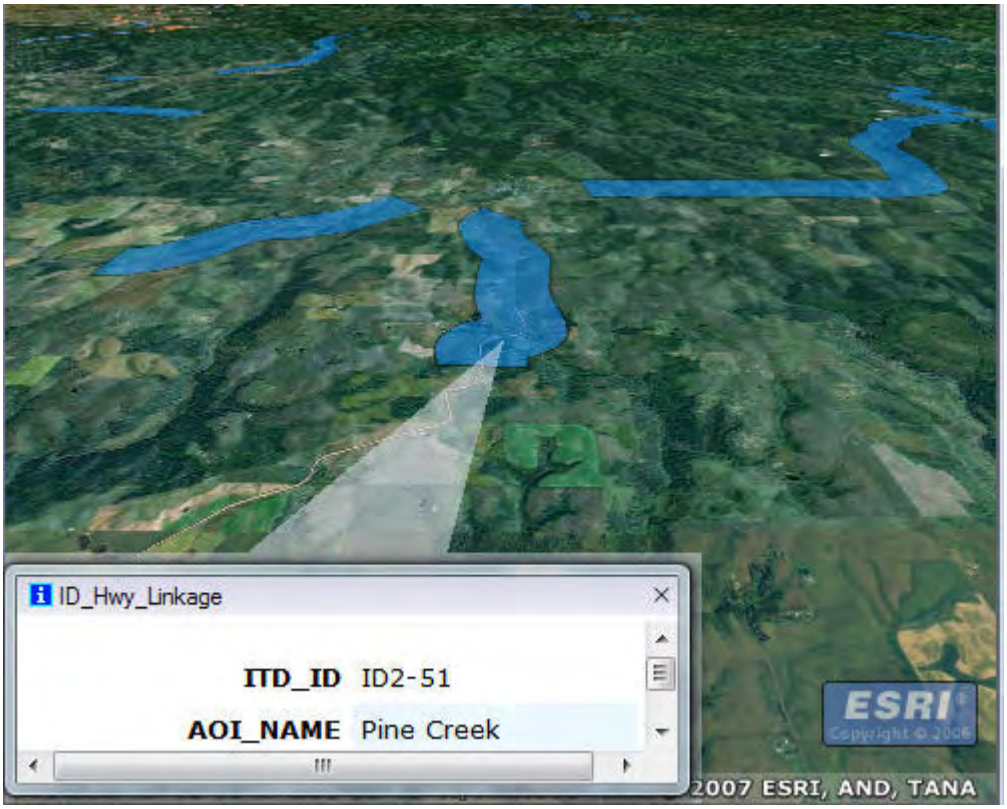
SEASON: Spring, Fall, Winter

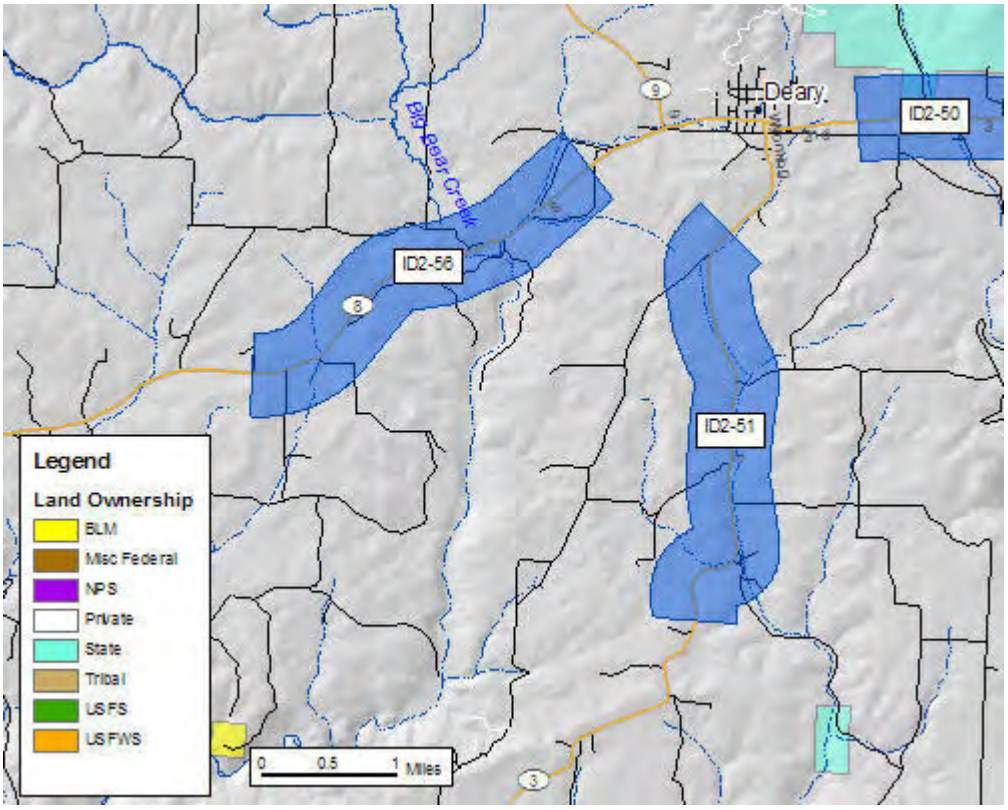
ATTRACT: water/riparian

AGENCIES:

ADDITIONAL COMMENTS:
Elk calving in Hog Meadow, which is close to the highway. MP 34 wolf crossings. White-tailed deer and turkeys common in this area.

ITD2_ID: ID2-51





ITD2_ID: ID2-51

AOI_NAME: Pine Creek

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

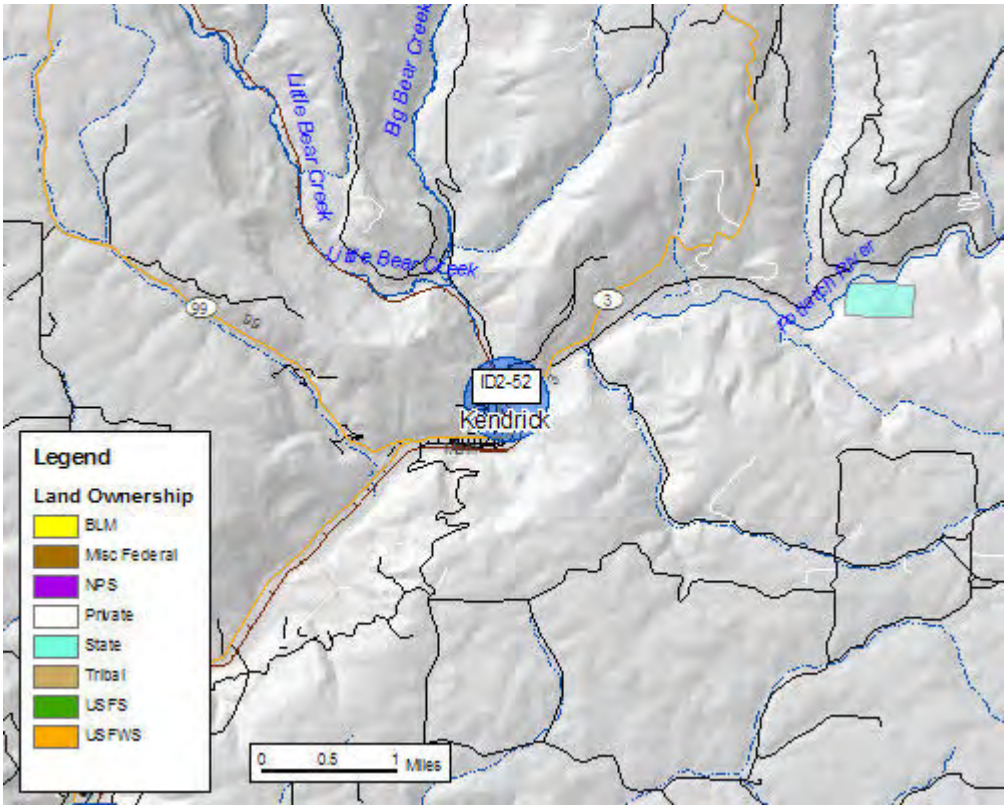
ATTRACT: sand shed acts as a salt attractant for wildlife

AGENCIES:

ADDITIONAL COMMENTS:

There are occasional elk and a few moose within this linkage area. White-tail deer are the primary ungulate present. MP 27 state maintenance shed.

ITD2_ID: ID2-52



ITD2_ID: ID2-52

AOI_NAME: Little Bear

PRIORITY: Low

SPECIES: steelhead

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

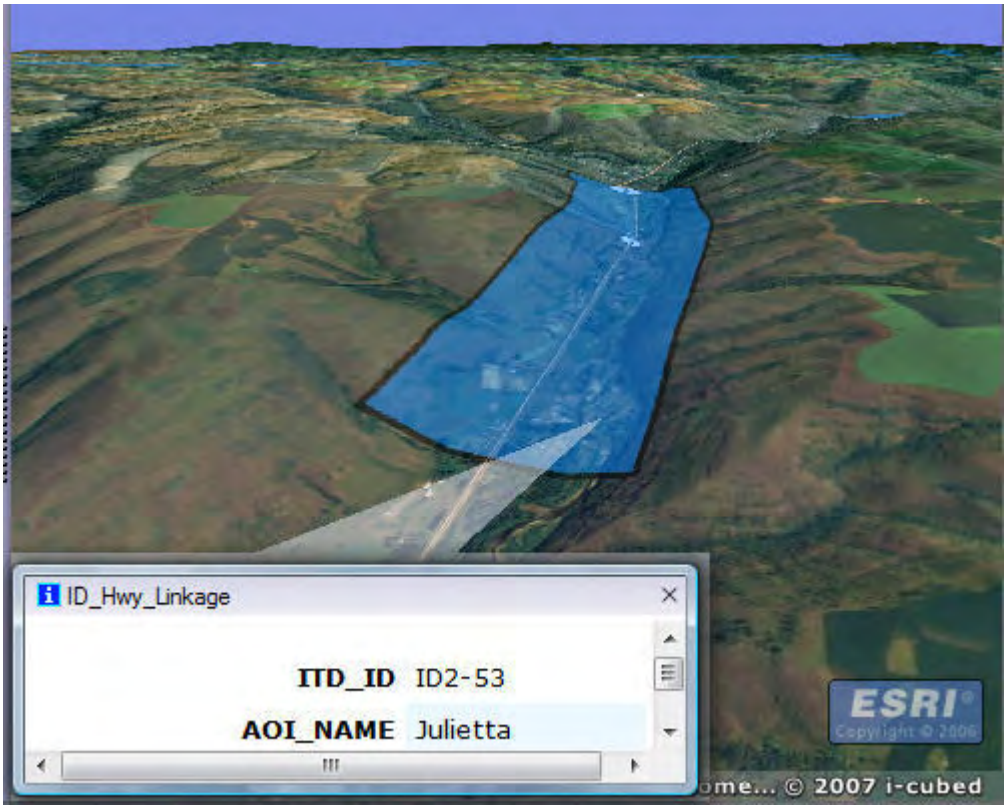
ATTRACT:

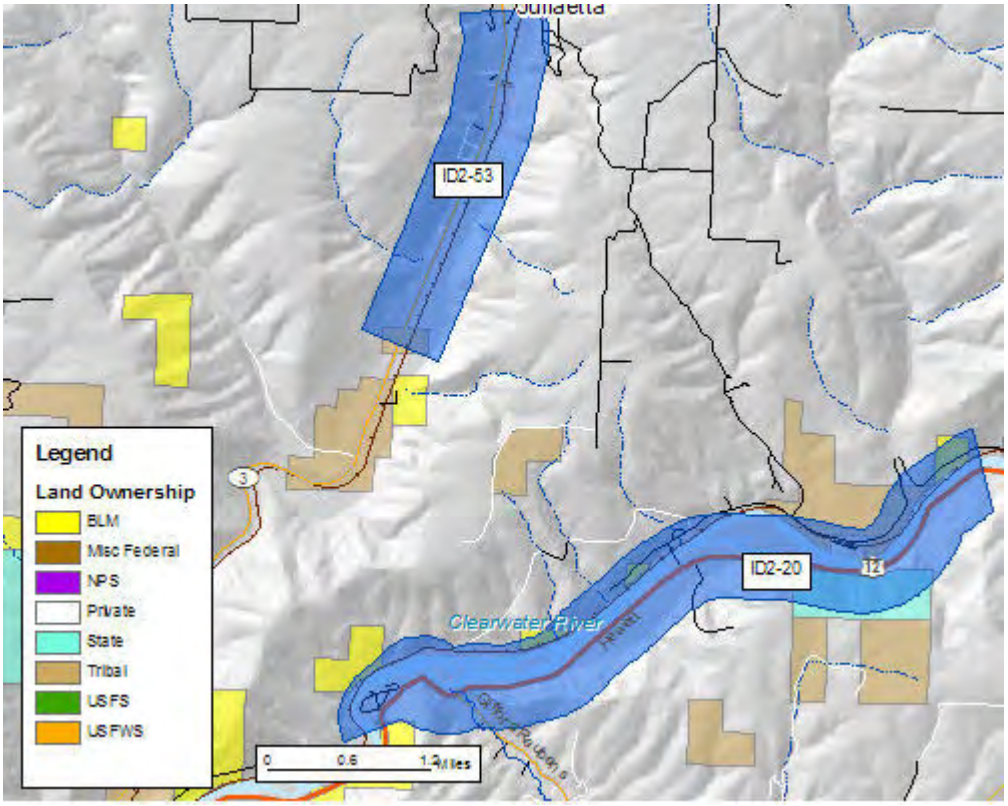
AGENCIES:

ADDITIONAL COMMENTS:

No known fish passage problems within this linkage. Bridge; mp 15-25 porter rail.

ITD2_ID: ID2-53





ITD2_ID: ID2-53

AOI_NAME: Julietta

PRIORITY: Low

SPECIES: white-tail deer/ elk

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON: Winter - Elk present in higher numbers in the winter.

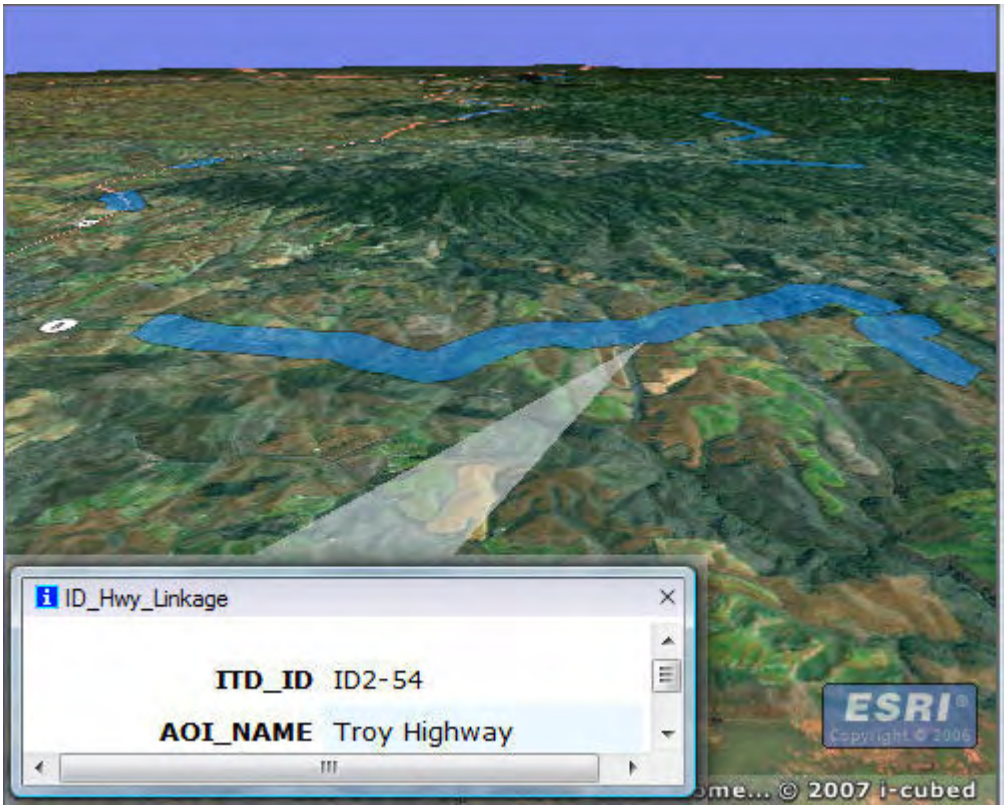
ATTRACT: water/riparian

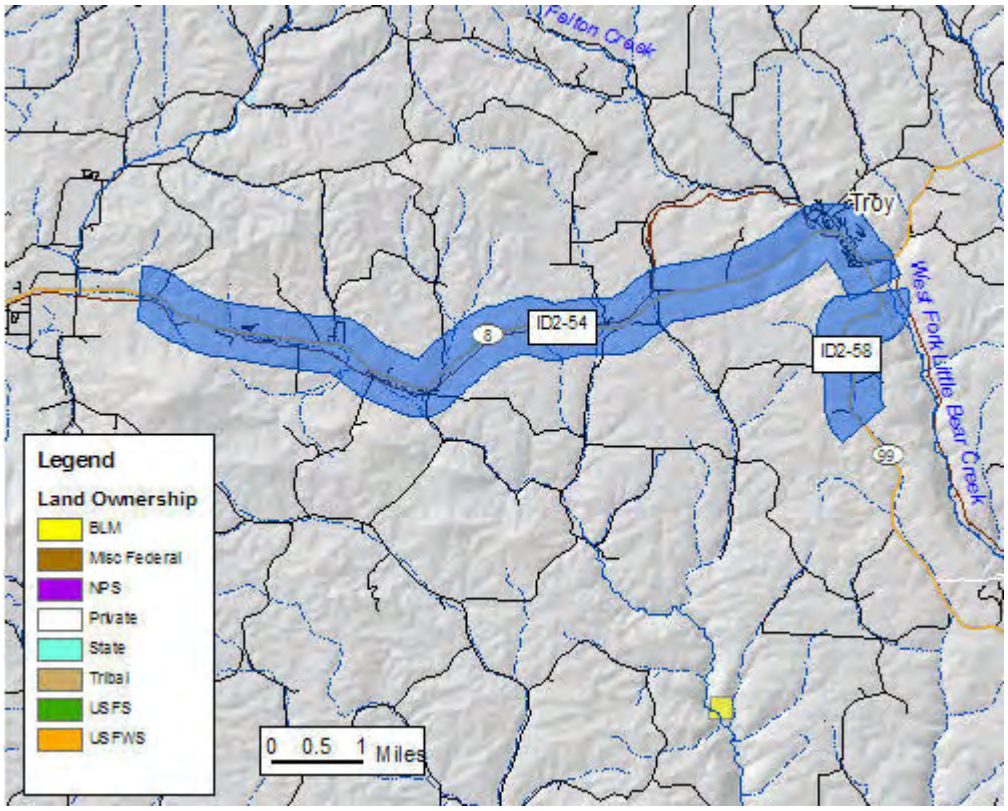
AGENCIES:

ADDITIONAL COMMENTS:

Elk also found in the side canyons in this linkage area. MP 8 bridge.

ITD2_ID: ID2-54





ITD2_ID: ID2-54

AOI_NAME: Troy Highway

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose/ black bear/ wolf

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

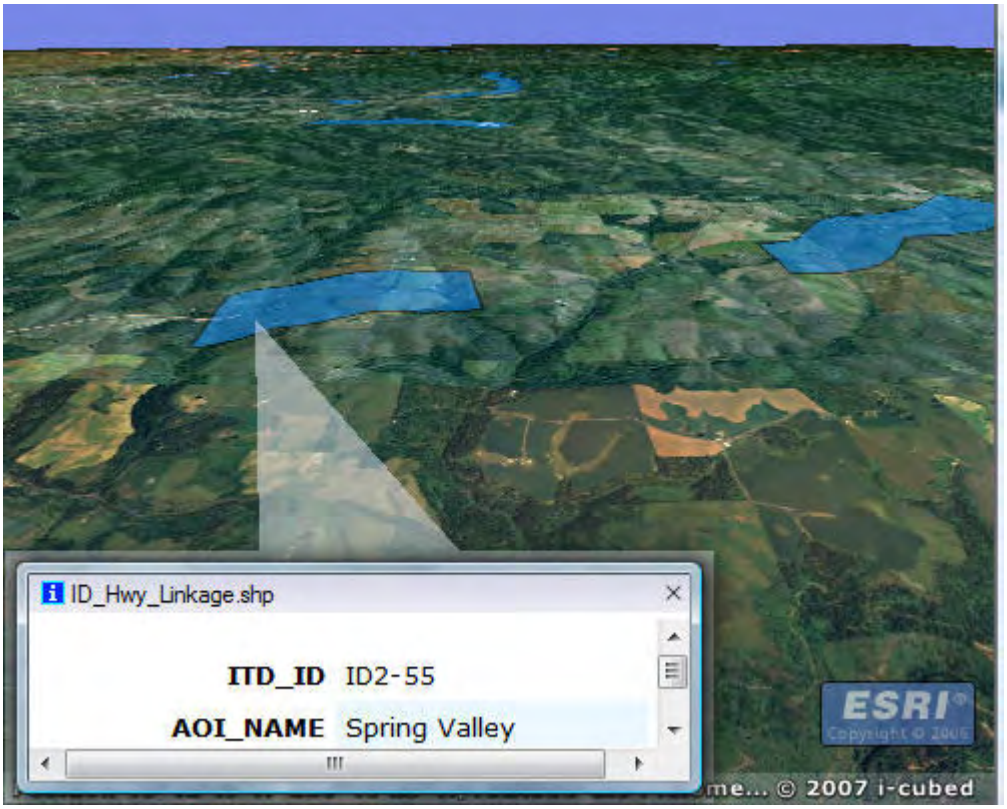
ATTRACT:

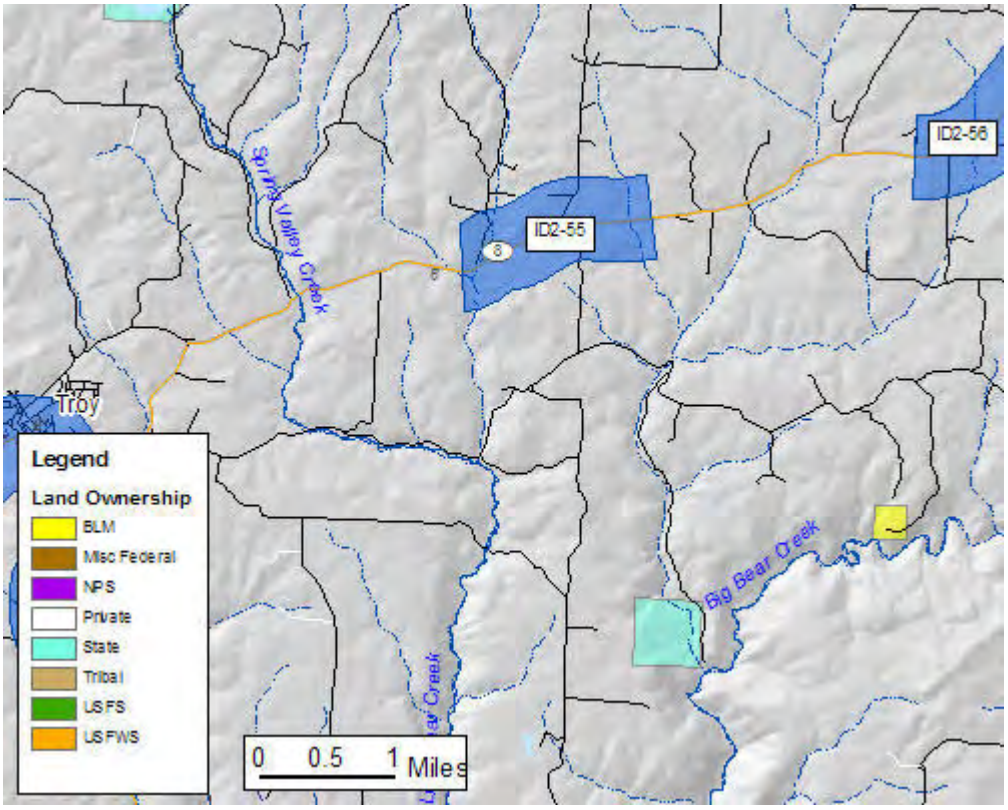
AGENCIES:

ADDITIONAL COMMENTS:

Occasional elk. MP 10 bear kill. Two other bear have been sighted in this linkage area.

ITD2_ID: ID2-55





ITD2_ID: ID2-55

AOI_NAME: Spring Valley

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose/ black bear

MIG_POP:

LOC_POP:

SCALE:

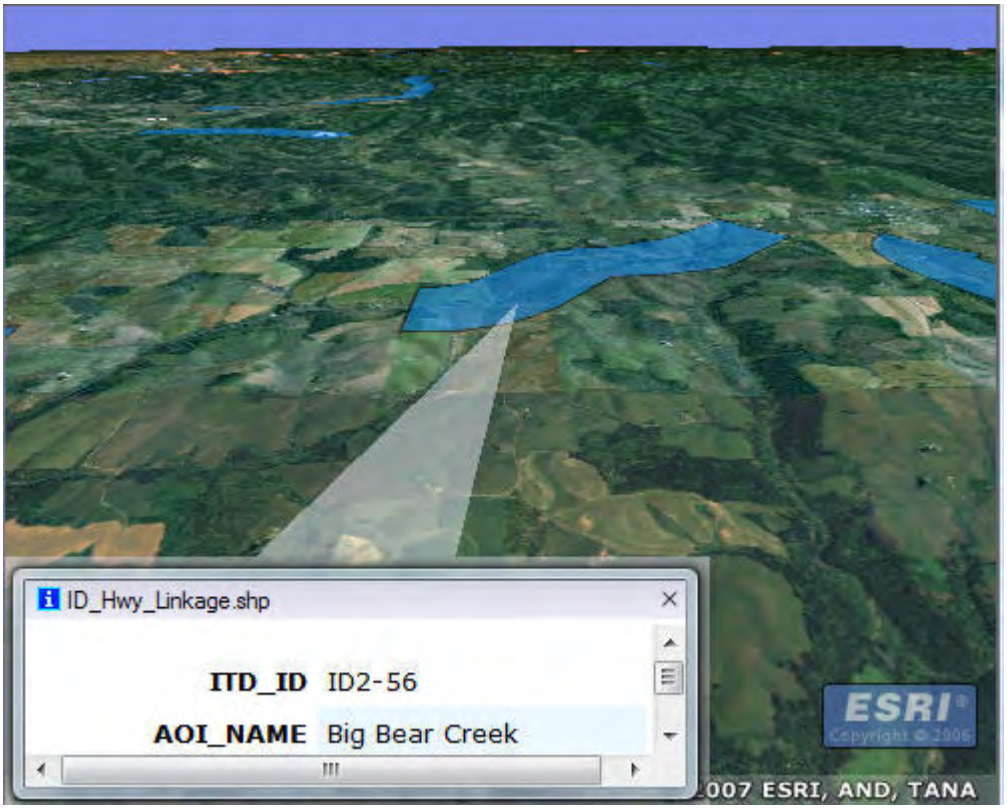
HWY_MORT:

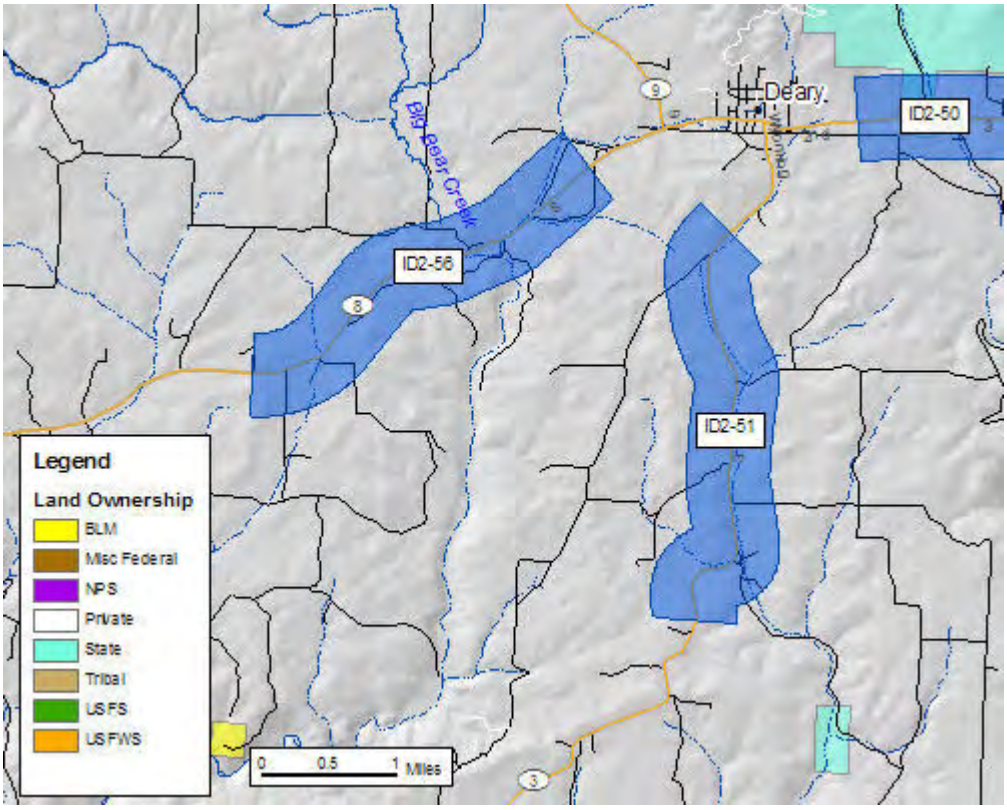
SEASON:

ATTRACT:

AGENCIES:

ITD2_ID: ID2-56





ITD2_ID: ID2-56

AOI_NAME: Big Bear Creek

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose/ black bear

MIG_POP:

LOC_POP:

SCALE: regional

HWY_MORT:

SEASON:

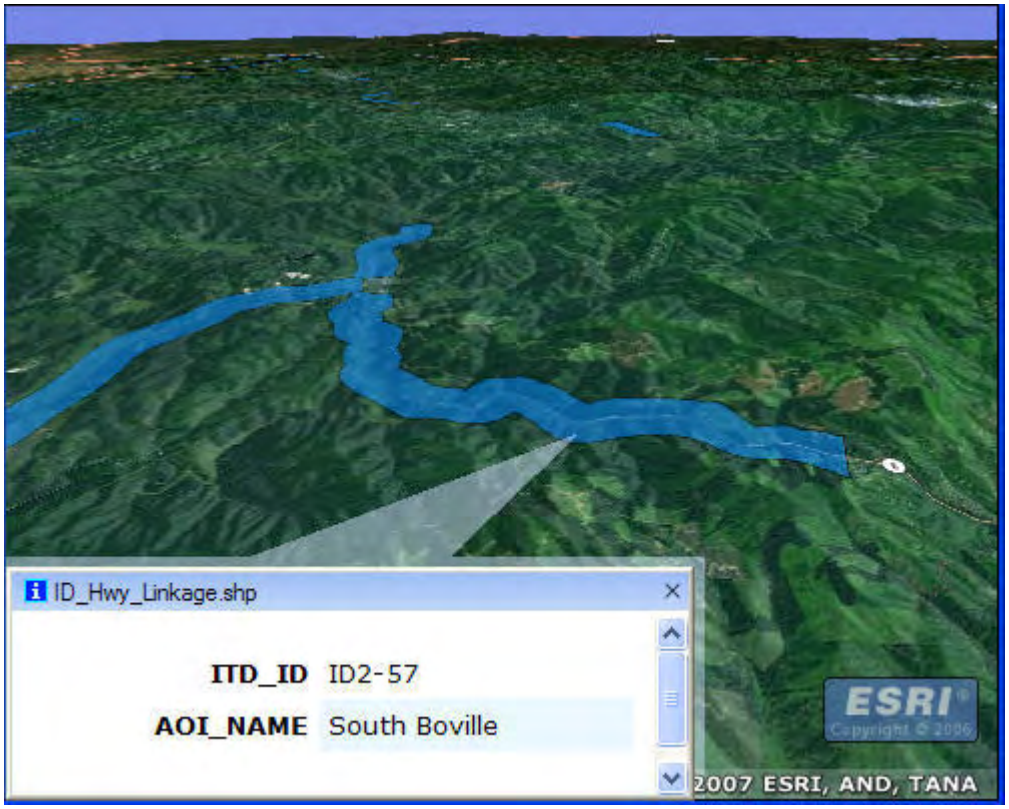
ATTRACT:

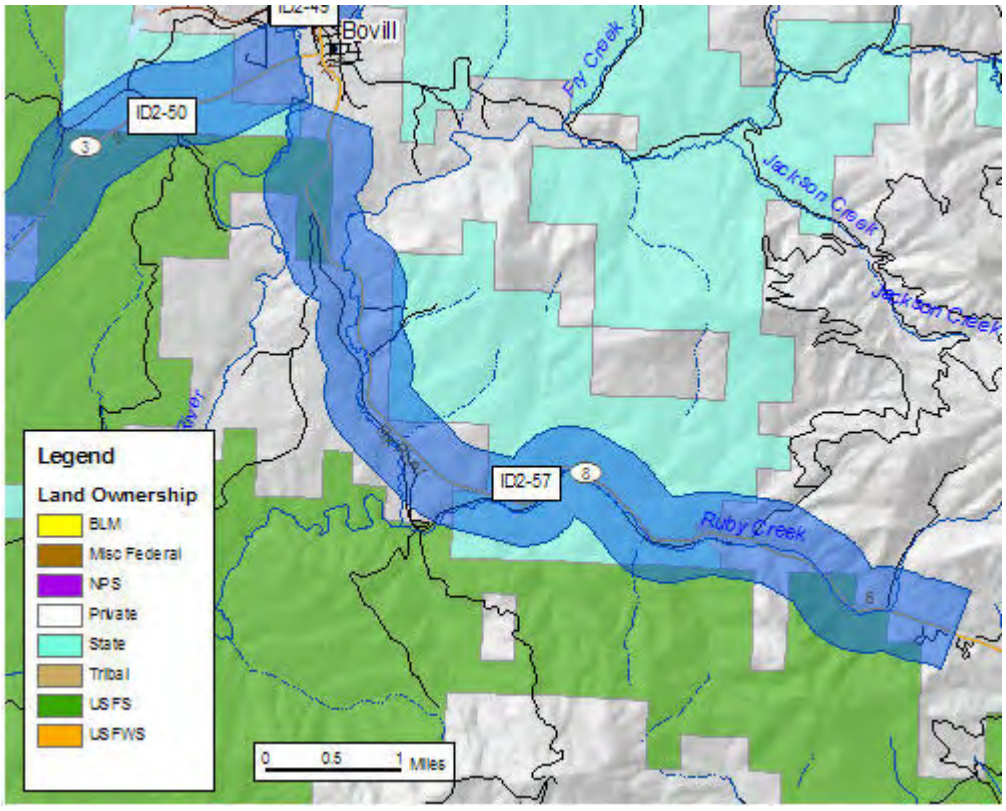
AGENCIES:

ADDITIONAL COMMENTS:

North to south movements. Regional linkage area.

ITD2_ID: ID2-57





ITD2_ID: ID2-57

AOI_NAME: South Boville

PRIORITY: Moderate

SPECIES: white-tail deer/ elk/ moose/ black bear/ wolf/ marten/ fisher/ amphibians

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

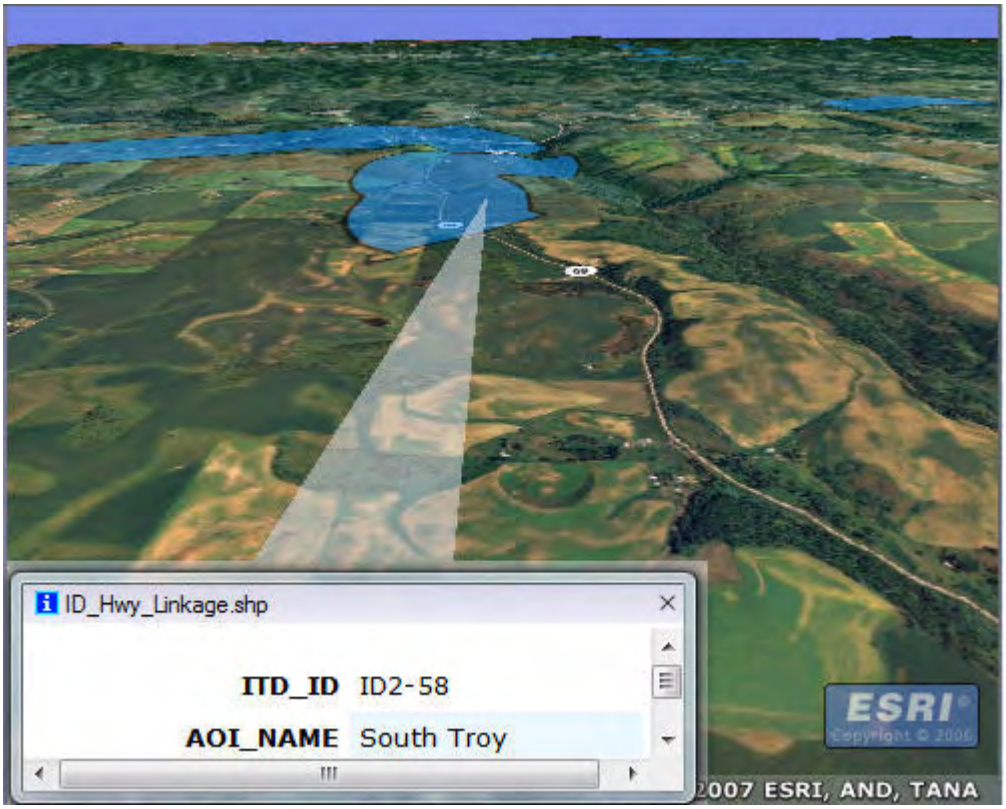
ATTRACT: water/riparian

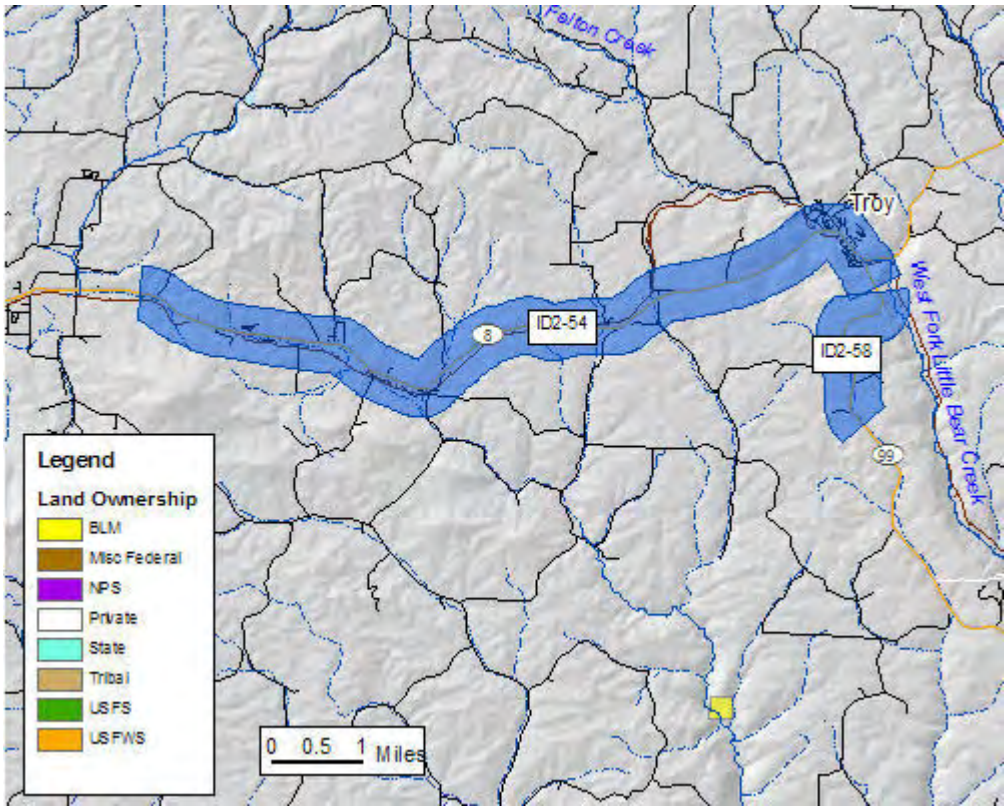
AGENCIES:

ADDITIONAL COMMENTS:

Wolf activity is higher south towards Dworshak reservoir. Wolf sightings; elk mp 39-40 largest concentration. Moose area. Bridge over RR, tracks abandoned.

ITD2_ID: ID2-58





ITD2_ID: ID2-58

AOI_NAME: South Troy

PRIORITY: Low

SPECIES: white-tail deer/ elk

MIG_POP:

LOC_POP:

SCALE:

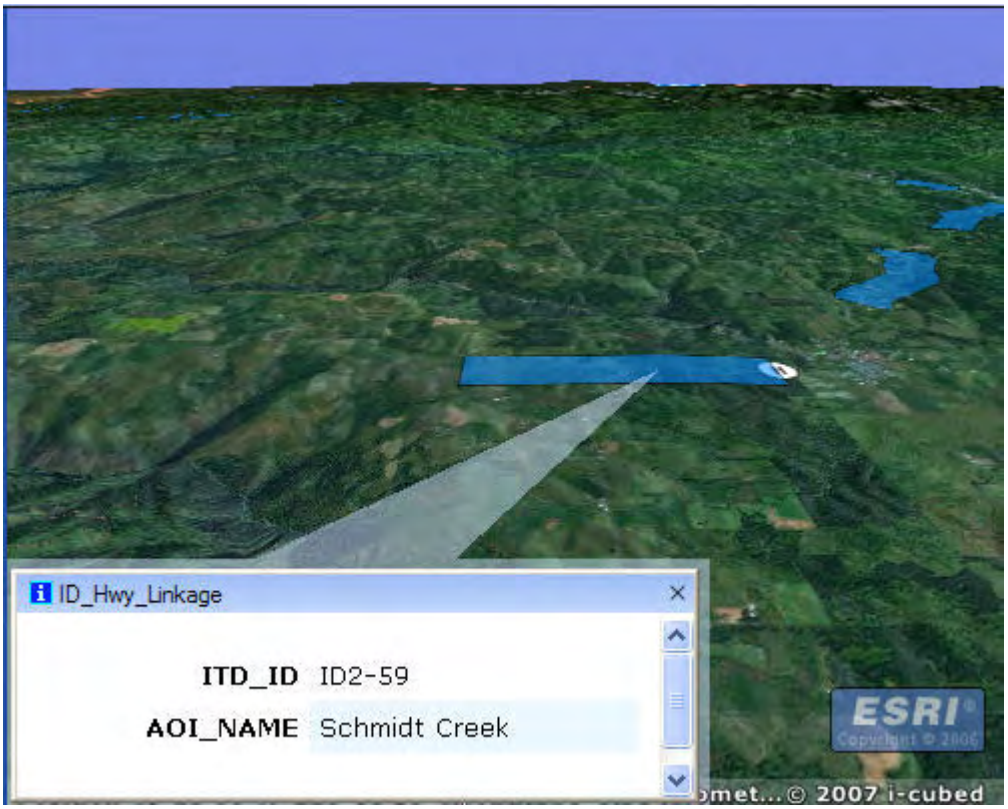
HWY_MORT:

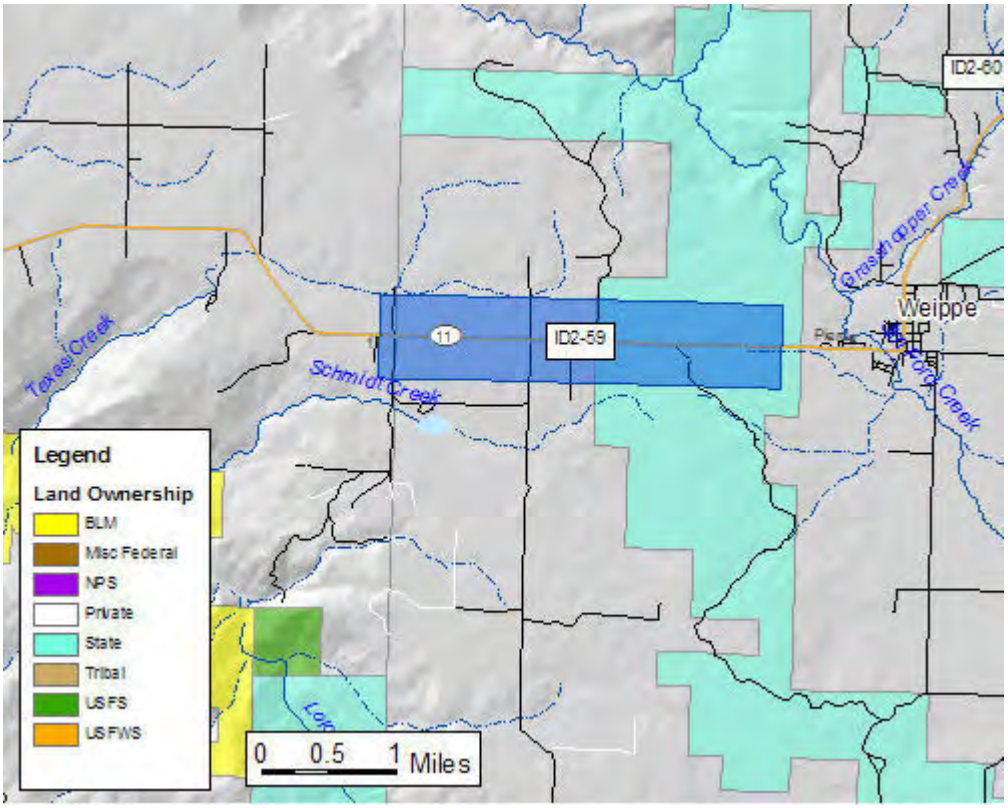
SEASON:

ATTRACT:

AGENCIES:

ITD2_ID: ID2-59





ITD2_ID: ID2-59

AOI_NAME: Schmidt Creek

PRIORITY: Low

SPECIES: white-tail deer

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT: White-tail deer, birds, small mammals

SEASON: Deer year-round residents

ATTRACT:

AGENCIES:

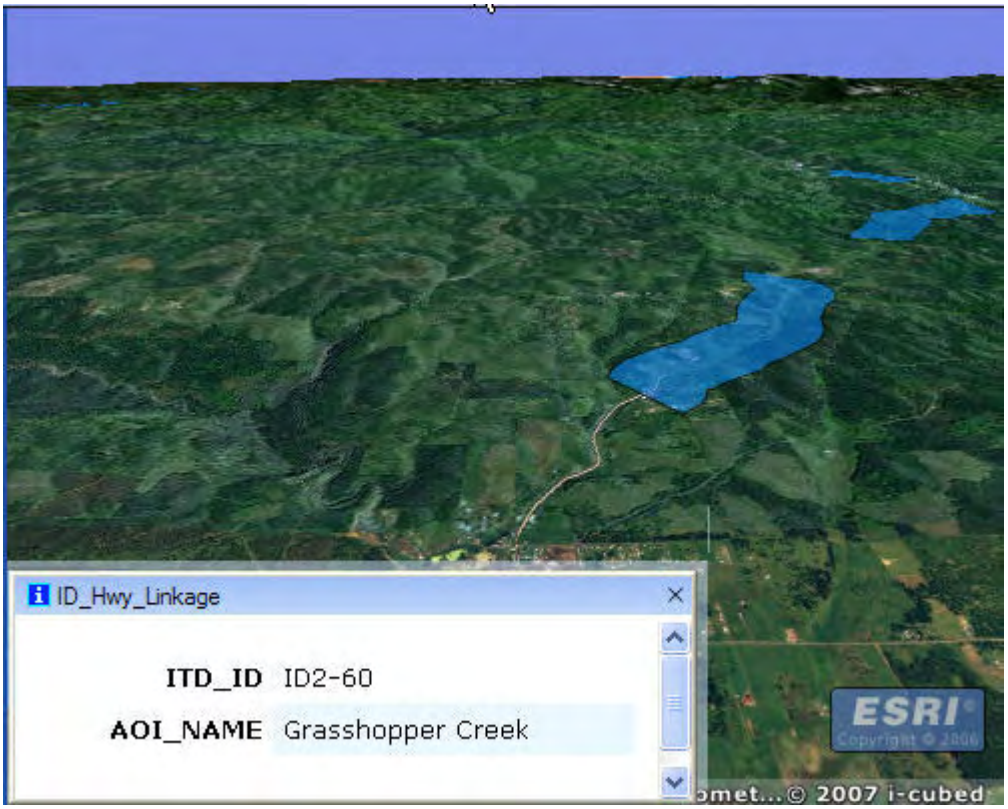
ADDITIONAL COMMENTS:

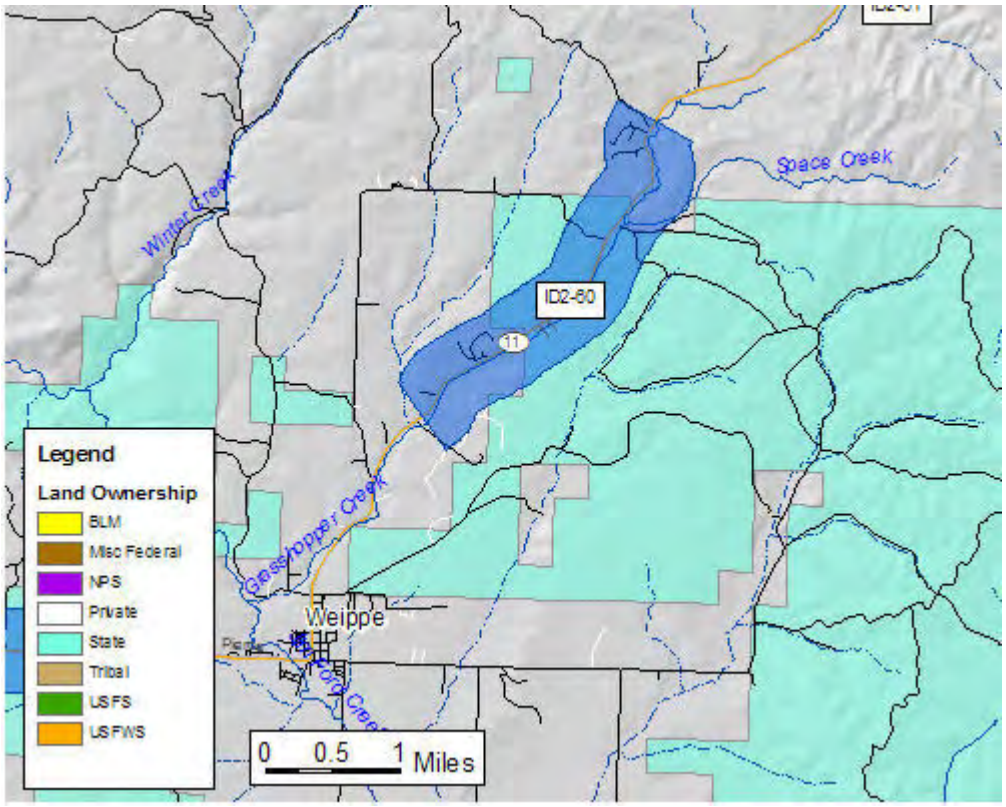
Permanent Human Presence: Residential homes.

Effective functioning of linkage area: Site functions with moderate levels of wildlife mortalities.

Opportunities to improve the effectiveness of the linkage area: Signage

ITD2_ID: ID2-60





ITD2_ID: ID2-60

AOI_NAME: Grasshopper Creek

PRIORITY: Low

SPECIES: white-tail deer

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT: White-tail deer

SEASON: Deer year-round residents

ATTRACT:

AGENCIES:

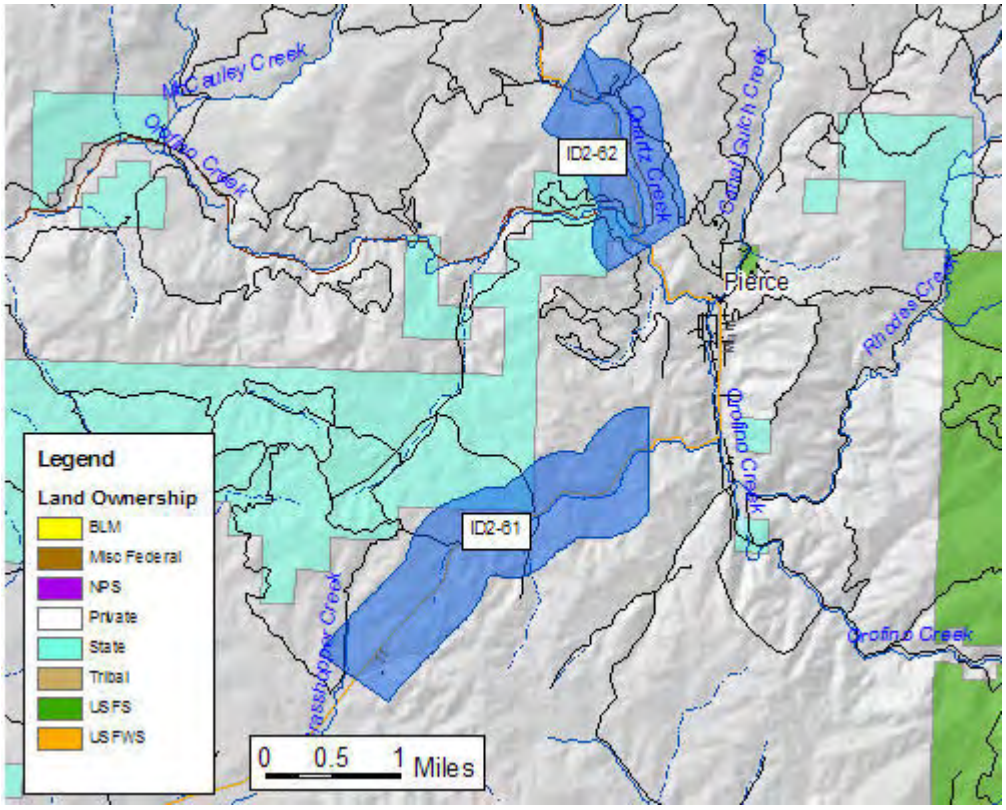
ADDITIONAL COMMENTS:

Permanent Human Presence: Residential homes

Effective functioning of linkage area: Site functions with moderate levels of wildlife mortalities.

Opportunities to improve the effectiveness of the linkage area: Signage

ITD2_ID: ID2-61



ITD2_ID: ID2-61

AOI_NAME: Pierce Divide

PRIORITY: Low

SPECIES: white-tail deer

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT: White-tail deer

SEASON: Deer year-round residents

ATTRACT:

AGENCIES:

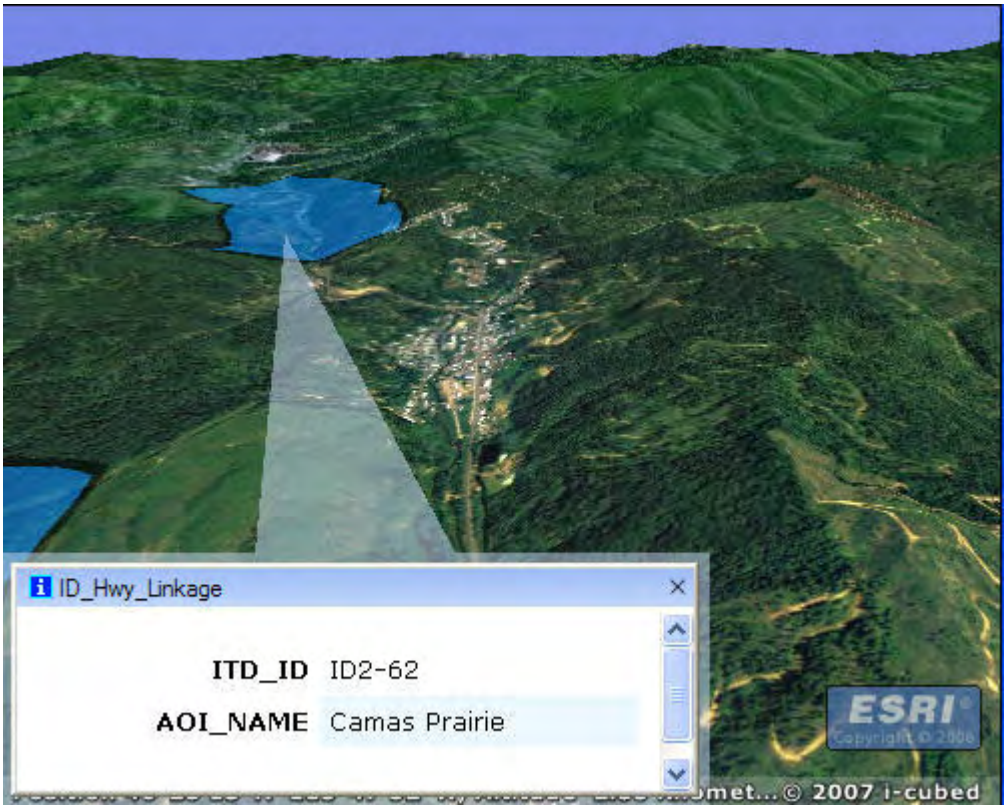
ADDITIONAL COMMENTS:

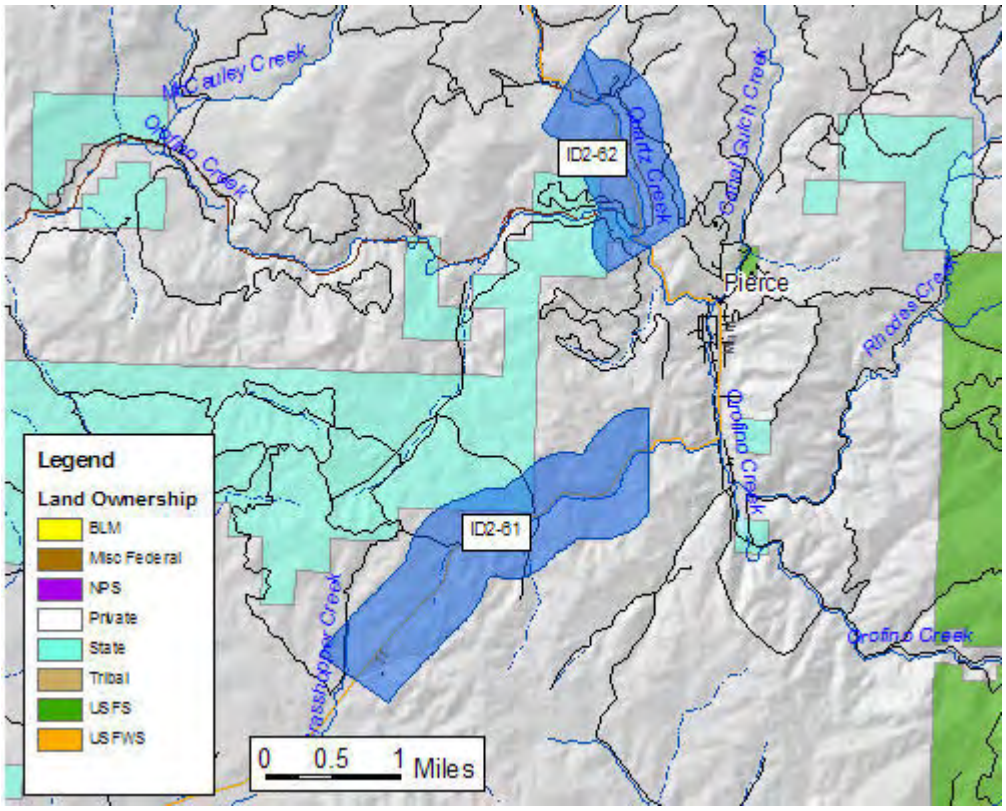
Permanent Human Presence: Residential homes

Effective functioning of linkage area: Site functions with moderate levels of wildlife mortalities.

Opportunities to improve the effectiveness of the linkage area: Signage

ITD2_ID: ID2-62





ITD2_ID: ID2-62

AOI_NAME: Camas Prairie

PRIORITY: Low

SPECIES: cougar

MIG_POP:

LOC_POP:

SCALE:

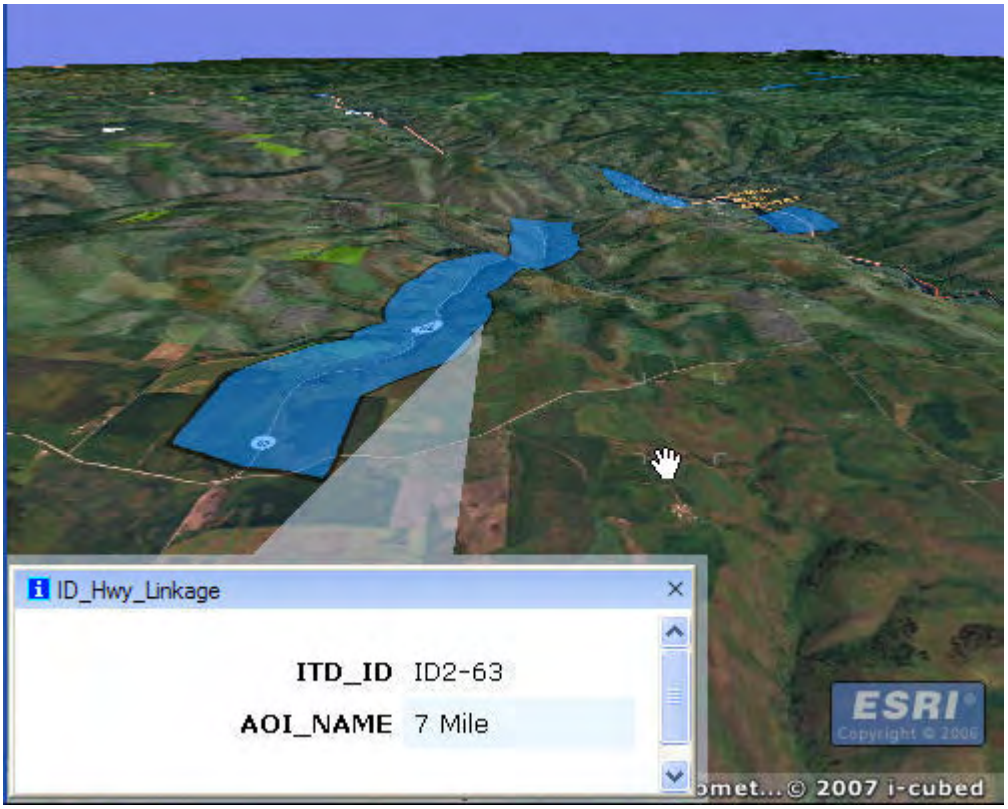
HWY_MORT:

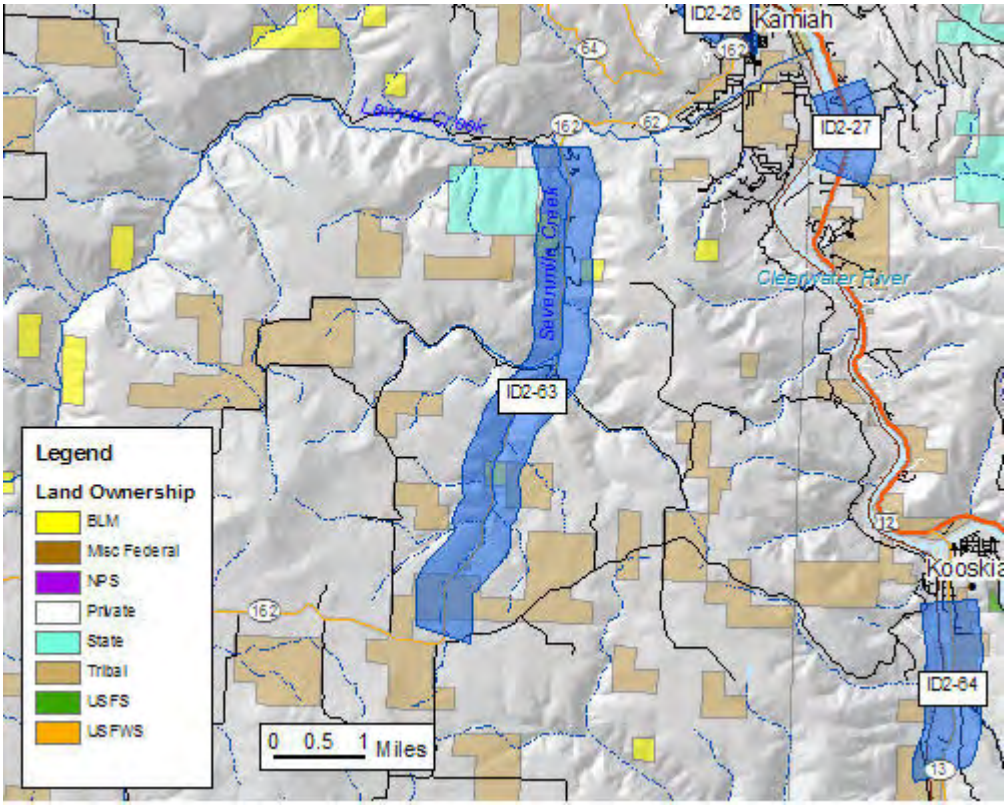
SEASON:

ATTRACT:

AGENCIES:

ITD2_ID: ID2-63





ITD2_ID: ID2-63

AOI_NAME: 7 Mile

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose/ black bear

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT: White-tail deer

SEASON: Deer year-round residents

ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:

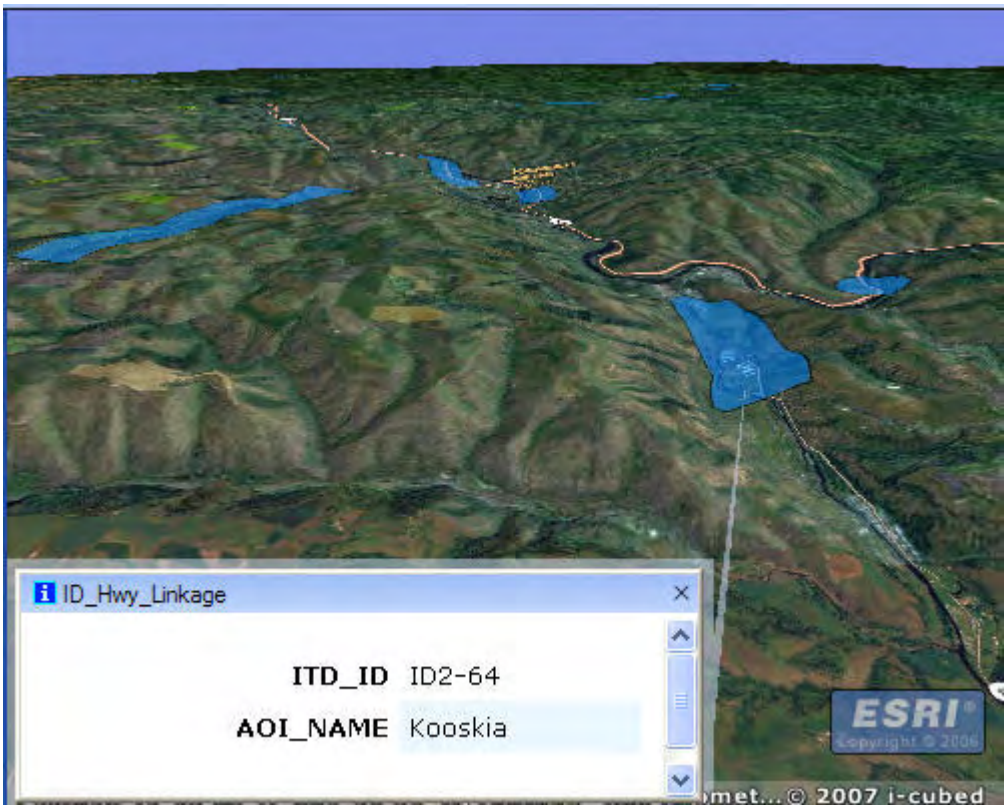
Permanent Human Presence: Residential homes

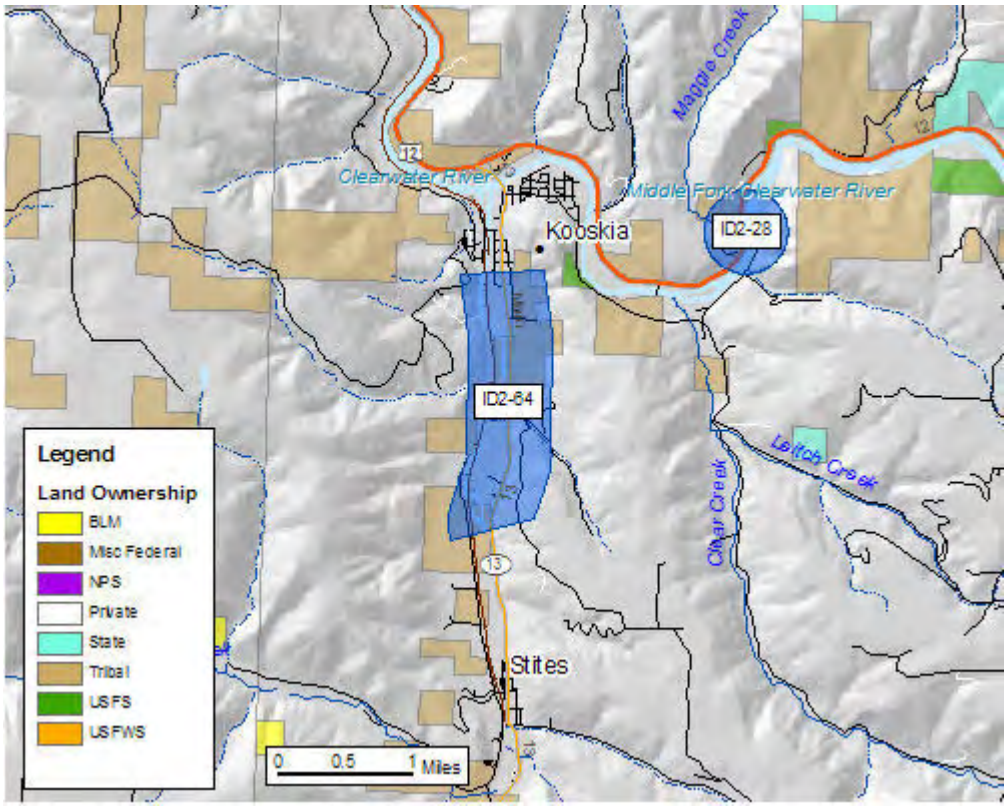
Effective functioning of linkage area: Site functions with moderate levels of wildlife mortalities.

Opportunities to improve the effectiveness of the linkage area: Signage

Not a high population of elk.

ITD2_ID: ID2-64





ITD2_ID: ID2-64

AOI_NAME: Kooskia

PRIORITY: Low

SPECIES: white-tail deer/ steelhead/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

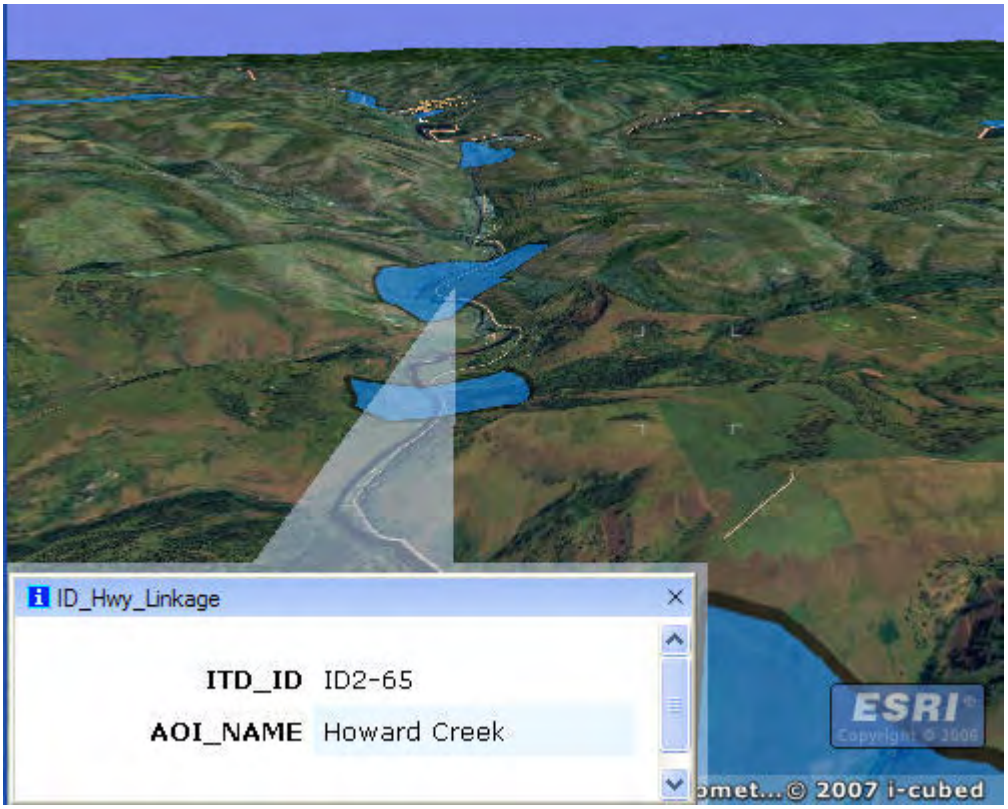
ATTRACT:

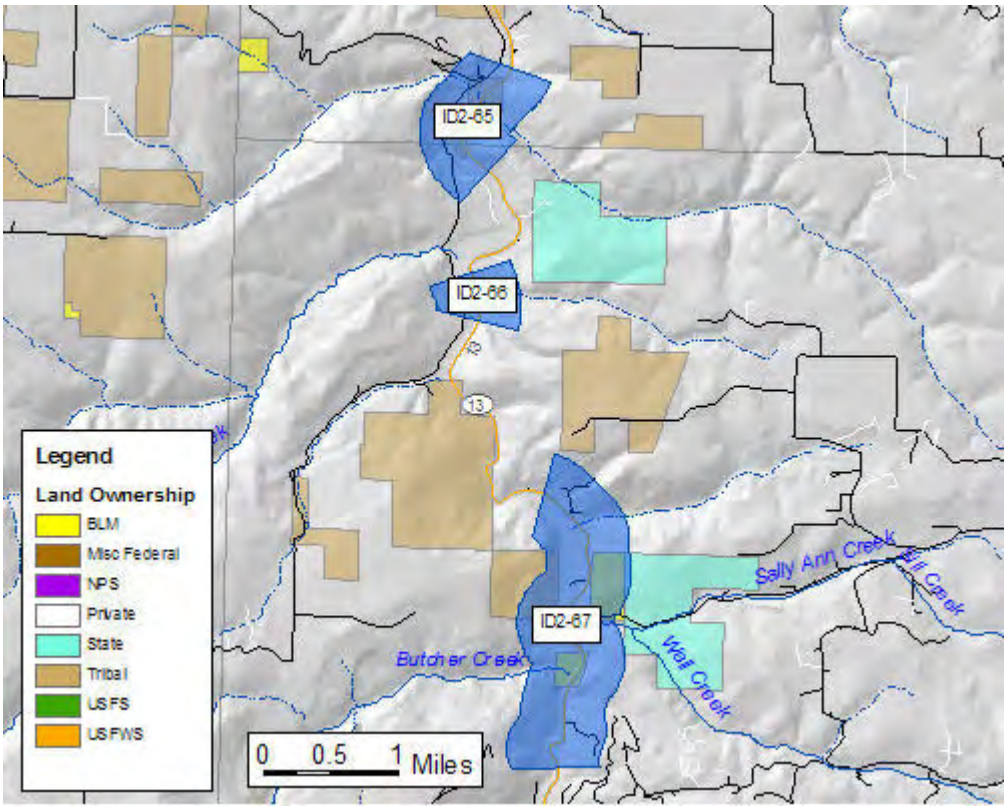
AGENCIES:

ADDITIONAL COMMENTS:

White-tail deer are hit at mp 125.

ITD2_ID: ID2-65





ITD2_ID: ID2-65

AOI_NAME: Howard Creek

PRIORITY: Low

SPECIES: white-tail deer

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

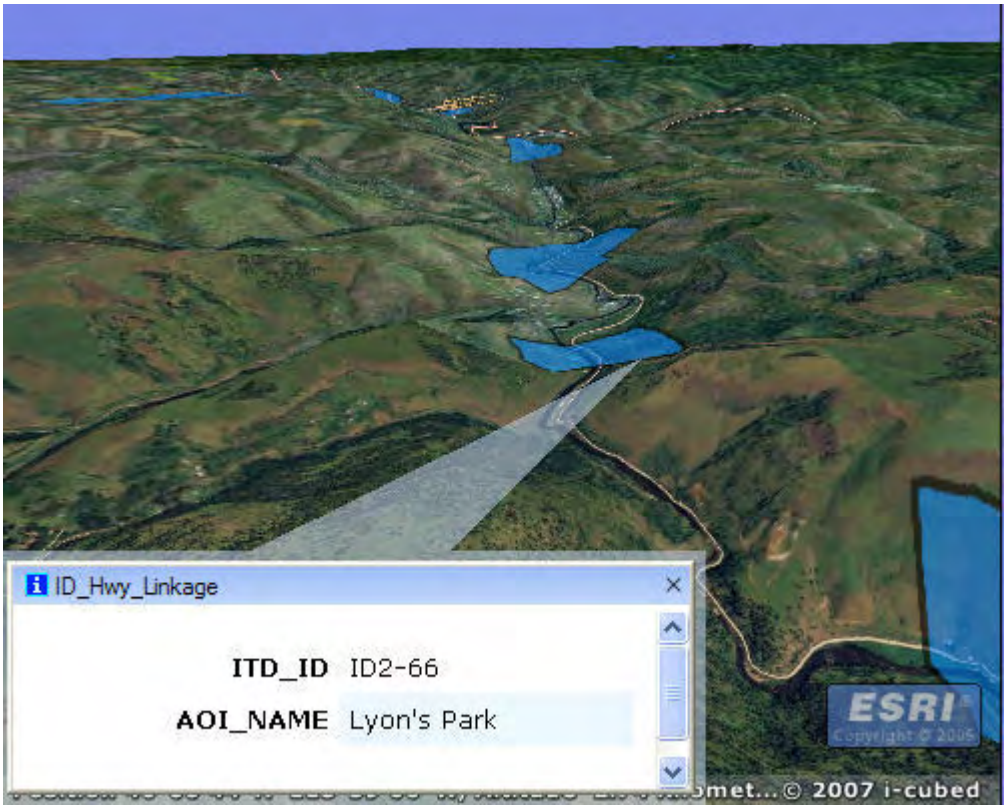
SEASON:

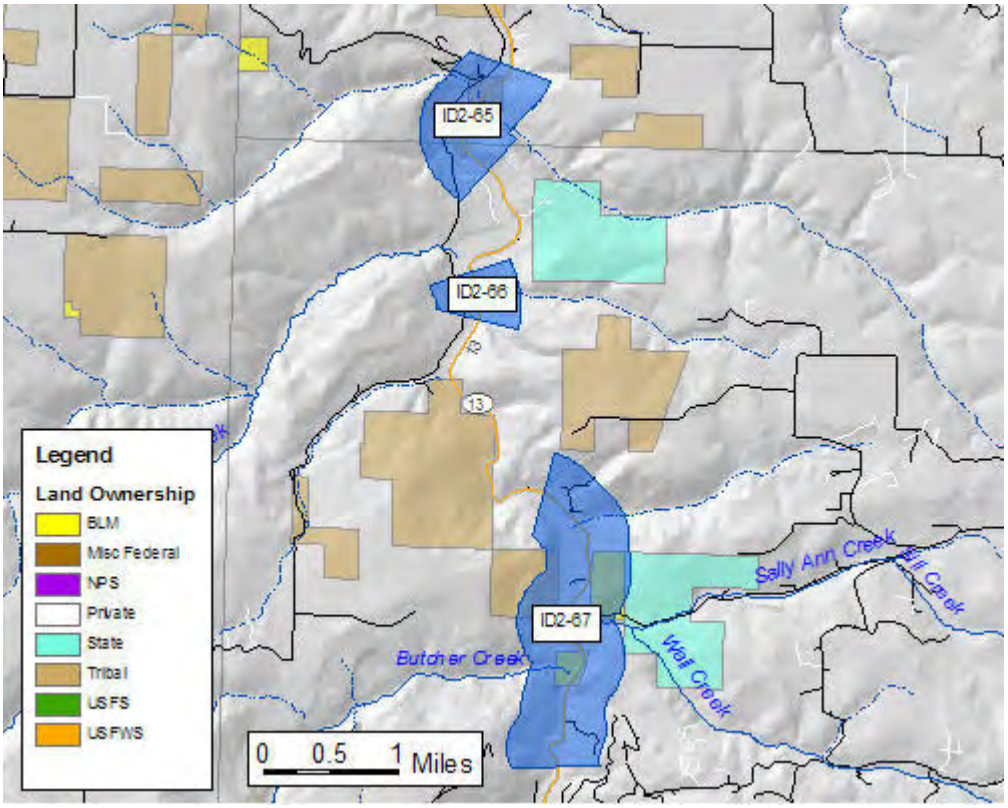
ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:
There are no elk within this linkage area. Highest concentration of deer.

ITD2_ID: ID2-66





ITD2_ID: ID2-66

AOI_NAME: Lyon's Park

PRIORITY: Low

SPECIES: white-tail deer/ steelhead/ potential fish passage issues

MIG_POP:

LOC_POP:

SCALE:

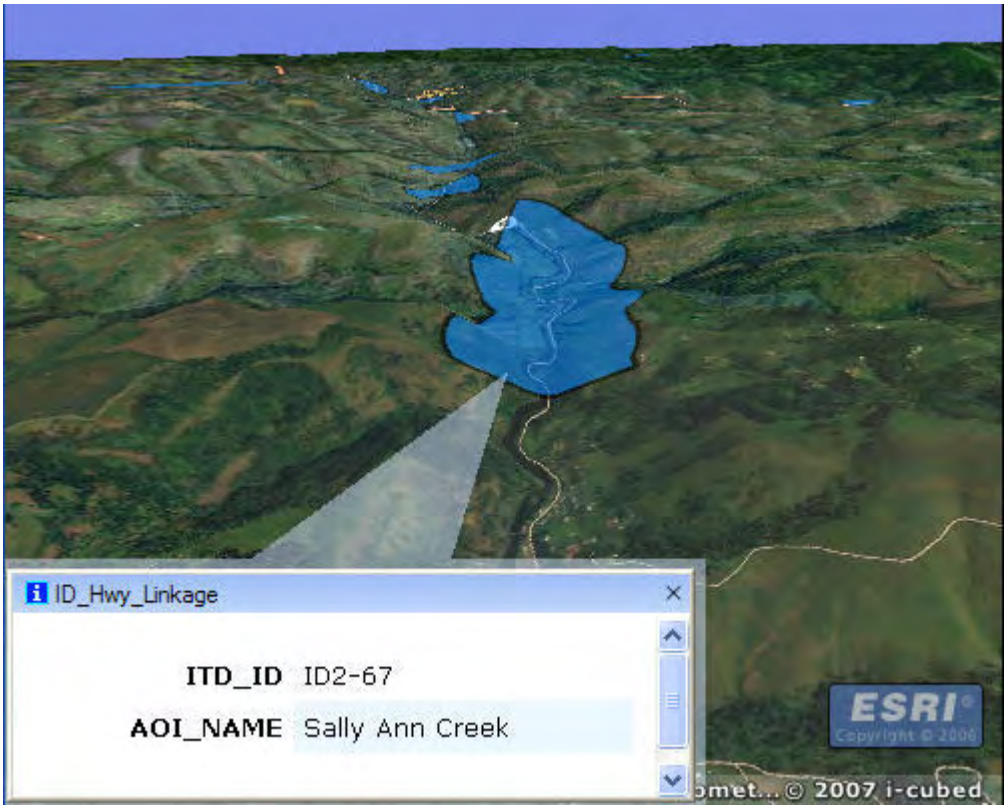
HWY_MORT:

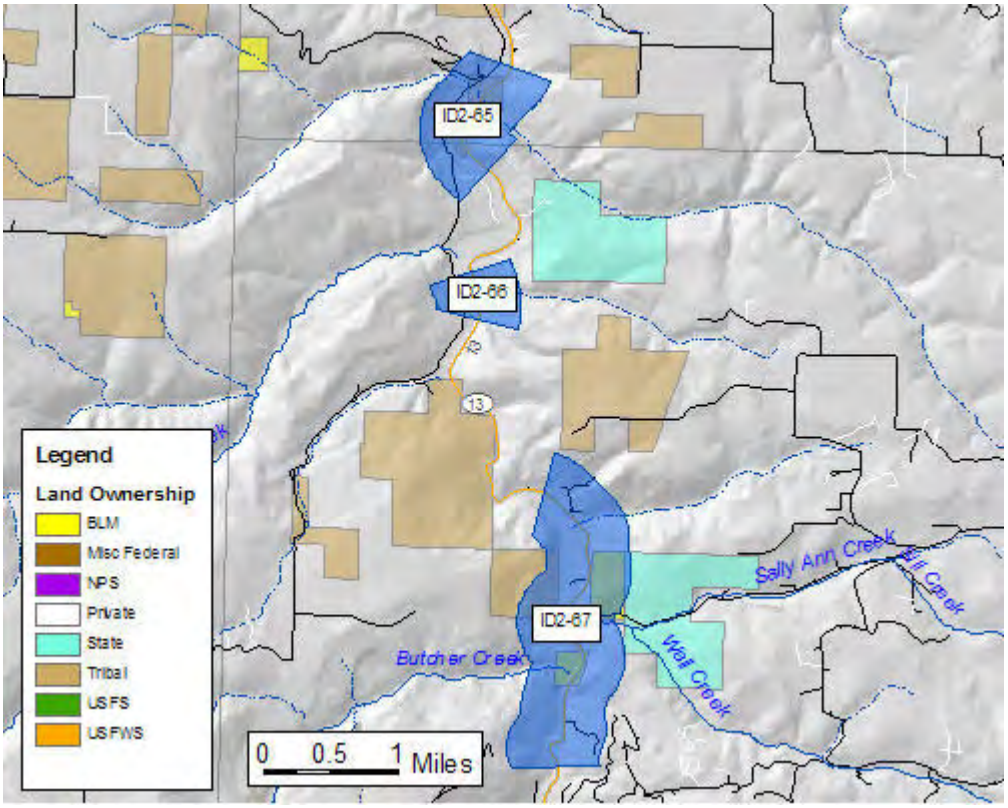
SEASON:

ATTRACT:

AGENCIES:

ITD2_ID: ID2-67





ITD2_ID: ID2-67

AOI_NAME: Sally Ann Creek

PRIORITY: Moderate

SPECIES: white-tail deer/ elk/ black bear/ bobcat/ steelhead/ potential fish blockage/ coyotes

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

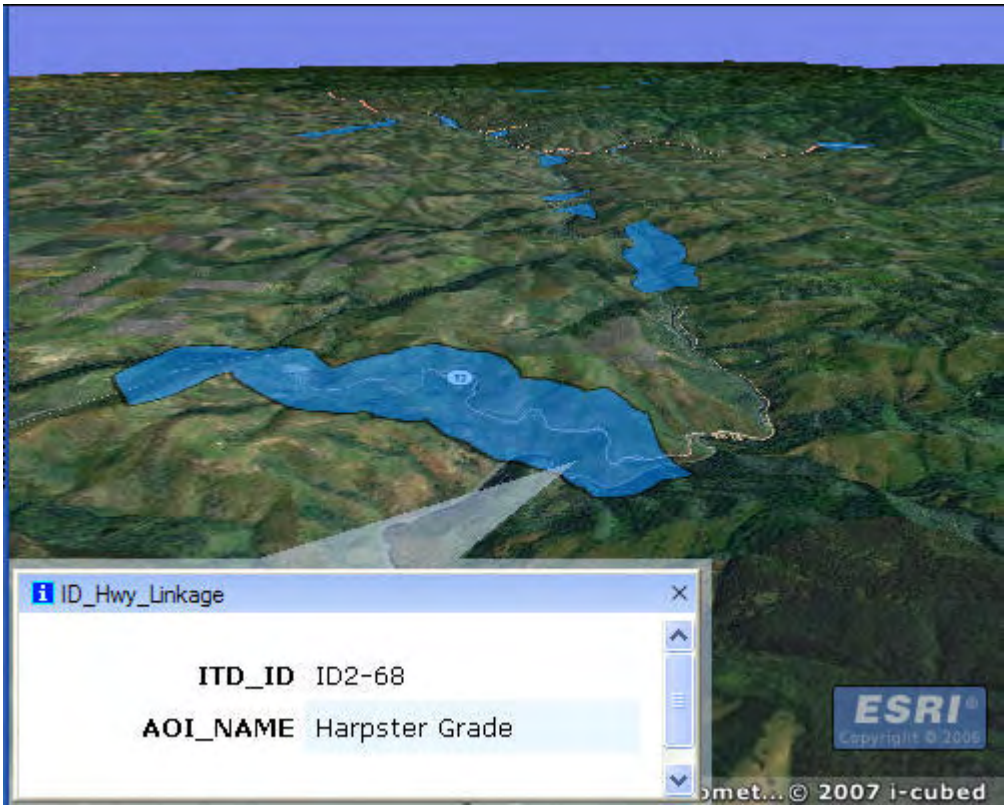
ATTRACT:

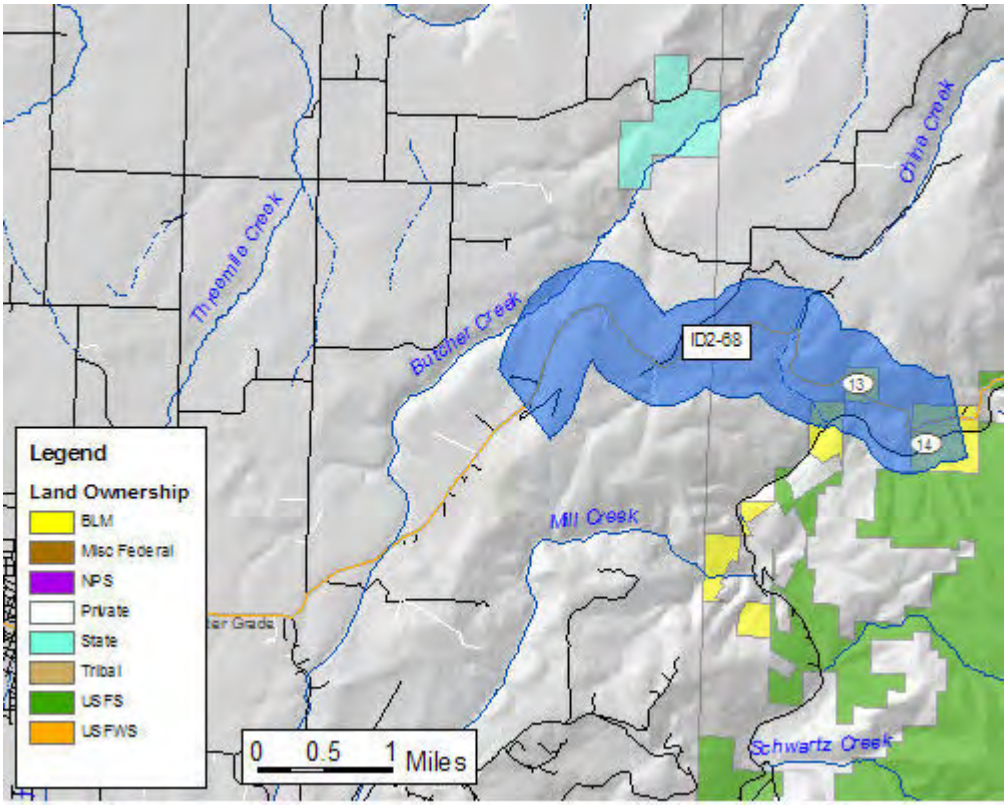
AGENCIES:

ADDITIONAL COMMENTS:

High white-tail deer road kill area.

ITD2_ID: ID2-68





ITD2_ID: ID2-68

AOI_NAME: Harpster Grade

PRIORITY: Moderate

SPECIES: white-tail deer/ elk/ moose/ black bear/ small mammals

MIG_POP:

LOC_POP:

SCALE: Local

HWY_MORT: white-tail deer

SEASON: Deer year-round residents

ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:

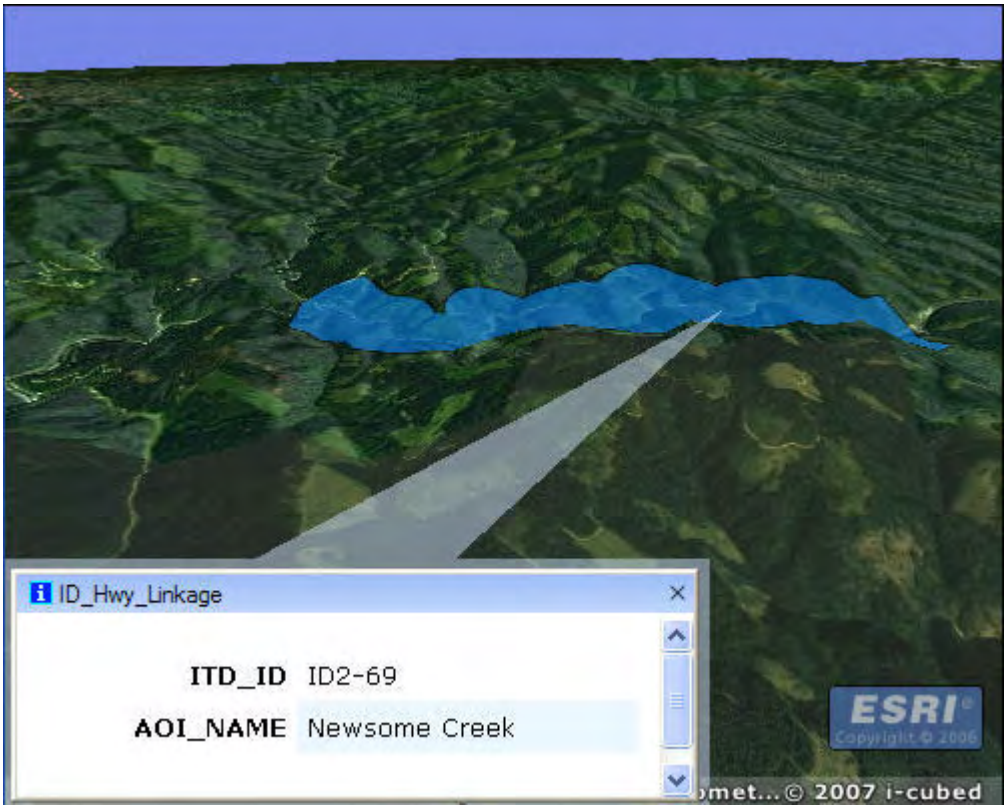
Permanent Human Presence: Residential homes

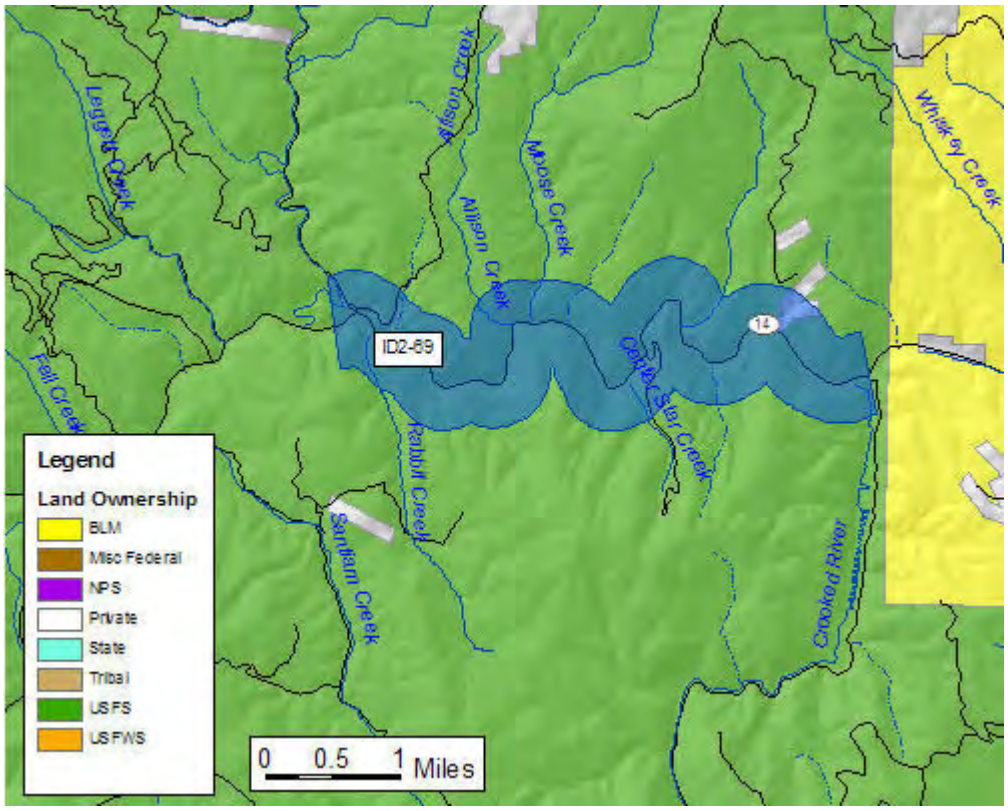
Effective functioning of linkage area: Site functions with moderate levels of wildlife mortalities.

Opportunities to improve the effectiveness of the linkage area: Signage

White-tail deer are the primary issue with collisions in this area.

ITD2_ID: ID2-69





ITD2_ID: ID2-69

AOI_NAME: Newsome Creek

PRIORITY: Low

SPECIES: white-tail deer/ elk/ moose/ black bear/ bobcat/ wolf

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

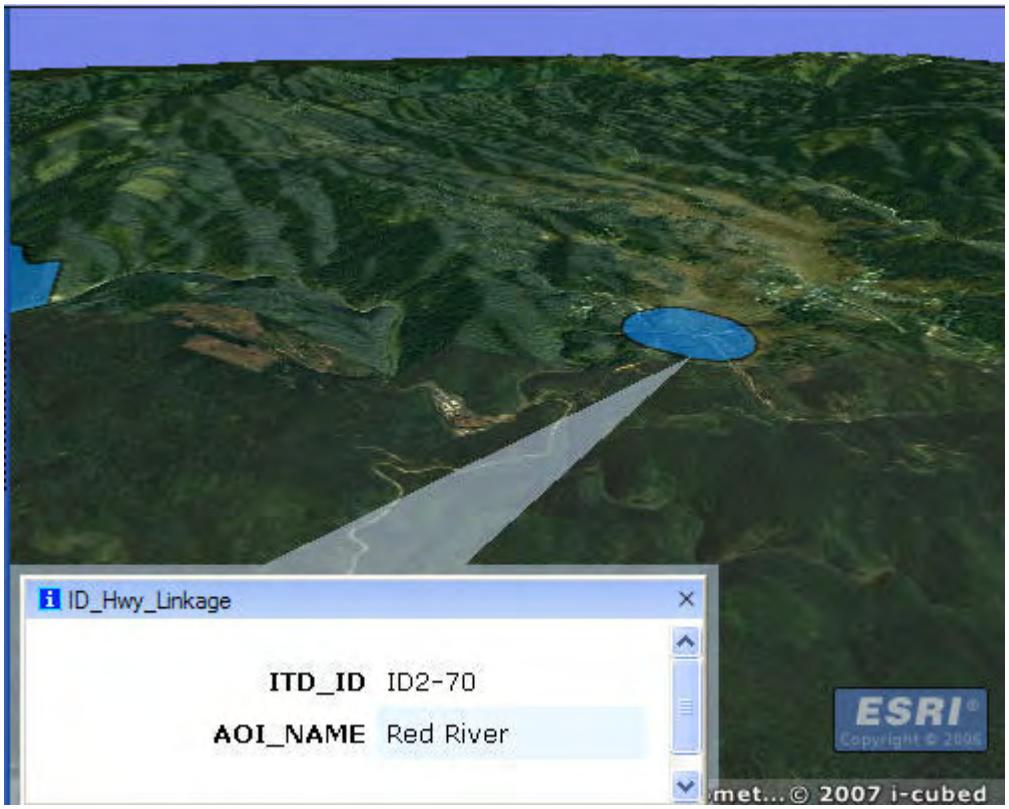
ATTRACT:

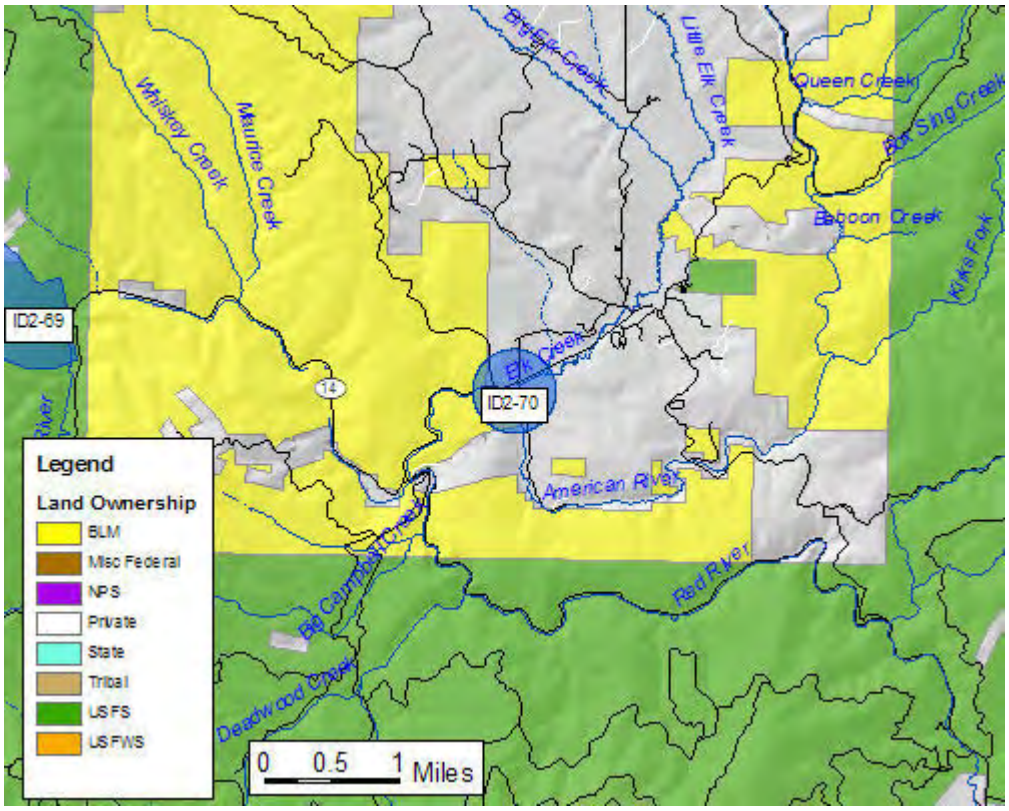
AGENCIES:

ADDITIONAL COMMENTS:

A lot of wolf activity lately. North and south movements.

ITD2_ID: ID2-70





ITD2_ID: ID2-70

AOI_NAME: Red River

PRIORITY: Low

SPECIES: moose/ steelhead

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:

Replacing culvert in next few years.

Appendix C – Workshop Participants

District 2 Lewiston: April 2, 2008

Name	Organization
Ken Puderbaugh	Idaho Transportation Department
Jim Pratt	Idaho Transportation Department
Leona Svancara	Idaho Fish and Game- Conservation Data Center
Marcie Carter	Nez Perce Tribe
Shawn Smith	Idaho Transportation Department
Ray Hennekey	Idaho Fish and Game
Joel Sauder	Idaho Fish and Game
Vicki Taylor	University of Idaho
Kim Just	Idaho Transportation Department
Bill Ruediger	Wildlife Consulting Resources
Greg Burak	Idaho Fish and Game
Ken Wall	Geodata Services Inc.
Wayne Melquist	CREX Consulting
Zach Funkhouser	Idaho Transportation Department

District 2 Lewiston: December 14, 2005

Name	Organization
Tim Cramer	Idaho Transportation Department
Ken Ohls	Idaho Transportation Department
Jim Smith	Idaho Transportation Department District 2
Blake Thompson	Idaho Transportation Department District 2
Mark Schuster	Idaho Transportation Department District 2
Zach Funkhouser	Idaho Transportation Department District 2
Chris Tretter	Idaho Department of Lands CdA Staff
Shawn Smith	Idaho Transportation Department District 2 Env
Bud Converse	Idaho Transportation Department District 2
Ray Hennekey	Idaho Fish and Game
Wayne Melquist	University of Idaho
Joel Sander	Idaho Fish and Game
Paul Moroz	US Forest Service Clearwater National Forest

Appendix D – Detailed GIS Methodology (Metadata and Tools)

WILDLIFE LINKAGE AREA POLYGONS METADATA

Identification_Information:
  Citation:
    Citation_Information:
      Originator: Idaho Transportation Department
      Publication_Date: 20080501
      Title: itd2_hwylinks
      Geospatial_Data_Presentation_Form: vector digital data
      Online_Linkage: \\BEARTOOTH\C$\data\ITD2\WildLifeLinkage\itd2_hwylinks.shp
  Description:
    Abstract: Idaho Transportation Department Fish and Wildlife Linkage Project
    Purpose: Linkage zones in Idaho Transportation Department District 2 with documentation collected from biologists and other experts during workshops and revew comments.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 20080501
    Currentness_Reference: publication date
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: Unknown
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -117.078281
      East_Bounding_Coordinate: -114.558043
      North_Bounding_Coordinate: 47.103004
      South_Bounding_Coordinate: 45.160374
  Keywords:
    Theme:
      Theme_Keyword_Thesaurus: Idaho State Highways
      Theme_Keyword: Highways
      Theme_Keyword: State Highways
      Theme_Keyword: Wildlife
    Place:
      Place_Keyword_Thesaurus: Idaho
      Place_Keyword: Idaho
  Access_Constraints: Contact Shawn Smith, Idaho Transportation Department.
  Use_Constraints: Contact Shawn Smith, Idaho Transportation Department.
  Point_of_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: Idaho Transportation Department - District 2
        Contact_Person: Shawn Smith
      Contact_Address:

Address_Type: physical address
Address: 2600 Frontage Rd
City: Lewiston
State_or_Province: Idaho
Postal_Code: 83501
Country: USA
Contact_Address:
Address_Type: mailing address
Address: PO Box 837
City: Lewiston
State_or_Province: Idaho
Postal_Code: 83501
Country: USA
Contact_Voice_Telephone: 208-799-5090
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.2.2.1350
Data_Quality_Information:
Completeness_Report: Complete as of 20080501
Lineage:
Process_Step:
Process_Description:
1. Intersect draft linkage polygons from expert workshops with state highway features.
2. Buffer road segments.
Distance: 500 meter
End type: FLAT
3. Edit linkage zone buffers.
Curvy road segments sometimes cause gaps or spikes in the buffer polygons. Gaps were filled and spikes were clipped.
4. Add ID field: NEW_ID
5. Join spatial features to data table.
Process_Date: 20080501
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: G-polygon
Point_and_Vector_Object_Count: 70
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Transverse Mercator
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -114.000000

Latitude_of_Projection_Origin: 42.000000
False_Easting: 2500000.000000
False_Northing: 1200000.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: 0.000000
Ordinate_Resolution: 0.000000
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: itd2_hwylinks
Attribute:
Attribute_Label: FID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Shape
Attribute_Definition: Feature geometry.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Coordinates defining the features.
Attribute:
Attribute_Label: NEW_ID
Attribute_Definition: The linkage identifier number, including the district number.
Attribute:
Attribute_Label: AOI_NAME
Attribute_Definition: The name assigned to the linkage by workshop participants.
Attribute:
Attribute_Label: PRIORITY
Attribute_Definition: High, medium, or low. Subjective rankings assigned by workshop participants.
Attribute:
Attribute_Label: SPECIES
Attribute_Definition: The wildlife species mentioned by workshop participants or on online forms or interviews.
Attribute:

Attribute_Label: MIG_POP
Attribute_Definition: Indication by workshop participants on whether the wildlife population was migratory, which has some bearing on the success of different wildlife crossing structures.
Attribute:
Attribute_Label: LOC_POP
Attribute_Definition: Indication by workshop participants on whether the wildlife population was local, which has some bearing on the success of different wildlife crossing structures.
Attribute:
Attribute_Label: SCALE
Attribute_Definition: The scale of the linkage area. Those of ecosystem scale provide linkage primarily between large areas of federal lands important to wildlife. Those of local scale are important for local populations.
Attribute:
Attribute_Label: HWY_MORT
Attribute_Definition: A comment on highway wildlife vehicle accidents and highway related wildlife mortality.
Attribute:
Attribute_Label: SEASON
Attribute_Definition: A comment on the linkage area if it is primarily used by wildlife in one or more specific seasons of the year.
Attribute:
Attribute_Label: ATTRACT
Attribute_Definition: A comment on any attractants for wildlife in the area of the linkage or the immediate surroundings.
Attribute:
Attribute_Label: AGENCIES
Attribute_Definition: The agencies that are either responsible for or have primary interest in the area in or around a linkage area.
Distribution_Information:
Resource_Description: Downloadable Data
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.347
Metadata_Reference_Information:
Metadata_Date: 20080513
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Geodata Services, Inc.
Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address: 1121 E. Broadway St. #133

City: Missoula
State_or_Province: Montana
Postal_Code: 59802
Country: USA
Contact_Voice_Telephone: 406-532-3239.
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

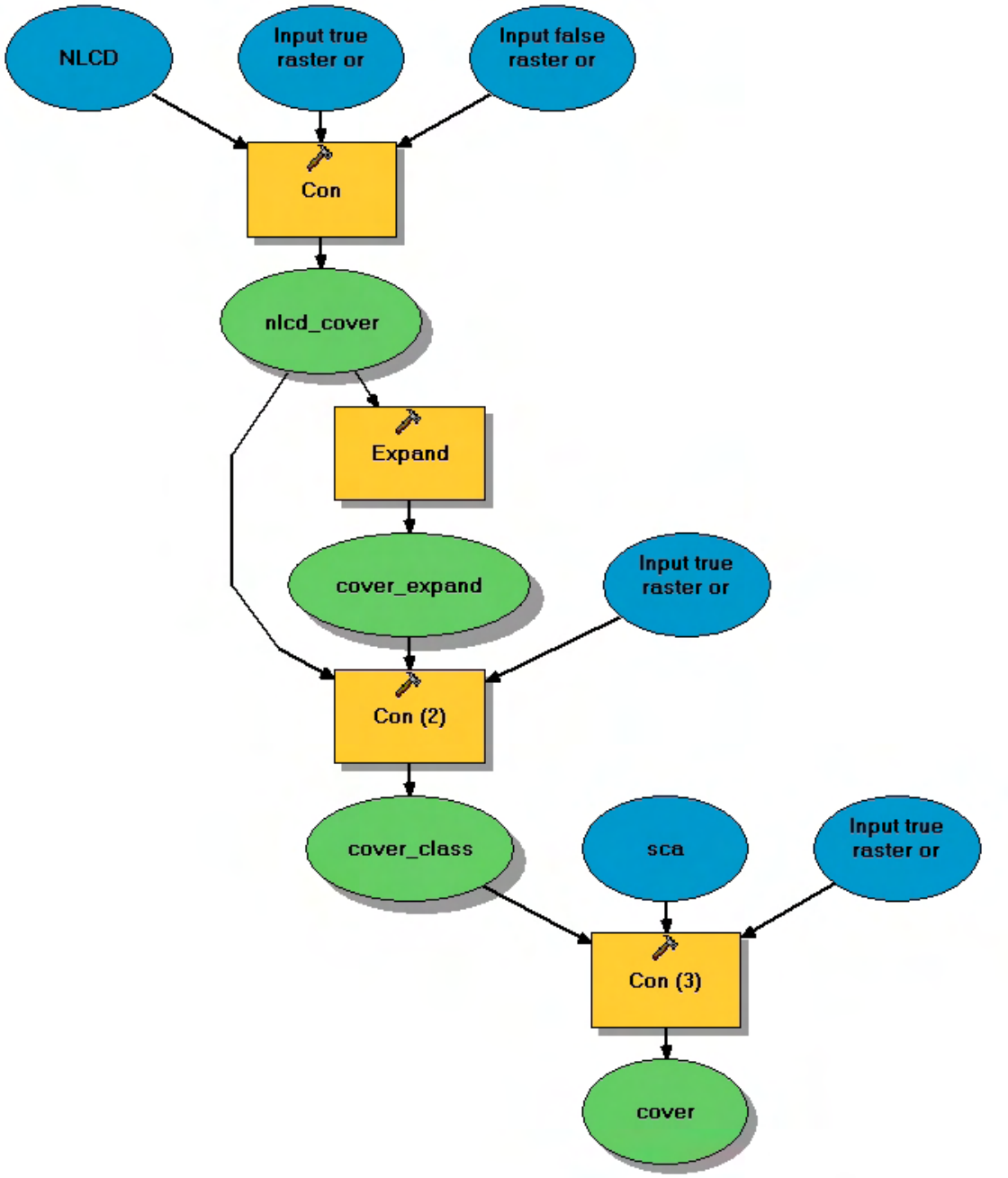
ITD Linkage Zone Model Tools

These tools are the modules of the Identification of Potential Linkages Zones model for large carnivores and ungulates. The tools were built in ESRI Modelbuilder, a component of Arcview 9 and provided as a deliverable for this project. The toolbox for the model and associated parameters can be optionally loaded along with the grid layers to re-run or tweak parameters of the model. Impacts of human activities and beneficial features of the landscape were considered. A rating system for each type of impact and vegetation condition was used to score each model component and then the values were combined and classified into impact level categories of high, moderate, low, or minimal. The impacts and vegetation conditions considered were distance from roads, road density, developed sites, riparian areas and hiding cover. While distance from roads was not applied directly to the final score it was used to define secure core areas which was then used to modify the rating of road density and hiding cover.

The following pages describe the primary component of the model, along with a flowchart from Modelbuilder illustrating the relationships, along with formal metadata and Grid processing steps.

Linkage Zone - Cover

LZ Cover extracts the cover types from the National Land Cover Data that could be considered as hiding cover. A 30 meter edge buffer was created that expanded the hiding cover areas. Finally, the hiding cover values were modified by their location either in or out of secure core areas. All areas, hiding, edge, or open were classified as hiding within secure core areas. Edge areas outside of a SCA were given an impact rating one level higher than hiding cover and open areas were given a rating of 2 levels higher than hiding cover.



LZ Cover

Data format: ArcToolBox Tool

Abstract: LZ Cover extracts the cover types from the National Land Cover Data that could be considered as hiding cover. A 30 meter edge was buffer was created that expanded the hiding cover areas. Finally, the hiding cover values were modified by their location either in or out of secure core areas. All areas, hiding, edge, or open were classified as hiding within secure core areas. Edge areas outside of a SCA were given an impact rating one level higher than hiding cover and open areas were given a rating of 2 levels higher than hiding cover.

ISO and ESRI Metadata:

Metadata elements shown with blue text are defined in the International Organization for Standardization's (ISO) document 19115 *Geographic Information - Metadata.* Elements shown with green text are defined by ESRI and will be documented as extentions to the ISO 19115. Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog.

Metadata Information

***Last update:** 20050520

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Resource Identification Information:

Citation:

Title: LZ Cover

Party responsible for the resource:
Individual's name: Joe Grigsby
Organization's name: Geodata Services, Inc.
Contact's position:
Contact's role:

Contact information:
Phone:
Voice: 406.721.8856
Fax:

Address:
Delivery point:

City: Missoula
Administrative area: MT
Postal code: 59801
Country:
e-mail address:

Descriptive keywords:
Keywords: National Land Cover Database, secure core areas, hiding cover, edge, NLCD

Abstract:
LZ Cover extracts the cover types from the National Land Cover Data that could be considered as hiding cover. A 30 meter edge was buffer was created that expanded the hiding cover areas. Finally, the hiding cover values were modified by their location either in or out of secure core areas. All areas, hiding, edge, or open were classified as hiding within secure core areas. Edge areas outside of a SCA were given an impact rating one level higher than hiding cover and open areas were given a rating of 2 levels higher than hiding cover.

Resource constraints:
Constraints:
Limitations of use:

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Distribution Information:

Distributor:
Available format:
Format name: ArcToolBox Tool

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LZ_Cover_Model Report Expand/Collapse All

Generated on: Mon May 12 16:26:04 2008

Variables

sca

Data Type:Composite Geodataset
Value:sca

Input true raster or constant value (3)

Data Type:Composite Geodataset
Value:10

NLCD_D2

Data Type:Composite Geodataset
Value:NLCD_D2

Input true raster or constant value (2)

Data Type:Composite Geodataset
Value:100

Input false raster or constant value (2)

Data Type:Composite Geodataset
Value:10000

Con_NLCD_D21

Data Type:Raster Dataset
Value:C:\Data\ITD2\Temp\con_nlcd_d21

Input true raster or constant value

Data Type:Composite Geodataset
Value:10

Expand_Con_N1

Data Type:Raster Dataset
Value:C:\Data\ITD2\Temp\expand_con_n1

Con_Con_NLCD1

Data Type:Raster Dataset
Value:C:\Data\ITD2\Temp\con_con_nlcd1

cover

Data Type:Raster Dataset
Value:C:\Data\ITD2\LZModel\Cover\cover

Processes

Con

Tool Name:Con
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Conditional\Con

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input conditional raster	Input	Required	Composite Geodataset	NLCD_D2
Input true raster or constant value	Input	Required	Composite Geodataset	100
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\Temp\con_nlcd_d21
Input false raster or constant value	Input	Optional	Composite Geodataset	10000
Expression	Input	Optional	SQL Expression	"Value" = 41 OR "Value" = 42 OR "Value" = 43 OR "Value" = 91

Messages:

Executing (Con): Con NLCD_D2 100 C:\Data\ITD2\Temp\Con_NLCD_D21 10000 ""Value" = 41 OR "Value" = 42 OR "Value" = 43 OR "Value" = 91"

Start Time: Mon Nov 07 16:32:02 2005

Executed (Con) successfully.

End Time: Mon Nov 07 16:32:49 2005 (Elapsed Time: 47.00 seconds)

Expand

Tool Name:Expand
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Generalization\Expand

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\Temp\con_nlcd_d21
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\Temp\expand_con_n1
Number of cells	Input	Required	Long	1
Zone values	Input	Required	Multiple Value	100

Messages:

Executing (Expand): Expand C:\Data\ITD2\Temp\con_nlcd_d21 C:\Data\ITD2\Temp\Expand_Con_N1 1 100

Start Time: Mon Nov 07 16:32:50 2005

Executed (Expand) successfully.

End Time: Mon Nov 07 16:33:13 2005 (Elapsed Time: 23.00 seconds)

Con (2)

Tool Name:Con
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Conditional\Con

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*

Input conditional raster	Input	Required	Composite Geodataset	C:\Data\ITD2\Temp\con_nlcd_d21
Input true raster or constant value	Input	Required	Composite Geodataset	10
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\Temp\con_con_nlcd1
Input false raster or constant value	Input	Optional	Composite Geodataset	C:\Data\ITD2\Temp\expand_con_n1
Expression	Input	Optional	SQL Expression	VALUE = 100

Messages:

Executing (Con (2)): Con C:\Data\ITD2\Temp\con_nlcd_d21 10 C:\Data\ITD2\Temp\Con_Con_NLCD1 C:\Data\ITD2\Temp\expand_con_n1 "VALUE = 100"

Start Time: Mon Nov 07 16:33:14 2005

Executed (Con (2)) successfully.

End Time: Mon Nov 07 16:34:14 2005 (Elapsed Time: 1 minutes 0 seconds)

Con (3)

Tool Name:Con
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Conditional\Con

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input conditional raster	Input	Required	Composite Geodataset	sca
Input true raster or	Input	Required	Composite Geodataset	10

constant value				
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\LZModel\Cover\cover
Input false raster or constant value	Input	Optional	Composite Geodataset	C:\Data\ITD2\Temp\con_con_nlcd1
Expression	Input	Optional	SQL Expression	Value = 1

Messages:

Executing (Con (3)): Con sca 10
C:\Data\ITD2\LZModel\Cover\cover
C:\Data\ITD2\Temp\con_con_nlcd1 "Value = 1"

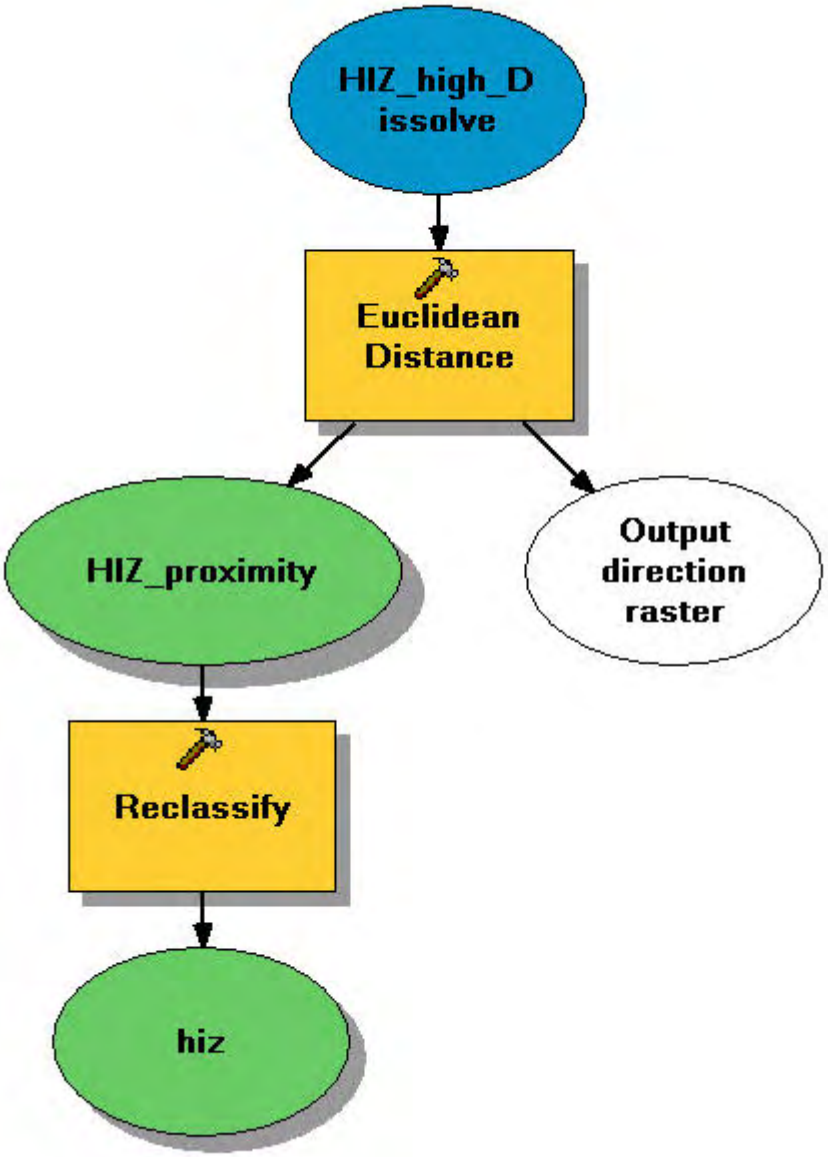
Start Time: Mon Nov 07 16:34:15 2005

Executed (Con (3)) successfully.

End Time: Mon Nov 07 16:35:12 2005 (Elapsed Time: 57.00 seconds)

Linkage Zone – HIZ

Defines Human Impact Zones around developed sites. A high impact zone layer was generated by buffering all developed sites point and polygon features. Two additional impact zones, each 120 meters wide, are then delineated around the high impact zone polygons. These additional rings are then assigned medium and low impact values moving outward from the high impact zone.



LZ_HIZ

Data format: ArcToolBox Tool

Abstract: Defines Human Impact Zones around developed sites. A high impact zone layer was generated by buffering all developed sites point and polygon features. Two additional impact zones, each 120 meters wide, are then delineated around the high impact zone polygons. These additional rings are then assigned medium and low impact values moving outward from the high impact zone.

ISO and ESRI Metadata:

Metadata elements shown with blue text are defined in the International Organization for Standardization's (ISO) document 19115 *Geographic Information - Metadata.* Elements shown with green text are defined by ESRI and will be documented as extentions to the ISO 19115. Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog.

Metadata Information

***Last update:** 20051215

Back to Top

Resource Identification Information:

Citation:

Title: LZ_HIZ

Party responsible for the resource:
Individual's name: Joe Grigsby
Organization's name: Geodata Services, Inc.
Contact's position: GIS Analyst
Contact's role:

Contact information:
Phone:
Voice: 406.721.8865
Fax: 406.721.1023

Address:
Delivery point:
104 South Ave E.
City: Missoula

Administrative area: MT
Postal code: 59801
Country: USA
e-mail address: kwall@geodata-mt.com

Descriptive keywords:
Keywords: developed sites, Cumulative Effects Modeling, human influence zone, habitat reduction

Abstract:
Defines Human Impact Zones around developed sites. A high impact zone layer was generated by buffering all developed sites point and polygon features. Two additional impact zones, each 120 meters wide, are then delineated around the high impact zone polygons. These additional rings are then assigned medium and low impact values moving outward from the high impact zone.

Resource constraints:
Constraints:
Limitations of use:

Back to Top

Distribution Information:

Distributor:
Available format:
Format name: ArcToolBox Tool

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LZ_HIZ_Model Report Expand/Collapse All

Generated on: Mon May 12 16:34:04 2008

Variables

HIZ_high2dissolve

Data Type:Feature Layer
Value:HIZ_high2dissolve

Output direction raster

Data Type:Raster Dataset
Value:

Messages:

The value is empty.

HIZ_temp1

Data Type:Raster Dataset
Value:C:\Data\ITD2\Temp\hiz_temp1

HIZ

Data Type:Raster Dataset
Value:C:\Data\ITD2\LZModel\HIZ\hiz

Processes

Euclidean Distance

Tool Name:Euclidean Distance
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Distance\EucDistance

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster or feature	Input	Required	Composite Geodataset	HIZ_high2dissolve

source data				
Output distance raster	Output	Required	Raster Dataset	C:\Data\ITD2\Temp\hiz_temp1
Maximum distance	Input	Optional	Double	240
Output cell size	Input	Optional	Analysis cell size	30
Output direction raster	Output	Optional	Raster Dataset	

Messages:

Executing (Euclidean Distance): EucDistance HIZ_high2dissolve C:\Data\ITD2\Temp\hiz_temp1 240 30 #

Start Time: Fri Dec 09 15:00:00 2005

Executed (Euclidean Distance) successfully.

End Time: Fri Dec 09 15:01:38 2005 (Elapsed Time: 1 minutes 38 seconds)

Reclassify

Tool Name:Reclassify
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Reclass\Reclassify

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\Temp\hiz_temp1
Reclass field	Input	Required	Field	Value
Reclassification	Input	Required	Remap	0 100000;0 120 10000;120 240 1000;NODATA 10
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\LZModel\HIZ\hiz
Change missing values to NoData	Input	Optional	Boolean	false

Messages:

Executing (Reclassify): Reclassify C:\Data\ITD2\Temp\hiz_temp1 Value "0 100000;0 120 10000;120 240 1000;NODATA 10" C:\Data\ITD2\LZModel\HIZ\hiz DATA

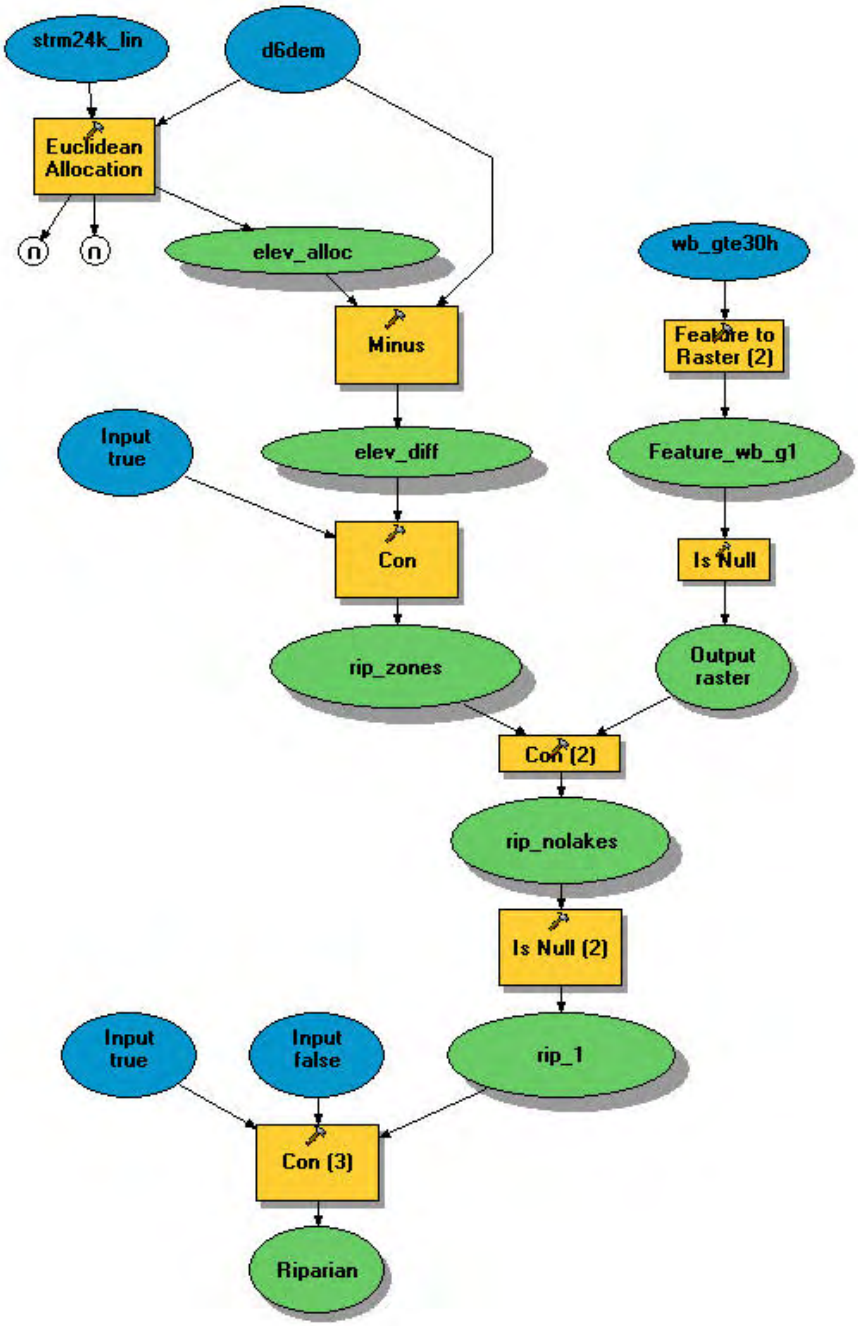
Start Time: Fri Dec 09 15:01:38 2005

Executed (Reclassify) successfully.

End Time: Fri Dec 09 15:02:52 2005 (Elapsed Time: 1 minutes 14 seconds)

Linkage Zone – RIPARIAN

This model generates an approximate or potential riparian zone grid based on proximity to streams and elevation gradient. This method provides a better approximation of the extent of riparian areas in mountainous and topographically diverse regions than the common approach of applying a constant buffer along all water courses. A constant buffer would tend to over-estimate the extent of riparian areas where stream gradients and banks are steeper. The process follows the method outlined in the masters thesis "Identification of Potential Linkage Zones for Grizzly Bears in the Swan-Clearwater Valley Using GIS", P. Sandstrom, 1996.



LZ Riparian

Data format: ArcToolBox Tool

Abstract: This model generates an approximate or potential riparian zone grid based on proximity to streams and elevation gradient. This method provides a better approximation of the extent of riparian areas in mountainous and topographically diverse regions than the common approach of applying a constant buffer along all water courses. A constant buffer would tend to over-estimate the extent of riparian areas where stream gradients and banks are steeper. The process follows the method outlined in the masters thesis "Identification of Potential Linkage Zones for Grizzly Bears in the Swan-Clearwater Valley Using GIS", P. Sandstrom, 1996.

ISO and ESRI Metadata:

Metadata elements shown with blue text are defined in the International Organization for Standardization's (ISO) document 19115 *Geographic Information - Metadata.* Elements shown with green text are defined by ESRI and will be documented as extentions to the ISO 19115. Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog.

Metadata Information

***Last update:** 20051214

Back to Top

Resource Identification Information:

Citation:

Title: LZ Riparian

Party responsible for the resource:
Individual's name: Joe Grigsby
Organization's name: Geodata Services, Inc.
Contact's position: GIS Analyst
Contact's role:

Contact information:
Phone:
Voice: 406.721.8865
Fax: 406.721.1023

Address:
Delivery point:
104 South Ave E.

City: Missoula
Administrative area: MT
Postal code: 59801
Country: USA
e-mail address: kwall@onewest.net

Descriptive keywords:

Keywords: DEM, Digital Elevation Model, hydrography, perennial, intermittent, lakes, swamps, marshes, riparian

Abstract:

This model generates an approximate or potential riparian zone grid based on proximity to streams and elevation gradient. This method provides a better approximation of the extent of riparian areas in mountainous and topographically diverse regions than the common approach of applying a constant buffer along all water courses. A constant buffer would tend to over-estimate the extent of riparian areas where stream gradients and banks are steeper. The process follows the method outlined in the masters thesis "Identification of Potential Linkage Zones for Grizzly Bears in the Swan-Clearwater Valley Using GIS", P. Sandstrom, 1996.

Resource constraints:
Constraints:
Limitations of use:

Back to Top

Distribution Information:

Distributor:
Available format:
Format name: ArcToolBox Tool

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LZ_Riparian_Model Report Expand/Collapse All

Generated on: Mon May 12 16:29:45 2008

Variables

NHDWB_D2_gt30H

Data Type:Feature Layer
Value:NHDWB_D2_gt30H

Feature_NHDW1

Data Type:Raster Dataset
Value:C:\Data\ITD2\NHD_Hydro\NHD\feature_nhdw1

Output raster

Data Type:Raster Dataset
Value:C:\Data\ITD2\NHD_Hydro\NHD\isnull_featu1

NED integer

Data Type:Composite Geodataset
Value:NED integer

NHD_D2.shp

Data Type:Feature Layer
Value:C:\Data\ITD2\NHD_Hydro\NHD\NHD_D2.shp

EucAllo_NHD_1

Data Type:Raster Dataset
Value:C:\Data\ITD2\NHD_Hydro\NHD\eucallo_nhd_1

Minus_nedint1

Data Type:Raster Dataset
Value:C:\Data\ITD2\NED\minus_nedint1

Input true raster or constant value (3)

Data Type:Composite Geodataset
Value:1

rip_zones

Data Type:Raster Dataset
Value:C:\Data\ITD2\NED\con_minus_ne1

rip_nolakes

Data Type:Raster Dataset
Value:C:\Data\ITD2\NHD_Hydro\NHD\con_isnull_f1

rip_1

Data Type:Raster Dataset
Value:C:\Data\ITD2\NHD_Hydro\NHD\isnull_con_i1

Input true raster or constant value

Data Type:Composite Geodataset
Value:10

Input false raster or constant value

Data Type:Composite Geodataset
Value:1

Riparian

Data Type:Raster Dataset
Value:C:\Data\ITD2\LZModel\Riparian\riparian

Output distance raster

Data Type:Raster Dataset
Value:

Messages:

The value is empty.

Output direction raster

Data Type:Raster Dataset
Value:

Messages:

The value is empty.

Processes

Feature to Raster (2)

Tool Name:Feature to Raster
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Conversion Tools.tbx\To Raster\FeatureToRaster

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input features	Input	Required	Composite Geodataset	NHDWB_D2_gt30H
Field	Input	Required	Field	FType
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\NHD_Hydro\NHD\feature_nhdw1
Output cell size	Input	Optional	Analysis cell size	30

Messages:

Executing (Feature to Raster (2)): FeatureToRaster NHDWB_D2_gt30H FType c:\data\itd2\NHD_Hydro\NHD\feature_nhdw1 30

Start Time: Thu Nov 03 13:12:23 2005

Executed (Feature to Raster (2)) successfully.

End Time: Thu Nov 03 13:12:27 2005 (Elapsed Time: 4.00 seconds)

Is Null

Tool Name:Is Null
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Math\Logical\IsNull

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\NHD_Hydro\NHD\feature_nhdw1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\NHD_Hydro\NHD\isnull_featu1

Messages:

Executing (Is Null): IsNull
C:\Data\ITD2\NHD_Hydro\NHD\feature_nhdw1
c:\data\itd2\NHD_Hydro\NHD\isnull_featu1

Start Time: Thu Nov 03 13:12:27 2005

Executed (Is Null) successfully.

End Time: Thu Nov 03 13:12:40 2005 (Elapsed Time: 13.00 seconds)

Euclidean Allocation

Tool Name:Euclidean Allocation
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Distance\EucAllocation

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster or feature source data	Input	Required	Composite Geodataset	C:\Data\ITD2\NHD_Hydro\NHD\NHD_D2.shp
Output allocation raster	Output	Required	Raster Dataset	C:\Data\ITD2\NHD_Hydro\NHD\eucallo_nhd_1
Maximum distance	Input	Optional	Double	210
Input value raster	Input	Optional	Composite Geodataset	NED integer
Output cell size	Input	Optional	Analysis cell size	30
Source field	Input	Optional	Field	ComID
Output distance raster	Output	Optional	Raster Dataset	
Output direction	Output	Optional	Raster Dataset	

raster				

Messages:

Executing (Euclidean Allocation): EucAllocation
c:\data\itd2\NHD_Hydro\NHD\NHD_D2.shp
c:\data\itd2\NHD_Hydro\NHD\eucallo_nhd_1 210 "NED integer" 30 ComID
# #

Start Time: Thu Nov 03 13:12:40 2005

Executed (Euclidean Allocation) successfully.

End Time: Thu Nov 03 13:14:40 2005 (Elapsed Time: 2 minutes 0 seconds)

Minus

Tool Name:Minus
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Math\Minus

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster or constant value 1	Input	Required	Composite Geodataset	NED integer
Input raster or constant value 2	Input	Required	Composite Geodataset	C:\Data\ITD2\NHD_Hydro\NHD\eucallo_nhd_1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\NED\minus_nedint1

Messages:

Executing (Minus): Minus "NED integer"
C:\Data\ITD2\NHD_Hydro\NHD\eucallo_nhd_1
c:\data\itd2\NED\minus_nedint1

Start Time: Thu Nov 03 13:14:41 2005

Executed (Minus) successfully.

End Time: Thu Nov 03 13:15:01 2005 (Elapsed Time: 20.00 seconds)

Con

Tool Name:Con
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Conditional\Con

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input conditional raster	Input	Required	Composite Geodataset	C:\Data\ITD2\NED\minus_nedint1
Input true raster or constant value	Input	Required	Composite Geodataset	1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\NED\con_minus_ne1
Input false raster or constant value	Input	Optional	Composite Geodataset	
Expression	Input	Optional	SQL Expression	VALUE < 8

Messages:

Executing (Con): Con C:\Data\ITD2\NED\minus_nedint1 1 c:\data\itd2\NED\con_minus_ne1 # "VALUE < 8"

Start Time: Thu Nov 03 13:15:02 2005

Executed (Con) successfully.

End Time: Thu Nov 03 13:15:35 2005 (Elapsed Time: 33.00 seconds)

Con (2)

Tool Name:Con
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Conditional\Con

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input conditional raster	Input	Required	Composite Geodataset	C:\Data\ITD2\NHD_Hydro\NHD\isnull_featu1
Input true raster or constant value	Input	Required	Composite Geodataset	C:\Data\ITD2\NED\con_minus_ne1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\NHD_Hydro\NHD\con_isnull_f1
Input false raster or constant value	Input	Optional	Composite Geodataset	
Expression	Input	Optional	SQL Expression	

Messages:

Executing (Con (2)): Con C:\Data\ITD2\NHD_Hydro\NHD\isnull_featu1 C:\Data\ITD2\NED\con_minus_ne1 c:\data\itd2\NHD_Hydro\NHD\con_isnull_f1 # #

Start Time: Thu Nov 03 13:15:35 2005

Executed (Con (2)) successfully.

End Time: Thu Nov 03 13:16:04 2005 (Elapsed Time: 29.00 seconds)

Is Null (2)

Tool Name:Is Null
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Math\Logical\IsNull

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\NHD_Hydro\NHD\con_isnull_f1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\NHD_Hydro\NHD\isnull_con_i1

Messages:

Executing (Is Null (2)): IsNull C:\Data\ITD2\NHD_Hydro\NHD\con_isnull_f1 c:\data\itd2\NHD_Hydro\NHD\isnull_con_i1

Start Time: Thu Nov 03 13:16:04 2005

Executed (Is Null (2)) successfully.

End Time: Thu Nov 03 13:16:19 2005 (Elapsed Time: 15.00 seconds)

Con (3)

Tool Name:Con
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Conditional\Con

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input conditional raster	Input	Required	Composite Geodataset	C:\Data\ITD2\NHD_Hydro\NHD\isnull_con_i1
Input true raster or constant value	Input	Required	Composite Geodataset	10
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\LZModel\Riparian\riparian
Input false raster or constant value	Input	Optional	Composite Geodataset	1
Expression	Input	Optional	SQL Expression	Value = 1

Messages:

Executing (Con (3)): Con C:\Data\ITD2\NHD_Hydro\NHD\isnull_con_i1 10 C:\Data\ITD2\LZModel\Riparian\riparian 1 "Value = 1"

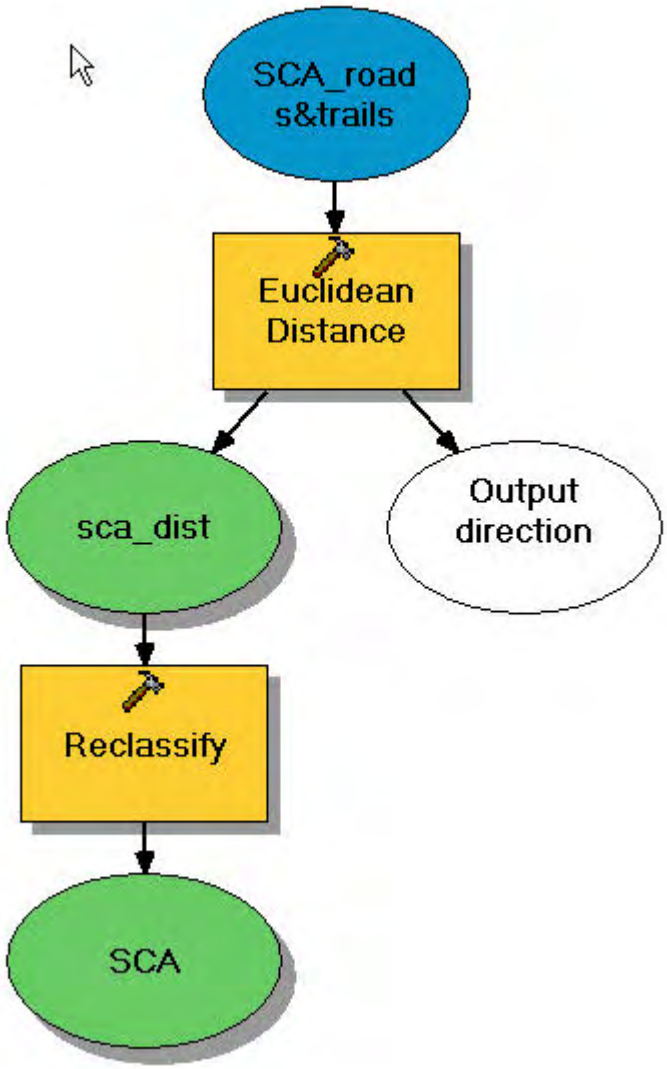
Start Time: Thu Nov 03 13:18:41 2005

Executed (Con (3)) successfully.

End Time: Thu Nov 03 13:19:07 2005 (Elapsed Time: 26.00 seconds)

Linkage Zone – SCA

Secure core areas (SCA) are delineated based on distance from roads. The euclidian distance to the nearest road segment is calculated for each grid cell and then reclassified as either "In SCA" (greater than 500 meters from a road), or "Out of SCA" (within 500 meters of a road). The secure core area designation is then used to modify the impacts of other factors.



LZ SCA

Data format: ArcToolBox Tool

Abstract: Secure core areas (SCA) are delineated based on distance from roads. The euclidian distance to the nearest road segment is calculated for each grid cell and then reclassified as either "In SCA" (greater than 500 meters from a road), or "Out of SCA" (within 500 meters of a road). The secure core area designation is then used to modify the impacts of other factors.

ISO and ESRI Metadata:

Metadata elements shown with blue text are defined in the International Organization for Standardization's (ISO) document 19115 *Geographic Information - Metadata.* Elements shown with green text are defined by ESRI and will be documented as extentions to the ISO 19115. Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog.

Metadata Information

***Last update:** 20051216

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Resource Identification Information:

Citation:

Title: LZ SCA

Party responsible for the resource:
Individual's name: Joe Grigsby
Organization's name: Geodata Services, Inc.
Contact's position: GIS Analyst
Contact's role:

Contact information:
Phone:
Voice: 406.721.8865
Fax: 406.721.1023

Address:
Delivery point:
104 South Ave. E.
City: Missoula

Administrative area: MT
Postal code: 59801
Country: USA
e-mail address: kwall@geodata-mt.com

Descriptive keywords:
Keywords: SCA, secure core area, roads, high use trails

Abstract:
Secure core areas (SCA) are delineated based on distance from roads. The euclidian distance to the nearest road segment is calculated for each grid cell and then reclassified as either "In SCA" (greater than 500 meters from a road), or "Out of SCA" (within 500 meters of a road). The secure core area designation is then used to modify the impacts of other factors.

Resource constraints:
Constraints:
Limitations of use:

Back to Top

Distribution Information:

Distributor:
Available format:
Format name: ArcToolBox Tool

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LZ_SCA_Model Report Expand/Collapse All

Generated on: Mon May 12 16:31:30 2008

Variables

StrMap-detailed

Data Type:Feature Layer
Value:StrMap-detailed

Output direction raster

Data Type:Raster Dataset
Value:

Messages:

The value is empty.

EucDist_StrM1

Data Type:Raster Dataset
Value:C:\Data\ITD2\Roads\eucdist_strm1

SCA

Data Type:Raster Dataset
Value:C:\Data\ITD2\LZModel\SCA\sca

Processes

Euclidean Distance

Tool Name:Euclidean Distance
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Distance\EucDistance

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster or feature	Input	Required	Composite Geodataset	StrMap-detailed

source data				
Output distance raster	Output	Required	Raster Dataset	C:\Data\ITD2\Roads\eucdist_strm1
Maximum distance	Input	Optional	Double	
Output cell size	Input	Optional	Analysis cell size	30
Output direction raster	Output	Optional	Raster Dataset	

Messages:

Executing (Euclidean Distance): EucDistance StrMap-detailed C:\Data\ITD2\Roads\eucdist_strm1 # 30 #

Start Time: Fri Nov 04 13:44:41 2005

Executed (Euclidean Distance) successfully.

End Time: Fri Nov 04 13:45:59 2005 (Elapsed Time: 1 minutes 18 seconds)

Reclassify

Tool Name:Reclassify
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Reclass\Reclassify

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\Roads\eucdist_strm1
Reclass field	Input	Required	Field	Value
Reclassification	Input	Required	Remap	0 500 10;500 25000 1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\LZModel\SCA\sca
Change missing values to NoData	Input	Optional	Boolean	false

Messages:

Executing (Reclassify): Reclassify
C:\Data\ITD2\Roads\eucdist_strm1 Value "0 500 10;500 25000 1"
C:\Data\ITD2\LZModel\SCA\sca DATA

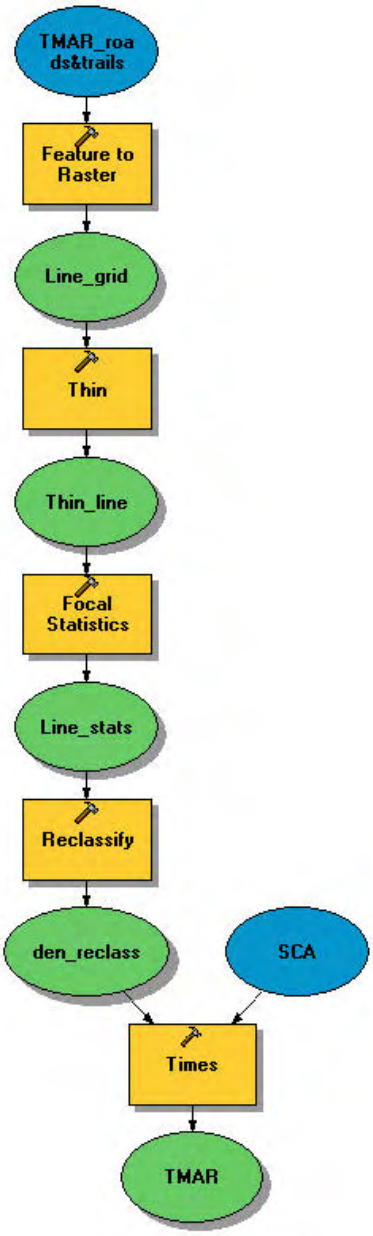
Start Time: Fri Nov 04 13:45:59 2005

Executed (Reclassify) successfully.

End Time: Fri Nov 04 13:46:36 2005 (Elapsed Time: 37.00 seconds)

Linkage Zone – TMAR

Total motorized access route density (TMAR) is the road density calculated for the one mile circular area around each grid cell in the area of interest. The calculated road density is then classified into 4 categories - 0 miles/sq. mile, 0.01 - 1 miles/sq mile, 1.01 - 2 miles/sq mile, and > 2 miles/sq mile. Impact values are assigned to each category and then modified based on whether they are in or out of secure core areas (SCA). Impact values for areas out of SCA are increased by one level, and areas within an SCA retain the original value.



LZ TMAR

Data format: ArcToolBox Tool

Abstract: Total motorized access route density (TMAR) is the road density calculated for the one mile circular area around each grid cell in the area of interest. The calculated road density is then classified into 4 categories - 0 miles/sq. mile, 0.01 - 1 miles/sq mile, 1.01 - 2 miles/sq mile, and > 2 miles/sq mile. Impact values are assigned to each category and then modified based on whether they are in or out of secure core areas (SCA). Impact values for areas out of SCA are increased by one level, and areas within an SCA retain the original value.

ISO and ESRI Metadata:

Metadata elements shown with blue text are defined in the International Organization for Standardization's (ISO) document 19115 *Geographic Information - Metadata.* Elements shown with green text are defined by ESRI and will be documented as extentions to the ISO 19115. Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog.

Metadata Information

***Last update:** 20051214

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Resource Identification Information:

Citation:

Title: LZ TMAR

Party responsible for the resource:
Individual's name: Joe Grigsby
Organization's name: Geodata Services, Inc.
Contact's position: GIS Analyst
Contact's role:

Contact information:
Phone:
Voice: 406.721.8865
Fax: 406.721.1023

Address:
Delivery point:

104 South Ave E.
City: Missoula
Administrative area: MT
Postal code: 59801
Country: USA
e-mail address: kwall@geodata-mt.com

Descriptive keywords:
Keywords: TMAR, total motorized access routes, SCA, secure core areas, roads, trails, road density

Abstract:
Total motorized access route density (TMAR) is the road density calculated for the one mile circular area around each grid cell in the area of interest. The calculated road density is then classified into 4 categories - 0 miles/sq. mile, 0.01 - 1 miles/sq mile, 1.01 - 2 miles/sq mile, and > 2 miles/sq mile. Impact values are assigned to each category and then modified based on whether they are in or out of secure core areas (SCA). Impact values for areas out of SCA are increased by one level, and areas within an SCA retain the original value.

Resource constraints:
Constraints:
Limitations of use:

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Distribution Information:

Distributor:
Available format:
Format name: ArcToolBox Tool

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LZ_TMAR_Model Report Expand/Collapse All

Generated on: Mon May 12 16:32:47 2008

Variables

TMAR_roads&trails

Data Type:Composite Geodataset
Value:StrMap-detailed

Feature_StrM1

Data Type:Raster Dataset
Value:C:\Data\ITD2\Roads\feature_strm1

Thin_Feature1

Data Type:Raster Dataset
Value:C:\Data\ITD2\Roads\thin_feature1

FocalSt_Thin1

Data Type:Raster Dataset
Value:C:\Data\ITD2\Roads\focalst_thin1

Reclass_Foca1

Data Type:Raster Dataset
Value:C:\Data\ITD2\Roads\reclass_foca1

SCA

Data Type:Composite Geodataset
Value:sca

TMAR

Data Type:Raster Dataset
Value:C:\Data\ITD2\LZModel\TMAR\tmar

Processes

Feature to Raster

Tool Name:Feature to Raster
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Conversion Tools.tbx\To Raster\FeatureToRaster

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input features	Input	Required	Composite Geodataset	StrMap-detailed
Field	Input	Required	Field	ObjectID
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\Roads\feature_strm1
Output cell size	Input	Optional	Analysis cell size	30

Messages:

Executing (Feature to Raster): FeatureToRaster StrMap-detailed ObjectID C:\Data\ITD2\Roads\feature_strm1 30

Start Time: Mon Nov 07 13:06:07 2005

Executed (Feature to Raster) successfully.

End Time: Mon Nov 07 13:06:32 2005 (Elapsed Time: 25.00 seconds)

Thin

Tool Name:Thin
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Generalization\Thin

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\Roads\feature_strm1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\Roads\thin_feature1
Background value	Input	Optional	String	NODATA
Filter input first	Input	Optional	Boolean	false

Shape for corners	Input	Optional	String	SHARP
Maximum thickness of input linear features	Input	Optional	Double	45

Messages:

Executing (Thin): Thin C:\Data\ITD2\Roads\feature_strm1 C:\Data\ITD2\Roads\thin_feature1 NODATA NO_FILTER SHARP 45

Start Time: Mon Nov 07 13:06:32 2005

Executed (Thin) successfully.

End Time: Mon Nov 07 13:06:51 2005 (Elapsed Time: 19.00 seconds)

Focal Statistics

Tool Name:Focal Statistics
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Neighborhood\FocalStatistics

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\Roads\thin_feature1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\Roads\focalst_thin1
Neighborhood	Input	Optional	Neighborhood	Circle 30 CELL
Statistics type	Input	Optional	String	SUM
Ignore NoData in calculations	Input	Optional	Boolean	false

Messages:

Executing (Focal Statistics): FocalStatistics C:\Data\ITD2\Roads\thin_feature1 C:\Data\ITD2\Roads\focalst_thin1

"Circle 30 CELL" SUM NODATA

Start Time: Mon Nov 07 13:06:51 2005

Executed (Focal Statistics) successfully.

End Time: Mon Nov 07 14:17:48 2005 (Elapsed Time: 1 hours 10 minutes 57 seconds)

Reclassify

Tool Name:Reclassify
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Reclass\Reclassify

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\Roads\focalst_thin1
Reclass field	Input	Required	Field	Value
Reclassification	Input	Required	Remap	0 1;1 53 10;54 105 100;106 10000 1000;NODATA 1
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\Roads\reclass_foca1
Change missing values to NoData	Input	Optional	Boolean	false

Messages:

Executing (Reclassify): Reclassify C:\Data\ITD2\Roads\focalst_thin1 VALUE "0 1;1 53 10;54 105 100;106 10000 1000;NODATA 1" C:\Data\ITD2\Roads\reclass_foca1 DATA

Start Time: Mon Nov 07 14:17:48 2005

Executed (Reclassify) successfully.

End Time: Mon Nov 07 14:18:08 2005 (Elapsed Time: 20.00 seconds)

Times

Tool Name:Times
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Math\Times

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster or constant value 1	Input	Required	Composite Geodataset	C:\Data\ITD2\Roads\reclass_foca1
Input raster or constant value 2	Input	Required	Composite Geodataset	sca
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\LZModel\TMAR\tmar

Messages:

Executing (Times): Times C:\Data\ITD2\Roads\reclass_foca1 sca C:\Data\ITD2\LZModel\TMAR\tmar

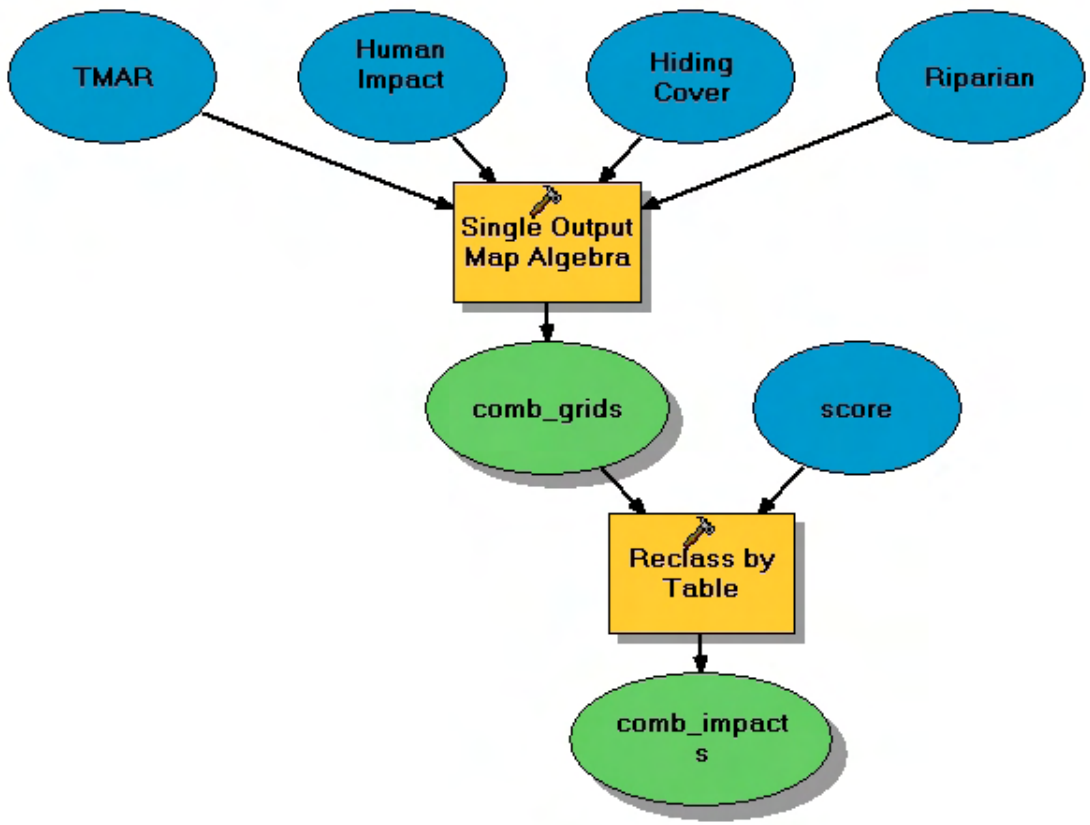
Start Time: Mon Nov 07 14:18:08 2005

Executed (Times) successfully.

End Time: Mon Nov 07 14:19:05 2005 (Elapsed Time: 57.00 seconds)

LZ – COMBINED IMPACTS

LZ Combined Impacts adds the impact values from the component models and classifies the resultant grid into impact categories of minimal (1), low (2), moderate (3), or high (4).



LZ Combined Impacts

Data format: ArcToolBox Tool

Abstract: LZ Combined Impacts adds the impact values from the component models and classifies the resultant grid into impact categories of minimal (1), low (2), moderate (3), or high (4).

ISO and ESRI Metadata:

Metadata elements shown with blue text are defined in the International Organization for Standardization's (ISO) document 19115 *Geographic Information - Metadata.* Elements shown with green text are defined by ESRI and will be documented as extentions to the ISO 19115. Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog.

Metadata Information

***Last update:** 20051214

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Resource Identification Information:

Citation:

Title: LZ Combined Impacts

Party responsible for the resource:
Individual's name: Joe Grigsby
Organization's name: Geodata Services, Inc.
Contact's position: GIS Analyst
Contact's role:

Contact information:
Phone:
Voice: 406.721.8865
Fax: 406.721.1023

Address:
Delivery point:
104 South Ave. E.
City: Missoula
Administrative area: MT
Postal code: 59801

Country: USA
e-mail address: kwall@geodata-mt.com

Descriptive keywords:
Keywords: cover, TMAR, total motorized access routes, SCA, secure core areas, riparian, HIZ, human impact zone

Abstract:
LZ Combined Impacts adds the impact values from the component models and classifies the resultant grid into impact categories of minimal (1), low (2), moderate (3), or high (4).

Resource constraints:
Constraints:
Limitations of use:

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Distribution Information:

Distributor:
Available format:
Format name: ArcToolBox Tool

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LZ_Comb_Impacts_Model Report Expand/Collapse All

Generated on: Mon May 12 16:49:06 2008

Variables

TMAR

Data Type:Composite Geodataset
Value:C:\Data\ITD2\LZModel\TMAR\tmar

Human Impact Zones

Data Type:Composite Geodataset
Value:C:\Data\ITD2\LZModel\HIZ\hiz

Hiding Cover

Data Type:Composite Geodataset
Value:C:\Data\ITD2\LZModel\Cover\cover

Riparian

Data Type:Composite Geodataset
Value:C:\Data\ITD2\LZModel\Riparian\riparian

comb_grids

Data Type:Raster Dataset
Value:C:\Data\ITD2\LZModel\comb_grids

score.dbf

Data Type:Table View
Value:C:\Data\ITD2\LZModel\score.dbf

comb_impacts

Data Type:Raster Dataset
Value:C:\Data\ITD2\LZModel\comb_impacts

Processes

Single Output Map Algebra

Tool Name:Single Output Map Algebra
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\
Map Algebra\SingleOutputMapAlgebra

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Map Algebra expression	Input	Required	MapAlgebra Expression	C:\data\ITD2\LZModel\Riparian\riparian + C:\data\ITD2\LZModel\Cover\cover + C:\data\ITD2\LZModel\HIZ\hiz + C:\data\ITD2\LZModel\TMAR\tmar
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\LZModel\comb_grids
Input raster or feature data	Input	Optional	Multiple Value	C:\Data\ITD2\LZModel\TMAR\tmar; C:\Data\ITD2\LZModel\HIZ\hiz; C:\Data\ITD2\LZModel\Cover\cover; C:\Data\ITD2\LZModel\Riparian\riparian

Messages:

Executing (Single Output Map Algebra): SingleOutputMapAlgebra "C:\data\ITD2\LZModel\Riparian\riparian + C:\data\ITD2\LZModel\Cover\cover + C:\data\ITD2\LZModel\HIZ\hiz + C:\data\ITD2\LZModel\TMAR\tmar " C:\Data\ITD2\LZModel\comb_grids C:\Data\ITD2\LZModel\TMAR\tmar;C:\Data\ITD2\LZModel\HIZ\hiz; C:\Data\ITD2\LZModel\Cover\cover;C:\Data\ITD2\LZModel\Riparian\riparian

Start Time: Fri Dec 09 15:17:10 2005

Executed (Single Output Map Algebra) successfully.

End Time: Fri Dec 09 15:19:01 2005 (Elapsed Time: 1 minutes 51 seconds)

Reclass by Table

Tool Name:Reclass by Table
Tool Source:C:\Program Files\ArcGIS\ArcToolbox\Toolboxes\Spatial Analyst Tools.tbx\Reclass\ReclassByTable

Parameters:

Name	*Direction*	*Type*	*Data Type*	*Value*
Input raster	Input	Required	Composite Geodataset	C:\Data\ITD2\LZModel\comb_grids
Input remap table	Input	Required	Table View	C:\Data\ITD2\LZModel\score.dbf
From value field	Input	Required	Field	CIC2
To value field	Input	Required	Field	CIC2
Output value field	Input	Required	Field	code
Output raster	Output	Required	Raster Dataset	C:\Data\ITD2\LZModel\comb_impacts
Change missing values to NoData	Input	Optional	Boolean	false

Messages:

Executing (Reclass by Table): ReclassByTable C:\Data\ITD2\LZModel\comb_grids C:\Data\ITD2\LZModel\score.dbf CIC2 CIC2 code C:\Data\ITD2\LZModel\comb_impacts DATA

Start Time: Fri Dec 09 15:19:01 2005

Executed (Reclass by Table) successfully.

End Time: Fri Dec 09 15:19:36 2005 (Elapsed Time: 35.00 seconds)

ITD Tools

Data format: ArcToolBox Toolbox

Abstract: These tools are the modules of the Identification of Potential Linkages Zones model for grizzly bears. Impacts of human activities and beneficial features of the landscape were considered. A rating system for each type of impact and vegetation condition was used to score each model component and then the values were combined and classified into impact level categories of high, moderate, low, or minimal. The impacts and vegetation conditions considered were distance from roads, road density, developed sites, riparian areas and hiding cover. While distance from roads was not applied directly to the final score it was used to define secure core areas which was then used to modify the rating of road density and hiding cover. This model is based on the thesis "Identification of Potential Linkage Zones for Grizzly Bears in the Swan-Clearwater Valley Using GIS" by Per Lennart Sandstrom for his Masters of Science degree at the University of Montana, 1996.

ISO and ESRI Metadata:

Metadata elements shown with blue text are defined in the International Organization for Standardization's (ISO) document 19115 *Geographic Information - Metadata.* Elements shown with green text are defined by ESRI and will be documented as extentions to the ISO 19115. Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog.

Metadata Information

***Last update:** 20050628

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Resource Identification Information:

Citation:

Title: ITD Tools

Party responsible for the resource:
Individual's name: Joe Grigsby
Organization's name: Geodata Services, Inc.
Contact's position: GIS Analyst
Contact's role:

Contact information:
Phone:

Voice: 406.721.8865
Fax: 406.721.1023

Address:
Delivery point:
104 South Ave E.
City: Missoula
Administrative area: MT
Postal code: 59801
Country: USA
e-mail address: kwall@geodata-mt.com

Descriptive keywords:

Keywords: human activities, human impacts, road density, secure core area, developed site, hiding cover, riparian, linkage zone, NLCD, total motorized access routes, cumulative effects modeling, cover conditions, grizzly bear

Abstract:
These tools are the modules of the Identification of Potential Linkages Zones model for grizzly bears. Impacts of human activities and beneficial features of the landscape were considered. A rating system for each type of impact and vegetation condition was used to score each model component and then the values were combined and classified into impact level categories of high, moderate, low, or minimal. The impacts and vegetation conditions considered were distance from roads, road density, developed sites, riparian areas and hiding cover. While distance from roads was not applied directly to the final score it was used to define secure core areas which was then used to modify the rating of road density and hiding cover. This model is based on the thesis "Identification of Potential Linkage Zones for Grizzly Bears in the Swan-Clearwater Valley Using GIS" by Per Lennart Sandstrom for his Masters of Science degree at the University of Montana, 1996.

Resource constraints:
Constraints:
Limitations of use:

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Distribution Information:

Distributor:
Available format:
Format name: ArcToolBox Toolbox

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