ATTACHMENT P1-7B
FISH HABITAT AND STREAM CROSSING ASSESSMENT SUMMARY REPORT

Fish Habitat and Stream Crossing Assessment Summary Report

Boardman to Hemingway Transmission Line Project

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1.0 INTRODUCTION

This Fish Habitat and Stream Crossing Assessment Summary Report summarizes the results of field surveys conducted in 2014 and 2016 of potential transmission line or access road crossings of fish-bearing streams along the proposed and alternative routes of the Boardman to Hemingway Transmission Line Project (Project). The surveys assessed fish habitat conditions, stream crossing characteristics, and the crossing risks. In addition, the report describes the steps Idaho Power Company (IPC) would take to avoid, minimize, and mitigate those potential stream crossing impacts. This report will aid in demonstrating that the Project would be consistent with Oregon Department of Fish and Wildlife's (ODFW) fish and wildlife standards.

The Project would result in disturbances related to the construction of permanent facilities such as transmission tower pads, stations, communication stations, and permanent access roads, as well as temporary disturbances related to fly yards, multi-use areas, pulling and tensioning sites, and temporary access roads. For fish and their habitat, the primary source of potential impact is the stream crossing sites of new or modified roads and the transmission line crossing areas where stream-side habitat conditions may be affected. In addition, the Project would include the initial construction clearing and continued maintenance of tree heights near the transmission line, resulting in permanent alteration of vegetation in forested areas. To help determine the degree of impact that could occur due to the construction and operation of these Project components, the location and characteristics of fish and their habitats, relative to road and transmission line stream crossings, need to be determined.

The Project, as proposed, and the four alternatives being considered (West of Bombing Range Road Alternatives 1 and 2, Morgan Lake Alternative, and Double Mountain Alternative) would cross both public and private lands where streams are present (Figures 1a and 1b). Since permission to access all crossing sites on private land could not be obtained, some crossing sites could not be directly surveyed to assess fish and their habitats, as well as crossing characteristics and risks. In those instances, data from surveys conducted on adjacent segments on nearby streams were used to report on the characteristics of fish and their habitats, relative to the road and transmission line stream crossings.

The following sections provide a summary of the fisheries habitat and crossings surveys. Section 2 contains a description of the survey area and objectives. Section 3 describes the details of the data collection methods. Field forms associated with the fisheries habitat and crossing surveys are referenced in the subsequent sections and provided in Appendices A through C. Section 4 contains the survey results including a summary of the stream riparian and morphological conditions at the crossings and a final risk level determination for proposed road and transmission line crossing. Section 5 contains the report conclusions, and all references cited in the report are provided in Section 6.

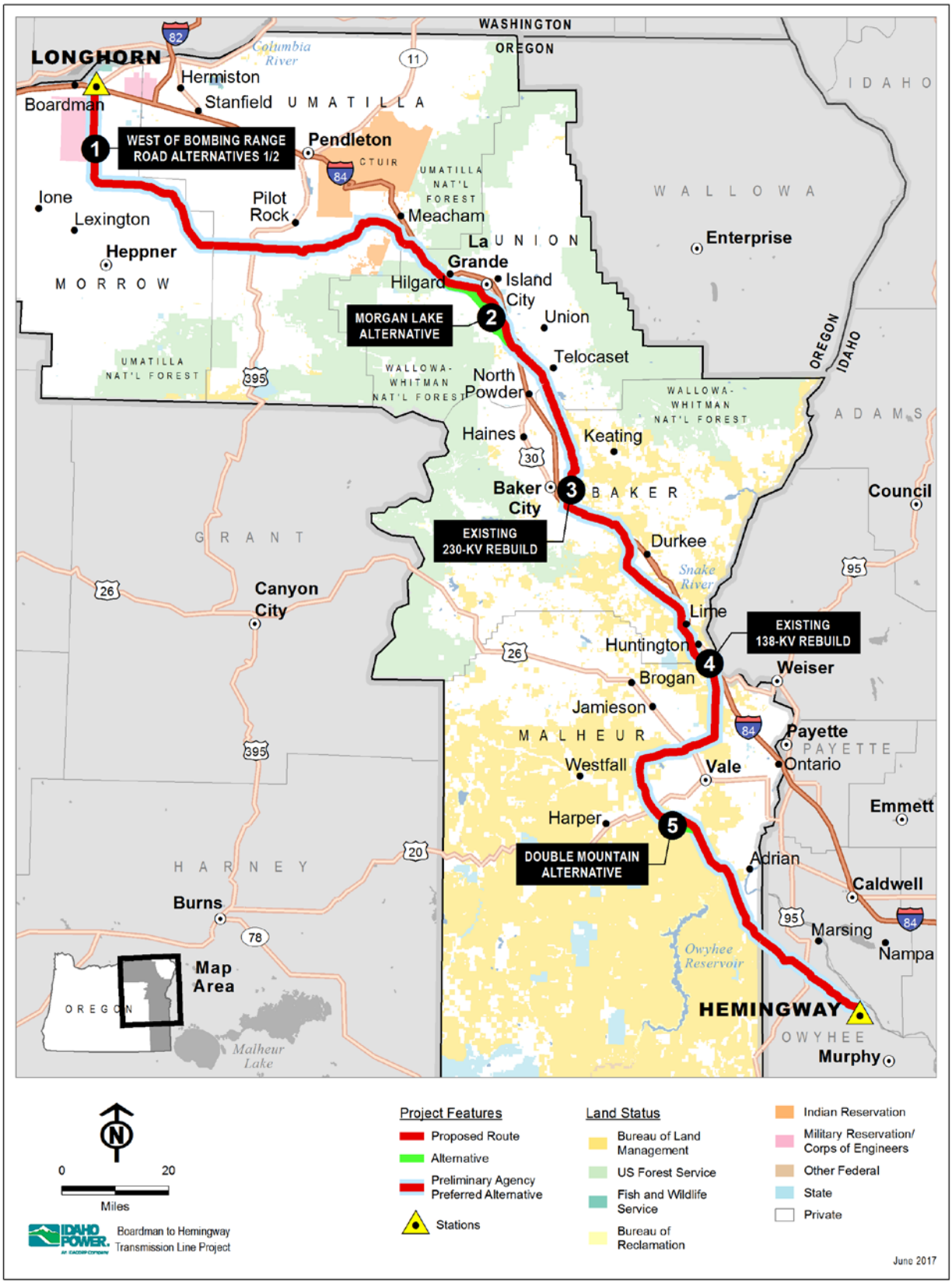


Figure 1a. Project Overview

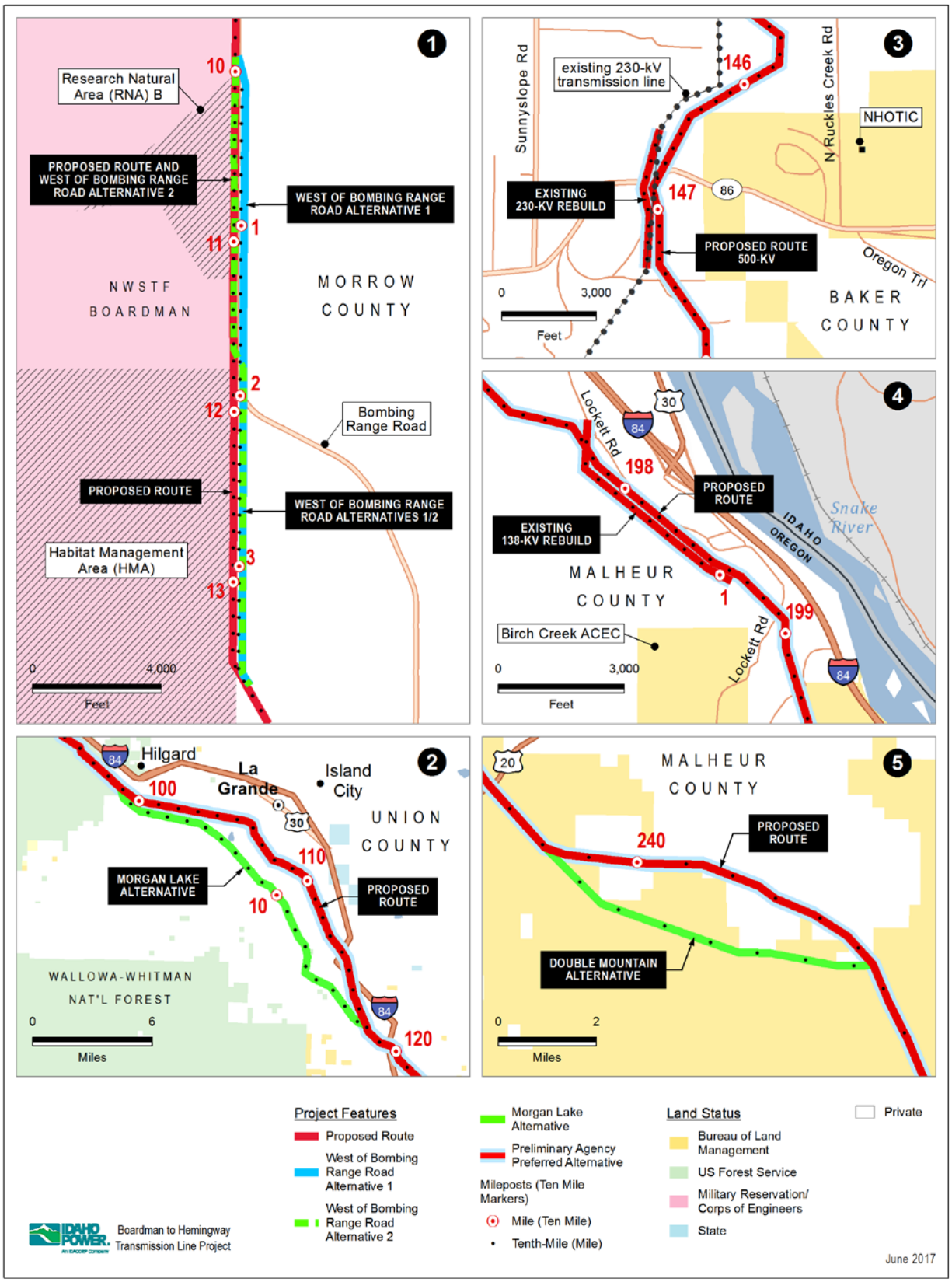


Figure 1b. Detail of Alternatives and 230-kV and 138-kV Rebuilds

2.0 SURVEY AREA AND OBJECTIVES

The Project area, shown in Figures 1a and 1b, includes the Proposed Route, four alternatives, and two line segments proposed for rebuild. Preliminary survey sites included all road and transmission line crossings (new or rebuilt) of streams determined to have known, or potential, fish use. Fish use was determined by mapping fish-bearing streams through a desktop analysis as described in Section 3.1.

The objective of the fish habitat surveys was to collect habitat data on streams identified as known or potentially fish-bearing and use the data to determine fish presence where ODFW and Idaho Department of Fish and Game (IDFG) had not already made a determination of historic or current native migratory fish use. As described in Section 3.2.1, the data were intended to provide a detailed description of the fish habitat and geomorphic stream characteristics of those streams.

The objective of the crossing assessments was to characterize the specific elements and level of risk at individual crossing locations. The crossing assessments were intended to better characterize the site-specific conditions that may be susceptible to new crossing construction, modification of crossing structures, or vegetation removal. As described in Section 3.2.2, crossing information was collected to assess the stability of the crossing location, whether or not an existing structure meets fish passage criteria; determining what crossing structure type and size may be most suitable; and identifying what bank, bed, slope, and substrate concerns may need to be considered at these locations.

Although some of the data collected as part of the crossing assessments partially overlap with the fish habitat surveys, data collected as part of the crossing assessments focus specifically on the conditions at the crossing location.

3.0 METHODS

The assessment methods for the fisheries habitat and crossings surveys included a desktop analysis and field surveys. The desktop analysis, described in Section 3.1, was completed to identify potentially fish-bearing streams crossed by the Project roads or transmission line. These sites were identified as the sites to be surveyed in the field. The field survey data collection methods, described in Section 3.2, include a description of the field data collection methods for fish habitat and fish presence surveys (Section 3.2.1) and for crossing assessments (Section 3.2.2).

Surveys to assess fish habitat conditions, stream crossing characteristics, and the crossing risks occurred first in 2014 (Tetra Tech 2014a) and again in 2016 following Project route modifications. Surveys were conducted using the methods described in two plans that had been reviewed and approved by ODFW before conducting the surveys. The ODFW determined that these plans contained sufficient detail and structured protocols to meet the department's expectations and requirements (Nigel Seidel, personal communication, May 13, 2014). The Fish Presence Determination Survey Plan (Tetra Tech 2014b) details IPC's plan, described in Section 3.2.1, for determining whether fish are, or were, present on the streams that would be crossed by Project features. The Fisheries Habitat and Crossing Assessment Plan (Tetra Tech 2014c) describes the approach IPC took in investigating road and transmission line crossings of fish-bearing streams along the Project route. A summary of these plans is provided in Section 3; more detail is supplied in the two plans.

3.1 Desktop Analysis

Geographic information system (GIS) mapping of fish-bearing streams along the Project route was conducted. This mapping incorporated data from existing GIS data layers and sources (e.g., StreamNet; ODFW; Oregon Department of Forestry [ODF]) into one GIS layer. Using this layer, maps of fish-bearing streams along the Project route were created, and these maps were distributed to local biologists at ODFW, the U.S. Department of Agriculture Forest Service, and Bureau of Land Management (BLM) for review and comment. Input on fish-bearing stream locations in the Idaho portion of the route was received from the BLM Owyhee Field Office and included comments referencing ODFW and IDFG documented fish distribution.

Based on the input received from the agencies as well as GIS data evaluation by Tetra Tech fish biologists comparing likely fish-bearing channel characteristics against the known distribution, further refinements were made to the GIS fish stream distribution layer. This layer was then used to determine which Project stream crossing had or may have fish present and required field survey and evaluation.

The desktop analysis of these crossing sites identified 76 potentially fish-bearing streams along the proposed and alternative routes and associated roads. The analysis found a total of 128 crossing locations (73 road crossings and 55 transmission line crossings) along the Proposed Route and alternatives. These locations were those sites that would be assessed for crossing characteristics and risks, and field survey if access was allowed.

3.2 Field Surveys

All field staff were required to have experience performing similar types of fisheries habitat surveys, with each field team consisting of a fish biologist and a hydrologist or geomorphologist to ensure effective data collection and accurate determination of stream and fish habitat characteristics. To ensure consistent data collection and recording, field staff reviewed and

followed the procedures described in the Fish Presence Determination Survey Plan (Tetra Tech 2014b) and the Fisheries Habitat and Crossing Assessment Plan (Tetra Tech 2014c).

The intent was to survey all 128 potential fish-bearing stream crossings (road and transmission line), regardless of perennial, intermittent, or ephemeral designation. However, landowner permission was not granted for all crossing sites. For sites with no access, habitat data were collected, if possible, on the same stream as close to the crossing as access allowed. Some sites had no or only indirect surveys, including 22 sites with no field surveys and another 15 sites that were surveyed at a nearby location other than the direct crossing site.

3.2.1 Fisheries Habitat and Presence Surveys

Fisheries habitat and presence surveys were intended to achieve several objectives. First, for streams not already designated as fish-bearing streams by ODFW or IDFG, the data collected were intended to adequately determine if streams did, or likely could, support fish use. Second, the habitat data collected were intended to help describe riparian and instream conditions, which are both important components of fish habitat quality. Lastly, habitat data were also collected to provide additional information about Project-related risks to assist with the crossing assessments. This information collected and reported in Tetra Tech (2014a) was used to help develop the proposed road crossing structure plans and procedures where new or improved crossings may be needed. These plans were developed in the Fish Passage Plans and Designs report (Tetra Tech 2016), which was used to obtain approval from ODFW for fish passage designs for these sites.

3.2.1.1 Fish Presence Determination

Fish presence was assumed for streams designated by ODFW or IDFG as fish-bearing streams. Field data were used as the primary factor for fish presence determination in streams not already designated by ODFW or IDFG. Fish sampling, as described below, was conducted only in the rare case where potential fish presence could not be reasonably determined from habitat surveys.

The presence of fish habitat was identified and documented based on the data collected as part of the fish habitat field surveys. The presence or absence of fish habitat, or potential need for fish sampling, was typically based on channel gradient and bankfull width with considerations given to available habitat (Table 1).

Table 1. Fish Habitat Presence Criteria

Fish Habitat Presence	Fish Habitat Criteria[1]	Possible Considerations[2]
Fish Habitat Present	Slope < 20%, active channel width ≥ 2 feet, and pools	Consider location: if not closely connected to known fish stream, consider potential for fish presence sampling
Potential for Fish Presence Sampling (see Section 3.2.1.2 below)	Slope < 20% and active channel width < 2 feet Or Slope > 20% and active channel width > 2 feet	Consider location: if not closely attached to known fish stream consider potential for fish presence sampling
Fish Habitat Absent	Slope > 20%, active channel width < 2 feet, and no pools	Consider location: if closely attached to known fish stream consider potential for fish presence sampling

[1] Criteria are based on professional judgment and literature from the following sources: ODF 1999; Latterell et al. 2003; Cole et al. 2006; Robison and Runyon 2006; Mount et al. 2011; Washington Administrative Code 222-16-031.
[2] Based on conversations with ODFW, other streams may be considered for fish presence sampling.

Potential fish-bearing streams with a bankfull width greater than or equal to 2 feet may be considered fish-bearing if other factors (such as slope, lack of natural barriers, or adequate habitat) are present (Robison and Runyon 2006; Latterell et al. 2003; Washington Administrative Code 222-16-031). In contrast, existing scientific literature suggests that streams with channel slopes greater than 20 percent or channel width less than 2 feet are likely to be non-fish-bearing streams (see Robison and Runyon 2006; Cole et al. 2006; ODF 1999; Latterell et al. 2003; Mount et al. 2011). Smaller and steeper streams may require abbreviated stream habitat surveys to evaluate their potential to be fish bearing. When a stream is connected by flow to a known fish-bearing stream and the habitat conditions are adequate for fish use, the stream was considered fish bearing. In some instances, small (less than 2-foot-wide) segments of very flat or steep streams could be considered to be fish-bearing if the location provides seasonal rearing or refugia habitat for native migratory fish. No streams less than 2 feet wide fit this characteristic during Project field surveys.

3.2.1.2 Fish Presence Sampling

Fish presence sampling was not performed if a less intrusive and effective method was available. When needed, fish presence sampling was conducted with a backpack electrofisher. Sampling followed electrofishing protocols, which include a sampling reach that typically extends downstream at least 50 yards and includes at least six pools of at least 1-foot deep or more (ODF and ODFW undated). Fish sampling via the electrofishing method did not occur on any stream where Endangered Species Act listed species may be present.

3.2.1.3 Fish Habitat Characteristics

Surveys were conducted to determine the general habitat condition of streams at locations where the Project construction footprint proposes a direct impact to the resource. The information was collected at each road and transmission line crossing area where access was available. Fish habitat surveys and data collection included characterizing conditions upstream and downstream of the location over a reach length typically 100 to 500 feet, extending farther when necessary to accurately assess the habitat.

Three general types of fish habitat data were collected, within distinct geomorphic stream segments: riparian vegetation characteristics, stream morphology, and stream substrate characteristics. Data were collected using the Stream Habitat Survey Datasheet (Appendix A), and data collected within each segment focused on common habitat measures including:

- Riparian classes present (within 100 feet from channel);
- Shade;
- Riparian tree characteristics;
- Overhanging vegetation;
- Channel gradient;
- Active and bankfull channel widths;
- Floodplain width;
- Bank stability;
- Undercut banks;
- Pool and large woody debris (LWD) frequency;
- Presence of beaver activity;
- Substrate characteristics and size; and
- Percent embeddedness and fines (Bain and Stevenson 1999; ODFW 2010; USFS 2001 and 2010).

3.2.2 Crossing Assessments

Road and transmission line crossing assessments were performed for all potentially fish-bearing streams crossed by the Project where access was available. These assessments were completed to characterize the site-specific conditions that may be susceptible to road construction improvements at the existing crossing site, modification of crossing structures, or vegetation removal. Crossing information collected also aided in assessing the likely stability of the crossing location, assessing if the existing structure meets fish passage criteria, determining what crossing structure type and size may be most suitable, and identifying bank, bed, slope, and substrate concerns may need to be considered at these locations.

The information collected at the transmission line and road stream-crossings was also used in the Project Screening Matrix of the River Restoration Assessment Tool (River RAT) developed by the National Oceanic and Atmospheric Administration National Marine Fisheries Service and U.S. Fish and Wildlife Service (RestorationReview.com 2014; Skidmore et al. 2011). The matrix screening tool is designed to provide an efficient and effective way to identify impacts and stream response potential associated with a proposed project. The screening tool helps to characterize the relative risk to natural resources from a proposed project. The risk evaluation uses site-specific data to evaluate the risk to natural resources based on stream sensitivity to disturbance (response potential, referred to hereafter as “stream risk”) and risks associated with the proposed project itself (project impact potential, referred to hereafter as “project risk”). The stream crossing risk matrices for road and transmission line crossings are contained in Figures 2 and 3, respectively. The crossing analysis assesses the risk characteristics of the elements in each axis of Figures 2 and 3 and assigns a stream and project risk rating of low, medium, or high.

The stream risk at road crossings was determined from six factors: landscape sensitivity/stream type, riparian corridor, adjacent vegetation type, bank characteristics, scour potential, and dominant hydrologic regime. The project risk at road stream crossings was determined from five factors: road crossing width/active channel width, design approach, angle of crossing channel regrade potential, and artificial bank or bed stabilization constraints (Figure 2).

The stream risk at transmission line crossings was determined from six factors: landscape sensitivity/stream type, riparian corridor, land cover type, bank characteristics, scour potential, and dominant hydrologic regime. The project risk at transmission line crossings was determined from six factors: floodplain disturbance, clearing intensity, channel disturbance, angle of crossing, channel regrade potential, and artificial bank or bed stabilization constraints (Figure 3).

The results of this risk evaluation can be used to aid in the completion of the road and transmission line stream crossing designs at each crossing location.

A risk evaluation was also developed for road and transmission line crossings that were not field surveyed. In those cases, a desktop assessment was completed to estimate risk matrix parameters. The source of this information varied by site but included stream characteristics from other locations on that same stream, information from similar streams near the crossed streams, aerial views of the site, and GIS information.

The following subsections describe the specific data collection methods for road crossings locations and transmission line crossing locations, respectively.

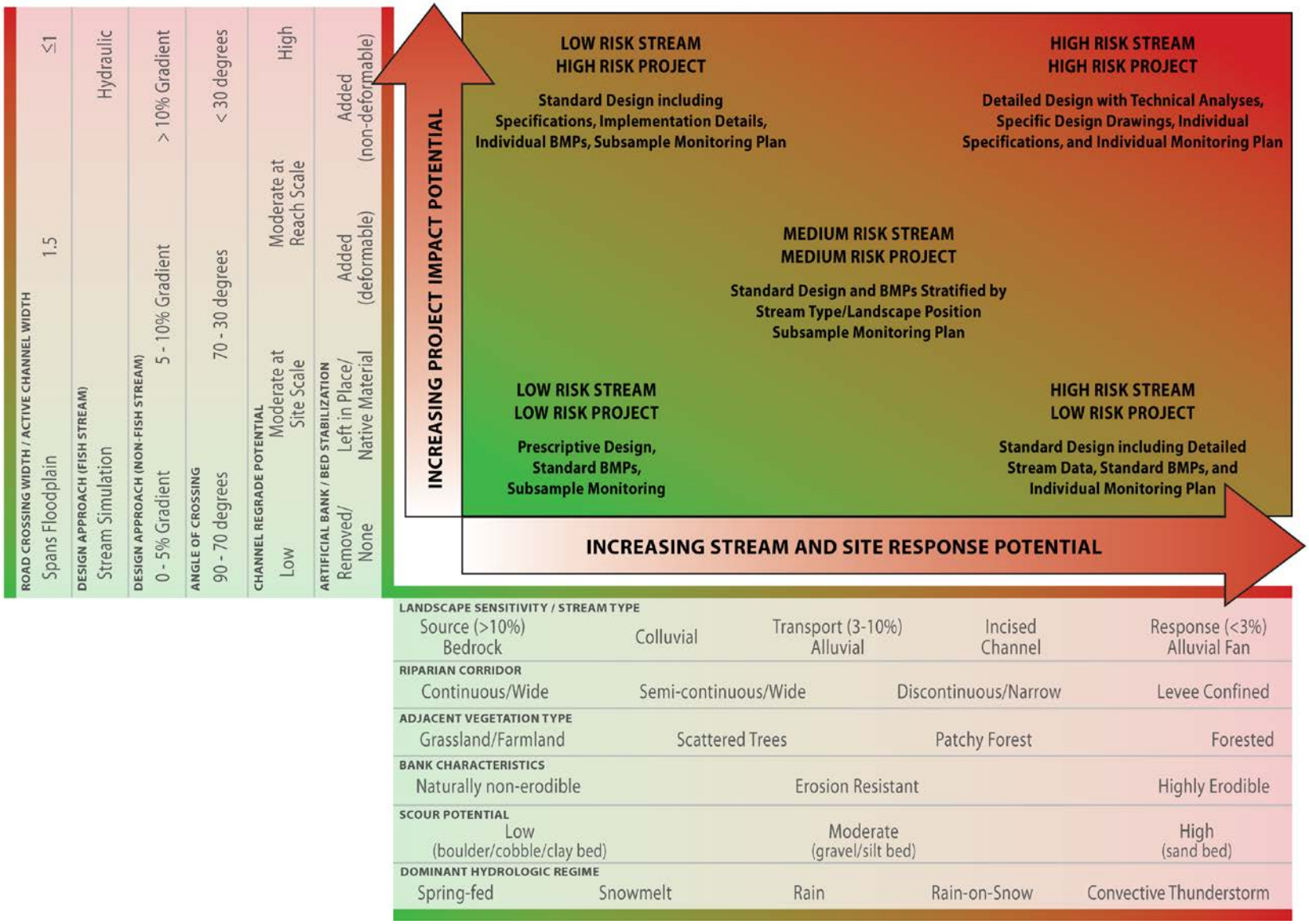


Figure 2. Road Crossing Risk Matrix

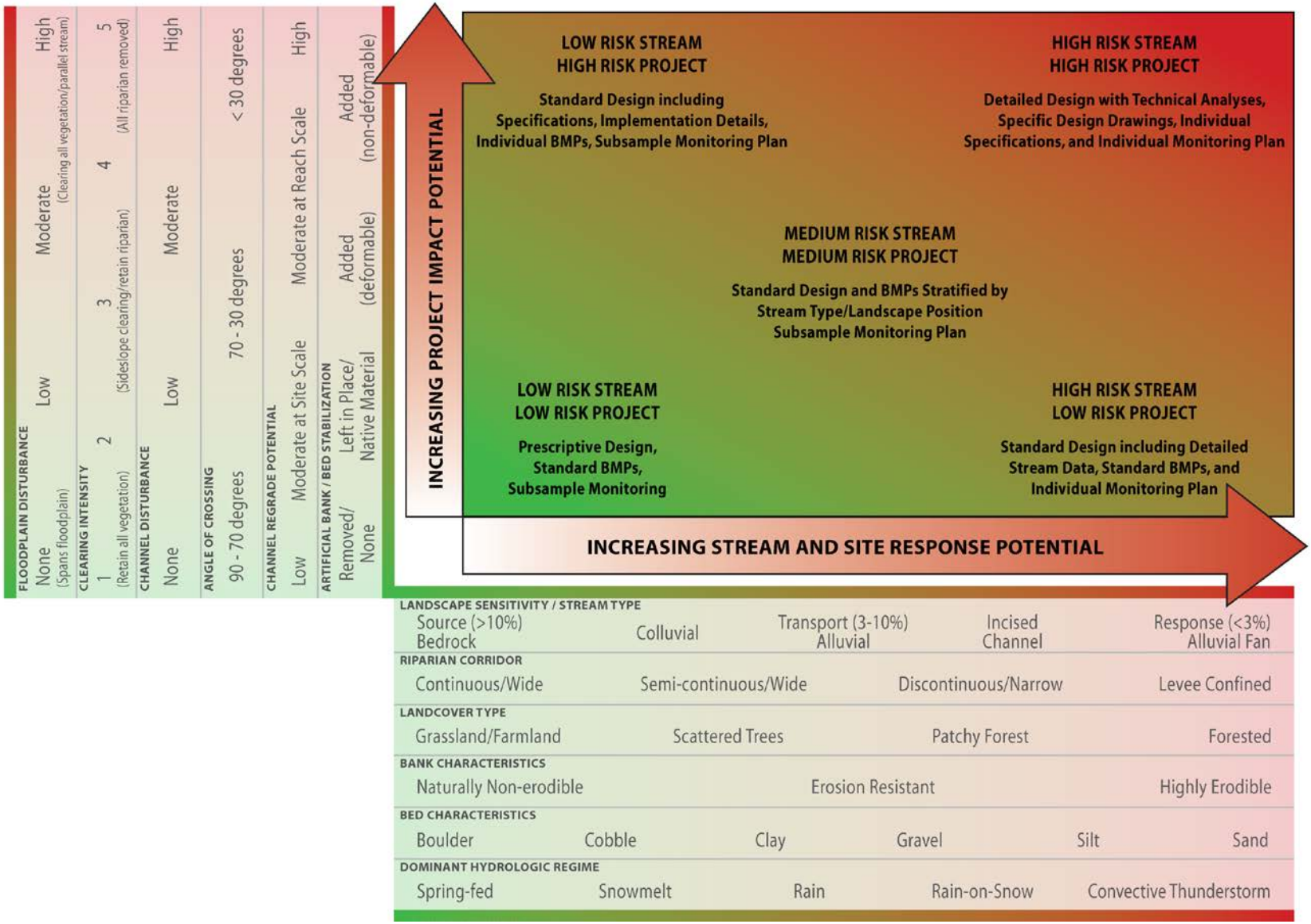


Figure 3. Transmission Line Crossing Risk Matrix

3.2.2.1 Road Crossings

At each accessible road crossing of a potentially fish-bearing stream, field survey data collection was conducted using the Road/Stream Crossing Field Condition Assessment Form (a copy of which is included in Appendix B). To ensure accurate and thorough data collection, field crews used the form to gather the specific road crossing information. The exception to this was where a designated Project road was a major road (e.g., a state or county road with asphalt, cement, or well-maintained crushed gravel surface unlikely to need any modification; five instances total); limited field surveys were conducted at these crossings. Where road crossings were accessible, alternative potential crossing locations that would decrease stream impacts were also identified, based on field observations. This information will be used to assist final design of the Project.

Crews used hand-held global positioning system (GPS) units containing the crossing locations referenced by a unique tracking identifier. The streambed or bank upstream and downstream of the crossing was walked a distance of at least 40 feet. Where property access allowed, crews walked a distance encompassing at least the influence of the crossing, if necessary up to 20 times the bankfull width, to adequately characterize the site. Field crews recorded channel gradient, bankfull width, floodplain width, and streambed material, and documented the presence or absence of grade controls such as bedrock and LWD. The road crossing assessment was performed in conjunction with the fish habitat surveys to streamline these similar data collection efforts. Information collected at road crossings included:

- Type of crossing structure existing (e.g., ford, culvert, bridge);
- Characteristics of the structure (e.g., corrugated pipe, wood bridge, size);
- Dimensions of structure (e.g., culvert diameter, length);
- Condition of the structure (e.g., rusted pipe, perched);
- Bed slope;
- Culvert slope;
- Fish passage barrier assessment (height of distinct drops [e.g., culvert “perch height” - drop at outlet], water surface to water surface elevation differences at fords [across the entire structure, as well as differential at downstream end of ford where it ties back into the natural stream]) (OWEB 1999; WDFW 2009; ODFW 2012);
- Fish passage barrier determination[1] (Yes/No) (OWEB 1999; WDFW 2009; ODFW 2012);
- Bank angle at crossing;
- Bed width;
- Active channel width;
- Signs of head cut as an indicator of on-site stability;
- Riparian vegetation characteristics; and
- Local substrate description (as a percentage of total, e.g., 25% cobble, 50% gravel, 10% fines, 15% large rock).

At existing crossings, the road width was measured and the road prism documented. At locations where existing road crossings included a culvert, bridge, or ford, additional structure-specific measurements were collected as shown in the Road/Stream Crossing Field Condition Assessment Form (Appendix B), including the dimensions, general conditions, and potential for failure.

[1] Note that although this assessment presents fish passage data, information, and makes preliminary assessments of fish passage, the authority for final determination resides with ODFW.

3.2.2.2 Fish Passage Conditions

Existing structures were also evaluated relative to ODFW fish passage criteria as identified in OAR 635-412-0035(3). In cases where an existing road crossing or other anthropogenic impact may be altering the local channel gradient, the stream profile was assessed far enough upstream and downstream to determine how and where the natural channel gradient has been altered. Potential fish barriers encountered had key variables collected at existing crossings, such as plunge pool depth, outlet drop height, culvert slope, and water depth within the culvert, which in combination with other on-site factors (barrier dimensions, channel widths, channel gradients) were noted to help characterize fish passage barrier severity. Additional data collected, related to road crossings, were used as described in Tetra Tech (2016).

3.2.2.3 Transmission Line Crossings

At each accessible proposed transmission line crossing of a fish-bearing stream, field survey data collection was conducted using the Transmission Line/Stream Crossing Field Condition Assessment Form (Appendix C). To ensure accurate and thorough data collection, crews used this form to gather the specific transmission line crossing information.

Crews used hand-held GPS units containing the crossing locations and right-of-way boundaries. Surveys were conducted within these boundaries. Crossing data for the proposed transmission line were collected on both the stream characteristics and landscape factors that could influence how the transmission line crossing would affect the stream. The assessments characterized streams based on two categories of data: riparian vegetation (e.g., dominant forest cover, tree density, tree height, and successional class) and stream morphology (e.g., incision depth, channel gradient, bankfull width/depth, floodplain width, substrate, grade control). This information was collected in conjunction with the fisheries habitat and presence survey data described in Section 3.2.1.

4.0 RESULTS

This section provides a summary of field survey results organized into fisheries habitat surveys and crossing assessments. Section 4.1 contains the fisheries habitat survey results, including a field-based determination of fish presence and geomorphic and riparian habitat characteristics at fish-bearing Project crossings. Section 4.2 contains the crossing assessment results, including characterization of the existing crossing structures and a summary of stream characteristics used to evaluate the potential for effects to fish-bearing streams at crossing locations. Crossing assessments also provide site-specific information for future crossing considerations to minimize potential risks. Habitat and risk data from streams surveyed but determined not to be fish streams are not discussed in this section but are provided in Appendix D.

A map series showing the location of all fish-bearing road and transmission line crossings, including risk ratings (described in Section 4.2) is included as Appendix E. Field photos showing typical stream conditions for survey sites are contained in Appendix F.

4.1 Fisheries Habitat and Presence Surveys

As noted earlier, a total of 76 fish-bearing streams were identified as present along the Proposed Route and alternatives (Table 2). Crossings along these fish streams totaled 128 (73 road and 55 transmission line crossings; Table 3). Of these 128 crossing sites, 105 occurred along the 2016 Proposed Route and 23 along the Morgan Lake Alternative.

4.1.1 Fish Presence Determination

Streams designated as fish bearing by ODFW or IDFG were assumed to have fish use and were not evaluated for fish presence during field surveys. Fish presence in the other streams identified as potentially fish bearing in the desktop assessment or during field surveys was evaluated primarily on habitat conditions at or near the crossing (Table 3). Fish sampling was conducted during 2014 at only one road crossing site on Benson Creek (R-68790, in Baker County, Oregon) using a Smith Root backpack electrofisher. Concurrence was obtained for this fish presence sampling from the local ODFW biologist, Nigel Seidel, who was present during the electrofishing survey. Sampling was conducted over the entire extent of the reach (about 400 feet) of Benson Creek. While no fish were captured during electrofishing, a fish may have been observed that was not captured. The final determination considered the site a fish-bearing stream based on habitat (e.g., low gradient) and proximity to known downstream fish use (Snake River), with no known fish passage barriers. Fish presence was adequately determined for all stream crossings in 2016 without fish sampling.

Table 2. Fish Use Designation by Project Area Streams Crossed by Roads or Transmission Lines

6th Level (HUC 12)			Pre-field Fish Use Designation				Post-field Fish Use
Watershed Name	Watershed Number	Stream Name[1]	Source[2]	Anadromous Species	Resident Species[3]	Fish Use	Fish Use
Lower Reynolds Creek	170501030604	Reynolds Creek	IDFG	–	Redband Trout	Resident	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	IDFG	–	Redband Trout	Resident	Resident
Lower Squaw Creek	170501030703	Squaw Creek	IDFG	–	Redband Trout	Resident	Resident
Middle Jump Creek	170501031002	Poison Creek	IDFG	–	Redband Trout	Resident	Resident
Middle Jump Creek	170501031002	Jump Creek	Tetra Tech	–	Unknown	Non-Fish	Resident
Rock Spring Canyon-Owyhee River	170501100704	Owyhee River	ODFW	–	Redband Trout	Resident	Resident
Vine Hill-Malheur River	170501170403	Malheur River	ODFW	–	Redband Trout	Resident	Resident
Washington Creek-Bully Creek	170501180302	Bully Creek	ODFW	–	Redband Trout	Resident	Resident
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	ODFW	–	Redband Trout	Resident	Resident
Willow Creek	170501190603	Willow Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Lower Birch Creek	170502010204	Birch Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Benson Creek	170502010205	Benson Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Powell Creek-Burnt River	170502020603	Burnt River	ODFW	–	Redband Trout	Resident	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	ODFW	–	Redband Trout	Resident	Resident
Powell Creek-Burnt River	170502020603	Unnamed Stream [1174989445634] (previously True Blue Gulch)	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Lower Alder Creek	170502020703	Alder Creek	ODFW	–	Redband Trout	Resident	Resident
Lower Alder Creek	170502020703	Hill Creek	ODFW	–	Redband Trout	Resident	Resident
Lower Alder Creek	170502020703	Low Creek	Tetra Tech	–	Unknown	Resident	Non-Fish
Lower Alder Creek	170502020703	Straw Ranch Creek	Tetra Tech	–	Unknown	Resident	Non-Fish
Shirttail Creek-Burnt River	170502020803	Burnt River	ODFW	–	Redband Trout	Resident	Resident
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	Tetra Tech	–	Unknown	Resident	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Shirttail Creek-Burnt River	170502020803	Ray Creek	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Dixie Creek	170502020807	Dixie Creek	ODFW	–	Redband Trout	Resident	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Durbin Creek-Burnt River	170502020809	Durbin Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	Tetra Tech	–	Unknown	Resident	Non-Fish
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	Tetra Tech	–	Unknown	Resident	Resident
Gentry Creek-Powder River	170502030408	Gentry Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Jimmy Creek	170502030603	Clover Creek	Tetra Tech	–	Redband Trout	Resident	Resident

Table 2. Fish Use Designation by Project Area Streams Crossed by Roads or Transmission Lines (continued)

6th Level (HUC 12)			Pre-field Fish Use Designation				Post-field Fish Use
Watershed Name	Watershed Number	Stream Name[1]	Source[2]	Anadromous Species	Resident Species[3]	Fish Use	Fish Use
Jimmy Creek	170502030603	Jimmy Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Thief Valley Reservoir-Powder River	170502030605	Powder River	ODFW	–	Redband Trout	Resident	Resident
Rock Creek	170601040306	Graves Creek	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Rock Creek	170601040306	Rock Creek	ODFW, StreamNet, Umatilla Tribe[4]	Spring Chinook, Summer Steelhead	Redband Trout	Anadromous	Anadromous
Rock Creek	170601040306	Sheep Creek	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Rock Creek	170601040306	Little Graves Creek	Tetra Tech	–	Redband Trout	Resident	Resident
Rock Creek	170601040306	Little Rock Creek	Tetra Tech	–	Unknown	Resident	Resident
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	ODFW, StreamNet	Spring Chinook, Summer Steelhead	Redband Trout, Bull Trout	Anadromous	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Pelican Creek	170601040402	Dry Creek	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	ODFW	–	Redband Trout	Resident	Resident
Upper Ladd Creek	170601040601	Unnamed stream	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream [1180502451927]	Tetra Tech	–	Redband Trout	Resident	Resident
Upper Ladd Creek	170601040601	Unnamed stream [1180301452110]	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream [1180496451929]	ODFW	–	Redband Trout	Resident	Resident
East Fork Ladd Creek	170601040602	Unnamed stream [1180138451966]	Tetra Tech	–	Unknown	Resident	Non-Fish
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	Tetra Tech	–	Unknown	Non-Fish	Resident
East Fork Ladd Creek	170601040602	Unnamed stream [1180049451917]	Tetra Tech	–	Unknown	Non-Fish	Resident
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	ODFW, StreamNet, BLM	Summer Steelhead	Redband Trout	Anadromous	Anadromous

Table 2. Fish Use Designation by Project Area Streams Crossed by Roads or Transmission Lines (continued)

6th Level (HUC 12)			Pre-field Fish Use Designation				Post-field Fish Use
Watershed Name	Watershed Number	Stream Name[1]	Source[2]	Anadromous Species	Resident Species[3]	Fish Use	Fish Use
Beaver Creek-Meacham Creek	170701030201	Little Beaver Creek	ODFW, BLM	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Beaver Creek-Meacham Creek	170701030201	Unnamed stream	Tetra Tech	–	Unknown	Resident	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184156454783]	Tetra Tech	–	Unknown	Resident	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184504454902]	Tetra Tech	–	Unknown	Anadromous	Anadromous
Wood Hollow-McKay Creek	170701030403	Little Rail Creek	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Wood Hollow-McKay Creek	170701030403	McKay Creek	ODFW	–	Redband Trout	Resident	Resident
Wood Hollow-McKay Creek	170701030403	Rail Creek	ODFW	–	Redband Trout	Resident	Resident
Wood Hollow-McKay Creek	170701030403	Unnamed Stream [1185935454536] (previously Wood Hollow)	ODFW	–	Redband Trout	Resident	Resident
Sevenmile Creek-McKay Creek	170701030406	McKay Creek	ODFW	–	Redband Trout	Resident	Resident
Stewart Creek-Birch Creek	170701030608	Ray Creek	Tetra Tech	–	Unknown	Resident	Resident
Slusher Canyon-Butter Creek	170701030906	Unnamed stream [1192143455270]	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Middle Little Butter Creek	170701031002	Little Butter Creek	ODFW	–	Redband Trout	Resident	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	ODFW	–	Redband Trout	Resident	Resident
Hog Hollow-Butter Creek	170701030904	Butter Creek	ODFW	–	Redband Trout	Resident	Resident
Bear Creek-West Birch Creek	170701030604	Bear Creek	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous
West Birch Creek	170701030606	West Birch Creek	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Lower East Birch Creek	170701030603	Unnamed Stream [1188272454537] (previously Spring Hollow)	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Lower East Birch Creek	170701030603	East Birch Creek	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Lower East Birch Creek	170701030603	California Gulch	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Whiskey Creek	170601040305	Whiskey Creek	ODFW, StreamNet	Summer Steelhead	Redband Trout	Anadromous	Anadromous

Table 2. Fish Use Designation by Project Area Streams Crossed by Roads or Transmission Lines (continued)

6th Level (HUC 12)			Pre-field Fish Use Designation				Post-field Fish Use
Watershed Name	Watershed Number	Stream Name[1]	Source[2]	Anadromous Species	Resident Species[3]	Fish Use	Fish Use
Gekeler Slough	170601040603	Deal Creek	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Gekeler Slough	170601040603	Mill Creek	ODFW	Summer Steelhead	Redband Trout	Anadromous	Anadromous
Lower Ladd Creek	170601040604	Ladd Creek Pickup Ditch	StreamNet	Summer Steelhead	Unknown	Anadromous	Anadromous
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	Tetra Tech	–	Unknown	Non-Fish	Non-Fish
Swayze Creek-Burnt River	170502020802	Burnt River	ODFW	–	Redband Trout	Resident	Resident

[1] Some streams originally included in the 2014 survey were not crossed in any of the routes in 2016.

[2] BLM: Bureau of Land Management - Review of Tetra Tech Fish Distribution; IDFG: Idaho Department of Fish & Game - Review of Tetra Tech Fish Distribution; ODF: Oregon Department of Forestry - Fish Distribution; ODFW: Oregon Department of Fish & Wildlife - Redband Trout Fish Distribution; StreamNet: Hydrographic Base Layer (MSHv3) and Fish Distribution for Chinook, Coho, Steelhead, and Bull Trout; Tetra Tech: Pre-field desktop determination

[3] ODFW indicator species is redband trout.

[4] Personal communication with the Umatilla Tribe concerning spring Chinook salmon presence in Rock Creek

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Table 3. Road and Transmission Line Crossing Locations by Stream Survey Sites and Fish Use

6th Level (HUC 12)										
Watershed Name	Watershed Number	Stream Name	Ownership	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Alternative	Crossing Type	Field Survey Location[3]	Evaluation Year[4]	Final Fish Use Determination
Middle Little Butter Creek	170701031002	Little Butter Creek	Private	T-08977	27.7	Proposed Route	T-Line	At Crossing	2016	Resident
Middle Little Butter Creek	170701031002	Little Butter Creek	Private	R-08883	27.8	Proposed Route	Road	At Crossing	2016	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	Private	R-08916	27.9	Proposed Route	Road	At Crossing	2016	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	Private	T-09139	28.1	Proposed Route	T-Line	At Crossing	2016	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	Private	R-11312	34.2	Proposed Route	Road	At Crossing	2016	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	Private	T-11354	34.2	Proposed Route	T-Line	Downstream (280 ft)	2016	Resident
Slusher Canyon-Butter Creek	170701030906	Unnamed stream [1192143455270]	Private	R-13058	36.9	Proposed Route	Road	At Crossing	2016	Non-Fish
Hog Hollow-Butter Creek	170701030904	Butter Creek	Private	R-17426	49.9	Proposed Route	Road	At Crossing	2016	Resident
Hog Hollow-Butter Creek	170701030904	Butter Creek	Private	T-17405	50.1	Proposed Route	T-Line	R-17426	2016	Resident
Bear Creek-West Birch Creek	170701030604	Bear Creek	Private	T-19947	58.6	Proposed Route	T-Line	At Crossing	2016	Anadromous
West Birch Creek	170701030606	West Birch Creek	Private	R-20404	59.7	Proposed Route	Road	At Crossing	2016	Anadromous
West Birch Creek	170701030606	West Birch Creek	Private	T-20275	59.7	Proposed Route	T-Line	At Crossing	2016	Anadromous
Lower East Birch Creek	170701030603	Unnamed Stream [1188272454537] (previously Spring Hollow)	Private	T-20870	61.7	Proposed Route	T-Line	Not Surveyed	2016	Non-Fish
Lower East Birch Creek	170701030603	East Birch Creek	Private	R-20809	63.2	Proposed Route	Road	Not Surveyed	2016	Anadromous
Lower East Birch Creek	170701030603	California Gulch	Private	R-21694	64.1	Proposed Route	Road	T-21673	2016	Anadromous
Lower East Birch Creek	170701030603	California Gulch	Private	T-21673	64.1	Proposed Route	T-Line	Downstream (0.2 mi)	2016	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	Private	R-21604	64.2	Proposed Route	Road	At Crossing	2016	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	Private	T-21807	64.7	Proposed Route	T-Line	At Crossing	2016	Anadromous
Stewart Creek-Birch Creek	170701030608	Ray Creek	Private	R-20492	65.9	Proposed Route	Road	At Crossing	2016	Resident
Wood Hollow-McKay Creek	170701030403	Unnamed Stream [1185935454536] (previously Wood Hollow)	Private	R-23502	75.5	Proposed Route	Road	Not Surveyed	2016	Resident
Wood Hollow-McKay Creek	170701030403	McKay Creek	Private	R-23514	75.5	Proposed Route	Road	Downstream (0.37 mi)	2016	Resident
Sevenmile Creek-McKay Creek	170701030406	McKay Creek	Private	T-23443	75.6	Proposed Route	T-Line	At Crossing	2016	Resident
Wood Hollow-McKay Creek	170701030403	Little Rail Creek	Private	T-23153	78.4	Proposed Route	T-Line	At Crossing	2014	Non-Fish
Wood Hollow-McKay Creek	170701030403	Rail Creek	Private	T-23539	80.3	Proposed Route	T-Line	At Crossing	2014	Resident
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	Private	R-24303	83.2	Proposed Route	Road	At Crossing	2016	Anadromous
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	Private	R-24242	83.3	Proposed Route	Road	At Crossing	2016	Anadromous
Beaver Creek-Meacham Creek	170701030201	Little Beaver Creek	Private	T-24622	83.4	Proposed Route	T-Line	Not Surveyed	2014	Anadromous
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184504454902]	Private	R-24656	83.8	Proposed Route	Road	Not Surveyed	2016	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	Private	R-24664	84.2	Proposed Route	Road	At Crossing	2016	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	Private	R-24814	84.3	Proposed Route	Road	At Crossing	2016	Anadromous
Beaver Creek-Meacham Creek	170701030201	Unnamed stream	Private	R-25185	84.8	Proposed Route	Road	At Crossing	2014	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	Private	T-25186	84.8	Proposed Route	T-Line	At Crossing	2014	Anadromous
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184156454783]	Private	R-25394	85.2	Proposed Route	Road	At Crossing	2014	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	Private	R-25593	86.1	Proposed Route	Road	At Crossing	2016	Anadromous
Pelican Creek	170601040402	Dry Creek	USFS	T-29279	94.8	Proposed Route	T-Line	At Crossing	2014	Anadromous
Pelican Creek	170601040402	Dry Creek	USFS	R-29313	95.0	Proposed Route	Road	At Crossing	2014/2016	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	Private	R-31086	99.2	Proposed Route	Road	Not Surveyed	2016	Anadromous
Whiskey Creek	170601040305	Whiskey Creek	Private	R-31388	99.5	Morgan Lake Alternative	Road	At Crossing	2016	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	Private	T-31337	99.5	Proposed Route	T-Line	At Crossing	2014/2016	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	Private	R-31352	99.6	Morgan Lake Alternative	Road	At Crossing	2016	Non-Fish
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	Private	T-31377	99.6	Morgan Lake Alternative	T-Line	At Crossing	2014	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	Private	T-31396	99.7	Proposed Route	T-Line	Not Surveyed	2016	Non-Fish
Rock Creek	170601040306	Rock Creek	Private	R-31715	100.8	Proposed Route	Road	At Crossing	2014	Anadromous
Rock Creek	170601040306	Rock Creek	Private	T-31906	101.1	Proposed Route	T-Line	Not Surveyed	2014/2016	Anadromous

Table 3. Road and Transmission Line Crossing Locations by Stream Survey Sites and Fish Use (continued)

6th Level (HUC 12)										
Watershed Name	Watershed Number	Stream Name	Ownership	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Alternative	Crossing Type	Field Survey Location[3]	Evaluation Year[4]	Final Fish Use Determination
Rock Creek	170601040306	Graves Creek	Private	T-32195	101.5	Morgan Lake Alternative	T-Line	At Crossing	2014	Anadromous
Rock Creek	170601040306	Little Graves Creek	Private	R-32785	101.8	Morgan Lake Alternative	Road	At Crossing	2016	Resident
Rock Creek	170601040306	Rock Creek	Private	T-32272	101.8	Morgan Lake Alternative	T-Line	At Crossing	2014	Anadromous
Rock Creek	170601040306	Graves Creek	Private	R-32979	102.4	Morgan Lake Alternative	Road	Not Surveyed	2016	Anadromous
Rock Creek	170601040306	Sheep Creek	Private	T-32519	102.5	Morgan Lake Alternative	T-Line	At Crossing	2014	Anadromous
Rock Creek	170601040306	Little Rock Creek	Private	R-33010	102.9	Morgan Lake Alternative	Road	Not Surveyed	2016	Resident
Rock Creek	170601040306	Rock Creek	Private	R-33011	102.9	Morgan Lake Alternative	Road	R-33147	2016	Anadromous
Rock Creek	170601040306	Rock Creek	Private	R-33033	103.0	Morgan Lake Alternative	Road	R-33147	2016	Anadromous
Rock Creek	170601040306	Rock Creek	Private	R-33147	103.2	Morgan Lake Alternative	Road	At Crossing	2016	Anadromous
Rock Creek	170601040306	Sheep Creek	Private	T-33215	104.2	Morgan Lake Alternative	T-Line	At Crossing	2016	Anadromous
Gekeler Slough	170601040603	Deal Creek	Private	R-33156	104.8	Proposed Route	Road	At Crossing	2016	Non-Fish
Gekeler Slough	170601040603	Deal Creek	Private	T-33164	104.8	Proposed Route	T-Line	At Crossing	2016	Non-Fish
Rock Creek	170601040306	Sheep Creek	Private	R-33628	106.4	Morgan Lake Alternative	Road	At Crossing	2016	Anadromous
Gekeler Slough	170601040603	Mill Creek	Private	T-33812	106.5	Proposed Route	T-Line	At Crossing	2016	Anadromous
Gekeler Slough	170601040603	Mill Creek	Private	R-34099	107.2	Proposed Route	Road	At Crossing	2016	Anadromous
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	Private	R-35660	110.9	Proposed Route	Road	At Crossing	2016	Non-Fish
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	Private	T-35662	110.9	Proposed Route	T-Line	Downstream (100 ft)	2016	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream [1180502451927]	Private	R-36299	112.9	Morgan Lake Alternative	Road	At Crossing	2014	Resident
Upper Ladd Creek	170601040601	Unnamed stream [1180301452110]	Private	R-37018	114.1	Morgan Lake Alternative	Road	At Crossing	2016	Non-Fish
Lower Ladd Creek	170601040604	Ladd Creek Pickup Ditch	Private	T-37045	114.1	Proposed Route	T-Line	At Crossing	2016	Anadromous
Upper Ladd Creek	170601040601	Unnamed stream	Private	R-37117	114.9	Morgan Lake Alternative	Road	At Crossing	2016	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	Private	R-37121	115.0	Morgan Lake Alternative	Road	At Crossing	2016	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	Private	R-37124	115.2	Morgan Lake Alternative	Road	At Crossing	2016	Non-Fish
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	Private	T-37129	115.2	Morgan Lake Alternative	T-Line	At Crossing	2014	Resident
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	Private	R-37179	115.5	Morgan Lake Alternative	Road	At Crossing	2016	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	Private	T-37694	115.8	Proposed Route	T-Line	At Crossing	2016	Resident
Upper Ladd Creek	170601040601	Unnamed stream [1180496451929]	Private	R-37369	115.9	Morgan Lake Alternative	Road	At Crossing	2016	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	Private	R-37969	116.3	Proposed Route	Road	At Crossing	2016	Resident
East Fork Ladd Creek	170601040602	Unnamed stream [1180049451917]	Private	R-38011	116.4	Proposed Route	Road	Downstream (500 ft)	2016	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	Private	R-38059	116.5	Proposed Route	Road	At Crossing	2016	Resident
East Fork Ladd Creek	170601040602	Unnamed stream [1180138451966]	Private	T-38337	117.4	Morgan Lake Alternative	T-Line	At Crossing	2014	Non-Fish
Jimmy Creek	170502030603	Clover Creek	Private	R-41281	124.1	Proposed Route	Road	At Crossing	2016	Resident
Jimmy Creek	170502030603	Clover Creek	Private	T-41492	124.7	Proposed Route	T-Line	At Crossing	2014/2016	Resident
Jimmy Creek	170502030603	Jimmy Creek	Private	T-41615	124.9	Proposed Route	T-Line	At Crossing	2016	Resident
Thief Valley Reservoir-Powder River	170502030605	Powder River	Private	T-42996	128.2	Proposed Route	T-Line	Not Surveyed	2014/2016	Resident
Gentry Creek-Powder River	170502030408	Gentry Creek	Private	R-44271	131.4	Proposed Route	Road	At Crossing	2016	Resident
Lower Alder Creek	170502020703	Straw Ranch Creek	Private	T-56168	164.3	Proposed Route	T-Line	At Crossing	2014	Non-Fish
Lower Alder Creek	170502020703	Alder Creek	Private	R-56681	165.4	Proposed Route	Road	At Crossing	2016	Resident
Lower Alder Creek	170502020703	Low Creek	Private	T-56762	165.6	Proposed Route	T-Line	At Crossing	2014	Non-Fish
Lower Alder Creek	170502020703	Alder Creek	Private	T-56949	166.0	Proposed Route	T-Line	At Crossing	2014	Resident
Lower Alder Creek	170502020703	Hill Creek	Private	R-56890	166.1	Proposed Route	Road	At Crossing	2016	Resident
Powell Creek-Burnt River	170502020603	Burnt River	Private	R-59115	171.3	Proposed Route	Road	Not Surveyed	2016	Resident
Powell Creek-Burnt River	170502020603	Burnt River	BLM	T-58761	171.3	Proposed Route	T-Line	At Crossing	2016	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	Private	R-59645	173.9	Proposed Route	Road	At Crossing	2016	Resident
Powell Creek-Burnt River	170502020603	Unnamed Stream [1174989445634] (previously True Blue Gulch)	Private	R-59743	174.0	Proposed Route	Road	At Crossing	2016	Non-Fish
Swayze Creek-Burnt River	170502020802	Burnt River	Private	R-59830	174.3	Proposed Route	Road	At Crossing	2016	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	Private	T-60285	175.0	Proposed Route	T-Line	Downstream (0.2 mi)	2016	Resident
Shirttail Creek-Burnt River	170502020803	French Creek	Private	T-60872	176.3	Proposed Route	T-Line	Not Surveyed	2016	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	BLM	R-61298	177.5	Proposed Route	Road	Not Surveyed	2016	Non-Fish
Shirttail Creek-Burnt River	170502020803	Burnt River	Private	R-61345	178.0	Proposed Route	Road	At Crossing	2016	Resident

Table 3. Road and Transmission Line Crossing Locations by Stream Survey Sites and Fish Use (continued)

6th Level (HUC 12)										
Watershed Name	Watershed Number	Stream Name	Ownership	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Alternative	Crossing Type	Field Survey Location[3]	Evaluation Year[4]	Final Fish Use Determination
Shirttail Creek-Burnt River	170502020803	Ray Creek	Private	T-61670	178.2	Proposed Route	T-Line	Not Surveyed	2016	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	Private	R-61834	178.7	Proposed Route	Road	At Crossing	2016	Resident
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	Private	R-61864	178.7	Proposed Route	Road	At Crossing	2016	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	Private	R-61839	178.8	Proposed Route	Road	At Crossing	2016	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	Private	T-61953	178.8	Proposed Route	T-Line	At Crossing	2016	Non-Fish
Dixie Creek	170502020807	Dixie Creek	Private	R-64752	185.2	Proposed Route	Road	At Crossing	2016	Resident
Dixie Creek	170502020807	Dixie Creek	Private	T-64755	185.4	Proposed Route	T-Line	At Crossing	2016	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	Private	T-65793	188.3	Proposed Route	T-Line	At Crossing	2016	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	Private	R-65725	188.4	Proposed Route	Road	At Crossing	2016	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	Private	R-66818	190.7	Proposed Route	Road	At Crossing	2016	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	Private	T-66832	190.7	Proposed Route	T-Line	At Crossing	2016	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	Private	R-66868	190.8	Proposed Route	Road	At Crossing	2014	Resident
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	BLM	R-67099	191.2	Proposed Route	Road	At Crossing	2016	Non-Fish
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	Private	T-67058	191.3	Proposed Route	T-Line	At Crossing	2016	Non-Fish
Durbin Creek-Burnt River	170502020809	Durbin Creek	BLM	R-67679	192.8	Proposed Route	Road	Not Surveyed	2016	Resident
Durbin Creek-Burnt River	170502020809	Durbin Creek	BLM	T-67673	192.8	Proposed Route	T-Line	At Crossing	2014	Resident
Benson Creek	170502010205	Benson Creek	Private	R-68790	195.4	Proposed Route	Road	At Crossing	2014	Resident
Benson Creek	170502010205	Benson Creek	Private	R-69626	197.4	Proposed Route	Road	At Crossing	2016	Resident
Lower Birch Creek	170502010204	Birch Creek	Private	T-70402	199.1	Proposed Route [5]	T-Line	At Crossing	2014	Resident
Willow Creek	170501190603	Willow Creek	Private	T-74072	215.7	Proposed Route	T-Line	Road (390 ft East of Crossing)	2014	Resident
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	Private	R-72465	226.8	Proposed Route	Road	Road (120 ft North of T-72430)	2014	Resident
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	Private	T-72430	226.8	Proposed Route	T-Line	Road (120 ft North of Crossing)	2014	Resident
Washington Creek-Bully Creek	170501180302	Bully Creek	Private	T-72925	228.4	Proposed Route	T-Line	Not Surveyed	2014	Resident
Vine Hill-Malheur River	170501170403	Malheur River	Private	T-74342	231.9	Proposed Route	T-Line	At Crossing	2014	Resident
Rock Spring Canyon-Owyhee River	170501100704	Owyhee River	Private	T-83708	255.2	Proposed Route	T-Line	Road (300 ft Northwest of Crossing)	2014/2016	Resident
Middle Jump Creek	170501031002	Poison Creek	Private	R-92529	275.8	Proposed Route	Road	At Crossing	2016	Resident
Middle Jump Creek	170501031002	Poison Creek	BLM	T-92627	276.2	Proposed Route	T-Line	At Crossing	2014	Resident
Middle Jump Creek	170501031002	Jump Creek	Private	R-92884	277.8	Proposed Route	Road	At Crossing	2016	Resident
Middle Jump Creek	170501031002	Jump Creek	Private	R-93078	277.9	Proposed Route	Road	At Crossing	2014/2016	Resident
Lower Squaw Creek	170501030703	Squaw Creek	Private	R-95383	283.3	Proposed Route	Road	At Crossing	2014/2016	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	BLM	R-97770	288.9	Proposed Route	Road	At Crossing	2014	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	BLM	T-97950	289.2	Proposed Route	T-Line	At Crossing	2014	Resident
Lower Reynolds Creek	170501030604	Reynolds Creek	Private	T-99884	294.0	Proposed Route	T-Line	Downstream (0.5 mi)	2014	Resident
Lower Reynolds Creek	170501030604	Reynolds Creek	Private	R-99900	294.1	Proposed Route	Road	Not Surveyed	2016	Resident

[1] Crossing numbers used in 2016; those starting with “R” are roads crossings, those starting with “T” are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed route location.
[3] Location where specific crossing information was collected. Stream habitat data may have been collected at this site or another representative location.
[4] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
[5] Existing 138-kV rebuild transmission line crossing of Birch Creek also at this site (within 400 feet).
BLM – U.S. Department of the Interior, Bureau of Land Management
USFS – U.S. Department of Agriculture, Forest Service
HUC – Hydrologic Unit Code

Based on the field survey data, of the 128 crossings, 101 (58 road and 43 transmission line crossings) were determined be on fish-bearing streams (Table 4). Of the road and transmission line crossings surveyed, 36 currently contain anadromous fish species, 65 contain resident fish species only, and 27 are non-fish-bearing streams. A total of 20 road crossings were on streams with anadromous fish present, 38 on streams with resident fish only, and 15 on non-fish-bearing streams. Almost 80 percent (46 of 58) of the road crossings of fish-bearing streams would likely have no additional road modifications at the crossing (Table 4), although final determination of modifications will be done as part of the final design of the Project. Sixteen transmission line crossings were identified on streams with anadromous fish present, 27 on streams with resident fish only, and 12 on non-fish-bearing streams (Tables 3 and 4). The locations of the road and transmission line crossings on fish-bearing streams are shown in the maps in Appendix E. Data from survey streams determined to be non-fish bearing are provided in Appendix D.

Table 4. Number of Stream Crossings by Type and Fish Use

Stream Type	Road Crossings by Expected Improvement Level					Transmission Line Crossings	Grand Total
	Existing, 21-70% Improved	Existing, 71-100% Improved	Existing, No Substantial Improvements	New, Bladed[1]	Total		
Anadromous	2	1	17	0	**20**	16	**36**
Resident	5	2	29	2	**38**	27	**65**
Total	**7**	**3**	**46**	**2**	**58**	**43**	**101**

[1] Existing roads are present at these two crossings

Of anadromous species, summer steelhead (*O. mykiss*) were noted in 14 streams (Table 2). Spring Chinook salmon (*O. tshawytscha*) were documented as present in the Grande Ronde River and Rock Creek. It is assumed that five crossings on tributaries to Meacham Creek (Umatilla County, Oregon) may have anadromous Pacific lamprey (*Lampetra tridentata*) as they are known to be in this stream system (not designated in the table). Other than redband trout, the only database-identified resident species is bull trout (*Salvelinus confluentus*), which is present in the Grande Ronde River along the Project route. Bull trout are present in some stream drainages, but not at or near any of the crossing locations.

Many of the resident fish streams crossed by the Project historically contained anadromous stocks. These stocks are not currently present in these streams due to either impassible dams downstream of the crossings or from flow modifications or blockages through other land use actions (such as water diversion for irrigation). The historical distribution relative to Project crossings include the main channels and tributaries in several of the drainages crossed, including Willow Creek, McKay Creek, Butter Creek, Burnt River, Powder River, Malheur River, and Owyhee River.

4.1.2 Fish Habitat Characteristics

Many of the fish-bearing streams surveyed were small, low-gradient streams with limited or no stream-side vegetation (Tables 5 and 6). The central to southern portion of the route was characterized by grass and forbs along stream channels. While most stream systems were crossed infrequently, a few like Butter Creek in the north were paralleled by some of the routes and crossed multiple times by roads and the transmission line. Streams along the middle northern portion of the Proposed Route, about 40 miles in length, passing through portions of the Blue Mountains and the area just south of La Grande, differed from those along most of the route, featuring low to moderate gradient streams in mostly conifer forests.

4.1.2.1 Riparian Characteristics

Riparian vegetation size and density were limited at most survey sites (Table 5). Over half of the survey sites were dominated by low vegetation designated in the grass/forbs and shrub/seedling category. In many cases, riparian vegetation consisted of sagebrush and grasses, particularly along the southern portion of the route south of the East Fork of Ladd Creek watershed (south of milepost 116). Field photos showing typical riparian vegetation characteristics for survey sites can be found in Appendix F.

Riparian areas dominated by trees were present in the northern portion of the Proposed Route between mileposts 60 and 115 (Table 5). These areas were primarily conifer forests of fir and pine. The most common forest type, which includes areas with a limited number of trees along the stream banks, was primarily deciduous trees dominated by willow, cottonwood, and hawthorn. The range of tree heights was estimated near the crossing area. In some cases, the height was determined from a few scattered trees within the surveyed area, especially where density was noted as low. In the areas dominated by low density deciduous forests, tree heights were generally 50 feet or less. Survey sites in medium density coniferous riparian areas often had trees over 60 feet tall.

Stream shade, which was based on densiometer readings, was highly varied as many site-specific factors affect shade at the stream surface. For example, small streams may be fully shaded at the water surface from tall grass, whereas a large stream with moderate riparian forest may have large open areas not being shaded by trees. On average, conifer-dominated riparian areas had greater percent shade than did deciduous forests, and both, on average, had more non-forested riparian areas along the route.

4.1.2.2 Geomorphic Characteristics

Geomorphic characteristics of survey streams were highly varied. Stream size ranged from very small (4-foot bankfull width) to rivers over 100 feet wide (Table 6). As would be expected for fish-bearing streams, most had relatively low stream gradients at the crossing sites. More than half of the survey sites had gradients of 2 percent or less, with only four sites with a slope over 10 percent (Table 6).

About half of the crossing sites had narrow floodplains less than 35 feet wide, with the narrowest floodplains found on ditches and steeper streams. About 20 percent of the measured crossing sites had floodplains over 150 feet wide. The widest floodplain widths recorded were typically large flat valleys with adjacent farm fields such as those found along the Burnt River, Clover Creek, and East Birch Creek. See Appendix F for field photos showing typical geomorphic characteristics for survey sites.

The dominant stream substrate at Project crossings was evenly represented by cobble, gravel, and sand. The portion of fines in riffles was moderately high with about half of the streams surveyed having an estimated 20 percent or higher. The number of pools ranged from zero to 370 per mile, with about half the crossing sites having 53 pools per mile or more.

Some amount of bank instability was common along most streams, as indicated by eroding banks at or near the crossing. For most crossing sites, bank instability was relatively low, with about three-fourths of all sites having instability of 30 percent or less. A few crossing sites had a very high portion of eroding banks, which is an indicator of channel instability, particularly in incised channels, and often associated with the presence of livestock.

Table 5. Riparian Habitat Conditions of Fish-bearing Streams by Crossing Location

6th Level (HUC 12)												
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year[3]	Dominant Successional Class	Forested Type	Tree Height (ft)	Tree Density	Shade (%)	Fish Type
Middle Little Butter Creek	170701031002	Little Butter Creek	T-08977	27.7	T-Line	2016	Grass/Forb	Non-forested	6	DNA	100	Resident
Middle Little Butter Creek	170701031002	Little Butter Creek	R-08883	27.8	Road	2016	Grass/Forb	Non-forested	6	DNA	100	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-08916	27.9	Road	2016	Grass/Forb	Non-forested	10	DNA	21	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	T-09139	28.1	T-Line	2016	Grass/Forb	Non-forested	10	Low	21	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-11312	34.2	Road	2016	Grass/Forb	Non-forested	4	DNA	46	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	T-11354	34.2	T-Line	2016	Grass/Forb	Non-forested	4	DNA	46	Resident
Hog Hollow-Butter Creek	170701030904	Butter Creek	R-17426	49.9	Road	2016	Grass/Forb	Non-forested	5	DNA	NS	Resident
Hog Hollow-Butter Creek	170701030904	Butter Creek	T-17405	50.1	T-Line	2016	NS	NS	2	NS	NS	Resident
Bear Creek-West Birch Creek	170701030604	Bear Creek	T-19947	58.6	T-Line	2016	Grass/Forb	Deciduous	30	Low	27	Anadromous
West Birch Creek	170701030606	West Birch Creek	R-20404	59.7	Road	2016	Small Tree	Deciduous	30	Low	24	Anadromous
West Birch Creek	170701030606	West Birch Creek	T-20275	59.7	T-Line	2016	Small Tree	Deciduous	30	Medium	24	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	R-20809	63.2	Road [4]	2016	NS	NS	NS	NS	NS	Anadromous
Lower East Birch Creek	170701030603	California Gulch	R-21694	64.1	Road	2016	Small Tree	Deciduous	60	Low	100	Anadromous
Lower East Birch Creek	170701030603	California Gulch	T-21673	64.1	T-Line	2016	Small Tree	Deciduous	60	Medium	100	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	R-21604	64.2	Road	2016	Small Tree	Deciduous	50	Low	87	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	T-21807	64.7	T-Line	2016	Small Tree	Deciduous	50	Medium	87	Anadromous
Stewart Creek-Birch Creek	170701030608	Ray Creek	R-20492	65.9	Road	2016	NS	NS	NS	NS	NS	Resident
Wood Hollow-McKay Creek	170701030403	Unnamed Stream [1185935454536] (previously Wood Hollow)	R-23502	75.5	Road	2016	NS	NS	NS	NS	NS	Resident
Wood Hollow-McKay Creek	170701030403	McKay Creek	R-23514	75.5	Road	2016	NS	NS	NS	NS	NS	Resident
Sevenmile Creek-McKay Creek	170701030406	McKay Creek	T-23443	75.6	T-Line	2016	Small Tree	Deciduous	50	Medium	31	Resident
Wood Hollow-McKay Creek	170701030403	Rail Creek	T-23539	80.3	T-Line	2014	Small Tree	Conifer	60-90	Medium	93	Resident
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24303	83.2	Road	2016	Small Tree	Conifer	100	Medium	100	Anadromous
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24242	83.3	Road	2016	NS	NS	NS	NS	NS	Anadromous
Beaver Creek-Meacham Creek	170701030201	Little Beaver Creek	T-24622	83.4	T-Line	2014	NS	NS	NS	NS	NS	Anadromous
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184504454902]	R-24656	83.8	Road	2016	NS	NS	NS	NS	NS	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24664	84.2	Road	2016	Small Tree	Conifer	65	Medium	40	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24814	84.3	Road	2016	NS	NS	NS	NS	NS	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	T-25186	84.8	T-Line	2014	Small Tree	Conifer	50-100	High	95	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-25593	86.1	Road	2016	Small Tree	Conifer	80	Medium	97	Anadromous
Pelican Creek	170601040402	Dry Creek	T-29279	94.8	T-Line	2014	Small Tree	Conifer	10-100	Low	98	Anadromous
Pelican Creek	170601040402	Dry Creek	R-29313	95.0	Road [4]	2014/2016	NS	NS	NS	NS	NS	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	R-31086	99.2	Road [4]	2016	NS	NS	NS	NS	NS	Anadromous
Whiskey Creek	170601040305	Whiskey Creek	R-31388	99.5	Road	2016	NS	NS	NS	NS	NS	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	T-31337	99.5	T-Line	2014/2016	NR	Mixed	80	Medium	NR	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	T-31377	99.6	T-Line	2014	Small Tree	Conifer	15-110	Medium	NR	Anadromous
Rock Creek	170601040306	Rock Creek	R-31715	100.8	Road	2014	Grass/ Forb	Conifer	12-15	NR	33	Anadromous
Rock Creek	170601040306	Rock Creek	T-31906	101.1	T-Line	2014/2016	NS	NS	NS	NS	NS	Anadromous
Rock Creek	170601040306	Graves Creek	T-32195	101.5	T-Line	2014	Large Tree	Mixed	55-90	Medium	67	Anadromous
Rock Creek	170601040306	Little Graves Creek	R-32785	101.8	Road	2016	Small Tree	Conifer	80	Low	NS	Resident
Rock Creek	170601040306	Rock Creek	T-32272	101.8	T-Line	2014	Grass/ Forb	Mixed	12-90	Medium	9	Anadromous
Rock Creek	170601040306	Graves Creek	R-32979	102.4	Road	2016	NS	NS	NS	NS	NS	Anadromous
Rock Creek	170601040306	Sheep Creek	T-32519	102.5	T-Line	2014	Small Tree	Conifer	90-130	Medium	46	Anadromous
Rock Creek	170601040306	Little Rock Creek	R-33010	102.9	Road	2016	NS	NS	NS	NS	NS	Resident
Rock Creek	170601040306	Rock Creek	R-33011	102.9	Road	2016	NS	NS	NS	NS	NS	Anadromous
Rock Creek	170601040306	Rock Creek	R-33033	103.0	Road	2016	NS	NS	NS	NS	NS	Anadromous
Rock Creek	170601040306	Rock Creek	R-33147	103.2	Road	2016	Small Tree	Conifer	70	Low	19	Anadromous
Rock Creek	170601040306	Sheep Creek	T-33215	104.2	T-Line	2016	NR	Mixed	25	Medium	NR	Anadromous
Rock Creek	170601040306	Sheep Creek	R-33628	106.4	Road	2016	Large Tree	Deciduous	50	Low	84	Anadromous
Gekeler Slough	170601040603	Mill Creek	T-33812	106.5	T-Line	2016	Small Tree	Conifer	35	Medium	95	Anadromous

Table 5. Riparian Habitat Conditions of Fish-bearing Streams by Crossing Location (continued)

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year [3]	Dominant Successional Class	Forested Type	Tree Height (ft)	Tree Density	Shade (%)	Fish Type
Watershed Name	Watershed Number											
Gekeler Slough	170601040603	Mill Creek	R-34099	107.2	Road	2016	NS	NS	NS	NS	NS	Anadromous
Upper Ladd Creek	170601040601	Unnamed stream [1180502451927]	R-36299	112.9	Road	2014	Small Tree	Conifer	6-30	DNA	90	Resident
Lower Ladd Creek	170601040604	Ladd Creek Pickup Ditch	T-37045	114.1	T-Line	2016	Large Tree	Conifer	30	Medium	54	Anadromous
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	T-37129	115.2	T-Line	2014	Small Tree	Mixed	4-80	Medium	76	Resident
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	R-37179	115.5	Road	2016	NS	NS	NS	NS	NS	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	T-37694	115.8	T-Line	2016	Grass/Forb	Non-forested	DNA	DNA	66	Resident
Upper Ladd Creek	170601040601	Unnamed stream [1180496451929]	R-37369	115.9	Road	2016	NS	NS	NS	NS	NS	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-37969	116.3	Road	2016	Sapling/Pole	Deciduous	35	Low	54	Resident
East Fork Ladd Creek	170601040602	Unnamed stream [1180049451917]	R-38011	116.4	Road	2016	Grass/Forb	Deciduous	1	DNA	DNA	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-38059	116.5	Road	2016	NS	NS	NS	NS	NS	Resident
Jimmy Creek	170502030603	Clover Creek	R-41281	124.1	Road	2016	Grass/Forb	Non-forested	3	DNA	0	Resident
Jimmy Creek	170502030603	Clover Creek	T-41492	124.7	T-Line	2014/2016	NS	Deciduous	12	Low	NS	Resident
Jimmy Creek	170502030603	Jimmy Creek	T-41615	124.9	T-Line	2016	Grass/Forb	Non-forested	4	DNA	8	Resident
Thief Valley Reservoir-Powder River	170502030605	Powder River	T-42996	128.2	T-Line	2014/2016	NS	NS	NS	NS	NS	Resident
Gentry Creek-Powder River	170502030408	Gentry Creek	R-44271	131.4	Road	2016	Grass/Forb	Non-forested	3	DNA	NS	Resident
Lower Alder Creek	170502020703	Alder Creek	R-56681	165.4	Road	2016	Grass/Forb	Non-forested	15	DNA	68	Resident
Lower Alder Creek	170502020703	Alder Creek	T-56949	166.0	T-Line	2014	Grass/ Forb	Deciduous	15	Low	59	Resident
Lower Alder Creek	170502020703	Hill Creek	R-56890	166.1	Road	2016	Grass/Forb	Non-forested	10	DNA	51	Resident
Powell Creek-Burnt River	170502020603	Burnt River	R-59115	171.3	Road	2016	NS	NS	NS	NS	NS	Resident
Powell Creek-Burnt River	170502020603	Burnt River	T-58761	171.3	T-Line	2016	Shrub/Seedling	Deciduous	30	Low	43	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	R-59645	173.9	Road	2016	NS	NS	NS	NS	NS	Resident
Swayze Creek-Burnt River	170502020802	Burnt River	R-59830	174.3	Road	2016	NS	NS	NS	NS	NS	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	T-60285	175.0	T-Line	2016	Small Tree	Mixed Forest	80	Low	77	Resident
Shirttail Creek-Burnt River	170502020803	Burnt River	R-61345	178.0	Road [4]	2016	NS	NS	NS	NS	NS	Resident
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61834	178.7	Road	2016	NS	NS	NS	NS	NS	Resident
Dixie Creek	170502020807	Dixie Creek	R-64752	185.2	Road [4]	2016	NS	NS	NS	NS	NS	Resident
Dixie Creek	170502020807	Dixie Creek	T-64755	185.4	T-Line	2016	Sapling/Pole	Deciduous	60	Low	39	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	T-65793	188.3	T-Line	2016	NR	Deciduous	25	Low	NR	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	R-65725	188.4	Road	2016	Grass/Forb	Non-forested	3	DNA	7	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66818	190.7	Road	2016	Grass/Forb	Non-forested	8	DNA	20	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	T-66832	190.7	T-Line	2016	NS	NS	NS	NS	NS	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66868	190.8	Road	2014	Sapling Pole	Deciduous	40	Medium	100	Resident
Durbin Creek-Burnt River	170502020809	Durbin Creek	R-67679	192.8	Road	2016	NS	NS	NS	NS	NS	Resident
Durbin Creek-Burnt River	170502020809	Durbin Creek	T-67673	192.8	T-Line	2014	Sapling/Pole	Deciduous	8-25	Medium	75	Resident
Benson Creek	170502010205	Benson Creek	R-68790	195.4	Road	2014	Grass/ Forb	Non-forested	15	DNA	1	Resident
Benson Creek	170502010205	Benson Creek	R-69626	197.4	Road	2016	NS	NS	NS	NS	NS	Resident
Lower Birch Creek	170502010204	Birch Creek	T-70402	199.1	T-Line	2014	Grass/ Forb	Deciduous	8-35	Low	54	Resident
Willow Creek	170501190603	Willow Creek	T-74072	215.7	T-Line	2014	Grass/ Forb	Non-forested	20-25	Low	NR	Resident
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	R-72465	226.8	Road	2014	Grass/ Forb	Deciduous	3	NS	NR	Resident

Table 5. Riparian Habitat Conditions of Fish-bearing Streams by Crossing Location (continued)

6th Level (HUC 12)												
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year[3]	Dominant Successional Class	Forested Type	Tree Height (ft)	Tree Density	Shade (%)	Fish Type
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	T-72430	226.8	T-Line	2014	Grass/ Forb	Deciduous	3	NS	NR	Resident
Washington Creek-Bully Creek	170501180302	Bully Creek	T-72925	228.4	T-Line	2014	NS	NS	NS	NS	NS	Resident
Vine Hill-Malheur River	170501170403	Malheur River	T-74342	231.9	T-Line	2014	Grass/ Forb	Deciduous	<20	Low	NR	Resident
Rock Spring Canyon-Owyhee River	170501100704	Owyhee River	T-83708	255.2	T-Line	2014/2016	NR	Deciduous	30	Low	NR	Resident
Middle Jump Creek	170501031002	Poison Creek	R-92529	275.8	Road	2016	Shrub/Seedling	Deciduous	NR	Low	NS	Resident
Middle Jump Creek	170501031002	Poison Creek	T-92627	276.2	T-Line	2014	Shrub/Seedling	Deciduous	10-20	High	75	Resident
Middle Jump Creek	170501031002	Jump Creek	R-92884	277.8	Road	2016	NS	NS	NS	NS	NS	Resident
Middle Jump Creek	170501031002	Jump Creek	R-93078	277.9	Road	2014/2016	NS	NS	NS	NS	NS	Resident
Lower Squaw Creek	170501030703	Squaw Creek	R-95383	283.3	Road	2014/2016	NS	NS	NS	NS	NS	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	R-97770	288.9	Road	2014	Grass/ Forb	Non-forested	DNA	DNA	NR	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	T-97950	289.2	T-Line	2014	Grass/ Forb	Non-forested	DNA	DNA	NR	Resident
Lower Reynolds Creek	170501030604	Reynolds Creek	T-99884	294.0	T-Line	2014	Shrub/Seedling	Non-forested	30-40	DNA	NR	Resident
Lower Reynolds Creek	170501030604	Reynolds Creek	R-99900	294.1	Road [4]	2016	NS	NS	NS	NS	NS	Resident

[1] Crossing numbers used in 2016; those starting with "R" are roads crossings, those starting with "T" are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
[4] Major road crossing that would not be changed from Project actions and not needing to be surveyed
Codes : NR – not recorded, DNA – Does not apply, NS – Site not surveyed
HUC – Hydrologic Unit Code

Table 6. Stream Habitat Conditions of Fish Streams by Crossing Location

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year[3]	Floodplain Width (ft)	Bankfull Width (ft)	Flowing Width	Upstream Gradient (%)	Downstream Gradient (%)	Left Bank Channel Instability (%)	Right Bank Channel Instability (%)	Pools/ mile	Substrate (%)	Embed-dedness (%)	Portions of Fines in Fast Water (%)	Fish Use
Watershed Name	Watershed Number																	
Middle Little Butter Creek	170701031002	Little Butter Creek	T-08977	27.7	T-Line	2016	16	11	3	1.6	1	50	60	79	CO(45), SA(35), GR(20)	40	25	Resident
Middle Little Butter Creek	170701031002	Little Butter Creek	R-08883	27.8	Road	2016	NR	11	3	0.5	0.5	50	60	79	CO(45), SA(35), GR(20)	40	25	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-08916	27.9	Road	2016	33	14	8	1	2	20	30	70	SA(60), GR(20), CO(15), BO(5)	65	15	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	T-09139	28.1	T-Line	2016	45	14	8	1	1.2	20	30	70	SA(60), GR(20), CO(15), BO(5)	65	15	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-11312	34.2	Road	2016	25	15	12	<1	<1	20	50	53	CO(40), GR(25), SA(15), BO(10), BR(10)	50	20	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	T-11354	34.2	T-Line	2016	20	15	12	0.5	0.5	20	50	53	CO(40), GR(25), SA(15), BO(10), BR(10)	50	20	Resident
Hog Hollow-Butter Creek	170701030904	Butter Creek	R-17426	49.9	Road	2016	30	20	15	1	1	20	40	106	GR(60), SA(30), CO(10)	20	15	Resident
Hog Hollow-Butter Creek	170701030904	Butter Creek	T-17405	50.1	T-Line	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Resident
Bear Creek-West Birch Creek	170701030604	Bear Creek	T-19947	58.6	T-Line	2016	16	12	0	3	3	40	10	0	GR(60), SA(20), CO(20)	20	15	Anadromous
West Birch Creek	170701030606	West Birch Creek	R-20404	59.7	Road	2016	26	26	10	3	3	10	5	40	CO(50), GR(40), SA(10)	10	10	Anadromous
West Birch Creek	170701030606	West Birch Creek	T-20275	59.7	T-Line	2016	40	26	10	4	4	10	5	40	CO(50), GR(40), SA(10)	10	10	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	R-20809	63.2	Road [4]	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Anadromous
Lower East Birch Creek	170701030603	California Gulch	R-21694	64.1	Road	2016	30	8	5	3	3	25	20	53	GR(50), SA(25), CO(25)	20	20	Anadromous
Lower East Birch Creek	170701030603	California Gulch	T-21673	64.1	T-Line	2016	25	8	5	3	3	25	20	53	GR(50), SA(25), CO(25)	20	20	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	R-21604	64.2	Road	2016	50	24	16	4	2	5	5	53	CO(60), GR(20), SA(10), BO(10)	5	5	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	T-21807	64.7	T-Line	2016	600	24	16	4	2	5	5	53	CO(60), GR(20), SA(10), BO(10)	5	5	Anadromous
Stewart Creek-Birch Creek	170701030608	Ray Creek	R-20492	65.9	Road	2016	17	13	NR	0.5	1	5	5	NR	SA(85), GR(15)	NR	NR	Resident
Wood Hollow-McKay Creek	170701030403	Unnamed Stream [1185935454536] (previously Wood Hollow)	R-23502	75.5	Road	2016	NS	11	NS	4	4	NS	NS	NS	NS	NS	NS	Resident
Wood Hollow-McKay Creek	170701030403	McKay Creek	R-23514	75.5	Road	2016	74	32	NR	1	0.5	60	5	NR	GR(50), CO(45), SA(5)	NR	NR	Resident
Sevenmile Creek-McKay Creek	170701030406	McKay Creek	T-23443	75.6	T-Line	2016	74	63	20	1	0.5	20	10	26	GR(50), CO(45), SA(5)	10	5	Resident
Wood Hollow-McKay Creek	170701030403	Rail Creek	T-23539	80.3	T-Line	2014	45	13	6	10	7	40	5	370	CO(50), BO(10), GR(35), SA(5)	2	5	Resident
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24303	83.2	Road	2016	24	7	3	4	1	25	30	176	CO(50), GR(30), SA(10), BO(10)	10	5	Anadromous
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24242	83.3	Road	2016	50	13	NR	0.5	1	40	40	NR	GR(45), SA(35), CO(20)	NR	NR	Anadromous

Table 6. Stream Habitat Conditions of Fish Streams by Crossing Location (continued)

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year[3]	Floodplain Width (ft)	Bankfull Width (ft)	Flowing Width	Upstream Gradient (%)	Downstream Gradient (%)	Left Bank Channel Instability (%)	Right Bank Channel Instability (%)	Pools/ mile	Substrate (%)	Embed-dedness (%)	Portions of Fines in Fast Water (%)	Fish Use
Watershed Name	Watershed Number																	
Beaver Creek-Meacham Creek	170701030201	Little Beaver Creek	T-24622	83.4	T-Line	2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Anadromous
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184504454902]	R-24656	83.8	Road	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24664	84.2	Road	2016	48	21	9	0.5	1.5	5	10	18	SA(60), GR(25), CO(15)	39	20	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24814	84.3	Road	2016	20	12	NR	1	1	5	10	NR	GR(60), SA(30), CO(10)	NS	NS	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	T-25186	84.8	T-Line	2014	35	10	4	3	2	20	20	233	GR(65), SA(30), CO(5)	15	10	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-25593	86.1	Road	2016	23	10	4	1	0.8	60	45	92	SA(40), GR(50), CO(10)	60	40	Anadromous
Pelican Creek	170601040402	Dry Creek	T-29279	94.8	T-Line	2014	15	11	5	3	3	5	5	315	GR(55), CO(30), SA(10), BO(5)	5	5	Anadromous
Pelican Creek	170601040402	Dry Creek	R-29313	95.0	Road	2014/2016	50	12	NS	3	3	0	0	NS	CO(70), GR(20), SA(5), BO(5)	NS	NS	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	R-31086	99.2	Road 4	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Anadromous
Whiskey Creek	170601040305	Whiskey Creek	R-31388	99.5	Road	2016	20	8	NR	1	NR	NR	NR	NR	GR(70), SA(20), CO(10)	NS	NS	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	T-31337	99.5	T-Line	2014/2016	NR	100	NR	0.5	0.5	20	5	NR	GR(45), CO(45), SA(5), BO(5)	NR	NR	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	T-31377	99.6	T-Line	2014	120	108	84	1	1	0	0	NR	CO(80)	NR	NR	Anadromous
Rock Creek	170601040306	Rock Creek	R-31715	100.8	Road	2014	370	29	16	2	1.5	20	10	22	CO(60), GR(20), SA(10)	30	10	Anadromous
Rock Creek	170601040306	Rock Creek	T-31906	101.1	T-Line	2014/2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Anadromous
Rock Creek	170601040306	Graves Creek	T-32195	101.5	T-Line	2014	33	14	10	2	3.5	10	10	66	CO(40), SB(30), GR(20), SA(5), BR(5)	20	5	Anadromous
Rock Creek	170601040306	Little Graves Creek	R-32785	101.8	Road	2016	12	6	2	0.5	0.5	50	50	NR	SA(100)	0	100	Resident
Rock Creek	170601040306	Rock Creek	T-32272	101.8	T-Line	2014	165	35	28	3	3	5	60	26	CO(45), GR(40) SB(10), SA(10)	5	5	Anadromous
Rock Creek	170601040306	Graves Creek	R-32979	102.4	Road	2016	NS	9	NS	2	1	NS	NS	NS	NS	NS	NS	Anadromous
Rock Creek	170601040306	Sheep Creek	T-32519	102.5	T-Line	2014	58	42	18	4	4	25	50	59	GR(40), CO(40), SB(5), SA(15)	40	20	Anadromous
Rock Creek	170601040306	Little Rock Creek	R-33010	102.9	Road	2016	NS	19	NS	3	2	10	10	NR	CO(40), GR(25), BO(25), SA(10)	NS	NS	Resident
Rock Creek	170601040306	Rock Creek	R-33011	102.9	Road	2016	180	20	NS	2	2	10	10	NR	CO(40), GR(25), BO(25), SA(10)	NS	NS	Anadromous
Rock Creek	170601040306	Rock Creek	R-33033	103.0	Road	2016	180	20	NS	2	2	10	10	NR	CO(40), GR(25), BO(25), SA(10)	NS	NS	Anadromous
Rock Creek	170601040306	Rock Creek	R-33147	103.2	Road	2016	180	20	0	3	2	10	10	0	CO(40), BO(30), GR(20), SA(10)	10	10	Anadromous

Table 6. Stream Habitat Conditions of Fish Streams by Crossing Location (continued)

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year[3]	Floodplain Width (ft)	Bankfull Width (ft)	Flowing Width	Upstream Gradient (%)	Downstream Gradient (%)	Left Bank Channel Instability (%)	Right Bank Channel Instability (%)	Pools/ mile	Substrate (%)	Embed-dedness (%)	Portions of Fines in Fast Water (%)	Fish Use
Watershed Name	Watershed Number																	
Rock Creek	170601040306	Sheep Creek	T-33215	104.2	T-Line	2016	200	7	5	1	0.5	40	30	106	CO(70), GR(20), SA(5), BO(5)	20	20	Anadromous
Rock Creek	170601040306	Sheep Creek	R-33628	106.4	Road	2016	40	8	6	1.5	1	10	10	158	CO(45), SA(40), GR(10), BO(5)	40	30	Anadromous
Gekeler Slough	170601040603	Mill Creek	T-33812	106.5	T-Line	2016	15	9	5	6	5	5	5	307	GR(50), CO(25), SA(20), BO(5)	20	20	Anadromous
Gekeler Slough	170601040603	Mill Creek	R-34099	107.2	Road	2016	7	5	NR	3.5	2	30	10	NR	GR(30), SA(25), CO(25), BO(20)	NS	NS	Anadromous
Upper Ladd Creek	170601040601	Unnamed stream [118050245 1927]	R-36299	112.9	Road	2014	16	8	4	8	9	<5	<5	160	CO(40), GR(30), BO(20), SA(10)	30	30	Resident
Lower Ladd Creek	170601040604	Ladd Creek Pickup Ditch	T-37045	114.1	T-Line	2016	25	16	10	4	5	5	5	106	CO(55), GR(35), SA(15), BO(5)	10	5	Anadromous
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	T-37129	115.2	T-Line	2014	80	20	10	2.5	2.5	30	5	177	CO(60), GR(25), BO(10), Fines(5)	5	5	Resident
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	R-37179	115.5	Road	2016	57	22	NR	3	4	15	25	NR	CO(40), BO(30), GR(20), SA(10)	NS	NS	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [118026645 2136] (previously Ladd Canyon)	T-37694	115.8	T-Line	2016	500	12	6	0.5	0.7	30	60	40	SA(45), GR(35), CO(20)	20	NR	Resident
Upper Ladd Creek	170601040601	Unnamed stream [118049645 1929]	R-37369	115.9	Road	2016	32	10	NR	2	3	10	10	NR	CO(50), GR(30), BO(10), SA(10)	NS	NS	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [118026645 2136] (previously Ladd Canyon)	R-37969	116.3	Road	2016	27	10	5	0.5	0.5	30	40	106	SA(65), CO(20), GR(10), BO(5)	40	50	Resident
East Fork Ladd Creek	170601040602	Unnamed stream [118004945 1917]	R-38011	116.4	Road	2016	6	4	2	NR	0.5	30	30	NR	SA(40), GR(30), CO(30)	20	20	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [118026645 2136] (previously Ladd Canyon)	R-38059	116.5	Road	2016	15	8	NR	2	1	20	5	NR	CO(80), SA(10), GR(10)	NR	NR	Resident
Jimmy Creek	170502030603	Clover Creek	R-41281	124.1	Road	2016	12	8	6	0.5	0.5	50	90	26	SA(100)	100	100	Resident
Jimmy Creek	170502030603	Clover Creek	T-41492	124.7	T-Line	2014/2016	14	8	NR	0.5	0.5	70	60	NR	SA(95), BO(5)	NR	NR	Resident

Table 6. Stream Habitat Conditions of Fish Streams by Crossing Location (continued)

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year[3]	Floodplain Width (ft)	Bankfull Width (ft)	Flowing Width	Upstream Gradient (%)	Downstream Gradient (%)	Left Bank Channel Instability (%)	Right Bank Channel Instability (%)	Pools/ mile	Substrate (%)	Embed-dedness (%)	Portions of Fines in Fast Water (%)	Fish Use
Watershed Name	Watershed Number																	
Jimmy Creek	170502030603	Jimmy Creek	T-41615	124.9	T-Line	2016	14	9	8	0.1	0.1	50	50	18	SA(100)	100	100	Resident
Thief Valley Reservoir-Powder River	170502030605	Powder River	T-42996	128.2	T-Line	2014/2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Resident
Gentry Creek-Powder River	170502030408	Gentry Creek	R-44271	131.4	Road	2016	4	4	0	5	4	20	20	0	SA(90), GR(10)	90	90	Resident
Lower Alder Creek	170502020703	Alder Creek	R-56681	165.4	Road	2016	10	5	4	1	1	30	30	26	SA(80), GR(15), CO(5)	50	80	Resident
Lower Alder Creek	170502020703	Alder Creek	T-56949	166.0	T-Line	2014	33	6	6	2	2	0	0	0	SA	95	95	Resident
Lower Alder Creek	170502020703	Hill Creek	R-56890	166.1	Road	2016	9	6	4	1	2	50	50	211	SA(90), GR(10)	80	80	Resident
Powell Creek-Burnt River	170502020603	Burnt River	R-59115	171.3	Road	2016	NS	20	NS	1	1	NS	NS	NS	NS	NS	NS	Resident
Powell Creek-Burnt River	170502020603	Burnt River	T-58761	171.3	T-Line	2016	200	42	36	3	2.2	5	10	26	BO(45), CO(25), GR(10), SA(15), BR(5)	20	20	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	R-59645	173.9	Road	2016	300	35	NR	3	1	30	30	NR	GR(45), CO(30), SA(25)	NS	NS	Resident
Swayze Creek-Burnt River	170502020802	Burnt River	R-59830	174.3	Road	2016	3,000	81	NR	1.5	1	20	35	NR	SA(40), CO(35), GR(25)	NS	NS	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	T-60285	175.0	T-Line	2016	15	11	5	14	12	10	5	137	CO(40), BO(30), GR(20), SA(10)	15	10	Resident
Shirttail Creek-Burnt River	170502020803	Burnt River	R-61345	178.0	Road [4]	2016	400	57	NR	0.5	0.5	10	30	NR	SA(80), GR(15), BO(5)	NS	NS	Resident
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61834	178.7	Road	2016	82	15	NR	3	17	60	70	NR	SA(70), GR(25), CO(5)	NS	NS	Resident
Dixie Creek	170502020807	Dixie Creek	R-64752	185.2	Road [4]	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Resident
Dixie Creek	170502020807	Dixie Creek	T-64755	185.4	T-Line	2016	35	12	6	2	2	10	20	73	GR(60), CO(25), SA(15)	30	15	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	T-65793	188.3	T-Line	2016	10	7	NR	7	7	0	0	NR	SA(80), GR(20)	NR	NR	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	R-65725	188.4	Road	2016	5	8	2	5	9	0	0	NR	SA(80), GR(20)	80	80	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66818	190.7	Road	2016	10	6	3	4	12	15	30	211	GR(80), SA(15), CO(5)	5	15	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	T-66832	190.7	T-Line	2016	6	5	NR	8	15	15	15	NR	GR(65), SA(30), CO(5)	NR	NR	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66868	190.8	Road	2014	NR	6	3	8	3	0	0	79	GR(70), SA(30)	20	20	Resident
Durbin Creek-Burnt River	170502020809	Durbin Creek	R-67679	192.8	Road 4	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Resident
Durbin Creek-Burnt River	170502020809	Durbin Creek	T-67673	192.8	T-Line	2014	15	8	5	4	4	5	5	161	SA(40), GR(10), CO(40); BO(10)	10	10	Resident
Benson Creek	170502010205	Benson Creek	R-68790	195.4	Road	2014	18	18	17	<1	<1	5	5	11	SA(95), GR(5)	100	100	Resident
Benson Creek	170502010205	Benson Creek	R-69626	197.4	Road	2016	600	51	NS	NS	NS	50	50	NS	NS	NS	NS	Resident
Lower Birch Creek	170502010204	Birch Creek	T-70402	199.1	T-Line	2014	75	16	11	<1	<1	20	10	120	SA(90), CO(5), GR(5)	100	95	Resident
Willow Creek	170501190603	Willow Creek	T-74072	215.7	T-Line	2014	0	15	14	<1	<1	5	5	53	SA(100)	100	100	Resident
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	R-72465	226.8	Road	2014	<20	10	10	1.5	1.5	DNA	25	20	CO (60), GR (30), SA (10)	NR	15	Resident

Table 6. Stream Habitat Conditions of Fish Streams by Crossing Location (continued)

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year[3]	Floodplain Width (ft)	Bankfull Width (ft)	Flowing Width	Upstream Gradient (%)	Downstream Gradient (%)	Left Bank Channel Instability (%)	Right Bank Channel Instability (%)	Pools/ mile	Substrate (%)	Embeddedness (%)	Portions of Fines in fast water (%)	Fish Use
Watershed Name	Watershed Number																	
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	T-72430	226.8	T-Line	2014	20	15	10	NS	NS	10	10	20	CO (60), GR (30), SA (10)		15	Resident
Washington Creek-Bully Creek	170501180302	Bully Creek	T-72925	228.4	T-Line	2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Resident
Vine Hill-Malheur River	170501170403	Malheur River	T-74342	231.9	T-Line	2014	205	200	185	<0.5	<0.5	50	40	0	SA(100)		100	Resident
Rock Spring Canyon-Owyhee River	170501100704	Owyhee River	T-83708	255.2	T-Line	2014/2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Resident
Middle Jump Creek	170501031002	Poison Creek	R-92529	275.8	Road	2016	300	10	4	0.6	0.1	10	5	NS	SA(95), GR(5)	100	90	Resident
Middle Jump Creek	170501031002	Poison Creek	T-92627	276.2	T-Line	2014	30	10	3	3.5	9	33	15	264	GR(45), CO(35), SA(15), BO(5)	30	10	Resident
Middle Jump Creek	170501031002	Jump Creek	R-92884	277.8	Road	2016	300	27	NR	1.5	2	15	20	NR	CO(50), GR(35), SA(15)	NR	NR	Resident
Middle Jump Creek	170501031002	Jump Creek	R-93078	277.9	Road	2014/2016	200	29	NR	0.3	0.7	10	10	NR	SA(70), GR(30),	NR	NR	Resident
Lower Squaw Creek	170501030703	Squaw Creek	R-95383	283.3	Road	2014/2016	700	63	NR	2	1	10	10	NR	SA(50), CO(40), GR(10)	NR	NR	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	R-97770	288.9	Road	2014	9	3	0	2	4	25	50	0	GR(90), CO(5), SA(5)	0	5	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	T-97950	289.2	T-Line	2014	180	7	0	2	2	75	50	0	GR(90), CO(10)	20	NR	Resident
Lower Reynolds Creek	170501030604	Reynolds Creek	T-99884	294.0	T-Line	2014	NS	NR	5	1	1	0	0	NR	GR(60), CO(40)	NR	NR	Resident
Lower Reynolds Creek	170501030604	Reynolds Creek	R-99900	294.1	Road 4	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Resident

[1] Crossing numbers used in 2016; those starting with “R” are roads crossings, those starting with “T” are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
[4] Major road crossing that would not be changed from Project actions and not needing to be surveyed.
Codes : NR – not recorded, DNA – does not apply, NS – site not surveyed
HUC – Hydrologic Unit Code
Substrate Codes: SA – sand/silt/clay, GR – gravel, CO – cobble, BO – boulder, SB – small boulder, BR – bedrock

4.2 Crossing Assessments

Site-specific crossing information was collected to evaluate new crossing construction, modification of crossing structures, or vegetation removal at survey crossing sites. Stream risk and project risk ratings were calculated for each road and transmission line crossing, as described in Section 3.2.2. A summary of the rating of road and transmission line crossing is presented below.

4.2.1 Road Crossings

Road crossing sites covered a range of stream widths, but most of those measured were less than 30 feet, with the greatest width being 81 feet (Table 6). Of the 58 road crossings, all are on existing roads and all but 4 have existing crossing structures (bridge, culvert, or established ford). The crossing structures that are existing or assumed (where field survey staff did not have access) included 27 bridges, 28 culverts, and 3 fords. Crossing characteristics of these road crossing are shown in Table 7, with specific characteristics of each existing crossing type shown in Tables 8, 9, and 10 for bridge, culvert, and ford crossings, respectively.

General road condition was described by considering factors that affect the level of function (e.g., road width, surfacing, existing use, surface erosion). Roads at the survey crossings were generally described to be in fair to excellent condition at most sites (Table 7). About seven of the crossings appeared to be in poor condition. Road material varied at each crossing, with some sites having dirt, others gravel or aggregate, and several with crushed gravel, asphalt, or concrete (i.e., major roads, which are state or well-maintained county roads that would not require crossing modification).

Although an engineering-level determination was not part of the evaluation, the general condition of the 27 existing bridge crossings was described by considering factors that affect the level of function (e.g., bridge materials, age, size, and condition). The bridges were described to be in a range of conditions, with most in “fair” condition or better. Four were known or assumed to be bridges (over Rock Creek and Little Rock Creek) in the past but have been washed out (see Table 8). Bridge spans range from 15 to 100 feet, with most less than 50 feet. Of the bridges for which survey crews had physical access, most (12) included some steel in their structure, while 6 had some concrete and only 1 was an entirely wooden structure.

A total of 27 road crossings with existing or assumed culverts were evaluated. Some of these were not directly surveyed due to access limitations or because they were on major roads (e.g. state or well-maintained county roads that would not require crossing modification and therefore any further survey information). Culvert diameter ranged from 1.7 to 7.5 feet, with most 4.0 feet or less (Table 9). All of the culverts appeared to be functional and none showed signs of damage that would impede water flow or function.

Ford widths were between 8 and 9 feet with moderate to low channel slopes (less than 1 to 4 percent; Table 10). The three fords all have road travel conditions that could be improved by receiving some repair or modification. At a minimum, they could use armoring for heavy vehicles or temporary bridges because substrate at the crossings was generally of finer to medium grain material; during crossing use, sediment is dispersed, potentially impacting local fish habitat. The Fish Passage Plans and Design report (Tetra Tech 2016) addresses potential repair or modifications at these crossings.

A total of 10 of 58 road crossings had a “high” stream or project risk rating (Tables 11 and 12). These crossings were on both resident (six) and anadromous (four) fish-bearing streams. Those crossings with no higher rating than medium risk included 10 anadromous and 22 resident fish-

bearing streams. There were seven crossings of resident fish-bearing streams and four of anadromous fish-bearing streams with a “low-low” rating. Two crossings had a “high-high” risk rating (Table 12). These two crossings are both existing structures: a newly installed culvert on Beaver Creek (labeled R-25593 on Table 12) and an existing ford on Cavanaugh Creek (labeled R-66818). In addition, the 10 crossings with either a “high-medium” or “medium-high” risk rating will likely need additional scrutiny during planning and any construction at these locations to minimize the potential for adverse effects to stream conditions and fish resources. Risk rating by site ownership is shown in Table 13. The risk status of a crossing is considered during the design phase of Project development for stream crossings, as detailed in the Fish Passage Plans and Designs report (Tetra Tech 2016).

Potential fish passage barriers were observed during field surveys at nine of the existing culvert road crossing sites (Table 9). These were primarily related to perching and relative plunge pool depth at the outfall. Some passage issues like those at an unnamed tributary to East Fork Ladd Creek (R-38011) and Hill Creek (R-56890) were related to slope and/or culvert length.

Other than passage barriers at road crossings, no streams surveyed had an observed fish passage barrier, such as falls with inadequate jumping pool or long chute sections with high gradient.

Table 7. Existing and Proposed Road Crossing Characteristics

6th Level (HUC 12)							General Road Characteristics									
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	Road Crossing Type	Road Crossing Type - Explanation	Crossing Considerations	Road Condition[4]	Angle of Crossing (deg)	Road Prism Improvement Needed?	Road Width (ft)	Road Surface Material	Road Failure?	Describe Road Failure
Middle Little Butter Creek	170701031002	Little Butter Creek	R-08883	27.8	2016	Resident	Culvert	Squash pipe	Culvert is under-sized with limited fill covering pipe.	Good, very little fill above culvert	60	No	26	asphalt	No	DNA
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-08916	27.9	2016	Resident	Bridge	Older steel I-beam with center supports	Relatively good condition, not likely to be replaced	Asphalt	90	No	14	asphalt	No	DNA
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-11312	34.2	2016	Resident	Bridge	Existing bridge	Bridge and abutments should be replaced with similar railcar	Some improvement needed	70-90	Yes	11	Gravel and dirt	No	Overgrown with vegetation
Hog Hollow-Butter Creek	170701030904	Butter Creek	R-17426	49.9	2016	Resident	Bridge	Existing bridge	No	Gravel road in good condition	60	No	15	Gravel	No	DNA
West Birch Creek	170701030606	West Birch Creek	R-20404	59.7	2016	Anadromous	Bridge	Steel I-beam; minimal	Needs decking, may need some structural support	Good	80	No	14	Gravel	No	DNA
Lower East Birch Creek	170701030603	East Birch Creek	R-20809	63.2	2016	Anadromous	Bridge[5]	A major road (asphalt road) crossing that would not be changed from Project actions and not needing to be surveyed	No	Excellent	NS	No	NR	Asphalt	No	DNA
Lower East Birch Creek	170701030603	California Gulch	R-21694	64.1	2016	Anadromous	Likely Culvert	Did not have access to survey, but likely bridge or culvert appears to be a culvert based on aerials.	No	Good	70	No	15	Gravel	No	DNA
Lower East Birch Creek	170701030603	East Birch Creek	R-21604	64.2	2016	Anadromous	Bridge	Steel I-beam, minimal	Replanting, possibly some structural modifications	Good	70	No	11	Gravel	No	DNA
Stewart Creek-Birch Creek	170701030608	Ray Creek	R-20492	65.9	2016	Resident	Culvert	CMP	No	Gravel/dirt	30	Yes	14	Dirt and gravel	No	DNA
Wood Hollow-McKay Creek	170701030403	Unnamed Stream [1185935454536] (previously Wood Hollow)	R-23502	75.5	2016	Resident	Likely Culvert	Viewed in aerials only	Looks sound in aerials, likely no change needed. May be a bridge but can't tell so assume culvert as can see no planking.	Moderate in aerials	80	NS	11	Gravel	No	DNA
Wood Hollow-McKay Creek	170701030403	McKay Creek	R-23514	75.5	2016	Resident	Bridge	Appears from aerial to be a good bridge, but unknown as not surveyed due to access.	Utilize existing bridge	Unknown	30	NS	NS	Likely gravel	NS	NS
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24303	83.2	2016	Anadromous	Culvert	CMP	No	Good	70	No	27	Native dirt and crushed gravel	No	DNA
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24242	83.3	2016	Anadromous	Culvert	CMP	No	Good	80	No	24	Dirt and gravel	Yes	Erosion at top of culvert

Table 7. Existing and Proposed Road Crossing Characteristics (continued)

6th Level (HUC 12)							General Road Characteristics									
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	Road Crossing Type	Road Crossing Type - Explanation	Crossing Considerations	Road Condition[4]	Angle of Crossing (deg)	Road Prism Improvement Needed?	Road Width (ft)	Road Surface Material	Road Failure?	Describe Road Failure
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184504454902]	R-24656	83.8	2016	Anadromous	Likely Culvert	Viewed in aerials only	Looks good in aerials as road conditions good but can't see structure.	Good	NS	No	12	Gravel	No	DNA
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24664	84.2	2016	Anadromous	Culvert	CMP	No	Moderate-good	90	NR	15	Native, crushed rock	No	DNA
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24814	84.3	2016	Anadromous	Bridge	Good condition	No	Good	60	No	12	Gravel	No	DNA
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-25593	86.1	2016	Anadromous	Culvert	CMP	No	Good, crushed rock	90	No	20	Crushed rock	No	DNA
Pelican Creek	170601040402	Dry Creek	R-29313	95.0	2014/2016	Anadromous	Bridge	Asphalt-covered concrete bridge	No	Good	60	No	24	Asphalt	No	DNA
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	R-31086	99.2	2016	Anadromous	Bridge [5]	A major road (asphalt road) crossing that would not be changed from Project actions and does not needing to be surveyed	No	Excellent	NS	NS	NS	NS	NS	NS
Whiskey Creek	170601040305	Whiskey Creek	R-31388	99.5	2016	Anadromous	Culvert	Partial barrier culvert	If replaced, realign crossing	Good	40	NR	25	Asphalt	No	DNA
Rock Creek	170601040306	Rock Creek	R-31715	100.8	2014	Anadromous	Bridge	Solid bridge with rail guards	Easterly approach angle (76 degrees) may be difficult for crane	good drivable road	80	Y	13	SA, GR, aggregate	N	US LB rip rap scour
Rock Creek	170601040306	Little Graves Creek	R-32785	101.8	2016	Resident	Bridge	Steel I-beam, wood plank bridge	No	Good	90	No	12	Gravel	No	DNA
Rock Creek	170601040306	Graves Creek	R-32979	102.4	2016	Anadromous	Likely Culvert	Viewed in aerials only	NS	Looks moderate in aerials, farm access	NR	NR	12	Gravel	No	DNA
Rock Creek	170601040306	Little Rock Creek	R-33010	102.9	2016	Resident	Likely Bridge	Likely an old bridge, now gone. Former county road.	Road and crossing need lots of improvement including completely installing a new crossing structure and rebuilding road.	Poor, ATV only.	90	Yes	<10	Dirt	Yes	No maintenance and stream washed out bridge and road. Road indistinct in aerials
Rock Creek	170601040306	Rock Creek	R-33011	102.9	2016	Anadromous	Likely Bridge	Likely an old bridge, now gone. Former county road.	Road and crossing need lots of improvement including completely installing a new crossing structure and totally rebuilding road which has been washed out by stream.	Poor, ATV only.	45	Yes	<10	Dirt	Yes	No maintenance and stream washed out bridge and road. Road indistinct in aerials.

Table 7. Existing and Proposed Road Crossing Characteristics (continued)

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	General Road Characteristics									
Watershed Name	Watershed Number						Road Crossing Type	Road Crossing Type - Explanation	Crossing Considerations	Road Condition[4]	Angle of Crossing (deg)	Road Prism Improvement Needed?	Road Width (ft)	Road Surface Material	Road Failure?	Describe Road Failure
Rock Creek	170601040306	Rock Creek	R-33033	103.0	2016	Anadromous	Likely Bridge	Likely an old bridge, now gone. Former county road.	Road and crossing need lots of improvement including completely installing a new crossing structure and totally rebuilding road which has been washed out by stream.	Poor, ATV only.	45	Yes	<10	Dirt	Yes	No maintenance and stream washed out bridge and road. Road indistinct in aerials.
Rock Creek	170601040306	Rock Creek	R-33147	103.2	2016	Anadromous	Likely Bridge	Was an old bridge, now gone. Former county road.	Road and crossing need lots of improvement including completely installing a new crossing structure and totally rebuilding road which has been washed out by stream.	Poor, ATV only.	90	Yes	<10	Dirt	Yes	No maintenance and stream washed out bridge and road. Road ends at stream.
Rock Creek	170601040306	Sheep Creek	R-33628	106.4	2016	Anadromous	Culvert	CMP	No	Good	90	Yes	12	Gravel	No	DNA
Gekeler Slough	170601040603	Mill Creek	R-34099	107.2	2016	Anadromous	Culvert	Concrete	No	Good	60	No	27	Gravel	No	DNA
Upper Ladd Creek	170601040601	Unnamed stream [1180502451927]	R-36299	112.9	2014	Resident	Bridge	Ecoblock foundation, I-beams (12", 4 total), 8"x8" pressure treated 12"x4" planks	Road used for Timber harvest	fair locally, rough into site	90	NR	10' on bridge, 14-16' around perimeter	gravel	N	NR
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	R-37179	115.5	2016	Resident	Bridge	Gravel covered with railings, metal base	No	Moderate	80	No	18	Dirt/gravel	No	DNA
Upper Ladd Creek	170601040601	Unnamed stream [1180496451929]	R-37369	115.9	2016	Resident	Bridge	Existing steel girder bridge	No	Moderate	90	Yes	NR	Native dirt with some crushed rock	Yes	Some erosion near bridge edge
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-37969	116.3	2016	Resident	Culvert	Twin CMPs	Spring drains down the road from the west side. Angle of road going to the west.	Poor on west side.	40	Yes	11	Native dirt and rock	No	DNA
East Fork Ladd Creek	170601040602	Unnamed stream [1180049451917]	R-38011	116.4	2016	Resident	Culvert	CMP	Goes under 3 roads, all in good condition, including I-84	Good to excellent	90	No	14	Gravel, cement	No	DNA
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-38059	116.5	2016	Resident	Culvert	CMP	Near existing residence	Good	2	No	16	Asphalt	No	DNA
Jimmy Creek	170502030603	Clover Creek	R-41281	124.1	2016	Resident	Culvert	CMP	Likely no change would be needed	Very good	80	No	24	Gravel	No	DNA

Table 7. Existing and Proposed Road Crossing Characteristics (continued)

6th Level (HUC 12)							General Road Characteristics									
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	Road Crossing Type	Road Crossing Type - Explanation	Crossing Considerations	Road Condition[4]	Angle of Crossing (deg)	Road Prism Improvement Needed?	Road Width (ft)	Road Surface Material	Road Failure?	Describe Road Failure
Gentry Creek-Powder River	170502030408	Gentry Creek	R-44271	131.4	2016	Resident	Culvert	CMP	May need to add fill	Good	70	No	11	Gravel	No	DNA
Lower Alder Creek	170502020703	Alder Creek	R-56681	165.4	2016	Resident	Culvert	Relatively new culvert CMP	No	Good	50	No	17	Gravel	No	DNA
Lower Alder Creek	170502020703	Hill Creek	R-56890	166.1	2016	Resident	Culvert	CMP	Minor improvements needed including more fill placed above culvert and improve approaches both sides	Fair to good	90	Yes	11	Native	No	DNA
Powell Creek-Burnt River	170502020603	Burnt River	R-59115	171.3	2016	Resident	Bridge	Viewed in aerials only	Bridge quality unknown	Looks good in aerials, farm access	70	NS	11	Gravel	No	DNA
Powell Creek-Burnt River	170502020603	Powell Creek	R-59645	173.9	2016	Resident	Culvert	CMP	No	Moderate	80	NR	11	Native dirt, crushed gravel	No	DNA
Swayze Creek-Burnt River	170502020802	Burnt River	R-59830	174.3	2016	Resident	Bridge	Concrete bridge	No	Excellent	75	No	30	Asphalt	NS	NS
Shirttail Creek-Burnt River	170502020803	Burnt River	R-61345	178.0	2016	Resident	Bridge	A major road (cement bridge?) crossing	No	Good	70	No	NS	Asphalt	No	DNA
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61834	178.7	2016	Resident	Culvert	Squash pipe	No	Good	70	No	17	Dirt	Yes	Rilling and some erosion around culvert
Dixie Creek	170502020807	Dixie Creek	R-64752	185.2	2016	Resident	Bridge[5]	Good wide major road crossing with railing that would not be changed from Project actions and not needing to be surveyed	No	Good	60	No	26	Gravel	No	DNA
Jett Creek-Burnt River	170502020808	Goodman Creek	R-65725	188.4	2016	Resident	Ford	Unimproved ford	Steep on river left (west) bank. Curvy road.	Fair	85	NR	10	Native soil and rock.	No	DNA
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66818	190.7	2016	Resident	Ford	Existing primitive ford that will require improvements.	Span with temporary bridge	Needs improvement; maybe 20-70%. Blading and clearing necessary.	70	Yes	11	Gravel and sand	Yes	At ford, bottom has eroded
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66868	190.8	2014	Resident	culvert	Buried culvert with substrate 4.3 feet clearance to inside top of culvert	NR	good	NR	N	NR	concrete	NR	Some rills near upstream end of guard rail
Durbin Creek-Burnt River	170502020809	Durbin Creek	R-67679	192.8	2016	Resident	Culvert[5]	A major road (box culvert?) crossing that would not be changed from Project actions and not needing to be surveyed	No	Excellent	60	No	20	Gravel	No	DNA

Table 7. Existing and Proposed Road Crossing Characteristics (continued)

6th Level (HUC 12)							General Road Characteristics									
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	Road Crossing Type	Road Crossing Type - Explanation	Crossing Considerations	Road Condition[4]	Angle of Crossing (deg)	Road Prism Improvement Needed?	Road Width (ft)	Road Surface Material	Road Failure?	Describe Road Failure
Benson Creek	170502010205	Benson Creek	R-68790	195.4	2014	Resident	Ford	Ford needs improvement and approaches	Ford with high cattle use. Stream is of low quality	dirt, decent quality	90-70	N	NR	Dirt	N	NR
Benson Creek	170502010205	Benson Creek	R-69626	197.4	2016	Resident	Bridge	Major highway bridge	No	Good	90	No	27	Asphalt	Yes	Erosion near bridge, especially from Snake River side
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	R-72465	226.8	2014	Resident	Culvert - assumed	Cannot see directly but no clear indication of bridge	Could not access to asses existing structure. Road is dirt track with ample room for widening.	Fair	90	Y	15	compact dirt	N	Level road level at crossing then goes uphill - no failure
Middle Jump Creek	170501031002	Poison Creek	R-92529	275.8	2016	Resident	Culvert	Circular metal pipe	No	Good	80	No	17	Gravel	No	DNA
Middle Jump Creek	170501031002	Jump Creek	R-92884	277.8	2016	Resident	Bridge	Laminated wood bridge	Bridge has 6-ton weight limit	Fair	90	Yes	16	Gravel road with laminate bridge will need replacing	No	DNA
Middle Jump Creek	170501031002	Jump Creek	R-93078	277.9	2014/2016	Resident	Bridge	Steel	No	Good	85	No	18	Gravel	No	DNA
Lower Squaw Creek	170501030703	Squaw Creek	R-95383	283.3	2014/2016	Resident	Bridge	Box culvert/concrete bridge	No	Excellent	90	No	30	Tar and gravel	No	DNA
Hardtrigger Creek	170501030701	Hardtrigger Creek	R-97770	288.9	2014	Resident	Culvert	NR	No	Fair	90	NR	13	Native soil	No	NR
Lower Reynolds Creek	170501030604	Reynolds Creek	R-99900	294.1	2016	Resident	Culvert [5]	A major road (asphalt road) crossing, with 3 culverts, that would not be changed from Project actions and not needing to be surveyed	No	Excellent	NS	No	NS	Asphalt	No	DNA

[1] Crossing numbers used in 2016; those starting with "R" are roads crossings, those starting with "T" are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
[4] Road condition was described by considering road width, road surfacing (depth and quality), level of existing use, and signs of rutting or other surface erosion.
[5] Major road crossing that would not be changed from Project actions and not needing to be surveyed.
Codes : NR – not recorded, DNA – does not apply, NS – site not surveyed
CMP – corrugated metal pipe; HUC – Hydrologic Unit Code

Table 8. Bridge Crossing Details

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	Crossing Type	Bridge Detail								
Watershed Name	Watershed Number							Span (ft)	Width (ft)	Date (if Present)	General Bridge Condition[4]	Bridge Material	Bridge Material - Explanation	Exposed Rebar?	Corroded Materials?	Utilities Present?
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-08916	27.9	2016	Resident	Bridge	90	14	Unknown	Fair	Steel	2 center concrete and I-beam supports	No	Yes	No
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-11312	34.2	2016	Resident	Bridge	48	11	Unknown	Old rail car needing improvement	Rail car	Wood decking with rail car	No	No	No
Hog Hollow-Butter Creek	170701030904	Butter Creek	R-17426	49.9	2016	Resident	Bridge	30	15	Unknown	Older steel bridge in adequate condition	Steel	Steel framed bridge	No	Yes	No
West Birch Creek	170701030606	West Birch Creek	R-20404	59.7	2016	Anadromous	Bridge	42	20	Unknown	Fair to good	Steel	Steel I-beams (small)	No	Yes	No
Lower East Birch Creek	170701030603	East Birch Creek	R-20809	63.2	2016	Anadromous	Bridge[5]	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lower East Birch Creek	170701030603	East Birch Creek	R-21604	64.2	2016	Anadromous	Bridge	43	15	Unknown	Fair to good	Steel	NR	No	Yes	No
Wood Hollow-McKay Creek	170701030403	McKay Creek	R-23514	75.5	2016	Resident	Bridge	50	12	NS	Moderate	Wood decking	Can see wood decking, can't see support in aerial	NS	NS	NS
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24814	84.3	2016	Anadromous	Bridge	21	16	Unknown	Good	Steel	Steel I-beam with concrete decking	No	Yes	No
Pelican Creek	170601040402	Dry Creek	R-29313	95.0	2014/2016	Anadromous	Bridge	36	40	Unknown	Good	Concrete	NR	No	No	No
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	R-31086	99.2	2016	Anadromous	Bridge[5]	NS	NS	NS	NS	NS	NS	NS	NS	NS
Rock Creek	170601040306	Grande Ronde River	R-31715	100.8	2014	Anadromous	Bridge	50	13	2006	Excellent bridge with concrete abutment into bedrock; rip rap at abutments	steel	NR	N	N	N
Rock Creek	170601040306	Little Graves Creek	R-32785	101.8	2016	Resident	Bridge	15	17	Unknown	Good	Steel	Steel and wood planking	No	No	No
Rock Creek	170601040306	Little Rock Creek	R-33010	102.9	2016	Resident	Likely Bridge	DNA	DNA	DNA	Currently no crossing structure; based on past crossing methods used near here, this would likely be a bridge	DNA	Washed out?	DNA	DNA	DNA
Rock Creek	170601040306	Rock Creek	R-33011	102.9	2016	Anadromous	Likely Bridge	DNA	DNA	DNA	Currently no crossing structure; based on past crossing methods used near here, this would likely be a bridge	DNA	Washed out?	DNA	DNA	DNA
Rock Creek	170601040306	Rock Creek	R-33033	103.0	2016	Anadromous	Likely Bridge	DNA	DNA	DNA	Currently no crossing structure; based on past crossing methods used near here, this would likely be a bridge	DNA	Washed out?	DNA	DNA	DNA

Table 8. Bridge Crossing Details (continued)

6th Level (HUC 12)								Bridge Detail								
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	Crossing Type	Span (ft)	Width (ft)	Date (if Present)	General Bridge Condition[4]	Bridge Material	Bridge Material - Explanation	Exposed Rebar?	Corroded Materials?	Utilities Present?
Rock Creek	170601040306	Rock Creek	R-33147	103.2	2016	Anadromous	Likely Bridge	DNA	DNA	DNA	A bridge had been present at this site but it was washed out many years ago	DNA	Washed out	DNA	DNA	DNA
Upper Ladd Creek	170601040601	Unnamed stream [1180502451927]	R-36299	112.9	2014	Resident	Bridge	17	10', 15' outside of bridge	Unknown	Fair-Good	Concrete/steel/ wood -see crossing type	10' planked, 15' outside	N	rusty bolts	N
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	R-37179	115.5	2016	Resident	Bridge	31	18	Unknown	Moderate to good	Steel	NR	No	Yes	No
Upper Ladd Creek	170601040601	Unnamed stream [1180496451929]	R-37369	115.9	2016	Resident	Bridge	19	25	Unknown	Moderate	Steel	NR	No	Yes	No
Powell Creek-Burnt River	170502020603	Burnt River	R-59115	171.3	2016	Resident	Bridge	24	14	NS	good	NS	Likely wood planks on surface	NS	NS	NS
Swayze Creek-Burnt River	170502020802	Burnt River	R-59830	174.3	2016	Resident	Bridge	100	25	Unknown	Good	Concrete	NR	No	No	No
Shirttail Creek-Burnt River	170502020803	Burnt River	R-61345	178.0	2016	Resident	Bridge	94	31	Unknown	Good	Steel	NR	No	No	Yes
Dixie Creek	170502020807	Dixie Creek	R-64752	185.2	2016	Resident	Bridge[5]	NS	NS	NS	NS	NS	NS	NS	NS	NS
Benson Creek	170502010205	Benson Creek	R-69626	197.4	2016	Resident	Bridge	85	29	Unknown	Good	Concrete	NR	No	No	No
Middle Jump Creek	170501031002	Jump Creek	R-92884	277.8	2016	Resident	Bridge	25	20	Unknown	Fair	Wood	Steel with wood and gravel	No	Yes	Yes
Middle Jump Creek	170501031002	Jump Creek	R-93078	277.9	2014/2016	Resident	Bridge	28	22	Unknown	Good	Steel	NR	No	Yes	No
Lower Squaw Creek	170501030703	Squaw Creek	R-95383	283.3	2014/2016	Resident	Bridge	24	43	Unknown	NR	Concrete	Cement box culvert	No	No	No

[1] crossing numbers used in 2016; those starting with “R” are roads crossings, those starting with “T” are transmission line crossings.
[2] nearest milepost are all relative to the Proposed route location.
[3] survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
[4] Bridge condition was described by considering the age of the bridge, bridge material condition, bridge size relative to the waterbody, and signs of scour at the abutments.
[5] Major road crossing that would not be changed from Project actions and not needing to be surveyed.
Codes : NR – not recorded, DNA – does not apply, NS – site not surveyed
HUC – Hydrologic Unit Code

Table 9. Culvert Crossing Details

6th Level (HUC 12)								Culvert Detail														
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	Crossing Type	Length (ft)	Diameter (ft)	Fill Depth Above (ft)	Slope (%)	Culvert Material	Rusted?	Rip Rap?	Damaged?	Damage - Explanation	Perched?	Perch Height (ft)	Plunge Pool Depth (ft)	Pool Depth/ Perch Height	Embedded?	Substrate Present?	Barrier?
Middle Little Butter Creek	170701031002	Little Butter Creek	R-08883	2016	27.8	Resident	Culvert	19	7.5	1	2	CMP	Yes	Yes	Yes	Exposed at road shoulder on US end, squashed, only 4.7 feet opening	No	DNA	DNA	DNA	Yes	Yes	No
Lower East Birch Creek	170701030603	California Gulch	R-21694	2016	64.1	Anadromous	Culvert assumed	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DNA
Stewart Creek-Birch Creek	170701030608	Ray Creek	R-20492	2016	65.9	Resident	Culvert	29	3.5	2	0.5	CMP	NR	NR	No	DNA	No	DNA	DNA	DNA	Yes	Yes	No
Wood Hollow-McKay Creek	170701030403	Unnamed Stream [11859354545 36] (previously Wood Hollow)	R-23502	2016	75.5	Resident	Culvert assumed	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DNA
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24303	2016	83.2	Anadromous	Culvert	30	3	0.2	1	CMP	NR	NR	Yes	Denting at edges	No	DNA	DNA	DNA	No	Yes	No
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24242	2016	83.3	Anadromous	Culvert	29	4.6	0.7	0.7	CMP	NR	No	No	DNA	Yes	0.1	0.8	>2	No	No	No
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [11845044549 02]	R-24656	2016	83.8	Anadromous	Culvert assumed	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DNA
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24664	2016	84.2	Anadromous	Culvert	28	4	2.5	1.2	CMP	Yes	Yes	Yes	Squashed, ripped at upstream end	No	DNA	DNA	DNA	No	NR	No
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-25593	2016	86.1	Anadromous	Culvert	29	3	0	0	CMP	No	Yes	No	DNA	No	DNA	DNA	DNA	No	No	No
Whiskey Creek	170601040305	Whiskey Creek	R-31388	2016	99.5	Anadromous	Culvert	66	5	4.5	4	CMP	Rusted but relatively good condition	Yes	No	DNA	Yes	0.5	0.5	<2	No	No	Yes
Rock Creek	170601040306	Graves Creek	R-32979	2016	102.4	Anadromous	Culvert assumed	30	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	DNA
Rock Creek	170601040306	Sheep Creek	R-33628	2016	106.4	Anadromous	Culvert	20	3	1.5	2	CMP	Older rusted	Yes	Yes	Rusted but functional	No	DNA	DNA	DNA	Yes	Yes	No
Gekeler Slough	170601040603	Mill Creek	R-34099	2016	107.2	Anadromous	Culvert	37	3.3	3	1.5	Other (concrete?)	No	Yes	No	No	Yes	0.1	0	<2	No	Yes	Yes
East Fork Ladd Creek	170601040602	Unnamed Stream [11802664521 36] (previously Ladd Canyon)	R-37969	2016	116.3	Resident	Culvert	20	1.7 and 2.0	1.5	1	CMP (2)	Yes	No	Yes	One is older and rustier	No	DNA	DNA	DNA	No	Yes	No
East Fork Ladd Creek	170601040602	Unnamed stream [11800494519 17]	R-38011	2016	116.4	Resident	Culvert	500	3.5	NR	4	CMP	No	No	No	DNA	Yes	0.3	1.2	>2	No	No	Yes
East Fork Ladd Creek	170601040602	Unnamed Stream [11802664521 36] (previously Ladd Canyon)	R-38059	2016	116.5	Resident	Culvert	200	4	4	2	CMP	Yes	No	No	DNA	Yes	0.5	2	>2	No	No	Yes
Jimmy Creek	170502030603	Clover Creek	R-41281	2016	124.1	Resident	Culvert	36	6.5	2	2	CMP	Yes	Yes	No	DNA	Yes	1	1	<2	No	No	Yes

Table 9. Culvert Crossing Details (continued)

6th Level (HUC 12)		Stream Name	Crossing ID [1/]	Nearest Proposed Route Milepost [2/]	Evaluation Year [3/]	Fish Use	Crossing Type	Culvert Detail														
Watershed Name	Watershed Number							Length (ft)	Diameter (ft)	Fill Depth Above (ft)	Slope (%)	Culvert Material	Rusted?	Rip Rap?	Damaged?	Damage - Explanation	Perched?	Perch Height (ft)	Plunge Pool Depth (ft)	Pool Depth/ Perch Height	Embedded?	Substrate Present?	Barrier?
Gentry Creek-Powder River	170502030408	Gentry Creek	R-44271	2016	131.4	Resident	Culvert	20	2	1	2	CMP	No	Yes	No	DNA	Yes	0.2	0	<2	No	No	Yes
Lower Alder Creek	170502020703	Alder Creek	R-56681	2016	165.4	Resident	Culvert	35	3	2	1	CMP	No	Yes	No	DNA	No	DNA	DNA	DNA	No	No	Yes
Lower Alder Creek	170502020703	Hill Creek	R-56890	2016	166.1	Resident	Culvert	20	2	0.5	9	CMP	No	No	No	DNA	No	DNA	DNA	DNA	Yes	Yes	Yes
Powell Creek-Burnt River	170502020603	Powell Creek	R-59645	2016	173.9	Resident	Culvert	23	6.5	2	1	CMP/Arch	Yes	Yes	Yes	Bit dented	No	DNA	DNA	DNA	NR	Yes	No
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61834	2016	178.7	Resident	Culvert	26	3.5	1.5	2	CMP	Yes	Yes	Yes	Top edge banged up	Yes	1	0.6	<2	No	NR	Yes
Durbin Creek-Burnt River	170502020809	Durbin Creek	R-67679	2016	192.8	Resident	Culvert [4/]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	R-72465	2014	226.8	Resident	Culvert assumed	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Middle Jump Creek	170501031002	Poison Creek	R-92529	2016	275.8	Resident	Culvert	42	4.6	1.5	1	CMP	No	No	No	DNA	No	DNA	DNA	DNA	Yes	Yes	No
Hardtrigger Creek	170501030701	Hardtrigger Creek	R-97770	2014	288.9	Resident	Culvert	45	5	4	1	CMP	No	No	Yes	Slight crushing in center of road	No	DNA	DNA	DNA	Yes	Yes	No
Lower Reynolds Creek	170501030604	Reynolds Creek	R-99900	2016	294.1	Resident	Culvert [4/]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

[1] Crossing numbers used in 2016; those starting with "R" are roads crossings, those starting with "T" are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
[4] Major road crossing that would not be changed from Project actions and not needing to be surveyed
Codes : NR – not recorded, DNA – does not apply, NS – site not surveyed
CMP – corrugated metal pipe

Table 10. Ford Crossing Details

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Fish Use	Crossing Type	Ford Detail						
Watershed Name	Watershed Number							Span (ft)	Road Width (ft)	Channel Gradient (%)	Ford Material	Scour?	Incised Channel?	General Condition
Jett Creek-Burnt River	170502020808	Goodman Creek	R-65725	188.4	2016	Resident	Ford	8	11	1	Gravel	No	No	Fair condition for 4-wheel-drive vehicles.
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66818	190.7	2016	Resident	Ford	9	11	4	Gravel	Yes	Yes	Needs improvement or temp bridge. Will function for O&M.
Benson Creek	170502010205	Benson Creek	R-68790	195.4	2014	Resident	Ford	NR	NR	<1	Sand/Silt	No	Yes	silty, sandy ford

[1] Crossing numbers used in 2016; those starting with "R" are roads crossings, those starting with "T" are transmission line crossings
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
Codes : NR – not recorded, DNA – does not apply, NS – site not surveyed
HUC – Hydrologic Unit Code

Table 11. Number of Road Crossings by Fish Use and Risk Rating

Risk Rating	Anadromous	Resident	Total
High Risk Stream / High Risk Project	1	1	2
High Risk Stream / Medium Risk Project		1	1
Medium Risk Stream / High Risk Project	3	4	7
Subtotal High Risk	**4**	**6**	**10**
Medium Risk Stream / Medium Risk Project	4	11	15
Medium Risk Stream / Low Risk Project	1	1	2
Low Risk Stream / Medium Risk Project	5	10	15
Subtotal Medium Risk	**10**	**22**	**32**
Low Risk Stream / Low Risk Project	4	7	11
Not Rated[1]	2	3	5
Totals	**20**	**38**	**58**

[1] The crossings not rated were on major roads or highways that would not be modified.

Table 12. Risk Ratings of Road Stream Crossings

6th Level (HUC 12)								Risk Rating		
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Ownership	Road Status	Stream	Project	Fish Use
Middle Little Butter Creek	170701031002	Little Butter Creek	R-08883	27.8	2016	Private	Existing	Medium	Medium	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-08916	27.9	2016	Private	Existing	Medium	Medium	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	R-11312	34.2	2016	Private	Existing	Low	Medium	Resident
Hog Hollow-Butter Creek	170701030904	Butter Creek	R-17426	49.9	2016	Private	Existing	Medium	Low	Resident
West Birch Creek	170701030606	West Birch Creek	R-20404	59.7	2016	Private	Existing	Low	Medium	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	R-20809	63.2	2016	Private	Existing	Not Rated[4]	Not Rated[4]	Anadromous
Lower East Birch Creek	170701030603	California Gulch	R-21694	64.1	2016	Private	Existing	Medium	Low	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	R-21604	64.2	2016	Private	Existing	Low	Medium	Anadromous
Stewart Creek-Birch Creek	170701030608	Ray Creek	R-20492	65.9	2016	Private	Existing	Low	Low	Resident
Wood Hollow-McKay Creek	170701030403	Unnamed Stream [1185935454536] (previously Wood Hollow)	R-23502	75.5	2016	Private	Existing	Medium	Medium	Resident
Wood Hollow-McKay Creek	170701030403	McKay Creek	R-23514	75.5	2016	Private	Existing	Low	Medium	Resident
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24303	83.2	2016	Private	Existing	Low	Medium	Anadromous
Beaver Creek-Meacham Creek	170701030201	Twomile Creek	R-24242	83.3	2016	Private	Existing	Low	Low	Anadromous
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184504454902]	R-24656	83.8	2016	Private	Existing	Medium	Medium	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24664	84.2	2016	Private	Existing	Low	Low	Resident
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-24814	84.3	2016	Private	Existing	Low	Low	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	R-25593	86.1	2016	Private	Existing	High	High	Anadromous
Pelican Creek	170601040402	Dry Creek	R-29313	95	2014/2016	USFS	Existing	Low	Low	Anadromous
Whiskey Creek	170601040305	Whiskey Creek	R-31388	99.5	2016	Private	Existing	Medium	Medium	Anadromous
Rock Creek	170601040306	Rock Creek	R-31715	100.8	2014	Private	Existing	Low	Medium	Anadromous

Table 12. Risk Ratings of Road Stream Crossings (continued)

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Ownership	Road Status	Risk Rating		Fish Use
Watershed Name	Watershed Number							Stream	Project	
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	R-31086	99.2	2016	Private	Existing	Not Rated[4]	Not Rated[4]	Anadromous
Rock Creek	170601040306	Little Graves Creek	R-32785	101.8	2016	Private	Existing	Low	Low	Resident
Rock Creek	170601040306	Graves Creek	R-32979	102.4	2016	Private	Existing	Medium	Medium	Anadromous
Rock Creek	170601040306	Little Rock Creek	R-33010	102.9	2016	Private	Existing	Medium	High	Resident
Rock Creek	170601040306	Rock Creek	R-33011	102.9	2016	Private	Existing	Medium	High	Anadromous
Rock Creek	170601040306	Rock Creek	R-33033	103	2016	Private	Existing	Medium	High	Anadromous
Rock Creek	170601040306	Rock Creek	R-33147	103.2	2016	Private	Existing	Medium	High	Anadromous
Rock Creek	170601040306	Sheep Creek	R-33628	106.4	2016	Private	Existing	Medium	Medium	Anadromous
Gekeler Slough	170601040603	Mill Creek	R-34099	107.2	2016	Private	Existing	Low	Medium	Anadromous
Upper Ladd Creek	170601040601	Unnamed stream [1180502451927]	R-36299	112.9	2014	Private	New, Bladed [5/]	Low	Medium	Resident
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	R-37179	115.5	2016	Private	Existing	Low	Medium	Resident
Upper Ladd Creek	170601040601	Unnamed stream [1180496451929]	R-37369	115.9	2016	Private	Existing	Medium	Medium	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-37969	116.3	2016	Private	Existing	Medium	Medium	Resident
East Fork Ladd Creek	170601040602	Unnamed stream [1180049451917]	R-38011	116.4	2016	Private	Existing	Low	Medium	Resident
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-38059	116.5	2016	Private	Existing	Medium	Medium	Resident
Jimmy Creek	170502030603	Clover Creek	R-41281	124.1	2016	Private	Existing	Low	Medium	Resident
Gentry Creek-Powder River	170502030408	Gentry Creek	R-44271	131.4	2016	Private	Existing	Medium	High	Resident
Lower Alder Creek	170502020703	Alder Creek	R-56681	165.4	2016	Private	Existing	Low	Low	Resident
Lower Alder Creek	170502020703	Hill Creek	R-56890	166.1	2016	Private	Existing	Medium	Medium	Resident
Powell Creek-Burnt River	170502020603	Burnt River	R-59115	171.3	2016	Private	Existing	Low	Medium	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	R-59645	173.9	2016	Private	Existing	Low	Medium	Resident

Table 12. Risk Ratings of Road Stream Crossings (continued)

6th Level (HUC 12)								Risk Rating		
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Ownership	Road Status	Stream	Project	Fish Use
Swayze Creek-Burnt River	170502020802	Burnt River	R-59830	174.3	2016	Private	Existing	Low	Low	Resident
Shirttail Creek-Burnt River	170502020803	Burnt River	R-61345	178	2016	Private	Existing	Low	Low	Resident
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61834	178.7	2016	Private	Existing	Medium	Medium	Resident
Dixie Creek	170502020807	Dixie Creek	R-64752	185.2	2016	Private	Existing	Not Rated[4]	Not Rated[4]	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	R-65725	188.4	2016	Private	New, Bladed [5/]	High	Medium	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66818	190.7	2016	Private	Existing	High	High	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	R-66868	190.8	2014	Private	Existing	Medium	Medium	Resident
Durbin Creek-Burnt River	170502020809	Durbin Creek	R-67679	192.8	2016	BLM	Existing	Not Rated[4]	Not Rated[4]	Resident
Benson Creek	170502010205	Benson Creek	R-68790	195.4	2014	Private	Existing	Medium	High	Resident
Benson Creek	170502010205	Benson Creek	R-69626	197.4	2016	Private	Existing	Low	Medium	Resident
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	R-72465	226.8	2014	Private	Existing	Medium	Medium	Resident
Middle Jump Creek	170501031002	Poison Creek	R-92529	275.8	2016	Private	Existing	Low	Low	Resident
Middle Jump Creek	170501031002	Jump Creek	R-92884	277.8	2016	Private	Existing	Medium	Medium	Resident
Middle Jump Creek	170501031002	Jump Creek	R-93078	277.9	2014/2016	Private	Existing	Low	Medium	Resident
Lower Squaw Creek	170501030703	Squaw Creek	R-95383	283.3	2014/2016	Private	Existing	Low	Low	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	R-97770	288.9	2014	BLM	Existing	Medium	High	Resident
Lower Reynolds Creek	170501030604	Reynolds Creek	R-99900	294.1	2016	Private	Existing	Not Rated[4]	Not Rated[4]	Resident

[1] Crossing numbers used in 2016; those starting with "R" are road crossings, those starting with "T" are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
[4] Major road crossing that would not be changed from Project actions and not needing to be surveyed or rated.
[5] Existing road is present at this stream crossing.
Codes : NR – not recorded, DNA – does not apply, NS – site not surveyed
HUC – Hydrologic Unit Code
BLM – U.S. Department of the Interior, Bureau of Land Management
USFS – U.S. Department of Agriculture, Forest Service

Table 13. Number of Road Crossings by Ownership and Risk Rating

Risk Rating	BLM	USFS	Private	Total
High Risk Stream / High Risk Project			2	2
High Risk Stream / Medium Risk Project			1	1
Medium Risk Stream / High Risk Project	1		6	7
Subtotal High Risk	**1**	**0**	**9**	**10**
Medium Risk Stream / Medium Risk Project			15	15
Medium Risk Stream / Low Risk Project			**2**	2
Low Risk Stream / Medium Risk Project			15	15
Subtotal Medium Risk	**0**	**0**	**32**	**32**
Low Risk Stream / Low Risk Project		1	10	11
Not Rated[1]	1		4	5
Totals	**2**	**1**	**55**	**58**

[1] The crossings not rated were on major roads or highways and would not be modified.
BLM – U.S. Department of the Interior, Bureau of Land Management
USFS – U.S. Department of Agriculture, Forest Service

4.2.2 Transmission Line Crossings

Transmission line crossings occurred over a range of stream sizes ranging from 5 to 200 feet bankfull width, with about half 15 feet wide or smaller. A few larger streams would also be crossed by the transmission line, including 4 crossings on streams over 60 feet wide or greater bankfull width. Of the 43 transmission line crossings surveyed, 11 were rated as having a high stream or project risk (Table 14). A total of 4 of these crossings were on anadromous fish streams and 7 on resident fish streams. A total of 7 crossings had high rating for potential Project effects, with 2 sites having a high stream risk rating. A total of 24 crossings (9 anadromous and 15 resident fish streams) had a medium rating in one or both categories. Eight sites had a low rating for both categories. Rating by land crossing ownership is shown in Table 15.

Crossing sites that would likely need extra scrutiny during the design and construction phase are those with a “high-high,” “high-medium,” and “medium-high” rating. These sites include one “high-high” rated crossing on Hardtrigger Creek (T-97950) designated as a resident fish stream, as well as one crossing with a high stream/medium project and 6 crossings with a medium stream/high project risk rating (Table 16).

Table 14. Number of Transmission Line Crossings by Fish Use and Risk Rating

Risk Rating	Anadromous	Resident	Total
High Risk Stream / High Risk Project		1	**1**
High Risk Stream / Medium Risk Project	**1**		**1**
Medium Risk Stream / High Risk Project	**3**	**3**	**6**
Low Risk Stream / High Risk Project		**3**	**3**
Subtotal High Risk	**4**	**7**	**11**
Medium Risk Stream / Medium Risk Project	4	4	8
Medium Risk Stream / Low Risk Project		1	1
Low Risk Stream / Medium Risk Project	5	10	15
Subtotal Medium Risk	**9**	**15**	**24**
Low Risk Stream / Low Risk Project	3	5	8
Totals	**16**	**27**	**43**

Table 15. Number of Transmission Line Crossings by Ownership and Risk Rating

Risk Rating	BLM	USFS	Private	Total
High Risk Stream / High Risk Project	1			1
High Risk Stream / Medium Risk Project			1	1
Medium Risk Stream / High Risk Project			6	6
Low Risk Stream / High Risk Project			3	3
Subtotal High Risk	**1**	**0**	**10**	**11**
Medium Risk Stream / Medium Risk Project			8	8
Medium Risk Stream / Low Risk Project			1	1
Low Risk Stream / Medium Risk Project	2		13	15
Subtotal Medium Risk	**2**	**0**	**22**	**24**
Low Risk Stream / Low Risk Project	1	1	6	8
Totals	**4**	**1**	**38**	**43**

BLM – U.S. Department of the Interior, Bureau of Land Management
USFS – U.S. Department of Agriculture, Forest Service

Table 16. Risk Rating of Transmission Line Stream Crossings

6th Level (HUC 12)							Risk Rating		
Watershed Name	Watershed Number	Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Ownership	Stream	Project	Fish Use
Middle Little Butter Creek	170701031002	Little Butter Creek	T-08977	27.7	2016	Private	Low	High	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	T-09139	28.1	2016	Private	Low	Medium	Resident
Ayers Canyon-Butter Creek	170701030907	Butter Creek	T-11354	34.2	2016	Private	Low	Low	Resident
Hog Hollow-Butter Creek	170701030904	Butter Creek	T-17405	50.1	2016	Private	Low	Medium	Resident
Bear Creek-West Birch Creek	170701030604	Bear Creek	T-19947	58.6	2016	Private	Low	Low	Anadromous
West Birch Creek	170701030606	West Birch Creek	T-20275	59.7	2016	Private	Low	Medium	Anadromous
Lower East Birch Creek	170701030603	California Gulch	T-21673	64.1	2016	Private	Low	Medium	Anadromous
Lower East Birch Creek	170701030603	East Birch Creek	T-21807	64.7	2016	Private	Medium	Medium	Anadromous
Sevenmile Creek-McKay Creek	170701030406	McKay Creek	T-23443	75.6	2016	Private	Low	Medium	Resident
Wood Hollow-McKay Creek	170701030403	Rail Creek	T-23539	80.3	2014	Private	Medium	Medium	Resident
Beaver Creek-Meacham Creek	170701030201	Little Beaver Creek	T-24622	83.4	2014	Private	Medium	High	Anadromous
Beaver Creek-Meacham Creek	170701030201	Beaver Creek	T-25186	84.8	2014	Private	Medium	High	Anadromous
Pelican Creek	170601040402	Dry Creek	T-29279	94.8	2014	USFS	Low	Low	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	T-31337	99.5	2014/2016	Private	Medium	Medium	Anadromous
Coleman Ridge-Grande Ronde River	170601040307	Grande Ronde River	T-31377	99.6	2014	Private	Low	Medium	Anadromous
Rock Creek	170601040306	Rock Creek	T-31906	101.1	2014/2016	Private	Low	Medium	Anadromous
Rock Creek	170601040306	Graves Creek	T-32195	101.5	2014	Private	Medium	Medium	Anadromous
Rock Creek	170601040306	Rock Creek	T-32272	101.8	2014	Private	Medium	High	Anadromous
Rock Creek	170601040306	Sheep Creek	T-32519	102.5	2014	Private	High	Medium	Anadromous
Rock Creek	170601040306	Sheep Creek	T-33215	104.2	2016	Private	Medium	Medium	Anadromous
Gekeler Slough	170601040603	Mill Creek	T-33812	106.5	2016	Private	Low	Medium	Anadromous
Lower Ladd Creek	170601040604	Ladd Creek Pickup Ditch	T-37045	114.1	2016	Private	Low	Low	Anadromous
Upper Ladd Creek	170601040601	Ladd Creek Pickup Ditch	T-37129	115.2	2014	Private	Medium	Low	Resident

Table 16. Risk Rating of Transmission Line Stream Crossings (continued)

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Evaluation Year[3]	Ownership	Risk Rating		Fish Use
Watershed Name	Watershed Number						Stream	Project	
East Fork Ladd Creek	170601040602	Unnamed Stream [1180266452136] (previously Ladd Canyon)	T-37694	115.8	2016	Private	Low	High	Resident
Jimmy Creek	170502030603	Clover Creek	T-41492	124.7	2014/2016	Private	Medium	High	Resident
Jimmy Creek	170502030603	Jimmy Creek	T-41615	124.9	2016	Private	Low	Medium	Resident
Thief Valley Reservoir-Powder River	170502030605	Powder River	T-42996	128.2	2014/2016	Private	Medium	High	Resident
Lower Alder Creek	170502020703	Alder Creek	T-56949	166.0	2014	Private	Medium	Medium	Resident
Powell Creek-Burnt River	170502020603	Burnt River	T-58761	171.3	2016	BLM	Low	Low	Resident
Powell Creek-Burnt River	170502020603	Powell Creek	T-60285	175.0	2016	Private	Low	Low	Resident
Dixie Creek	170502020807	Dixie Creek	T-64755	185.4	2016	Private	Medium	Medium	Resident
Jett Creek-Burnt River	170502020808	Goodman Creek	T-65793	188.3	2016	Private	Low	Low	Resident
Durbin Creek-Burnt River	170502020809	Cavanaugh Creek	T-66832	190.7	2016	Private	Low	Medium	Resident
Durbin Creek-Burnt River	170502020809	Durbin Creek	T-67673	192.8	2014	BLM	Low	Medium	Resident
Lower Birch Creek	170502010204	Birch Creek	T-70402	199.1	2014	Private	Medium	High	Resident
Willow Creek	170501190603	Willow Creek	T-74072	215.7	2014	Private	Low	Medium	Resident
Swede Flat Creek-Cottonwood Creek	170501180303	Cottonwood Creek	T-72430	226.8	2014	Private	Low	Medium	Resident
Washington Creek-Bully Creek	170501180302	Bully Creek	T-72925	228.4	2014	Private	Low	Medium	Resident
Vine Hill-Malheur River	170501170403	Malheur River	T-74342	231.9	2014	Private	Low	High	Resident
Rock Spring Canyon-Owyhee River	170501100704	Owyhee River	T-83708	255.2	2014/2016	Private	Low	Low	Resident
Middle Jump Creek	170501031002	Poison Creek	T-92627	276.2	2014	BLM	Low	Medium	Resident
Hardtrigger Creek	170501030701	Hardtrigger Creek	T-97950	289.2	2014	BLM	High	High	Resident
Lower Reynolds Creek	170501030604	Reynolds Creek	T-99884	294.0	2014	Private	Medium	Medium	Resident

[1] Crossing numbers used in 2016; those starting with "R" are roads crossings, those starting with "T" are transmission line crossings.

[2] Nearest milepost is all relative to the Proposed Route location.

[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.

HUC – Hydrologic Unit Code; BLM – U.S. Department of the Interior, Bureau of Land Management; USFS – U.S. Department of Agriculture, Forest Service

5.0 CONCLUSION

Field studies and associated desktop evaluations were prepared to determine the presence of fish, condition of the current road crossing structure (if any), and levels of risk to fish-bearing streams from potential Project crossings by transmission line or roads. Field surveys of all considered alternatives determined that only 101 fish-bearing streams would be crossed by the Project (road and transmission line). Of these road crossings, 2 were assessed as a "high-high" risk to stream resources, an additional 10 had a combination of high and medium risk at the road crossing, and the remaining 89 crossings had lower risks. Of the 43 transmission line crossings of fish-bearing streams, one crossing was considered to be a "high-high" risk, another 7 had some combination of high and moderate risk, while the remaining 35 had lower risk levels. All fish-bearing road crossings, including those with the higher risk level, are evaluated further in the Fish Passage Plans and Design report (Tetra Tech 2016). The plans and designs presented in the Tetra Tech (2016) report address potential repair or modifications at these crossings. The information presented in this fish habitat and stream crossing assessment report will aid in future construction actions and post-construction site assessment.

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APPENDIX A
STREAM HABITAT SURVEY FIELD FORM

2014 Stream Habitat Survey Datasheet
Boardman to Hemingway Transmission Line Project

Date:_____Surveyors:_____Time:_____ QA/QC by:_____
Stream Reach/Point #:_____ Field Map Page #:_____Stream Lng. Surveyed _____
GPS Unit #____ Pt ID_____ #_____ GPS Unit #____ Pt ID_____ #_____
GPS Unit #____ Pt ID_____ #_____ GPS Unit #____ Pt ID_____ #_____

Riparian classes present (can total over 100% due to overlap of vegetation)

	0-5%	6-25%	25-50%	50-75%	75-100%
Grass/Forb	_____	_____	_____	_____	_____
Shrub/Seedl.	_____	_____	_____	_____	_____
Sapling/Pole	_____	_____	_____	_____	_____
Small Tree	_____	_____	_____	_____	_____
Large Tree	_____	_____	_____	_____	_____
Mature Tr.	_____	_____	_____	_____	_____
Dead Wood St.	_____	_____	_____	_____	_____

Dominant successional class:_____ If forested circle one: conifer or hardwood

General Stream Morphology Veg overhang from to bank (ft): Lt _____ Rt_____

Channel Gradient (%):_____ Downstream Direction (Degrees):_____
Left Bank Angle (%):_____ Incision Depth:_____ft
Right Bank Angle (%):_____ Incision Depth:_____ft
Left Bank Channel Shade (°):_____ Right Bank Channel Shade (°):_____
Flowing width:_____ft Undercut banks: Circle Y / N
Bankfull width:_____ft Bankfull depth:_____ft
Left Bank Stability (%):_____ Right Bank Stability (%):_____
Perennial Pools (#):_____ Pools (> 1m Deep) (#):_____
LWD (>60cm & >10m) (#):_____

Stream Substrate Characteristics

Dominant substrate (%):_____ Subdominant substrate (%):_____
Relative embeddedness (%):_____Portion of fines (e.g., sand/silt) in riffle-run areas (%):____

Stream Shade

	Vegetation Height			**Densiometer**					
#	Dist	Angle(°)	Ht	Bank	UpStr	Right	Dwn	Left	Bank
1	_____	_____	_____	_____	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____	_____	_____	_____	_____

Other Characteristics

Fish Bearing? Y/N Reason:_____

Fish observed? Y/N Species:_____
Sensitive fish observed? Y/N Species & status:_____
Fish migration barriers? Y/N List:_____
Presence of beaver activity? Y/N List:_____
Restoration Opportunity? Y/N List:_____
Circle all that apply: Water divisions/withdrawal site, culvert, road, eroding bank, side channel
Explain. If culvert, record length, height, width (all in ft), and shape (i.e. circle/box):

_____

Photos

Photo number:_____ Direction of photo:_____ Additional notes:_____
Comments:_____

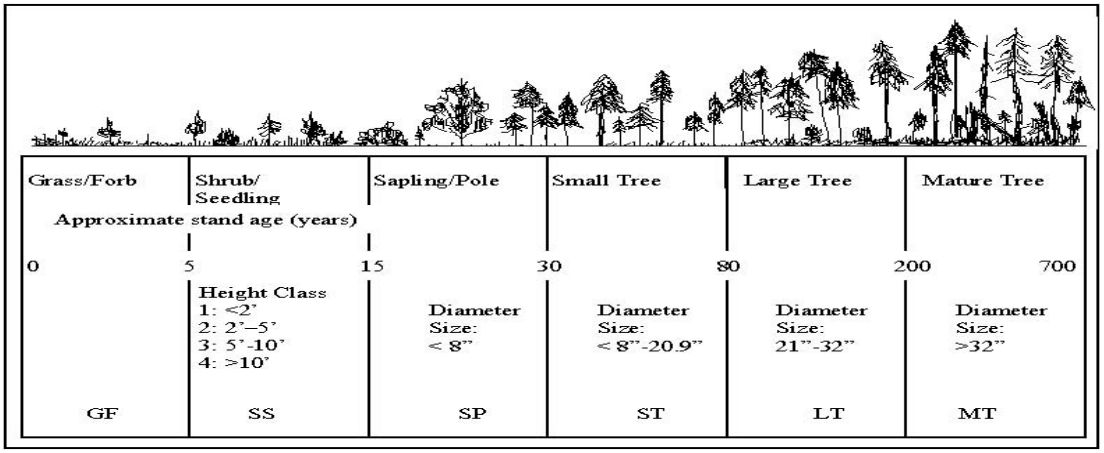
_____

Reference materials

Streambed Substrate

SA = Sand, Silt, and Clay	(<0.08 in....<2 mm.)	(smaller than "BB")
GR = Gravel	(0.08 _ 2.5 in....2 - 64 mm.)	("BB" to tennis ball size)
CO = Cobble	(2.5 _ 10 in....64 - 256 mm.)	(tennis ball size to basketball size)
BO = Boulder	(10.0 - 160 in....256 - 4096 mm.)	(basketball to small car)
BR = Bedrock	(>160 in. >4096 mm.)	(larger than a small car)

Successional Class



Code:

NV = No Vegetation. The no vegetation condition is characterized by the predominance of bare soil or naked rock.
GF = Grass/Forb condition. The grass/forb stand condition lasts 2-5 years and occasionally as long as 10 years. Shrubs and some trees that sprout are not yet dominant.
SS = Shrub/Seedling condition. The shrub stand condition often lasts 3-10 years but may remain for 20-30 years if tree generation is delayed. Tree regeneration may be common, but trees are generally less than 10-ft. tall and provide less than 30 percent of crown cover.
SP = Sapling/Pole condition. The open sapling/pole condition occurs when trees exceed 10 ft. in height and are between 5 in. and 8.9 in. dbh.
ST = Small Tree condition. The small tree condition has very little ground vegetation because of closed crown canopy. Average stand dbh is 9 in. to 20.9 in.
LT = Large Tree condition. The large tree condition is characterized by trees with an average dbh of 21 in. to 32 in. dbh. An understory of shrubs and young shade-tolerant trees is present.
MT = Mature Tree condition. The mature tree stand conditions are characterized by old live trees, snags, down woody material, and the replacement of some of the long-lived pioneer species such as Douglas-fir by shade-tolerant species such as western hemlock. Size is generally greater than 32 in. dbh.

APPENDIX B
ROAD/STREAM CROSSING FIELD CONDITION ASSESSMENT FORM

2014 ROAD/STREAM CROSSING FIELD CONDITION ASSESSMENT

B2H TRANSMISSION LINE PROJECT

Site Information

Tt_ID _____ Surveyed By _____ Date _____

Stream Class _____ Road Status proposed / existing Road Number _____

Road Category existing limited / existing MNR / existing NI / new OTR / new OTR PC / new Bladed / new ATV / new Temp

GPS Unit # _____ Crossing Point # _____ DS Point # _____ US Point # _____

Crossing Structure Characteristics

Proposed / Existing

Crossing Type culvert / bridge / ford /other Explain _____

Any Crossing Considerations yes / no Explain _____

_____

General

Road Condition _____ Angle of crossing (deg.) _____

Road Prism Imp. Needed? yes / no Road Width (ft) _____

Road Surface Material _____ Road Failure yes / no

Describe Road Failure _____

Culvert

Length (ft) _____ Dia. (ft) _____ Fill Depth Above (ft) _____

Slope (%) _____ Culvert Material CMP / HDPE / Steel / Other Explain _____

Rusted? yes / no Rip Rap yes / no

Damaged? yes / no List (crushed, pinched, etc.) _____

Perched? yes / no Perch Height (ft) _____ Plunge Pool Depth (ft) _____

Pool Depth/Perch Height _____ Embedded? yes / no Substrate Present? yes / no

Barrier yes / no

Answer yes if any of the following are true. 1) gradient for non-embedded metal or concrete culvert > 0.5%; 2) pool depth to perch height ratio <2; or 3) perch height exceeds 6".

Bridge

Span (ft) _____ Width (ft) _____ Date (if present) _____

General Bridge Condition _____

Bridge Material concrete / steel / wood / log / railcar / other Explain _____

Exposed Rebar? yes / no Corroded Materials? yes / no

Utilities Present yes / no

Ford

Span (ft) _____ Road Width (ft) _____ Channel Gradient (%) _____

Ford Material sand / gravel / cobble Scour yes / no Incised Channel Yes / No

General Condition _____

Stream Characteristics

Bankfull width (ft) _____ u/s gradient (%) _____ d/s gradient (%) _____

Stream Type _____ Substrate _____ Floodplain Width _____

Bank Material _____

Grade Controls _____

Left Bank Stability (%) _____ Rt Bank Stability (%) _____

Erosion Along Banks? yes / no Headcut? yes / no Debris Jam d/s? yes / no Jam u/s? yes / no

Aggradation yes/no Explain _____

Fish Migration Barriers yes / no List _____

Risk Assessment Desktop Crossing Risk, if present _____

Field-Verified Crossing Risk _____

Project Risk _____ Risk Project	Proposed Crossing Structure Type (assumed) _____			
Road Crossing Width/Active Channel	Spans Floodplain		1.5	<=1
Design Approach (Fish)		Stream Simulation (≤ 6 %)		Hydraulic (> 6 %)
Design Approach (Non-Fish)	0-5%	5-10%		>10%
Angle of Crossing (deg.)	90-70	70-30		<30
Channel Regrade Potential	Low	Mod @ Site	Mod @ Reach	High
Artificial Bank / Bed Stabilization (proposed crossing)	Removed/ None	In Place/ Native	Added (deformable)	Added (non-deformable)

Stream Risk _____ Risk Stream					
Landscape Sensitivity / Stream Type	Source (>10%) Bedrock	Colluvial	Trans (3-10%) Alluvial	Incised	Response (<3%) Fan
Riparian Corridor	Continuous/ wide	Semi/ Wide		Dis/ Narrow	Levee Confined
Adjacent vegetation type	Grass/ Farm	Scattered Trees		Patchy Forest	Forested
Bank characteristics	Naturally Non-erodible		Erosion resistant		Highly Erodible
Scour potential	Low		Moderate		High
Dominant hydrologic regime	Spring	Snowmelt	Rain	Rain-on-snow	Conv. Thunderstorm

Other Characteristics/Comments _____

Photo numbers/Descriptions _____

Streambed Substrate

SA = Sand, Silt, and Clay	(<0.08 in, <2mm.)	(smaller than "BB")
GR = Gravel	(0.08 - 2.5 in., 2 - 64 mm.)	("BB to tennis ball)
CO = Cobble	(2.5 - 10 in., 64 - 256 mm.)	(tennis ball to basketball)
BO = Boulder	(10 - 160 in., 256 - 4096 mm.)	(basketball to small car)
BR = Bedrock	>160 in., >4096 mm.)	(larger than a small car)

APPENDIX C
TRANSMISSION LINE CROSSING FIELD CONDITION ASSESSMENT FORM

2014 TRANSMISSION LINE CROSSING FIELD CONDITION ASSESSMENT

B2H TRANSMISSION LINE PROJECT

Site Information

Tt_ID _____ Surveyed By _____ Date _____

Stream Class _____ Stream Name _____

GIS ID - Site _____ GIS ID - Access _____

GPS Unit # _____ GPS Point # _____

Crossing Characteristics

Any Crossing Considerations yes / no Explain _____

_____

Left Bank Height (ft) _____ Rt Bank Height (ft) _____

Left bank Channel Stability (%) _____ Rt Bank Channel Stability (%) _____

Erosion Along Chanel Banks? yes / no Headcut? yes / no

Debris Jam u/s yes / no Debris Jam d/s? yes / no

Left Hillslope Height (ft) _____ Rt Hillslope Height (ft) _____

Left Hillslope Gradient (%) _____ Rt Hillslope Gradient (%) _____

Left Slope Stability (low, med, high) _____ Rt Slope Stability (low, med, high) _____

Signs of Slope Instability yes / no Explain _____

_____

Tree Species	DBH (in)	Angle (deg)	Distance (ft)	Tree Height (ft)

Dominant Stand Type (conifer, deciduous, mixed) _____ Average DBH _____

Stand Density (low, med, high) _____

Proposed T-Line Tower within Channel Valley? yes / no Distance to T-Line Tower (ft) _____

Slope Stability at Proposed Tower Location (low, med, high) _____

Stream Characteristics

Stream Morphology Type _____

Floodplain Width (ft) _____ u/s gradient (%) _____ d/s gradient (%) _____

Bankfull Width (ft) _____ Bankfull Depth (ft) _____

Active Channel Width (ft) _____ Active Channel Depth (ft) _____

Substrate _____

Bank Material _____

Grade Controls _____

Risk Assessment Desktop Crossing Risk _____

Field-Verified Crossing Risk _____

Project Risk _____ Risk Project

Floodplain Disturbance	Low		Moderate		High
Clearing Intensity	1	2	3	4	5
Channel Disturbance	None	Low	Moderate		High
Angle of Crossing (deg.)	90-70		70-30		<30
Channel regrade potential	Low	Mod @ Site		Mod @ Reach	High
Artificial bank / bed stabilization	Removed/ None	In Place/ Native		Added (deformable)	Added (non-deformable)

Stream Risk _____ Risk Stream

Landscape Sensitivity / Stream Type	Source (>10%) Bedrock	Colluvial	Trans (3-10%) Alluvial	Incised	Response (<3%) Fan
Riparian Corridor	Continuous/ wide	Semi/ Wide		Dis/ Narrow	Levee Confined
Adjacent vegetation type	Grass/ Farm	Scattered Trees		Patchy Forest	Forested
Bank characteristics	Naturally Non-erodible		Erosion resistant		Highly Erodible
Scour potential	Low		Moderate		High
Dominant hydrologic regime	Spring	Snowmelt	Rain	Rain-on-snow	Conv. Thunderstorm

Other Characteristics/Comments _____

Photo numbers/Descriptions _____

Streambed Substrate

SA = Sand, Silt, and Clay	(<0.08 in, <2mm.)	(smaller than "BB")
GR = Gravel	(0.08 - 2.5 in., 2 - 64 mm.)	("BB to tennis ball)
CO = Cobble	(2.5 - 10 in., 64 - 256 mm.)	(tennis ball to basketball)
BO = Boulder	(10 - 160 in., 256 - 4096 mm.)	(basketball to small car)
BR = Bedrock	>160 in., >4096 mm.)	(larger than a small car)

APPENDIX D
NON-FISH STREAM FIELD DATA RESULTS

Table D-1. Road and Transmission Line At Crossing Locations of Non-Fish Streams by Survey Sites and Fish Use

6th Level (HUC 12)									Pre-field Fish Use Designation		
Watershed Name	Watershed Number	Stream Name	Crossing ID [1]	Nearest Proposed Route Milepost [2]	Alternative	Crossing Type	Field Survey Location [3]	Evaluation Year [4]	Source	Fish Use	Post-field Fish Use
Slusher Canyon-Butter Creek	170701030906	Unnamed stream [1192143455270]	R-13058	36.9	Proposed Route	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Lower East Birch Creek	170701030603	Unnamed Stream [1188272454537] (previously Spring Hollow)	T-20870	61.7	Proposed Route	T-Line	Not Surveyed	2016	Tetra Tech	Resident	Non-Fish
Wood Hollow-McKay Creek	170701030403	Little Rail Creek	T-23153	78.4	Proposed Route	T-Line	At Crossing	2014	Tetra Tech	Resident	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Unnamed stream	R-25185	84.8	Proposed Route	Road	At Crossing	2014	Tetra Tech	Resident	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184156454783]	R-25394	85.2	Proposed Route	Road	At Crossing	2014	Tetra Tech	Resident	Non-Fish
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	R-31352	99.6	Morgan Lake Alternative	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	T-31396	99.7	Proposed Route	T-Line	Not Surveyed	2016	Tetra Tech	Resident	Non-Fish
Gekeler Slough	170601040603	Deal Creek	R-33156	104.8	Proposed Route	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Gekeler Slough	170601040603	Deal Creek	T-33164	104.8	Proposed Route	T-Line	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	R-35660	110.9	Proposed Route	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	T-35662	110.9	Proposed Route	T-Line	Downstream (100 ft)	2016	Tetra Tech	Resident	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream [1180301452110]	R-37018	114.1	Morgan Lake Alternative	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37117	114.9	Morgan Lake Alternative	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37121	115	Morgan Lake Alternative	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37124	115.2	Morgan Lake Alternative	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
East Fork Ladd Creek	170601040602	Unnamed stream [1180138451966]	T-38337	117.4	Morgan Lake Alternative	T-Line	At Crossing	2014	Tetra Tech	Resident	Non-Fish
Lower Alder Creek	170502020703	Straw Ranch Creek	T-56168	164.3	Proposed Route	T-Line	At Crossing	2014	Tetra Tech	Resident	Non-Fish
Lower Alder Creek	170502020703	Low Creek	T-56762	165.6	Proposed Route	T-Line	At Crossing	2014	Tetra Tech	Resident	Non-Fish
Powell Creek-Burnt River	170502020603	Unnamed Stream [1174989445634] (previously True Blue Gulch)	R-59743	174	Proposed Route	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	T-60872	176.3	Proposed Route	T-Line	Not Surveyed	2016	Tetra Tech	Resident	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	R-61298	177.5	Proposed Route	Road	Not Surveyed	2016	Tetra Tech	Resident	Non-Fish
Shirttail Creek-Burnt River	170502020803	Ray Creek	T-61670	178.2	Proposed Route	T-Line	Not Surveyed	2016	Tetra Tech	Resident	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61864	178.7	Proposed Route	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	R-61839	178.8	Proposed Route	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	T-61953	178.8	Proposed Route	T-Line	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	R-67099	191.2	Proposed Route	Road	At Crossing	2016	Tetra Tech	Resident	Non-Fish
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	T-67058	191.3	Proposed Route	T-Line	At Crossing	2016	Tetra Tech	Resident	Non-Fish

[1] Crossing numbers used in 2016; those starting with "R" are roads crossings, and those starting with "T" are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Location where specific crossing information was collected. Stream habitat data may have been collected at this site or another representative location.
[4] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
HUC – Hydrologic Unit Code

Table D-2. Riparian Habitat Conditions of Non-Fish Stream Road and Transmission Line Crossing Locations

6th Level (HUC 12)												
Watershed Name	Watershed Number	Stream Name	Crossing ID [1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year [3]	Dominant Successional Class	Forested Type	Tree Height (ft)	Tree Density	Shade (%)	Fish Type
Slusher Canyon-Butter Creek	170701030906	Unnamed stream [1192143455270]	R-13058	36.9	Road	2016	NS	NS	NS	NS	NS	Non-Fish
Lower East Birch Creek	170701030603	Unnamed Stream [1188272454537] (previously Spring Hollow)	T-20870	61.7	T-Line	2016	NS	NS	NS	NS	NS	Non-Fish
Wood Hollow-McKay Creek	170701030403	Little Rail Creek	T-23153	78.4	T-Line	2014	Shrub/Seedling	Deciduous	8 to 20	Medium	100	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Unnamed stream	R-25185	84.8	Road	2014	Small Tree	Conifer	50 to 100	NR	NR	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184156454783]	R-25394	85.2	Road	2014	Small Tree	Conifer	30 to 100+	NR	89	Non-Fish
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	R-31352	99.6	Road	2016	NR	NR	NR	NR	NR	Non-Fish
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	T-31396	99.7	T-Line	2016	NS	NS	NS	NS	NS	Non-Fish
Gekeler Slough	170601040603	Deal Creek	R-33156	104.8	Road	2016	Sapling/Pole	Hardwood	20	NR	57	Non-Fish
Gekeler Slough	170601040603	Deal Creek	T-33164	104.8	T-Line	2016	NR	Mixed	15	Medium	NR	Non-Fish
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	R-35660	110.9	Road	2016	Small Tree	Hardwood	18	NR	100	Non-Fish
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	T-35662	110.9	T-Line	2016	NR	Deciduous	5	Low	NR	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream [1180301452110]	R-37018	114.1	Road	2016	NR	NR	NR	NR	NR	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37117	114.9	Road	2016	NR	NR	NR	NR	NR	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37121	115	Road	2016	NR	NR	NR	NR	NR	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37124	115.2	Road	2016	NR	NR	NR	NR	NR	Non-Fish
East Fork Ladd Creek	170601040602	Unnamed stream [1180138451966]	T-38337	117.4	T-Line	2014	Sapling/Pole	Conifer	15 to 60	Medium	100	Non-Fish
Lower Alder Creek	170502020703	Straw Ranch Creek	T-56168	164.3	T-Line	2014	Grass/Forb	DNA	DNA	DNA	0	Non-Fish
Lower Alder Creek	170502020703	Low Creek	T-56762	165.6	T-Line	2014	Grass/Forb	DNA	5 to 40	DNA	14	Non-Fish
Powell Creek-Burnt River	170502020603	Unnamed Stream [1174989445634] (previously True Blue Gulch)	R-59743	174	Road	2016	NR	NR	NR	NR	NR	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	T-60872	176.3	T-Line	2016	NS	NS	NS	NS	NS	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	R-61298	177.5	Road	2016	NS	NS	NS	NS	NS	Non-Fish
Shirttail Creek-Burnt River	170502020803	Ray Creek	T-61670	178.2	T-Line	2016	NS	NS	NS	NS	NS	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61864	178.7	Road	2016	NR	NR	NR	NR	NR	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	R-61839	178.8	Road	2016	Shrub/Seedling	Conifer	0	NR	NR	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	T-61953	178.8	T-Line	2016	Shrub/Seedling	Conifer	0	Medium	67	Non-Fish
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	R-67099	191.2	Road	2016	NR	NR	NR	NR	NR	Non-Fish
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	T-67058	191.3	T-Line	2016	Grass/Forb	Non-forested	30	NS	NS	Non-Fish

[1] Crossing numbers used in 2016; those starting with "R" are roads crossings, and those starting with "T" are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
Codes : NR – not recorded, DNA – Does not apply, NS – Site not surveyed
HUC – Hydrologic Unit Code

Table D-3. Stream Habitat Conditions of Non-Fish Stream Road and Transmission Line Crossing Locations

6th Level (HUC 12)		Stream Name	Crossing ID [1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year [3]	Floodplain width (ft)	Bankfull Width (ft)	Flowing Width (ft)	Upstream Gradient (%)	Downstream Gradient (%)	Left Bank Channel Instability (%)	Right Bank Channel Instability (%)	Pools/ mile	Substrate (%)	Embeddedness (%)	Portions of Fines in Fast Water (%)	Fish Use
Watershed Name	Watershed Number																	
Slusher Canyon-Butter Creek	170701030906	Unnamed stream [1192143455270]	R-13058	36.9	Road	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Non-Fish
Lower East Birch Creek	170701030603	Unnamed Stream [1188272454537] (previously Spring Hollow)	T-20870	61.7	T-Line	2016	NS	NS	NS	8	3	NS	NS	NS	NS	NS	NS	Non-Fish
Wood Hollow-McKay Creek	170701030403	Little Rail Creek	T-23153	78.4	T-Line	2014	5 to 30	10	1.5	23	18	10	15	88	CO(40), BO(35), GR(25), SA(10)	30	10	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Unnamed stream	R-25185	84.8	Road	2014	8	4	0	4	1	<5	<5	DNA	SA(60), CO(40)	NR	NR	Non-Fish
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184156454783]	R-25394	85.2	Road	2014	10	2	0	2	2	<5	<5	DNA	SA(100)	100	100	Non-Fish
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	R-31352	99.6	Road	2016	5	3	NR	10	1	NA	NA	NR	CO(85), BO(10), BR(5)	NR	NR	Non-Fish
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	T-31396	99.7	T-Line	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Non-Fish
Gekeler Slough	170601040603	Deal Creek	R-33156	104.8	Road	2016	15	3	1	8	7	30	30	79	CO(60), GR(25), SA(15)	10	10	Non-Fish
Gekeler Slough	170601040603	Deal Creek	T-33164	104.8	T-Line	2016	8	3	3	7	11	10	10	NR	CO(50), GR(30), SA(10), BO(10)	NR	NR	Non-Fish
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	R-35660	110.9	Road	2016	5	3	0	22	22	0	0	0	GR(45), CO(40), BO(10), SA(5)	10	5	Non-Fish
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	T-35662	110.9	T-Line	2016	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream [1180301452110]	R-37018	114.1	Road	2016	NR	2	NR	NR	NR	NR	NR	NR	NR	NR	NR	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37117	114.9	Road	2016	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37121	115	Road	2016	12	12	NR	23	1	50	20	NR	CO(50), BO(25), GR(20), SA(5)	NR	NR	Non-Fish
Upper Ladd Creek	170601040601	Unnamed stream	R-37124	115.2	Road	2016	20	6	NR	1	2	5	5	NR	SA(60), GR(30), CO(10)	NR	NR	Non-Fish
East Fork Ladd Creek	170601040602	Unnamed stream [1180138451966]	T-38337	117.4	T-Line	2014	5	3	0	7	7	25	25	DNA	SA(50), GR(50)	15	NR	Non-Fish
Lower Alder Creek	170502020703	Straw Ranch Creek	T-56168	164.3	T-Line	2014	6	1.3	0	5	6	15	30	DNA	SA(100)	100	100	Non-Fish
Lower Alder Creek	170502020703	Low Creek	T-56762	165.6	T-Line	2014	5	2	1.6	3	3	10	10	0	GR(75), SA(20), BR(5)	10	10	Non-Fish
Powell Creek-Burnt River	170502020603	Unnamed Stream [1174989445634] (previously True Blue Gulch)	R-59743	174	Road	2016	8	2.5	NR	3	15	NR	NR	NR	SA(55), GR(40), CO(5)	NR	NR	Non-Fish

Table D-3.Stream Habitat Conditions of Non-Fish Stream Road and Transmission Line Crossing Locations (continued)

6th Level (HUC 12)		Stream Name	Crossing ID [1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year [3]	Floodplain width (ft)	Bankfull Width (ft)	Flowing Width (ft)	Upstream Gradient (%)	Downstream Gradient (%)	Left Bank Channel Instability (%)	Right Bank Channel Instability (%)	Pools/ mile	Substrate (%)	Embeddedness (%)	Portions of Fines in fast water (%)	Fish Use
Watershed Name	Watershed Number																	
Shirttail Creek-Burnt River	170502020803	French Creek	T-60872	176.3	T-Line	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	R-61298	177.5	Road	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Non-Fish
Shirttail Creek-Burnt River	170502020803	Ray Creek	T-61670	178.2	T-Line	2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61864	178.7	Road	2016	200	6.5	NR	15	3	80	50	NR	SA(70), GR(20), CO(10)	NR	NR	Non-Fish
Shirttail Creek-Burnt River	170502020803	French Creek	R-61839	178.8	Road	2016	58	2.5	0	14	2	10	10	0	CO(45), GR(35), SA(20)	30	15	Non-Fish
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	T-61953	178.8	T-Line	2016	68	6.3	1	4	6	50	50	0	SA(80), GR(10), CO(5), BO(5)	85	90	Non-Fish
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	R-67099	191.2	Road	2016	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Non-Fish
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	T-67058	191.3	T-Line	2016	20	6	0	8	8	10	5	0	CO(60), GR(15), BO(20), SA(5)	NR	NR	Non-Fish

[1] Crossing numbers used in 2016; those starting with “R” are roads crossings, and those starting with “T” are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
Codes : NR – not recorded, DNA – Does not apply, NS – Site not surveyed
HUC – Hydrologic Unit Code
Substrate Codes: SA – sand/silt/clay, GR – gravel, CO – cobble, BO – boulder, SB – small boulder, BR – bedrock

Table D-4. Risk Ratings of Non-Fish Stream Road and Transmission Line Crossings

6th Level (HUC 12)		Stream Name	Crossing ID[1]	Nearest Proposed Route Milepost[2]	Crossing Type	Evaluation Year[3]	Ownership	Risk Rating	
Watershed Name	Watershed Number							Stream	Project
Slusher Canyon-Butter Creek	170701030906	Unnamed stream [1192143455270]	R-13058	36.9	Road	2016	Private	NS	NS
Lower East Birch Creek	170701030603	Unnamed Stream [1188272454537] (previously Spring Hollow)	T-20870	61.7	T-Line	2016	Private	Medium	Medium
Wood Hollow-McKay Creek	170701030403	Little Rail Creek	T-23153	78.4	T-Line	2014	Private	Low	Low
Beaver Creek-Meacham Creek	170701030201	Unnamed stream	R-25185	84.8	Road	2014	Private	Medium	Medium
Beaver Creek-Meacham Creek	170701030201	Unnamed stream [1184156454783]	R-25394	85.2	Road	2014	Private	Medium	Low
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	R-31352	99.6	Road	2016	Private	Medium	Medium
Coleman Ridge-Grande Ronde River	170601040307	Unnamed stream [1182386453299]	T-31396	99.7	T-Line	2016	Private	NS	NS
Gekeler Slough	170601040603	Deal Creek	R-33156	104.8	Road	2016	Private	Medium	Medium
Gekeler Slough	170601040603	Deal Creek	T-33164	104.8	T-Line	2016	Private	Low	Low
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	R-35660	110.9	Road	2016	Private	Medium	Low
Lower Ladd Creek	170601040604	Unnamed stream [1180443452583]	T-35662	110.9	T-Line	2016	Private	Low	Low
Upper Ladd Creek	170601040601	Unnamed stream [1180301452110]	R-37018	114.1	Road	2016	Private	Low	Low
Upper Ladd Creek	170601040601	Unnamed stream	R-37117	114.9	Road	2016	Private	Low	Medium
Upper Ladd Creek	170601040601	Unnamed stream	R-37121	115	Road	2016	Private	Low	Low
Upper Ladd Creek	170601040601	Unnamed stream	R-37124	115.2	Road	2016	Private	Low	Low
East Fork Ladd Creek	170601040602	Unnamed stream [1180138451966]	T-38337	117.4	T-Line	2014	Private	High	Medium
Lower Alder Creek	170502020703	Straw Ranch Creek	T-56168	164.3	T-Line	2014	Private	High	Medium
Lower Alder Creek	170502020703	Low Creek	T-56762	165.6	T-Line	2014	Private	High	Medium
Powell Creek-Burnt River	170502020603	Unnamed Stream [1174989445634] (previously True Blue Gulch)	R-59743	174	Road	2016	Private	Medium	Medium
Shirttail Creek-Burnt River	170502020803	French Creek	T-60872	176.3	T-Line	2016	Private	NS	NS
Shirttail Creek-Burnt River	170502020803	French Creek	R-61298	177.5	Road	2016	BLM	NS	NS
Shirttail Creek-Burnt River	170502020803	Ray Creek	T-61670	178.2	T-Line	2016	Private	NS	NS
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	R-61864	178.7	Road	2016	Private	Low	Medium
Shirttail Creek-Burnt River	170502020803	French Creek	R-61839	178.8	Road	2016	Private	Medium	Medium
Shirttail Creek-Burnt River	170502020803	Shirttail Creek	T-61953	178.8	T-Line	2016	Private	Low	High
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	R-67099	191.2	Road	2016	BLM	NS	NS
Durbin Creek-Burnt River	170502020809	Unnamed stream [1172894443660]	T-67058	191.3	T-Line	2016	Private	Low	Low

[1] Crossing numbers used in 2016; those starting with “R” are roads crossings, and those starting with “T” are transmission line crossings.
[2] Nearest milepost is all relative to the Proposed Route location.
[3] Survey year where crossing data and habitat data were collected. In some cases, the most suitable information on the crossing site or stream habitat was collected in different years.
Codes : NR – not recorded, NS – Site not surveyed
HUC – Hydrologic Unit Code

APPENDIX E
ROAD AND TRANSMISSION LINE FISH STREAM CROSSINGS AND RISK RATING FIGURES

LOWER LITTLE BUTTER CREEK

MORROW COUNTY

MIDDLE LITTLE BUTTER CREEK

AYERS CANYON -BUTTER CREEK

R-08916

R-08883

T-08977

T-09139

27

28

29

Little Butter Creek

Butter Creek

Stream, Project Risk
- Low, Low
- Low, Medium
- Medium, Low
- Medium, Medium
- Medium, High
- High, Low
- High, Medium
- High, High
- Not Surveyed

Fish Distribution
- Anadromous Fish
- Resident Fish
- Non-Fish
- 6th Field Subwatershed

Crossing ID

IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

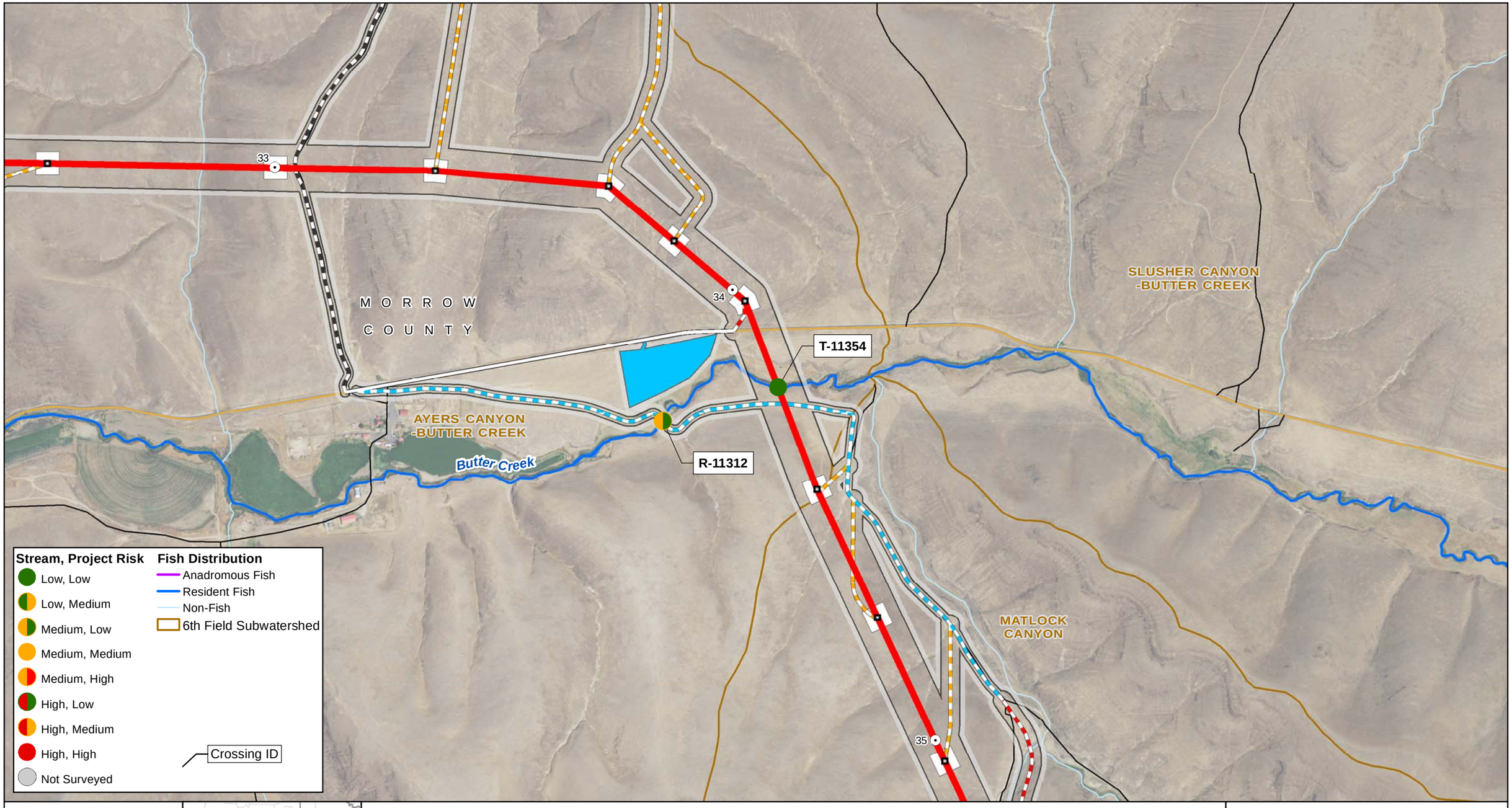
Basemap
- Primary Limited Acess or Interstate
- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP27 - MP29
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

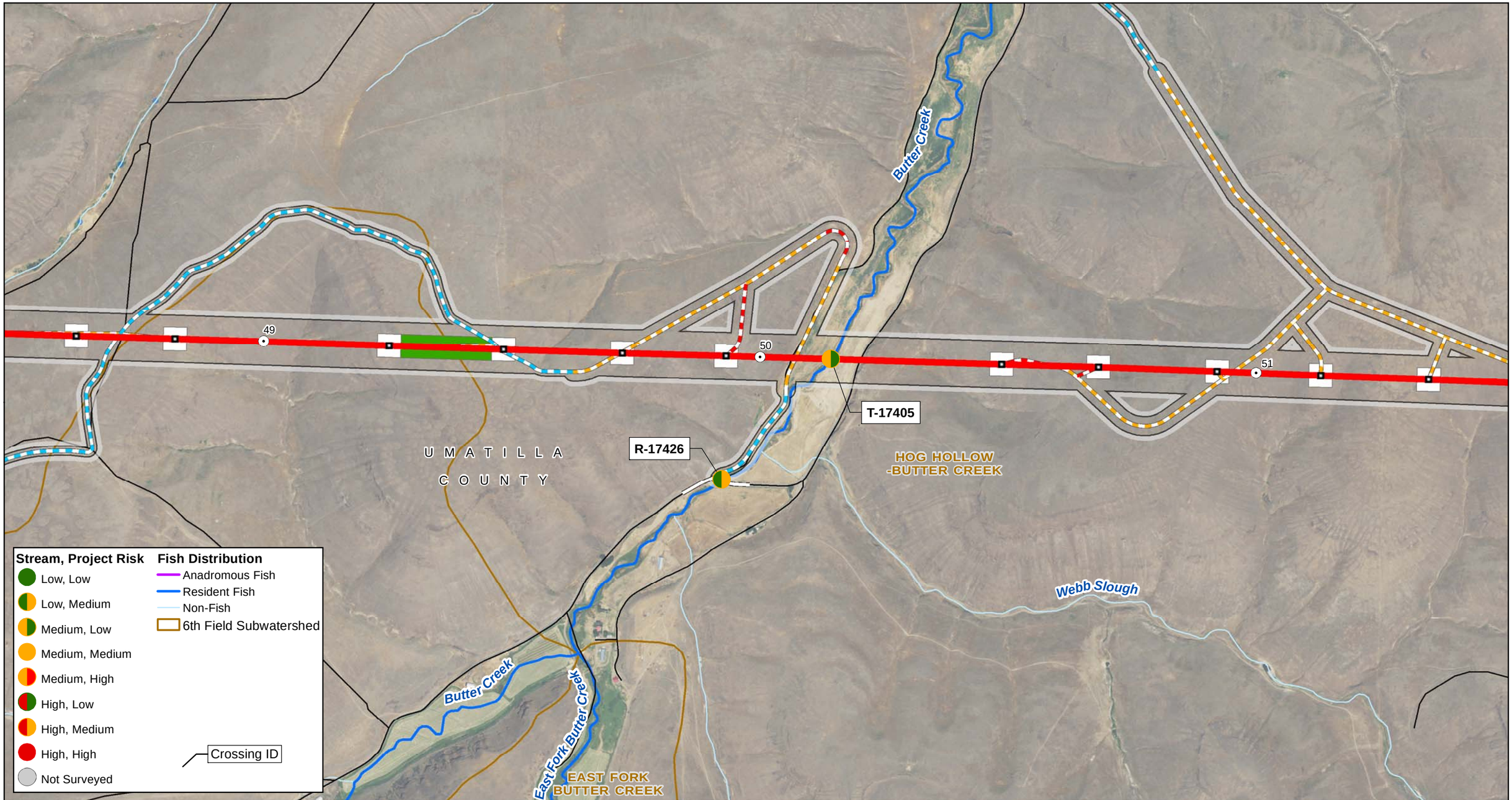
Basemap
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- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP33 - MP35
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Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

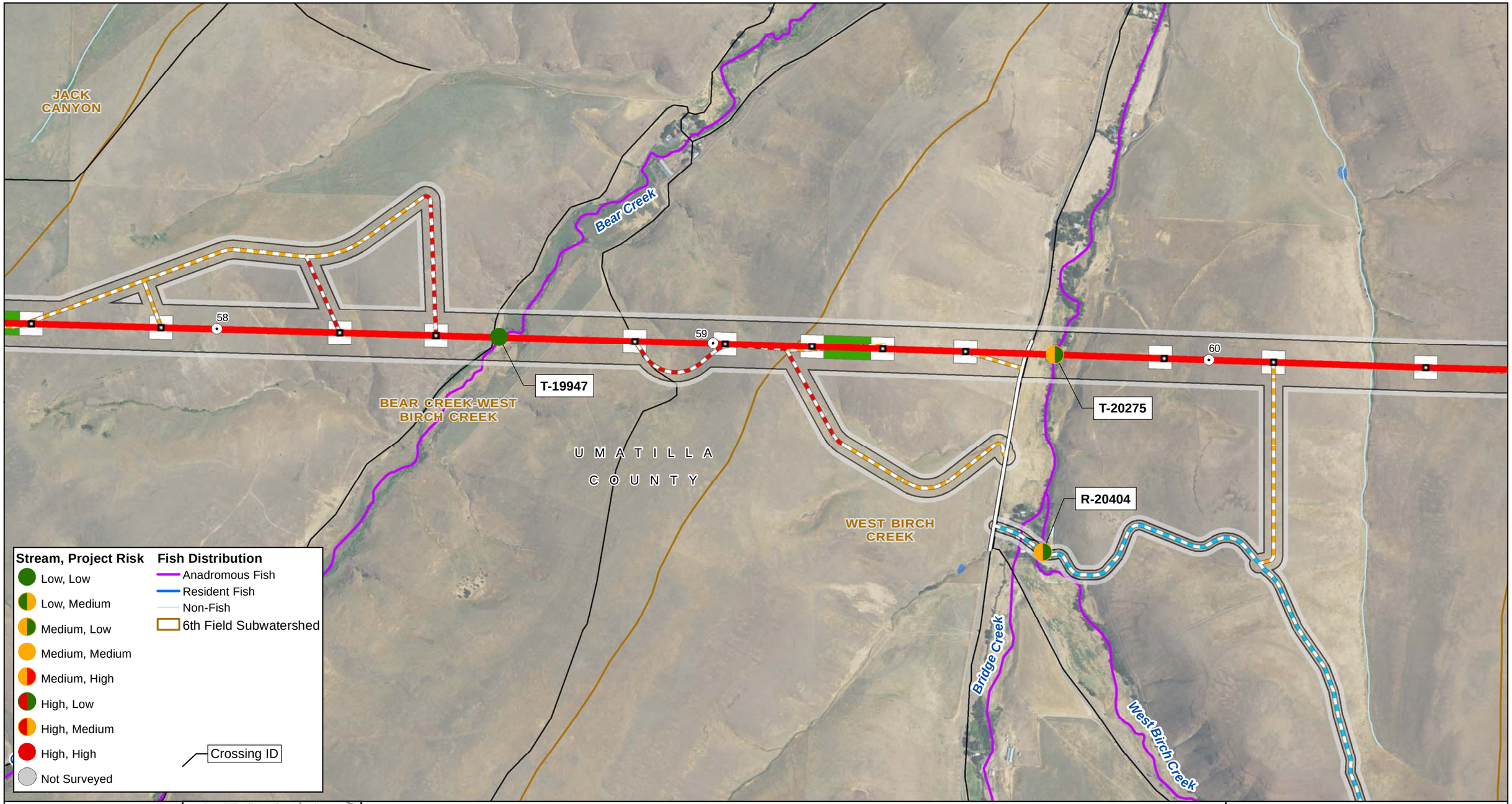
Basemap
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- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP49 - MP51

Idaho Power Company
Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

Basemap
- Primary Limited Acess or Interstate
- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP58 - MP60
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

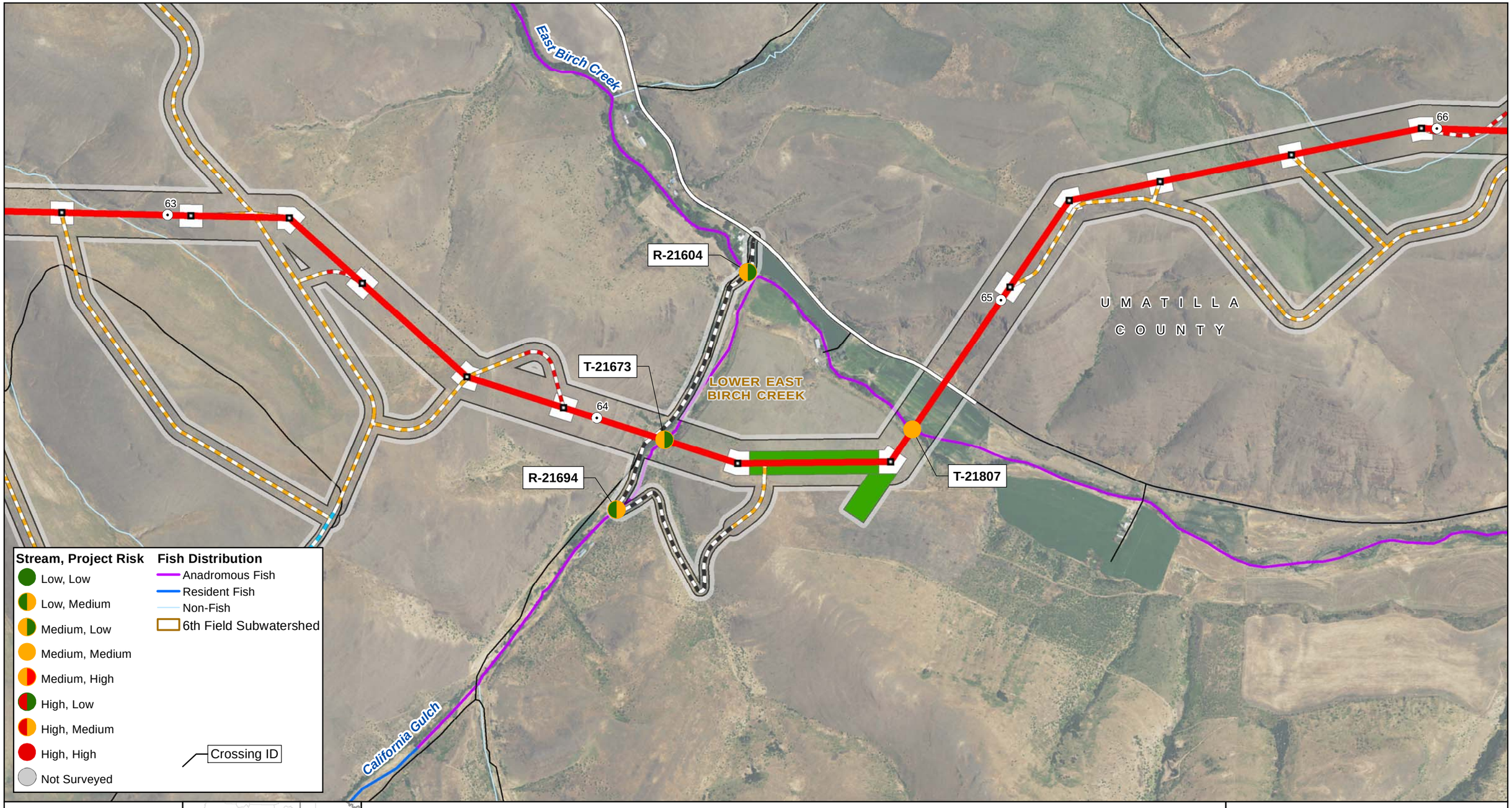
Basemap
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- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP62 - MP65
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October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

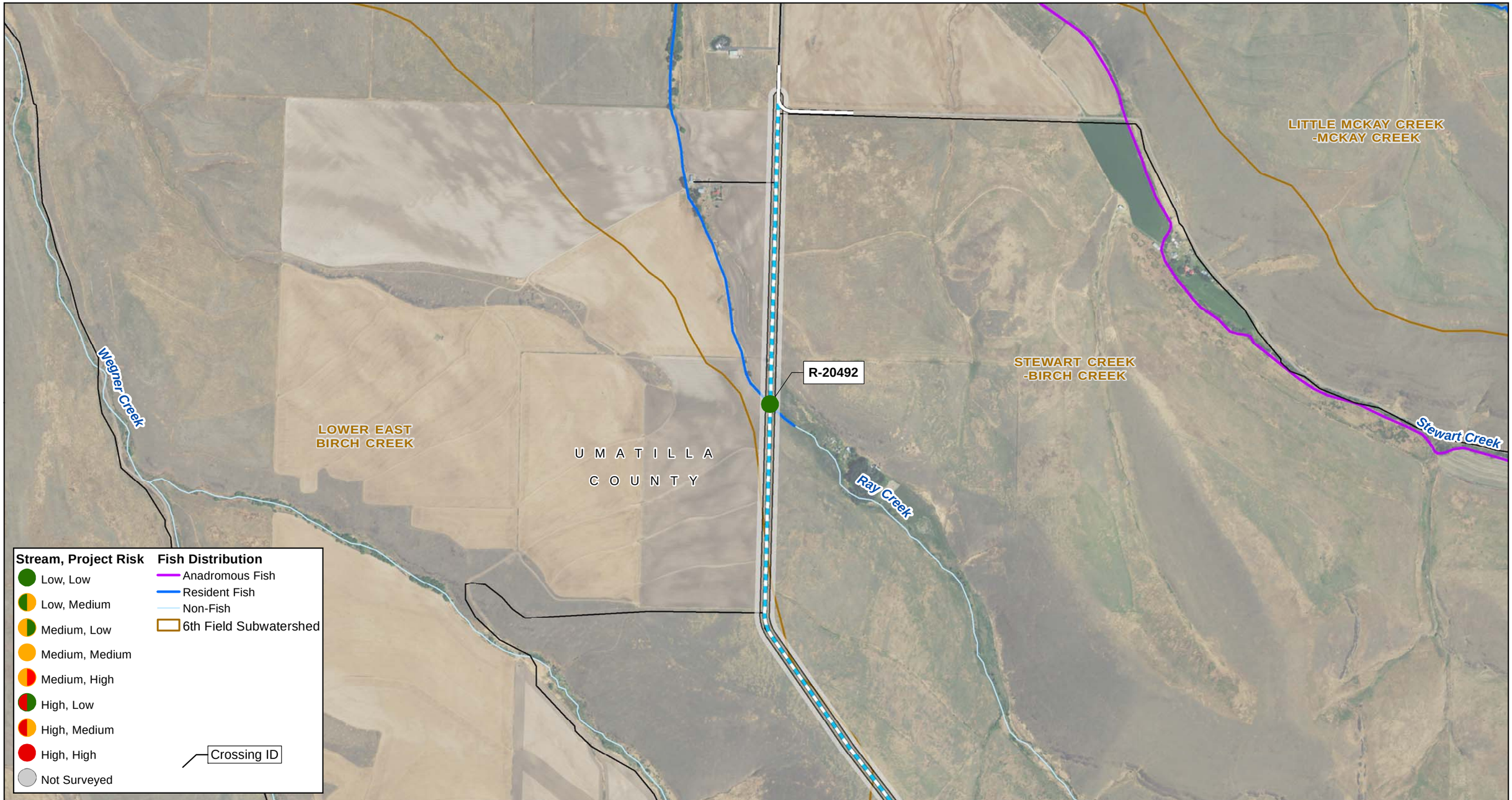
Basemap
- Primary Limited Acess or Interstate
- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP63 - MP66
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

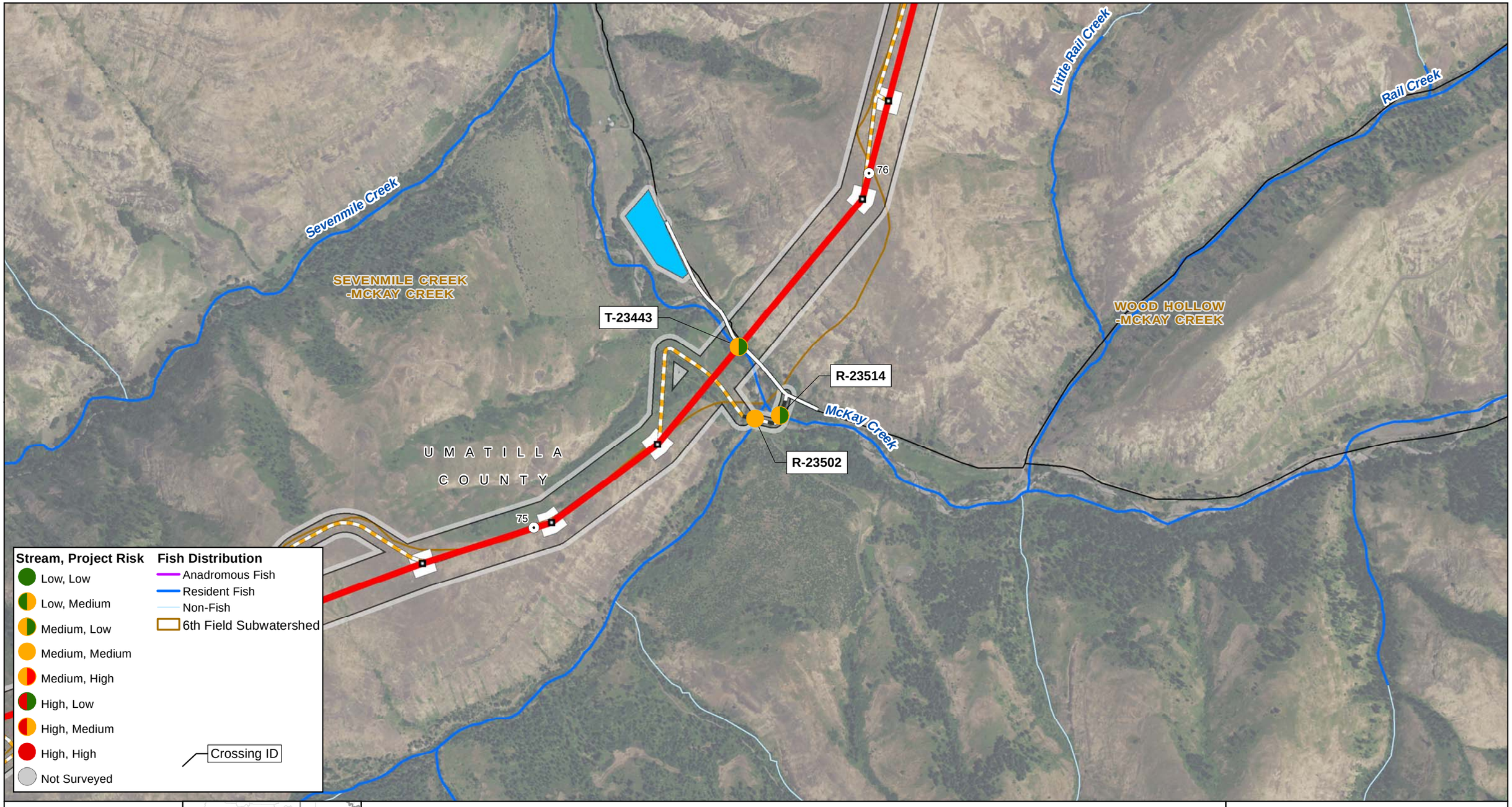
Basemap
- Primary Limited Acess or Interstate
- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
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Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

Basemap
- Primary Limited Acess or Interstate
- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP74 - MP76
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

October 2016

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Rail Creek

Calamity Creek

LOWER NORTH FORK
MCKAY CREEK

U M A T I L L A

C O U N T Y

80

81

WOOD HOLLOW
-MCKAY CREEK

T-23539

SNIPE CREEK
-MCKAY CREEK

Stream, Project Risk
- Low, Low
- Low, Medium
- Medium, Low
- Medium, Medium
- Medium, High
- High, Low
- High, Medium
- High, High
- Not Surveyed

Fish Distribution
- Anadromous Fish
- Resident Fish
- Non-Fish
- 6th Field Subwatershed

Crossing ID

IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
- Existing, 21-70% Improved
- Existing, 71-100% Improved
- New, Bladed
- New, Primitive

Project Work Areas
- Communication Station
- Light-Duty Fly Yard
- Multi-Use Area
- Pulling and Tensioning
- Structure Work Area (Removal Only)
- Structure Work Area
- Site Boundary

Basemap
- Primary Limited Acess or Interstate
- Primary US and State Highways
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- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP79 - MP81
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Boardman to Hemingway
Transmission Line Project

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R-24242

R-24303

R-24664

LOWER NORTH FORK
MCKAY CREEK

U M A T I L L A
C O U N T Y

BUTCHER CREEK
-MEACHAM CREEK

BEAVER CREEK
-MEACHAM CREEK

Twomile Creek

Meachem Creek

Tod Creek

Beaver Creek

Stream, Project Risk
- Low, Low
- Low, Medium
- Medium, Low
- Medium, Medium
- Medium, High
- High, Low
- High, Medium
- High, High
- Not Surveyed

Fish Distribution
- Anadromous Fish
- Resident Fish
- Non-Fish
- 6th Field Subwatershed

Crossing ID

IDAHO POWER
An IDACORP Company

0 1,000
Feet

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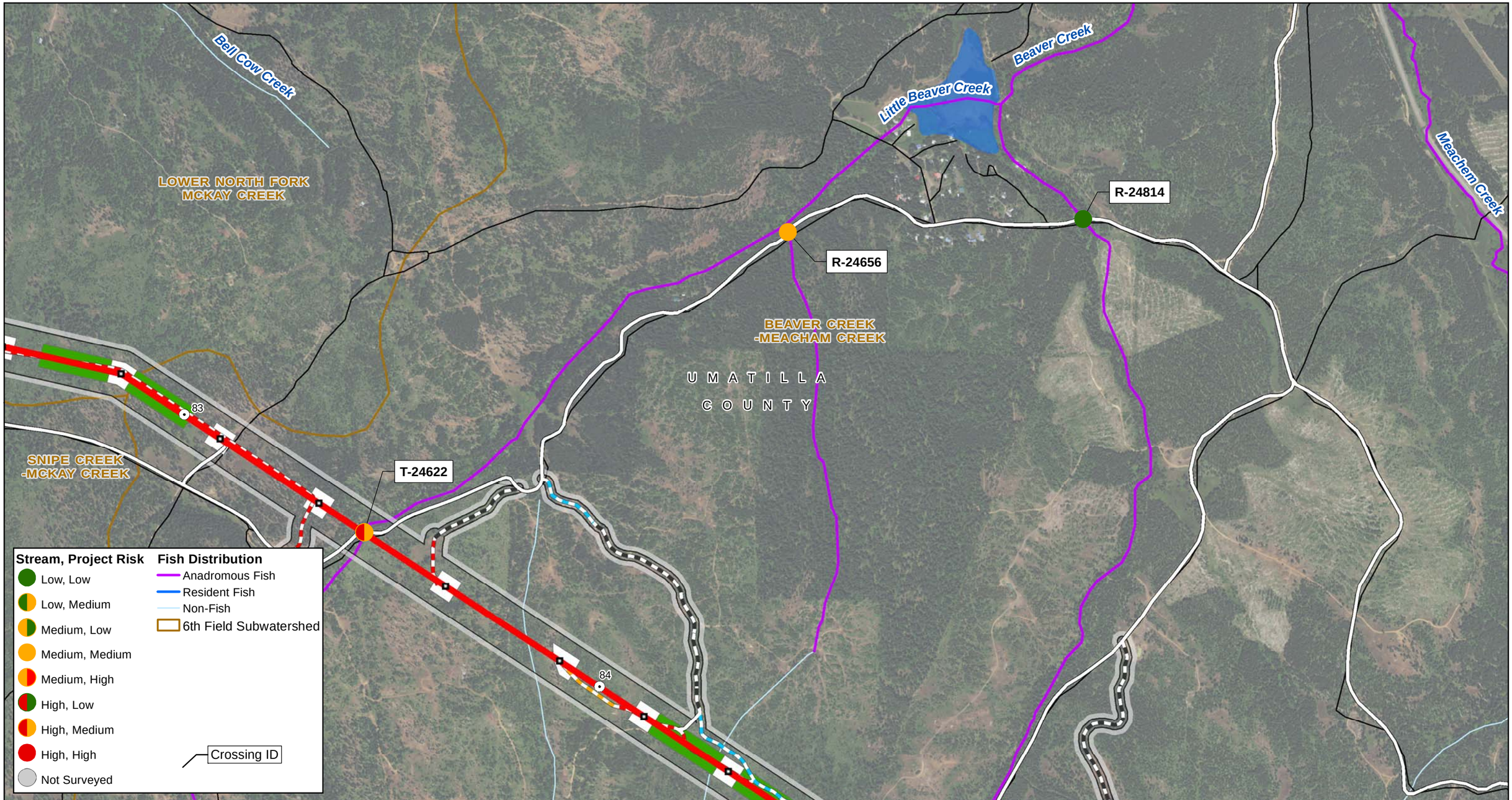
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- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP83 - MP85
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

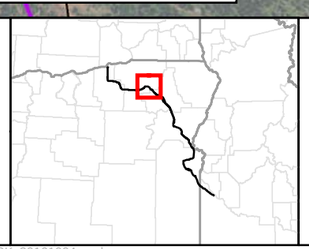
October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet



Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP83 - MP85
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Boardman to Hemingway
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T-25186

85

86

R-25593

Beaver Creek

Little Beaver Creek

Meachem Creek

UMATILLA
COUNTY

BEAVER CREEK
-MEACHAM CREEK

Stream, Project Risk
- Low, Low
- Low, Medium
- Medium, Low
- Medium, Medium
- Medium, High
- High, Low
- High, Medium
- High, High
- Not Surveyed

Fish Distribution
- Anadromous Fish
- Resident Fish
- Non-Fish
- 6th Field Subwatershed

Crossing ID

IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
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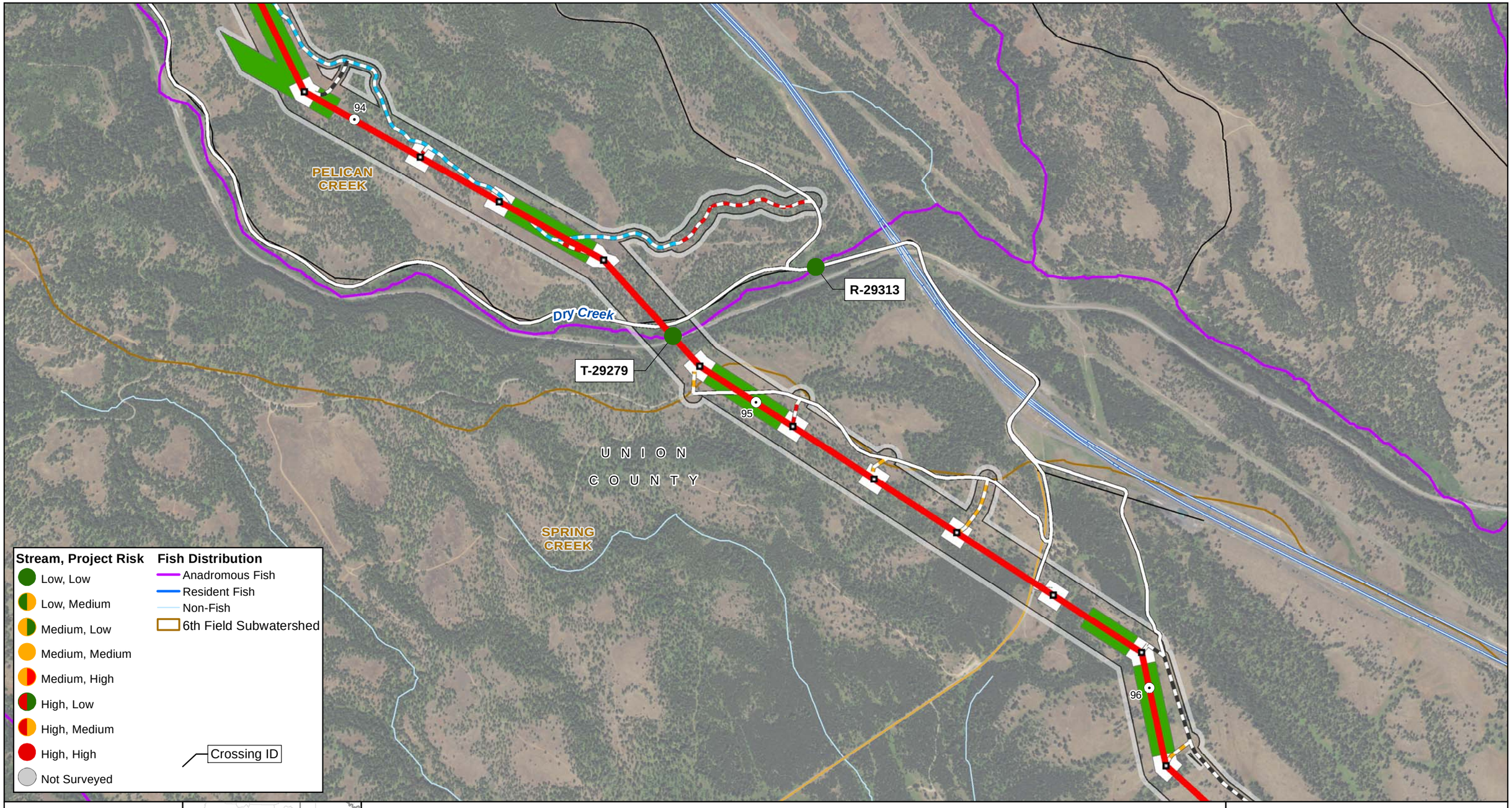
Basemap
- Primary Limited Acess or Interstate
- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP85 - MP86
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Transmission Line Project

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
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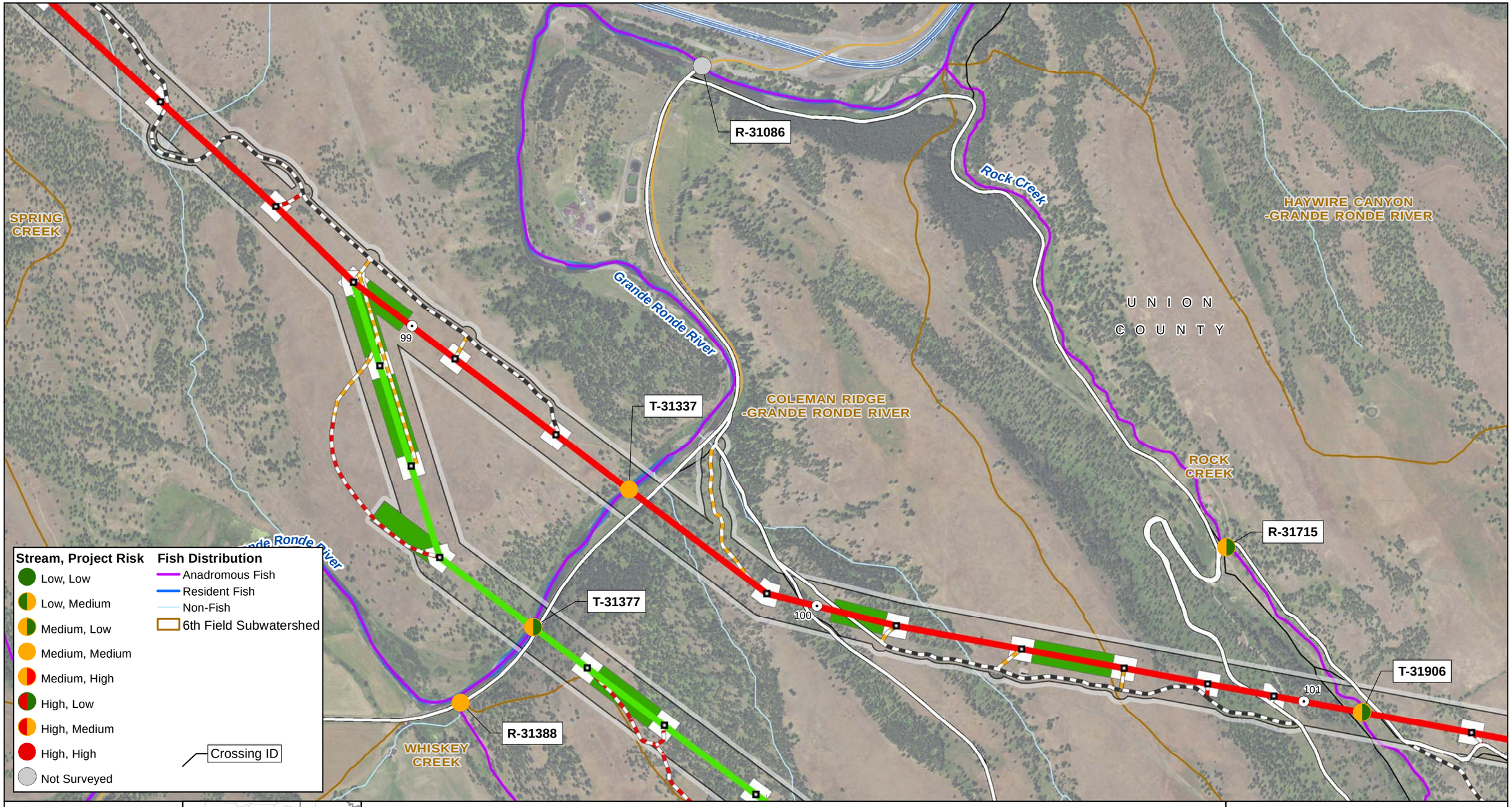
Basemap
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- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP94 - MP96
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
- Existing, No Substantial Improvements
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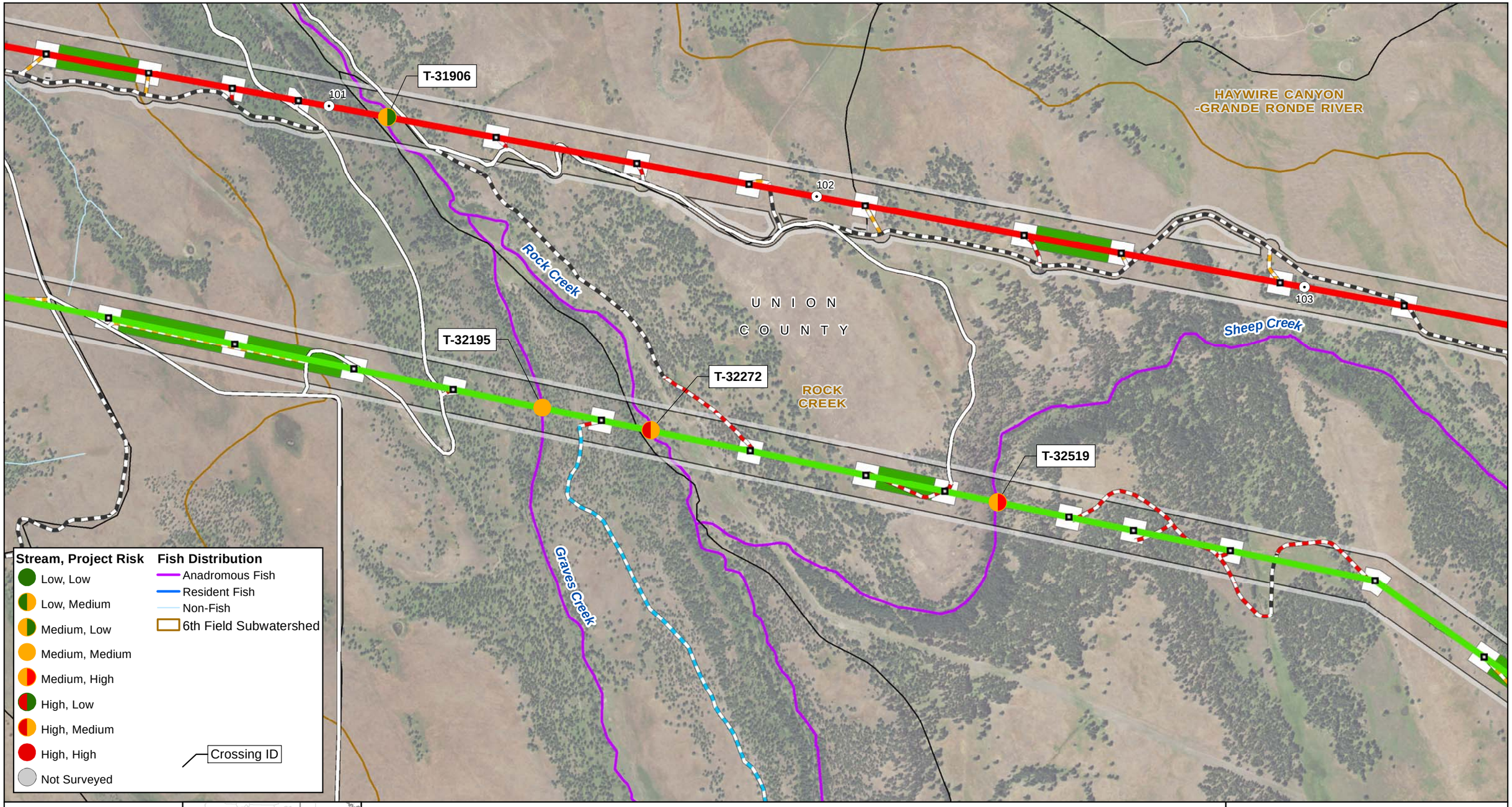
Basemap
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- Primary US and State Highways
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- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP98 - MP101
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

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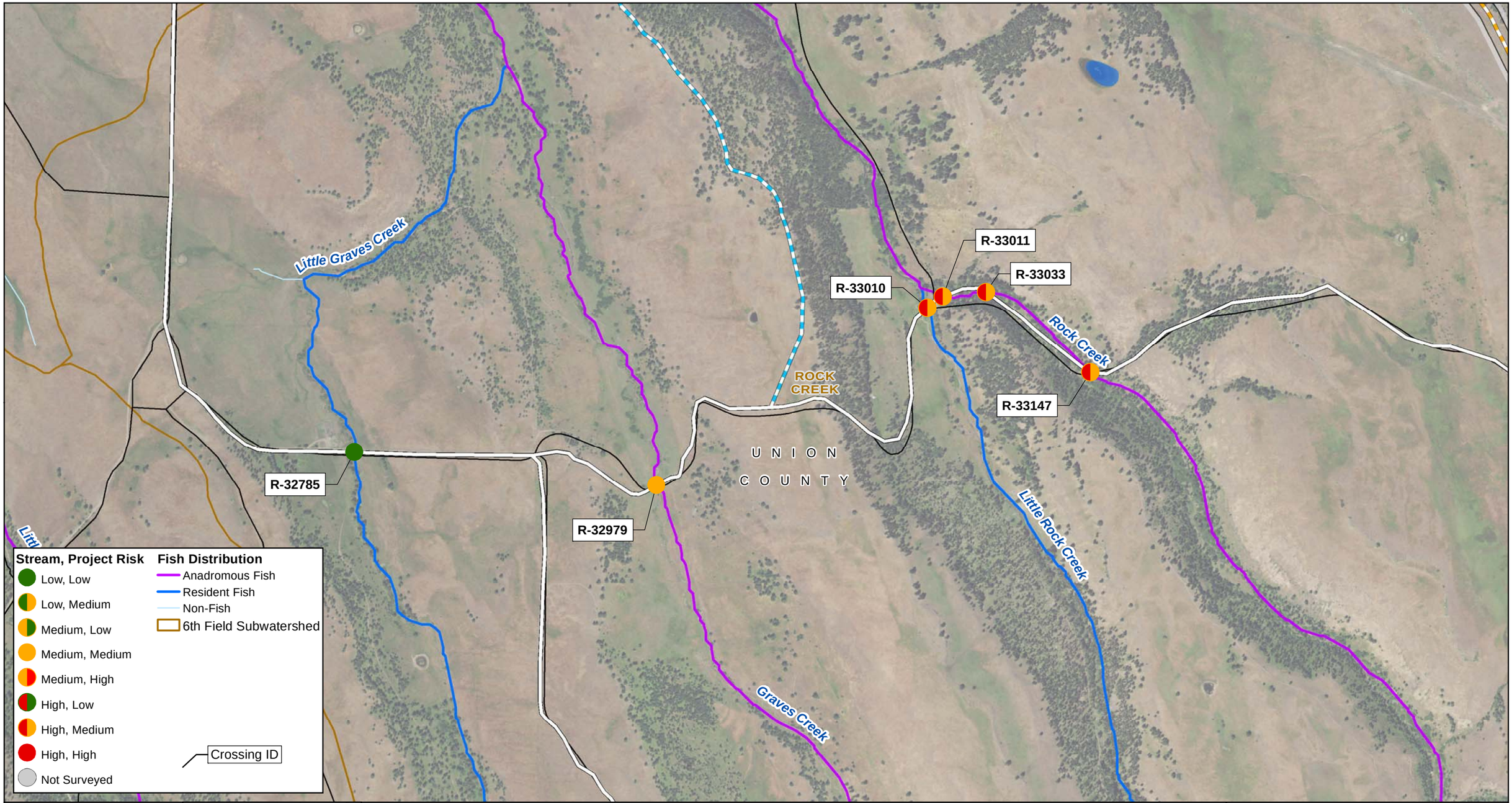
Basemap
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- Primary US and State Highways
- Secondary State and County Highways
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- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP101 - MP103
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
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- Alternative Route
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- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP101 - MP103
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
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- Alternative Route
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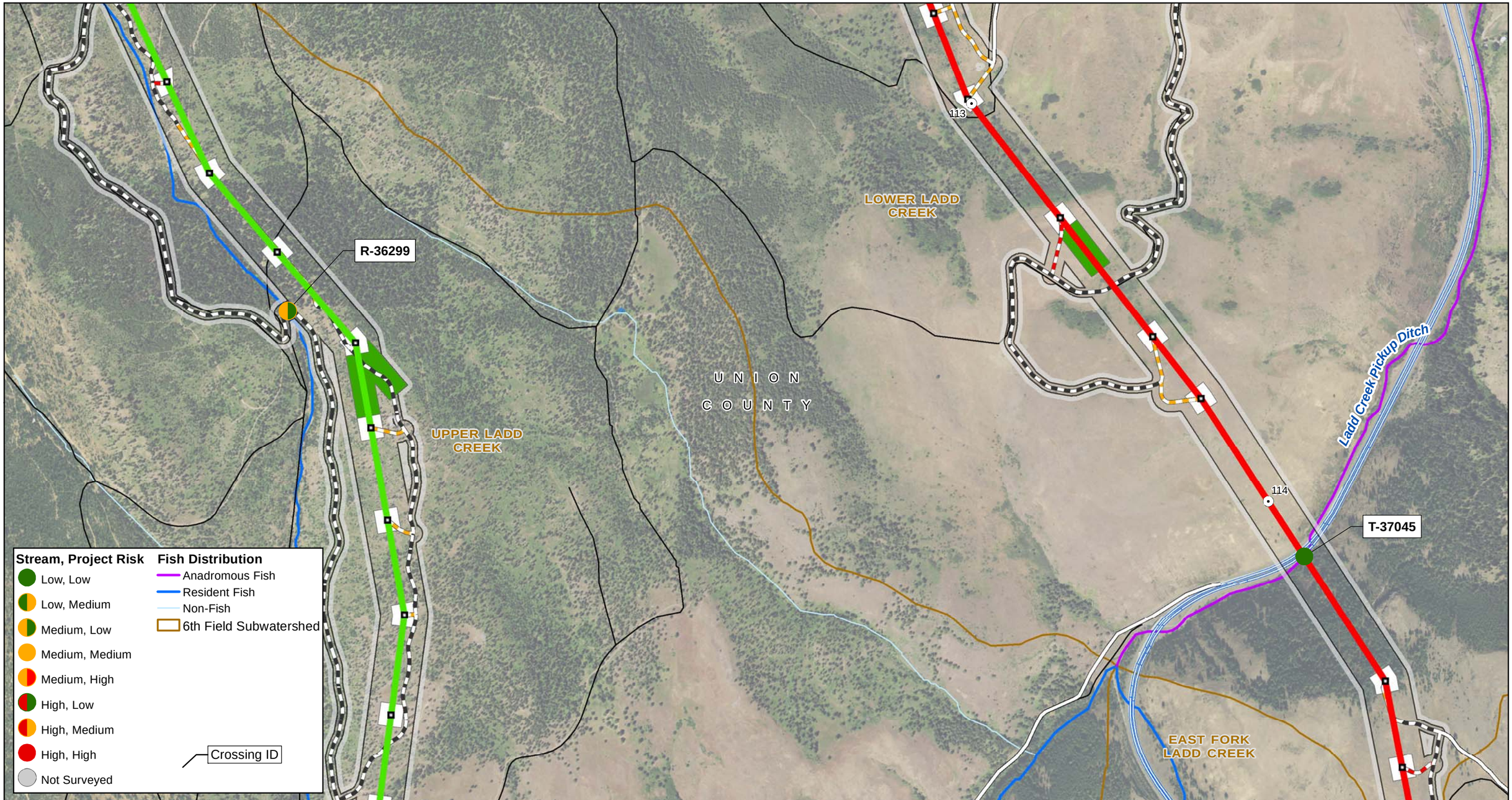
Basemap
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- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP106 - MP107
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

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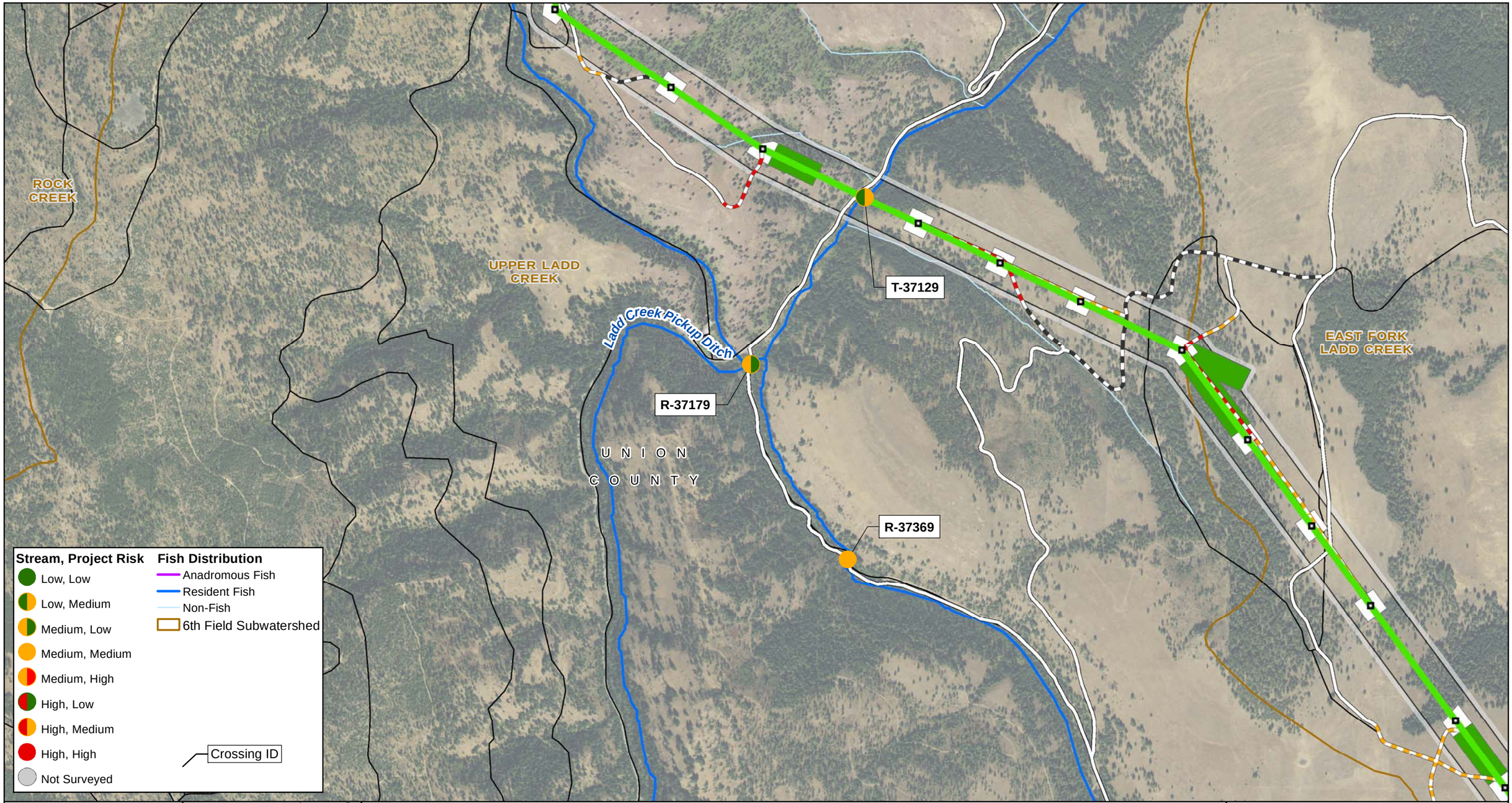
Basemap
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- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP113 - MP114
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
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- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP115 - MP116
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T-37694

R-38011

R-37969

R-38059

EAST FORK
LADD CREEK

116

U N I O N

C O U N T Y

Stream, Project Risk
- Low, Low
- Low, Medium
- Medium, Low
- Medium, Medium
- Medium, High
- High, Low
- High, Medium
- High, High
- Not Surveyed

Fish Distribution
- Anadromous Fish
- Resident Fish
- Non-Fish
- 6th Field Subwatershed

Crossing ID

IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
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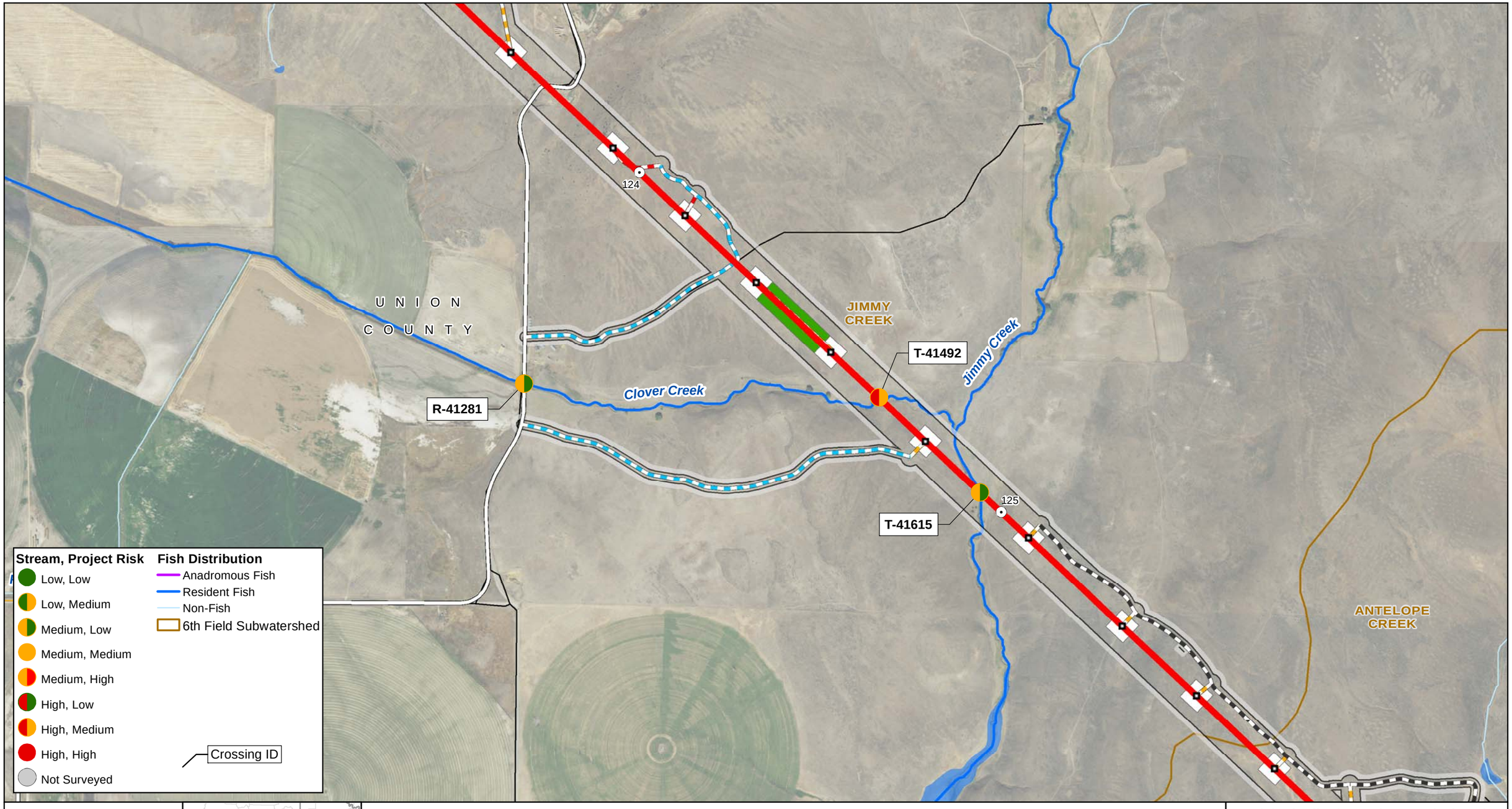
Basemap
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- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP116 - MP117
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
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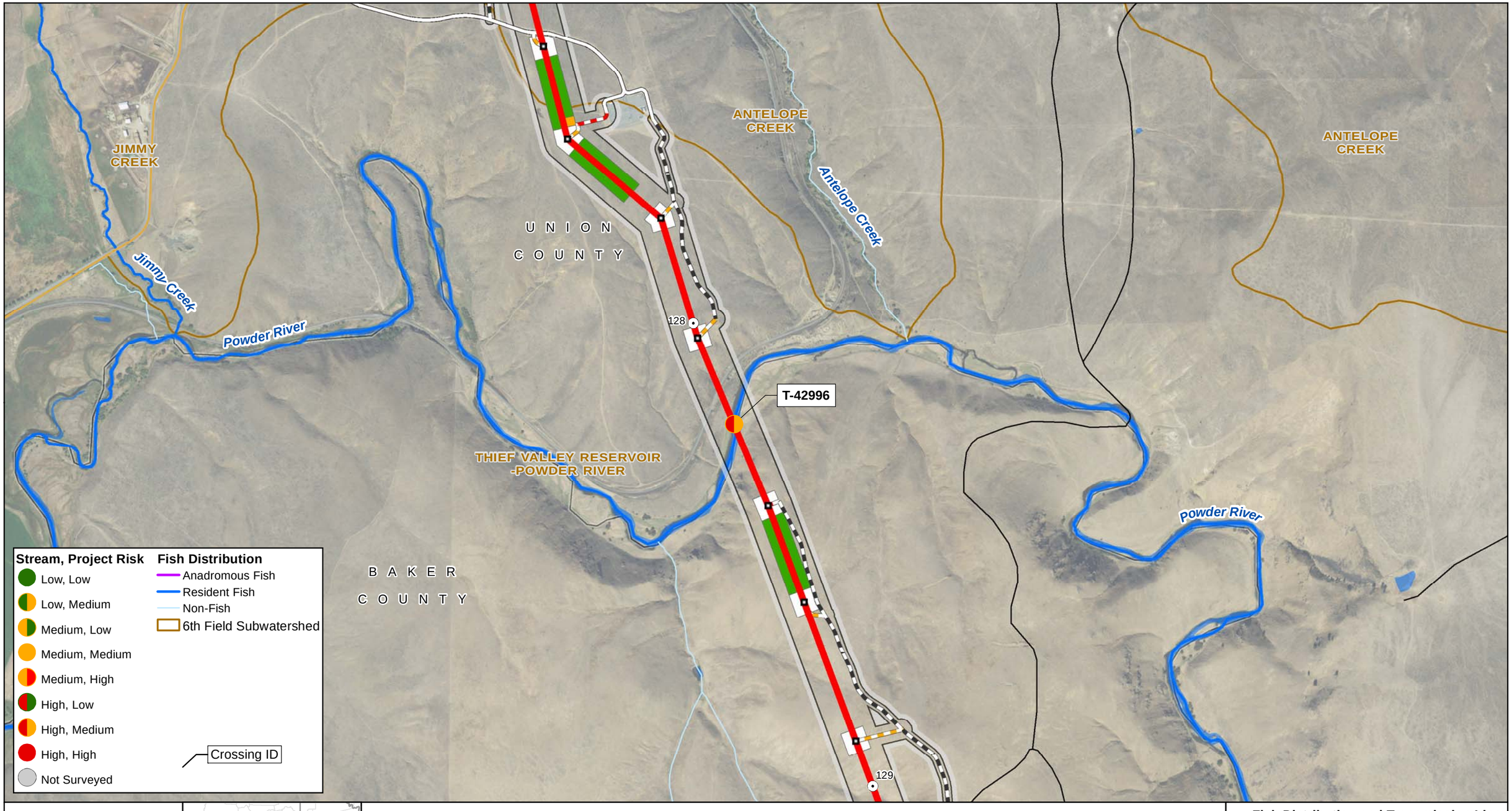
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- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP124 - MP126
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Boardman to Hemingway
Transmission Line Project

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IDAHO POWER An IDACORP Company

0 1,000
Feet

Project Routes
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP131 - MP132
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
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- Primary US and State Highways
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- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
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Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
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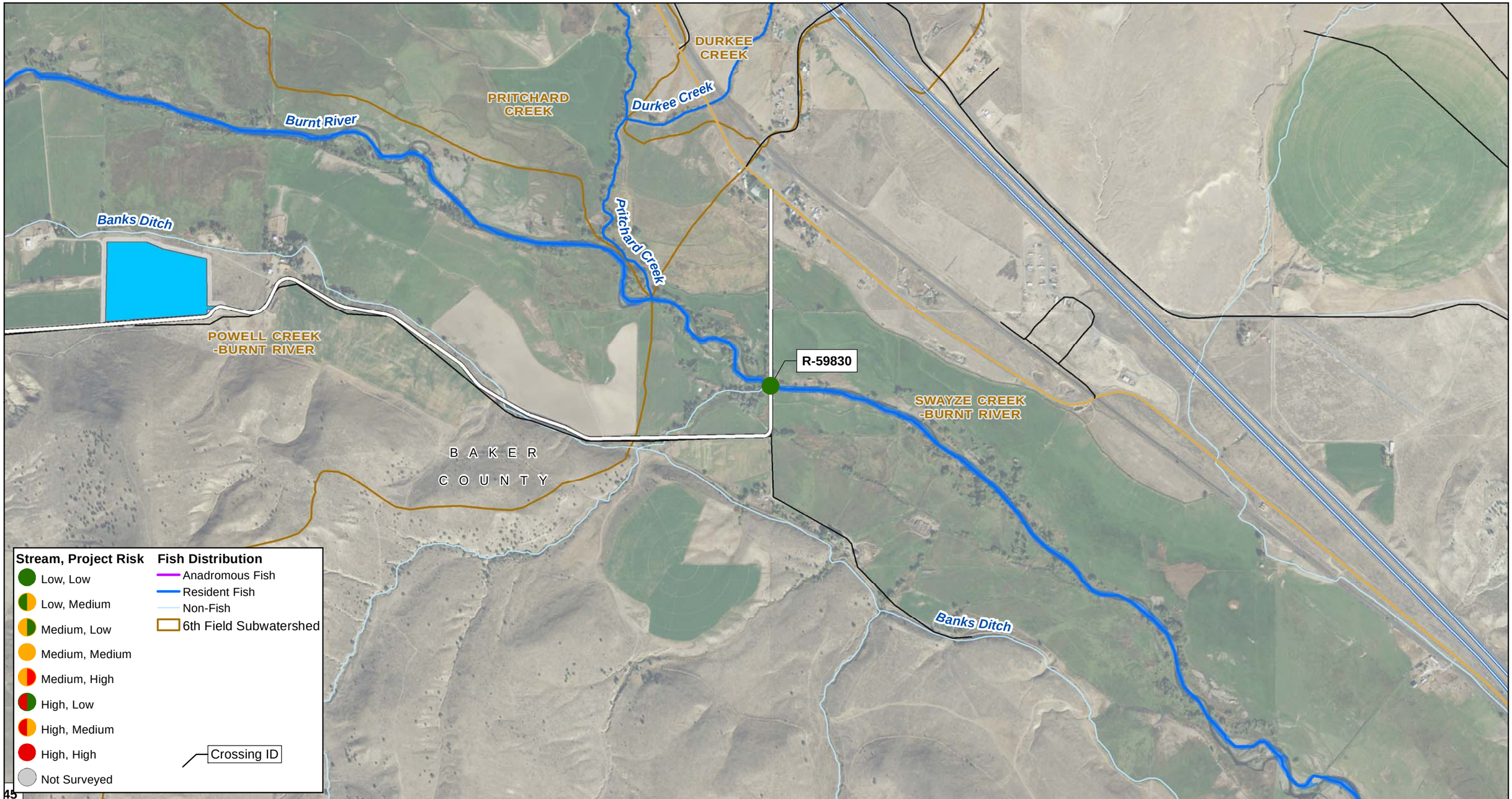
Basemap
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- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP171 - MP173
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

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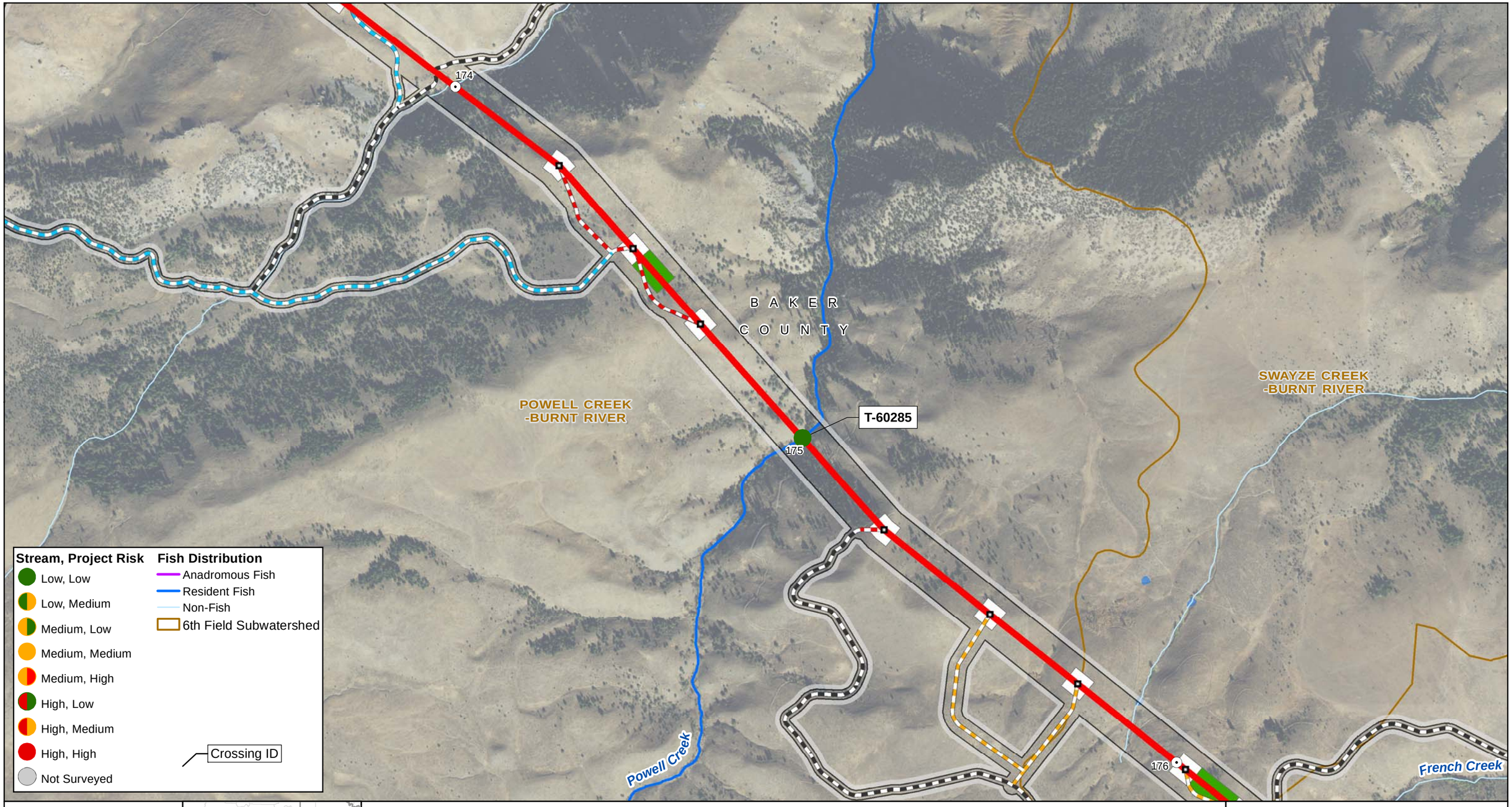
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- Primary US and State Highways
- Secondary State and County Highways
- Local, neighborhood, rural or City Street
- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP173 - MP175
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Boardman to Hemingway
Transmission Line Project

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

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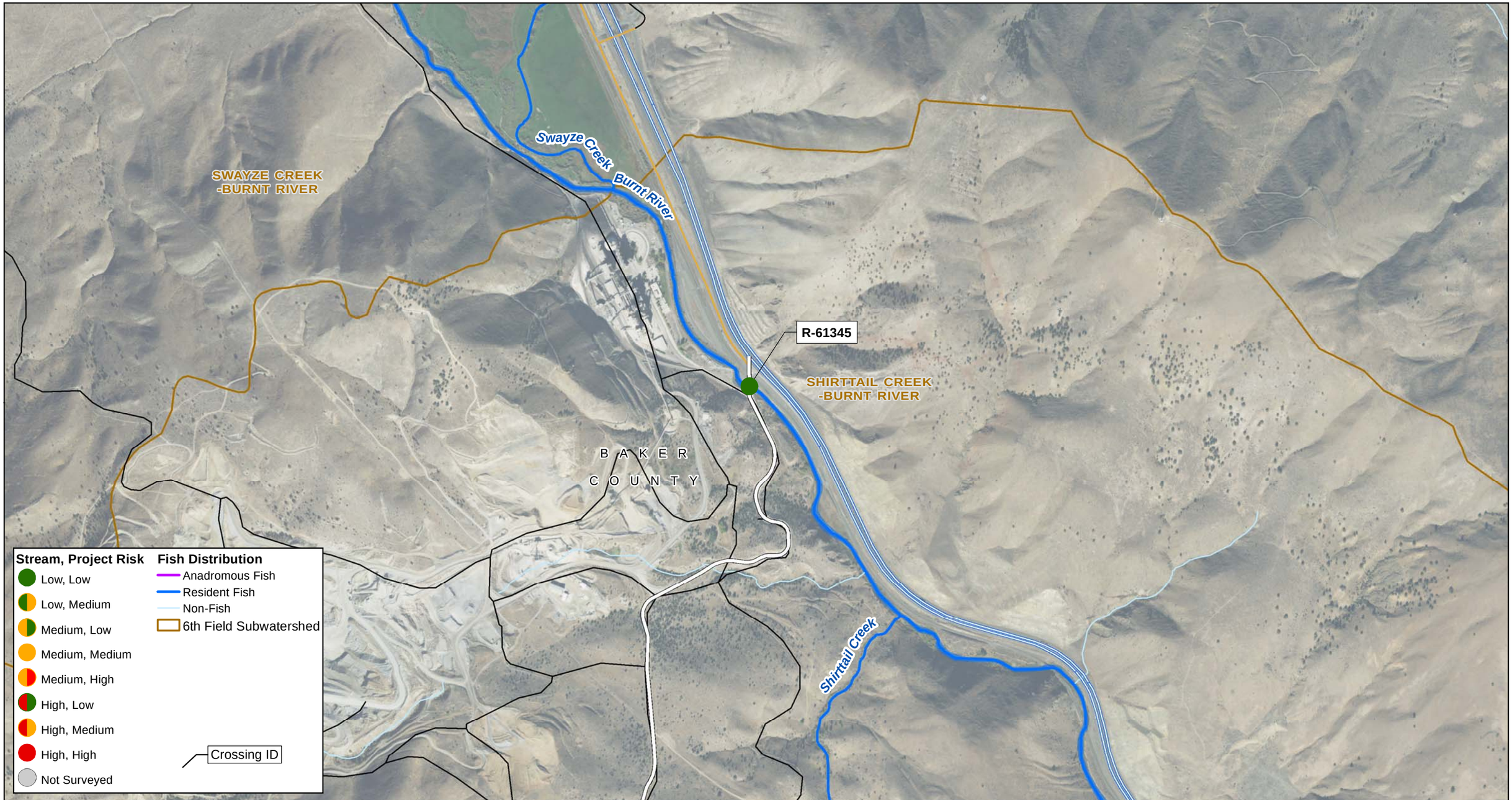
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- State Boundary
- County Boundary

Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP174 - MP176
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Boardman to Hemingway
Transmission Line Project

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
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Project Work Areas
- Communication Station
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- Multi-Use Area
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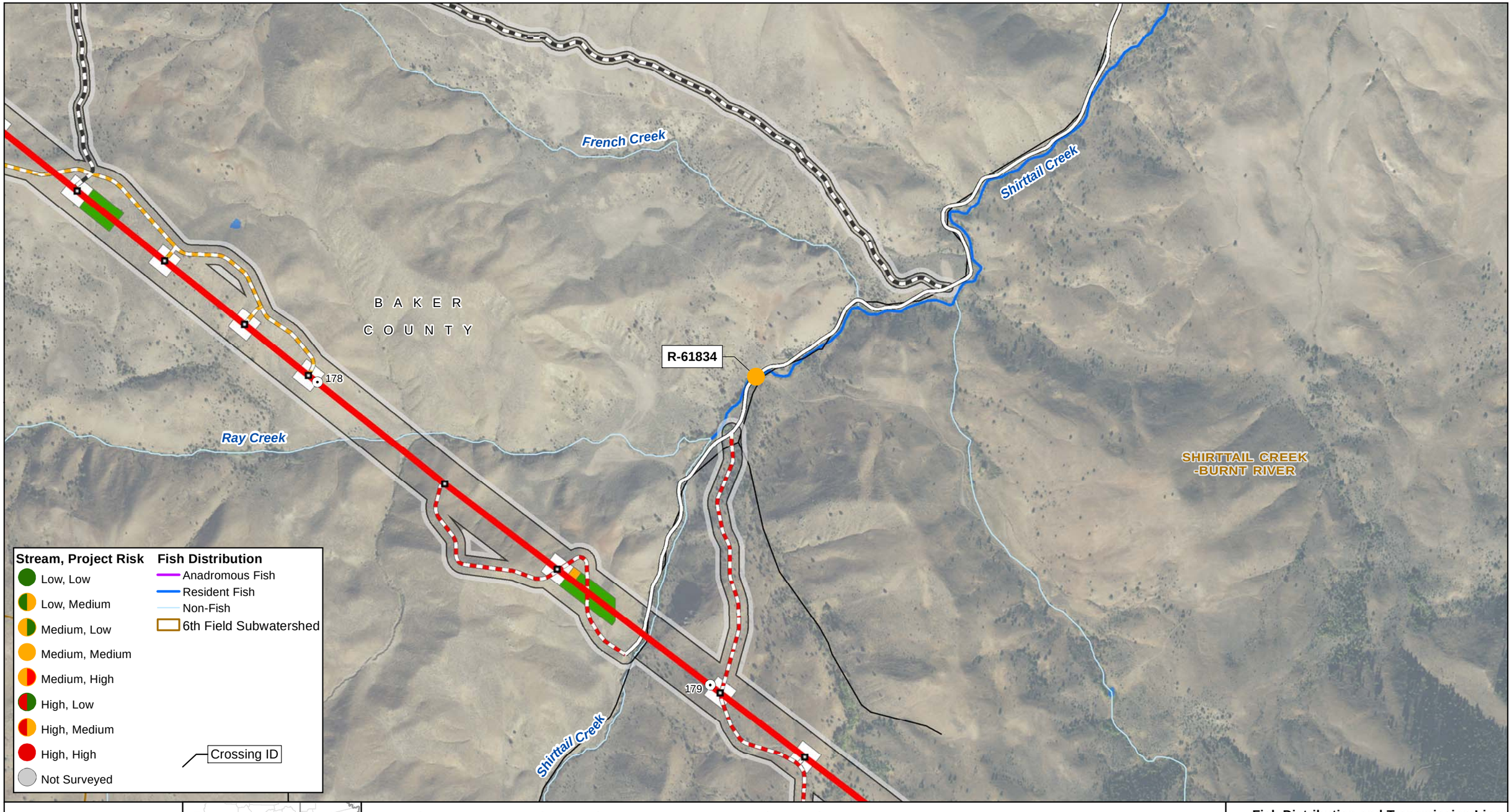
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP177 - MP179
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
- Proposed Route
- Proposed Removal
- Alternative Route
- Mile Marker

Project Roads
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- Existing, 21-70% Improved
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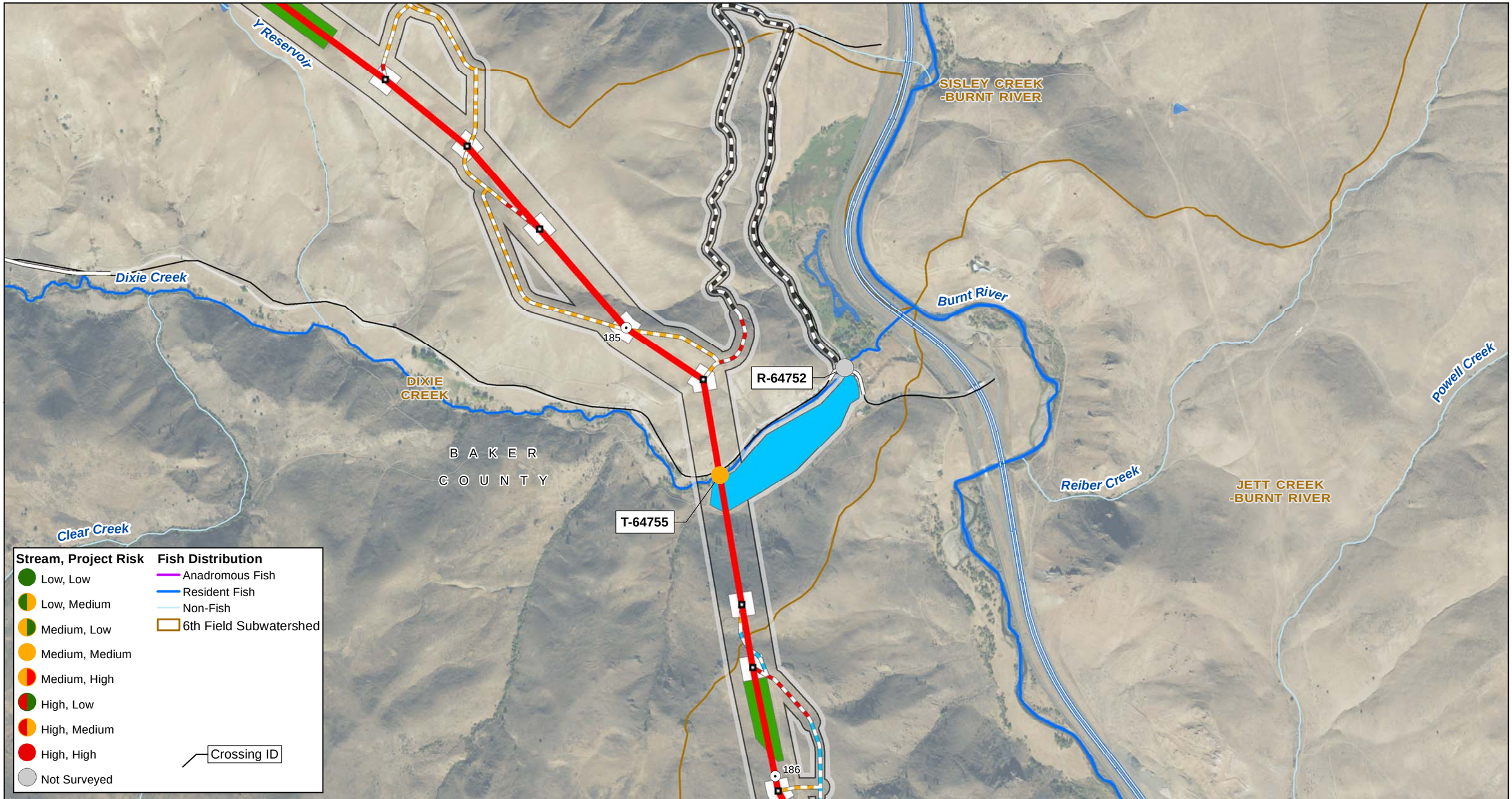
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MP178 - MP179
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Boardman to Hemingway
Transmission Line Project

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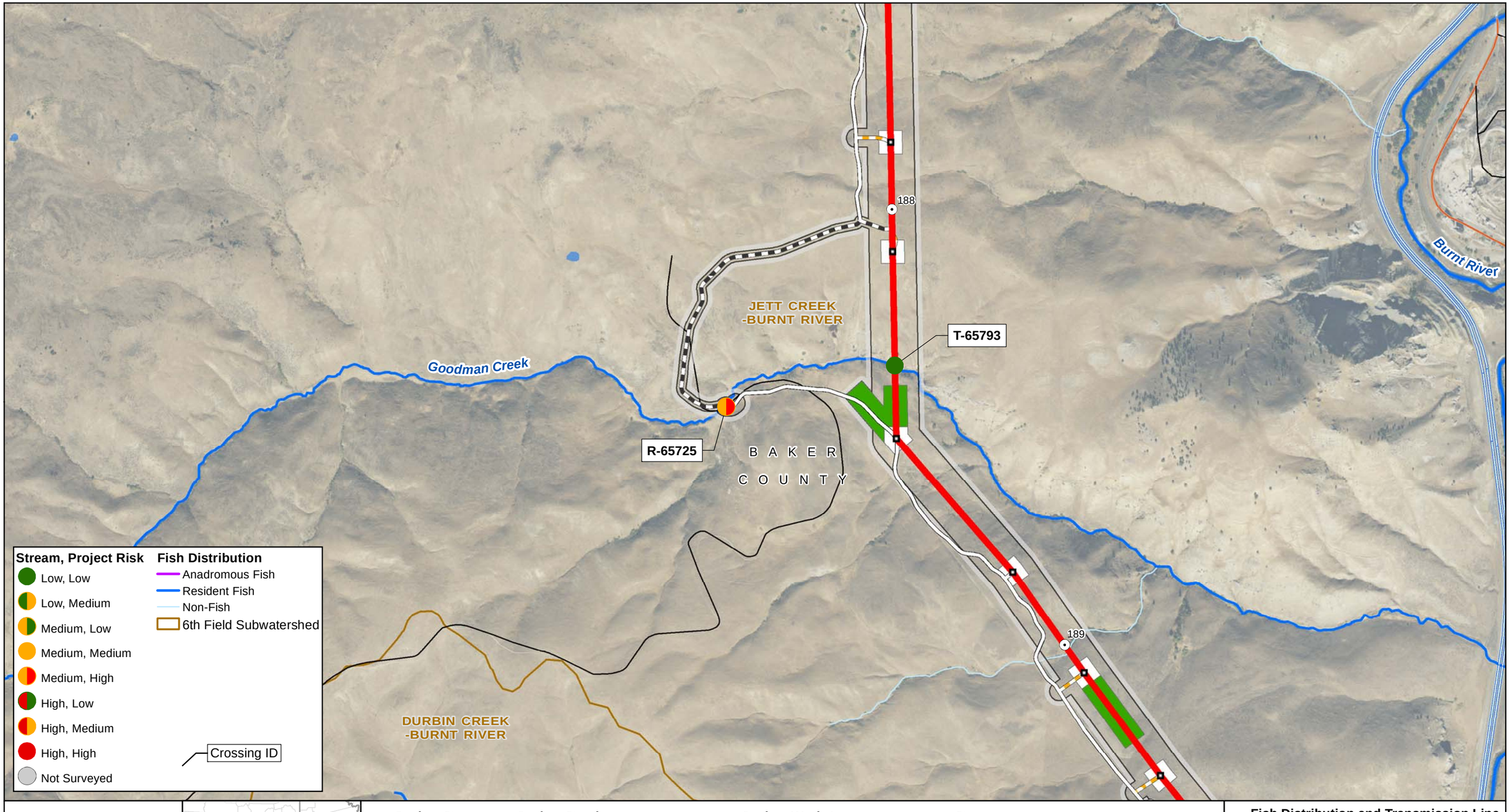
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
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Boardman to Hemingway
Transmission Line Project

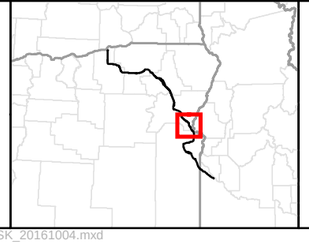
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IDAHO POWER
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Boardman to Hemingway
Transmission Line Project

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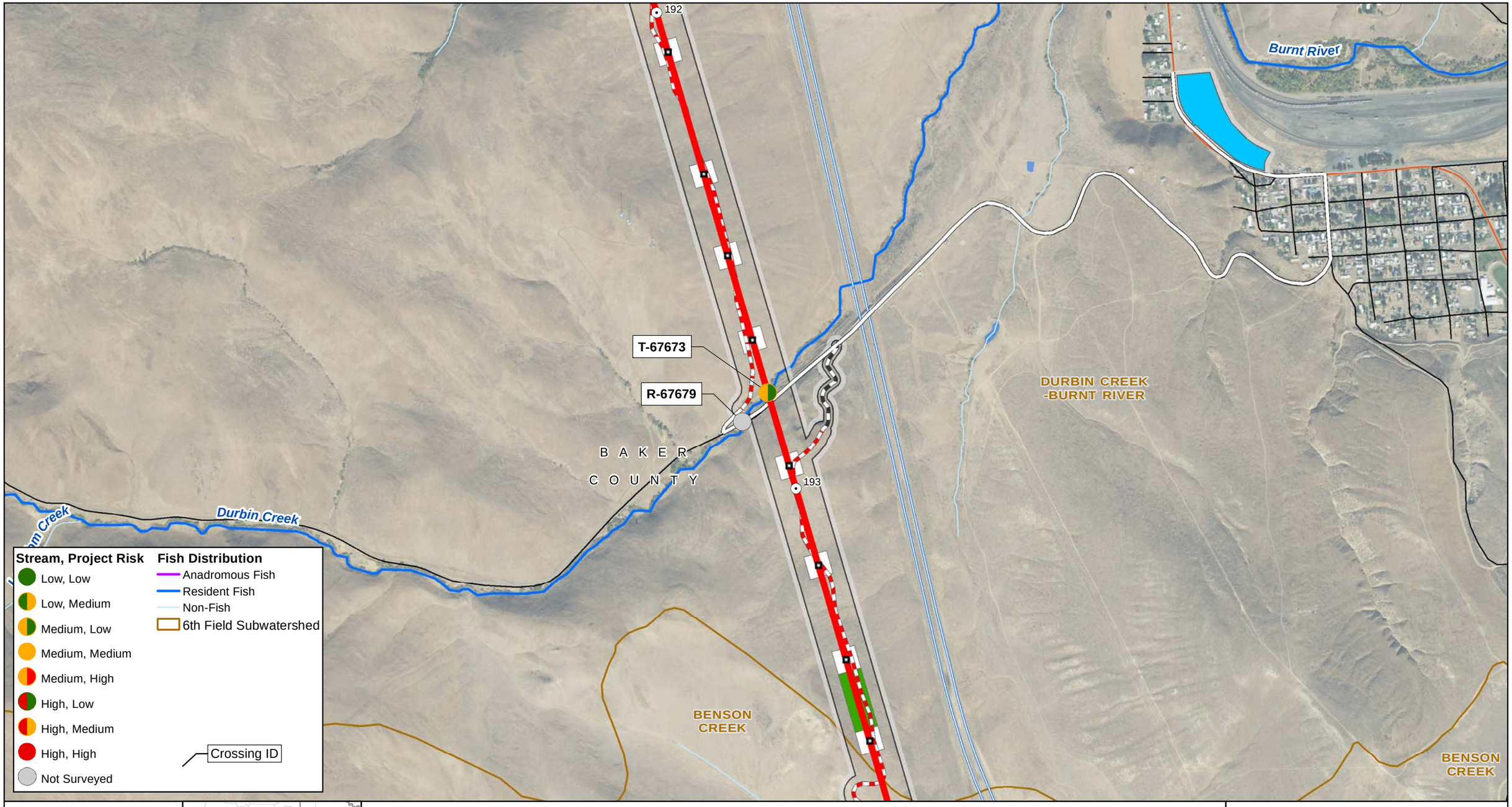
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
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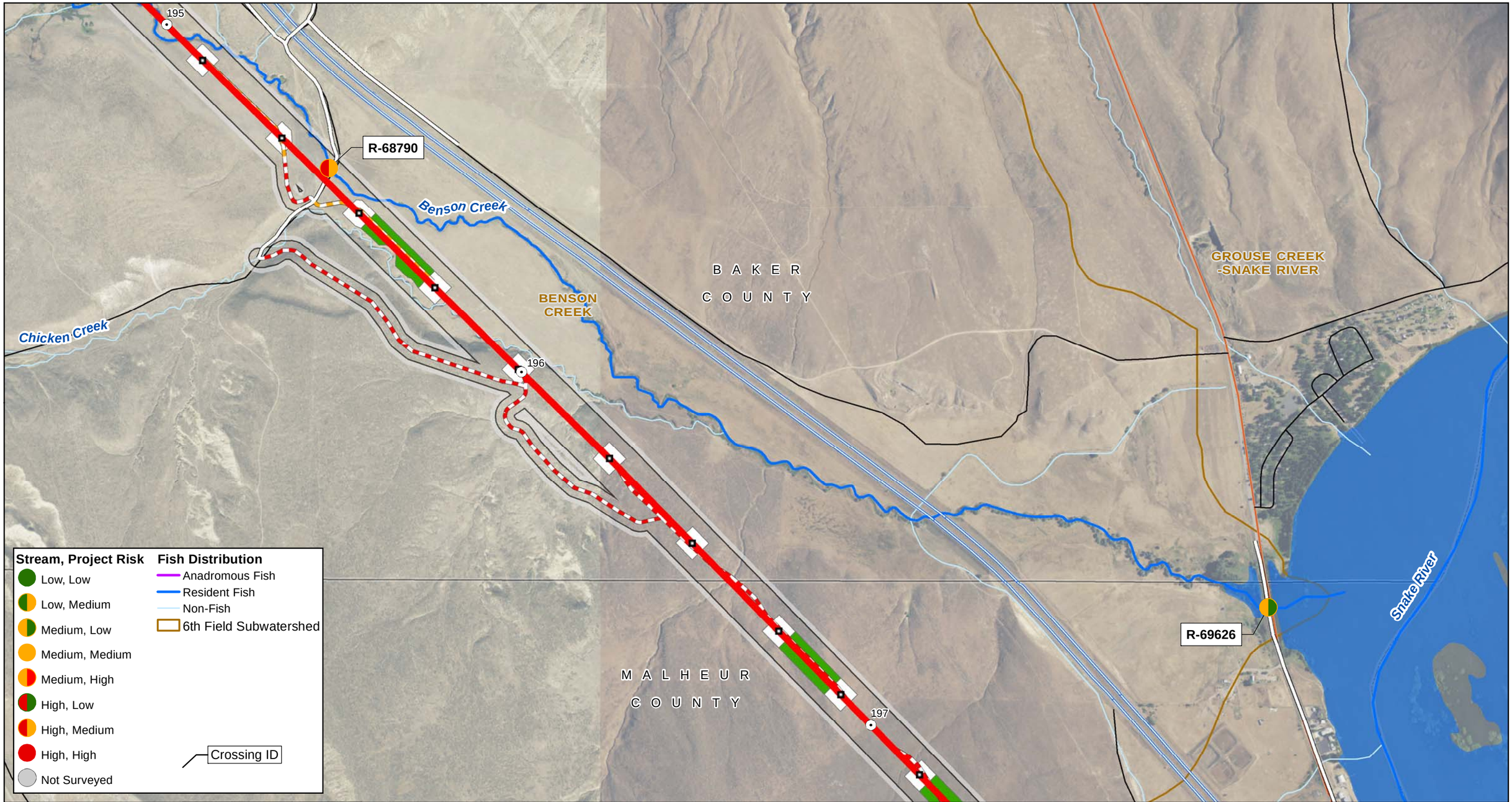
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP192 - MP193
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Boardman to Hemingway
Transmission Line Project

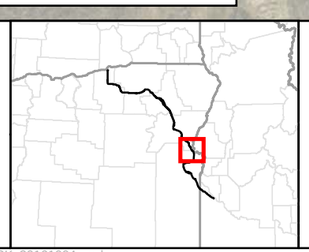
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IDAHO POWER
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0 1,000
Feet



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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP195 - MP197
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Boardman to Hemingway
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198

199

T-70402

GROUSE CREEK
-SNAKE RIVER

LOWER BIRCH
CREEK

Birch Creek

McBride Ditch

MALHEUR
COUNTY

WASHINGTON
COUNTY

ROAD GULCH
-SNAKE RIVER

Snake River

Stream, Project Risk
- Low, Low
- Low, Medium
- Medium, Low
- Medium, Medium
- Medium, High
- High, Low
- High, Medium
- High, High
- Not Surveyed

Fish Distribution
- Anadromous Fish
- Resident Fish
- Non-Fish
- 6th Field Subwatershed

Crossing ID

IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
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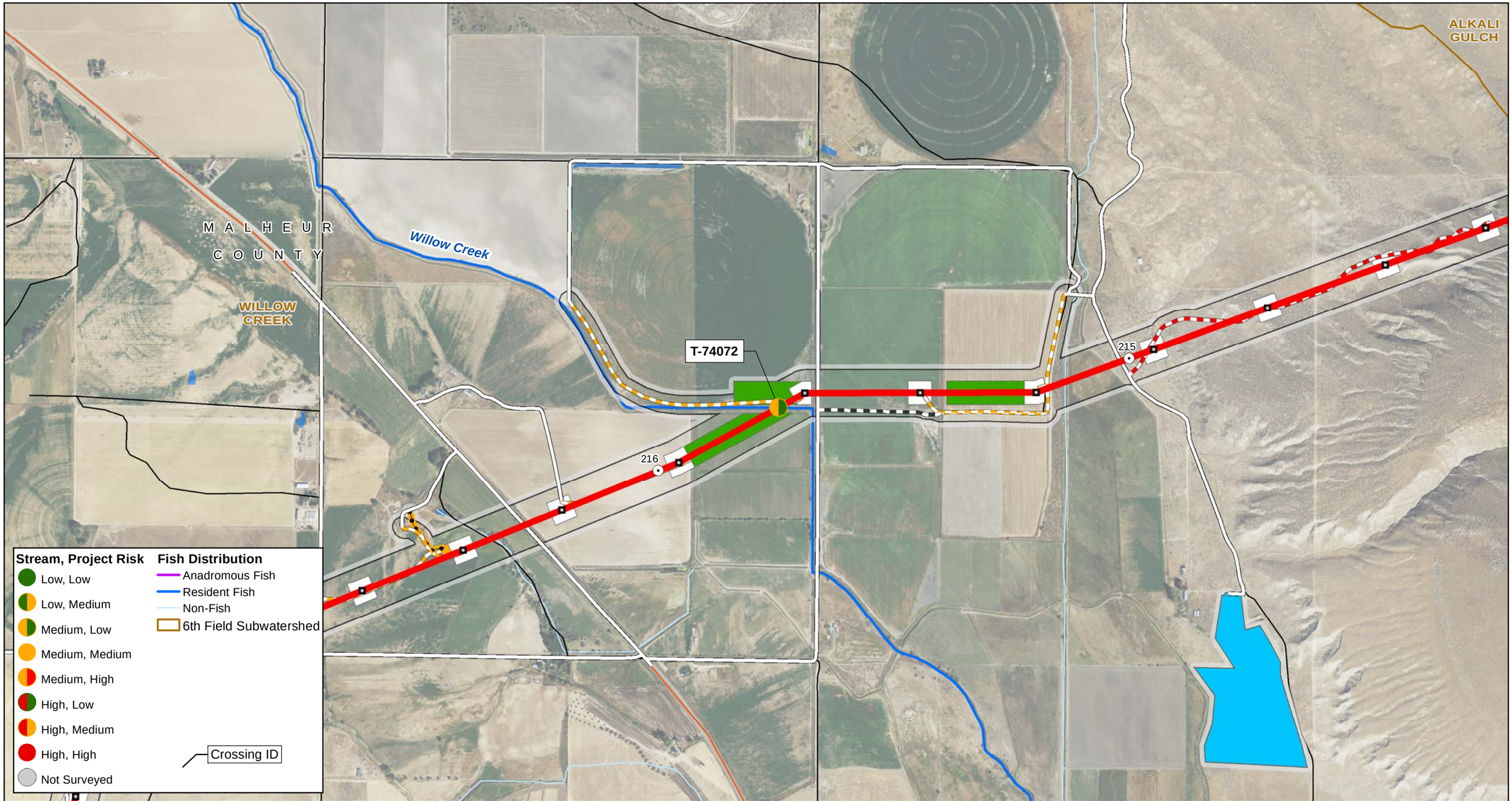
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
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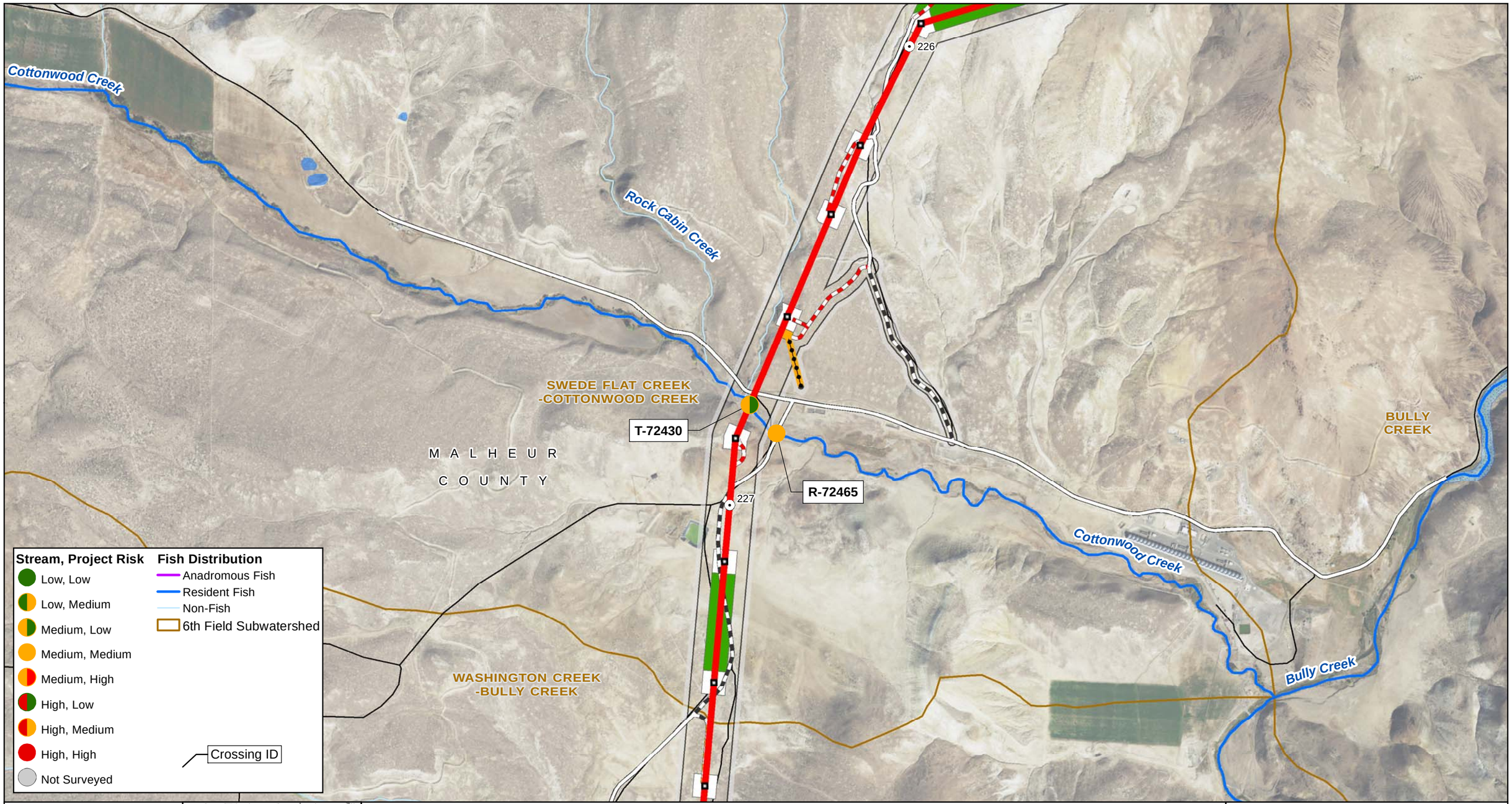
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP215 - MP217
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Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
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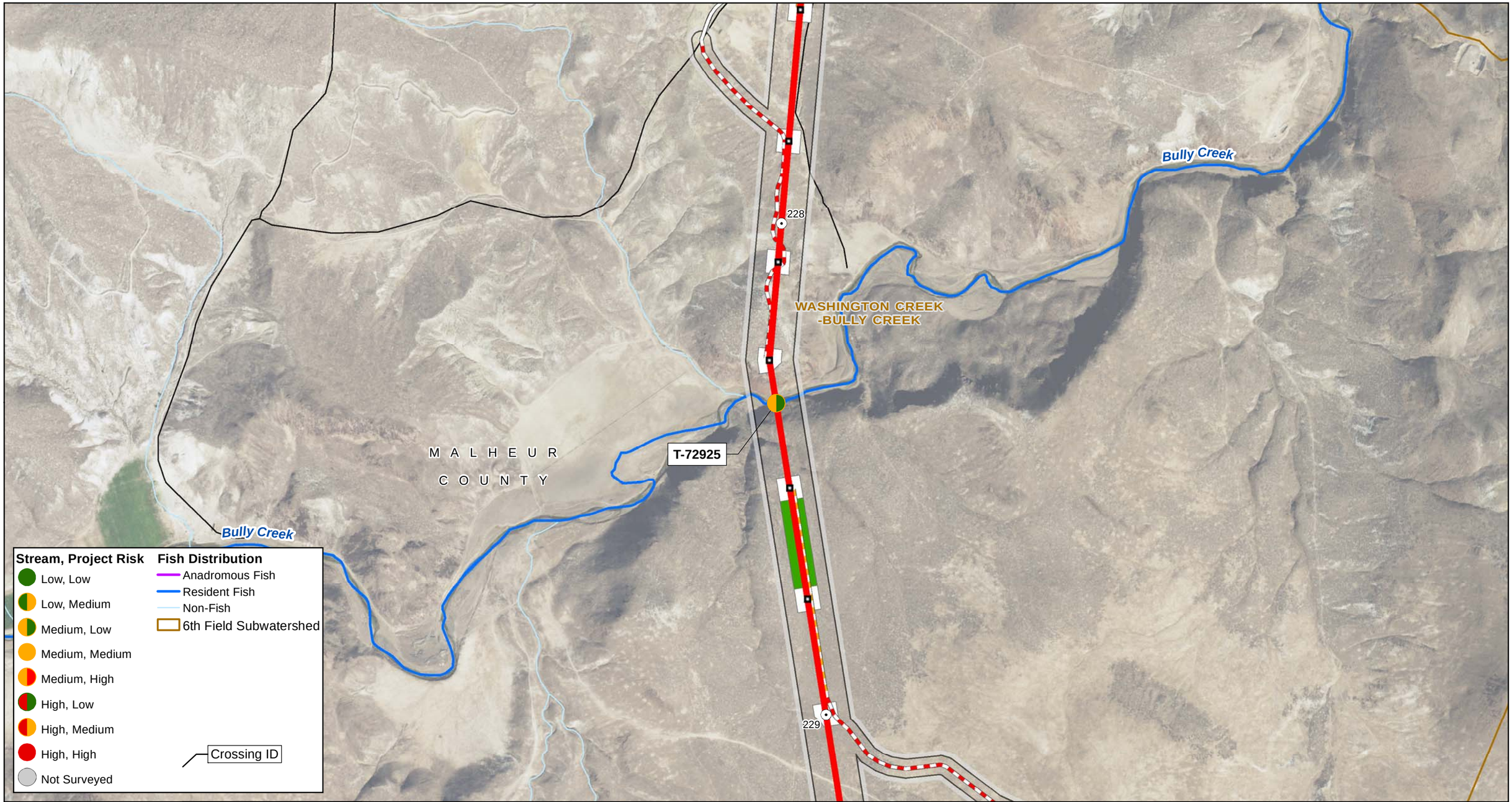
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP226 - MP227
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

October 2016

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IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP228 - MP229

Idaho Power Company
Boardman to Hemingway
Transmission Line Project

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231

232

Malheur River

Vines Ditch

MALHEUR
COUNTY

VINE HILL
-MALHEUR RIVER

T-74342

Stream, Project Risk
- Low, Low
- Low, Medium
- Medium, Low
- Medium, Medium
- Medium, High
- High, Low
- High, Medium
- High, High
- Not Surveyed

Fish Distribution
- Anadromous Fish
- Resident Fish
- Non-Fish
- 6th Field Subwatershed

Crossing ID

IDAHO POWER
An IDACORP Company

0 1,000
Feet

Project Routes
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP231 - MP233
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IDAHO POWER
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Feet

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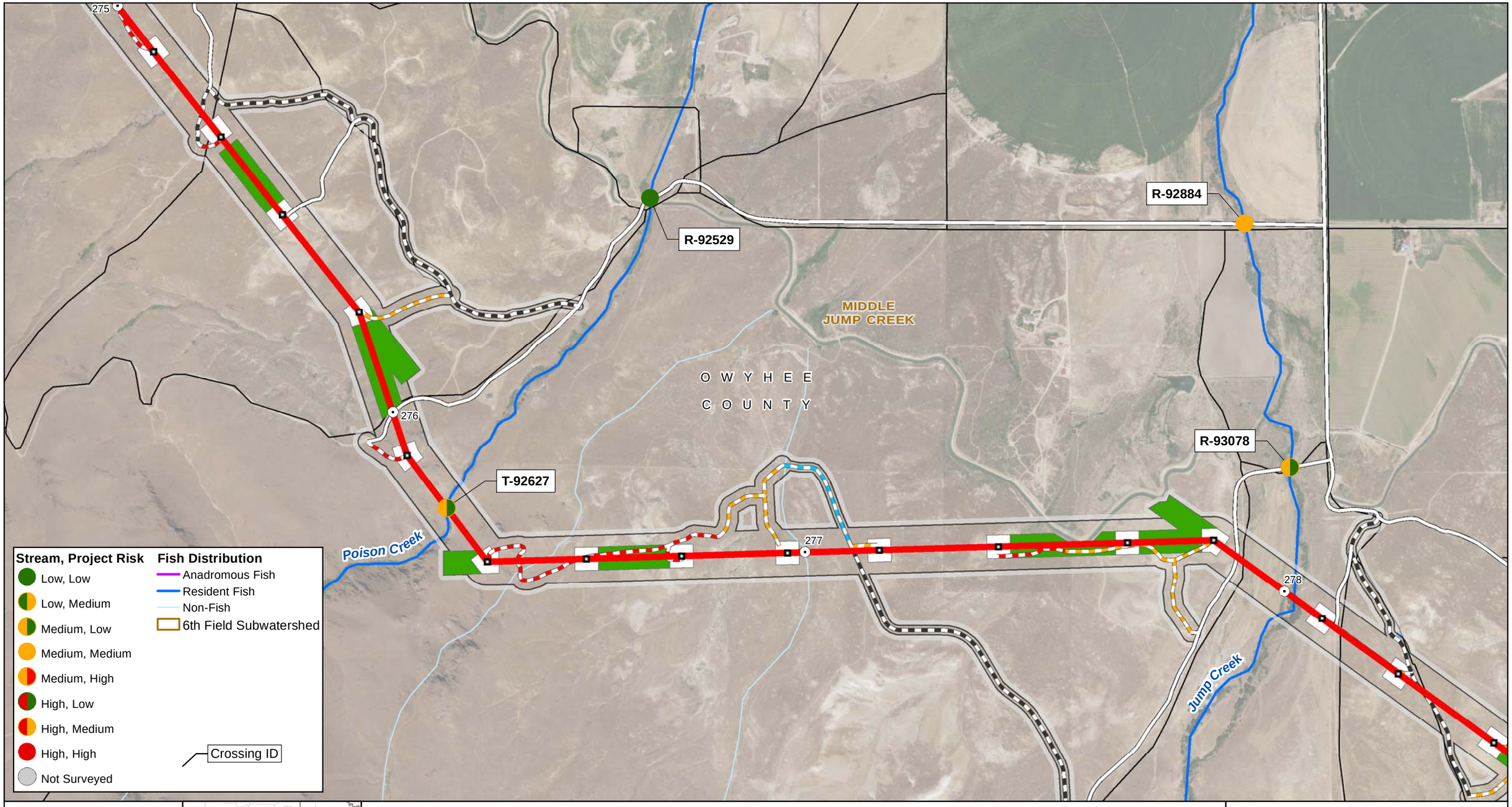
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP254 - MP256
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Feet

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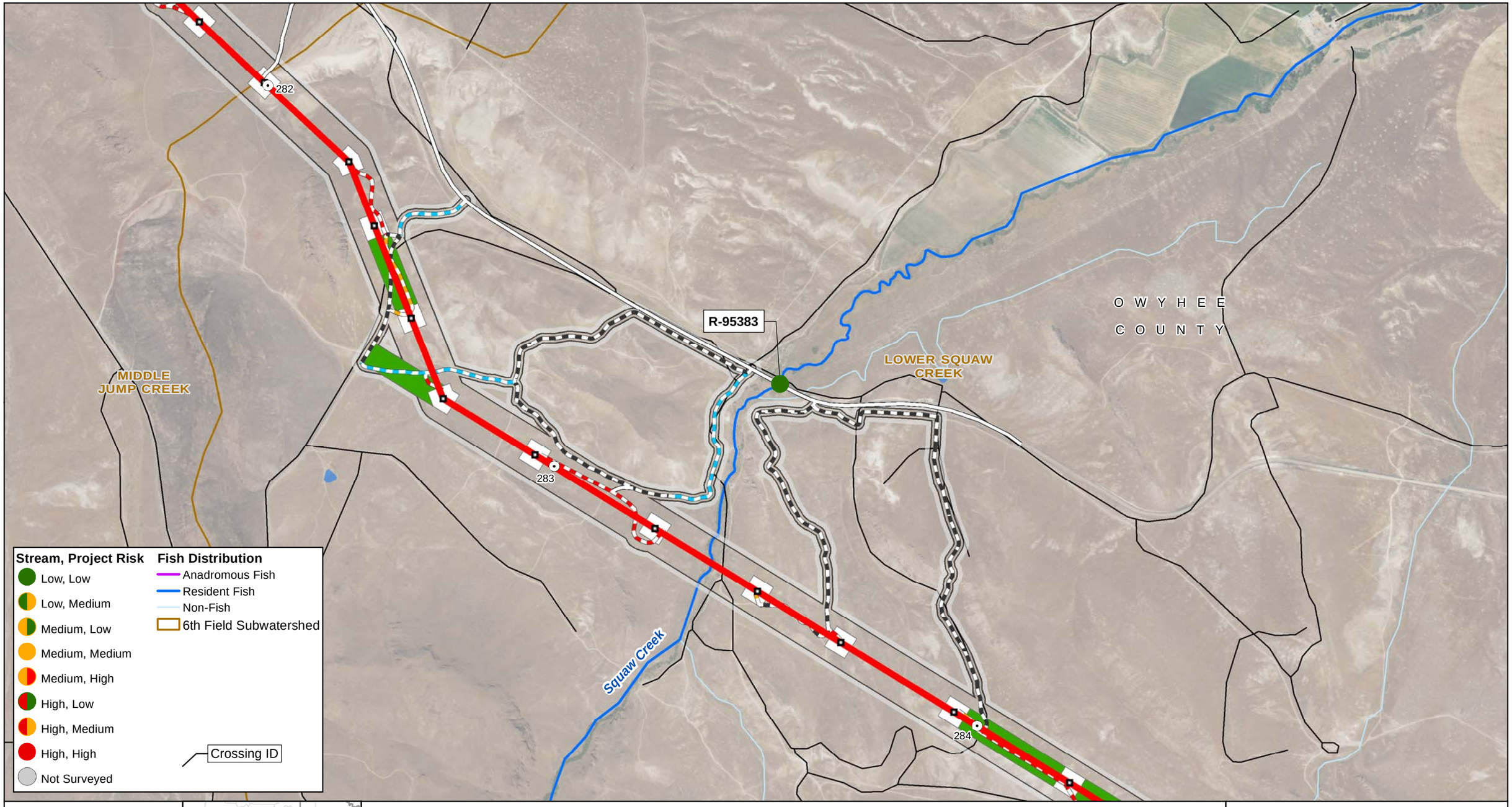
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
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October 2016

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IDAHO POWER
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0 1,000
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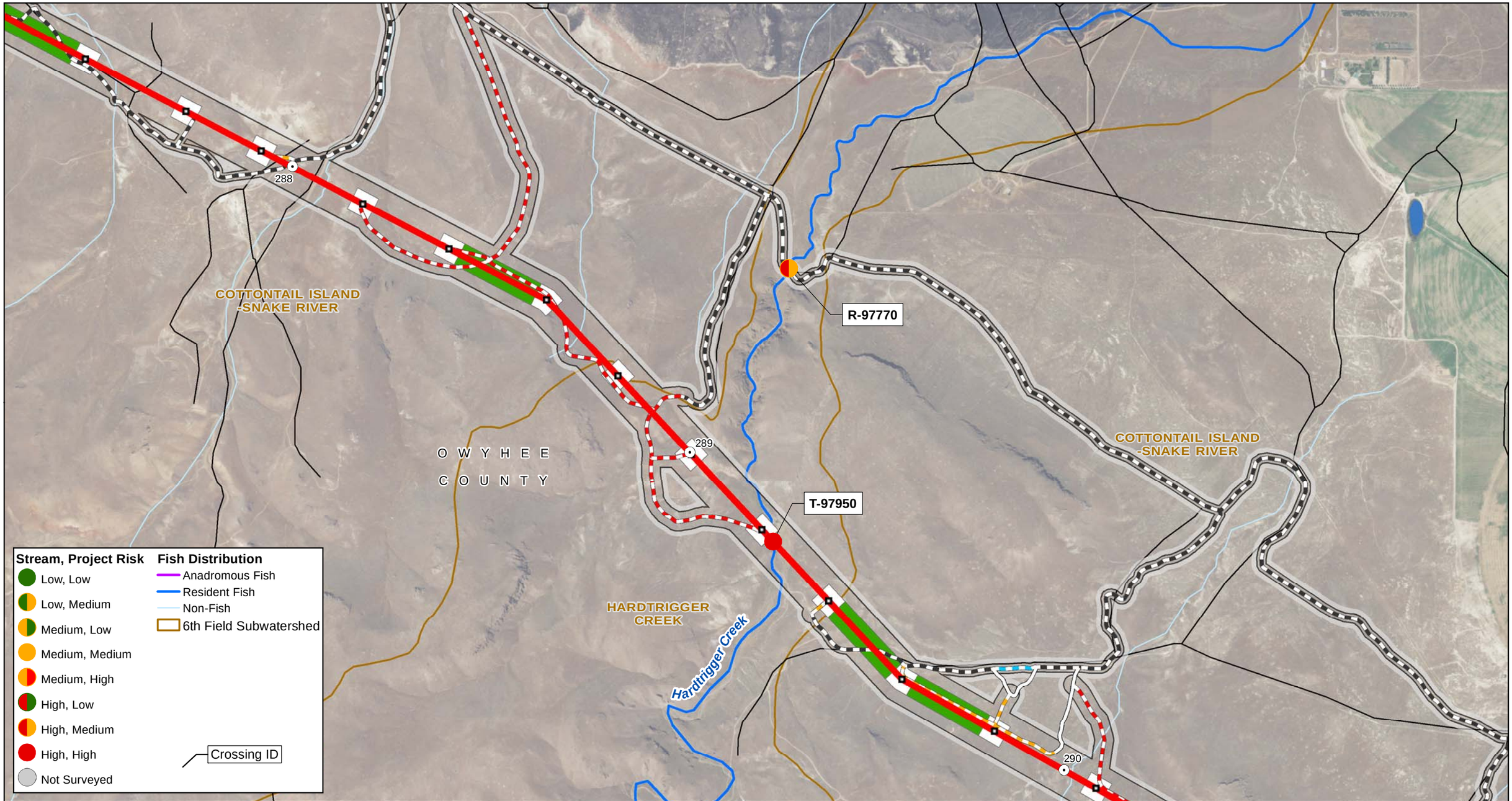
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
MP282 - MP284
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Idaho Power Company
Boardman to Hemingway
Transmission Line Project

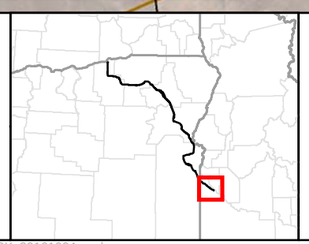
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IDAHO POWER
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0 1,000
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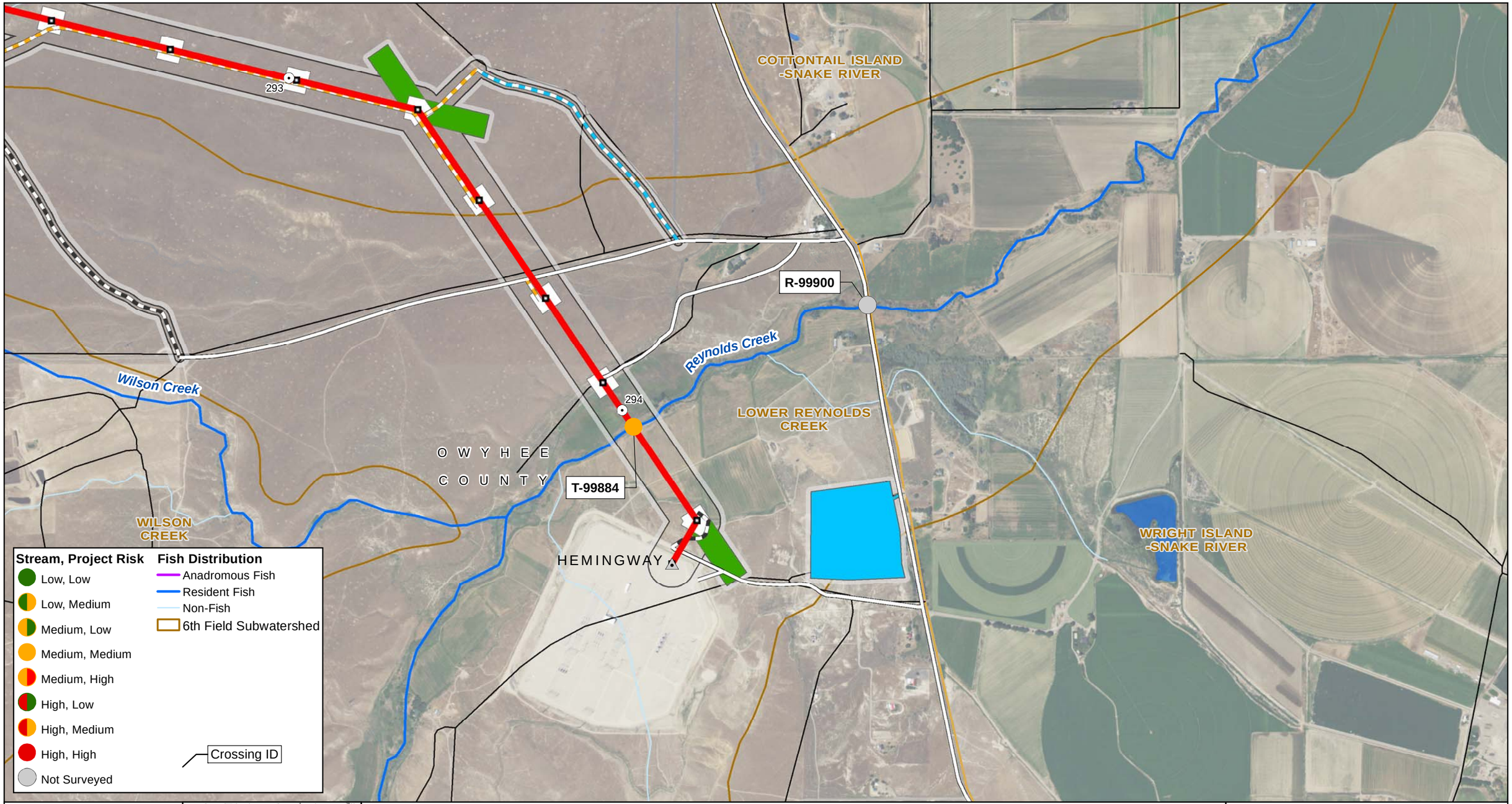
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
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IDAHO POWER
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0 1,000
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Fish Distribution and Transmission Line and Road Crossing Risk Levels
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Transmission Line Project

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APPENDIX F
PHOTO LOG OF STREAMS SURVEYED FOR ROAD AND TRANSMISSION LINE CROSSING



Little Butter Creek: Road Crossing ID R-08883, approximately 0.5 mile downstream from crossing ID T-08977. View is looking upstream from culvert.



Butter Creek: Transmission Line ID T-09139, approximately 0.7 mile upstream from R-08916. Looking downstream.



Butter Creek: Road Crossing ID R-11312. Looking upstream toward the crossing.



Butter Creek: Transmission Line Crossing ID T-11354. Looking upstream. Approximately 300 feet downstream from transmission line crossing.



Butter Creek Tributary: Road Crossing ID R-13058.



Butter Creek: Road Crossing ID R-17426. Approximately 0.36 mile upstream from T-17405.



Bear Creek: Transmission Line crossing ID T-19947.



West Birch Creek: Road Crossing ID R-20404. Looking upstream from bridge. Located approximately 0.4 mile upstream from T-20275.



Ray Creek: Road Crossing ID R-20492. Looking downstream from culvert; intermittent flow.



East Birch Creek: Road Crossing ID R-21604. Looking upstream from bridge.



California Gulch: Transmission Line crossing ID T-21673. Road Crossing ID R-21694 is approximately 0.2 mile upstream.



East Birch Creek: Transmission Line Crossing T-21807. Approximately 0.5 mile upstream from R-21604.



Little Rail Creek: Transmission Line Crossing ID T-23153. Photo is looking upstream.



McKay Creek: Road Crossing ID R-23514, photo approximately 0.37 mile downstream; and approximately 0.2 mile downstream of T-23443.



Rail Creek: Transmission Line Crossing ID T23539. Photo looking upstream.



Two-Mile Creek: Road Crossing ID R-24242. Looking downstream from culvert crossing.



Two-Mile Creek: Road Crossing ID R-24303.



Beaver Creek: Road Crossing R-24664. Looking downstream from culvert crossing.



Beaver Creek: Road crossing ID R-24814. Looking downstream.



Tributary to Beaver Creek: Road Crossing ID R-25185. Photo from road looking upstream. No distinct channel.



Beaver Creek: Transmission Line Crossing ID T-25186. Photo downstream of crossing; looking downstream.



Tributary to Meacham Creek: Road Crossing ID R-25394. Photo looking upstream.



Beaver Creek: Downstream from road crossing ID R-25593



Dry Creek: Transmission Line Crossing ID T-29279, approximately 0.25 mile upstream of R-29313. Photo looking upstream.



Unnamed Tributary to Grande Ronde River: Looking upstream from road crossing ID R-31352, about 0.1 miles downstream of T-31396.



Grande Ronde River: Transmission Line Crossing ID T-31377, approximately 1.7 miles upstream of R-31086 and 0.34 mile upstream of T-31337. Photo looking upstream.



Whisky Creek: Looking upstream from road crossing ID R-31388



Rock Creek: Road Crossing ID R-31715. Photo taken upstream looking downstream towards bridge.



Graves Creek: Transmission Line Crossing ID T-32195. Approximately 2 miles downstream of R-32979. Photo taken looking upstream.



Sheep Creek: Transmission Line Crossing ID T-32519. Photo taken looking downstream.



Little Graves Creek: Looking upstream from road crossing R-32785.



Rock Creek: Road Crossing ID R-33147, looking upstream. Approximately 0.25 mile upstream of R-33033 and 0.3 mile upstream of R-33011.



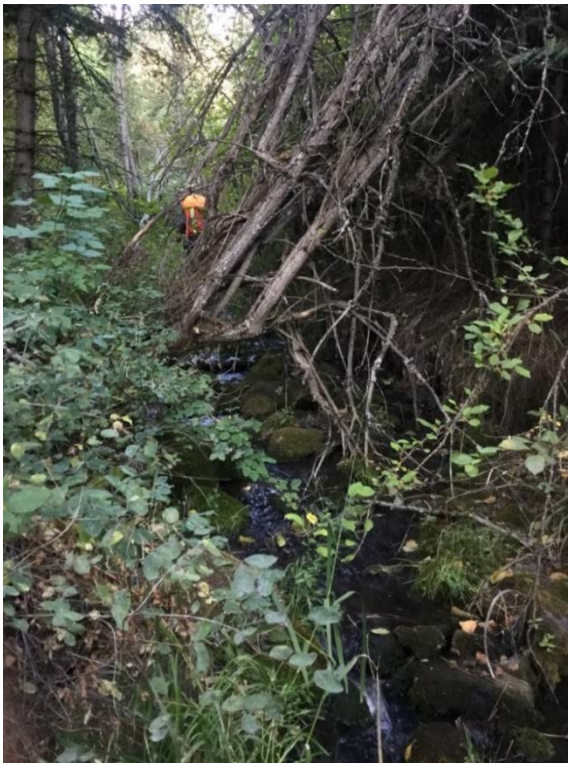
Deal Creek: Road Crossing ID R-33156 and T-33164. Looking upstream.



Sheep Creek: Transmission Line Crossing ID T-33215, approximately one mile downstream of R-33628.



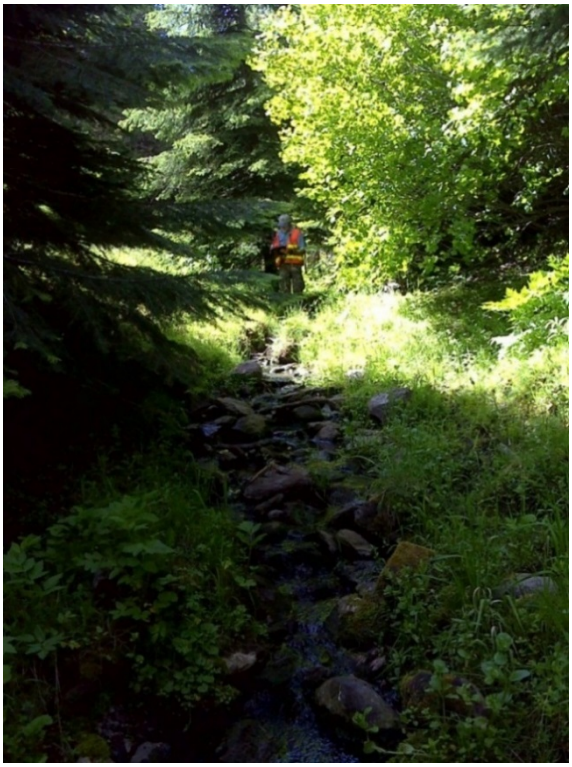
Sheep Creek: Road Crossing ID R-33628, looking downstream towards culvert inlet.



Mill Creek: Transmission Line Crossing T-33812, looking upstream. Approximately 1.0 mile downstream of R-34099.



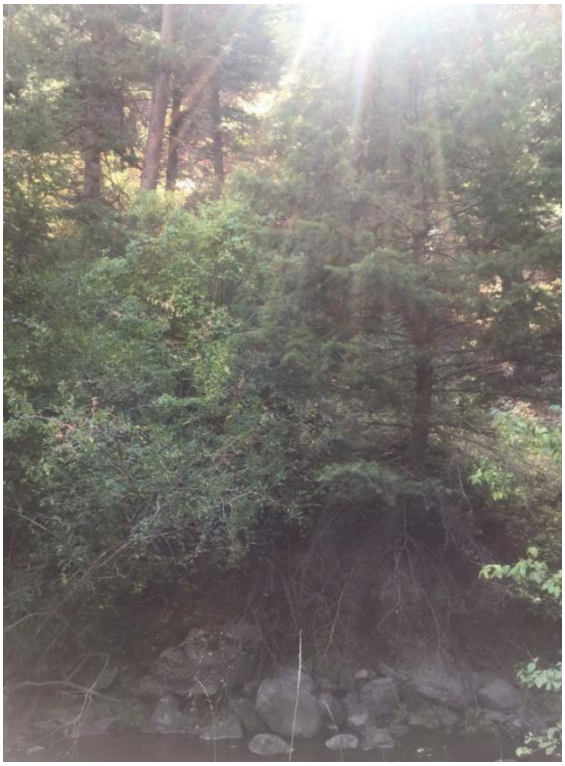
Unnamed Tributary: Transmission line Crossing T- 35662, adjacent to R-35660.



Tributary to Ladd Creek Pickup Ditch: Road Crossing ID R-36299. Photo looking upstream.



Unnamed Tributary to Ladd Creek Pickup Ditch: Road Crossing ID R-37018.



Ladd Creek Pickup Ditch: Transmission Line Crossing ID T-37045. Looking east from stream.



Unnamed Tributary to Ladd Creek Pickup Ditch: Road Crossing R-37117, looking upslope.



Unnamed Tributary to Ladd Creek Pickup Ditch: Road Crossing R-37121, looking upstream.



Unnamed Tributary to Ladd Creek Pickup Ditch: Road Crossing ID R-37124. Looking downstream toward Ladd Creek Pickup Ditch.



Rock Creek: Transmission Line Crossing ID T-37129. Photo taken looking upstream.



Ladd Creek Pickup Ditch: Transmission Line Crossing ID T-37129. Photo looking downstream.



Ladd Creek Pickup Ditch: Road Crossing ID R-37179. Looking downstream from bridge crossing.



Unnamed Tributary to Ladd Creek Pickup Ditch: Road Crossing ID R-37369. Looking downstream.



Unnamed Tributary to Ladd Creek Pickup Ditch: Approximately 500 feet downstream from Road Crossing ID R-38011.



Unnamed (Previously Ladd Canyon) tributary to Ladd Creek Pickup Ditch: Road Crossing ID R-37969, about 0.3 miles downstream of R-38059. Looking upstream at culvert crossing.



Unnamed tributary to Ladd Creek Pickup Ditch: Transmission Crossing ID T-38337. Photo looking upstream.



Clover Creek: Road Crossing ID R-41281.



Clover Creek: Midway between Transmission Line Crossing ID T-41492 and Road Crossing ID R-41281. Photo looking downstream.



Clover Creek: Transmission Line Crossing T-41492. Located approximately 0.75 mile downstream of R-41281.



Jimmy Creek: Transmission Line Crossing ID T-41615. Looking downstream.



Powder River: Transmission Line Crossing approximately 0.5 mile upstream of T-42996. Photo looking upstream.



Gentry Creek: Road Crossing ID R-44271. Looking downstream.



Straw Ranch Creek: Transmission Line Crossing ID T-56168. Photo looking downstream.



Alder Creek: Road Crossing ID R-56681. Looking downstream.



Low Creek: Transmission Line Crossing ID T-56762. Photo looking upstream.



Hill Creek: Road Crossing ID 56890. View looking downstream from approximately 425 feet downstream of the culvert.



Alder Creek: Transmission Line Crossing ID T-56949. Photo looking downstream towards T-Line.



Burnt River: Transmission Line Crossing ID T-58761, about 1.2 miles upstream of R-59115. Looking upstream.



Powell Creek: Road Crossing ID R-59645, looking upstream. Water starts just upstream from farmhouse, near lowest water withdrawal.



Unnamed Tributary to Powell Creek: Road Crossing at ID R-59743. Non-fish stream due to lack of habitat and natural barriers downstream.



Burnt River: Road Crossing ID R-59830, looking upstream from major road bridge.



Powel Creek: Transmission Line Crossing ID T-60285. Approximately 1,000 feet downstream from crossing.



Burnt River: Road Crossing ID R-61345, looking upstream from major road bridge.



Ray Creek: Transmission Line Crossing ID T-61670. Photo location about 0.7 miles downstream of crossing. Photo looking upstream.



Shirttail Creek: Road Crossing ID R-61834.



French Creek: Road Crossing ID R-61839, looking upstream from culvert crossing. R-61298 is 1.4 miles and T-60872 about 2.9 miles upstream of photo.



Shirttail Creek: Road Crossing ID R-61864, looking downstream from culvert crossing.



Shirttail Creek: Transmission Line Crossing ID T-61953. Approximately 0.3 mile upstream from R-61864.



Dixie Creek: Road Crossing ID R-64752.



Dixie Creek: Transmission Line Crossing ID T-64755, about 0.3 mile upstream of R-64752.



Goodman Creek: Road Crossing ID R-65725, looking upstream. About 0.4 mile upstream of T-65793.



Cavanaugh Creek: Road Crossing ID R-66818. Photo taken looking upstream. Approximately 235 feet upstream from T-66832.



Cavanaugh Creek: Road Crossing ID R-66866. Photo taken looking upstream.



Unnamed Tributary to Burnt River: Road Crossing ID R-67099, approximately 0.2 mile from T-67058. Photo taken looking downstream.



Durbin Creek: Transmission Line Crossing ID T-67673. Photo looking upstream.



Benson Creek: Road Crossing ID R-68790. Photo looking downstream.



Benson Creek: Road Crossing ID R-69626. Looking upstream from major road bridge and junction with Snake River.



Birch Creek: Transmission Line Crossing ID T-70402. Photo looking downstream.



Cottonwood Creek: Road Crossing ID R-72465 and Transmission Line Crossing T-72420. No access to sites, view from public road.



Willow Creek: Transmission Line Crossing ID T-74072. Photo looking downstream.



Malheur River: Transmission Line Crossing ID T-74342.



Poison Creek: Road Crossing ID R-92529. Looking upstream.



Poison Creek: Transmission Line Crossing ID T-92627. Photo looking upstream. No flow at crossing downstream of photo location.



Jump Creek: Road Crossing ID R-92884. Looking upstream from bridge.



Jump Creek: Road Crossing ID R-93078.



Squaw Creek: Road Crossing ID R-95383. Photo looking upstream.



Hardtrigger Creek: Road Crossing ID R-97770. Photo taken looking upstream.



Hardtrigger Creek: Transmission Line Crossing ID T-97950. Looking upstream towards the incision above the transmission line. Dry channel.



Reynolds Creek: Transmission Line Crossing ID T-99884. No access to site. Photo location about 2,800 feet downstream at HWY 78 bridge looking downstream.