



State of Washington
Department of Fish and Wildlife
Habitat Program, Fish Passage

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To: William Meyer, WDFW Habitat Biologist Region 3

From: Justin Zweifel, WDFW Fish Passage Inventory and Assessment Unit
Supervisor

Date: November 23, 2015

Subject: 2015 Teanaway Community Forest Fish Passage Inventory Final Report

We are pleased to provide the 2015 Teanaway Community Forest (TCF) Fish Passage Final Report. This inventory and assessment effort began in April 2015 and continued through June 2015. This report provides the results for the inventory and assessment of road crossings in the Teanaway River watershed and the First Creek and Cabin Creek watersheds within the TCF project area.

Detailed electronic reports were produced as a result of the inventory and assessment surveys (Appendix).

We appreciate the opportunity to serve you and your partners and are available to continue to provide expert services in this field.

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Teanaway Community Forest Fish Passage Inventory and Assessment Final Report: April 27, 2015 through June 30, 2015



In 2013, the state of Washington authorized the purchase of the 50,241-acre (~78.5 sq. mi.) Teanaway Community Forest (TCF) as a means to protect and enhance watersheds, maintain working lands, and conserve and restore vital habitats for fish and wildlife. Lawmakers directed the Washington Department of Natural Resources (WDNR) to manage the property in consultation with the Washington Department of Fish and Wildlife (WDFW). The two agencies formalized a co-management approach in a Deed of Habitat Restoration and Working Lands Easement on the TCF property (Reference: Easement #58-090537, 2013). In June 2015, a management plan was completed for the TCF. One of the goals of the management plan is to conserve and restore vital habitat for native fish species, including spring Chinook and federally-listed steelhead and bull trout.

Between April 27 and June 30, 2015, the WDFW conducted a fish passage barrier inventory as part of an effort to establish baseline aquatic habitat connectivity conditions in subwatersheds of the Yakima Basin within the TCF and adjacent lands. This fish passage inventory and assessment work was funded through a contract to WDFW from the Department of Ecology as part of the Yakima Basin Integrated Plan. Prior to this effort, the WDFW's Fish Passage and Diversion Screening Inventory (FPDSI) and the WDNR's Road Maintenance and Abandonment Plans (RMAP) databases were incomplete in describing all fish passage barriers in and around the TCF. The 2015 fish passage inventory efforts included a reassessment of the existing data in the FPDSI database and a review of RMAP data provided by WDNR. The results of the reassessments and all new fish passage inventory were added to the FPDSI database and summarized in this report. Detailed FPDSI database reports are included in the Appendix.

PROJECT AREA

The primary focus of this effort was to inventory and assess water crossing structures on fish-bearing streams within the TCF. The TCF is in the Yakima River basin. The project area was delineated to encompass the watersheds that intersect TCF parcels (Map 1). Within the project area, there are three main watersheds: Teanaway River, First Creek, and Cabin Creek. The portion of these watersheds that traverse TCF and WDNR trust land parcels were selected as the focus areas for conducting a comprehensive fish passage inventory and assessment and are herein referred to as 'blocks' (Maps 2-4).

METHODS

To prepare for inventory field work, maps were created that included the TCF boundaries, watershed priority designations, stream crossings, road names, and existing FPDSI database records. RMAP site locations were provided by DNR for field verification. Private landowners were contacted to inform them of the TCF fish passage inventory and assessment project and to request permission for any work that would be occurring on their property.

WDFW field crews drove to all mapped stream crossings within the TCF to document, photograph, and take the necessary measurements to inventory and assess water crossing structures using the methods described in WDFW's Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual (WDFW 2009). Field crews surveyed all accessible mapped stream crossings including those on the County-owned Teanaway Road, private property where permission was granted, adjacent WDNR trust lands, and USFS-owned roads within and adjacent to the TCF. Any unmapped stream crossings that were encountered while working within the Project Area were also documented and evaluated; this opportunistic data collection occurred on roadways owned by Kittitas County, United States Forest Service, and private landowners.

RMAP stream crossing structures were field verified and assessed for potential fish use upstream and downstream of the structure by applying the Washington Administrative Code (WAC) 222-16-031 criteria for Type "F" water. Those that were determined to be on Type F streams were evaluated for fish passage and entered into the FPDSI database. Water crossings at non-fish bearing (NFB) sites were documented when encountered within the Project Area. NFB sites were not assessed for fish passage and were not included in the FPDSI database.

DATA SUMMARY

Between April 27, 2015 and June 30, 2015, 117 fish passage features were evaluated in the Project Area: 115 stream crossings and 2 dams (Appendix). Sixty stream crossings and 1 dam were determined to be fish passage barriers. Some culverts were difficult to evaluate using the Level A or B assessments described in WDFW 2009 due to complex culvert hydraulic or hydrologic field conditions. Common examples of these conditions include culverts with an internal grade break, wetland conditions at the culvert outlet, and tributaries located immediately downstream of the culvert. At these sites, barrier status is unknown and may require engineering review. The barrier summary of the 115 stream crossings are categorized by road responsibility in Table 1.

Table 1. Barrier Summary by Road Responsibility

Responsibility	Barriers	Non- Barriers	Unknown	Total Sites
TCF Land Parcels	23	16	1	40
Private	13	12	1	26
Kittitas County	13	10	1	24
USFS	9	9	0	18
WDFW	1	3	0	4
WDNR	1	0	0	1
WA State Parks	0	1	0	1
WSDOT	0	1	0	1
All	60	52	3	115

Eighty-three RMAP sites were visited to determine the presence of a fish passage feature, evaluate potential fish use, and assess for fish passage when appropriate. Of the 83 RMAP sites, 46 were confirmed to have been removed during previous RMAP efforts, 25 were assessed for fish passage and added to the FPDSI database, 8 were determined to be NFB, and 4 could not be located. The 25 sites assessed for fish passage are included in Table 1.

NEXT STEPS

Barrier prioritization helps ensure that the projects providing the greatest benefits to fish are constructed first. The WDFW developed a Prioritization Index (PI) model that consolidates biological and feasibility factors into a manageable framework for developing prioritized lists of barriers (WDFW 2009). The output of the model is a numeric indicator that is used to compare the relative values of fish passage barrier correction projects. This tool is often used with the consideration of other relevant factors related to project success such as community support, coordination opportunities, and contribution to other restoration efforts conducted in the watershed. The PI model has been applied statewide for nearly 20 years.

To generate PI values for ranking barriers, a habitat assessment must be conducted to assess the quantity and quality of habitat that would be realized once a barrier is corrected. Completing habitat surveys for the TCF barriers also allows us to identify fish passage features that are not associated with a roadway, and therefore may have been missed in this inventory effort. Habitat surveys also help verify the potential fish use determinations that were made during the road-based barrier assessments. Upon WDNR's initial review of the TCF barrier data, WDNR noted that approximately 20 of the TCF fish barriers are on streams that are not mapped for fish use. As described by WDNR, these stream maps are based on a multiparameter GIS logistic regression

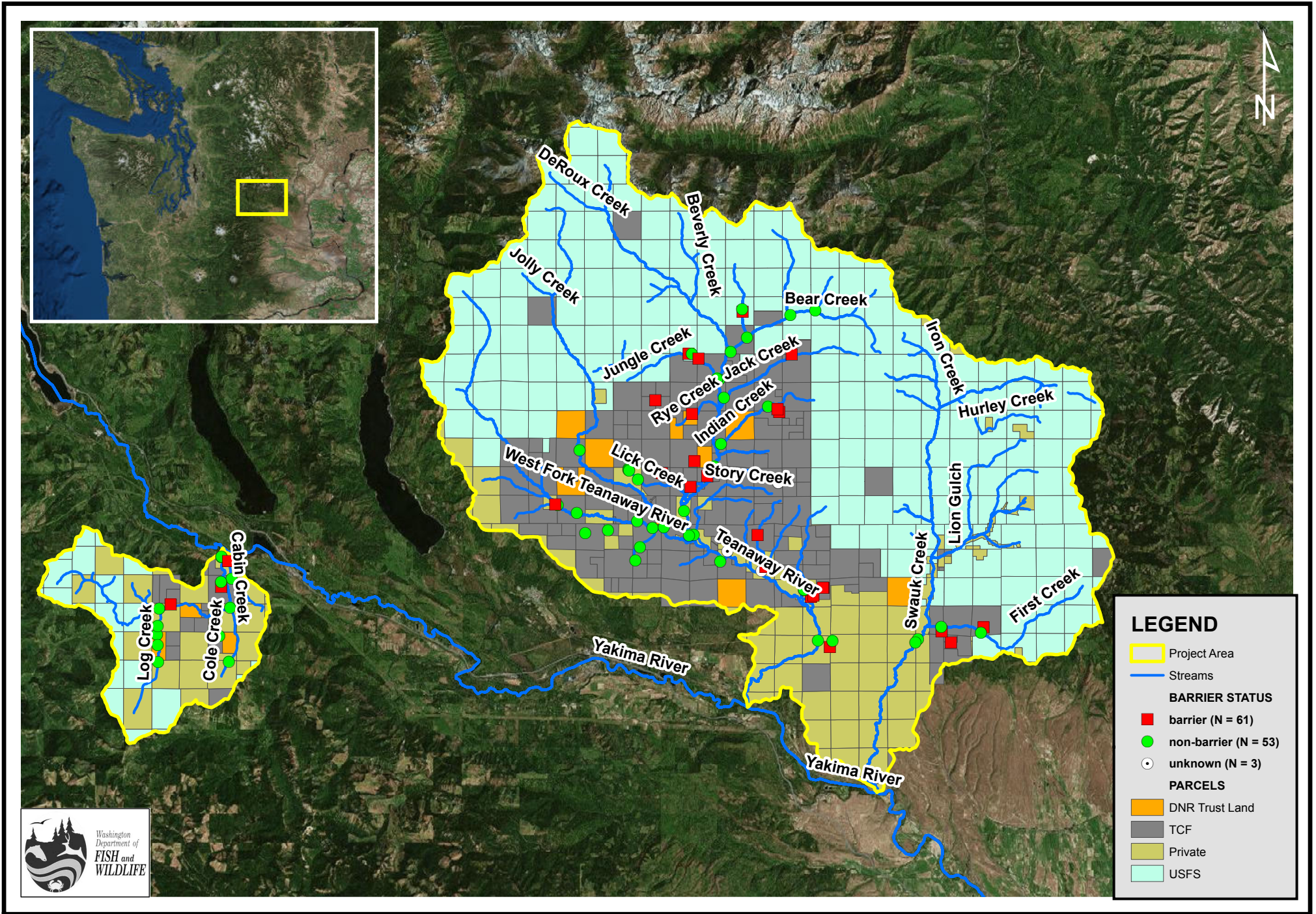
model. The model is designed to identify fish habitat using geomorphic features such as basin size, gradient, elevation and other indicators.

WDFW recommends conducting habitat surveys to prioritize TCF barriers, identify other instream barriers, and to make a final determination of potential fish use based on field measurements that apply the definitions for fish use described in WAC 222-16-031.

FISH PASSAGE TEAM

Richard Visser II organized and led the field data collection, mapping, and database management for this project. Field data collection, entry, and QA/QC by Andrew Annanie, Daniel Barrett, Sam Phillips, Daniel Phinney, and Portia Leigh.

Map 1. Project Area



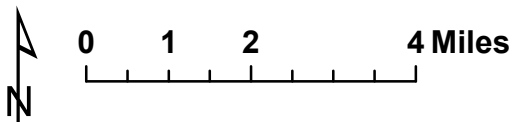
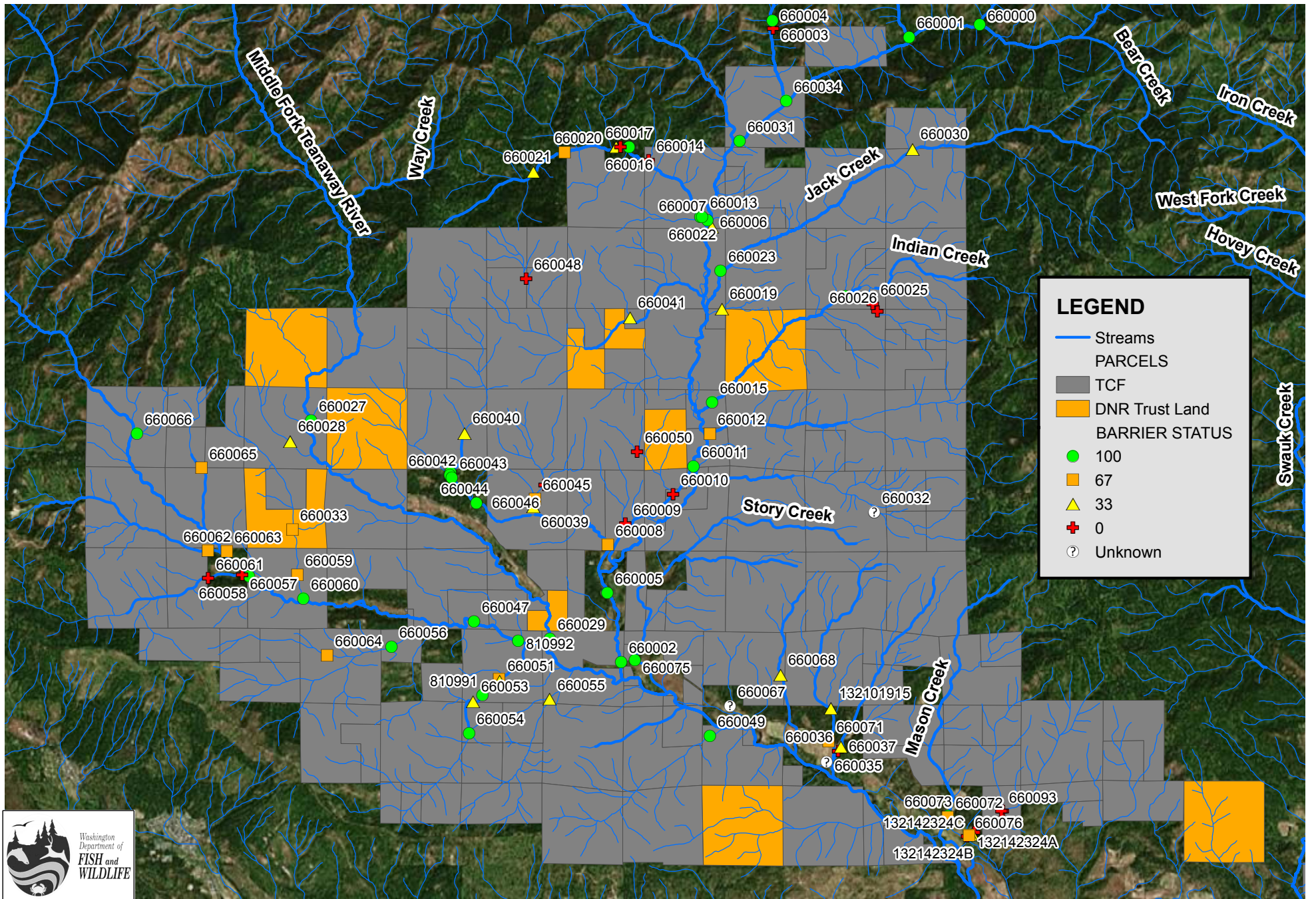
LEGEND

- Project Area
- Streams
- BARRIER STATUS**
- barrier (N = 61)
- non-barrier (N = 53)
- unknown (N = 3)
- PARCELS**
- DNR Trust Land
- TCF
- Private
- USFS



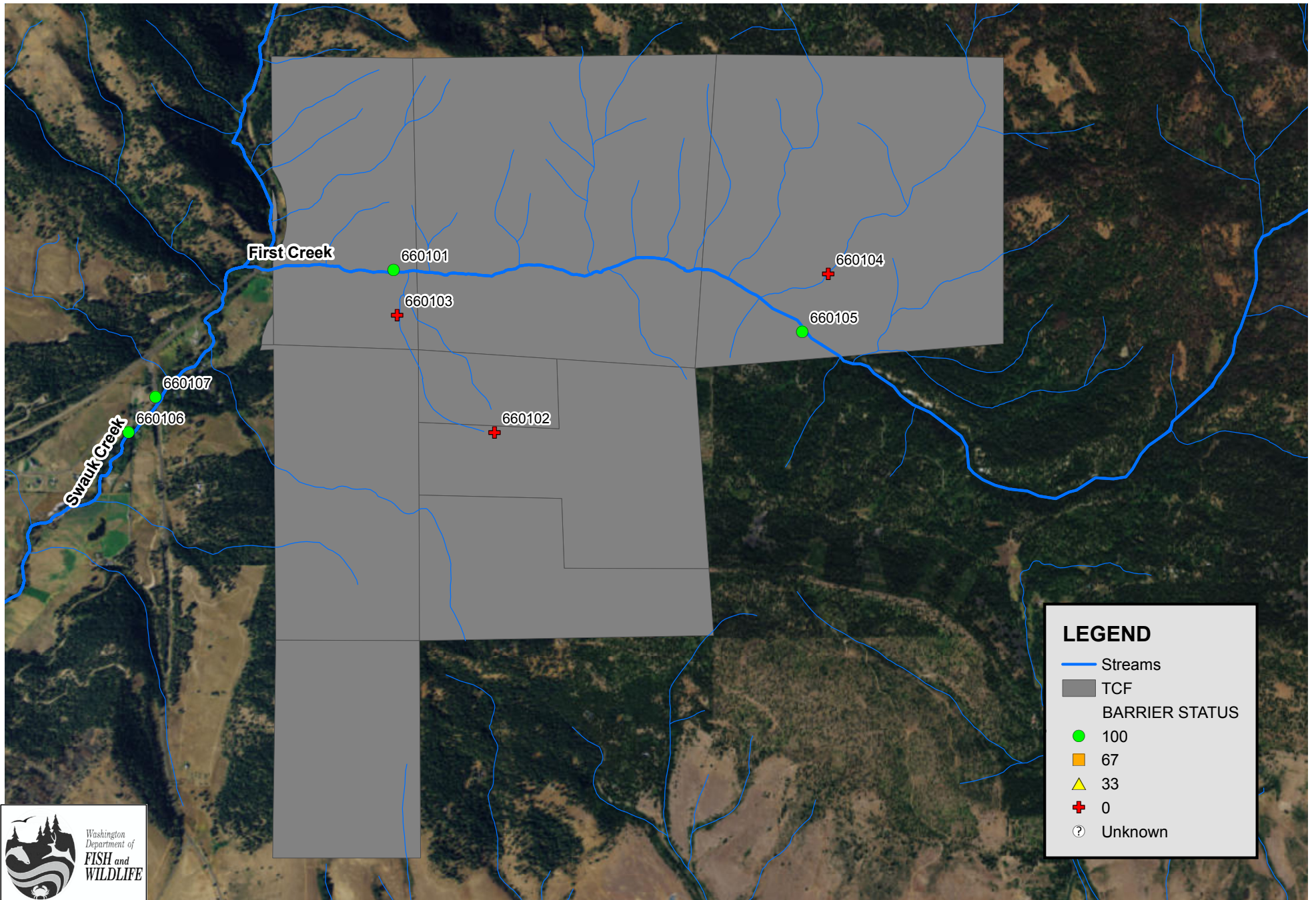
Map created November 2015
by Justin Zweifel, WDFW

Map 2. Teanaway River Block



Map created November 2015
by Justin Zweifel, WDFW

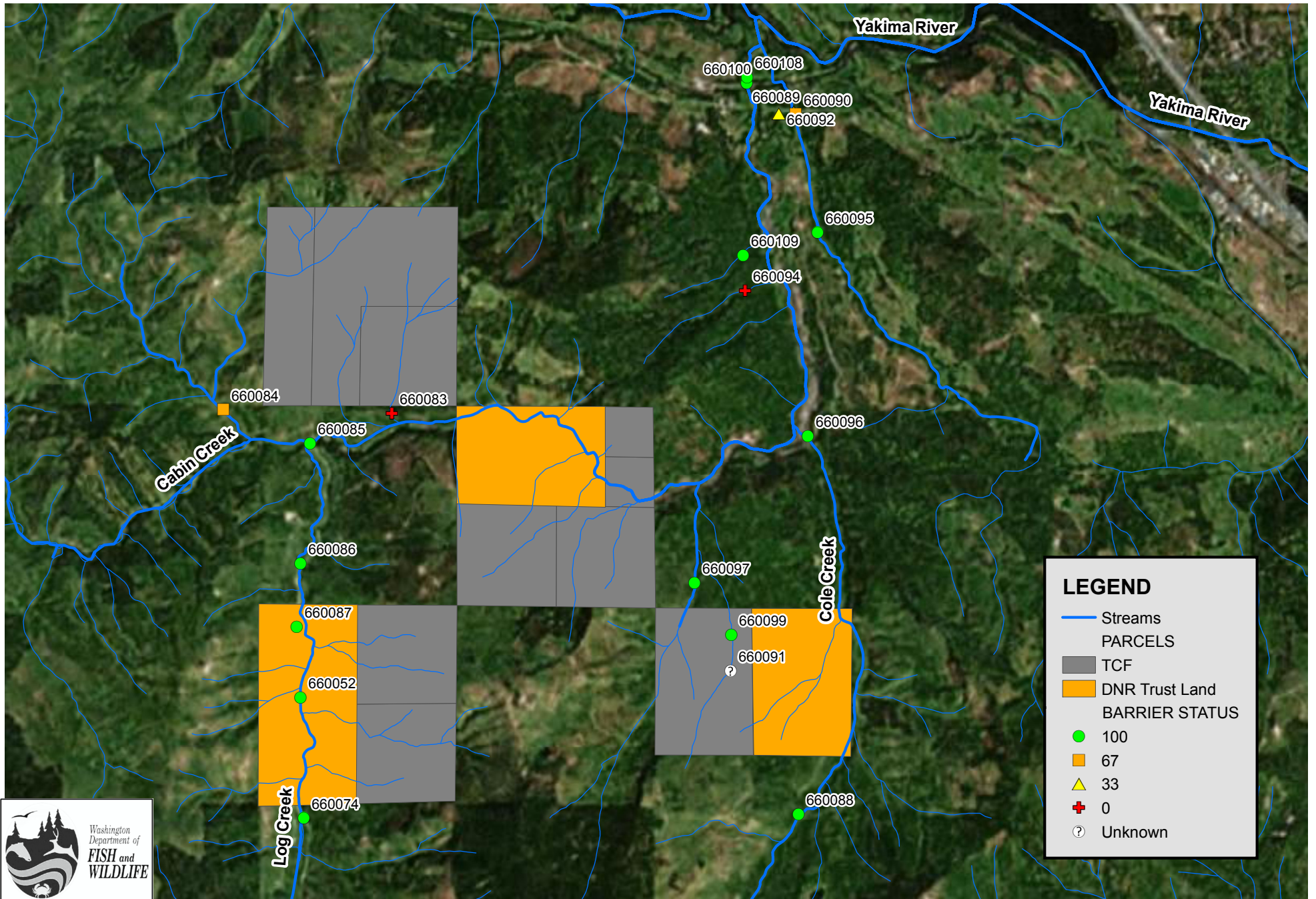
Map 3. First Creek Block



0 0.25 0.5 1 Miles

Map created November 2015
by Justin Zweifel, WDFW

Map 4. Cabin Creek Block



LEGEND

- Streams
- PARCELS
- TCF
- DNR Trust Land
- BARRIER STATUS
- 100
- 67
- ▲ 33
- + 0
- ? Unknown



Map created November 2015
by Justin Zweifel, WDFW

REFERENCE

Washington Department of Fish and Wildlife. 2009. Fish Passage and Surface Water Diversion Screening Assessment and Prioritization Manual. Washington Department of Fish and Wildlife. Olympia, Washington.

**APPENDIX: WDFW Fish Passage and Diversion Screening Inventory Database
Table and Detailed Reports**

Teanaway Community Forest Fish Passage Inventory 2015

Stream Name	Tributary to	Barrier	Passability	Feature Type	Road Responsibility	Road Name	Latitude	Longitude	Site Id
Cabin Cr	Yakima R	No	100	Non-Culvert Xing	Private	Log Cr Rd	47.217215	-121.275212	660085
Cabin Cr	Yakima R	No	100	Non-Culvert Xing	WA State Parks	Iron Horse Trail	47.243396	-121.228544	660100
Cabin Cr	Yakima R	No	100	Non-Culvert Xing	Private	unnamed	47.2438	-121.2285	660108
Carlson Cr	WF Teanaway R	Yes	33	Culvert	TCF	Carlson Cr Rd	47.251105	-120.910811	660051
Carlson Cr	WF Teanaway R	Yes	67	Culvert	TCF	Carlson Cr Rd	47.251412	-120.910914	810990
Carlson Cr	WF Teanaway R	No	100	Culvert	TCF	Carlson Cr Rd	47.248516	-120.915335	810991
Cole Cr	Cabin Cr	No	100	Culvert	Private	NF-140	47.19029	-121.222984	660088
Cole Cr	Cabin Cr	No	100	Non-Culvert Xing	USFS	NF-41	47.217754	-121.221989	660096
Dickey Cr	NF Teanaway R	Unk	Unknown	Culvert	TCF	NF-115	47.281303	-120.811935	660032
Dingbat Cr	WF Teanaway R	Yes	67	Culvert	Private	unnamed	47.269428	-120.987632	660061
First Cr	Swauk Cr	No	100	Non-Culvert Xing	TCF	NF-3506	47.207989	-120.689969	660101
First Cr	Swauk Cr	No	100	Non-Culvert Xing	TCF	NF-3506	47.204922	-120.660175	660105
Indian Cr	NF Teanaway R	No	100	Culvert	Kittitas Co.	NF Teanaway Rd	47.300965	-120.854719	660015
Indian Cr	NF Teanaway R	No	100	Non-Culvert Xing	TCF	Indian Cr Rd	47.319945	-120.819541	660024
Jack Cr	NF Teanaway R	No	100	Culvert	Kittitas Co.	NF Teanaway Rd	47.324469	-120.852491	660023
Jungle Cr	NF Teanaway R	No	100	Non-Culvert Xing	TCF	8100	47.334155	-120.857353	660013
Jungle Cr	NF Teanaway R	No	100	Culvert	USFS	Jungle Cr Rd	47.346589	-120.876598	660016
Jungle Cr	NF Teanaway R	Yes	33	Culvert	USFS	Jungle Cr Rd	47.346627	-120.880068	660018
Jungle Cr	NF Teanaway R	No	100	Culvert	TCF	Little Jungle Cr Rd	47.334114	-120.857808	660022
Lick Cr	NF Teanaway R	Yes	67	Culvert	Kittitas Co.	Teanaway Rd NF	47.275457	-120.882223	660008
Lick Cr	NF Teanaway R	Yes	33	Culvert	TCF	Lick Cr Rd	47.295378	-120.920012	660040
Lick Cr	NF Teanaway R	No	100	Non-Culvert Xing	Private	Spoke Ln	47.287887	-120.923929	660042
Lick Cr	NF Teanaway R	No	100	Non-Culvert Xing	Private	Wagon Wheel Rd	47.287436	-120.923407	660043
Lick Cr	NF Teanaway R	No	100	Non-Culvert Xing	Private	Wagon Wheel Rd	47.282901	-120.91689	660044
Lick Cr	NF Teanaway R	Yes	67	Culvert	TCF	Lick Cr Rd	47.283672	-120.901421	660045
Lick Cr	NF Teanaway R	No	100	Non-Culvert Xing	Private	Wagonwheel Rd	47.28837	-120.92374	132131488
Log Cr	Cabin Cr	No	100	Non-Culvert Xing	USFS	NF-4110	47.198749	-121.276237	660052
Log Cr	Cabin Cr	No	100	Non-Culvert Xing	Private	NF-4110	47.190001	-121.275881	660074
Log Cr	Cabin Cr	No	100	Non-Culvert Xing	Private	Log Cr Rd	47.208513	-121.276232	660086
Log Cr	Cabin Cr	No	100	Non-Culvert Xing	Private	Log Cr Rd	47.203888	-121.276643	660087
MacCanyon Cr	Teanaway R	Yes	67	Culvert	Private	private; Teanaway Rd	47.210422	-120.759514	132151418
MF Teanaway R	Yakima R	No	100	Non-Culvert Xing	TCF	MF Teanaway Rd	47.297711	-120.960482	660027
MF Teanaway R	Yakima R	No	100	Non-Culvert Xing	Kittitas Co.	WF Teanaway Rd	47.258657	-120.897505	660029
Middle Cr	NF Teanaway R	Yes	67	Culvert	Kittitas Co.	Teanaway Rd NF	47.295332	-120.855302	660012
Miller Cr	Bear Cr	No	100	Non-Culvert Xing	USFS	NF-9703	47.368518	-120.78416	660000
Musser Cr	Teanaway R	Yes	0	Culvert	Kittitas Co.	Teanaway Rd	47.22321	-120.787471	660076
Musser Cr	Teanaway R	Yes	33	Culvert	Kittitas Co.	Teanaway Rd	47.200557	-120.773064	660077
Musser Cr	Teanaway R	Yes	0	Culvert	TCF	T2300	47.22776	-120.77803	660082
Musser Cr	Teanaway R	Yes	33	Culvert	Private	private; Teanaway Rd	47.223373	-120.78695	132142324A
Musser Cr	Teanaway R	Yes	67	Culvert	Private	private; Teanaway Rd	47.223544	-120.786543	132142324B
Musser Cr	Teanaway R	Yes	67	Culvert	Private	private; Teanaway Rd	47.223693	-120.786129	132142324C
Musser Cr	Teanaway R	Yes	0	Culvert	Private	private; Teanaway Rd	47.223873	-120.785576	132142324D

Teanaway Community Forest Fish Passage Inventory 2015

Stream Name	Tributary to	Barrier	Passability	Feature Type	Road Responsibility	Road Name	Latitude	Longitude	Site Id
NF Teanaway R	Teanaway R	No	100	Non-Culvert Xing	Kittitas Co.	Teanaway Rd	47.254434	-120.87874	660002
NF Teanaway R	Teanaway R	No	100	Non-Culvert Xing	Private	private; NF Ranch Rd	47.266817	-120.882387	660005
NF Teanaway R	Teanaway R	No	100	Non-Culvert Xing	USFS	NF-9701	47.254434	-120.855959	660007
NF Teanaway R	Teanaway R	No	100	Non-Culvert Xing	Kittitas Co.	Teanaway Rd NF	47.289494	-120.859631	660011
Rye Cr	NF Teanaway R	Yes	0	Culvert	TCF	Rye Cr Rd	47.316079	-120.876349	660041
Rye Cr	NF Teanaway R	Yes	0	Culvert	TCF	Rye Cr Rd	47.323075	-120.903773	660048
Sandstone Cr	WF Teanaway R	Yes	67	Culvert	Private	Sandstone Rd	47.274406	-120.987719	660062
Stafford Cr	NF Teanaway R	No	100	Non-Culvert Xing	USFS	NF-9703	47.366239	-120.80277	660001
Stafford Cr	NF Teanaway R	No	100	Non-Culvert Xing	USFS	NF-9737	47.347679	-120.847486	660031
Standup Cr	Stafford Cr	No	100	Non-Culvert Xing	USFS	NF-112	47.369261	-120.838852	660004
Standup Cr	Stafford Cr	No	100	Non-Culvert Xing	USFS	NF-9703	47.354892	-120.835208	660034
Story Cr	Teanaway R	No	100	Culvert	Kittitas Co.	Teanaway Rd	47.254779	-120.875064	660075
Swauk Cr	Yakima R	No	100	Non-Culvert Xing	Kittitas Co.	Burke Rd	47.199929	-120.709288	660106
Swauk Cr	Yakima R	No	100	Non-Culvert Xing	WSDOT	SR 97	47.201693	-120.707321	660107
Teanaway R	Yakima R	No	100	Non-Culvert Xing	Kittitas Co.	Red Bridge Rd	47.201117	-120.782217	950037
unnamed	Standup Cr	Yes	0	Culvert	USFS	NF-112	47.36783	-120.838609	660003
unnamed	NF Teanaway R	Yes	33	Culvert	USFS	NF-9701	47.332311	-120.854792	660006
unnamed	NF Teanaway R	Yes	0	Culvert	Kittitas Co.	Teanaway Rd NF	47.279183	-120.877583	660009
unnamed	NF Teanaway R	Yes	0	Culvert	Kittitas Co.	Teanaway Rd NF	47.28455	-120.865014	660010
unnamed	Jungle Cr	Yes	0	Culvert	USFS	NF-9701	47.34426	-120.87146	660014
unnamed	Jungle Cr	Yes	0	Culvert	USFS	Jungle Cr Rd	47.346633	-120.878902	660017
unnamed	N Fork Teanaway R	Yes	33	Culvert	Kittitas Co.	NF Teanaway Rd	47.317703	-120.852159	660019
unnamed	Jungle Cr	Yes	67	Culvert	USFS	Jungle Cr Rd	47.345682	-120.893658	660020
unnamed	Jungle Cr	Yes	33	Culvert	USFS	Jungle Cr Rd	47.34214	-120.901889	660021
unnamed	Indian Cr	Yes	0	Culvert	TCF	Indian Cr Rd	47.3186	-120.812353	660025
unnamed	Indian Cr Rd	Yes	0	Culvert	TCF	Indian Cr Rd	47.317201	-120.811139	660026
unnamed	MF Teanaway R	Yes	33	Culvert	TCF	MF Teanaway Rd	47.293929	-120.966054	660028
unnamed	Jack Cr	Yes	0	Culvert	USFS	NF-9738	47.34627	-120.801842	660030
unnamed	WF Teanaway R	Yes	33	Culvert	WDNR	T5300	47.278151	-120.965459	660033
unnamed	Teanaway R	Unk	Unknown	Culvert	Private	private; Teanaway Rd	47.236509	-120.824478	660035
unnamed	Teanaway R	Yes	0	Culvert	Private	private; Teanaway Rd	47.238526	-120.821451	660036
unnamed	Teanaway R	Yes	67	Culvert	Kittitas Co.	Teanaway Rd	47.239209	-120.820745	660037
unnamed	Teanaway R	Yes	33	Culvert	Private	private; Teanaway Rd	47.242837	-120.818676	660038
unnamed	Lick Cr	Yes	33	Culvert	TCF	Lick Cr Rd	47.282196	-120.901889	660039
unnamed	Lick Cr	Yes	0	Culvert	TCF	Lick Cr Rd	47.286132	-120.898924	660046
unnamed	Teanaway R	No	100	Culvert	TCF	unimproved road	47.241209	-120.855295	660049
unnamed	NF Teanaway R	Yes	0	Culvert	TCF	Shirk Canyon Rd	47.292144	-120.874507	660050
unnamed	WF Teanaway R	Yes	33	Culvert	TCF	unnamed	47.247374	-120.917792	660053
unnamed	WF Teanaway R	No	100	Non-Culvert Xing	TCF	unnamed	47.241726	-120.918849	660054
unnamed	WF Teanaway R	Yes	33	Culvert	TCF	unnamed	47.247848	-120.89759	660055
unnamed	WF Teanaway R	No	100	Non-Culvert Xing	TCF	Rabbit Gulch Rd	47.257169	-120.939292	660056
unnamed	WF Teanaway R	Yes	0	Culvert	Private	Dingbat Rd	47.270131	-120.978682	660057

Teanaway Community Forest Fish Passage Inventory 2015

Stream Name	Tributary to	Barrier	Passability	Feature Type	Road Responsibility	Road Name	Latitude	Longitude	Site Id
unnamed	WF Teanaway R	Yes	67	Culvert	TCF	WF Teanaway Rd	47.270065	-120.964145	660059
unnamed	WF Teanaway R	No	100	Non-Culvert Xing	TCF	Old West Fork Rd	47.26583	-120.9626	660060
unnamed	WF Teanaway R	Yes	67	Culvert	Private	unnamed	47.274278	-120.982778	660063
unnamed	WF Teanaway R	No	100	Culvert	TCF	Rabbit Gulch Rd	47.255609	-120.956257	660064
unnamed	WF Teanaway R	Yes	67	Culvert	TCF	Middle Fork Rd	47.289212	-120.989419	660065
unnamed	WF Teanaway R	No	100	Non-Culvert Xing	TCF	unnamed	47.295376	-121.006446	660066
unnamed	Teanaway R	Unk	Unknown	Culvert	Kittitas Co.	Teanaway Rd	47.246586	-120.849946	660067
unnamed	Teanaway R	Yes	33	Culvert	TCF	Lower Storey Rd	47.252113	-120.836711	660068
unnamed	Teanaway R	Yes	0	Culvert	TCF	Lower Storey Rd	47.254576	-120.827353	660070
unnamed	Teanaway R	Yes	67	Culvert	Kittitas Co.	Teanaway Rd	47.240278	-120.823978	660071
unnamed	Teanaway R	No	100	Culvert	Kittitas Co.	Teanaway Rd	47.226665	-120.792565	660072
unnamed	Teanaway R	No	100	Dam	Private	unnamed	47.226854	-120.792521	660073
unnamed	Teanaway R	Yes	33	Culvert	Kittitas Co.	Teanaway Rd	47.19765	-120.773011	660078
unnamed	Teanaway R	Yes	0	Dam	Private	unnamed	47.197804	-120.773236	660079
unnamed	Teanaway R	No	100	Culvert	Kittitas Co.	Ballard Hill Rd	47.200869	-120.771275	660081
unnamed	Cabin Cr	Yes	0	Culvert	Private	NF-41	47.219406	-121.266468	660083
unnamed	Cabin Cr	Yes	67	Culvert	USFS	unnamed	47.219681	-121.284483	660084
unnamed	Cabin Cr	Yes	0	Culvert	Kittitas Co.	Cabin Cr Rd	47.241299	-121.223513	660089
unnamed	Cabin Cr	Yes	67	Culvert	Kittitas Co.	Cabin Cr Rd	47.241126	-121.223275	660090
unnamed	Cabin Cr	Yes	67	Culvert	Kittitas Co.	Cabin Creek Rd	47.241176	-121.225081	660092
unnamed	Teanaway R	Yes	0	Culvert	TCF	Downs Rd	47.22772	-120.77843	660093
unnamed	Cabin Cr	Yes	0	Culvert	WDFW	unnamed	47.228329	-121.228702	660094
unnamed	Cabin Cr	No	100	Non-Culvert Xing	WDFW	NF-41	47.232548	-121.220941	660095
unnamed	Cabin Cr	No	100	Non-Culvert Xing	WDFW	unnamed	47.207101	-121.23411	660097
unnamed	unnamed Cabin Cr trib	No	100	Non-Culvert Xing	TCF	unnamed	47.203334	-121.230179	660099
unnamed	First Cr	Yes	0	Culvert	TCF	NF-3506	47.199924	-120.682613	660102
unnamed	First Cr	Yes	0	Culvert	TCF	NF-3506	47.205751	-120.689707	660103
unnamed	First Cr	Yes	0	Culvert	TCF	NF-3506	47.207779	-120.658268	660104
unnamed	Cabin Cr	No	100	Non-Culvert Xing	WDFW	unnamed	47.230877	-121.228893	660109
unnamed	Teanaway R	Yes	33	Culvert	Private	private;Teanaway Rd	47.24615	-120.82336	132101915
WF Teanaway R	Teanaway R	No	100	Non-Culvert Xing	Private	WF Teanaway Rd	47.261707	-120.917512	660047
WF Teanaway R	Yakima R	No	100	Non-Culvert Xing	TCF	Dingbat Rd	47.269858	-120.97691	660058
WF Teanaway R	Teanaway R	No	100	Non-Culvert Xing	TCF	WF Teanaway Rd	47.258263	-120.905873	810992