



Field-Based Data Collection & Verification of the Stream Classification Database for Klamath/Lake

FINAL MONITORING REPORT

OWEB Grant # 217-4040-14296



**Klamath Watershed Partnership
February 22, 2021**

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SUMMARY

KWP worked with the Oregon Department of Forestry (ODF) and Oregon Department of Fish and Wildlife (ODFW) to collect baseline data regarding stream classification, fish presence, fish passage barriers, and restoration opportunities on private lands in Klamath County. This data is referenced in ODF's Stream Classification Database and is critical to their protection of fish and aquatic resources under the Oregon Forest Practices Act. Partners prioritized watersheds for data collection based on the abundance of erroneous or missing data in the Classification Database, the abundance of forestry or other watershed projects, data gaps for fish habitat and barriers, and data needs for potential habitat for anadromous fish. Focal areas for this grant included tributaries to the Klamath River and the Camp 6 area of the upper North Fork Sprague. Surveys conducted in April through July of 2018 through 2020 resulted in verification of stream presence and/or physical habitat surveys along 946 miles of streams noted in the Database, addressing 95% (747 miles) of the streams previously listed as "Unknown" fish status. Confirmed fish streams increased by 50% (65 miles). Two miles of new streams were recorded and restoration opportunities were documented through georeferenced photos.

BACKGROUND

The Oregon Department of Forestry (ODF) follows the OFPA as it regulates forestry on private and state-owned lands. In partnership with the Oregon Department of Fish and Wildlife (ODFW), the ODF has created and seeks to maintain a water classification system based on size and beneficial use (domestic water use or fish). Streams are considered to support fish if they can be used by salmonid (including anadromous salmonids) or T&E species fish seasonally or year-round (OAR 629-635-0200). The results of the classification efforts and subsequent data collection have been summarized in a Stream Classification Database.

The Klamath-Lake District office of ODF administers forestry programs on 1.4 million acres of private and state land. In many cases, the ODF Stream Classification Database for the Klamath-Lake District is lacking or incorrect for small streams. Where ground-truthed data has not been collected, models have used geographic features to predict stream presence. This approach and the reliability of the data are problematic in the highly altered and pumice-dominated areas of the Eastern Cascades. The Pumice Plateau and Pumice Plateau Basins ecoregions (EPA Level IV) encompassing most of northern Klamath and northwestern Lake counties have deep, highly permeable soils of pumice and volcanic ash. Depressions and drainages in these systems may experience ephemeral to no surface flow, however models indicate stream presence.

The Water Protection Rules of the OFPA dictate that all fish-bearing streams have a riparian management area (RMA). The RMA provides for vegetation retention and downed wood management

to support stream function and to provide fish and wildlife habitat. On a case-by-case basis where the Stream Classification Database is believed to have erroneous information regarding stream or fish presence, ODF must take additional time and steps to consult with the landowner, ground-truth maps, develop justifications, and/or consult with ODFW to validate a decision to modify the dataset. In many such cases, ODFW has based fish presence on professional opinion rather than conduct additional sampling. These hurdles delay projects, frustrate partners, consume State resources, and ultimately do not provide sufficient assurance that aquatic resources are being adequately protected. The frequency of mapping/data issues brings the credibility of ODF into question, especially with large landowners that have experienced problems more than once. When industrial landowners are actively managing forests, delays affect their bottom line, which trickles into the local economy.

Accurate designation of stream presence not only impacts forestry management goals and objectives, but also the relative importance of protecting and/or potentially restoring that reach for fish. Juvenile fish may seek refuge in small tributaries from high flows and elevated temperatures in larger streams. As ODFW evaluates instream habitat characteristics for recolonization by anadromous fish, accurate data regarding habitat potential in small tributaries will be important in identifying areas of potential steelhead spawning. Furthermore, surveys can provide ODFW with current conditions in some of these smaller tributaries that may be targeted for rehabilitation efforts such as large wood and beaver enhancement projects. According to the Oregon Fish Passage Barrier Data Standard, there are nearly 2,000 fish passage barriers or potential barriers in Klamath and Lake Counties; however, efforts to address deficiencies in data currency, completeness and accuracy are ongoing and are often limited by lack of sufficient resources. ODFW is especially interested in the accuracy of these data as they reflect the ability of a particular structure to pass both adult and juvenile fish, upstream and downstream.

PROTOCOL AND SAMPLING DESIGN

Crews conducted field verification of stream classification and physical habitat assessments for fish presence during the field seasons of April through July in 2018 through 2020. Locations for the stream surveys were based on a combination of priorities and data needs for ODF and ODFW. Specifically, ODF was addressing stream reaches within their Stream Classification Database that were incorrect and/or where fish presence was unknown. Areas where there were many problems with the database and there were current or planned forestry practices were high priority. ODFW wanted to identify and characterize potential habitats, restoration and passage issues, and enhancement opportunities, especially as they related to state species of interest (redband), Threatened species (bull trout), and recolonizing anadromous species. Crews referenced the Oregon Forest Practices Act guidelines for true streams. Standard ODF protocols were used regarding physical habitat and fish as indicated in the Physical Habitat Survey Training Manual (ODF State Forests Division, June 2009) and Surveying Forest Streams for Fish Use (ODF/ODFW, 1995). Specifically:

- Ground-truthing small "streams" included written and photo documentation of water features that are not to be considered "streams" by OFPA definition (e.g. ephemeral streams, road drainages, water developments such as irrigation ditches, etc.). Sites requiring follow-up assessment by ODF/ODFW were also noted.

- Physical habitat surveys for determination of natural barriers to fish use followed ODF protocol (OAR 629-635- 0200(13)(c)) as amended and agreed upon with local ODFW fisheries biologists. This guidance locates the first natural barrier to fish use by physically walking the stream reach in question to observe and locate natural channel features. Protocol dictates use of stream levels based on bankfull width as points of reference in measuring channel drops. At a minimum, physical surveys:

- 1) documented and measured natural barriers (falls and chutes, channel steepness, and pool depth as an indicator of livable space);

- 2) noted the presence and condition of artificial barriers and natural elements that may be providing a temporary barrier; ODFW will be able to cross reference this with their existing barrier database and determine follow-up sites after each field season.

- 3) included photo references for all natural and artificial barriers, as well as any other site condition that could impact stream classification or habitat condition; and

- 4) collected locations and photos of potential non-barrier restoration sites, such as degraded streambanks and areas of insufficient riparian vegetation.

- Although physical habitat surveys typically ended once a natural barrier was documented, the remainder of the watershed was ground-truthed for stream presence. While assessing stream presence, the technician visually surveyed the stream for isolated habitat or fish populations above a natural barrier. Any discoveries of fish above the natural barrier were evaluated as grounds to assess the reach as fish-bearing until the next upstream natural barrier was determined.

- Quality assurance and quality control of data collected were obtained through several mechanisms related to staff, data collection, and review. ODF staff with experience with the protocol were used as the technicians. In all three seasons, the lead technician was the same individual. This consistency of staff/training assured consistency in the implementation of the protocols. Quality assurance was also provided by collecting and entering data in an iPad in the field. This ensured accuracy of locations and comparison with mapped features, as well as eliminating the potential for error with written notes/data entry. Quality control was provided through levels of review by internal and external sources. A preliminary assessment of the streams was conducted by ODF technicians prior to field work. This assessment involved review of DEM model data and comparison with any additional ODF data. After data was collected, it was shared with and reviewed by ODFW and landowners such as Green Diamond. ODFW compared data with their barrier dataset and personal knowledge of the areas covered. Green Diamond likewise compared the results with their historical paper maps and GIS database. Where questions arose, these secondary reviewers consulted with ODF and conducted site visits to verify results.

RESULTS

A summary of before and after stream classification information by subarea is presented in the table below. Summary maps presenting before and after stream classification data as well as survey data markers are included at the end of this report.

	Klamath River										Camp 6	
	Spencer Creek		Camp 4		Johnson Creek		Aspen Lake		Bear Valley		Before	After
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Fish	31	56	19	34	17	21	19	41	0	0	39	37
Non-Fish	0	73	12	252	11	68	0	28	0	37	8	111
Unknown	171	8	288	5	70	0	86	4	58	12	117	13
Deleted		64		28		8		32		9		3
New						1						1
Total	201		319		98		105		58		165	

MONITORING QUESTIONS AND OBJECTIVES

KWP worked with ODF and ODFW to collect baseline data regarding stream classification, fish presence, fish passage barriers, and restoration opportunities on private lands in Klamath County. Activities and outcomes related to project objectives are below:

Objective 1: Use ODF and ODFW experience, priorities, and mapping to prioritize the regions to be addressed through this monitoring effort and identify the landowners to be contacted for access permission.

In year one project partners looked at the landscape to identify areas where their respective interests for data could be addressed. For ODF this involved areas where the Stream Classification Database was especially erroneous or lacking, overlapped with an abundance of private lands where forestry operations have been or will be occurring. For ODFW, priorities included areas with known fish passage issues, important areas for life history stages of fish species of concern, and areas that could be accessed by recolonizing anadromous fish. This prioritization resulted in the following areas in order from top to bottom priority: tributaries of the Klamath River (including nearby areas of Aspen Lake and Bear Valley); the Camp 6 area of the upper North Fork Sprague River, the Longbell tract in the upper Sycan watershed, the Antelope Desert area of the upper Williamson watershed. These priorities were revisited prior to each field season.

KWP worked with ODF to identify and seek access permission from private landowners. In most of the Klamath River areas, Green Diamond was the predominant landowner; however lack of landowner permission did create some data collection challenges for the Bear Valley section of the Klamath River region, and Camp 6 (see maps). Where there were no landowner permissions, streams were assessed up to the property line on both upstream and downstream sides. Streams were also visibly assessed where they could be seen from the property lines. Most often, barriers were identified before or after these properties, and where they were identified upstream of these private properties, the stream was left classified as unknown to avoid assumptions. This was mostly an issue in the Bear Valley area, but nearly all of the stream segments that were not accessible were on agricultural land classified as grazing. There were also several diversions in the Camp 6 area that were not accessible that were left as unknown.

Objective 2: Conduct field verification of stream classification on 150 miles (each year) of streams in Klamath and Lake Counties during the field seasons of May through July 2018 and 2019.

Due to low water years and early Springs where surveys were occurring, it was decided in partnership with ODFW that surveys could begin in April and run through July. Additionally, funding allowed the project to continue into the 2020 season. Sites verified under this grant all occurred in Klamath County. Annual accomplishments varied due to accessibility and other technician commitments, but overall 946 miles of stream were verified. This included 144 miles of previously identified “streams” that were actually not to be considered and managed through the OFPA, such as irrigation ditches, ephemeral streams, and road drainages. These are shown as “Deleted” reaches on the attached maps. No stream sizes, such as “small” to “medium”, were adjusted as there was not adequate evidence or data collected to justify any changes. Anything that was a modification to the waterway or could be considered an artificial barrier, such as a culvert, was documented. Some additional restoration opportunities identified through these verifications included places where small streams were diverted by road crossings.

Objective 3: Conduct physical habitat assessments for fish presence on 60 miles (each year) of streams in Klamath and Lake Counties during the field season of May through July 2018 and 2019.

Modifications to the timing and locations of these field seasons noted for Objective 2 apply to Objective 3 as well. Overall physical habitat assessments confirmed fish presence on 188 miles of stream, an increase of 50% above previously confirmed fish bearing streams. Where natural barriers were documented, surveys continued for an additional 300 feet to see if fish existed above the barrier. This additional surveying did not identify any additional fish areas. Surveys confirmed 569 miles as non-fish, and although these were not assessed past the 300-feet above the natural barrier, they were verified for stream presence and visually evaluated for fish presence. This effort addressed 95% of the previously “Unknown” fish classifications (789 miles unknown before; 43 miles unknown after). Because the assessments included a comprehensive record of artificial potential barriers, there was no analysis done of previously documented artificial barriers and whether or not they had been addressed. ODFW will be able to cross reference this data with their database to see where changes have been made that require follow-up. There were no notifications required under OAR 629-635-0210, as this is only required when a stream goes from “non-fish” to “fish”, which did not occur in the areas assessed.

Objective 4: Coordinate with ODFW to fill gaps in fish survey data and evaluate stream restoration opportunities.

ODF consulted with ODFW during and after each field season with questions or verification needs. Although there was no concurrent or opportunistic ODFW fish surveys that could be incorporated, ODFW did provide stream electroshocking in two areas to confirm fish presence at the request of ODF and Green Diamond. In one case this identified green sunfish, which are not native, but are considered game fish that could be considered a managed species. Following discussions with local ODFW staff, state-level fish biologists, and ODF, it was determined that the fish were illegally stocked and their protection was not required under the OFPA. Some restoration opportunities have been identified and shared with the partners. These are also being shared, along with the stream data, with Trout Unlimited as part of a post-dam restoration assessment for the Klamath River basin. It is anticipated that the elevated prioritization of this area after dam removal will result in some of these projects being completed. Another complication with the pursuit of restoration in both the Klamath River and the

Camp 6 area is the pending Safe Harbor Agreement between Green Diamond and the USFWS. Until this agreement is finalized, Green Diamond is unwilling to pursue restoration projects. It should be noted, however, that Green Diamond has replaced some previously-problematic culverts on their own, as documented by this project and shared with ODFW.

Objective 5: Coordinate with ODF and ODFW to update the Stream Classification Database and distribute detailed summary documents and maps.

The data for this project has been collected, entered, verified, and shared with partners and other interested parties, including USGS for the National Hydrography Dataset (NHD) and ODFW through the Natural Resource Information Management Program (NRIMP). Data for 2018 and 2019 field seasons is already available online through ODF's Forest Activity Electronic Notification and Reporting System (FERNs), and 2020 data should be online soon. A Final Report on this project is uploaded to OGMS and has been shared with partners including ODF, ODFW, and Trout Unlimited.

USE OF DATA TO INFORM FUTURE ACTIONS

This project collected baseline data for the stream classification database where modelling had generated questionable results or where actual data were more than 20 years old. Interpretation and application of stream classification data as it guides forest management practices is specified in the Water Protection Rules and subsequent amendments of the Oregon Forest Practices Act. Database updates have been and will continue to be applied with regard to stream classification and corresponding riparian management areas or other vegetation retention practices that must be followed for every forest management practice on private or state lands. The classification data is available online through the Forest Activity Electronic Reporting and Notification System (FERNs; <https://ferns.odf.oregon.gov/E-Notification/>), which mines stream and fish data to assess site conditions for proposed forest operations. Private lands partners are able to use this current information to develop better plans and prescriptions to protect water resources from the start, saving time and money for all partners. Additionally, correct database information will serve to improve ODF's wildfire response as it pertains to the use of aerially-applied retardant in stream areas. This data use will facilitate the most effective wildfire response techniques while protecting aquatic resources.

ODFW has been highly interested in engaging in this monitoring effort as it coincides with the development of monitoring plans for anadromous salmonids and adfluvial redband trout. ODFW has data gaps related to small tributaries and fish passage barriers, and their current efforts in reintroduction planning will benefit from the data collected through this project. Regional prioritization, data collection, evaluation, and application were directed at identification of potential habitat, passage issues, and restoration/enhancement opportunities. With the significant changes anticipated for the fisheries resources of the Upper Klamath Basin over the next decade, any information that helps to ensure the success of reintroduced and recolonized fish and continued sustainability of existing native populations will be valuable.

Through coordination and communication, KWP has gained and shared insight into opportunities for habitat protection, restoration, and enhancement. As a liaison between public natural resource agencies and private landowners, KWP is taking this data collection beyond stream reach protection to provide

the foundation for planning broader scale watershed efforts. The summary documents and maps produced by KWP will inform future project evaluation, planning, and grant writing. This is already happening with respect to the Klamath River tributaries, as data collected by this project are helping to streamline and refine a new robust restoration study by Trout Unlimited, Pacific States Marine Fisheries Commission, and the National Oceanic and Atmospheric Administration. Information gathered will substantiate future requests for project assessments and implementation, and will provide baseline conditions against which improvements can be assessed. Based on the location of the surveys and the severity of the need, restoration projects may not rank high in the bigger picture of prioritization in the Upper Klamath Basin (e.g. the ODA Strategic Implementation Area, USFWS critical habitats for suckers or bull trout, or locally driven Watershed Action Plan) or be within the focus areas of current regional funding efforts (e.g. NRCS RCPP). Where needed, KWP will work with options such as OWEB small grants and other funding sources to accomplish restoration projects.

PHOTOGRAPHS



Data collection for physical habitat assessments – use of a clinometer for slope.



Data collection for physical habitat assessments – use of a measuring tape for current and bankfull widths



Data collection for physical habitat assessments – use of a measuring tape and rod to measure pool depths associated with barriers and the end of a survey



Example of waterfall in Klamath river tributary – height of falls and presence/depth of jump pool determine whether or not it is a natural barrier considering current species with notes for anadromous species



Example of lack of livable space natural barrier in Bear Valley area
- if a stream has no pools that are 12 inches or deeper for a distance of 300 feet and no fish are observed, there would be a barrier due to lack of livable space



Example of channel gradient natural barrier in Klamath River tributary – factors including slope, the presence of pools, and the length of the reach determine if this is a barrier to fish passage



Example of artificial barrier in Camp 6 area – in spite of being a likely barrier to fish passage, artificial barriers like this culvert are not considered to change fish status, and upstream areas are protected as fish bearing



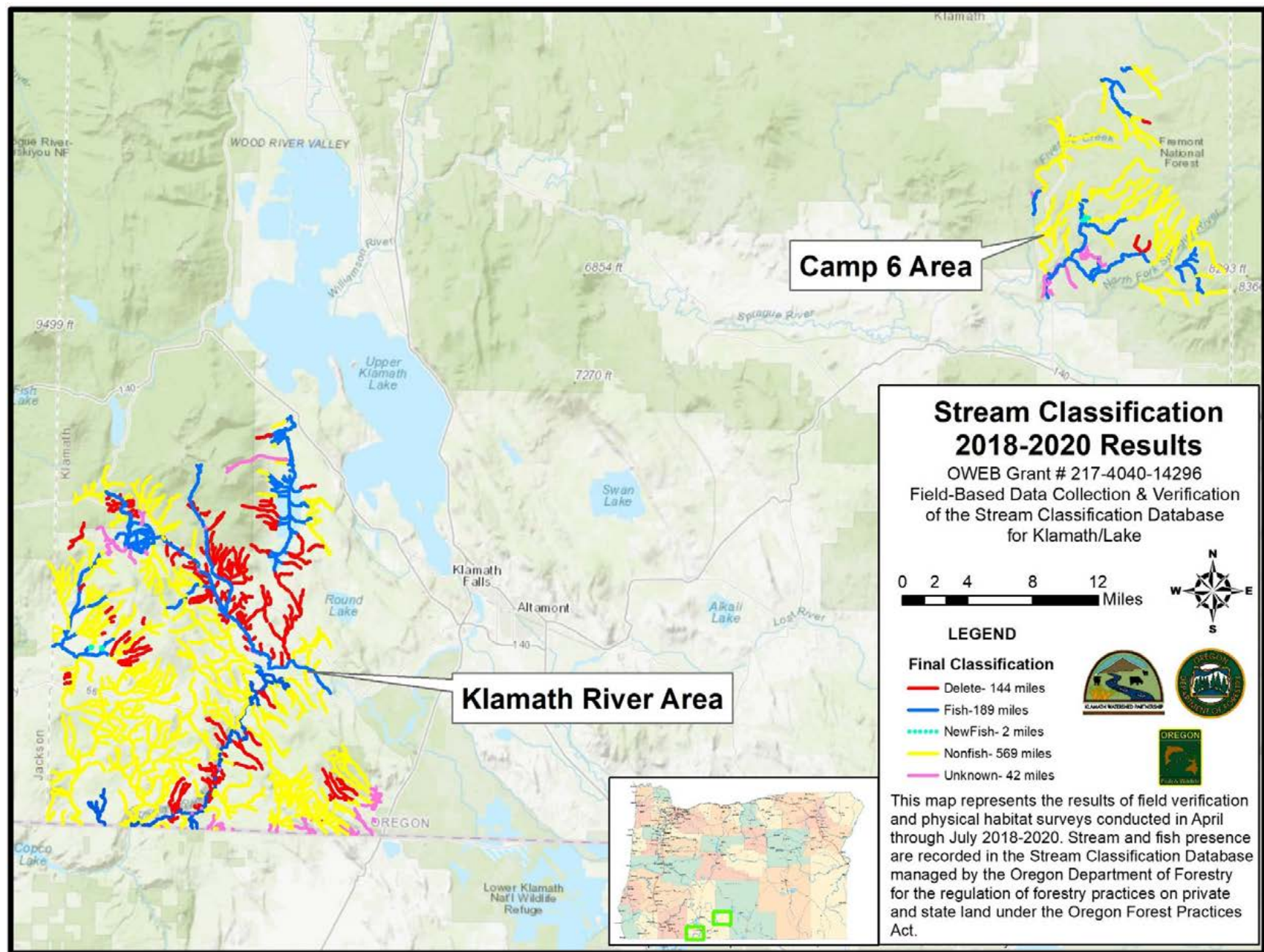
Example of a restoration opportunity in Camp 6 area – this knickpoint below a road crossing on a fish bearing stream is an example of projects that will be shared with partners for follow up investigations and project evaluation as needed

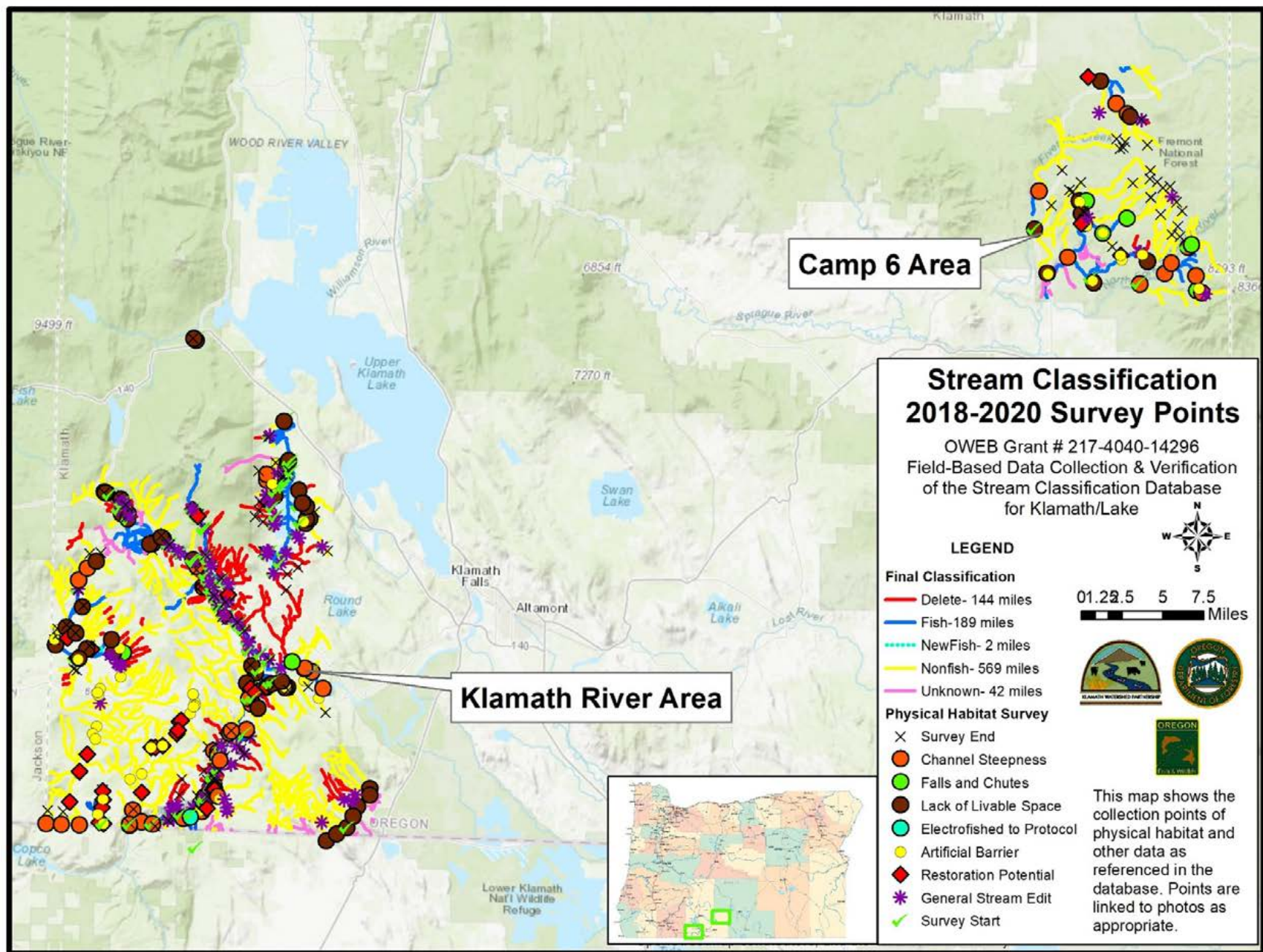


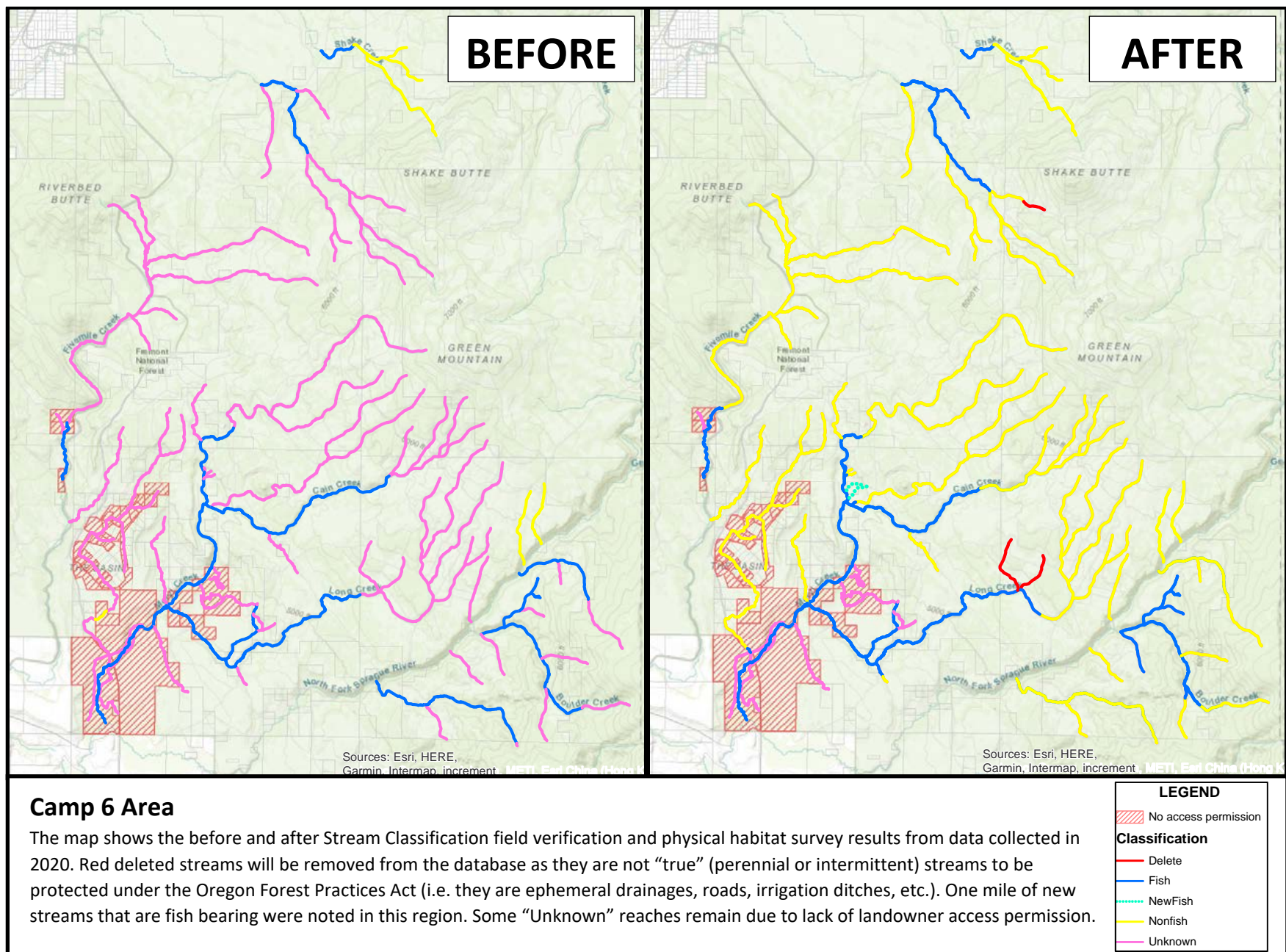
Example of a restoration opportunity in Klamath River Spencer Creek area – this cattle crossing was brought to the attention of Green Diamond and their consulting range management specialist

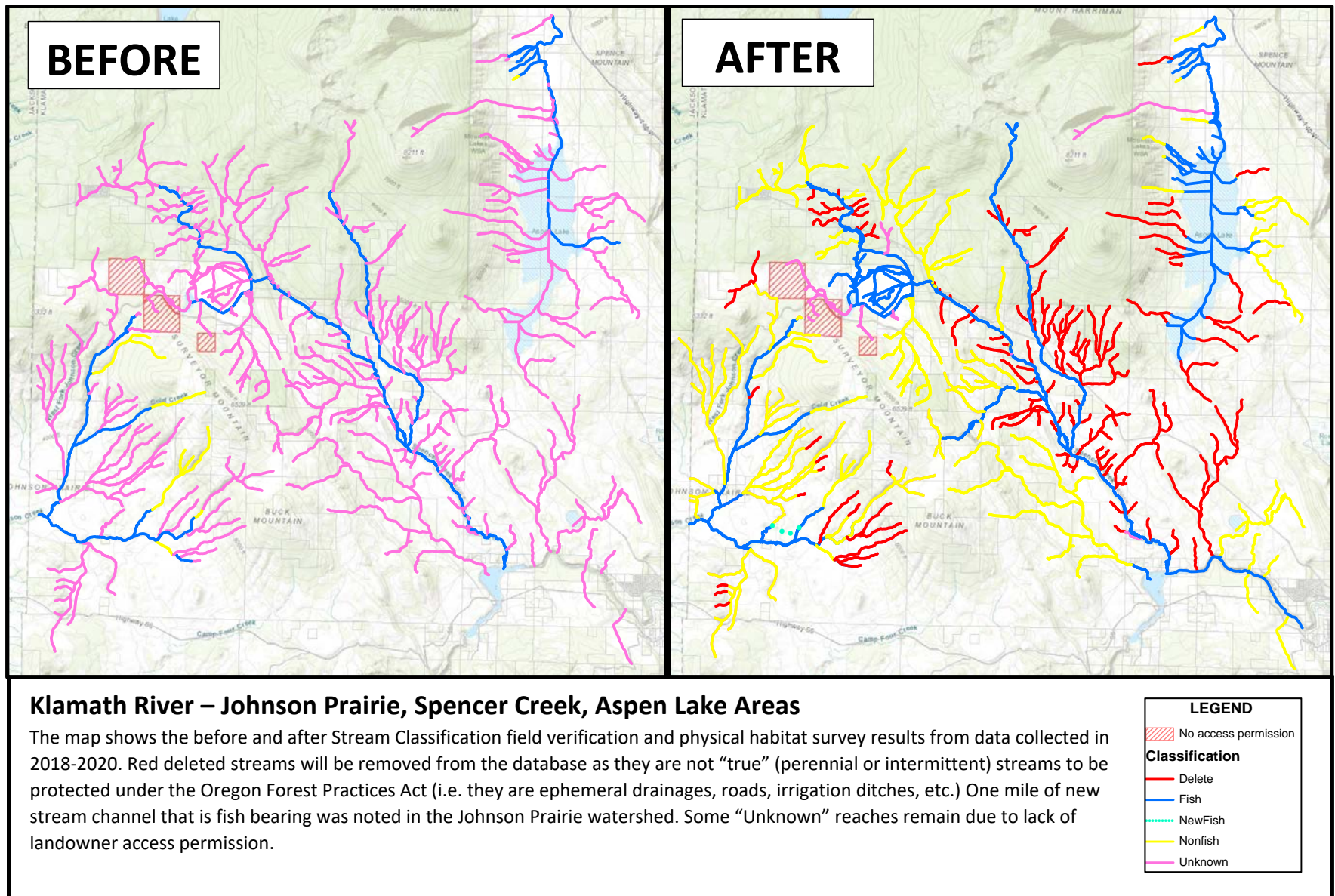


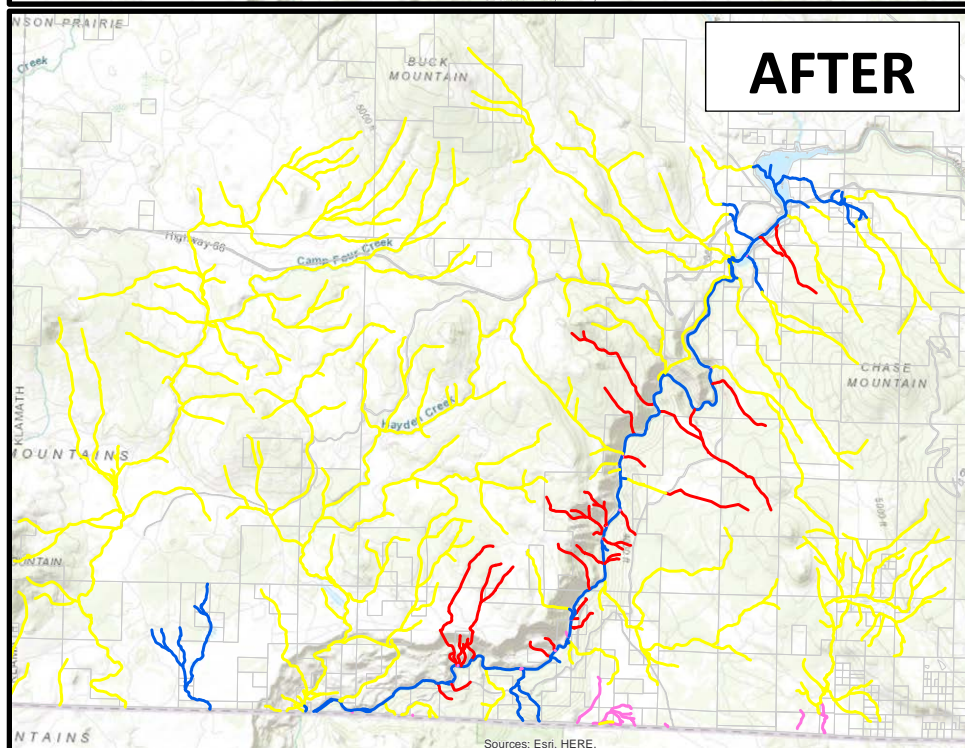
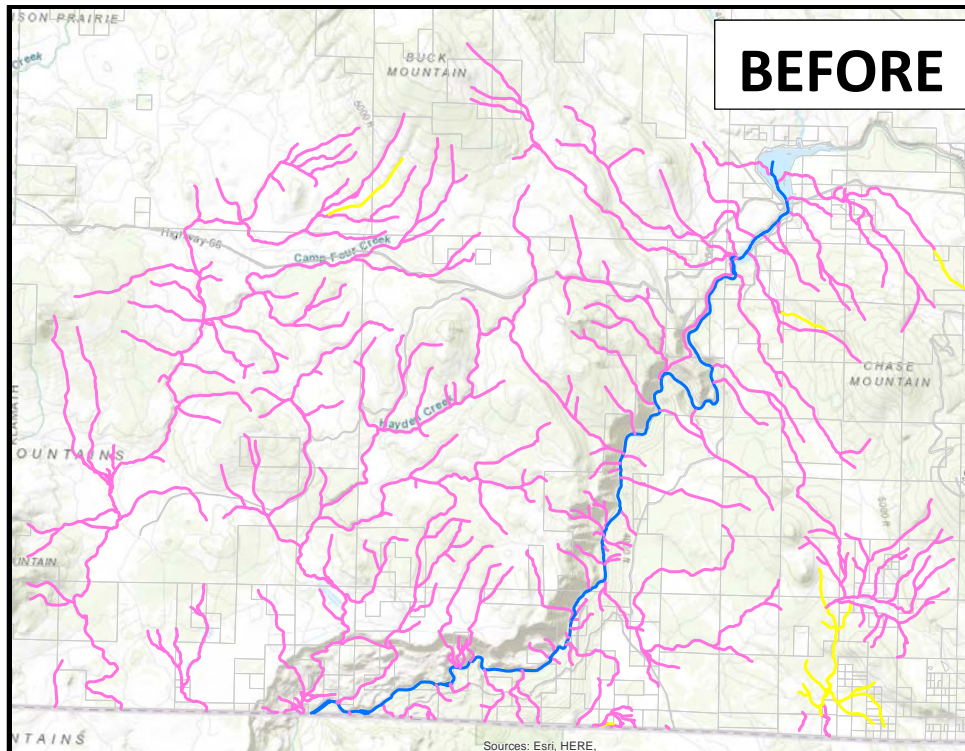
2018 field season- ODF technicians located green sunfish (a non-native game fish) in a stream and requested follow up surveys by ODFW. An ODFW fisheries biologist and technician electroshocked the stream to document presence





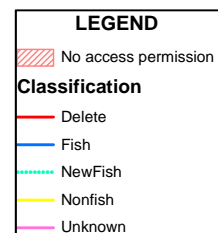


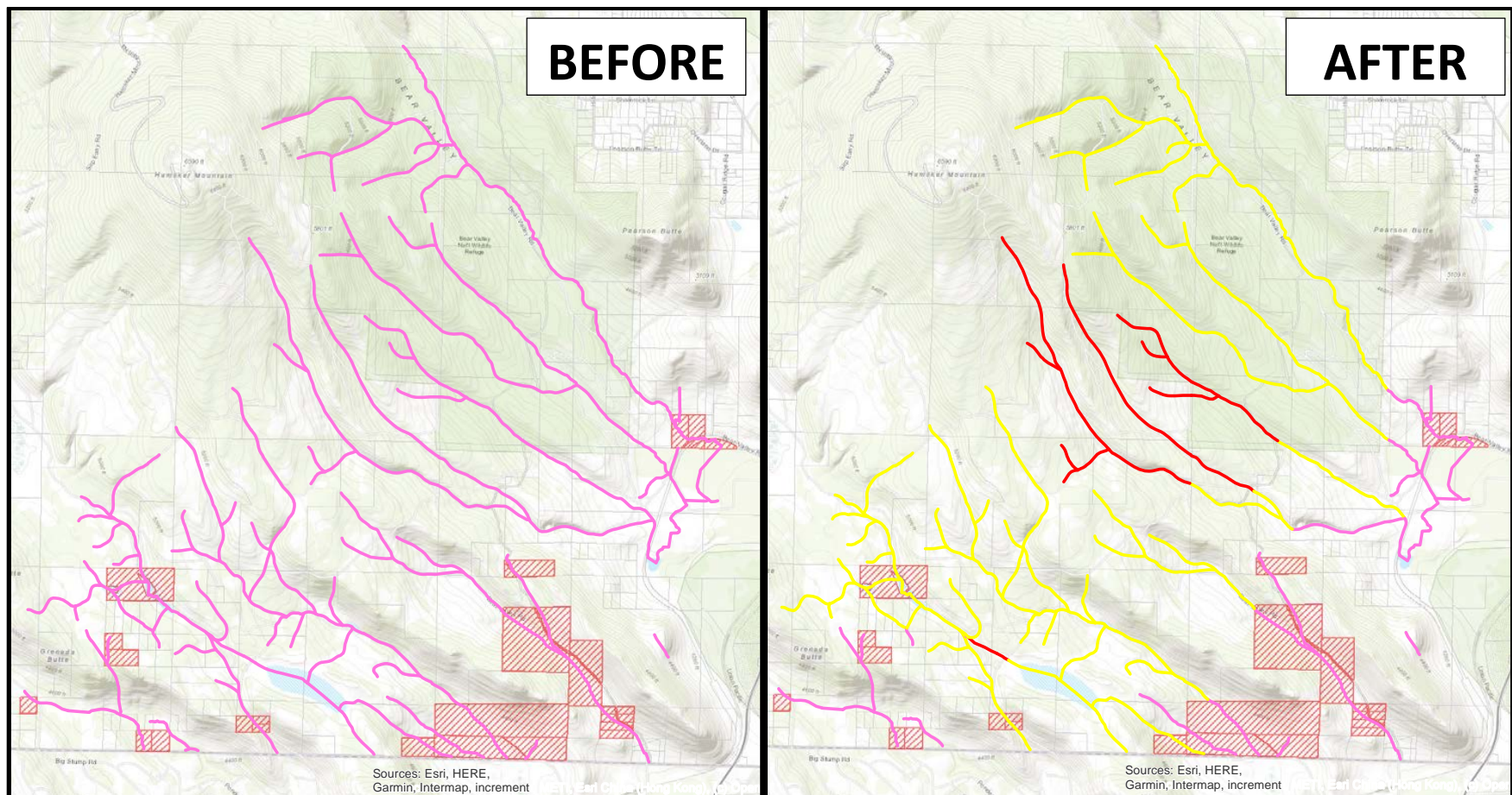




Klamath River - Camp 4 Area

The map shows the before and after Stream Classification field verification and physical habitat survey results from data collected in 2018. Red deleted streams will be removed from the database as they are not “true” (perennial or intermittent) streams to be protected under the Oregon Forest Practices Act (i.e. they are ephemeral drainages, roads, irrigation ditches, etc.)





Klamath River - Bear Valley Area

The map shows the before and after Stream Classification field verification and physical habitat survey results from data collected in 2019 and 2020. Red deleted streams will be removed from the database as they are not “true” (perennial or intermittent) streams to be protected under the Oregon Forest Practices Act (i.e. they are ephemeral drainages, roads, irrigation ditches, etc. Some “Unknown” reaches remain due to lack of landowner access permission. No fish bearing streams were identified in the Bear Valley area.

LEGEND	
	No access permission
Classification	
	Delete
	Fish
	NewFish
	Nonfish
	Unknown



» Data » My Records

Home Data



ODFW Data Clearinghouse
My Records

[View All Records](#) | [My Records](#) | [Data Templates](#)

[Add A New Record](#)

DCH-Data-Index_User Module - Unfinished

My Records

	Title	Submission Status	Approval Status	Date Created	Date Last Modified	Original Owner
Edit	Barriers Observed During Physical Habitat Surveys	Submitted	Approved	2/22/2021 9:18:24 AM	2/22/2021 10:12:35 AM	Petersen, Patrick
Edit	Klamath and Lake County Stream Classifications Based On Fish Presence	Submitted	Approved	2/22/2021 8:45:52 AM	2/22/2021 10:09:19 AM	Petersen, Patrick