

## APPENDIX 4

### OBSERVATIONS TO ACCOMPANY AQUATIC HABITAT ASSESSMENT SPREADSHEET (APPENDIX 12)

Topics below include:

Observations

- Primary observations
- Skill level
- Formatting and filling the spreadsheets
- Potential for errors
- Conclusions

Time spent

**Primary observations:** Aquatic Habitat Assessment reports or similar documents may be prepared by large industrial landowners and included in THPs but they are not required by the Forest Practice Rules. Hawthorne Timber Company owned most the Campbell Creek Planning Watershed from 2000-2015 and prepared the most recent THPs available to this project (specifically, THPs from 2007-2015). Keep in mind for any future pilot projects, Hawthorne Timber Company (and possibly Lyme Redwood Timber LLC, who now owns the same lands) may be the only landowner that has included this level of detail in their THPs. The Aquatic Habitat Assessment reports can be found in THP Section V, as supporting documentation. This level of detail should not be expected in THPs in watersheds where the ownerships are small and/or where there hasn't been a long history of timber management by just one or two owners on any given property. The function of these reports in the THPs that were reviewed may be associated with Forest Stewardship Council or other certification programs as much as for conformance to the Forest Practice Rules.

Like the Watershed and Biological Assessment Areas many of the assessment areas evaluated in the Aquatic Habitat Assessment reports were not confined to the Campbell Creek Planning Watershed (seven of the eight most recent THPs have harvest units in other watersheds). THPs with harvest units in more than one watershed often include watercourse analysis for drainages other than those in the Campbell Creek Planning Watershed. Therefore, caution should be exercised when using the Aquatic Habitat Assessment reports: Some stream segments described may be in other planning watersheds, discussion and conclusions may not be specific to the Campbell Creek Planning Watershed.

Spawning and rearing habitats, Class I, II, III and Class I restorable streams were mapped. The requirements of the Forest Practice Rule are met, but no additional aquatic habitat mapping was provided in the THPs evaluated. No raw stream survey data was provided in the most recent THPs (2008-2015).

When stream reaches were surveyed by the plan submitter they were not always clearly identified on maps in the Aquatic Habitat Assessment. Surveyed stream reaches were clearly depicted on the spawning and rearing maps in THP 1-08-015 MEN. That did not seem to be the case with THP 1-15-107 MEN, although it is possible to visualize the rough location of the surveyed stream segments by applying descriptions in the text to the spawning and rearing maps or maps found elsewhere in the THP.

The most complete aquatic survey data for the Campbell Creek Planning Watershed is in the three 2012 California Department of Fish and Wildlife (CDFW) Stream Inventory Reports: South Fork Ten Mile River,

Campbell Creek and Smith Creek (Draft). These Stream Inventory Reports were cited or included in different ways for different THPs:

- Incorporation by reference, including reference to the THPs discussed below.
- Inclusion of the complete CDFW Stream Inventory Reports for South Fork Ten Mile River and for Campbell Creek as Addendums 1 and 2 of the Aquatic Habitat Assessment in THP 1-14-126 MEN (THP Section V).
- Inclusion of the complete CDFW Draft Stream Inventory Report for Smith Creek as an addendum to the Aquatic Habitat Assessment in THP 1-13-031 MEN (THP Section V).

Where CDFW Stream Inventory Reports presented gaps, only short (approximately 600, 1,000, 1,500 or 2,000 feet) stretches of watercourses were independently surveyed by the plan submitter (per the most recent THPs, 2007-2015, see the spreadsheet #2 in Appendix 5). The discussion of the survey methods in those THPs discloses that the intent was to survey at least 30% of the of the Class I stream habitat adjacent to the plan, not the full length of these previously unsurveyed stream segments. These surveys were identified as Level II surveys, a less thorough level of survey than conducted by the CDFW in 2012 (Level IV surveys). The CDFW Stream Inventory Surveys generally included the entire length of a major drainage, as opposed to the plan submitter conducted partial surveys described above.

Where a wider view (scale at the drainage level) is discussed in the most recent THPs (2013-2015) the 2012 CDFW reports found in THPs 1-14-126 MEN and 1-13-031 MEN are cited. The summary of CDFW Stream Inventory Reports found in THPs/NTMPs may be too general for the purposes of guiding restoration work (providing only averages for entire drainages) and supplemental data gathered by the plan submitter is focused on too small an area to help form a picture at the watershed scale. But there were instances where restoration opportunities were identified. The conclusion of the Aquatic Habitat Assessment in THP 1-13-031 MEN states (pages 497-498, underlining added for emphasis):

"... Structural pool complexity and LWD loading were found to be less than ideal in both creeks, and LWD introduction was recommended in both CDFW 2012 Habitat Inventory Reports ... The implementation of the proposed CTM Smith Creek LWD restoration project should increase favorable conditions for salmonids."

This indicates that a primary driver for restoration project opportunities is the CDFW Stream Inventory Reports. This is understandable as those reports are more thorough than surveys done by the plan submitter (see above). Also, CDFW is the State agency responsible for issues concerning aquatic species, including anadromous fish.

At the THP level (as described above, for the pilot project watershed) when there are gaps they are filled with lower level surveys, surveys that covered only a portion of the stream reaches that did not have the more detailed CDFW data. But there are also situations where no attempt was made by the plan submitter to supplement existing data with even a partial stream survey (THP 1-08-015 MEN (page 399):

"It should be noted that portions of the main stem South Fork River and Smith Creek are adjacent to units AB and AC of the Luce Gulch THP. These sections of streams are not within CTM's property boundary and therefore were not surveyed ..."

Note for possible future pilot projects: In this Campbell Creek Planning Watershed most the watershed is in a single large commercial timberland ownership. Lyme Redwood Timberlands LLC (formerly Hawthorne Timber Company LLC and Georgia Pacific Corporation before that) owns (owned) over

111,000 acres. At the time of this pilot project the holdings of Lyme Redwood Timberlands, LLC include 85% of the watershed of the Ten Mile River (per their website, <http://lymetimber.com/portfolio/lyme-redwood-timberlands/>). The large size of the ownership facilitates stream surveying by the plan submitter because there are few places where trespassing onto other properties to do surveys would be an issue. In addition, large timber companies often have resource professionals (biologists, botanists, geologists, etc.) on staff to prepare reports and provide ownership-wide management guidance. Subsequent pilot projects are likely to find the amount of stream survey data provided by plan submitters less detailed if there are many small ownerships within a planning watershed.

**Skill level:** It is beyond the expertise of the part-time retired Forester (hired on May 24 2018 for “THP mining”) to dissect CDFW Stream Inventory Reports. It would be more appropriate for a fisheries or wildlife biologist to determine and collate what information may be of value. Also, CDFW Stream Inventory Reports should fall under “other available data sources,” as opposed to information that can only be found in THPs/NTMPs. CDFW should be in possession of the raw data used to prepare these reports, information not available in the THPs/NTMPs.

**Formatting and filling the spreadsheets:** It was difficult to present information that is specific to varying lengths (a few hundred feet to several miles) of watercourses. Some categories could have been subdivided, others might have been better if combined. The Appendix 5 spreadsheets are an attempt to present what was found in the Aquatic Habitat Assessments in the 2007-2015 THPs in the Campbell Creek Planning Watershed. The contents of the CDFW Stream Inventory Reports were not “mined” for information. However, the Aquatic Habitat Assessments summarized much of what was in the CDFW Stream Inventory Reports.

No value judgments were made on the numbers taken from the THP’s Aquatic Habitat Assessments. However, from a statistical point of view, the numbers should not be taken at face value, for example:

- Data on pool characteristics were based on as few as 5 pools to as many as 608 pools (or perhaps 10% of 608 pools) depending on THP being reviewed.
- In some surveys, every pool, riffle and flat water “unit” was measured. In other surveys, only every tenth “unit” was measured.
- Definition of “units” was unclear. Knowing the number of “units” with “unstable” banks may not be of any use since they are not mapped or further described.

Whether items such as these are important should be for a person with fisheries and statistical training to determine. It would likely discourage the ultimate end user (whether agency or the public) from using data collected if they first have to grapple with questions like those above.

Where possible data specific to the pilot project watershed also needed to be teased out those Aquatic Habitat Assessments or Stream Inventory Reports where the watercourse surveyed flows through more than one planning watershed. Sometimes this was not possible. The South Fork Ten Mile River is an excellent example. Most of the surveyed area from the CDFW South Fork Ten Mile River Stream Inventory Report is in Churchman Creek Planning Watershed, not the Campbell Creek Planning Watershed (Campbell Creek). Therefore, pool, riffle and flatwater data in the Appendix 5 spreadsheet reflect the average for many miles of the South Fork Ten Mile River drainage, most of which is not in the pilot project area. Whether planning watershed specific information can be separated out, or needs to be, should be done by a fisheries biologist and/or person with skills in statistics.

**Potential for errors:** When transcribing numbers to a spreadsheet the potential for error is high. Especially when similar values are reported for more than one watercourse in a single THP. Examples include:

- THP 1-15-107 MEN has data for 1,059 feet in Smith Creek and 628 feet in unnamed Tributary A in upper Campbell Creek.
- THP 1-14-126 MEN has riffle/flatwater/pool information for Campbell Creek (fully within the Campbell Creek Planning Watershed) and the South Fork Ten Mile River (an average for the 106,178-foot length of the river, most of which is not in the Campbell Creek Planning Watershed).
- THP 1-07-036 MEN has data for 2,000 feet in Smith Creek and 1,000 feet in the North Fork Smith Creek.

If numbers are taken from the Aquatic Habitat Assessment Reports without careful consideration a table could be created that gives the impression data is specific to a small area (i.e. that part of South Fork Ten Mile River within the Campbell Creek Planning Watershed) when in fact it is an average for about 20 miles of the river, much of which is not within the pilot project study area. Conversely numbers could be specific to only 1,000 or 2,000 feet of a drainage that is several miles in length.

THP 1-14-126 MEN (and by extension 1-15-094 MEN which includes by reference the Aquatic Habitat Assessment from THP 1-14-126 MEN), uses data that are averages for the 106,178-foot length of the South Fork Ten Mile River. This raises an issue that is associated with many individual THPs/NTMPs. The issue of the information not being specific to a single planning watershed. THP 1-14-126 MEN has one harvest unit adjacent to the South Fork Ten Mile River within the Campbell Creek Planning Watershed and two harvest units in the drainage of the South Fork Ten Mile River that is within the Churchman Creek Planning Watershed. The Aquatic Habitat Assessment has not distinguished between the two planning watersheds but provided values from the 2012 CDFW Stream Inventory Report that reflect the average condition for the entire length of the South Fork Ten Mile River. The 2012 CDFW Stream Inventory Report did not distinguish between the planning watersheds. Other information (perhaps fish numbers and temperature data) which may have been gathered by the plan submitter, may also be averages or may have been gathered from stations located outside of the Campbell Creek Planning Watershed. One example is in THP 1-14-126 MEN, the MWAT (Maximum Weekly Average Temperature) data from data points SFT3 and SFT26 are provided, SFT3 is in the Churchman Creek Planning Watershed. Another example is that values for coho and steelhead redds are probably averages that include stream sections in both the Campbell Creek (pilot project) and Churchman Creek Planning Watersheds.

**Consistency of the collection of the data:** In the geology webinar there was some discussion about data being collected by different individuals with different experience levels. The same would be true for aquatic habitat data. For THP 1-15-107 MEN the work done by the plan submitter's fisheries department is described (page 331):

“Due to time and staff constraints, we chose to modify the protocol. To accomplish our goal of sampling at least 50% of the total Class I habitat, we systematically selected stream reaches adjacent to the Dutchman West THP [THP 1-15-107 MEN].”

In other THPs the goal was to sample at least 30%. Some of the THPs used existing surveys prepared by CDFW. Regarding these surveys a paper titled “Logic for LWD Prioritization on the Mill Smith THP” reviewed during the July 26 PPIIT conference call made this observation:

“... Unfortunately, the CDFW habitat inventory surveys were often conducted by seasonal and less experienced staff, rather than by experienced aquatic biologists.”

This seems to be supported by the first page of the 2012 CDFW South Fork Ten Mile River Stream Inventory Report and the first page of the 2012 CDFW Draft Smith Creek Stream Inventory Report:

“... The watershed Stewards Project/AmeriCorps (WSP) members that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Wildlife (CDFW). This inventory was conducted by a two-person team.” (South Fork Ten Mile River Stream Inventory Report)

“... The California Department of Fish and Wildlife (CDFW) personnel and Watershed Stewards Project/AmeriCorps (WSP) members that conducted the inventory were trained in standardized habitat inventory methods by the CDFW. This inventory was conducted by a two-person team.” (Draft Smith Creek Stream Inventory Report).

THP 1-13-031 MEN also referenced inconsistencies within at least one of the CDFW Habitat Inventory Reports (page 488):

“...Please note that the attached report is in Draft form, and there are some inconsistencies between the text and the tabular data. Consequently, the metrics discussed in this report will be consistent with the tables generated directly from the collected data.”

There are differences in the data collected by the plan submitter when conducting stream surveys and in the surveys conducted by CDFW. “Logic for LWD Prioritization on the Mill Smith THP” noted that:

“... CTM staff tailored the surveys to fit our needs. The actual inventories were limited to the *Level II* analysis described in the *California Salmonid Stream Habitat Restoration Manual*, which limits survey resolution to just the pool, riffle, and run variables, without collection information on the types of scours occurring. However, CTM staff added variables that we thought were important, particularly existing LWD information. For our purposes, we changed the definition of LWD key pieces to all logs that were over 1.5 times the channel width. ...”

Therefore, reports from different sources (plan submitter and CDFW) may be using different definitions for some of the measurements. Again, sorting out these details might best be done by a biologist.

## Conclusions:

- While the Aquatic Habitat Assessment section of the THPs may contain some useful information, it would be most effective to have a fisheries biologist review and decide what information is of value and how to characterize it (in a spreadsheet or another format).
- While no set of information was found to be perfect, data should be gathered first from the most complete and detailed source. Aquatic habitat data (quantitative and qualitative) needed

to guide stream restoration is found in the 2012 CDFW Stream Inventory Reports, which provide more complete information than THPs/NTMPs. Where recent THPs in the pilot project area have filled in gaps in the available CDFW Stream Inventory Reports, they have done so with a less detailed survey and only targeted about 30%-50% of the stream reaches needing surveys. THPs/NTMPs may supplement the CDFW data, but this occurred in only a fraction of recent THPs in the pilot project area. Gaps remain. The CDFW reports need to be periodically repeated/updated, it has been six years since the 2012 reports were completed. Even the THPs are becoming dated, with the most recent one having been submitted over three years ago.

- The Forest Practice Rules have been designed to avoid the creation of or addition to adverse cumulative watershed effects. Monitoring has shown rule implementation and effectiveness to be good.
- THPs/NTMPs are not reliable sources of quantitative and qualitative information on past and present restoration projects. For example, an LWD project was developed and mentioned in THP 1-13-031 MEN, and other stream restoration activity was alluded to in Notice of Timber Operations #22 for 1-94-002 MEN. Some restoration projects receive grant funding that may require they not be included as mitigation in a THP/NTMP, therefore they tend not to be discussed in detail in the harvest documents. On the other hand these past restoration projects suggest that information adequate to identify and act on restoration opportunities is obtainable at the THP/NTMP or timberland ownership scale.
- Consideration needs to be given to professional judgement. Many RPF have been working in the same watershed or watersheds for 10+ or even 20+ years. They are familiar with historic conditions, elements of past THPs that may not have been labeled “restoration” but that have reduced sediment delivery to watercourses, improved access for fish (like when a culvert that is a barrier is replaced with a larger one, a bridge, or simply removed and the road abandoned), etc. This knowledge informs conclusions in THP/NTMP documents that existing impacts are not significant or that conditions are improving, but it is difficult to capture quantitatively or qualitatively.
- To answer the question of whether the planning watershed scale is the best scale for timber harvest cumulative impacts evaluation it is important to know what a planning watershed is. Planning watersheds were created to provide guidance for RPFs in the assessment of cumulative impacts. The creation of planning watersheds does not appear to have taken restoration needs into consideration. Here is how “planning watershed” is defined in the Forest Practice Rules (code section 14 CCR 895.1):

**Planning Watershed** means the contiguous land base and associated watershed system that forms a fourth order or other watershed typically 10,000 acres or less in size. Planning watersheds are used in planning forest management and assessing impacts. The Director has prepared and distributed maps identifying planning watersheds plan submitters must use. Where a watershed exceeds 10,000 acres, the Director may approve subdividing it. Plan submitters may propose and use different planning watersheds, with the Director’s approval. Examples include but are not limited to the following: when 10,000 acres or less is not a logical planning unit, such as on the Eastside Sierra Pine type, as long as the size in excess of 10,000 acres is the smallest that is practical. Third order basins flowing directly into the ocean shall also be considered an appropriate planning watershed.

Code sections 14 CCR 897(b)(1)(B) and 14 CCR 897(b)(2) state that, in addition to growing and harvesting timber, it is one of the goals of forest management on a specific ownership to

“Maintain functional wildlife habitat in sufficient condition for continued use by the existing wildlife community within the planning watershed.” “Individual THPs shall be considered in the context of the larger forest and planning watershed in which they are located, so that biological diversity and watershed integrity are maintained within the larger planning units and adverse cumulative impacts, including impacts on the quality and beneficial uses of water are reduced.” However, nothing in the rules requires a THP (or NTMP) to be confined to a single planning watershed so the assessment areas are often two or more planning watersheds simply because the harvest units are in two or more planning watersheds (the assessment area for Northern Spotted Owls is an exception, as it is usually that associated with the USFWS direction for avoidance of take - a specified distance around each known activity center and/or around the THP area, not a planning watershed).

The Forest Practice Rules and CEQA do not require evaluation of every acre within a planning watershed, only a reasoned discussion of the potential for the proposed harvest operations to have a significant adverse cumulative impact on resource values such as biological, watershed, soil productivity, recreation, visual, traffic and greenhouse gas. There are numerous references to planning watershed in the Forest Practice Rules. Thus, one can expect that cumulative impacts assessment areas in THPs will generally be one or more planning watersheds.

There is no reason that the planning watershed scale would be the most appropriate for the focus of the pilot project with respect to restoration, particularly watercourse or salmonid habitat restoration. As noted previously, some watercourses, like the South Fork Ten Mile River, cross planning watershed boundaries, rising in Churchman Creek Planning Watershed before flowing through Campbell Creek Planning Watershed and going through at least one more planning watershed before reaching the Pacific Ocean. CDFW Stream Inventory Reports are not confined to a single planning watershed where the drainage crosses planning watershed boundaries.

Water flowing through many planning watersheds combine at the mouth of larger river systems. Focusing on the planning watershed scale may not identify effects originating from upstream of, or created downstream of, a planning watershed being studied somewhere in the middle.

The attempt to capture quantitative information from the Aquatic Habitat Assessment reports in the THPs on spreadsheets, Appendix 5, took several hours (3 or more) for each THP. The data from 2012 CDFW Stream Inventory Reports included as attachments was not captured. THPs with more than one surveyed stream reach, such as THP 1-15-107 MEN, took approximately 5 hours. Even the THPs with very short Aquatic Habitat Assessments included some survey work to identify Class I/II transitions and/or restorable Class I stretches and required time for a thorough reading.