



CLALLAM COUNTY
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MARY ELLEN WINBORN, DIRECTOR

February 18, 2018

Michelle McConnell
Washington State Department of Ecology
300 Desmond Dr. SE,
Lacey, WA 98503

Sent Via Email

RE: Ecology CZM Mapping for Clallam County Shorelines

Dear Michelle:

As you are aware, the Board of County Commissioners (BOCC) has expressed concerns over the County's use of Ecology's potential channel migration zone (CMZ) mapping for regulation of new development subject to the County's Shoreline Master Program (SMP) update. A key issue is the wide to very-wide, generalized mapping of the outer extent of mapped CMZ's on the County's west end rivers that would put most west-end waterfront and many non-waterfront properties fully or substantially within the CMZ.

The BOCC is interested in obtaining an understanding Ecology's CMZ mapping for west-end rivers, especially in WRIA 20, given that the CMZ mapping includes:

- Large segments of river reaches that have incised channels and/or channels confined by topography that have experience little evidence of channel movement.
- Very wide CZM's (e.g., 1,500 to over 3,000 feet in width on one side) where development sites are at both considerable distance and/or elevation above the river.
- Many instances of developed and vacant rural lots that are fully within CZM's, and in some areas include multiple non-waterfront ownerships with one or more intervening ownerships.
- Wide mapped CZM's with no evidence of significant channel movement based on at aerial photos dating back to 1990's reviewed by Ecology and characterized by mature tree stands.
- A mapped "erosion hazard buffer" at varying widths that appears to be a significant, but unknown factor in establishing the outer CMZ boundary.
- Areas mapped in CMZ's with significant topographic changes (i.e., areas in CMZ at elevations well above the river bed).

To help with this understanding, below are 8 examples of CMZ mapping for west-end rivers with a short description and related questions. The related Ecology CMZ maps are attached for ease of reference. These examples are typical of the variety of situations on west-end rivers.

Example 1: Ecology Bogacheil River CMZ Map #9 (Vicinity of US 101/Fuhman & Walter Way Rd.)

Description: The mapped CZM in this reach between the river and US 101 ranges between 1,500 to 3,500+ feet in width, including all or most of the land between the Bogacheil River and US 101. This area of the CZM is also characterized by multiple lots and low density residential development separated from the river by other developed rural residential lots. There does not appear to have been any significant channel movement into the bulk of this area at least dating back to 1990 aerial photos used by Ecology.

- What data sources and model assumptions resulted in this very large area being mapped as CZM? How much of the CZM is attributed to “erosion hazard buffer” calculation?

Example 2: Ecology Bogacheil River CMZ Map #7 (Between US 101 and Bogachiel River)

Description: This reach of the Bogacheil River also has a very wide CZM (1,500 to 3,000 feet). The west/south side of the river here is commercial forest land. The area between the river and US 101 are rural lands much of which remains forested and undeveloped. As seen on Map 7, this reach contains two developed residential home sites that are fully within the mapped CZM and a logmill site that is partially within the mapped CZM. All three of these developed sites are separated from the channel by a significant elevation change. For example, the southern developed residential site visible on Map 7 is over a 100 feet above the elevation of the river and over 300 feet away from the channel, with no evidence of any significant channel movement in 20+ years.

- Why are these 3 developed sites included within the CZM given their significant elevation rise and distance from the river and no evidence of significant channel movement based on the aerial photo history analyzed by Ecology?
- What was the data sources and model assumptions that resulted in this large area being mapped as CZM? How much of the CZM is attributed to “erosion hazard buffer” calculation?

Example 3: Ecology Quillayute River CMZ Map #1 (Vicinity of Mora Rd (SR 110) and Richwine Rd. Intersection))

Description: The CZM mapped lands on the south side of the river channel are undeveloped commercial forest lands and clearly show an old channel meander. The mapped CZM area on the north side of the river ranges between 750 feet and 2000 feet in width, and is primarily characterized by a mix of rural lots of various lots sizes from small to large and contains many lots that are not waterfront.

- What data and model factors resulted in the wide width of the CZM on the north side of the river in this segment of the Quillayute River? How much of the CZM is attributed to “erosion hazard buffer” calculation?

Example 4: Ecology Calawah River CMZ Maps #4 , 5 & 6 (East of US 101 Crossing)

Description: This reach of the Calawah River east of the US 101 crossing borders the Forks Urban Growth Area (UGA). The south bank is City/UGA and the northbank is commercial forest lands. Much of the Calawah River in the reaches shown on Maps 4-6 are incised and/or confined by steep banks on both sides of the channel. Review of aerial photo history considered by Ecology shows no significant channel movement on these 3 maps. The width of the mapped CZM in the confined channel areas is still very wide at 250+ feet on both sides. The CZM on the first meander bend upstream from the US 101 bridge is very wide .

- What is the mapping basis for the outer extent of the mapped CZM along the reaches that are clearly confined by the topogarchy and have shown no significant channel movement? How much of the CZM is attributed to “erosion hazard buffer” calculation?
- What is the mapping basis for the outer extent location of the wide CZM located on the inside of the first meander east of the US 101 crossing, given lack of any significant channel movement over past 20+ years? How much of the CZM is based on the “erosion hazard buffer” calculation?

Example 5: Ecology Sol Duc River CMZ Map #11 (Steelhead Ave and Shuwah Rd Area)

Description: This reach like some other segments of the Sol Duc River is confined by topography. The west bank is characterized by rural residential development whereas the east bank is commercial forest lands. The mapped CMZ in this reach is very wide considering the relative straightness and confinement of the channel. The west bank is characterized by numerous developed residential lots that are at least 1 to 3 lots deep within the mapped CMZ. Review of aerial photo history dating back at least 20+ years (same time period of aerials considered by Ecology) shows no significant channel movement.

- What is the mapping basis for the outer extent of the mapped CZM along the reaches that are clearly confined by the topogarchy and have shown no significant channel movement? How much of the CZM is attributed to “erosion hazard buffer” calculation?

Example 6: Ecology Sol Duc River CMZ Map #18 (US 101 and Hillstrom Rd Area)

Description: This reach is characterized by a meandering stretch of the Sol Duc River. On the north-side of the river there are developed rural residential lots on a narrow stretch of land between the river and US 101 and also on the inner meander bend served by Hillstrom Rd. The mapped CMZ is quite wide in this area and completely encompasses all of these residential lots. Developed lots near US 101 are setback from the steep river bank whereas the homesites within the inside of meander are setback from the river at various distances. Review of aerial photo history considered by Ecology shows no significant channel movement.

- What is the mapping basis for the outer extent of the mapped CZM in the areas of residential development? How much of this is based on the erosion hazard buffer calculation?

Example 7: Ecology Big Creek/River CZM Map #5 (Hoko-Ozette Road)

Description: This reach of the Big River closely parallels the Hoko-Ozette Road. This reach also contains rural residential on larger lots. The mapped CZM includes a large Tributary

Alluvial Fan on east side of river. Other reaches of the Big Creek downstream also have mapped CZM that include large areas of adjacent mapped alluvial fans.

- How were the tributary alluvial fans along Big River mapped?
- Are the mapped alluvial fan areas part of the CZM? If not, how should the County address proposed development within these areas?
- How reliable is the data used to map alluvial fan areas in terms of County regulating development within such areas?

Example 8: Ecology Lyre River CZM Map # 46 (See Ecology 2011 Report)

Description: The CZM area near the mouth of the Lyre River is characterized by state and conservation lands on the east-side and rural residential lands on the west-side. On the west-side of the river, most of the rural residential lots between the river and W. Lyre River Road (north of intersection with Harrison Beach Rd) are fully or substantially within the mapped CZM. Landowners in this lower river reach have questioned the width of the CZM. The homes are setback generally more than 100 feet from the river and based on LIDAR on terraces 10+ feet above the river. There is no evidence of any significant channel movement on aerial photos in at least the last 20+ years.

- What is the basis of the outer extent of the CZM on the west side of the river in the developed areas near the mouth? How much of this is based on the erosion hazard buffer calculation?

Other Requests:

- How should the County address review of new development within the Ecology's potential mapped CZM's based on the examples above in terms of site evaluation and when a report by a qualified professional should be required?
- Please provide a response to public comments/questions related to Ecology's CZM mapping received by the County (see attachment).
- Clallam County is interested in improving CZM mapping, especially from a risk potential. To assist with estimating CZM mapping costs, what was the cost (e.g., average per river mile) of Ecology CZM mapping for WRIA 20 rivers. In addition, any information Ecology can provide to assist with recommended CZM mapping methodology and cost estimates for more detailed CZM mapping, especially based on "risk potential" would be appreciated.

Please let me know if you have any questions.

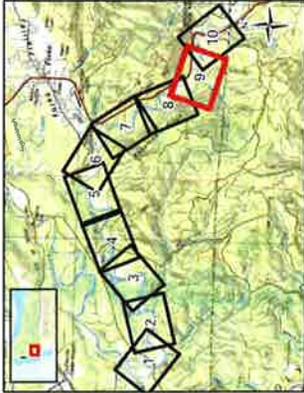
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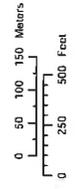
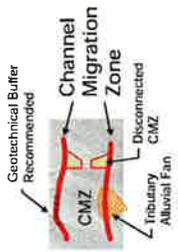
Steve Gray
Deputy Director/Planning Manager

cc. Board of Clallam County Commissioners

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- River Mile Marker
- CL_#_#_# Reach_ID
- Segment Boundaries



2010 aerial from Microsoft via ESRI World Imagery
 24,000 USGS DTM
 100-foot MHD stream alignment (USGS)
 Roads from TIGER (US Census Bureau)
 Coordinate System: NAD83 State Plane Washington North
 Analyzed by: Minda Troopi, LG (GeoEngineers)
 Reviewed by: Mary Ann Reinhart, LG, DEC (GeoEngineers)
 and/or Patricia Olson, PhD, URS, (WA Dept. of Ecology)



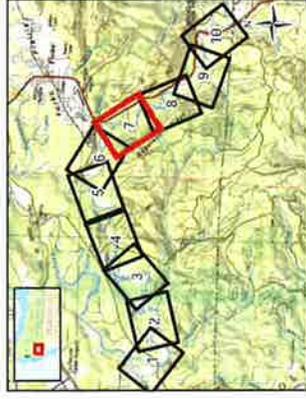
Channel Migration Assessment
 Prepared for the Shoreline Master Program Update
 Clallam County, Washington

Bogachiel River Map 9

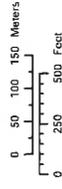
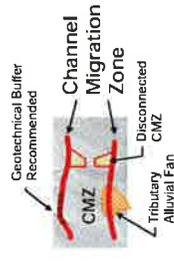


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- River Mile Marker
- Reach_ID
- Segment Boundaries



2010 aerial from Microsoft via ESRI World Imagery
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 1:24,000 NAD 83 State Plane
 Road data from TIGER (US Census Bureau)
 Coordinate System: NAD83 State Plane Washington North
 Analyzed by: Mirco Trovati, LG (GeoEngineers)
 Reviewed by: Rory Ann Reardon, LG, LEO (GeoEngineers)
 and/or Patricia O'Brien, PhD, LEO, (WV Dept. of Ecology)



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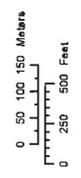
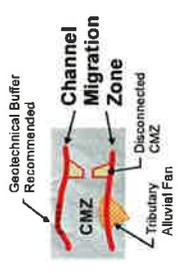
Bogachiel River **Map 7**



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 River Mile Marker
 CL_#_# Reach_ID
 Segment Boundaries



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 River Miles based from H&D stream alignment (USGS)
 River Miles based on the National Hydrography Dataset
 Coordinate System: NAD83 State Plane (Washington North)
 Analyzed by: Mirna Truzzi, LG (GeoEngineers)
 Reviewed by: Mary Ann Renner, LG, LEC (GeoEngineers)
 and/or: Patricia Olson, PhD, LMS, (WA Dept. of Ecology)



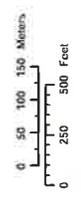
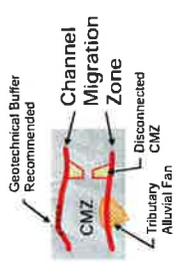
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Quillayute River Map 1

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 River Mile Marker
 Reach_ID
 Segment Boundaries



2010 aerial from Microtop via ESRI World Imagery
 1:24,000 USGS DRG
 River miles to reach from N10 stream segment (USGS)
 River mile to reach from N10 stream segment (USGS)
 Coordinate System: NAD83 State Plane Washington North
 Analyzed by: Minda Troost, LG (GeoEngineers)
 Reviewed by: Mary Ann Reinhart, LG, LEC (GeoEngineers)
 and/or Patrick Olson, PhD, LMG, (WA Dept. of Ecology)

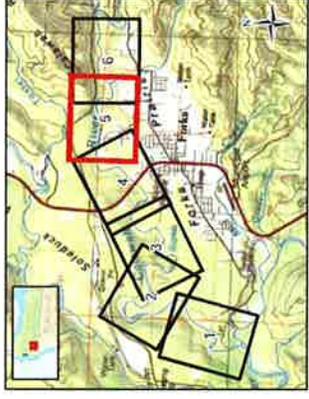
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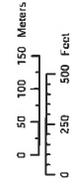
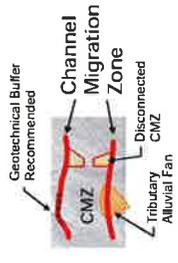
Calawah River **Map 4**

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River Mile Marker
 Reach_ID
 Segment Boundaries
 Geotechnical Buffer Recommended



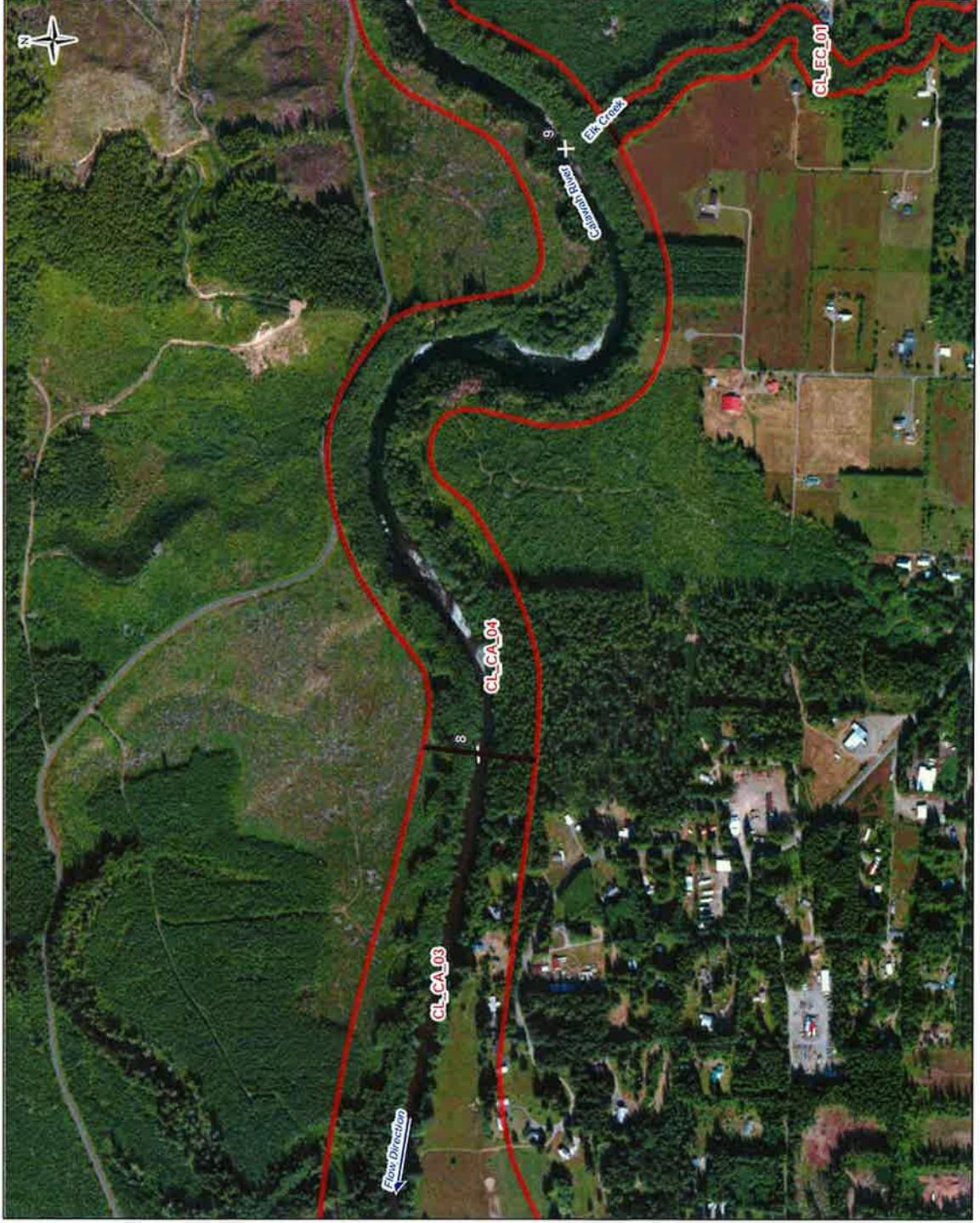
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 River miles calculated from NHD stream alignment (USGS)
 River Miles from NHD (National Hydrography Dataset)
 Coordinate System: NAD83 State Plane Washington North
 Analyzed by: Miranda Troost, LG (GeoEngineers)
 Reviewed by: May Ann Roanhar, LG, LEC (GeoEngineers)
 and/or Patricia Olson, PhD, LHC, (WA Dept. of Ecology)

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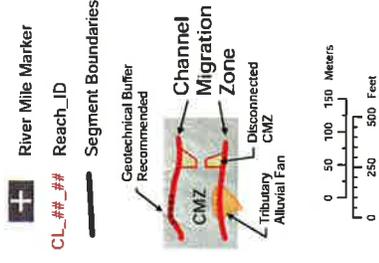
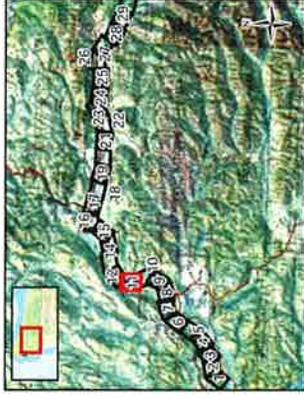
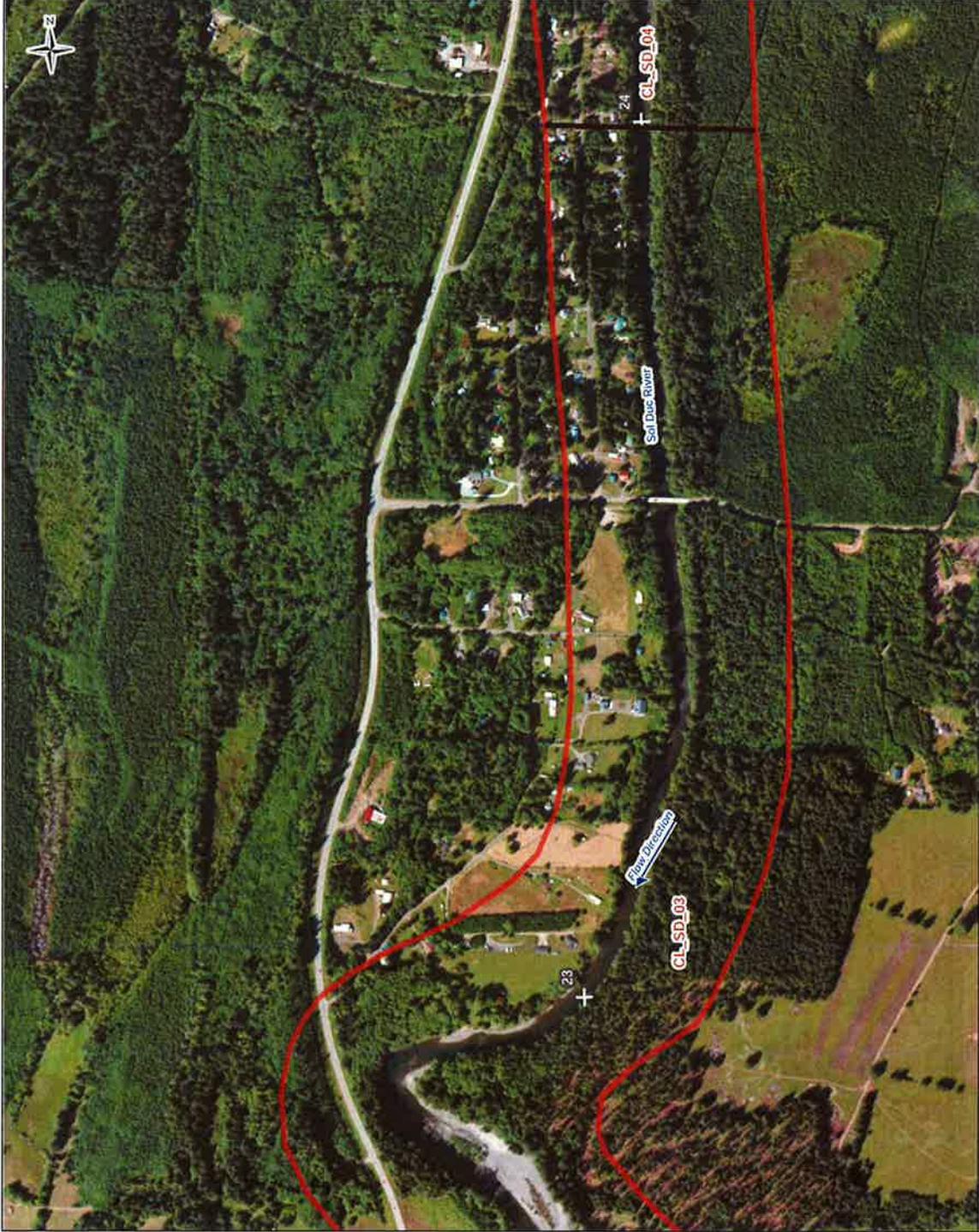
Calawah River

Map 5



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2010 aerial from Microsoft via ESR World Imagery
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 River miles calculated from NHD stream alignment (USGS)
 based from TIGER (US Census Bureau)
 Coordinate System: NAD83 State Plane Washington North
 Analyzed by: Alex Lavel (GeoEngineers)
 Reviewed by: Mary Ann Reinhart, L.G. EEC (GeoEngineers)
 and/or Patricia Olson, PhD, LHE, (WA Dept. of Ecology)

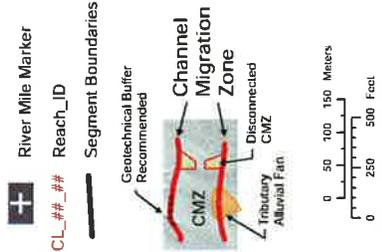
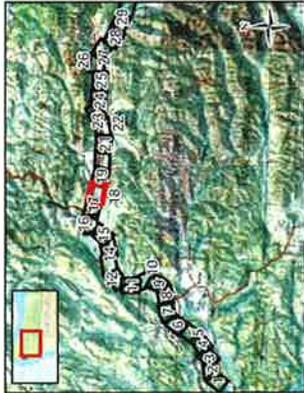


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Soleduck River **Map 11**

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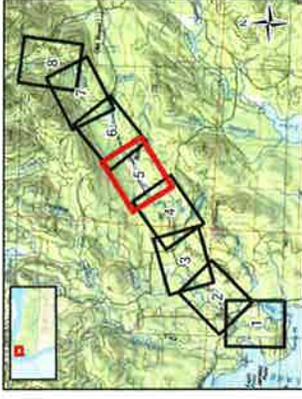
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 24,000 USGS DRG
 Roads from NHD stream alignment (USGS)
 Roads from TIGER (US Census Bureau)
 Coordinate System: NAD83 State Plane Washington North
 Analyzed by: Alex Levit (GeoEngineers)
 Reviewed by: Riley Anderson, CG, ECE (GeoEngineers)
 and/or Patrick Oboon, PhD, PhD, (WA Dept. of Ecology)

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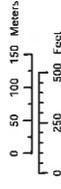
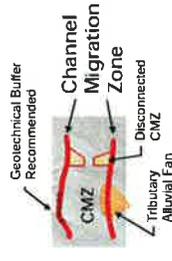
Soleduck River **Map 18**

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- River Mile Marker
- CL_#_#_#** Reach_ID
- Segment Boundaries



2010 aerial from Microsoft via ESRI World Imagery
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 Aerial Base Map: NAD 83 State Plane Alignment (USGS)
 Roads from TIGER (US Census Bureau)
 Coordinate System: NAD83 State Plane Washington North
 Analyzed by: Patricia Olson, PhD, LAG (WA Dept. of Ecology)
 Reviewed by: Nancy Ann Reinhardt, LC, LEC (GeoEngineers)
 and/or Patricia Olson, PhD, LAG, (WA Dept. of Ecology)

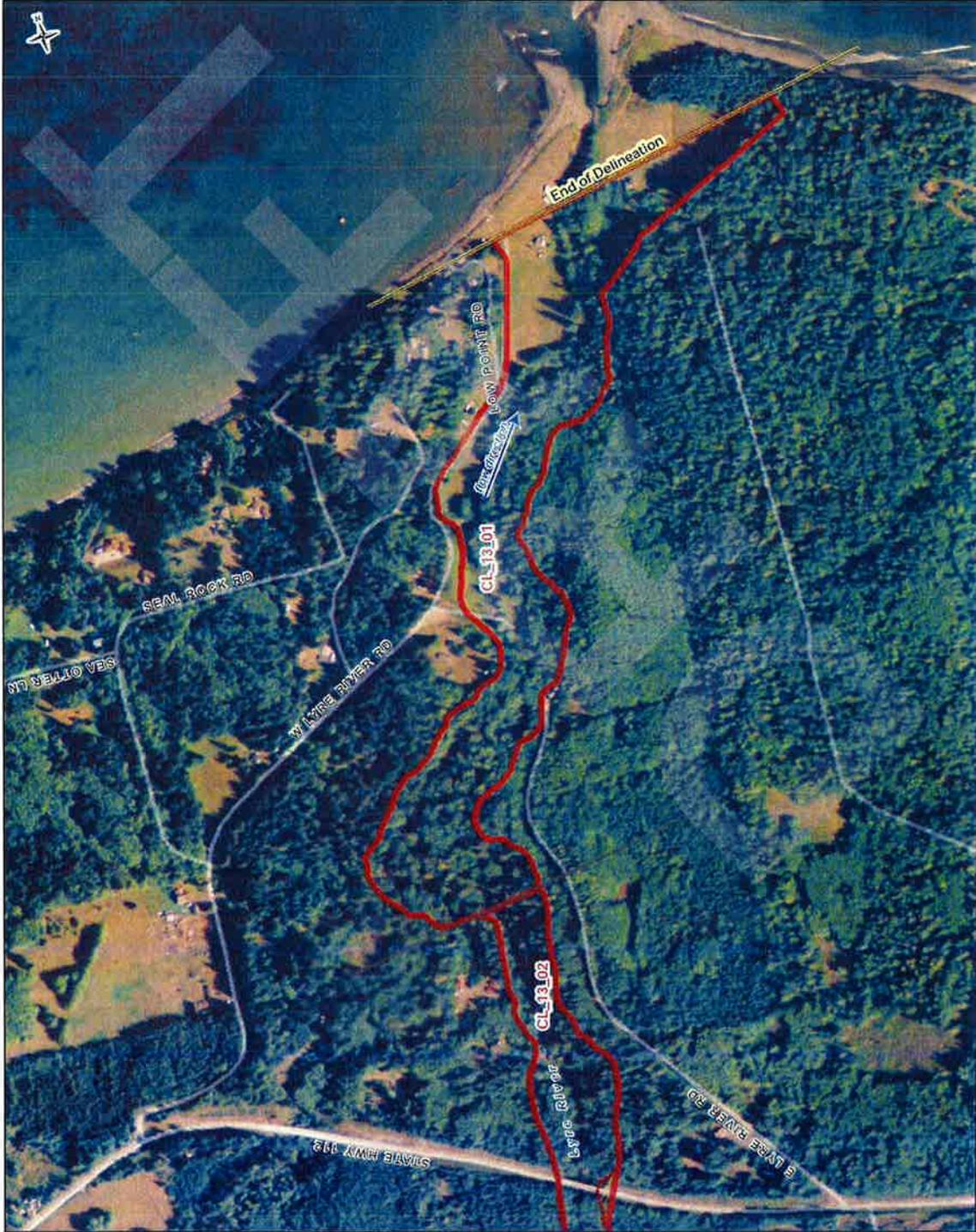


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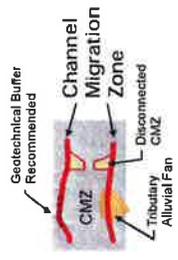
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Big Creek Map 5





- River Mile Marker
- Reach_ID
- Segment Boundary



2004 LIDAR topography (Puget Sound UDAR Consortium)
 10 m USGS Hillshade
 2006 and 2009 aerials from ESRI World Imagery
 WA State Dept of Nat. Resources 1:100,000 Geology
 National Hydrography Dataset
 Roads from TIGER (US Census Bureau)
 Coordinate System: State Plane Washington North
 Analyzed by Andrew Nelson (GeoEngineers)
 Reviewed by Mary Ann Reinher, LG, LEG (GeoEngineers)



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Lyre River Map 46

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Channel Migration Zone designation (CMZ), and delineation based on four reports (studies) provided by Department of Ecology – A product of General Studies not supportable of a property taking:

In general, the designations (delineations) of what is being proposed in the Clallam County SMP Update regarding CMZs of the riparian areas under the jurisdiction of the SMP, are a product/supported by four reports:

- one which was produced by a consultant to Ecology for "Clallam" that I refer to as Clallam 2011 (stated on the SMP website as a link titled "WRIA 17-19 CMZ Report - Dept. of Ecology"),
- one was a further study for Morse Creek area (which I am unfamiliar where that further study is captured or maybe incorporated as an appendix to the Clallam 2011 report),
- one produced by the Jamestown Tribe for the Dungeness (stated on the SMP website as a link titled "Delineation of Dungeness River - Jamestown S'Klallam"),
- and a report which is the predominate focus of my testimony and comment that is WRIA 20-specific produced by a consultant to Ecology (stated on the SMP website as a link titled "WRIA 20 CMZ Study - Dept. of Ecology") that I refer to as Clallam 2013. *In my following comments and concerns, references to report details, figures, tables, and pages are in relation to this Clallam 2013 report.*

- Figure 4.1, page 16

Single reach, single stream (Sooes) assessed for WRIA 20. By delineating regional areas in this figure, there is no supporting evidence if the analysis depends also on using conclusions in other regional areas to support the model's hypothesis. If such dependency is a tool in the analysis, that relationship and validation is imperative to reach a confidence level that goes beyond general details or looking at things from a "high altitude".

- Chapter section 4.3

Stated LIDAR as the primary source, with dependence on DEM in the absence of LIDAR. The report does not address that condition, the extent of the difference, and the effects on the model due to the amount of difference occurring, especially in consideration of WRIA 20 if inferences are occurring in the report that rely on conclusions reached in other regional areas (Figure 4.1) that don't have a similar amount of disparity.

Data types listed in tables 4.2 and 4.3 are considered for the purpose they serve in particular aspects of CMZs, how that is captured in the model has the potential for flaw if the weight of those factors in relation to the primary LIDAR/DEM components is not specified. If this has been accomplished, the report does not speak to the weighting of the different factors.

relied upon to be satisfied solely by the data available in the Hoko. There has to be validation to build a level of confidence in the model in this case, to extrapolate solely is a flaw. (But I propose that if such comparison between high/low available data was used between the Sooes and Big Rivers, then the confidence level is even more questionable)

Logically, table 4.4 captures data that meets a qualified standard for GIS:

- National Hydrography Data
- Shoreline Management Act (SMA) Suggested Arcs
- SSURGO soil data
- Washington State Geology
- Landslides (DGER)
- Light Detection and Ranging (LIDAR) elevation data
- DEM 10 m
- DEM 10 meter hillshade
- 2006, 2009 NAIP Orthophotos
- DOQQ
- Washington State 24K DRG Image Library
- FEMA Flood Hazard Zones
- Railroads
- Washington State Routes
- Washington State Local Roads

The three tables and the primary/alternate tools used to draw the conclusions of the report do not incorporate locally derived data. Unfortunately in many cases the local data would probably not fit neatly in any one of these tables (GIS quality or a specific labeled aspect) and it does not appear the model used (as spoken to in the report) or has the means to incorporate these variables or even considered a factor. And most likely even such data is unpublished or lack of being peer reviewed to establish confidence; but due to a lack of ground truth-ing by the study on those areas that are so dependent on where direct analysis was conducted, it is only reasonable to provide

legitimacy in being relied upon to set new restrictions on private property (as described above).

My recommendation, my need, the plan needs to be edited to reflect that **all streams that were not specifically a function of the model using the primary data source and supported by other viable data sources are limited in scope for those delineations and are "advisory" only for those changes that "exceed" the current county designations.**

If my government does not see fit to make this edit, or something similar regarding "advisory" as used in regards to Tsunami zoning, then at a minimum the need for language is essential to identify and address the burden on the landowner (the "Onus" concept used by the DCD director on several occasions with the public and also before the BOCC, resulting in a taking in the form of a burden to limit the landowner they must determine essentially a proportionate measure of mitigation) along with the application of such burden (specifying what that is, but this piece might not be needed if the language is there...just at this point in the process I don't have readily available/known) **and allowed exceptions.** Otherwise it is my opinion well-crosses the line in being respectful of due process and being subject to an uncompensated taking of property.