**Kittitas SMP-Channel Migration Zone (CMZ) mapping tables (Draft)**
**December 4, 2012**

Cabin Creek

| Cabin Creek-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Two subunits were identified in the Tier 2 section of the creek: break identified based upon change in valley width and stream sinuosity. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | No DMAs identified. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with steep slopes and mapped sedimentary rock..<br>These areas would require more detailed analysis to determine appropriate management measures. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium. |

Cle Elum River and Scatter Creek

| Cle Elum River-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Two subunits were identified along the Tier 1 section of theCle Elum River, primarily based on sinuosity, anasomosing vs single channel,. |
| Active Channel Corridor (ACC) | Digitized from 2011 aerial photo and relative water surface elevations (RWSE) | Active channel included bars and secondary channels judged to be frequently activated. This included secondary channels judged to be routinely activated during high flow events. |
| Alluvial Fans | Sketched over geologic and topographic data sources. | None identified. |
| Erosion Hazard Buffer (EHA) – from the Active Channel | Bbuffer from Active Channel, calculated by stream subunit. | Based on width measurements, the active channel meander amplitude was used as an initial buffer from the ACC. |
| Erosion Hazard Buffer – Avulsion hazard areas | Avulsion hazard areas typically identified using the RWSE data. | The Cle Elum River included a number of anastomosing reaches, indicating that the primary channel could easily migrate over the majority of the alluvial valley. These areas were typically included within the ACC if channels could engage at relatively low discharge levels. Avulsion hazards typically included channels that would engage at higher discharge levels. |
| Tier 1 Channel Migration Zone | Sketched along outside edge of the full EHA (from both the active channel and avulsion hazard zones) described above. | In almost all cases along the Cle Elum River, the EHA extended beyond the valley walls. The overall CMZ was mapped as including the valley walls with geotechnical hazard zones where applicable. |

| Cle Elum River-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Disconnected Migration Area (DMA) | Areas within the overall CMZ that are separated from the existing main channel by a linear feature that is likely to be maintained in the future (e.g., sole-source county roads and state highways) | None identified. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with taller terrace composed of landslide, sedimentary rock, or glacial outwash materials or where past erosion of the valley margin (e.g., scalloping) is evident.<br>These areas would require more detailed analysis to determine appropriate management measures. |

| Cle Elum River and Scatter Creek-TIER 2 | | |
|---|---|---|
| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Three subunits were identified in the Tier 2 section of the river: lower break identified based upon change in channel sinuosity (upstream of the river's outlet into Lake Cle Elum), and upper break identified by confluence with major tributary (Cooper River). |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | Lower Salmon La Sac Road is a sole-source county road; assumed that the road would be maintained in the event of channel migration. Upper Salmon La Sac Road, which is located entirely within National Forest land, was not identified as a DMA feature |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with steep slopes and mapped sedimentary rock.<br>These areas would require more detailed analysis to determine appropriate management measures. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium. |

Coal Creek

| Coal Creek-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were not identified in the Tier 2 section, as the analysis length is relatively short and conditions are similar. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | I-90 borders the creek; assumed that the interstate would be maintained in the event of channel migration. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | None identified. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography. |

Cooper River

| Cooper River-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Two subunits were identified within the analysis area: break identified based upon change in channel sinuosity (upstream of the river's outline into Cooper Lake). |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | None identified |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | None identified. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and evidence of relic channel observed on air photos. |

Gold Creek

| Gold Creek-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were not identified in the Tier 2 section, as the analysis length is relatively short and conditions are similar. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | None identified. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | None identified. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium. |

Little Naches River and tributaries

| Little Naches River and tributaries-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Four subunits were identified in the analysis length of the river. Breaks based primarily on significant changes in valley width and confluences with major tributaries. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | No DMAs identified. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with steep slopes and mapped mass-wasting deposits.<br>These areas would require more detailed analysis to determine appropriate management measures. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium.<br>A portion of the Little Naches River forms the boundary between Kittitas and Yakima counties. CMZ areas within Yakima County jurisdiction were not delineated. |

Log Creek

| Log Creek-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were not identified in the Tier 2 section, as the analysis length is relatively short and conditions are similar. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | None identified. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | None identified. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium. |

Manastash Creek

| Manastash Creek-TIER 1 | | |
|---|---|---|
| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were not identified in the Tier 1 section, as the analysis length is relatively short and conditions are similar. |
| Active Channel Corridor (ACC) | Digitized from 2011 aerial photo and relative water surface elevations (RWSE) | Active channel included main and distributary channels judged to be frequently activated. This included distributary channels occurring within the alluvial fan. |
| Avulsion Hazard Areas (AHA) | Taken from existing meander bend apex downstream if there is a relict channel or swale judged to be within the inundation area shown by the RWSE | Extensive avulsion hazard areas were identified on the alluvial fan. |
| Alluvial Fans | Sketched over geologic and topographic data sources. | The Manastash alluvial fan was mapped based on topography and aerial photographs, representing the majority of the overall CMZ in this instance. |
| Erosion Hazard Buffer (EHA) – from the Active Channel | Buffer from Active Channel, calculated by stream subunit. | The EHA buffer was not used within the alluvial fan portion of the Manastash CMZ. The ACC width was used to approximate the overall CMZ in the two main channels extending downstream from the alluvial valley to the mainstem Yakima River. |
| Erosion Hazard Buffer – Avulsion hazard areas | Typically from aerial photo evidence or RWSE lidar information. | Subsumed within the overall alluvial fan mapping. Agricultural land conversion is assumed to limit avulsion potential in the downstream segments. |

| Manastash Creek-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Tier 1 Channel Migration Zone | Sketched along outside edge of the full EHA (from both the active channel, alluvial fan, and avulsion hazard zones) described above. | The lower subunit was based primarily on an EHA buffer from the relatively incised primary channels. The upper portion of the Tier 1 CMZ encompasses the entire alluvial fan. The CMZ delineation was terminated to the north, as the flow potential in this direction is unknown; therefore the CMZ hazard are may extend past this area. |
| Disconnected Migration Area (DMA) | Areas within the overall CMZ that are separated from the existing main channel by a linear feature that is likely to be maintained in the future (e.g., sole-source county roads and state highways) | No DMAs were identified along the Manastash. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | The Tier 1 area occurs on a terrace that does not extend to the valley margin, so no geotechnical hazard flags were mapped here. |

| Manastash Creek-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were not identified in the Tier 2 section, as the analysis length is relatively short and conditions are similar. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | Small DMA section identified: Manastash Road is a sole-source county road; assumed that the road would be maintained in the event of channel migration. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | None identified; steep slopes are present, but mapped geology is basalt. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium. |

Manastash Creek, S. Fork

| Manastash Creek, S. Fork-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Three subunits were identified along the creek length: breaks identified based upon relatively short stretches of stream that do not have migration potential. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | None identified. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with steep slopes and mass-wasting deposits.<br>These areas would require more detailed analysis to determine appropriate management measures. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium. |

Swauk Creek

| Swauk Creek-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Seven subunits were identified in the Tier 1 section,with breaks typically occurring at geologic constrictions of the valley, or distince changes in channel form. |
| Active Channel Corridor (ACC) | Digitized from 2011 aerial photo and relative water surface elevations (RWSE) | Active channel included bars and secondary channels judged to be frequently activated. This included secondary channels connected to the mainstem with evidence of engagement in recent high flow events. |
| Alluvial Fans | Sketched over geologic and topographic data sources. | Alluvial fans from tributaries were identified adjacent to the CMZ as channel change is often rapid in these areas, and these areas have the potential for significant sediment input to the main channel. |
| Erosion Hazard Buffer (EHA) – from the Active Channel | 250 to 400 foot buffer from Active Channel, calculated by stream subunit. | Based on width measurements, the active channel meander amplitude typically ranged from 180 to 340 feet.<br>This initial EHA width was rarely noted as the extent of the CMZ along Swauk. |
| Erosion Hazard Buffer – Avulsion hazard areas | Typically from aerial photo evidence or RWSE lidar information. | Avulsion hazards extended well beyond the ACC and initial EHA width in the broad alluvial portions of Swauk Creek. These features are typically swales or channels mapped within 5 vertical feet of the active channel in the RWSE dataset. |

| Swauk Creek-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Tier 1 Channel Migration Zone | Sketched along outside edge of the full EHA (from both the active channel and avulsion hazard zones) described above. | The overall CMZ along Swauk typically included the entire alluvial valley in broader reaches based on the presence of avulsion hazards throughout the valley.<br>In more confined portions of the valley, the initial EHA often extended past the valley walls, so the CMZ delineation was extended to the top of the wall. |
| Disconnected Migration Area (DMA) | Areas within the overall CMZ that are separated from the existing main channel by a linear feature that is likely to be maintained in the future (e.g., sole-source county roads and state highways) | A disconnected area was noted at the upstream extent of the Tier 1 mapping near HWYs 970 and 97 |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Several identified in sedimentary and glacial rock deposits. |

| Swauk Creek-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were not identified in the Tier 2 section, as the analysis length is relatively short and conditions are similar. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | US 97 borders the creek; many DMAs are present. It is assumed that the highway would be maintained in the event of channel migration. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | None identified. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium. |

Taneum Creek

| Taneum Creek-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Six subunits were identified in the Tier 1 section of the creek: breaks identified based on change in valley width and channel plan form |
| Active Channel Corridor (ACC) | Digitized from 2011 aerial photo and relative water surface elevations (RWSE) | Active channel included bars and secondary channels judged to be frequently activated. |
| Alluvial Fans | Sketched over geologic and topographic data sources. | Alluvial fans from tributaries were identified adjacent to the CMZ as channel change is often rapid in these areas, and these areas have the potential for significant sediment input to the main channel. |
| Erosion Hazard Buffer (EHA) – from the Active Channel | Buffer from Active Channel, calculated by stream subunit. | Based on width measurements, the active channel meander amplitude typically ranged from 140 to 320 feet.<br>These calculations were performed by geomorphic subunit, then used as an initial buffer from the ACC. |

| Taneum Creek-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Erosion Hazard Buffer – Avulsion hazard areas | Identified in aerials or RWSE data. | Extensive avulsion hazard areas were identified on the alluvial valley, with most extending outside the ACC plus an EHA based on the meander amplitude.<br><br>Avulsion potential was identified in a broad alluvial valley upstream of I90, but the LiDAR data did not cover the entire valley to the wall in this location. This mapping was conservatively placed at the valley wall based on the tight meander bend at the upstream portion of the reach.<br><br>Avulsion hazards were considered to be significant in this reach given evidence of significant landsliding and therefore sediment source in the upper watershed, as well as the significant watershed area. |
| Tier 1 Channel Migration Zone | Sketched along outside edge of the full EHA (from both the active channel and avulsion hazard zones) described above. | In the lower subunits, the initial EHA intersected the valley wall, which also exhibited some scalloping, so the overall CMZ was extended to include the entire valley below I90.<br><br>The upper reach was extended to the valley margins based on avulsion hazards and lack of topographic information at the valley margin. |
| Disconnected Migration Area (DMA) | Areas within the overall CMZ that are separated from the existing main channel by a linear feature that is likely to be maintained in the future (e.g., sole-source county roads and state highways) | DMAs were identified in the lower subunit, associated with I-90. It is assumed that I-90 would be protected against channel migration. |

| Taneum Creek-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with taller terrace composed of landslide, sedimentary rock, or glacial outwash materials or where past erosion of the valley margin is evident.<br>These areas would require more detailed analysis to determine appropriate management measures. |

| Taneum Creek-TIER 2 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were not identified in the Tier 2 section, as the analysis length is relatively short and conditions are similar. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | None identified. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with steep slopes and mapped sedimentary rock, glacial deposits, or mass-wasting deposits.<br>These areas would require more detailed analysis to determine appropriate management measures. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography. |

Teanaway River

| Teanaway River-TIER 1 | | |
|---|---|---|
| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Five subunits were identified along the Tier 1 section of the mainstem Teanaway River, primarily based on sinuosity, and presence/absence of active gravel bars. |
| Active Channel Corridor (ACC) | Digitized from 2011 aerial photo and relative water surface elevations (RWSE) | Active channel included bars and secondary channels judged to be frequently activated. This included secondary channels connected to the mainstem with evidence of engagement in recent high flow events. |
| Avulsion Hazard Areas (AHA) | Included locations from 1950s aerials showing main channel outside existing active channel.<br>Taken from existing meander bend apex downstream if there is a relict channel or swale judged to be within the inundation area shown by the RWSE | Extensive avulsion hazard areas were identified on the alluvial valley, with most extending outside the ACC plus an EHA based on the meander amplitude. |
| Alluvial Fans | Sketched over geologic and topographic data sources. | Alluvial fans from tributaries were identified adjacent to the CMZ as channel change is often rapid in these areas, and these areas have the potential for significant sediment input to the main channel. |
| Erosion Hazard Buffer (EHA) – from the Active Channel | 250 to 400 foot buffer from Active Channel, calculated by stream subunit. | Based on width measurements, the active channel meander amplitude typically ranged from 150 to 400 feet.<br>These calculations were performed by geomorphic subunit, then used as an initial buffer from the ACC. |
| Erosion Hazard Buffer – Avulsion hazard areas | Variable buffer from Avulsion Hazard Areas. | Incorporated on the outside (away from Active Channel) edge of avulsion hazard areas. |

| Teanaway River-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Tier 1 Channel Migration Zone | Sketched along outside edge of the full EHA (from both the active channel and avulsion hazard zones) described above. | Typically, a 300 foot erosion hazard buffer was applied to the river left bank, and 150 feet were applied to the river right bank to capture the greater potential for migration into the alluvial valley.<br><br>The 300 foot buffer was then inspected against geomorphic features such as relict channels and low areas on the floodplain that present avulsion hazard risks, and the |
| Disconnected Migration Area (DMA) | Areas within the overall CMZ that are separated from the existing main channel by a linear feature that is likely to be maintained in the future (e.g., sole-source county roads and state highways) | DMAs were identified in the lower subunits. The largest area was delineated on the landward side of Red Bridge Road. Smaller DMAs were identified along Teanaway Road.<br><br>A potential DMA exists north of SR 970, but the channel appears to have the potential to avulse into the floodplain in the section between Red Bridge Road and SR 970, which would engage this area. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with taller terrace composed of landslide, sedimentary rock, or glacial outwash materials or where past erosion of the valley margin is evident.<br><br>These areas would require more detailed analysis to determine appropriate management measures. |

Teanaway River, N. Fork and N. Fork U.T.

| Teanaway River, N. Fork and N. Fork U.T.-TIER 2 | | |
|---|---|---|
| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were typically not identified in the Tier 2 sections, as the width of the CMZ closely resembles the valley bottom, rather than relying on meander amplitude widths. |
| Disconnected Migration Areas | Sketched along inside edge of road, using air photo. | NF Teanaway Road is a sole-source county road; assumed that the road would be maintained in the event of channel migration. |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with steep slopes and mapped sedimentary rock..<br>These areas would require more detailed analysis to determine appropriate management measures. |
| Tier 2 Channel Migration Zone | Sketched edge of valley bottom, using air photo, 10-m DEM, DNR 1:100,000 geology mapping, and 7.5 minute USGS topo map (10 foot contours). | CMZ determined based primarily by topography and mapped extent of alluvium. |

Yakima River

| Yakima River-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Subunits | Identified along the active channel based on geomorphic channel characteristics such as sinuosity, channel type, overall valley confinement, and gradient.<br>Note: these are referenced as 'reaches' in the Draft CMZ guidance from Ecology, but are termed subunits here to avoid confusion with SMP reaches. | Subunits were identified along the Tier 1 section of the mainstem Yakima River, primarily based on sinuosity, and overall channel plan form. These delineations were intended to be generally equivalent to previous geomorphic investigations performed by CWU in the 'Reaches' project (CITE).. |
| Active Channel Corridor (ACC) | Digitized from 2011 aerial photo and relative water surface elevations (RWSE) | Active channel included bars and secondary channels judged to be frequently activated. This included secondary channels connected to the mainstem with evidence of engagement in recent high flow events. |
| Alluvial Fans | Sketched over geologic and topographic data sources. | Alluvial fans from tributaries were identified adjacent to the CMZ as channel change is often rapid in these areas, and these areas have the potential for significant sediment input to the main channel. |
| Erosion Hazard Buffer (EHA) – from the Active Channel | Initial buffer from Active Channel, calculated by stream subunit. | These calculations were performed by geomorphic subunit, then used as an initial buffer from the ACC. |
| Erosion Hazard Buffer – Avulsion hazard areas | Identified using aerial photographs and the RWSE lidar information. | Extensive avulsion hazard areas were identified in portions of the alluvial valley, with most extending outside the ACC plus an EHA based on the meander amplitude. |

| Yakima River-TIER 1 | | |
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| **Element** | **Source/development** | **Notes** |
| Tier 1 Channel Migration Zone | Sketched along outside edge of the full EHA (from both the active channel and avulsion hazard zones) described above. | The overall CMZ for the mainstem Yakima displayed three generall patterns:<br>1.For much of the mainstem Yakima, avulsion hazard areas extend beyond the initial EHA area, representing by swales and secondary channels within 5 vetical feet of the mainstem as represented in the RWSE dataset.<br>2.In a number of confined reaches, the overall CMZ extends beyond the valley walls based on the initial EHA. This includes the reaches confined in canyons.<br>3. In reaches where the present channel has created an inset floodplain in glacial or other deposits, as near the confluence with the Menashtash, the CMZ is limited to he inset floodplain. An additional erosion buffer is included where the terrace can be eroded, generally equivalent to half the EHA. |
| Disconnected Migration Area (DMA) | Areas within the overall CMZ that are separated from the existing main channel by a linear feature that is likely to be maintained in the future (e.g., sole-source county roads and state highways) | Significant areas of DMA were identified for South Cle Elum, and along the I90 corridor.<br>A potential DMA exists in the City of Ellensburg, but the channel appears to have the potential to avulse to the north side of the highway upstream of the town (near Gladmar Rd bridge), so this area was not included in a DMA |

| Yakima River-TIER 1 | | |
|---|---|---|
| **Element** | **Source/development** | **Notes** |
| Geotechnical Hazard Flag | Sketched in locations where the CMZ intersects the valley wall. | Identified for locations with taller terrace composed of landslide, sedimentary rock, or glacial materials or where past erosion of the valley margin is evident.<br>These areas would require more detailed analysis to determine appropriate management measures. |