# Draft Examples of Performance Standards – Habitat

**10/10/18 – NOT FOR DISTRIBUTION**

WW = Western WA and EW = Eastern WA  D = Depression R = Riverine S = Slope L = Lacustrine Fringe F = Flats

| Objectives | Performance Standards and Notes | WW or EW | Other Functions | HGM Class | Source | Monitoring Methods | Reporting Year and Season | Contingency Actions<br>With many corrective actions, areas may need to be replanted. |
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| **Goal: Improve wetland habitat – hydroperiod/surface water** | | | | | | | | |
| 1. Improve habitat by increasing the number of **water regimes present**. | A minimum of X water regimes will be present in the compensatory wetland in all monitoring years.<br><br>**Minimum required:**<br>• Indicator must occupy either 10% of the wetland area (smaller wetlands) or at least 0.25 acre (0.10 ha.) (larger wetlands)<br>• Hydroperiods must be mapped.<br><br>**Notes:**<br>• The priorty is what is appropriate for the site/functions, not getting the highest number of possible water regimes.<br>• Can add multiple occurences to meet minimum size requirement.<br>• If don't meet size threshold, may accept a smaller size on a case by case basis. | WW | Hydro | D, F, R, S | WW H 1.2 pg. 91 | • Staff and crest gauge to measure duration of ponding or gauge with data logger.<br>• Representative transects across the compensatory wetland to help document extent and draw polygons.<br>• Use field observations and aerial photo interpretation to determine extent of surface water. Calculate area using GIS. In woody wetlands, most reliable with leaf off photos in the growing season, in earlier years, or areas of low canopy cover.<br>• Soil pits to identify areas of saturated soils. | Years 1, 2, 3, 5, 7, 10<br><br>Mid-February to early summer<br>and<br>late summer to early fall.<br><br>Two visits to determine inundation and overbank flooding regime. | • Regrade portions of the site.<br>• Modify the outlet.<br>• Add substrate to reduce the depth of inundation.<br>• Add water to increase the depth of inundation or reduce depth and extent of saturation.<br>• Use pond levelers and beaver deceivers if there is too much water due to beaver dams. |

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| 2. Improve wildlife habitat by providing areas of **ponded water**. | At least 10% of the compensatory wetland has areas of ponded water without emergent or woody plants during spring (March to early June) or early fall (August to end of September) in all monitoring years.<br><br>**Minimum required:**<br>• The ponded area must be contiguous.<br>• Indicator must occupy either 10% of the wetland area (smaller wetlands) or at least 0.25 acre (0.10 ha.) (larger wetlands)<br><br>**Note**:<br>• Aquatic bed species may be present to count.<br>• Ecology may add an upper limit for ponded water, not yet determined. | **EW** | | D, F, R | EW H 1.3.1 pg. 89 | • Identify the boundary of open water on the ground using GPS. Record, map, and and calculate extent using GIS.<br>• As a supplement to field observations, interpret aerial photos and draw polygon(s) to show the extent of open water. Calculate percent of compensatory wetland using GIS. | Years 1, 2, 3, 5, 7, & 10<br><br>March to early June or August to end of September. | • Regrade portions of the site.<br>• Modify the outlet. .<br>• Add water to increase the depth of inundation |
| **Goal: Improve wetland habitat – Vegetation** | | | | | | | | |
| 3. Improve habitat by increasing the number of **habitat niches/structural complexity**. | The compensatory wetland will contain X number of Cowardin classes in all monitoring years.<br><br>**Minimum required:**<br>• Indicator must occupy either 10% of the compensatory wetland area (smaller wetlands) or at least 0.25 acre (0.10 ha.) (larger wetlands).<br>• Patches have to be large enough so that no more than a combination of 10 are needed to meet the size threshold.<br>• An area must have 30% cover of the vegetation in the class type in the highest stratum to count as a Cowardin class. | WW<br><br>EW | | ALL | WW H 1.1 pg. 90<br><br>EW H 1.1 pg. 86 | Produce a map showing extent of Cowardin classes meeting size thresholds:<br>• Identify the boundary of each Cowardin class on the ground using GPS. Record, map, and and calculate extent using GIS.<br>• As a supplement to field observations, interpret aerial photos to draw polygons to show extent of Cowardin classes. Calculate areas using GIS.<br>• Sample along representative transects across the compensatory wetland to help document extent and draw polygons.<br>• Use quadrats along transects or plots to estimate percent cover. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Determine cause of mortality or low vigor.<br>• Replant with appropriate species.<br>• Selectively thin volunteers around installed plants.<br>• Improve weed management.<br>• Install herbivory protection temporarily. |

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| | **Notes:**<br>• The priorty is what is appropriate for the site, not getting the highest number of Cowardin classes.<br>• Because mitigation sites are developing, count areas planted with tree species even if they have not attained the minimum of 20 feet (6 m) in height required to be a forested class.<br>• Use 4 plants per 100 sq ft to estimate whether the site is on a trajectory to attain scrub-shrub and forested Cowardin classes in year 1, 2 & possibly 3. In early years, the compensation wetland will likely not meet 30% cover needed to be a Cowardin class | | | | | | | |
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| 4. Improve habitat by increasing the number of herbaceous **habitat niches/structural complexity**. | The compensatory wetland will contain at least two heights of native, emergent vegetation as the highest layer, using the following height categories.<br>• 0-12 inches (0-30 cm)<br>• >12-40 inches (>30-100 cm)<br>• > 40 inches (> 1 m)<br>In monitoring years 5, 7, & 10.<br><br>**Minimum required:**<br>• Indicator must occupy either 10% of the wetland area (smaller wetlands) or at least 0.25 acre (0.10 ha.) (larger wetlands).<br>• Patches have to be large enough so that no more than a combination of 10 are needed to meet the size threshold.<br>• Each height range must have at least 30% cover to be counted. | EW | | ALL | EW H 1.1 pg. 87 | Produce a map showing extent of the emergent areas with different vegetation heights:<br>• Measure height differences with a measuring device.<br>• GPS the boundary of each height class if GPS can accurately represent narrow zones.<br>• As a supplemental tool to on-site monitoring, aerial photo interpretation of Cowardin classes and calculate area using GIS.<br>• Representative transects across the compensatory wetland, using data to determine extent of different height classes.<br>• Quadrat or plots to estimate percent cover. | Years 5, 7, & 10<br><br>Height of the growing season | • Determine cause of mortality or low vigor.<br>• Replant with appropriate species.<br>• Improve weed management.<br>• Install herbivory protection temporarily. |

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| 5. Improve habitat by increasing the number of vertical strata in areas of wetland forest to provide **habitat niches/structural complexity**. | The forested class will contain a minimum of three strata of native plants , each covering at least 20% of the ground within the polygon identified as forest in the compensatory wetland in monitoring years 3, 5, 7, & 10<br><br>**Minimum required:**<br>• The native vegetation within each stratum must have a minimum percent cover:<br>o Year 3: 5%,<br>o year 5: 10%<br>o Year 7: 15%<br>o Year 10: 20%<br>to be counted toward the minimum percent of the forested class (looking from above).<br><br>**Note:**<br>• This assumes having a forested class (forest species) 30% cover as seen from above.<br>• Stratum include sub-canopy, shrub, herbaceous, groundcover.<br>• The priorty is what is appropriate for the site. Applying the standard will require some thought and care. Some sites may be too shady to support a dense herbaceous stratum. | WW | | ALL | **WW H1.1 pg. 90** | • In the field flag, or GPS, and then using aerial photos, map the boundary of the forested class.<br>• Use plots or quadrats to estimate the cover of vegetation within each stratum.<br>• Determine whether that stratum occupies the minimum percent of the forested class. | Years 3, 5, 7, & 10<br><br>Height of the growing season | Too much shade<br>• Thin new sapling growth if over story is shading sub-stratum and after thinning the sub-canopy still meets the required pecent cover.<br>• Plant more shade tolerant species.<br><br>Too wet for planted species<br>• Replant with appropriate plants species.<br><br>Others<br>• Improve weed control.<br>• Use herbivory protection temporarily. |

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| **6.** Increase the number of potential habitat niches by increasing the **number of native, <u>herbaceous</u> plant species.** | At least X native, herbaceous species will each provide at least 5 percent cover at the compensatory wetland in all monitoring years<br><br>**Notes:**<br>• Herbaceous are plants that have non-woody stems (includes emergent and aquatic species).<br>• Herbaceous plants under woody cover can be listed.<br>• Carefully consider what is appropriate for the site location. High species richness can be a sign of degradation in some wetland types.<br>• Species richness may be lower in later years. | WW<br><br>EW | | ALL | WW H 1.3 pg. 94 for general plant richness<br><br>EW H 1.4 pg. 91 for general plant richness | • Use representative transects across the compensatory wetland with 1 sq meter (9.6 sq ft) quadrats to record herbaceous species.<br>• Randomly placed 1 sq meter plots to record herbaceous species. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Determine why species are not thriving.<br>• Replant with appropriate species.<br>• Control aggressive non-native and noxious species.<br>• Protect plants from herbivores (such as waterfowl) temporarily. |
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| 7. Increase the number of potential habitat niches by increasing the **number of native, <u>woody</u> plant species.** | **WW:**<br>At least 2 species of native trees and 5 species of native shrubs (with exceptions of state listed noxious weeds) will each provide at least 5 percent cover in the forested and scrub-shrub areas in the compensatopry wetland in monitoring year 3, 5, 7 & 10.<br><br>**EW:**<br>At least 1 species of native trees and 3 species of native shrubs will each provide at least 5 percent cover in the forested and scrub-shrub areas in monitoring years 3, 5, 7 & 10.<br><br>**Notes:**<br>• Carefully consider what is appropriate for the site location. High species richness can be a sign of degradation in some wetland types.<br>• Species richness may be lower in later years. | WW<br><br>EW | | ALL | WW H 1.3 pg. 94 for general species richness<br><br>EW H 1.4 pg. 91 for general species richness | • Use representative transects across the compensatory wetland using belt transects, line intercept, or quadrats, or randomly located plots data to determine extent of different height classes and estimate percent cover of woody vegetation. | Years 3, 5, 7, 10<br><br>Height of growing season | • Determine why species are not thriving.<br>• Replant with appropriate species.<br>• Control aggressive or non-native or noxious species.<br>• Protect from browse (such as voles, beaver, ungulates, etc.) |

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| 8. Improve suitability for different wildlife guilds by **increasing the interspersion of native vegetation types and unvegetated areas.** | There will be a X (moderate or high) level of interspersion of Cowardin classes and unvegetated areas in the compensatory wetland in all monitoring years.<br><br>**Notes**:<br>• Use diagrams in rating system to choose level of interspersion of Cowardin classes and unvegetated areas.<br>• Three or more isolated patches of one structural category would be considered the same as one patch with many lobes.<br>• Some tree species will not reach 20 ft in height during the monitoring period. Therefore, areas planted with tree species and achieving 30% cover can be counted as a forested Cowardin class.<br>• It may not be appropriate to use this standard in mitigation wetlands that are based on a reference site that has low interspersion such aspen/sedge swamp forest (Populus tremuloides/Carex obnupta Swamp Forest) | WW | | R, D, F, & L | WW H 1.4 pg. 95 | Produce a map showing extent of Cowardin classes meeting size thresholds and unvegetated areas:<br>• Identify the boundary of each Cowardin class on the ground using GPS. Record, map, and and calculate extent using GIS.<br>• As a supplement to field observations, interpret aerial photos to draw polygons to show extent of Cowardin classes. Calculate areas using GIS.<br>• Sample along representative transects across the compensatory wetland to help document extent and draw polygons.<br>• Use quadrats along transects or plots to estimate percent cover.<br>• | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Determine what Cowardin classes have not developed as planned and determine what is preventing their establishment.<br>• Alter the hydrologic condition to achieve targeted Cowardin classes and unvegetated areas.<br>• Control noxious weeds.<br>• Replant with appropriate plant species. |
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| 9. Improve the suitability for different wildlife guilds by increasing the interspersion of native vegetation types and unvegetated areas. | There will be a __X_ (moderate or high) level of interspersion of plant structures (different heights of native emergent plants and Cowardin classes) and unvegetated areas in the compensatory wetland in all monitoring years.<br><br>**Minimum required:**<br>• The three height classes of native emergent plants are:<br>o 0-12 in (30.5 cm)<br>o >12-40 in (30.5 – 101.5 cm)<br>o >40 in (101.5 cm) | EW | | R, D, F, L | EW H 1.5 pg. 91 | • Use a measuring device to determine height classes .<br><br>Produce a map showing extent of Cowardin classes meeting size thresholds and unvegetated areas:<br>• Identify the boundary of each Cowardin class on the ground using GPS. Record, map, and and calculate extent using GIS.<br>• As a supplement to field observations, interpret aerial photos to draw polygons to show extent of Cowardin classes. Calculate areas using GIS. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Determine what Cowardin classes have not developed as planned and determine what is preventing their establishment.<br>• Alter the hydrologic condition to achieve targeted Cowardin classes and unvegetated areas.<br>• Control noxious weeds.<br>• Replant with appropriate plant species. |

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| 9. Continued | **Notes**:<br>• Use diagrams in rating system to choose level of interspersion of Cowardin classes and unvegetated areas.<br>• Three or more isolated patches of one structural category would be considered the same as one patch with many lobes.<br>• It may not be appropriate to use this standard except in mitigation wetlands that are based on a reference site that has low interspersion<br>• Some tree species will not reach 20 ft in height during the monitoring period. Therefore, areas planted with tree species and achieving 30% cover can be counted as a forested Cowardin class. | | | | | • Sample along representative transects across the compensatory wetland to help document extent and draw polygons.<br>• Use quadrats along transects or plots to estimate percent cover. | | • |
| **Goal: Improve wetland habitat – Special habitat features** | | | | | | | | |
| 10. Improve habitat in western Washington wetlands by providing and maintaining specific habitat features. | Thin-stemmed plants or woody branches in water will be present in a minimum of ¼ acre (0.01 hectares) in areas of the compensatory wetland that are permanently or seasonally inundated in all monitoring years.<br><br>**Minimum required:**<br>• Thinned stems must 8mm be (0.31 Inches) to count.<br><br>**Notes**:<br>• Will define permanent and seasonal.<br>• May provide a minimum percent cover to count toward ¼ acre. This is not a Cowardin emergent class | WW | | D, F, R, L | WW H 1.5 pg. 97 | • With a measuring device, measure the width of stems.<br>• G Identify the boundary of each Cowardin class on the ground using GPS. Record, map, and and calculate extent using GIS.<br>• Use quadrat along transects or plots to estimate percent cover. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season<br><br>Early spring for seasonally inundated) | • Replant with more thin-stemmed plants.<br>• Control cattails in early monitoring years to allow thin-stemmed, native plants to establish.<br>• Implement aggressive weed control to allow establishment of thin-stemmed, native plants.<br>• Provide more water to support needed water regime. |

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| 11. Improve habitat in western Washington wetlands by providing and maintaining specific habitat features. | Overhanging plants will extend at least 33 ft (1 m)over water in or contiguous to the compensatory wetland for at least 33 ft (10 m) in years 5, 7 & 10<br><br>**Minimum required**:<br>• The 33 feet has to be continuous.<br><br>**Note**:<br>• There is no maximum height above which an overhanging plant would not count. | WW | | D, F, R, L | **Rating form** for overhanging vegetation | • With a measuring device In the field, measure extension over water and length of extension. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Replant with species that will overhang water.<br>• Provide more water to support needed water regime |
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| 12. Improve habitat in western Washington wetlands by providing and maintaining specific habitat features. | State listed noxious plants cover less than X% of the compensatory wetland in every stratum of plants in all monitoring years.<br><br>**Note**:<br>Strata are canopy, sub-canopy, shrub, herbaceous, ground cover | WW | | ALL | WW H 1.5 pg. 97 | • Representative transects using quadrats, belt transects, point intercept transects, line intercept or circular plots to estimate cover of noxious species in each stratum. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Implement aggressive weed management to reduced noxious weed ill in later. |
| 13. Improve habitat in eastern Washington wetlands by providing and maintaining specific habitat features. | Invasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs, herbaceous, ground cover) | EW | | ALL | EW H 1.6 pg. 93 | • Representative transects using quadrats, belt transects, point intercept transects, line intercept or circular plots to estimate cover of noxious species in each stratum. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Implement aggressive weed management to reduced noxious weed |
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| 14. Improve habitat in eastern Washington wetlands by providing and maintaining specific habitat features. | Emergent or shrub vegetation are dominant in permanently inundated areas in the compensastory wetland in all monitoring years.<br><br>**Minimum required:**<br>• **Not Yet Determined** Example minimum: such as dominance (50%) or minimum cover to count. | EW | | D, F, R, L | EW H 1.6 pg. 93 | • Representative transects using quadrats, belt transects, point intercept transects, line intercept or circular plots to estimate cover of noxious species in each stratum. | Years 1, 2, 3, 5, 7, 10<br><br>Late summer | • Replant with native emergent and shrub species that will tolerate permanent inundation.<br>• Provide more water to support needed water regime. |

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| 15. Improve habitat in eastern Washington wetlands by providing and maintaining specific habitat features. | The compensatory wetland will contain areas of long term inundation as indicated by the dominance of obligate plant species.<br><br>**Minimum required:**<br>• **Not Yet Determined** Example minimum: such as dominance (50%) or minimum cover to count.<br><br>**Notes**:<br>• This substitutes the special habitat feature in rating "presence of cattails or bulrushes." | EW | | D, F, R, L | EW H 1.6 pg. 93 | • Representative transects using quadrats, belt transects, point intercept transects, line intercept or circular plots to estimate cover of noxious species in each stratum. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Replant with native, obligate species that will tolerate prolonged inundation.<br>• Provide more water to support needed water regime. Fill in later. |
| **Goal: Improve wetland habitat – Noxious plants** | | | | | | | | |
| 16. Improve wetland habitat by eradicating **Class A noxious plants.** | Washington State-listed or county-listed Class A weeds, Japanese knotweed, and purple loosestrife observed in any area of the compensatory mitigation site must be eradicated (zero percent). | WW<br><br>EW | | ALL | WSDOT | And<br><br>• Visual observations of noxious plants by walking meandering transects through site. Draw location on map. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Initiate eradication measures per the state noxious weed board. |
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| 17. Improve wetland habitat by controlling **designated Class B or C noxious plants.** | Class B or Class C weeds that have been designated for control by the XXX County Noxious Weed Control Board will be eradicated or will be less than 10% cover (but not to exceed baseline at the time of first observation) at the compensatory site.<br><br>**Minimum required:**<br>• Determine baseline percent cover and extent each species.<br><br>Note:<br>• Control is defined as preventing the spread beyond existing population | WW<br><br>EW | | ALL | **WSDOT** | • Visual observations of noxious plants by walking meandering transects through site. Map polygons.<br><br>And<br><br>• Representative transects using quadrats, belt transects, point intercept transects, line intercept or circular plots to estimate cover of noxious species in each stratum. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Initiate control measures per the state noxious weed board. |

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| 8, Improve wetland habitat by limiting **non-designate Class B or C noxious plants.** | Non-designate Class B and Class C Noxious weeds, or other species of concern, will be less than X% cover across the compensatory wetland in all monitoring years.<br><br>**Notes**:<br>• The list should include other species of concern, whether noxious or not, if they pose a threat to the successful establishment of native vegetation or are a know species of concern in the surrounding area.<br>• Ecology will provide factors to consider when determining the maximum percent cover. | WW<br><br>EW | | ALL | WSDOT | • Visual observations of noxious plants by walking meandering transects through site. Map polygons and include in estimate of percent cover.<br><br>And<br><br>• Representative transects using quadrats, belt transects, point intercept transects, line intercept or circular plots to estimate cover of noxious species in each stratum. | Years 1, 2, 3, 5, 7, 10<br><br>Height of the growing season | • Initiate aggressive weed management per the state noxious weed board. |

# Draft Examples of Performance Standards – Hydrologic

10/11/18 – **NOT FOR DISTRIBUTION**

## Goal: Reduce the potential for flooding and erosion

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| 1. Reduce down gradient flooding and erosion by **constricting the outlet**. | The compensation wetland will have an intermittently flowing or highly constricted outlet in monitoring years 5 and 10. | WW<br>EW | WQ | D, F | WW D 4.1 pg. 51<br>EW D 4.1 pg. 47 | • Visually observe scouring, compromised weir or sediment deposition that change constriction at outlet. | Years 5 & 10 | • Repair the constriction. |
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| 2. Reduce down-gradient flooding and erosion by increasing the **depth of live water storage** available during wet periods. | During wet periods, water depth in the compensation wetland will be at least X inches (X cm) between the highest and lowest levels of inundation in all monitoring years.<br><br>**Minimum required:**<br>If we move forward, we will work with stormwater manual criteria for some recommended depths.<br><br>**Notes:**<br>• Refer to the rating system manual for:<br>o Indicators of highest and lowest levels of inundation.<br>o Guidance for closed depressions.<br>• Wet periods such as rainfall, snowmelt events, or irrigation season may be at different times of year in some circumstances. For example, as wetlands influenced by irrigation may be wetter in the summer during the irrigation season. | WW<br>EW | | D, F | WW D 4.2 pg. 52<br>EW D 4.2 pg. 48 | • Use staffs/crest gauges to measure water depths or gauges with data loggers to determine depth of inundation.<br>• Survey spot elevation at the lowest point on the outlet and compare to elevations of marks of inundation. | Years 1, 2, 3, 5, 7 & 10<br><br>Wet periods.<br><br>Use WET tables to identify wet period or, for irrigation influenced wetlands, check what months irrigation is being applied.<br><br>AND<br><br>Late summer and fall.<br><br>For wetlands with permanent inundation to determine the lowest level of permanent ponding. | • Re-grade to planned depth.<br>• Repair the constriction.<br>• If part of the design, build up the berm for greater live storage. |

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| 3. Reduce down gradient flooding and erosion by increasing short-term storage by increasing **the width of the wetland compared to width of the channel.** | The average width of the wetland perpendicular to the direction of flow will be X times greater than the width of the stream channel at the compensation wetland site in monitoring years 5 and 10.<br><br>**Note:**<br>• If wetlands are within the banks of the river, this standard does not apply. | WW<br><br>EW | | R | WW R.4.1 pg. 64<br><br>EW R 4.1 pg. 60 | • Use representative transects across the compensation site measuring the average distance between top of banks of the stream and the average width of the compensatory wetland that is perpendicular to the direction of flow. | Years 5 & 10<br><br>Any season | • Re-establish wetland in all intended areas.<br>• Excavate outer edges of the wetland to increase width.<br>• Use dispersing features to increase hydrology to increase width of wetland. |
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| 4. Reduce the velocities of floodwater by **increasing the extent and cover of native, woody plants**. | Sixty six percent of the compensatory wetland will contain native shrub and tree species, at the specified percent covers below, in all monitoring years.<br><br>**Note:**<br>• Horizontal structures, such as LWD, can count toward percent cover/%of compensation wetland.<br><br>_____<br>**Stem density or percent cover** per monitoring year for zones with **trees and shrubs**:<br><br>**Years 1 & 2** Four plants per 100 sq feet in woody zones<br>**Year 3** either four plants per 100 sq ft or cover of 10%<br>**Year 5**: 25%<br>**Year 7**: 40%<br>**Year 10**: 50% | EW | WQ | R | EW R 4.2 pg. 62<br><br>_____<br>WSDOT for stem density and cover values | • Use representative transects using quadrats, belt transects, line intercept or randomly located circular plots to estimate stem density and percent cover of woody vegetation.<br>• Use transect data and field observations to map the extent of native woody areas on aerial photos to determine percent of the compensation wetland with woody vegetation of the specified cover.<br>• Use GIS to determine percent of compensation wetland | Years 1, 2, 3, 5, 7 & 10<br><br>Height of growing season | Determine why woody species are not establishing or are not vigorous.<br>• Substitute with plant species that will thrive in existing wetland hydrology and soils.<br>• Increase organic matter to reduce soil compaction.<br>• Plant more densely.<br>• Replacement LWD and anchor if can accomplish without wetland damage.<br>• Install container plants instead of bare root.<br>• Add more woody debris<br>• Increase maintenance activities to improve plant establishment. |

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| 5. Reduce the velocities of floodwater by **increasing the extent and cover of native emergent, herbaceous, and woody plants**. | At least 33% of the compensation wetland will contain native woody, at the specified percent covers below, in all monitoring years.<br><br>And/OR<br><br>At least 66% of the compensation wetland will contain emergent or herbaceous plants, at the specified percent covers below, in monitoring years 3, 5, 7, and 10.<br><br>**Percent cover** per monitoring year for zones with native **emergent** plants:<br>**Year 3**: 45%<br>**Year 5**: 60%<br>**Year 7**: 70%<br>**Year 10**: 80%<br><br>**Stem density or percent cover** per monitoring year for zones with native woody plants:<br><br>**Years 1 & 2** Four plants per 100 sq feet in woody zones<br>**Year 3** either four plants per 100 sq ft or woody cover: 20%<br>**Year 5**: 35%<br>**Year 7**: 50%<br>**Year 10**: 70%<br><br>**Notes:**<br>• Determine cover seen from person height (5 ft or 1.5 m). In high energy systems, you may count shrub cover that extends overhead.<br>• Horizontal structures, such as LWD, and tree trunks can count toward percent cover % of compensatory wetland.<br>• Emergent and herbaceous plants include those growing under woody canopy.<br>• One way to determine the cover of materials that reduce flood velocities is is to estimate percent cover of bare ground. | WW | WQ | **R** | WWR 4.2 pg. 66<br><br>WSDOT for stem density and cover values | • Use representative transects using quadrats, belt transects, line intercept or randomly located circular plots to estimate stem density and percent cover of woody vegetation.<br>• Use representative transects using point intercept or 1 meter quadrats to estimate percent cover of herbaceous vegetation.<br>• Use transect data and field observations to map the extent of native woody areas on aerial photos to determine percent of the compensation wetland with emergent and\or woody vegetation of the specified cover.<br>• Use GIS to determine percent of compensation wetland | Years 1, 2, 3, 5, 7 & 10 for woody plants<br><br>Years 3, 5, 7 & 10 for emergent<br><br>Height of growing season | • Determine why woody species are not establishing or are not vigorous.<br>• Replant intended or substitute species.<br>• Plant more densely.<br>• Put in replacement LWD and anchor if can do so without damaging the site.<br>• Install potted plants that have root masses. |

| Objectives | Performance Standards and Notes | WW or EW | Other Functions | HGM Class | Source | Monitoring Methods | Reporting Year and Season | Contingency Actions<br>With implementation of corrective actions, vegetation may need to be replanted. |
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| 6. Reduce shoreline erosion by **increasing the width and length of native, woody plants perpendicular to the lakeshore**. | Cowardin forested or scrub-shrub classes will be a minimum of 33 ft (10 m) wide perpendicular to the lakeshore for more than 3/4ths (75%) of the lakeshore at the compensatory wetland in all monitoring years.<br><br>**Note**:<br>• We recommend establishing percent cover values by monitoring year up to and beyond the minimum 30% cover for Cowardin classes using the specified covers below. The purpose is to identify problems with vegetation establishment early on.<br><br>**Stem density or percent cover** per monitoring year for zones with native **trees and shrubs**:<br><br>**Years 1 & 2** Four native plants per 100 sq feet in woody zones?<br>**Year 3** either native four native plants per 100 sq ft or native woody cover:<br>WW 20% EW 10%<br>**Year 5**: WW 35% EW 25%<br>**Year 7**: WW 50% EW 40%<br>**Year 10**: WW 70% EW 50% | WW<br><br>EW | | **L** | W WA L 4.1 pg. 78<br><br>E WA L 4.1 pg. 74<br><br>WSDOT for density and cover | • Use representative transects perpendicular to lakeshore.<br>• Use representative transects using quadrats, belt transects, line intercept or randomly located circular plots to estimate stem density and percent cover of woody vegetation.<br>• Measure length of shoreline in the field or using GPS. | Years 1, 2, 3, 5, 7 & 10<br><br>Any season<br><br>If cover values specified, monitoring during the height of the growing season. | • Determine why woody species are not establishing or are not vigorous.<br>• Replant with appropriate species within the shoreline zone.<br>• Install coir logs to stabilize the erosion zone and inter plant with livestakes. |

| Objectives | Performance Standards and Notes | WW or EW | Other Functions | HGM Class | Source | • Monitoring Methods | Reporting Year and Season | Contingency Actions<br>• With implementation of corrective actions, vegetation may need to be replanted. |
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| **7.** Reduce the peak flow and velocity of sheet flow by **improving the extent and cover of dense, uncut rigid, native plants.** | A minimum of 90% of the compensation wetland will contain dense, uncut, rigid native vegetation in monitoring years 3, 5, 7, and 10.<br><br>**Minimum required:**<br>Plants must meet the following criteria to be counted.<br>• Rigid - stems of plants thick enough to remain erect with surface flows (usually > 1/8 in. at the base).<br>• Dense – native plants cover greater than 75% of the ground.<br>• Uncut - 6 inches (15.2 cm) tall.<br><br>**Notes**:<br>• Rigid plants can be both woody and herbaceous (under woody canopy or in an emergent class).<br>• Density is viewed from a person's height (5 ft or 1.5 m).<br>• One way to determine whether the density criterion is met is to estimate percent cover of bare ground/cut/non-rigid plants.<br><br>_____<br>**Maximum percent cover of bare ground/non-rigid/cut vegetation** per monitoring year:<br><br>**Year 3:** 40%<br>**Year 5:** 35%<br>**Year 7:** 30%<br>**Year 10:** 25% | WW<br><br>EW | | **S** | **W WA S 4.1 pg. 87**<br><br>**E WA S 4.1 pg. 83**<br><br>_____<br>**Ecology PS Work Group** for percent bareground/non-rigid/cut vegetation. | • Use representative transects using quadrats, belt transects, line intercept or randomly located circular plots to estimate the cover of bare ground/cut/non-rigid vegetation.<br>• Use transect data and field observations to map the extent of vegetation, meeting the criteria, on aerial photos to determine percent of the compensation wetland. | Years 3, 5, 7 & 10<br><br>Height of the growing season | • Determine why plants are not establishing or are not vigorous.<br>• Replant with appropriate species that will meet rigidity requirements.<br>• Interplant to achieve higher density of rigid plants.<br>• Control non-rigid plants. |

# Draft Examples of Performance Standards – Water Quality

**10/11/2018 – NOT FOR DISTRIBUTION**

WW = Western WA and EW = Eastern WA  Depression R = Riverine S = Slope L = Lacustrine Fringe F = Flats

| Objectives | Performance Standards and Notes | WW or EW | Other Functions | HGM Class | Source | Monitoring Methods | Reporting Year and Season | Contingency Actions<br>With many corrective actions, areas may need to be replanted. |
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| **Goal: Improve water quality** | | | | | | | | |
| 1. Improve the removal of pollutants by trapping sediment and adsorbed pollutants by **constricting the outlet**. | The compensatory wetland will continue to have an intermittently flowing or highly constricted outlet in as confirmed in monitoring years 5 and 10. | WW | Hydrology | D, F | WW D 1.1 pg. 41. | • Visual observations of scouring, compromised weir or sediment deposition that changes constriction at outlet. | Years 5 & 10 | • Repair the constriction |
| | | EW | | | EW D 1.1 pg. 37 | | | |
| | | | | | | | | |
| 2. Improve sedimentation and filtration by establishing large areas of native, **persistent vegetation** with vertical structure. | X % of the compensatory wetland will be covered by persistent, un-grazed and un-mowed, native herbaceous and woody vegetation in monitoring years 3, 7, & 10.<br><br>**Minimum required:**<br>• A minimum of 30% cover of persistent vegetation and<br>• Indicator must occupy either 10% of the wetland area (smaller wetlands) or at least 0.25 acre (0.10 ha.) (larger wetlands) and<br>• The vegetation must be a minimum of 6 inches (15 cm.) tall.<br><br>**Notes:**<br>This includes emergent species under woody cover. | WW | Hydrology | D, F | WW D 1.3 pg. 44 | • Determine minimum height of 6 inch (15 cm.) for un-grazed using a measuring device.<br>• Representative transects using quadrats, belt transects, point intercept transects, line intercept or circular plots to estimate percent cover of persistent, herbaceous and woody vegetation.<br>• Map units on aerial photo and measure using GIS to determine percent of compensation wetland. | Years 3, 7, & 10<br><br>Height of the growing season | • Determine factors that may be affecting plant growth<br>• Replant with appropriate species in areas that do not meet standard. |
| | | EW | | | EW D 1.3 pg. 40 | | | |

| Objectives | Performance Standards and Notes | WW or EW | Other Functions | HGM Class | Source | Monitoring Methods | Reporting Year and Season | Contingency Actions<br>With many corrective actions, areas may need to be replanted. |
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| 3. Improve the removal of nitrogen through **seasonal inundation**. | X % of the compensation wetland will be seasonally inundated Surface water will be present at least 2 consecutive months but no more than 9 months during the growing season in all monitoring years | WW<br><br>EW | Hydrology<br>Habitat | D, F | WW D 1.4 pg. 45 for area of seasonal inundation and<br><br>H 1.2 pg. 92 for habitat hydroperiod including seasonal inundation.<br><br>EW D 1.4 pg. 41. | • Use staff/crest gauges or gauges with data logger to measure duration of ponding.<br>• Representative transects across the compensatory wetland to help document extent of seasonal inundation.<br>• Use field observations and aerial photo interpretation to determine extent of seasonal inundation. Calculate area using GIS. In woody wetlands, most reliable with leaf off photos in the growing season, in earlier years, or areas of low canopy cover. | Years 1, 2, 3, 5, 7, & 10<br><br>Spring through summer | Reduce hydrology by:<br>• Reduce constriction of the outlet (Increase outlet culvert size)<br>• Reducing water input<br>• Add substrate to increasing ground elevation<br><br>Increase hydrology by:<br>• Increase water input by discharging clean water into the wetland<br>Increase the constriction of outflow. |
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| 4. Improve the sequestering and removal of pollutants by achieving **large areas of dense, native, herbaceous vegetation.** | At least X% of the compensatory wetland will contain native, un-grazed and un-mowed, dense (minimum of 75% total cover) herbaceous plants in monitoring years 5, 7, & 10.<br><br>**Minimum required:**<br>• The vegetation must be a minimum of 6 inches (15 cm.) tall at the time when wetland receives surface waters.<br><br>**Note:**<br>• Cover of emergent vegetation should be estimated as seen from a person's height.<br>• May count herbaceous under woody.<br>• A person's height is considered to be around 5 feet (1.5 m.). | WW<br><br>EW | | S | WW S 1.3 pg. 83<br><br>EW S 1.3 pg. 79 | • Measure minimum height with a measuring device.<br>• Representative transects or plots across the compensatory wetland using 1 meter quadrats to estimate percent cover of herbaceous vegetation.<br>• Map units on aerial photo and measure using GIS to determine percent of compensatory wetland. | Years 5, 7, & 10<br><br>Height of growing season | • Determine factors that may be affecting dense plant growth<br>• Replant with appropriate species in areas that do not meet standard. |

| Objectives | Performance Standards and Notes | WW or EW | Other Functions | HGM Class | Source | Monitoring Methods | Reporting Year and Season | Contingency Actions<br>With many corrective actions, areas may need to be replanted. |
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| 5. Improve filtering and absorption of pollutants by increasing the **width of native wetland vegetation perpendicular to the shore.** | The average width of native wetland vegetation (including aquatic bed) perpendicular to the lakeshore will be a minimum of X ft. (X m.) wide at the compensation wetland in monitoring years 2, 5, and 10.<br><br>**Notes:**<br>• Lakes do not have to meet the definition in the Shoreline Management Act requiring a minimum size of 20 acres. The "lake" must however be deeper than 6.6 ft (2 m).<br>• Refer to rating system for instructions on averaging.<br>• We recommend establishing percent values by monitoring year up to and beyond the minimum 30% cover for Cowardin classes using the specified covers below. The purpose is to identify problems with vegetation establishment early on.<br><br>**_____**<br>**Stem density or percent cover** per monitoring year for zones with native **trees and shrubs**:<br><br>**Years 1 & 2** Four native plants per 100 sq feet in woody zones?<br>**Year 3** either native four native plants per 100 sq ft or native woody cover:<br>WW 20% EW 10%<br>**Year 5**: WW 35% EW 25%<br>**Year 7**: WW 50% EW 40%<br>**Year 10**: WW 70% EW 50% | WW<br><br>EW | Hydrology | L | WW L 1.1 pg. 72<br><br>EW L 1.1 pg. 68 | • Use representative transects perpendicular to the shoreline to measure width of wetland.<br>• Use transect data and field observations to map the extent of native wetland vegetation on aerial photos to determine percent of the compensation wetland with the specified cover.<br>• Based on field observations, map the extent of wetland vegetation and use GIS to determine width. | Years 2, 5, & 10<br><br>Height of growing season | • Determine factors that may be affecting plant growth<br>• Extend width of vegetation by installing plants.<br>• Fill in areas that are too narrow with additional soil and/or coir logs<br>• Floating coir logs to diminish wave energy if erosion is occurring.<br>• If possible reduce speed of boats, no wake signs, if erosion is occurring |

| Objectives | Performance Standards and Notes | WW or EW | Other Functions | HGM Class | Source | Monitoring Methods | Reporting Year and Season | Contingency Actions<br>With many corrective actions, areas may need to be replanted. |
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| 6. Improve sequestering metals, removing oils and other organics by establishing **native, herbaceous vegetation.** | X% of the vegetated area of the compensation wetland will contain native, herbaceous plants, at the specified percent cover by monitoring year below, during monitoring years 2, 5, 7, & 10.<br><br>**Minimum Required:**<br>• X% can't be less than 1/3rd (33%) of the compensation wetland.<br>• To be considered toward the percent of vegetated area, native herbaceous plants must have a minimum cover of:<br>o Year 2 - 5%<br>o Year 5: 10%<br>o Year 7: 15%<br>o Year 10: 20%<br>**Notes:**<br>• Herbaceous plants may occur within an emergent Cowardin class or be growing under woody cover.<br>• Herbaceous does not include aquatic bed species. | WW<br><br>EW | | L | WW L 1.2 pg. 73<br><br>EW L 1.2 pg. 69<br><br>Ecology PS Work Group – cover of herbaceous plants to count | • Use representative transects using point intercept or 1 meter quadrats to estimate percent cover of herbaceous vegetation.<br>• Use transect data and field observations to map the extent of native herbaceous areas on aerial photos to determine percent of the compensation wetland with the specified cover. | Years 2, 5, 7, & 10<br><br>Height of growing season | • Determine factors that may be affecting herbaceous plant growth.<br>• Replant with appropriate species in areas that don't meet standard. |
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| 7. Improve trapping of sediments and associated pollutants by **establishing large areas of native vegetation**. | X% of the compensation wetland will have native, emergent plants, at the specified, percent covers below, in monitoring years 3, 5, 7 & 10.<br><br>AND/OR<br><br>X% of the compensation wetland will have native, woody vegetation, at the specified, percent covers below, in all monitoring years.<br>_____<br>**Percent cover** per monitoring year for zones with native **emergent** class:<br><br>**Year 3**: WW 45% EW 10%<br>**Year 5**: WW 60% EW 25%<br>**Year 7**: WW 70% EW 40%<br>**Year 10**: WW 80% EW 50%<br>_____<br>**Stem density or percent cover** per monitoring year for zones with native **trees and shrubs**: | WW<br><br>EW | | R | WW R 1.2 pg. 60<br><br>**EW R 1.2 pg. 55** | • Determine minimum height of 6 inch (15 cm.) for un-grazed emergent plants using a measuring device.<br>• Use representative transects using point intercept or 1 meter quadrats to estimate percent cover of emergent vegetation.<br>• Use representative transects using quadrats, belt transects, line intercept or randomly located circular plots to estimate stem density and percent cover of woody vegetation.<br>• Use transect data and field observations to map the extent of native woody areas on aerial photos to determine percent of the compensation wetland native emergent or woody vegetation of the specified cover.<br>• Use GIS to determine percent of compensation wetland. | Years 3, 5, 7 & 10 for emergent plants<br><br>Years 1, 2, 3, 5, 7, 10 for woody vegetation<br><br>Height of growing season | • Determine factors that may be affecting emergent and woody plant growth.<br>• Adjust hydroperiod of site, if necessary<br>• Replant with appropriate species in areas that do not meet criteria |

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| | **Years 1 & 2** Four native plants per 100 sq feet in native woody zones<br>**Year 3** either four native plants per 100 sq ft or native woody cover: WW 20% EW 10%<br>**Year 5**: WW 35% EW 25%<br>**Year 7**: WW 50% EW 40%<br>**Year 10**: WW 70% EW 50%<br><br>**Minimum required:**<br>• Plants a minimum of 6 inches (15 cm) tall.<br>• X% must be greater than 1/3rd (33%) of the wetland<br>**Notes**:<br>• Cover of emergent vegetation should be estimated as seen from a person's height.<br>• A person's height is considered to be around 5 feet (1.5 m) | | | | WSDOT for stem density and cover values | | | |