Attachment 12505.1 Table of Uniform Performance Standards for Compensatory Mitigation Requirements

PS No	Aquatic resource type	PS type	Performance Standard	Reference	Target	Timing	Applicability	Suggested measure	CFCAM metric	Design considerations	Guidance
1	All	Physical	The permittee shall ensure the buffer adjacent to aquatic resource habitat in the mitigation site is dominated by native vegetation and has undisturbed soils. Specifically: a) By end of year N, at least __% cover by native vegetation; b) Permittee shall document undisturbed soils throughout buffer.	Yes - could be useful for identifying useful targets for an effective buffer in light of the area, geomorphic position, etc.	Case-specific: PM set target	If the buffer is being enhanced or restored, the coverage and quality of vegetation could increase over the monitoring period (i.e., would want increasing native vegetation and decreasing non-native vegetation each year).	If buffers are required as part of mitigation.	Riverine CRAM field book and draft NMRAM's buffer conditions, as described.	Riverine CRAM field book and draft NMRAM's buffer conditions	Yes	Riverine CRAM and draft NMRAM offer an approach to scoring buffer condition. Essentially, increasing buffer disturbance with respect to soils or vegetation yields lower scores. If the buffer is being enhanced or restored as part of the mitigation, vegetation and/or soil conditions should improve over time; otherwise, the buffer condition should be maintained during the monitoring period. Cross-reference: If buffer areas are being restored or enhanced, project managers may also want to include vegetation-related performance standards.
2	Riverine	Physical	The permittee shall ensure the mitigation retains or increases stream stability and does not cause site, upstream, or downstream excessive erosion or aggradation. Specifically: a. Annual measures of slope and longitudinal profiles must not deviate from as-built profiles by more than X% [Suggested starting point = 10%].* b. Dominant bed material composition (e.g. D50, embeddedness) shall not deviate from design parameters by more than than X% [Suggested starting point = 25%].** For single-thread channels c. Annual cross-section surveys shall not deviate from design parameters by more than X% [suggested starting point = 25%] as measured in terms of channel width to depth ratio (bankfull surface width /bankfull mean depth), entrenchment ratio (floodprone width/bankfull width) and cross-sectional area, as measured at a riffle and at a pool.*** For multi-thread (braided) channels d. Surveys should indicate no consistent trend of excessive net erosion and aggradation across entire active flow path that encompasses the entire multi-thread system. e. Overall channel form should not indicate a consistent trajectory indicating a transition from a multi-thread to a single thread channel form.	Yes - could help in identifying appropriate substrate composition in light of the mitigation goals and constraints.	Target for (a) = Less than 10% deviation from as-built values Target for (b) = Less than 25% Target for (c) = Less than 25% deviation from as-built values (e.g., with/depth ratio) Target for (d) = no trend during monitoring period to date Target for (e) = stable, multi-thread channel form during monitoring period to date	All years	The second version of this standard is appropriate where mitigation/ restoration goal is to decrease channel entrenchment/incision and re-access the [former] floodplain, to re-stabilize the stream.	Cross-sectional and longitudinal profiles at appropriate intervals within the mitigation reach as well as up- and downstream as access will allow at the same location each year of the monitoring. Riverine CRAM field book's riverine channel stability, as described. Specifically, channel width/depth ratio is suggested as an appropriate measure with target deviation of less than or equeal to 10% of as-built value. In general, as-built channel withd/depth ratios should be above 2. Width and depth would correspond to an ordinary high return interval (5-10 years).	Riverine CRAM field book's riverine channel stability.	Yes	Substrate composition (sand, silt, clay) is important as is whether excess material is being deposited within or taken from the mitigation site's riverine habitat. For example, excessive fine material being deposited in a historically sandy wash could discernibly alter the geomorphology and/or biological communities of the riverine habitat. In contrast, excess erosion of bed material could dewater the floodplain or otherwise disconnect the main channel from the rest of its floodplain. *unless prior-approved structures are installed which would establish a new baseline for measurement. **this performance standard would be less appropriate in systems with limited sediment supply and limited overall sediment size distribution. ***in complex stream mitigation or restoration projects, more robust measurement methods including installation of bank pins or scour chains to monitor stream/streambank stability may be more appropriate.
3	Riverine	Physical	The permittee shall ensure the mitigation site's riverine habitat provides physical features of macrotopographic and microtopographic complexity capable of dissipating energy and retaining water and organic material. Specifically: a. Annually, as viewed along representative cross-sections has at least two benches or breaks in slope, including the riparian area, above the channel bottom, not including the thalweg. [Annually: Y/N] b. By year 5, each of these benches, plus the slopes between the benches, as well as the channel bottom area contain physical patch types or features such as boulders or cobbles, animal burrows, partially buried debris, slump blocks, furrows or runnels that contribute to abundant micro-topographic relief, [as found as identified at selected reference site]. [Year 5: Y/N]	Yes - would help to identify the degree of topographic complexity that should be present.	Target for (a) = minimum of two Target for (b) = reference site	All years	Such features may not be present in confined or entrenched stream systems or in headwater or ephemeral streams lacking well-developed floodplains. Appropriate identification of stream or stream system type is highly recommended.	Riverine CRAM field book's topographic complexity or other regionally approved method (e.g., VTOPO in Draft Santa Margarita Watershed HGM Guidebook), as described.	Riverine CRAM field book's topographic complexity or other regionally approved method (e.g., VTOPO in Draft Santa Margarita Watershed HGM Guidebook).	Yes	Examples of physical features providing topographic complexity include pools/pits, sediment bars, hummocks, boulders, and secondary or high-flow channels. Topographic complexity, by definition, focuses on elevational differences. PM should ensure an adequate number of cross sections, the locations of which should be shown on a to-scale, plan-view map within the mitigation plan.
4	Riverine	Physical	The permittee shall ensure the mitigation site provides diverse physical features or surfaces contributing to riverine habitat function. Specifically: a. By year N, the site must contain 25% or more of the number of structural patch types found at the selected reference site. b. By year N+1 or 2, the site must contain 50% or more of the number of structural patch types found at the selected reference site. c. By year N+3 or 5, the site must contain 75% or more of the number of structural patch types found at the selected reference site. d. By year N+4 or 6, etc, the site must contain 90% or more of the number of structural patch types found at the selected reference site.	Yes - would help to identify what features should be present.	Target = reference site	All years	Such features may not be present in confined or entrenched systems or in headwater or ephemeral streams lacking well-developed floodplains. Project manager determination of stream type and appropriateness of standard application is advised.	Riverine CRAM field book's structural patch richness worksheet or other regionally approved method.	Riverine CRAM field book's structural patch richness worksheet or other regionally approved method.	Yes	It is expected that intermittent and perennial streams with well-developed floodplains would provide a greater diversity and number of physical features contributing to structural patch richness and riverine habitat function. Refer to the structural patch richness worksheet in the Riverine CRAM field book. The physical features can have a strong biological component, such as standing snags, tree-fall holes, animal burrows, adn macroalgae or algal mats. For Riverine CRAM, structural patch richness addresses the number of different patch types, in contrast to topographic complexity which addresses the spatial arrangement and interspersion of the features. Note: structural patch types as listed in CRAM Structural Patch Type Worksheet or other functional assessment list of patch types, as appropriate.
5	Riverine (wetlands)	Physical	The Permittee shall ensure the site exhibits surface organic matter accumulation/decomposition class 3 (defined by HGM Santa Margarita Operational Guidebook: having coarse woody debris without bark, few branches present, fungi present) by year 5.	Case-Specific	Target = class 3	Bi-annually for short term monitoring effort and evey 5-years for long-term monitoring.	Riverine systems where wetlands occur or are proposed on secondary terraces and/or floodplains Note: Not applicable for all vegetation systems.	Record percent cover of coarse woody debris [>0.2 feet (6cm) diameter], fine woody debris [<0.2 feet (6cm) diameter], and leaf litter. Record stage of decomposition or refer to regionally appropriate method.	HGM: Organic Carbon Accumulation and Export Function (thickness of organic layer and % cover of litter and debris variables). CRAM: Structural Patch Richness Metric.		a. Note: Higher decomposition classes (see applicable HGM guidebook) may be required on case-specific basis for sites with longer monitoring periods.

PS No	Aquatic resource type	PS type	Performance Standard	Reference	Target	Timing	Applicability	Suggested measure	CFCAM metric	Design considerations	Guidance
6	Riverine	Hydrologic	The permittee shall ensure the main channel geometry (width to depth ratio, sinuosity, etc.) exists, is restored, or is established in the mitigation site such that overbank flooding occurs or water can access high-flow channel(s) in the active floodplain at least once in years 1-3 or per reference site.	Yes - would help, particularly if have enough sites to develop effective discharge parameters (e.g, equilibrium width/depth ratio) for simiar watershed areas	Observation of overbank flooding or engaging high-flow channels in the active floodplain during the monitoring period, at least once in years 1-3 or per reference site (consistent with model/expectations);but note applicability.	All years	This standard would mainly apply to stream systems with naturally developed floodplains. It may be excluded where streams are confined or entrenched, such as bedrock channels. This standard may also not be relevant or appropriate in headwater/ephemeral reaches of stream systems lacking well-developed floodplains. Naturally occurring multi-channel/aggrading systems, which may include some desert washes, may have flow events accessing the floodplain on a less-frequent interval (longer period than every 5 years). Project manager determination of stream type/appropriateness of standard is recommended.	Cross-sectional and longitudinal profile at representative intervals in the same locations, annually. Riverine CRAM field book or draft draft NMRAM's hydrologic connectivity/channel entrenchment ratio, as described.	Riverine CRAM field book or draft NMRAM's hydrologic connectivity/ channel entrenchment ratio as applicable	Yes	Channel geometry is expected to change over time, so the monitoring should focus on whether the changes are substantial enough to suggest channel downcutting or aggradation is occurring. This performance standard can also be based on calculating an entrenchment ratio (flood-prone area width/bankfull width) as discussed in the Riverine CRAM field book and draft NMRAM. When applying Riverine CRAM, ratios greater than 2.0 indicate no entrenchment for confined channels, while ratios greater than 2.2 indicate no entrenchment in non-confined channels. When applying draft NMRAM, ratios greater than 2.2 indicate no entrenchment in non-confined (Rosgen C and E channel types) cases, while ratios of 1.8-2.2 indicate no entrenchment in confined (Rosgen B channel type) cases. At the PM's discretion, the monitoring period may be extended or the permittee may be released from meeting this performance standard if drought conditions persist.
7	Riverine	Hydrologic	The permittee shall ensure the mitigation site shows evidence of subsurface flow from upslope areas toward the main channel.	Not necessary - will vary by stream reach and needs to be considered in the mitigation site's water budget	Observed wetlands, seeps, water upwelling, or vegetation exhibiting new or vigorous growth during the dry season along the riverine/upland boundary or on the floodplain. Also may install piezometers to note sub-surface water levels.	All years	This standard may not be applicable in confined or entrenched stream systems such as those with bedrock channels. It would not be expected to apply in ephemeral stream cases. Project manager determination of stream type/appropriateness of standard is recommended.	Annual observation of evidence, such as wetlands, seeps, water upwelling, or vegetation exhibiting new or vigorous growth during the dry season along the riverine/upland boundary or on the floodplain. Also may install piezometers from which water level and other (temperature, pH, etc.) measurements may be collected.	Draft Santa Margarita Watershed Guidebook defines VSUBIN (subsurface flow into the wetland/water)	Yes	It is expected that subsurface flow indicators will be limited in most cases to intermittent or perennial riverine habitat.
8	Riverine	Hydrologic	The permittee shall ensure that groundwater in the mitigation site(s) occurs within X feet of the ground surface during the wet season and Y feet of the ground surface during the dry season.	Not necessary - site specific	Case-specific: PM set target	All years	This standard may not be applicable in confined or entrenched stream systems such as those with bedrock channels. It would not apply in ephemeral streams. Project manager determination of stream type/appropriateness of standard is recommended.	Observation of water in soil pits at the recommended depth during the recommended season, or installation of piezometers and measure water level at recommended intervals/seasons.	None	Yes	Groundwater will not be a component in ephemeral streams, and it will only be a component in some intermittent or perennial streams.
9	Riverine	Hydrologic	The permittee shall ensure the mitigation site supports features capable of storing surface water from upland sources and/or the main channel for several consecutive days during the wet season (typically 3-7 days depending on size of system) following return to baseflow condition.	Yes	Flood-prone area provides features (e.g., depressions with thin veneer of silty material that impedes infiltration, tenajas) capable of storing surface water for serveral days.	All years	This standard may not be applicable in confined or entrenched stream systems such as those with bedrock channels. This standard also may not apply to headwater/ephemeral portions of stream systems lacking well-developed floodplains. Project manager determination of stream type/appropriateness of standard is recommended.	Annuallly conduct a visual inspection of the flood-prone area for features (e.g., depressions with thin veneer of silty material that impedesinfiltration, tenajas) capable of storing surface water for serveral days.	Draft Santa Margarita HGM Guidebook defines VSURWAT (surface water persistence)	Yes	Examples of features that can pond water include pits, hummocks, tenajas, step pools, root masses, and high-flow channels.
10	ALL (wetlands)	Hydrologic	Hydric Soil Indicators - Permittee shall ensure area intended to be wetlands exhibit USDA NRCS hydric soil characteristics appropriate for the region (e.g. as determined by Corps Regional Supplements to the Corps Delineation Manual) by year X.	Yes-could be useful, but not required.	Case-specific: PM set target	Annually during the growing season	Riverine systems where wetlands occur or are proposed on secondary terraces and/or floodplains	Soil pits.	N/A	Yes	May not be applicable in all cases.
11	Tidal	Physical	The permittee shall ensure mitigation site soil surface elevations vary less than 10 percent compared to as-built conditions, excluding areas affected by tidal channel or inlet migration and similar natural/non-anthropogenic hydrogeomorphic changes.	Not for target, but would be useful for determining the ranges of elevations and under what tidal regimes particular tidal habitat types are found.	Case-specific: PM set target (10% as default) (e.g., +2 ft MSL as-built elevation would be expected to vary less than 0.2 ft)	All years - soil surface elevations can increase (accretion) or decrease (erosion or subsidence) over time and need to be monitored carefully.	Applies to all tidally influenced mitigation sites, but the degree will depend on the target habitat type(s); would not apply if a coastal wetland is not subject to tidal action.	Conduct annual topographic surveys (cm accuracy is needed in tidal systems).	None	Yes	Small (cm scale) differences in soil surface elevations can affect what tidal habitat types develop and persist. This is because elevations determine what areas can be reached by tidal water and/or freshwater, for how long, and when (elevation affects physical and hydrologic parameters). Therefore, any increases (e.g., sediment accretion) or decreases (e.g., erosion, subsidence) in elevation, can alter the supported habitat types and distribution. However, staff should consider that tidal channels and tidal inlets evolve or migrate, and other non-anthropogenic hydrogeomorphologic changes occur in these systems over time; these natural changes should not be included when determining whether the mitigation site is accreting or eroding in a manner that could negatively affect the targeted habitat types (for example, accretion due to sea level rise). Focus on areas that are expected to be more stable (e.g., marsh plain surfaces, rather than inlets and tidal channels) to determine whether soil is accreting, eroding, or subsiding to a degree that the long-term persistence of the habitats is in doubt (e.g., salt marsh transitioning to upland habitat).
12	Tidal	Physical	The permittee shall ensure the mitigation site provides different physical features or surfaces capable of dissipating wave energy, storing water, organic matter, and sediment, and providing habitat for organisms.	Yes - would help to identify what features should be present	Estuarine CRAM field book's structural patch richness description provides a generic target that could be modified to suit the region	The physical features would be present immediately and would be expected to persist; biological features would develop over time.	Yes - would apply in fully tidal situations, but could be less important in muted tidal cases.	Estuarine CRAM field book's structural patch richness, as described	Estuarine CRAM field book's structural patch richness	Yes	Refer to the structural patch richness worksheet in the Estuarine CRAM field book (Attribute 3, page 23; 15 possible structural patch types for estuarine habitat; CRAM ratings specified in Table 4.16). The physical features can have a strong biological component, such as standing snags, wrack, animal burrows, and macroalgae or algal mats.
13	Tidal	Hydrologic	STANDARD VARIES BASED ON INTENDED INLET CONDITION: <u>Always open inlet</u>: The permittee shall ensure the site is open to free exchange of tidal waters, with no obvious hydrologic alteration or restrictions present. <u>Seasonally open inlet</u>: The permittee shall ensure the tidal inlet opens at a frequency and duration to provide design-level site inundation and salinities. <u>Rarely open inlet</u>: The permittee shall ensure the site is not open to free exchange of tidal waters, except during rare extreme hydrologic events (typcially occurring once or twice per decade).	Regional reference sites would be critical to determining what type of inlet would be supported at a site, including expected frequency and duration of the inlet being open	Specific target depends on tidal inlet type and should be informed by regional reference site information. V_{HYDRO} (Table 9) in Regional HGM Guidebook for Northwest Gulf of Mexico Tidal Fringe Wetlands provides a target for always open inlets	All years - tidal inlet conditions should follow design from the beginning through the end of the monitoring period.	Applies to all tidal marshes with one or more inlets; specific performance standard and target depends on the tidal inlet type.	V_{HYDRO} (Table 9) in Regional HGM Guidebook for Northwest Gulf of Mexico Tidal Fringe Wetlands provides a target for always open inlets; it also represents the opposite condition for the rarely open inlet type.	V_{HYDRO} (Table 9) in Regional HGM Guidebook for Northwest Gulf of Mexico Tidal Fringe Wetlands provides a target for always open inlets; it also represents the opposite condition for the rarely open inlet type.	Yes	The specific performance standard used must be based on the target tidal inlet type (always open, seasonally open, rarely open). Regional information would also be beneficial for determining the frequency and duration seasonal tidal inlets should be open. The performance standard used can also include specific targets for site inundation and salinities, but caution should be used because these parameters can be highly variable. The frequency and duration that control tidal prism should be described in the mitigation plan. Tidal prism range should be specified in the design portion of the mitigation "work plan." If maintenance is expected to be necessary to maintain desired conditions after performance standards have been achieved, maintenance activities should be described in the long-term management plan portion of the mitigation plan to ensure habitat success in perpetuity.

PS No	Aquatic resource type	PS type	Performance Standard	Reference	Target	Timing	Applicability	Suggested measure	CFCAM metric	Design considerations	Guidance
14	Tidal	Hydrologic	The permittee shall ensure the mitigation site maintains total aquatic edge (tidally wetted linear edge measured at MHW) within 10 percent of as-built conditions, as well as comparable distribution of aquatic edge-providing features across the mitigation site sufficient to support the target habitats. (Note the target for measuring linear aquatic edge can be modified to High Tide Line or another datum if less frequently flooded areas [i.e. less frequently than daily] are also of interest.)	Yes - regional reference sites could provide useful information about the association between different aquatic features and tidal habitat types as well as potential templates/targets/ distributions.	Case-specific: PM set target (10% as default for aquatic edge area); standard can also be modified (e.g., measured at HTL) to include less frequently flooded (less than daily) areas to evaluate distribution and sustainability of higher marsh habitat types; increases in aquatic edge, even if above the target percentage, may be acceptable (depends on restoration goals).	All years - but similar to above, created aquatic features need to be monitored over time to evaluate their stability.	Applies to all tidally influenced habitats in the mitigation site, but the degree will depend on the target habitat types; would not apply if a coastal wetland is not subject to tidal action (groundwater or precipitation/runoff supported).	Conduct annual analysis of aerial photographs or field surveys of all aquatic features.	None	Yes	Tidal inlets, basins, bays, lagoons, streams/rivers, and tidal creeks provide interface between tidal and fresh water sources and coastal land masses. Such aquatic features provide means of entry and flux opportunities for water and associated nutrients, energy, propagules, and fauna to access and increase the functions (type and degree) performed by the mitigation site's habitats. For example, if additional tidal exchange is desired (e.g., additonal subtidal or intertidal habitat), additional tidal creeks could be established in the mitigation site (note that tidal creeks are often not stable and can migrate or sediment in over time - hydrodynamic modeling and understanding the local and regional coastal processes are important to predicting aquatic feature stability). A straightforward means of assessing this standard is to examine aerial photographs to measure total linear aquatic edge and evaluate the distribution of aquatic habitat-providing features across the mitigation site (measure both sides of tidal creeks, along the direct tidal/wave interface, and circumferences of ponded areas). The area of less frequently flooded areas (less than daily e.g., at the High Tide Line) can also be evaluated using aerial photographs to assess the distribution and sustainability of higher marsh habitat types.
15	Tidal	Hydrologic	The permittee shall ensure that groundwater in the target tidal habitat type(s) in the mitigation site occurs within X feet of the ground surface during the wet season and Y feet of the ground surface during the dry season.	Not necessary - will be a site-specific factor.	Case-specific: PM set target	All years	Only in some cases (e.g., portions of south Ormond Beach).	Observation of water in soil pits at the recommended depth during the recommended season, or installation of piezometers and measure water level at recommended intervals/seasons.	None	Yes	Groundwater can be an important component in some tidally influenced systems, particularly when inlets are only intermittently open (e.g., Ormond Beach). However, it it not an important hydrologic consideration in many tidally influenced mitigation sites.
16	Slope wetlands	Physical	The Permittee shall ensure the site exhibits surface organic matter accumulation/decomposition class 3 (see Colorado HGM guidebook for slope wetlands) by year 5.	Case-Specific	Target = class 3	all years	This performance standard is appropriate only in organic-dominated slope wetlands (generally fens). These occur primarily in the montane regions within SPD. Project managers should ensure the slope wetland mitigation site is organic-dominated prior to use of this standard.	Conduct annual carbon flux or other appropriate analyses to determine stability of carbon accumulation rates.	HGM: Organic Carbon Accumulation and Export (thickness of organic layer and % cover of litter and debris). CRAM: Structural Patch Richness Metric.	yes	Ensuring stability of organic matter accumulation within organic-dominated slope wetlands is a key factor in successful restoration/enhancement. Fens (bogs are excluded from slope wetlands as they are precipitation-driven, as opposed to groundwater-supplied) accumulate peat when carbon fixed through plant production exceeds losses from decomposition, leaching, and/or disturbance. Alteration of the rate of peat accumulation may adversely affect fen functions.
17	Slope wetlands	Hydrologic	Subsurface outflow/discharge - Permittee shall ensure persistent inflow due to groundwater discharge for X% of the growing season.	yes - baseline conditions	Case-specific: PM set target	all years	All slope wetlands.	Cross-sectional and longitudinal profiles in appropriate locations.	CRAM: Hydrology Attribute; Water Source, Hydroperiod or Channel Stability, Hydrologic Connectivity Metrics.HGM: Other areas of SPD use locally approved methods if available.	yes	Slope wetlands may be severely degraded by migrating headcuts or other downstream/downgradient alterations that propogate impacts to upstream/upgradient wetland areas. Downstream culvert or other crossings, other anthropogenic features should be designed to ensure the integrity of the slope wetland and its discharge area.
18	Slope wetlands	Hydrologic	Area of Surface Inundation/Surface Saturation - Permittee shall ensure outflow from wetland is characterized by diffuse flow with no channelized flow for X% of the growing season.	yes - baseline conditions	Case-specific: PM set target	annually, both in the wet and dry seasons	All slope wetlands. Methods of ensuring surface extent of saturation/inundation may also include restriction of land uses in upgradient areas to ensure hydrogeologic continuity between the slope wetland and its recharge area, to the extent possible, given existing uses.	Installation of piezometers and subsequent water level monitoring, and/or ponding or saturation to the surface as observed in soil pits.		yes	By definition, slope wetlands are characterized by groundwater supply from upgradient sources. Therefore, activities within the upgradient/recharge areas including devlopment or intensive activity may diminish recharge and thus reduce the duration of inundation/saturation at the slope wetland. Protection of upgradient groundwater sources may result in the retention of the area of surface inundation/saturation. Slope wetlands may be geomorphically-driven systems such as fens or geologically-driven systems such as fault-based wetlands.
19	Slope wetlands	Hydrologic	Duration of Surface Inundation/Saturation - Permittee shall ensure surface indundation/saturation for X% of growing season.	yes- baseline conditions	Case-specific: PM set target	annually, wet and dry season	All slope wetlands. Methods of ensuring duration of inundation/saturation relative to baseline conditions may also include restriction of land uses in upgradient/recharge areas to ensure hydrogeologic continuity between the slope wetland and its recharge area, to the extent possible, given existing uses.	Ponding or saturation to the surface as observed in soil pits.		yes - within upgradient/recharge area	By definition, slope wetlands are characterized by groundwater supply from upgradient/recharge sources. Therefore, activities within the upgradient/recharge areas including devlopment or intensive activity may diminish recharge and thus reduce the duration of inundation/saturation at the slope wetland. Protection of upgradient/recharge groundwater sources may result in the maintainance of surface inundation/saturation relative to baseline conditions. Slope wetlands may be geomorphically-driven systems such as fens or geologically-driven systems such as fault-based wetlands.
20	Depressional wetlands	Physical	The permittee shall ensure the mitigation site provides diverse physical features or surfaces contributing to depressional wetland habitat function. Specifically: a. By year N, the site must contain 25% or more of the number of structural patch types found at the selected reference site. b. By year N+1 or 2, the site must contain 50% or more of the number of structural patch types found at the selected reference site. c. By year N+3 or 5, the site must contain 75% or more of the number of structural patch types found at the selected reference site. d. By year N+4 or 6, etc, the site must contain 90% or more of the number of structural patch types found at the selected reference site.	Yes - would help to identify what features should be present	Target = reference site	Annually	All depressional wetlands	Qualitative and quantitative assessment of micro- and macro-topographic features and plant horizontal interspersion and zonation	HGM. CRAM: Physical Structure Attribute and Biotic Structure Attribute (Horizontal Interspersion and Zonation Metric)		Vernal pool complexes typically vary in the size, shape, and complexity of the pool and swales. Mima mounds, plant hummocks, animal burrows, bare soil and soil cracking may be found.
21	Depressional wetlands	Hydrologic	Soil Saturation - The permittee shall ensure at least X acres within the approved mitigation site boundaries are saturated to a depth within 10% of reference site range for at least Z months per calendar year (Z being within 10% of the reference site duration).	Yes	Case-specific: PM set target	Bi-annually	All depressional wetlands				
22	Depressional wetlands	Hydrologic	Inundation - The permittee shall ensure at least X acres within the approved mitigation site boundaries are inundated to a depth within 10% of reference site range for at least Z months per calendar year (Z being within 10% of the reference site duration).	Yes	Case-specific: PM set target	Bi-annually	All depressional wetlands				Aerial photographs should be taken three times annually to document the extent and duration of inundation (Max inundation, peak of flowering, and later spring/early summer)
23	Depressional wetlands	Hydrologic	Wet and Dry Season Depth to Groundwater (if applicable) - The permittee shall ensure that the depth to groundwater is within the range of reference wetland conditions.	Yes	Case-specific: PM set target	Annually	All depressional wetlands.	Permanent peizometers, shallow groundwater monitoring wells, or soil pits	HGM	yes	(depressions in clay soils typically do not intercept groundwater, and primary sources of water are precipitation and/or overland flow, whereas groundwater can be a primary source of water in depressions with more permeable soil types)
24	Depressional wetlands	Hydrologic	Hydric Soil Indicators - Permittee shall ensure the development of USDA NRCS hydric soil characteristics appropriate for the region (e.g. as determined by Corps Regional Supplements to the Corps Delineation Manual) by the end of the monitoring period.	Case-Specific	Case-specific: PM set target	Annually during the growing season	All depressional wetlands.	Soil pits.	N/A	Yes	

PS No	Aquatic resource type	PS type	Performance Standard	Reference	Target	Timing	Applicability	Suggested measure	CFCAM metric	Design considerations	Guidance
25	All	Faunal-Diversity Index	The permittee shall ensure a Shannon-Wiener Diversity index of target riparian/aquatic species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.	Yes (≥80% of reference)	Diversity within 80% of reference site or peer-reviewed study for similar habitat type by end of monitoring period.	Annually	All mitigation sites where wildlife habitat functions are relevant.	Shannon-Wiener Diversity index		Yes, if mitigation site is for habitat it needs to identify which species it is targeting and how it will meet those species needs.	Need to ensure that suite of species targeted are appropriate for region. Including ubiquitous, invasive, or tolerant species into the assessment may misrepresent habitat quality.
26	All	Flora	Survivorship: the permittee shall ensure target survivorship of tree, shrub, and herb strata container plants are met.	n/a	≥80% of containers	Annually until minimum of 2 years post-irrigation success					
27	All	Flora	Dominance of hydrophytes: the permittee shall ensure target [PM pick one or more: percent absolute cover (for combined strata), density, or height] of native, wetland species (OBL/FACW) are met for tree, shrub, and herb strata by year 5.	Yes	≥75% of reference If no reference site: absolute cover: ≥50% *Obl/FACW	Annually					May not be applicable in seasonal wetlands where FAC species dominate.
28	All	Flora	Dominance of natives: the permittee shall ensure target [PM pick one or more: percent absolute cover (for combined strata), density, or height] of native species are met for tree, shrub, and herb strata by year 5.	Yes	≥75% of reference If no reference site: relative cover*: ≥75% combined strata	Annually					*if only using this performance standard (and not dominance of hydrophytes), may need to add absolute cover target.
29	All	Flora	Dominance of exotics: the permittee shall ensure target [PM pick one or more: percent absolute cover (for combined strata), density, and height] are met for exotic species (tree, shrub, and herb strata) by year 5.	Yes	≤100% of reference If no reference site: ≤10% abs cover (zero tolerance for species considered highly invasive per Cal-IPC List or equivalent regional list)	Annually					May not be applicable in seasonal wetlands where FAC species dominate.
30	All	Flora	Recruitment: the permittee shall ensure target levels of new, native individuals are naturally recruited by year 5.	Yes	≥75% of reference If no reference site: ≥5% of dominance	Annually					
31	All	Flora	Species richness: The permittee shall ensure target native species richness values of tree, shrub, and herb strata are met by year 5.	Yes	≥75% of reference	Annually					
32	All	Flora	Spatial Habitat Heterogeneity: the permittee shall ensure [PM pick one or more: vertical and/or horizontal] target spatial habitat heterogeneity is met by year 5.	Yes	≥100% of reference	Annually	Vertical more appropriate if target habitat includes tree stratum. Horizontal if herbaceous or shrub strata.				
33	All	Water quality (ecological)	Permittee shall ensure an appropriate index of aquatic invertebrate health is within 10% of reference	Yes	Within 10% of reference	Anually	Mitigation sites were water quality is a concern in attaining restoring ecological functions.	Benthic IBI, EPT			This performance standard could be used in place of other more specifically-targeted water quality performance standards.
34	All	Water quality (ecological)	Organic carbon	Yes	≥75% of reference	Annually	Mitigation sites were water quality is a concern in attaining restoring ecological functions.	% soil organic carbon			Indirect measure (biogeochemistry) of water quality
35	All	Water quality (ecological)	Net primary productivity	Yes	≥75% of reference	Annually	Mitigation sites where water quality is a concern in attaining restoring ecological functions due to specific water quality parameter(s)/pollutant(s).	g NPP/sq meter			Indirect measure (biogeochemistry) of water quality
36	All	Water quality (ecological)	Redox potential	Yes	+/- 1 unit of reference	Annually	Mitigation sites where water quality is a concern in attaining restoring ecological functions due to specific water quality parameter(s)/pollutant(s).	pE			Indirect measure (biogeochemistry) of water quality
37	All	Water quality (ecological)	Pollutant reduction: measure concentration inflow/outflow	≥75% of reference	Case-specific: PM set target	Annually	Mitigation sites where water quality is a concern in attaining restoring ecological functions due to specific water quality parameter(s)/pollutant(s).	Conc inflow - conc outflow			Direct measure
38	All	Water quality (ecological)	Pollutant reduction: measure change in mass balance	≥75% of reference	Case-specific: PM set target	Annually	Mitigation sites where water quality is a concern in attaining restoring ecological functions due to specific water quality parameter(s)/pollutant(s).	Change in storage			Direct measure
39	All	Water quality (ecological)	Pollutant reduction: measure change in sediment chemistry	≥75% of reference	Case-specific: PM set target	Annually	Mitigation sites where water quality is a concern in attaining restoring ecological functions due to specific water quality parameter(s)/pollutant(s).	Change in concentration			Direct measure
40	All	Water quality (ecological)	Pollutant reduction: measure sediment accumulation	≥75% of reference	Case-specific: PM set target	Annually	Mitigation sites where water quality is a concern in attaining restoring ecological functions due to specific water quality parameter(s)/pollutant(s).	Inches accumulation			Direct measure
41	All	Water quality (ecological)	Pollutant reduction potential	≥75% of reference	Case-specific: PM set target	Annually	Mitigation sites where water quality is a concern in attaining restoring ecological functions due to specific water quality parameter(s)/pollutant(s).	g NO3 lost/unit time			Direct measure
42	All	Water quality (ecological)	Dissolved oxygen	Yes	Case-specific: PM set target	Annually	Mitigation sites where water quality is a concern in attaining restoring ecological functions due to specific water quality parameter(s)/pollutant(s).	mg/L			Direct measure