

consistent with the monitoring protocol described in the AMP. In addition to locations identified in the AMP, water level monitoring stations shall be established at one location in the Eel River Estuary near the mouth of the Salt River and at two locations within the Riverside Ranch tidal restoration area. Within the restoration area, one station shall be located in the northernmost portion of the restoration area within the internal slough channel most distant from the Salt River, and one station shall be similarly located in the most southern portion of the restoration area (CDP No. 1-10-032; Special Condition 2[A]6).

**Spot Salinity Measurements in the Salt River Channel.** Spot salinity measurements shall be collected in the Salt River channel within one hour of each higher high tide from 1 July through 31 October during the first summer following completion of restoration dredging in order to create a depth profile of salinity at several locations and to determine the upstream limit and approximate shape of the tidal salt water wedge (CDP No. 1-10-032; Special Condition 2[A]7). This monitoring will be consistent with continuous salinity monitoring per the AMP.

## QUANTITATIVE HABITAT MONITORING

### Tidal Wetland Habitat

**Percent Cover Success Criteria.** The percent cover values for naturally recruited native salt marsh and high marsh ecotone species in Riverside Ranch will show a steady trend toward meeting the success criteria (Table 8) for native wetland salt marsh species for Years 3, 5, 7, and 10. By Year 10, there shall be at least 60% cover of native plant species within the restoration areas that are within the appropriate elevation range for the target habitats. There are no salt marsh success criteria for percent cover for Years 1 and 2 as it will take several years for naturally recruiting salt marsh species to establish. The presence of invasive, non-native species will be limited to less than 5% within the restoration areas at the end of the 10-year monitoring period. Non-invasive non-native species will be limited to less than 15% of salt marsh and high marsh ecotone restoration areas. Sterile wheat seeded into areas for erosion control will not count towards percent cover success criteria.

**Table 8. Percent Cover Success Criteria for Naturally Recruiting Salt Marsh and Planted High Marsh Ecotone Species in Riverside Ranch**

HABITAT	YEAR 1	YEAR 2	YEAR 3	YEAR 5	YEAR 7	YEAR 10
Salt Marsh	-	-	10%	30%	50%	60%
High Marsh Ecotone	5%	15%	30%	40%	50%	60%

**Habitat Acreage Success Criteria.** Habitat mapping will take place pre-construction, and in Years 1, 3, 5, 7 and 10. The results will be reported in a format similar to Table 1 (Land Use and Habitat Projections). Deviations greater than 10% from the projected values in Year 5 (or later) may trigger more detailed evaluations of specific reaches to evaluate potential remedial or adaptive management actions. The final success criterion for the habitat mapping is to be within +/- 10% of the projected habitat (by category, see Table 1) by Year 10.

**Monitoring Methods.** Quantitative monitoring of the Riverside Ranch tidal restoration area will include mapping and estimating the total cover of broad community types (habitat acreage) and

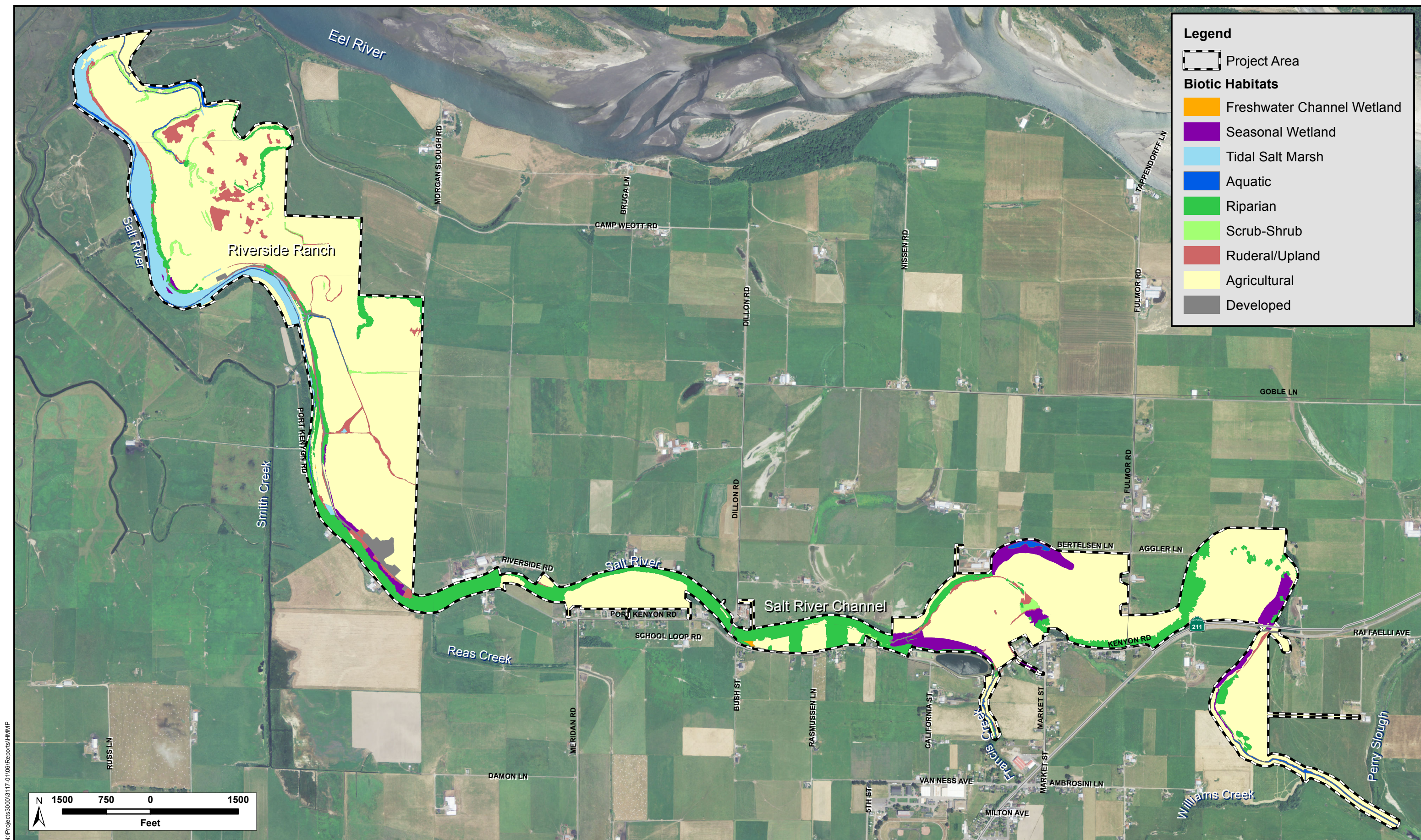
percent cover based on aerial or commercially available satellite imagery (CIR and true color satellite imagery). The imagery will be acquired in Years 1, 3, 5, 7, and 10 and used as the base for mapping. The scale and level of effort will be similar to the Existing Conditions habitat map (Figure 3) and will be presented in tabular form similar to Table 1. This will allow the changes in the mosaic of habitats to be tracked and compared to the habitat projections.

Field sampling to verify the mapping and cover of community types and percent cover will be conducted and will include spatially stratified, random samples with visual estimates of cover by species within elevational strata in both the north and south restoration areas. Elevational strata will be spatially stratified to ensure uniform sampling of the entire restoration area. The Kershaw method (1973) evaluates the relationship between cumulative average percent cover and quadrat number to ensure that a sufficient sample size is achieved. This is accomplished by graphing the cumulative average percent cover on the Y-axis against the number of quadrats on the X-axis. The point at which the slope approaches zero indicates a sufficient sample size (i.e. number of quadrats) (Kershaw 1973). Quadrats will be located throughout the site in a stratified-random design along permanently marked transects. The application of this method will guide the initial data collection for years zero and one and subsequently data will be examined in a power analysis to determine if there is sufficient statistical power (defined as 80% power to detect a difference of 20% between years, at an 80% confidence level) to detect a significant difference in percent cover between the observed state and the success criterion based on a t-test. A power analysis will not be possible until year one; because in year zero, there is no anticipated variance (the site will have been recently graded, so there will not be any cover yet, and therefore there would be no variance for estimates of percent cover). If the results of the power analysis based on year one initial data collection suggest that statistical power is below the defined minimum (see above), then data from additional transects will be collected to achieve adequate statistical power. For each subsequent year of data collection, this same process will be applied: collect data based on the best initial estimate of adequate sample size (based on power analysis from the previous year), then perform another power analysis after initial data collection, and collect additional samples if the power analysis indicates the need for additional sampling. Sampling will occur between 1 June and 31 August during monitoring years following completion of restoration activities (CDP No. 1-10-032; Special Condition 2[A]8).

## **Riparian Habitat**

**Percent Cover Success Criteria.** Average percent cover of native trees, shrubs, and herbaceous species will be estimated for all areas planted with riparian trees and/or shrubs (riparian forest and active channel edge riparian). Table 9 provides the performance criteria for native riparian species. It is expected that species diversity and composition of native riparian plants observed will initially include many of the species planted (see Table 5), but over time as the site evolves and natural recruitment engages the species composition will likely change, as would occur in a natural ecosystem. Additionally, the presence of invasive, non-native species will be limited to less than 5% within the active replanting areas within the project footprint at the end of the 10-year monitoring period. Non-invasive non-native species will be limited to less than 15% of active replanting areas.





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**Table 1. Land Use and Habitat Projections (all units in acres)<sup>1</sup>**

HABITAT TYPE	RIVERSIDE RANCH <sup>2</sup>				SALT RIVER <sup>2</sup>				OVERALL PROJECT			
	Existing	Removed	Replanted or Created	Projected or Created	Existing	Removed	Replanted or Created	Projected or Created	Total Existing	Total Projected	Projected Change	Creation Ratio <sup>7</sup>
Tidal Salt & Brackish Marsh	36	14	300	322	-	-	4	4	36	326	+290	9:1
High Marsh Ecotone	-	-	12	12	-	-	-	-	0	12	+12	12:1
Aquatic / Mudflat <sup>5</sup>	8	4	17	21	3	-	-	14	11	35	+24	3:1
Riparian Forest/Scrub	31	10	22	43	66	32	51	85	97	128 <sup>8</sup>	+31	1.3:1
Freshwater Wetland Habitats:												
a) Freshwater Channel Wetlands	<1	-	-	<1	1	<1	22	22	1	22	+22	22:1
b) Seasonal Wetlands	3	3	-	<1	21	11	-	10	24	10	-14	-
Agricultural/ Grassland/ Levees	358	303 <sup>9</sup>	18 <sup>4</sup>	73	240	52	-	188	598	262	-337	-
Scrub-Shrub	8	8	-	-	1	1	-	-	9	0	-9	-
Ruderal	20	20	-	-	3	3	-	-	23	0	-23	-
Developed	8	8	-	<1	1	<1	-	<1	9	<1	-8	-
Sediment Management Areas <sup>6</sup>	-	-	-	-	-	-	-	13 <sup>3</sup>	0	13	+13	13:1
Permanent Access Road or Improved Bridge Crossing	-	-	-	-	-	-	-	<1	0	<1	+<1	-
<b>Approximate Total</b>	<b>472</b>			<b>472</b>	<b>336</b>			<b>336</b>	<b>808</b>	<b>808</b>		

<sup>1</sup> Totals are approximate due to rounding of individual acreage amounts.

<sup>2</sup> The confluence of Reas Creek divides the restoration areas of Riverside Ranch (Phase 1) and Salt River (Phase 2).

<sup>3</sup> 13 ac have been depicted on the projected vegetation maps. However, an additional 7 ac are tentatively proposed within the project area on existing agricultural grasslands.

<sup>4</sup> New berm will be seeded with native and erosion control grass species, above 9 ft (NAVD 88) on tidal marsh side and entire side slope on opposing side.

<sup>5</sup> Existing habitat type includes impacted areas to existing Eel grass beds (1.2 ac). Projected habitat area includes an estimated 8.7 ac of Eel grass beds created. Reference: Salt River Ecosystem Restoration Project Rare Plant Mitigation and Monitoring Plan (H. T. Harvey & Associates and Winzler & Kelly, January 27, 2011).

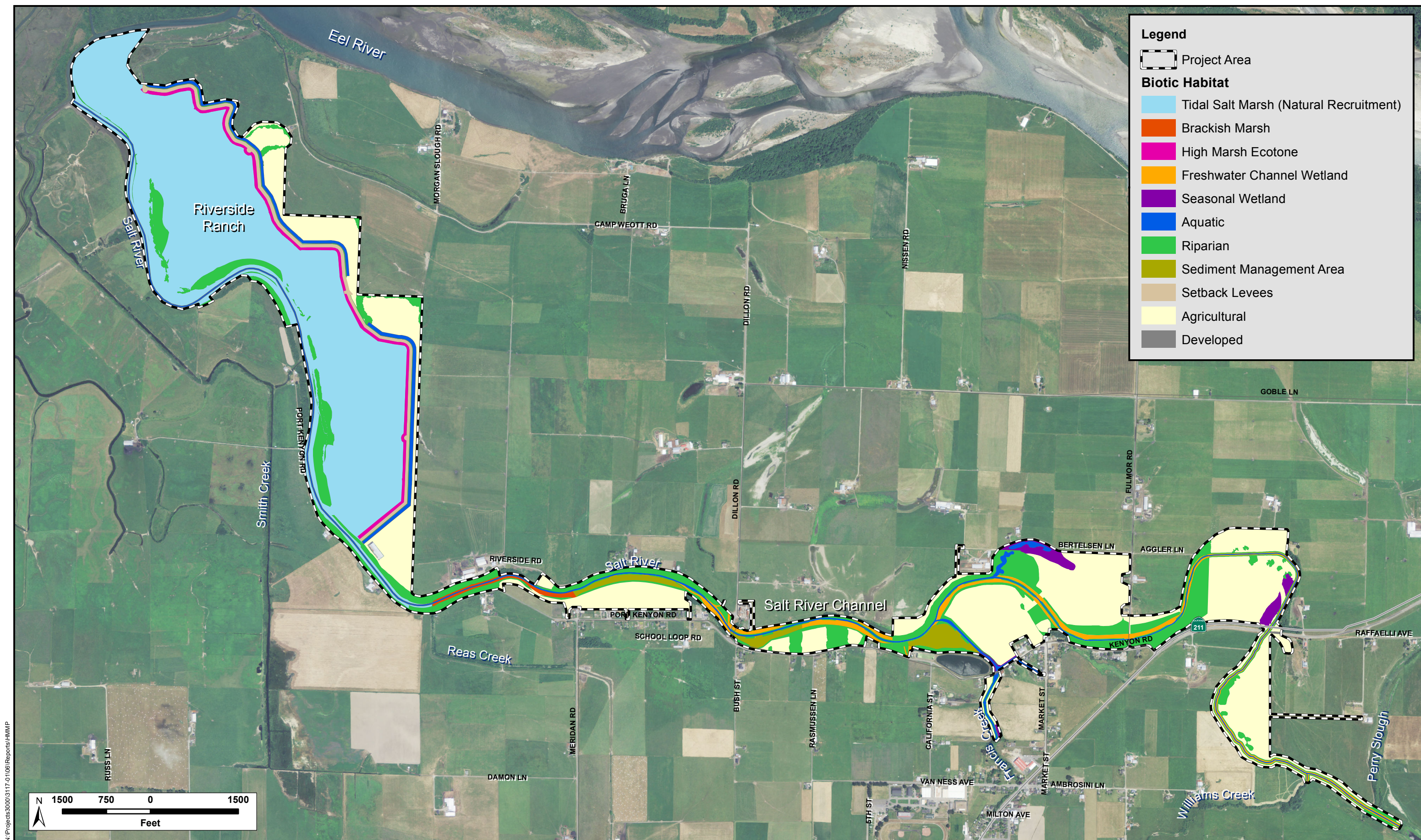
<sup>6</sup> The location of proposed Sediment Management Areas currently comprise approximately 85% Agricultural Grasslands and 15% Riparian Forest and have been accounted for in the respective Removed columns.

<sup>7</sup> Creation Ratio defined as total acres **Projected** (Created) to total acres **Existing**.

<sup>8</sup> Area does not include anticipated future natural recruitment of riparian habitat on the active bench. 20+ ac of projected freshwater and seasonal wetland habitats on the active bench could convert to riparian forest per Adaptive Management Plan.

<sup>9</sup> Area includes grassland habitat on existing levees some of which are not currently used for agricultural production.





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