

# Appendix A

## Project Areas Overview

### 1.1 Project Area Summary

This assessment used the project areas from the previous assessments as basic geomorphic reaches and modified and split as necessary to match current conditions. No new reaches were added, but project area boundaries were modified, and some project areas were split into subsections as discussed in this appendix. Table A-1 summarizes the location and status of each reach, and the provided GIS data display the aerial imagery and boundary for each project area, as well as the most up-to-date information on restoration structures currently built. Analysis results for each individual reach are laid out and described in more detail in the respective appendices of this report. The project area cut sheets in Appendix J describe each project area and identified restoration opportunities in more detail. Appendix J also provides a table of recognizable landmarks in relation to project areas for reference.

**Table A-1**  
**Project Area Summary**

Project Area	Valley Mile Start	Valley Length (mile)	River Mile Start	River Length (mile)	Treated or Untreated <sup>1</sup>
1.10	44.02	0.50	49.63	0.55	Treated
1.20	43.66	0.36	49.24	0.39	Untreated
2.00	43.10	0.56	48.60	0.64	Untreated
3.10	42.73	0.37	48.23	0.37	Untreated
3.20	41.44	1.29	46.79	1.44	Treated
4.00	41.23	0.21	46.55	0.24	Untreated
5.00	40.80	0.43	46.09	0.45	Untreated
6.00	40.16	0.64	45.35	0.74	Treated
7.00	39.74	0.42	44.90	0.45	Untreated
8.00	39.33	0.41	44.45	0.45	Treated
9.00	38.92	0.41	44.05	0.40	Treated
10.10	38.52	0.41	43.58	0.47	Treated
10.20	37.89	0.63	42.86	0.72	Treated
10.30	37.51	0.38	42.45	0.41	Treated
11.10	36.88	0.62	41.70	0.75	Treated
11.20	36.00	0.89	40.73	0.96	Treated
12.00	35.48	0.52	40.08	0.65	Untreated
13.00	34.81	0.67	39.32	0.77	Untreated
14.10	34.26	0.56	38.71	0.61	Treated

<b>Project Area</b>	<b>Valley Mile Start</b>	<b>Valley Length (mile)</b>	<b>River Mile Start</b>	<b>River Length (mile)</b>	<b>Treated or Untreated<sup>1</sup></b>
14.20	33.64	0.61	37.88	0.82	Treated
14.30	33.00	0.64	37.16	0.72	Untreated
15.10	32.68	0.32	36.78	0.38	Treated
15.20	32.29	0.39	36.36	0.42	Treated
16.00	31.05	1.24	34.97	1.39	Untreated
17.10	30.71	0.34	34.62	0.34	Untreated
17.20	30.45	0.27	34.32	0.31	Untreated
18.10	29.48	0.96	33.24	1.08	Treated
18.20	28.78	0.70	32.46	0.78	Untreated
19.00	28.31	0.47	31.90	0.56	Untreated
20.00	27.91	0.40	31.46	0.44	Untreated
21.00	26.85	1.06	30.41	1.05	Untreated
22.00	25.87	0.98	29.33	1.08	Treated
23.00	25.06	0.81	28.28	1.05	Treated
24.00	24.35	0.71	27.52	0.76	Treated
25.00	23.90	0.45	26.98	0.54	Untreated
26.00	21.11	2.79	23.99	2.99	Treated
27.00	20.21	0.90	22.95	1.05	Untreated
28.10	19.42	0.79	22.08	0.87	Untreated
28.20	18.41	1.01	20.91	1.17	Treated
28.30	17.38	1.03	19.75	1.16	Treated
29.00	16.37	1.01	18.63	1.12	Treated
30.00	15.54	0.83	17.62	1.01	Untreated
31.00	14.11	1.44	16.13	1.49	Untreated
32.10	13.42	0.69	15.34	0.79	Untreated
32.20	12.84	0.58	14.65	0.69	Untreated
33.00	11.71	1.12	13.43	1.22	Untreated
34.10	10.55	1.17	12.28	1.14	Untreated
34.20	9.92	0.63	11.50	0.78	Untreated
35.00	9.27	0.65	10.81	0.69	Untreated
36.00	7.83	1.44	9.11	1.70	Untreated
37.00	6.86	0.97	8.01	1.10	Untreated
38.00	4.09	2.77	5.04	2.97	Untreated
39.10	4.00	0.09	4.94	0.10	Untreated
39.20	3.68	0.31	4.61	0.33	Untreated
40.00	3.16	0.52	4.03	0.57	Treated
41.00	2.85	0.31	3.68	0.35	Untreated

Project Area	Valley Mile Start	Valley Length (mile)	River Mile Start	River Length (mile)	Treated or Untreated <sup>1</sup>
42.00	2.60	0.26	3.35	0.33	Untreated
43.00	2.32	0.28	2.92	0.43	Untreated
44.00	2.01	0.31	2.49	0.43	Untreated
45.00	1.58	0.43	1.96	0.52	Untreated

Notes:

1. Designates project areas where restoration activities have occurred since the 2010 Assessment.

## 1.2 Delineation of Geomorphically Distinct Reaches for Project Areas

The study area of this assessment includes approximately 51 river miles from the mouth of the Tucannon River, a scale which requires the delineation of the river into discrete units for analysis. Several of the following analysis methods rely on properly scaled reaches with geomorphically similar characteristics. In order to capture the significance of each analysis parameter, the reaches cannot span lengths of river with widely varying geomorphic characteristics. For example, should a reach begin in an area with well-connected floodplain and end in an area with poorly connected floodplain, it may appear in the floodplain connectivity analysis to be a moderately connected reach, which would misrepresent the geomorphic characteristics of the area. For this reason, the concept of performing analyses by river mile or by valley mile was discarded because these boundaries would fall in geomorphically random locations. Instead, previously delineated reaches served as the basis for the reach selection in this report.

The original *Tucannon River Geomorphic Assessment and Habitat Restoration Study* completed in 2010 (Anchor QEA 2011a) scaled the river into 10 reaches, which were delineated based on the results of the basin-scale geomorphic analyses with particular emphasis on floodplain confinement and hydrologic inputs. In the subsequent conceptual restoration plans and prioritizations (Anchor QEA 2011b, 2012a, 2012b), these reaches were separated into 45 distinct project areas based on localized geomorphic features as well as restoration opportunities. These project areas were defined by river mile location and ranged in length from a quarter of a mile to more than 3 miles. The original project areas captured the scale and geomorphic homogeneity necessary for the analyses of this report; however, several changes were made based on evolving geomorphic conditions.

For purposes of these analyses, evaluation units were modified by either subdividing project areas or moving the upstream or downstream boundary of the project area. Project area subdivision occurred due to changes in geomorphic conditions within a portion of the existing project area, or restoration activities within a portion of the project area. Project area boundaries were moved upstream or downstream to better include similar geomorphic conditions. This resulted in both changing the extents of project areas and dividing project areas into subsections to better capture geomorphic

differences within the project area. Additionally, the previous assessments (Anchor QEA 2011a, 2011b, 2012a, 2012b, 2012c) defined project areas by the beginning and ending river miles, which could make locating project area boundaries difficult should river avulsions or meanders occur. Project areas in this report are defined by valley mile, allowing the analyses to be repeatable over time and providing a consistent metric for measuring the temporal changes in geomorphic processes.

### 1.3 Changes to Project Areas

Changes to the project areas from the 2010 Tucannon Assessment were made based on shifting geomorphic features and reaches with restoration projects that only encompassed a portion of the reach. Additionally, a change was made in the theory behind assigning bridges to project areas. The previous assessments ended upstream or downstream of the bridge, with the idea that bridge removal or modification could be included as a restoration action in the project area. However, bridges often mark the beginning or end of distinct geomorphic reaches because they are major influences on the geomorphic processes themselves and, therefore, often represent the best place to split into a new reach to keep reaches with differing geomorphic characteristics separate. Furthermore, bridge modification projects are expensive and difficult, making them relatively uncommon. Therefore, this assessment often uses bridges as a break point for project areas. Table A-2 summarizes the project area changes from the original assessments to the current assessment.

**Table A-2**  
**Changes to Project Areas**

Original Project Area	New Project Area	Change Type	Change Justification
PA 1	PA 1.1	Boundary Moved Upstream	The upstream boundary was moved upstream to coincide with the nearby bridge and encompass the restoration work done in the area.
PA 1	PA 1.1 – PA 1.2	Project Split	Separated into treated and untreated sections.
PA 1 – PA 2	PA 1.2 – PA 2	Boundary Moved Upstream	Moved to section of river that is less geomorphically active than the previous location, based on LiDAR change analysis.
PA 2 – PA 3	PA 2 – PA 3.1	Boundary Moved Downstream	Boundary moved to coincide with bridge.
PA 3	PA 3.1 – 3.2	Project Split	Separated into treated and untreated sections.
PA 3 – PA 4	PA 3.2 – PA 4	Boundary Moved Downstream	Moved to better coincide with floodplain levee and avoid splitting a high-flow side channel.
PA 4 – PA 5	PA 4 – PA 5	Boundary Moved Upstream	Moved to better coincide with levee and consolidate floodplain opportunities in one PA.
PA 5 – PA 6	PA 5 – PA 6	Boundary Moved Upstream	Moved to coincide with U.S. Forest Service campground bridge.

<b>Original Project Area</b>	<b>New Project Area</b>	<b>Change Type</b>	<b>Change Justification</b>
PA 10	PA 10.1 – PA 10.2	Project Split	Split based on differing geomorphic characteristics. 10.1 is complex and depositional, 10.2 has been treated but has not reached full potential.
PA 10	PA 10.2 – PA 10.3	Project Split	Split based on differing geomorphic characteristics. 10.2 has been treated but has not reached full potential, 10.3 is characterized by a long side channel.
PA 11	PA 11.1 – PA 11.2	Project Split	Both reaches have been treated but 11.2 is much more complex than 11.1.
PA 12 – PA 13	PA 12 – PA 13	Boundary Moved Upstream	Moved boundary to coincide with hatchery dam.
PA 13 – PA 14	PA 13 – PA 14.1	Boundary Moved Upstream	Boundary moved to coincide with bridge.
PA 14	PA 14.1 – PA 14.2	Project Split	Both areas were treated but were split to isolate geomorphically similar reaches.
PA 14	PA 14.2 – PA 14.3	Project Split	Split to separate the untreated section (14.3) from the rest of the reach; split at bridge.
PA 15	PA 15.1 – PA 15.2	Project Split	Both reaches have been treated but were split based on differing geomorphic characteristics. PA 15.1 is characterized by a long side channel.
PA 16 – PA 17	PA 16 – PA 17.1	Boundary Moved Upstream	Boundary moved to coincide with bridge.
PA 17	PA 17.1 – PA 17.2	Project Split	Split to isolate geomorphically similar reaches. PA 17.1 is highly leveed and confined.
PA 18	PA 18.1 – PA 18.2	Project Split	Split into treated and untreated; split at bridge.
PA 18 – PA 19	PA 18.2 – PA 19	Boundary Moved Upstream	Boundary moved to coincide with levee encroaching on floodplain.
PA 19 – PA 20	PA 19 – PA 20	Boundary Moved Upstream	Boundary moved to coincide with bridge.
PA 20 – PA 21	PA 20 – PA 21	Boundary Moved Downstream	Boundary moved to consolidate floodplain opportunity.
PA 21 – PA 22	PA 21 – PA 22	Boundary Moved Upstream	Boundary moved to coincide with bridge.
PA 25 – PA 26	PA 25 – PA 26	Boundary Moved Upstream	Boundary moved to coincide with bridge.
PA 26 – PA 27	PA 26 – 27	Boundary Moved Upstream	Boundary moved to coincide with encroaching levee.
PA 27 – PA 28	PA 27 – PA 28.1	Boundary Moved Upstream	Boundary moved to coincide with bridge.
PA 28	PA 28.1 – PA 28.2	Project Split	Split to separate untreated section (28.1) from the rest of the reach.
PA 28	PA 28.1 – PA 28.2	Project Split	Both sections were treated but were split to isolate geomorphically similar reaches.

Original Project Area	New Project Area	Change Type	Change Justification
PA 29 – PA 30	PA 29 – PA 30	Boundary Moved Upstream	Boundary moved to coincide with bridge.
PA 32	PA 32.1 – PA 32.2	Project Split	Split at location of falls.
PA 33 – PA 34	PA 33 – PA 34.1	Boundary Moved Upstream	Boundary moved to coincide with bridge.
PA 34	PA 34.1 – PA 34.2	Project Split	Project area split at bridge.
PA 34 – PA 35	PA 34.2 – PA 35	Boundary Moved Upstream	Boundary moved to coincide with the start of the levee encroaching on the floodplain.
PA 43 – PA 44	PA 43 – PA 44	Boundary Moved Upstream	Moved to section of river that is less geomorphically active than the previous location, based on LiDAR change analysis.
PA 44 – PA 45	PA 44 – PA 45	Boundary Moved Downstream	Boundary moved to coincide with pinch point in floodplain.
PA 45	PA 45	Boundary Moved Downstream	Boundary moved to coincide with bridge.

Notes:

LiDAR: Light Detection and Ranging

PA: project area

## 1.4 References

Anchor QEA (Anchor QEA, LLC), 2011a. *Tucannon River Geomorphic Assessment and Habitat Restoration Study*. Prepared for Columbia Conservation District. April 2011.

Anchor QEA, 2011b. *Conceptual Restoration Plan Reaches 6 To 10*. Prepared for Columbia Conservation District. November 2011.

Anchor QEA, 2012a. *Conceptual Restoration Plan Reaches 3 and 4*. Prepared for Columbia Conservation District. October 2012.

Anchor QEA, 2012b. *Conceptual Restoration Plan Reaches 5*. Prepared for Columbia Conservation District. October 2012.

Anchor QEA, 2012c. *Integrated Species Restoration Prioritization*. Prepared for Columbia Conservation District. November 2012.