

# **APPENDIX A**

# **ASSESSMENT PROTOCOL**



RIVER CORRIDOR ASSESSMENT SHEET

<b>Stream segment</b>		
River miles (from/to)		
<b>Date</b>		
<b>A. Channel assessment</b>		
<b>A1. Current active/wet channel</b>		1 to 2.9 Severely Degraded
Bank erosion and stability		
Aggradation		3 to 4.9 Poor
Degradation		
Revetment		5 to 6.9 Fair
<b>A2. Disturbed floodplain</b>		7 to 8.9 Good
Bank erosion and stability		
Aggradation		9 to 10 Excellent
Degradation and headcutting		
<b>A3. Existing overbanks</b>		
Sediment deposition		
Headcutting		
Land use		
<b>A4. Riparian condition</b>		
<b>A5. Presence of Barriers</b>		
<b>Sum of A elements</b>		
<b>Number of elements</b>		
<b>Channel Assessment Score</b>		
<b>B. Risk to structures and infrastructures</b>		
B1. Buildings		1 to 2.9 Severely Degraded
B2. Utilities		
B3. Roads		3 to 4.9 Poor
<b>Sum of B elements</b>		5 to 6.9 Fair
<b>Number of elements</b>		
<b>Structure and Infrastructure Score</b>		8 to 8.9 Good
		9 to 10 Excellent

Element A1: Current active/wetted Channel			
<b>Bank erosion and stability</b>			
Banks are stable; protected by roots of natural vegetation, wood, and/or rock.  No bank failures	Banks are moderately stable, protected by roots of natural vegetation, wood, or rock or a combination of materials. Evidence of erosion or bank failures, some with reestablishment of vegetation.	Banks are moderately unstable; very little protection of banks by roots of natural wood, vegetation, or rock  Moderate bank failures	Banks are unstable; no bank protection with roots, wood, rock, or vegetation  Numerous bank failures
<b>Right Bank 9</b>	<b>10 8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Left Bank 9</b>	<b>10 8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Aggradation</b>			
No excessive aggradation	Evidence of some aggradation	Evidence of moderate to severe aggradation	Evidence of severe aggradation
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Degradation</b>			
No excessive degradation	Evidence of some degradation	Evidence of moderate to severe degradation	Evidence of severe degradation
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Channel revetment (riprap, concrete, gabions etc)</b>			
No observed deterioration	Minor discontinuous cracks or displacement	Cracking or displacement in portions of the reach	Failed revetment throughout system
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>A2:Disturbed floodplain</b>			
<b>Bank erosion and stability</b>			
Banks are stable; protected by roots of natural vegetation, wood, and/or rock.  No bank failures	Banks are moderately stable, protected by roots of natural vegetation, wood, or rock or a combination of materials  Evidence of erosion or bank failures, some with reestablishment of vegetation	Banks are moderately unstable; very little protection of banks by roots of natural wood, vegetation, or rock  Moderate bank failures	Banks are unstable; no bank protection with roots, wood, rock, or vegetation  Numerous bank failures
<b>Right Bank 10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Left Bank 10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>

Aggradation			
No excessive aggradation	Evidence of some aggradation	Evidence of moderate to severe aggradation	Evidence of severe aggradation
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Degradation and headcutting</b>			
No excessive degradation or headcutting	Evidence of some degradation and headcutting	Evidence of moderate to severe degradation and headcutting	Evidence of severe degradation and headcutting
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>A3:Existing overbanks</b>			
<b>Bank erosion and stability</b>			
Banks are stable; protected by roots of natural vegetation, wood, and/or rock.  No bank failures	Banks are moderately stable, protected by roots of natural vegetation, wood, or rock or a combination of materials  Evidence of erosion or bank failures, some with reestablishment of vegetation	Banks are moderately unstable; very little protection of banks by roots of natural wood, vegetation, or rock  Moderate bank failures	Banks are unstable; no bank protection with roots, wood, rock, or vegetation  Numerous bank failures
<b>Right Bank 10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Left Bank 10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Sediment deposition</b>			
No to little sediment deposition in overbanks; vegetation visible	Some sediment deposition in overbanks; vegetation mostly visible	Sediment deposition in overbanks; vegetation not visible	Sediment deposition in overbanks; vegetation not visible
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Headcutting</b>			
No headcutting into existing banks	Evidence of some headcutting into existing banks	Evidence of moderate to severe headcutting into existing banks	Evidence of severe headcutting into existing banks
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>Land Use</b>			
Land uses do not negatively impact overbank condition	Land uses are contributing slightly to overbank instability	Land uses are contributing moderately to overbank instability	Land uses are contributing to overbank instability
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>

<b>A4: Riparian condition</b>			
Natural and diverse riparian vegetation with composition, density and age structure appropriate for the site  No invasive species	Natural and diverse riparian vegetation with composition, density and age structure appropriate for the site  Invasive species present in small numbers(20% cover or less)	Natural vegetation compromised  Invasive species common(>20% <50% cover)	Little or no natural vegetation  Invasive species wide-spread(>50% cover)
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>A5: Presence of barriers to aquatic species movement</b>			
No artificial barriers that prohibit movement of aquatic organisms during any time of the year	Physical structures, water withdrawals and/or water quality seasonally restrict movement of aquatic species	Physical structures, water withdrawals and/or water quality restrict movement of aquatic species throughout the year	Physical structures, water withdrawals and/or water quality prohibit movement of aquatic species
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>

<b>B1: Buildings</b>			
Buildings not in flood corridor or appear to be sufficiently elevated above 2013 flood event and/or undamaged from flood event	Buildings present with possible evidence of inundation and damage during 2013 flood event  Building appears to be in a location not subject to future flooding	Buildings present with possible evidence of inundation and damage during 2013 flood event  Building appears to be in a location possibly subject to future flooding	Buildings present with possible evidence of inundation and damage during 2013 flood event  Building appears to be in a location subject to future flooding
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>B2: Utilities (buried infrastructure, overhead power, other)</b>			
Utilities not observed at site (not exposed or does not appear to be present).	Evidence of utility presence but does not appear to be currently at risk	Evidence of utility presence which could potentially be at risk with future flows	Evidence of utility presence and currently at risk
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>
<b>B3: Roads (buried infrastructure, overhead power, other)</b>			
Roads not observed at site or within or near limits of flood damaged corridor.	Roads near flood damaged corridor but do not appear to be currently at risk	Roads near or across flood damaged corridor that could potential be at risk with future flows	Roads near of across flood damaged corridor that have been damaged and are at risk with future flows
<b>10 9</b>	<b>8 7 6</b>	<b>5 4 3</b>	<b>2 1 0</b>

SUMMARY OF FIELD ASSESSMENTS																								
CHANNEL ASSESSMENT	Reach																							
	I		II			III				IV	V						VI			VII				
	I-1	I-2	II-1	II-2	II-3	III-1a	III-1b	III-1c	III-2	IV	V-1	V-2	V-3	V-4	Va-5	Va-6	VI-1	VI-2	VI-3	VII-1	VII-2	VIIa-3	VIIa-4a	VIIa-4b
	LTR Confluence with BT to CR 17	CR 17 to I25	I 25 to CR 7	CR 7 to CR 5 (DS at Koolstra Property)	CR 5 (DS at Koolstra property) to CR 1	CR 1 to Hwy 287	CR 1 to Hwy 287	CR 1 to Hwy 287	hwy 287 to Boulder Cty	Boulder Cty	Cty line to Roberts	Roberts to Stagecoach Rd	Stagecoach Rd to confluence NF	NF to Stagecoach Tr (Vancleve)	NF Stagecoach Tr to confluence with Spruce	NF confluence with Spruce to Pole Hill	Confluence with NF to Pinewood	Pinewood	Pinewood to CR 47	CR 47 to confluence with Lyons Gulch	Confluence with Lyons Gulch to headwaters	WF CR 47	WF US of BEM	Deer Creek US of BEM
<b>A. Channel assessment</b>																								
<b>A1. Current active/wet channel</b>	6.0	5.8	7.8	4.4	6.4	6.6	7.2	4.8	4.0	2.6	5.3	6.0	5.3	6.0	5.3	7.0	8.0	6.0	4.3	4.5	8.0	4.3	6.8	5.3
Bank erosion and stability (left)	6.5	5.0	8.0	3.0	6.0	6.0	8.0	4.0	2.0	1.0	5.0	6.0	5.0	6.0	5.0	7.0	8.0	6.0	4.0	4.0	7.0	5.0	7.0	6.0
Bank erosion and stability (right)	6.5	5.0	8.0	2.0	6.0	6.0	8.0	4.0	2.0	1.0	5.0	6.0	5.0	6.0	5.0	7.0	8.0	6.0	4.0	4.0	7.0	5.0	7.0	6.0
Aggradation	5.0	6.0	7.0	4.0	6.0	5.0	4.0	6.0	3.0	3.0	2.0	6.0	6.0	6.0	6.0	7.0	8.0	7.0	5.0	6.0	10.0	2.0	8.0	2.0
Degradation	7.0	7.0	8.0	7.0	6.0	8.0	8.0	5.0	5.0	3.0	9.0	6.0	5.0	6.0	5.0	7.0	8.0	5.0	4.0	4.0	8.0	5.0	5.0	7.0
Revetment	5.0	6.0	8.0	6.0	8.0	8.0	8.0		8.0	5.0														
<b>A2. Disturbed floodplain</b>	4.5	5.3	7.3	5.0	5.8	7.3	7.0	5.0	3.5	2.0	4.0	5.0	5.0	6.0	5.8	6.0	8.0	7.5	5.0	5.3	8.5		7.0	5.0
Bank erosion and stability (left)	5.0	5.0	8.0	5.0	6.0	8.0	8.0	4.0	2.0	1.0	4.0	4.0	4.0	6.0	6.0	6.0	8.0	6.0	5.0	5.0	8.0		7.0	7.0
Bank erosion and stability (right)	5.0	5.0	8.0	5.0	6.0	8.0	8.0	4.0	2.0	1.0	4.0	4.0	4.0	6.0	6.0	6.0	8.0	6.0	5.0	5.0	8.0		7.0	7.0
Aggradation	3.0	5.0	6.0	4.0	5.0	5.0	4.0	6.0	4.0	4.0	2.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0	5.0	6.0	10.0		8.0	2.0
Degradation and headcutting	5.0	6.0	7.0	6.0	6.0	8.0	8.0	6.0	6.0	2.0	6.0	6.0	6.0	6.0	5.0	6.0	8.0	10.0	5.0	5.0	8.0		6.0	4.0
<b>A3. Existing overbanks</b>	5.5	6.5	7.7	7.7	5.6	7.7	6.7	5.6	5.8	4.3	6.3													
Bank erosion and stability (left)	6.0	6.0			6.0			6.0	4.0	3.0														
Bank erosion and stability (right)					6.0			6.0	4.0	3.0														
Sediment deposition	3.0	7.0	7.0	7.0	4.0	7.0	4.0	6.0	4.0	3.0	9.0													
Headcutting	7.0	6.0	8.0	8.0	6.0	8.0	8.0	4.0	7.0	3.0	5.0													
Land use	6.0	7.0	8.0	8.0	6.0	8.0	8.0	6.0	8.0	8.0	5.0													
<b>A4. Riparian condition</b>	5.0	7.0	6.0	5.0	6.0	7.0	6.0	6.0	6.0	6.0		2.0	2.0	6.0	6.0	8.0	8.0	7.0	5.0	5.0	8.0	5.0	9.0	7.0
<b>A5. Presence of Barriers</b>	5.0	8.0	2.0	8.0	4.0	5.0	5.0	4.0	4.0	1.0	4.0	8.0	8.0	10.0	9.0	10.0	8.0	7.0	7.0	7.0	8.0	1.0	8.0	8.0
<b>Sum of A elements</b>	80.0	91.0	99.0	78.0	93.0	97.0	95.0	77.0	67.0	45.0	60.0	54.0	51	64.0	59.0	70.0	80.0	68.0	49.0	51.0	125.0	23.0	72.0	56.0
<b>Number of elements</b>	15	15	14	14	16	14	14	15	15	15	12	10	10	10	10	10	10	10	10	10	15	6	10	10
<b>Channel assessment score</b>	5.3	6.1	7.1	5.6	5.8	6.9	6.8	5.1	4.5	3.0	5.0	5.4	5.1	6.4	5.9	7.0	8.0	6.8	4.9	5.1	8.3	3.8	7.2	5.6
<b>Reach averaged score</b>	5.7		6.2			5.8				3.0	5.8						6.6			6.0				
<b>Channel Assessment Description</b>	Fair		Fair			Fair				Poor	Fair						Fair			Fair				
<b>STRUCTURES ASSESSMENT</b>																								
<b>B. Risk to structures and infrastructures</b>																								
B1. Buildings	4.0	4.0	-	8.0	5.0	8.0	8.0		2.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0	-	3.0	5.0	3.0	4.0	3.0	-	-
B2. Utilities	5.0	8.0	-	-	5.0	7.0		2.0	5.0	2.0	3.0			3.0	8.0	8.0	-	2.0	-	5.0	5.0	3.0	-	-
B3. Roads	5.0	4.0	6.0	4.0	6.0	7.0	8.0		5.0	4.0	5.0	4.0	4.0	2.0	6.0	6.0	-	3.0	3.0	5.0	5.0	3.0	-	-
<b>Sum of B elements</b>	14.0	16.0	6.0	12.0	16.0	22.0	16.0	2.0	10.0	7.0	9.0	5.0	5.0	6.0	18.0	18.0	-	8.0	8.0	13.0	14.0	9.0	-	-
<b>Number of elements</b>	3.0	3.0	1.0	2.0	3.0	3.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	-	3.0	2.0	3.0	3.0	3.0	-	-
<b>Structure and Infrastructure Score</b>	4.7	5.3	6.0	6.0	5.3	7.3	8.0	2.0	4.0	2.3	3.0	2.5	2.5	2.0	6.0	6.0	-	2.7	4.0	4.3	4.7	3.0	-	-
<b>Reach averaged score</b>	5.0		5.8			5.3				2.3	3.7						3.4			4.0				
<b>Structure and Infrastructure Description</b>	Fair		Fair			Fair				Severe	Poor						Poor			Poor				