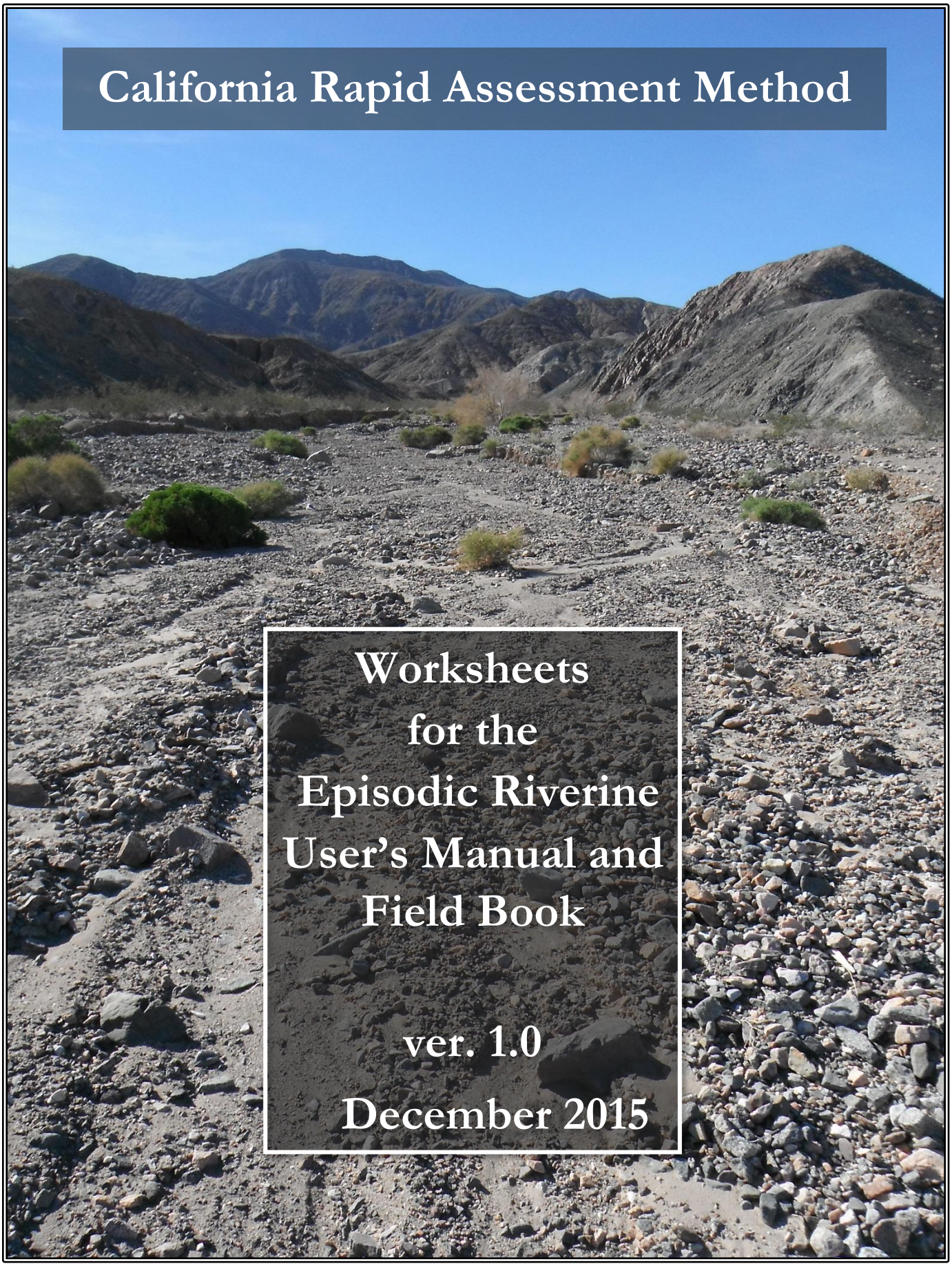
California Rapid Assessment Method



Worksheets for the Episodic Riverine User's Manual and Field Book

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Worksheet 3.1: Stream Corridor Continuity Metric for Riverine Systems

Using satellite imagery or aerial photography, identify the presence of unfavorable land uses, anthropogenic features (e.g. road crossings), and existing infrastructure over a distance of 500 m upstream and 500 m downstream of the AA (Table 3.3). Use the steps outlined in Table 3.1 and Worksheet 3.1 to calculate the metric score. Printed screen shots of aerials, specifically near the AA, should be brought to the field. In addition, the results from any GIS-based landscape assessment (if completed) should be reviewed prior to scoring this metric (See Figure 3.1).

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		**Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA**	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length		Downstream Total Length	

Worksheet 3.2: Percent of AA with Buffer

In the space provided below, make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: _____%

Worksheet 3.3: Calculating average buffer width of AA

Line	Buffer Width (m)
A	
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width ***Round to the nearest integer***	

Worksheet 3.4: Structural Patch Type for Episodic Streams

Circle each type of patch that is observed in the AA and enter the total number of observed patches in the Table below. Status as confined or non-confined must first be determined (see Figure 2.3) to determine which patches are expected in the system (indicated by a "1" in the table below). Any feature within the AA should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

STRUCTURAL PATCH TYPE (circle for presence)	**Episodic Riverine (Non-Confined)**	**Episodic Riverine (Confined)**
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrack or organic debris in channel or on floodplain	**1**	**1**
Animal mounds and burrows	**1**	**1**
Bank slumps or undercut banks in channels	**1**	**1**
Biotic/algal soil crusts	**1**	**1**
Cobbles and/or boulders	**1**	**1**
Debris jams	**1**	**1**
Course woody debris	**1**	**1**
Pannes or pools on floodplain	**1**	**n/a**
Plant hummocks and/or sediment mounds	**1**	**1**
Point bars and in-channel bars	**1**	**1**
Pools or depressions in channels (wet or dry channels)	**1**	**1**
Sand ripples	**1**	**n/a**
Secondary channels on floodplains	**1**	**n/a**
Swales on floodplain	**1**	**n/a**
Variegated, convoluted, or crenulated channel margins (instead of broadly arcuate or mostly straight)	**1**	**1**
Vegetated islands (*exposed at high-water stage*)	**1**	**n/a**
Water-cuts	**1**	**1**
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)		

Special Notes:
**Physical patches can be natural or unnatural (artificial) in origin.*
**Refer to the CRAM Photo Dictionary at* www.cramwetlands.org *for photos of each of the following patch types for dryland episodic channels.*

Worksheet 3.5: AA Topographic Complexity

This metric is scored for episodic streams using the alternative states described in Table 3.13. At three locations along the AA, sketch the cross-section profile of the AA lateral extent (by convention, the cross-section is depicted looking downstream). Draw the cross-section from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the macro-topography (e.g., breaks in slope) and intervening micro-topographic relief. Label the location of the low-flow channel and flood plain units. Based on these sketches and the profiles in Figure 3.6, choose a description in Table 3.16 that best describes the overall topographic complexity of the AA.

Profile 1
Profile 2
Profile 3

Worksheet 3.6: Plant Community Metric: Co-dominant species richness for Riverine wetlands

A thorough reconnaissance of an AA is required to assess its condition using the plant community submetrics. The assessment for each submetric is guided by a set of Plant Community Worksheets. The Plant Community metric is calculated based on these worksheets. (A dominant species represents ≥10% relative cover.)

Very Short (<0.2 m)	Invasive?	Short (0.2-0.5 m)	Invasive?
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5 -3.0 m)**	**Invasive?**
Very Tall (>3.0 m)		**Total number of co-dominant species for all layers combined (enter here and use in Table 3.16)**	
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 3.16)	

Special Notes:

* *Combine the counts of co-dominant species from all layers to identify the total co-dominant species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Worksheet 3.7: Horizontal Interspersion

Use the spaces below to make a quick sketch of the AA in plain view. It is helpful to first label the major hydrogeomorphic units present, and then identify and major plant zones (this should take no longer than 10 minutes). Label the zones and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.

	Assigned zones: ***1)*** ***2)*** ***3)*** ***4)***

Worksheet A.1: Wetland disturbances and conversions

Has a major disturbance or episodic event occurred at this site?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this site been converted from another type? If yes, then what was the previous type?	Perennial non-confined riverine	Perennial confined riverine	Episodic ephemeral	

Worksheet A.2: Stressor Checklist

HYDROLOGY ATTRIBUTE **(WITHIN 50 M OF AA)**	**Present**	**Significant negative effect on AA**
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE **(WITHIN 50 M OF AA)**	**Present**	**Significant negative effect on AA**
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	**Present**	**Significant negative effect on AA**
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	**Present**	**Significant negative effect on AA**
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		