California Rapid Assessment Method for Wetlands

Establishing the Assessment Area



Background

- The Assessment Area (AA) is the portion of the wetland that is assessed using CRAM.
  - An AA might include a small wetland in its entirety.
  - In most cases the AA will likely be a smaller portion of the wetland.

Background

- Establishing a proper AA is a critical step in correctly performing a rapid assessment using CRAM.
- The use of an incorrect AA can yield results that are not reproducible, and that are not likely to relate to stressors or management actions.
- Rules are therefore needed to define the AA.

Rule 1

- It is assumed that different wetlands, even neighboring wetlands of the same type, can be managed differently, or for different purposes, and can be subject to different stressors.
- Therefore, each AA must not encompass or involve more than one wetland, even of the same type (do not group wetlands together).

Rule 2

- Since CRAM metrics vary between wetland types, each AA must only represent one type of wetland.
- Different types of wetlands can be contiguous with each other, or even nested one within the other, but each AA must only represent one wetland type.

Rule 3

- The AA must be classified using CRAM typology.
  - Misclassification of wetlands can lead to using the wrong CRAM module, which in turn will lead to spurious assessments.
- The wetland must be assessed using the metrics designed for its wetland type.

Rule 4

- Experience has shown that for the purpose of standardizing the AAs for any wetland type, the overriding considerations are:
  - Hydro-geomorphic integrity
  - Size

Hydro-geomorphic Integrity

- Need to be able to distinguish between the effects of management actions and the natural variability within and among wetlands.
- AA should maximize the CRAM signal-to-noise ratio.
- Each AA must therefore encompass most, if not all, of the natural spatial variability in the visible form and structure of its encompassing wetland.
- AA should also encompass most of the internal workings of the wetland that account for its homeostasis.

Hydro-geomorphic Integrity

- For an AA to have this desired level of integrity, it should be bounded by obvious physical changes in topography, hydrology, or infrastructure that significantly control the:
  - Sources
  - Volumes
  - Rates
  - General composition

  … of sediment supplies or water supplies within the AA at the time of the field assessment.

Hydro-geomorphic Integrity

- In summary: The boundaries of an AA should not extend beyond any features that represent or cause a major spatial change in water source or sediment source.

AA Size

- Larger AAs typically yield higher CRAM scores.
  - CRAM is especially sensitive to wetland structural complexity, and larger AAs can afford more opportunity to encounter variability in structure.
- For any given wetland type, having AAs of very different sizes can introduce variability into CRAM scores.

AA Size

- Most of the AAs of each wetland type that are defined according to indicators of hydro-geomorphic integrity fall within a narrow range of size, although their shapes are more variable.
- This suggests that size guidelines can be applied to the process of establishing an AA without necessarily violating the criterion for the hydro-geomorphic integrity of the AA.

AA Size

- Some wetlands (wet meadows, brackish estuarine wetlands, large riverine systems, and fringing wetlands of playas and lacustrine systems) lack obvious hydrological breaks or other features that clearly demarcate changes in water supplies or sediment supplies.
- In these cases, overall size may be the dominant criterion for defining the AA.

AA Size

- Preferred AA size is generally larger for types of wetlands that tend to have broad, level plains than for wetlands fringing steep terrain.
- To the degree possible, the establishment of an AA should first be based on hydro-geomorphic considerations.
- If this is not applicable, then use the recommended AA size (not to exceed the maximum AA size). Practitioner may use BPJ.

Hydro-geomorphic Considerations for Identification of the AA

Examples of features that *should* be used to delineate AA boundaries:

Flow-Through Wetlands	Non Flow-Though Wetlands	
Riverine, Estuarine and Slope Wetlands	**Lacustrine, Wet Meadows, Depressional, and Playa Wetlands**	**Vernal Pools and Vernal Pool Systems**
• diversion ditches • end-of-pipe large discharges • grade control or water height control structures • major changes in riverine entrenchment, confinement, degradation, aggradation, slope, or bed form • major channel confluences • water falls • open water areas more than 30 m wide on average or broader than the wetland • transitions between wetland types • foreshores, backshores and uplands at least 5 m wide • weirs, culverts, dams, levees, and other flow control structures	• above-grade roads and fills • berms and levees • jetties and wave deflectors • major point sources or outflows of water • open water areas more than 30 m wide on average or broader than the wetland • foreshores, backshores and uplands at least 5 m wide • weirs and other flow control structures	• above-grade roads and fills • major point sources of water inflows or outflows • weirs, berms, levees and other flow control structures

Hydro-geomorphic Considerations for Identification of the AA

Examples of features that should *not* be used to establish any AAs:

- at-grade, unpaved, single-lane, infrequently used roadways or crossings
- bike paths and jogging trails at grade
- bare ground within what would otherwise be the AA boundary
- equestrian trails
- fences (unless designed to obstruct the movement of wildlife)
- property boundaries
- riffle (or rapid) – glide – pool transitions in a riverine wetland
- spatial changes in land cover or land use along the wetland border
- state and federal jurisdictional boundaries

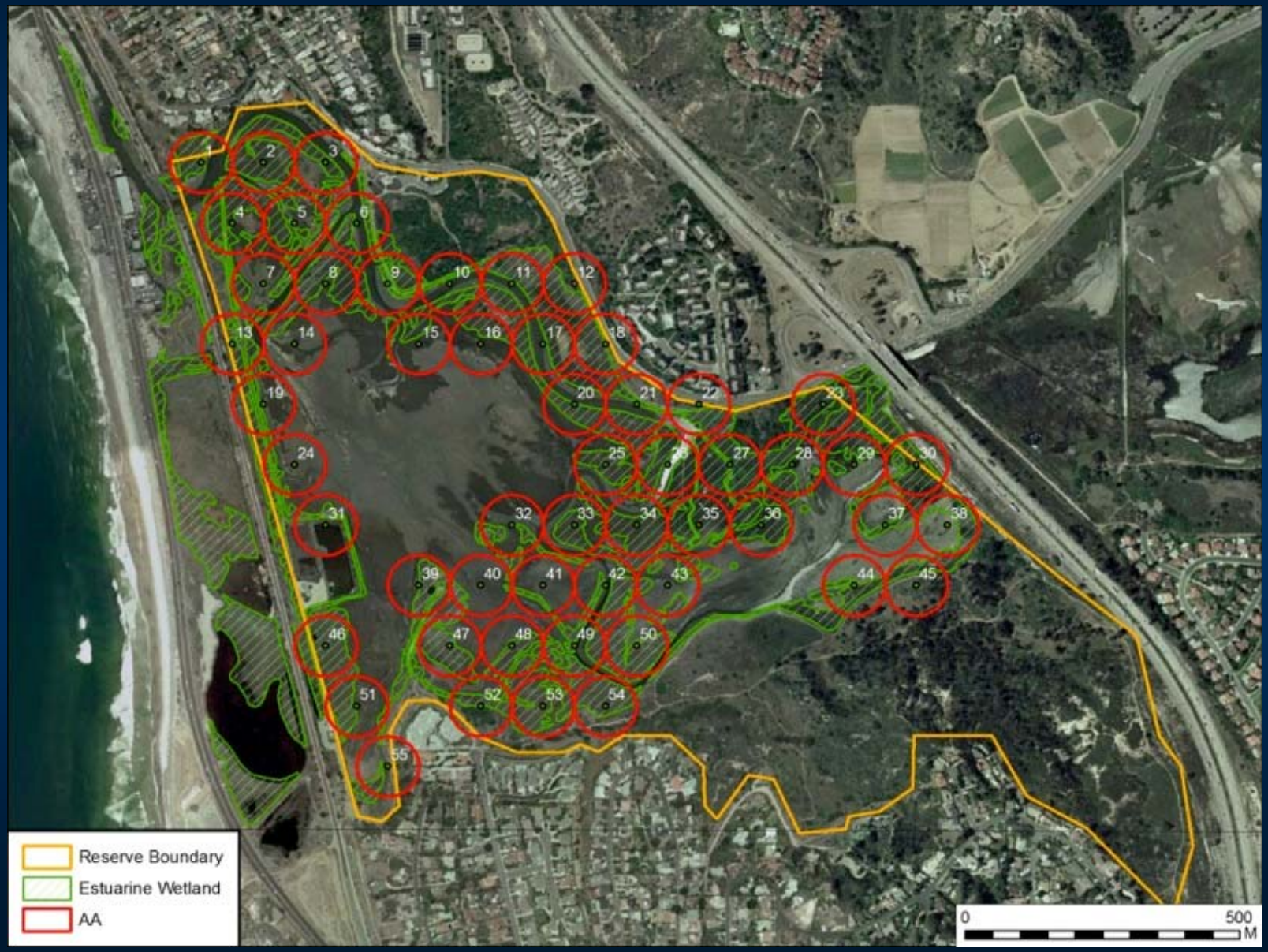
AA Size Guidelines

Wetland Type	Recommended AA Size
Slope	
Spring or Seep	Preferred size is 0.50 ha (about 75m x 75m, but shape can vary); there is no minimum size (least examples can be mapped as dots).
Wet Meadow	Preferred size is 1.0 ha (about 140m x 140m, but shape can vary); Maximum size is 2.0 ha; there is no minimum size.
Depressional	
Vernal Pool	There are no size limits.
Vernal Pool System	Preferred size is <10 ha (about 300m x 300m; shape can vary); there is no minimum size so long as there are between 3 and 6 pools. If the system has between 3 and 6 pools, assess all of them. If there are more than 6 pools, select 6 that represent the range in size of pools present on the site.
Other Depressional	Preferred size is 1.0 ha (a 56 m radius circle or about 100m x 100m, but shape can vary); Maximum size is 2.0 ha (an 80 m radius circle or about 140m x 140m, but shape can vary); There is no minimum size.
Riverine	
Confined and Non-confined	Recommended length is 10x average bankfull channel width; maximum length is 200 m; minimum length is 100 m. AA should extend laterally (landward) from the bankfull contour to encompass all the vegetation (trees, shrubs vines, etc.) that probably provide woody debris, leaves, insects, etc. to the channel and its immediate floodplain; minimum width is 2 m.
Lacustrine	Preferred size is 2.0 ha (about 140m x 140m, but shape can vary); Minimum size is 0.5 ha (about 75m x 75m).
Playa	Preferred size is 2.0 ha (about 140m x 140m, but shape can vary); Minimum size is 0.5 ha (about 75m x 75m).
Estuarine	
Perennial Saline	Preferred size and shape for estuarine wetlands is a 1.0 ha circle (radius about 55m), but the shape can be non-circular if necessary to fit the wetland and to meet hydro-geomorphic and other criteria. The minimum size is 0.1 ha (about 30m x 30m).
Perennial Non-saline	
Bar-Built	Maximum size is 2.25 ha (about 150 m x 150 m, but shape can vary), The minimum size is 0.1 ha (about 30m x 30m).

AA Identification

The location of the AA can be identified by the boundaries of a project, a Jurisdictional Delineation, or a wetland polygon in a Level 1 inventory.

Uniform Size



Summary of Considerations for Identification of the AA

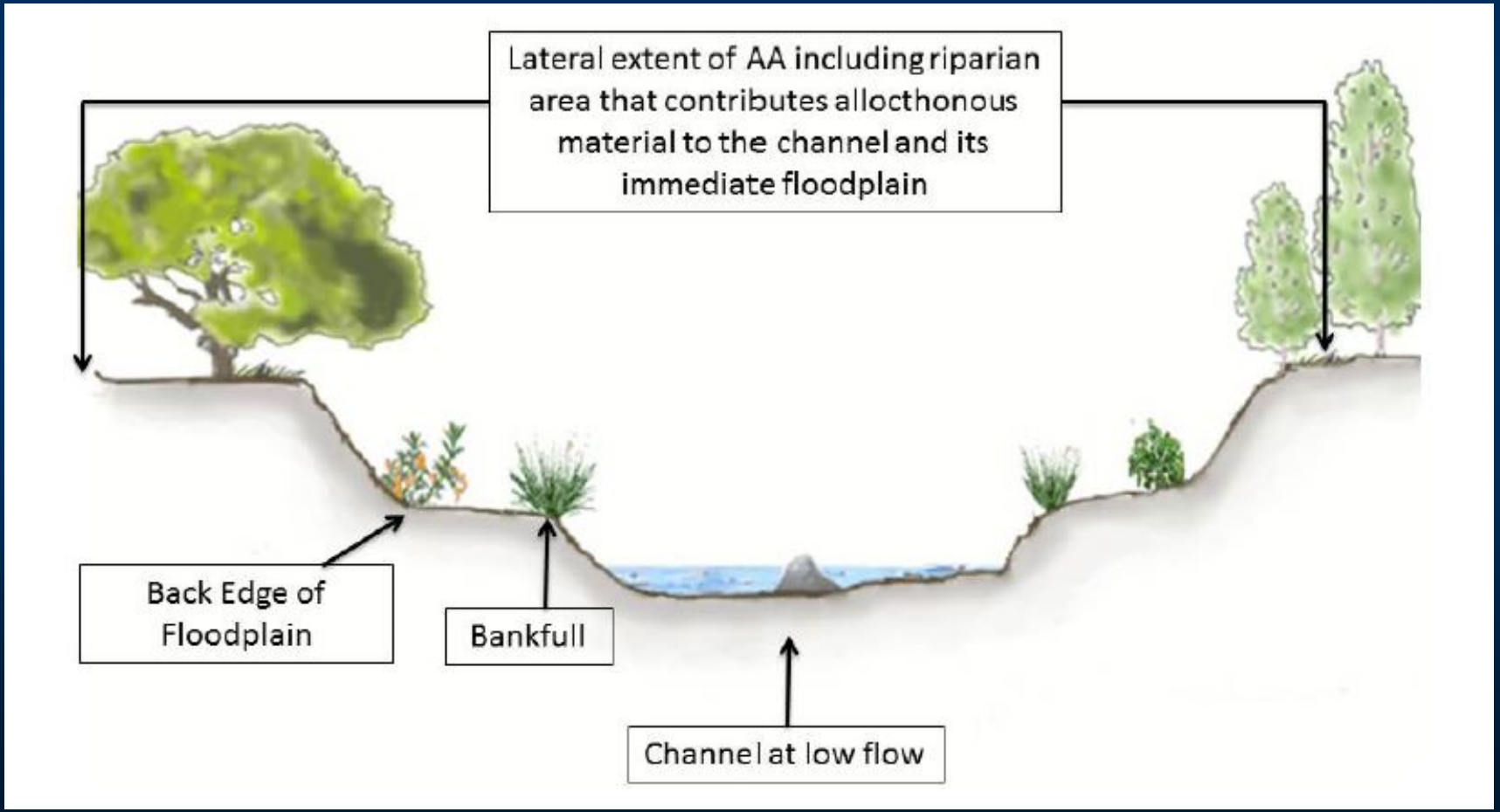
- Purpose of Assessment
  - Project (multiple AAs to cover site)
  - Ambient (AA located at probabilistic draw point)
- Hydrogeomorphic Integrity
  - Bounded by changes in flow and sediment regimes
  - Maximize detection of management effects
- Size Limits for AAs
  - Larger AAs have higher or more variable scores
  - Larger AAs take longer to assess

Riverine Systems

- AA is the channel, its immediate floodplain, and essential riparian area
- Length = 10x average bankfull width within limits of 100m and 200m

AA Includes Portion of Riparian Area Directly Affecting the Channel

AA lateral width includes portion of riparian area that directly provides allochthonous input to the channel and immediate floodplain.



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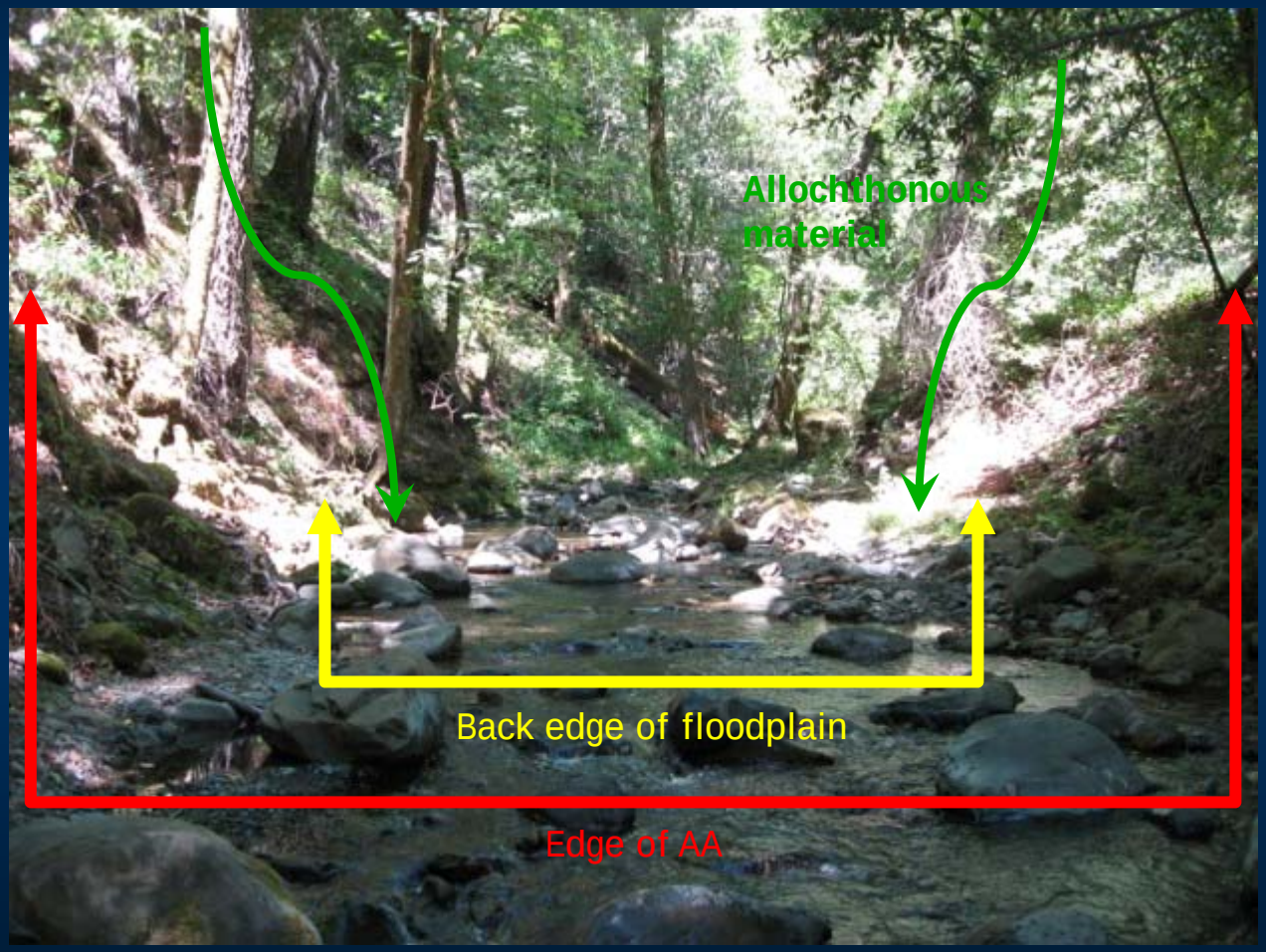

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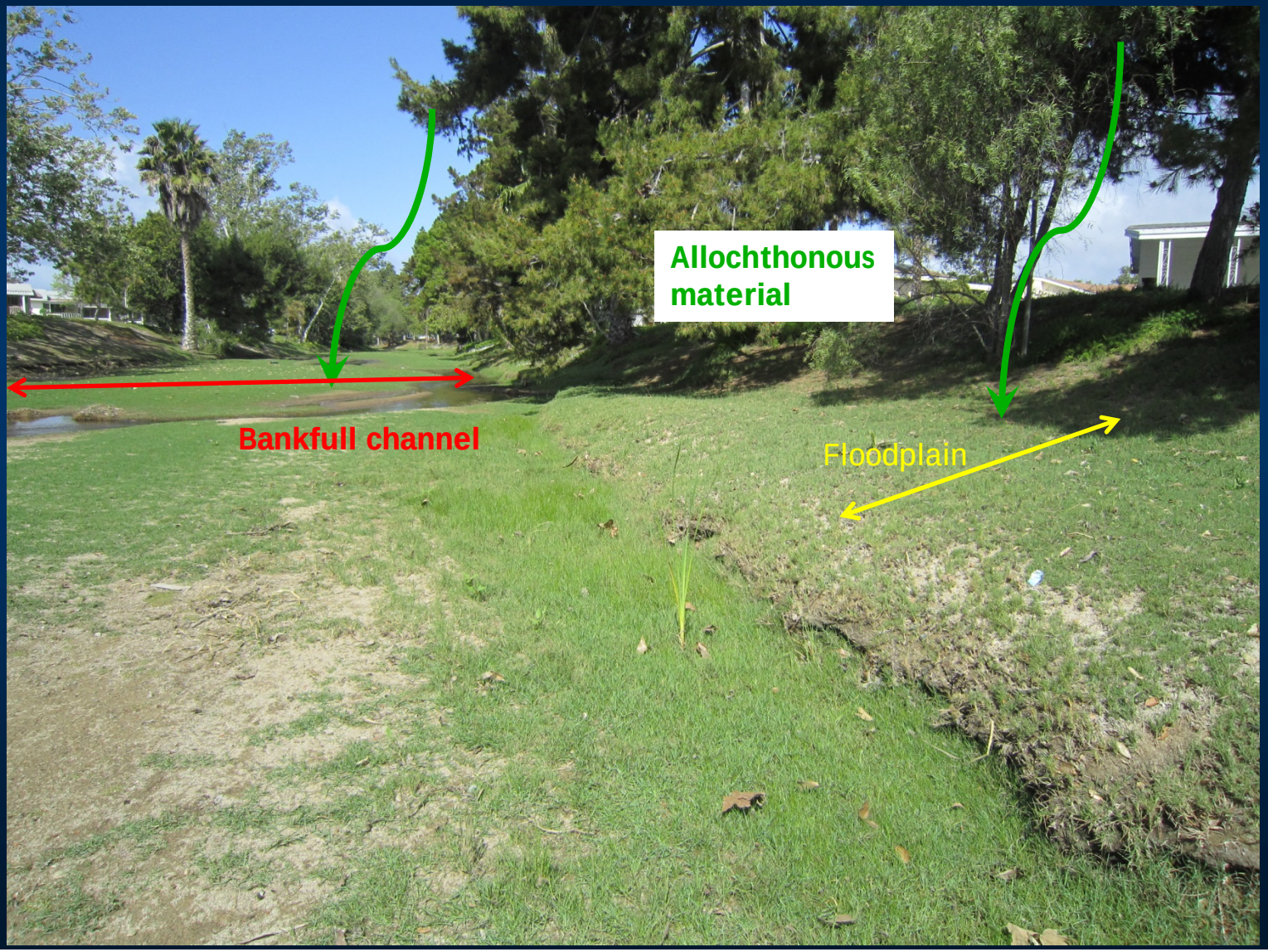


Minimum Width of AA

For systems lacking overhanging riparian vegetation, the minimum width of the AA should extend no less than 2 meters from the bankfull channel margin.

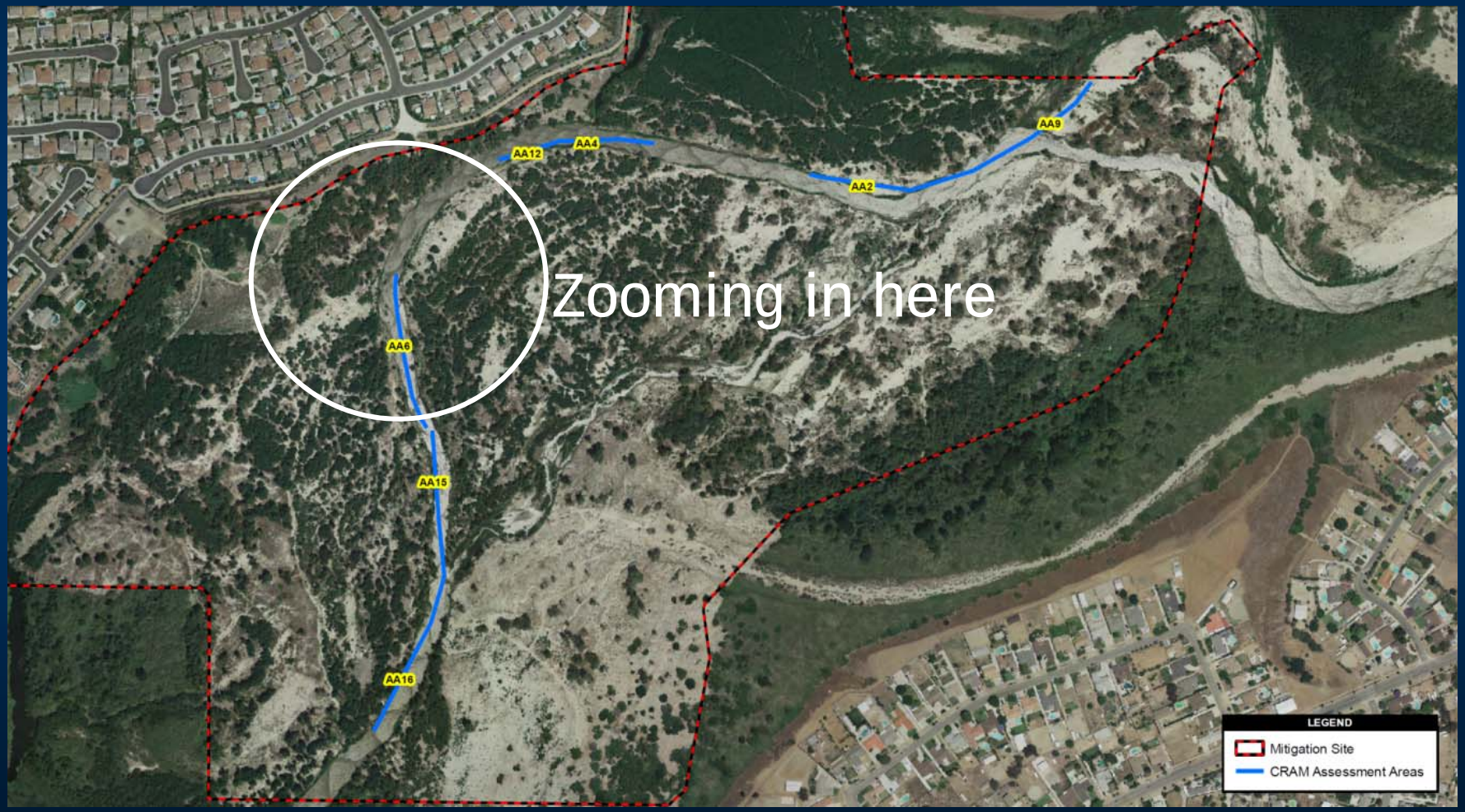
Riverine Systems

- AA should be placed above or below major confluences.
- Adjust the AA placement to account for the hydrogeomorphic break of the tributary. Placement depends on pre-established protocol of the study being conducted.

Special Considerations for Certain Riverine Systems

- The lateral extent of AA should be no more than 2 times the bankfull width on each side of the channel:
  - Large systems with very broad floodplains (10-20 times average channel width)
  - Narrow systems in a steep valley lacking a floodplain

Special Considerations for Certain Systems



Special Considerations for Certain Systems

Large systems with very broad floodplains (10-20 X average channel width)

Special Considerations for Certain Systems

Narrow systems in a steep valley lacking a floodplain

Depressional Systems

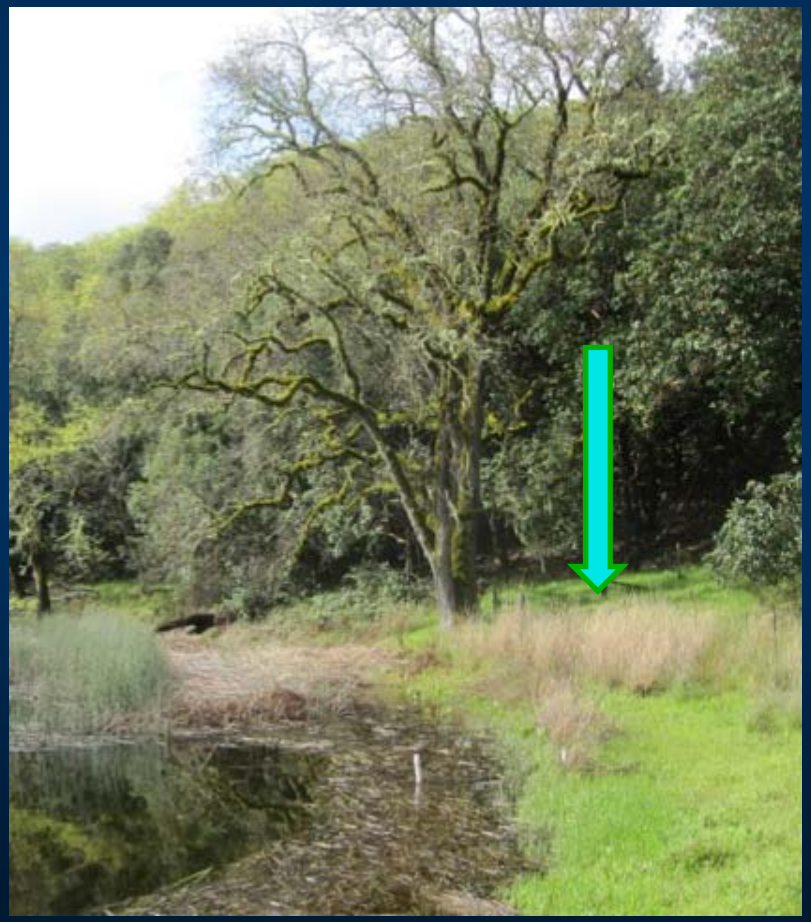
- Includes up to the backshore as indicated by:
  - Wrack lines
  - Transition from wetland to upland
- Includes the riparian vegetation overhanging the backshore (minimum 2m)
- Not to extend across:
  - More than 10m of open water

Depressional Systems

- If the wetland does not have a distinct area of open water in the middle but is more continuous emergent marsh habitat, the AA will be a 1 hectare circle.

Depressional Systems

Backshore of wetland and dripline of riparian vegetation



Depressional Systems

2m minimum and riparian vegetation overhanging the backshore

Estuarine Systems

- Determine boundary of AA at low tide:
- Not to extend above the backshore:
  - Wrack lines
  - Transition from tidal to upland
- Not to extend across:
  - More than 10m of non-vegetated tidal flat
  - Tidal channel more than 30m wide

Estuarine Systems

Identify AA boundaries using:

- Changes in hydrology – weirs, tide gates, etc.
- Backshore of wetland – wrack lines, transition from tidal to upland, etc.
- Change in wetland type – e.g., riverine to estuarine

Estuarine Systems

1 hectare circle (recommended AA size)

Vernal Pool AAs

Step 1: Identify Assessment Areas

- In the office, using aerial imagery
  - Identify pools *probably* interconnected by surface or subsurface hydrology
  - Vernal pool systems usually include 6 pools, with a minimum of 3 pools
    - AAs should not exceed ~10 hectares (300 x 300 m)
  - Extend AA boundary to surface drainage divide
    - But not exceeding 30 meters beyond pool boundary
- Ground-truth the AA boundary

Example of Determining AAs

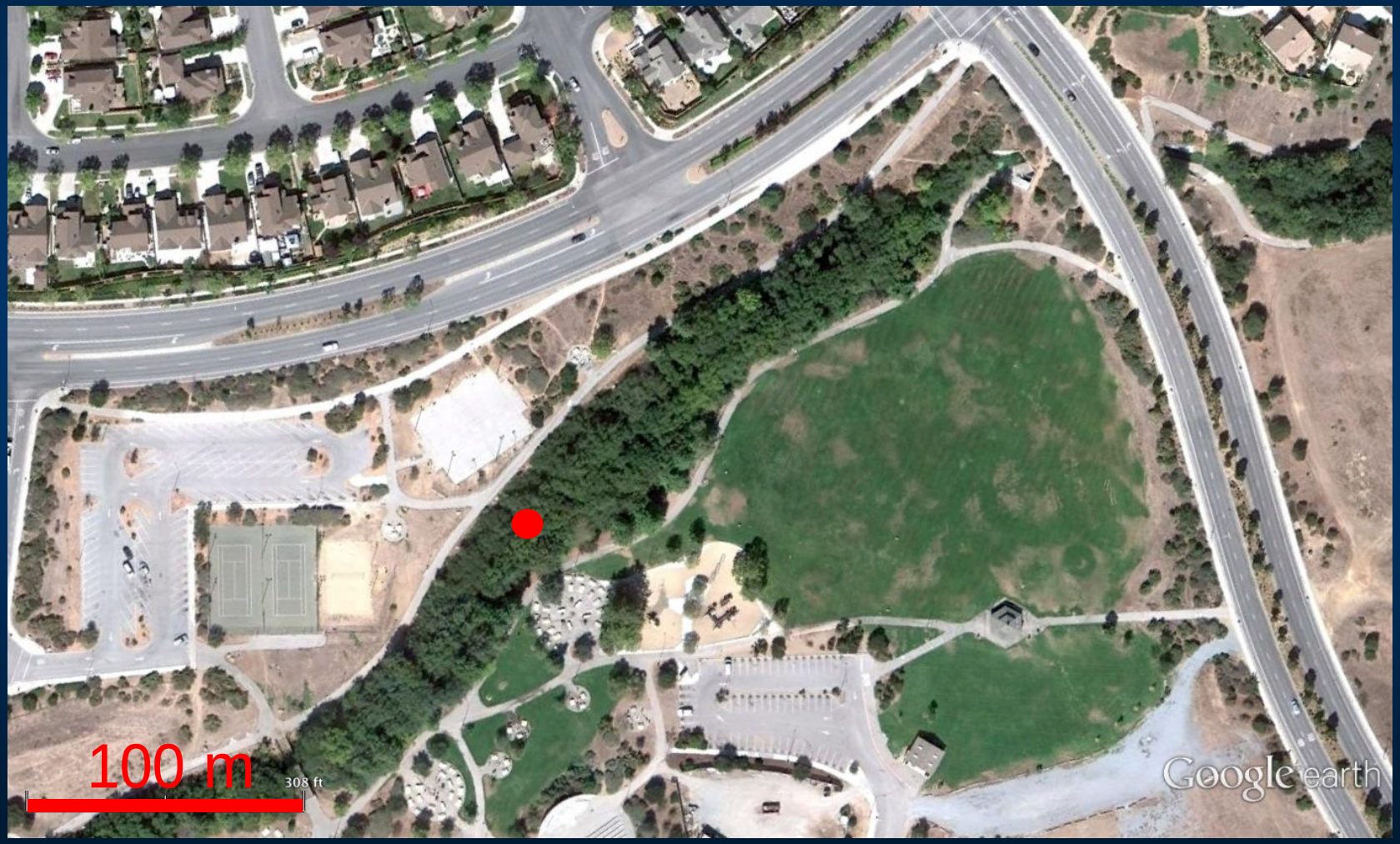
AA Boundary Rules

- AA boundaries *should be* limited by
  - Above grade roads
  - Other structures that alter hydrology
- AA boundaries *should not be* limited by
  - At grade and infrequently used
    - Single lane roads
    - Bike paths and equestrian or jogging trails
  - Changes in land cover or land use
  - Fences *that do not impede the movement of wildlife*
  - Property boundaries

Example of Vernal Pool AAs

Road grade is a hydrologic break

Drawing an AA – Riverine



Drawing an AA – Riverine

- Assume <10m average bankfull width
  - Relatively small stream system
  - Relatively small watershed
  - Can be adjusted once out in the field
- Therefore it will be 100m long
- Width dependent on riparian vegetation overhanging the channel/floodplain

Drawing an AA – Riverine

Drawing an AA - Riverine

Now it is your turn…