

Attachment #1  
For First Core Team Meeting

California Rapid Assessment Method for Wetlands v. 1.0

Draft Report

November 2002

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**Citations**

**Acknowledgements**

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## 1.0 Introduction

US EPA is supporting a number of efforts in the nation to develop and strengthen wetland monitoring and compensatory mitigation through grant assistance under the Wetland Development Grants and policy and technical support from Headquarters and the Regions. The technical framework for EPA's support consists of three complementary levels:

- Level 1, Landscape Assessment;
- Level 2, Rapid Assessment; and
- Level 3, Intensive Site-Specific Monitoring;

Each level supports or can be used to verify the other, and are further described below.

Landscape Assessment (Level 1) relies almost entirely on Geographic Information Systems (GIS) and remote sensing data to obtain information about watershed conditions and the distribution and abundance of wetland types within watersheds. The National Wetland Inventory (NWI) is an example of a Level 1 assessment. A Level 1 assessment can generate a sample frame for Level 1 and level 2 assessments of wetlands sites. Wetland landscape profiles and landscape development indices can also result from "Level 1" assessments (see also Bedford 1999, Gwin et al. 1999, Magee 1998, Bedford 1996).

Rapid Assessment (Level 2) uses relatively simple observations and records to assess conditions at wetland sites. The Level 2 assessment can help define the presence/absence of key attributes and can be used to develop hypotheses about the causes of the observed conditions. Level 2 assessments can also be used to calibrate or validate Level 1 assessments. In addition to California, other states currently in the process of developing or implementing Level 2 include Ohio, Pennsylvania, Delaware, Massachusetts, and Washington.

Intensive Site Assessment (Level 3) provides the field data necessary to refine and calibrate the Level 2 (rapid assessment) methods, characterize reference condition, test hypotheses about the causes of wetland conditions as observed through Level 2, and develop design and performance standards for wetland restoration, including compensatory wetland mitigation. Wetland bio-assessment (i.e., use of indices of biological integrity or IBIs) can be developed and used in Level 3 assessments.

## 2.0 Organization and Coordination

US EPA Region 9 awarded Wetland Development Grants in 2002 to ABAG and the San Francisco Estuary Institute (SFEI) as one partnership, and to the Southern California Coastal Water Research Project (SCCWRP). The CRAM will be developed collaboratively to meet the larger needs of the state for consistent wetlands assessment across wetland types and regions.

Development will involve both Core Development teams and Regional Technical Review teams (see Table 1). The Core Team will consist of key staff from SCCWRP, SFEI, and the Coastal Conservancy, as well as key technical experts from both northern and southern California. The Core Team will be responsible for development and testing of the draft CRAM. The objective of having a single Core Team is to foster collaboration and coordination between the regions for the purpose of producing one method of wetland assessment that is consistent across wetland types and over time throughout the state of California. The Core Team will make decisions and delegate internal roles and responsibilities by consensus as needed.

Regional Review Teams will consist of key agency and technical experts from each region and should represent expertise in both physical and biological wetland processes, as well as experience with assessment methodologies. Regional teams should also include representation from agencies that are intended end-users of the CRAM. The purpose of the Regional Teams is to provide technical review and to assure that the CRAM addresses differences in wetland form, structure, and function between different regions and across wetland types. The Regional Teams will also provide feedback as the utility of the CRAM for their agency's/organization's particular needs.

### **3.0 Purpose**

The overall goal of the CRAM is to periodically assess the abundance, distribution, and condition of wetlands and related resources of the State of California. The assessment should be able to be completed in a timely manner, built from a regional perspective, provide improved information from a management and evaluation perspective, and be accessible (understandable) to a broad range of expertise. The CRAM will be designed to survey the ambient and site-specific conditions of wetlands over time in the context of wetlands planning, management, and regulation.

### **4.0 Background from Other States and Related Efforts in California**

Two important aspects to incorporate into the CRAM development process are building off previous/existing assessment methods and incorporation of concepts from other assessment programs currently in place in California. The latter aspect will also help minimize redundancy between various assessment programs.

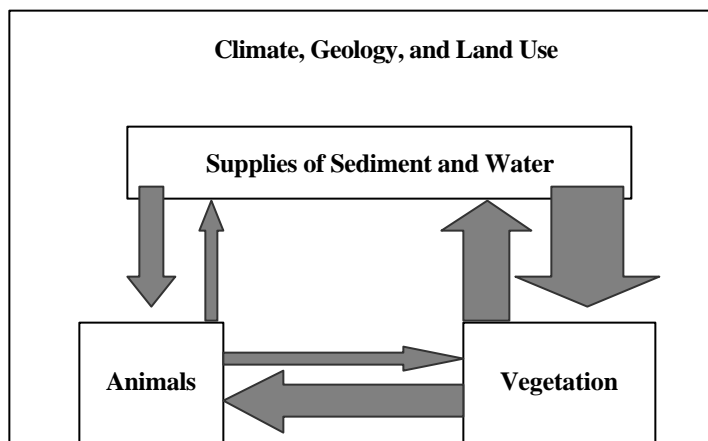
The USEPA Office of Research and Development (ORD) in Corvallis Oregon is currently completing a critical analysis and review of existing rapid and semi-rapid assessment methods. This study will provide information on metrics and approaches used in other locations and a proposed conceptual model for rapid assessment. The CRAM Core Team will use the information provided by the study as a starting point for method development. In addition, Dr. Mary Kentula, the principal investigator for this study, will serve as an advisory member on the Core Team.

Other assessment methods that currently exist or are in development include the California Department of Fish and Game's stream bioassessment and wildlife assessment procedures and the California Native Plant Society's Releve method. Elements of these methods that may be useful will be incorporated into the CRAM. In addition, staff from CDFG and CNPS will be included on the Regional

Review Teams to ensure communication and coordination between these efforts.

## 5.0 Overarching Assumptions

*Assumption 1: The evolution and natural maintenance of a wetland depend on supplies of water and sediment, as mitigated by vegetation. Water is needed to submerge the land, and sediment is needed to prevent the land from being too deeply submerged. The supplies of water and sediment are ultimately controlled by climate, geology, and land use, but vegetation can significantly affect the quality and quantity of local water and sediment.*



**Figure 1: Diagram of primary factors that control wetland form and function**

Climate, geology, and land use control supplies of water and sediment, which in turn control vegetation, which affects the distribution and abundance of animals. Arrows represent hydrology, herbivory, predation, or microbial processes, and point from what controls these processes to what they affect. Larger arrows represent greater responses.

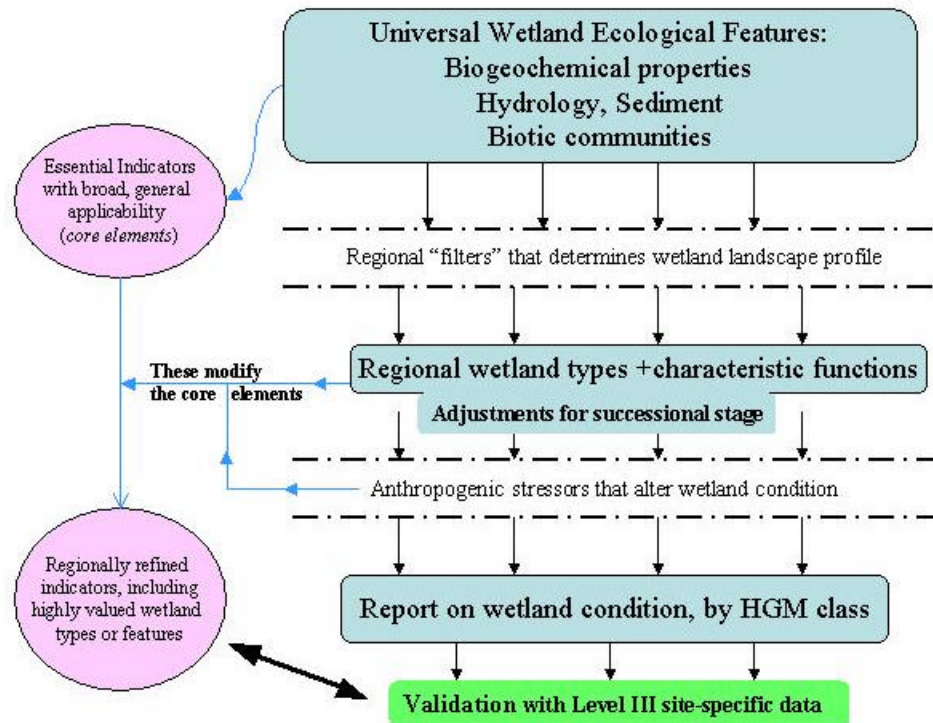
*Assumption 2: The distribution and abundance of wetlands, and the condition of any given wetland vary at many scales of space and time. Different metrics of the CRAM might pertain to the same wetland at different times.*

Assumption 3: Development of the CRAM will include the following components:

- ?? Method development
- ?? Field testing/calibration
- ?? Method refinement
- ?? Field validation (with level III studies)
- ?? Peer review
- ?? Education and outreach

Assumption 4: “Rapid” assessment means that for any given wetland site, implementation of the CRAM in the field should not take longer than XX hours; the collection of background site data and the analysis of the data collected will require additional time to complete.

Assumption 5: *The conceptual framework of the CRAM should be consistent across wetland types and regions, yet allow for customization to address characteristics of different regions and wetland classes.*



**Figure 2: Conceptual CRAM Model developed by Kentula, modified by Stein & Collins**

The USEPA ORD project group headed up by Mary Kentula has developed a conceptual model for the CRAM. We have slightly modified this conceptual model, which is shown above.

Key features of the CRAM development will include:

- ?? Method will address physical and biologic condition of wetlands
- ?? The method framework would be modified for regional wetland types
  - ☞☞ Core indicators would be modified to apply to specific wetland types
  - ☞☞ Not all indicators would be used for all wetland types
- ?? Reference standard condition would be based on "best attainable regional conditions"
- ?? Initial metrics/indicators will be based on literature survey/background research of existing studies relating physical or biological structure to faunal utilization
- ?? Method development will include field calibration and validation with Level III (site-specific) analysis

- ?? Output will be “customizable” depending on the goal of the assessment (e.g. condition evaluation, impact assessment, mitigation compliance)
- ?? Ultimately will include a strategy to use in a regional monitoring context (e.g. EMAP or other sampling-based approach)
- ?? Ultimately will develop institutional infrastructure for training, use, and data management via a central “clearinghouse”

## **6.0 Adoption of Rapid Assessment Methods in California**

### **7.0 Four Basic CRAM Steps**

#### **Step 1.**

Each person who employs the CRAM to assess a wetland or set of wetlands is called a Rater. The first step in each application of the CRAM is to provide the following information about each Rater:

- Name
- Professional title
- Business address, phone number and email address

#### **Step 2.**

The second step of the CRAM is to characterize the study site from a landscape perspective. This will include the following information:

- Site boundary map at minimum scale of 1:24,000 (boundary horizontal error should not exceed 100 ft)
- Address (name of watershed or nearest stream, elevation, section number, city,
- Size (acres to nearest tenth of an acre)
- Buffer characteristics
- NWI inventory information
- USGS mapping information
- Watershed characteristics
- NDDB listings
- National or local soils mapping information
- US Army Corps of Engineers jurisdictional delineations
- site history (e.g., other wildlife information resources)
- site sketch

#### **Step 3.**

Each Rater must complete the narrative questions in preparation for a site visit. This will assist in the fieldwork by providing important information on known conditions at the wetland site. Next, a Rater will want to obtain a copy of field data sheet and become familiar with the kinds of information

need to complete during the site visit.

#### **Step 4.**

Visit the site with the goal of filling out the field data sheet and verifying the information compiled during the “offsite” information gathering process. As in performing a jurisdictional delineation, it is strongly recommended that the Rater take the time to become familiar with the site from the “landscape perspective.” This would include careful investigation of the surrounding land uses, looking for sources of human disturbance, site modifications, watershed boundaries, buffer extent and condition, wildlife usage, and other visual sources of information. Care should be made in planning the site visit to ensure that the site is inspected at the optimal diurnal and seasonal conditions with respect to such variables as rainfall, tides, and wildlife usage.

### **8.0 Scoring Boundaries and Wetland Classification**

#### **9.0 Narrative Ratings**

#### **10.0 Metrics**

The following metrics have been selected for consideration in the first draft of the CRAM. Based on the ORAM manual version 5.0, and review of other methods, the best rapid indicators of wetland condition might be as follows.

#### **9.1 Size**

This metric is used to classify a wetland by its size alone. The size classes for consideration in this draft version are:

- Size class 1: > 300 acres
- Size class 2: 50-300 acres
- Size class 3: 25-50 acres
- Size class 4: 3-25 acres
- Size class 5: < 3 acres

*Rationale for metric consideration:* California has lost over 90% of the historical extent of wetlands since the beginning of European inhabitation. Most large, contiguous tracks of wetlands have been filled, converted, or otherwise destroyed. While we fully recognize that not all wetland functions are size dependent (such as vernal pools), generally the larger the wetland, the greater the functional capacity of the site. Many larger wetlands are made up of mosaics of habitats, thus increasing the number of wetland functions supported by that large area, such as flood storage, vegetation diversity, breeding bird sites, and other wildlife (citations). For these reasons, we are considering using size as a metric, with scoring to be distributed according to five classes of wetland size.

#### **9.2 Landscape condition, buffer size, and buffer condition**

The submetrics under consideration in this metric are:

### 9.2.1 Surrounding land use intensity

This is defined as the intensity of the surrounding land use outside of the wetlands buffers, but close enough to be able to assert a direct or indirect influence on physical or biological characteristics of the wetland.

### 9.2.2 Average buffer width

This is defined as the unaltered landscape immediately adjacent to the wetland, where human impacts are relatively minor or not detectable. This would include the upland transition area (or ecotone) between the wetland and the surrounding land.

### 9.2.3 Buffer condition

This refers to the ability of the buffer to protect the physical, chemical, and biological integrity of the wetland. If the area adjacent to a wetland is considered a buffer, it must be shown to provide some level of protection through filtering runoff, providing upland refugia, or simply by creating open space between more intensive land uses and the wetland under consideration. In many wetland landscapes, buffers are integral to the ecological services provided by organisms inhabiting the wetland, and these should be scrutinized carefully by the Rater. For example, in vernal pool complexes, amphibians (tiger salamander) and insects (solitary bees) use the immediate buffer area for reproduction. The bees also pollinate many vernal pool plant species.

### 9.2.4 Adjacent habitat condition

This submetric refers to the conditions of the lands next to the buffer. In many instances, buffers are narrow, as humans have encroached upon them by placing roads, agricultural lands, houses, or commercial development. The condition of this land can lessen or improve the effect an immediate buffer area has on the wetland under consideration.

*Rationale for metric consideration:* This metric is important for the many reasons that landscape condition can affect a particular wetland. In highly urbanized situations, the effects are often numerous and negative, ranging from non-point source inputs of contaminants, to introduction of non-native plants and feral predators, to direct disturbances from recreational activities such as hiking, boating, bike riding, and horseback riding. In agricultural settings, sediment and chemical inputs can affect wetland functions, and surrounding areas are often drained or ditched, which can cause undesired hydrologic impacts.

## 9.3 Hydrology

### 9.3.1 Sources of water

This refers to the various sources of input of water into the wetland being rated. Attributes under consideration include:

- ?? Groundwater
- ?? Surface water
  - perennial

seasonal or intermittent

- ?? Precipitation
- ?? Tidal waters

### 9.3.2 Connectivity

This submetric refers to the extent that a source of wetland hydrology is connected to the larger landscape. Attributes under consideration are:

- ?? 100-year floodplain (is the wetland connected or part of it)
- ?? Connected to a stream or lake in such a manner as to buffer the surface water from human activities.
- ?? Part of a wetland or upland complex
- ?? Part of a riparian corridor

### 9.3.3 Water fluctuations

This submetric assesses the particular expected hydrology for the wetland type. Attributes under consideration are:

- ?? Full tidal (where applicable)
- ?? Maximum water depth (> 70 cm for emergent marshes)
- ?? Muted tidal

### 9.3.4 Duration of saturation or inundation. Attributes under consideration are:

- ?? Semi-permanently to permanently inundated or saturated
- ?? Return interval less than 5 years
- ?? Sufficient to support hydrophytic vegetation

### 9.3.5 Modifications to the natural hydrologic regime. Attributes under consideration are:

- ?? None or none readily apparent
- ?? Slight, but capable of restoring to previous condition (over 5 years ago)
- ?? Moderate and likely to have long-lasting effects (within last few years)
- ?? Severe or permanent (or recent)

To assist in evaluating the extent of hydrologic disturbance, the Rater will list all the apparent disturbances from the following list:

- ✍ stormwater discharge
- ✍ point source discharge
- ✍ filling, dredging, grading, soil manipulation (affecting hydrology)
- ✍ dike or weir
- ✍ ditch, drain, or tile
- ✍ road or railroad track crossing wetland
- ✍ other \_\_\_\_\_

*Rationale for metric consideration:* The hydrology of a wetland site is arguably the single most important factor in its ability to function properly, and to maintain the expected suite of physical

and biological conditions for any particular type (Mitsch and Gosselink 1996, )

## 9.4 Habitat Structure

The hydrology of a site interacts with soil and watershed conditions to produce the natural habitats necessary for a wetland to develop. In this section, the Rater is asked to evaluate the natural community structure from a holistic perspective, considering the habitat requirements of and disturbance effects on wildlife and other aquatic organisms that make up a particular ecosystem. More detailed questions on the plant community will be asked in the section on vegetation community structure, and the extent to which habitat has been disturbed will be evaluated in the following section. Submetrics under consideration are:

### 9.4.1 Habitat development

This evaluation will be fairly subjective, based on the Raters understanding and professional judgment of the condition of similar wetlands within the HGM class, and will range according to the following categories:

- ☞ Excellent. Wetland is a superb example of its class.
- ☞ Very good. Wetland is similar to “excellent” but is lacking in one or more characteristic when compared to the very best examples of its type.
- ☞ Good. Wetland is a relatively capable of providing important ecosystem functions, but is impaired in some way apparent to the Rater due to readily observable past or present disturbances.
- ☞ Moderate. Wetland has some notable support functions (physical or biological); however, several expected functions are not apparent or the site is fairly modified or disturbed in such a manner that these functions are not expected to be present now or in the near future
- ☞ Fair. Wetland exhibits a few support functions, but is a marginal example of its class and is primarily in existence due to physical characteristics.
- ☞ Poor. Wetland is not a good example of its class and is severely impaired due to significant physical, chemical, or biological (highly invaded by exotic plants) stressors.

### 9.4.2 Structural and spatial diversity

Does this wetland exhibit heterogeneity in its structural diversity and landscape position? The attributes under consideration include the following:

- ☞ This wetland is part of a wetland complex of more than one HGM class.
- ☞ There are multiple habitat types supported in and adjacent to this wetland
- ☞ The wetland is mostly homogeneous with little to no structural diversity.
- ☞ The impervious cover in this watershed is greater than XX%

### 9.4.3 Floodplain (riparian systems) or watershed integrity.

The attributes under consideration include the following:

- ☒ The impervious cover in this watershed less than XX%.
- ☒ This wetland is connected to its floodplain, inundates regularly, and is capable of flood storage, exporting detritus and other matter, and other functions related to floodplain connectivity.
- ☒ The wetland is marginally or not readily connected to the floodplain or is in some apparent way disconnected from the natural areas in the watershed.
- ☒ The impervious cover in this watershed is greater than XX%

**9.4.4** Linear contiguity of habitat (riparian systems) or Connectivity with adjacent uplands/ecotones. The attributes under consideration include the following:

- ☒ Wetland is part of an intact riparian system (where applicable) or is connected to the adjacent buffer areas (and the wetland forms an ecotone with the surrounding land in a manner that readily supports wildlife functions, including providing cover, corridors, breeding and feeding areas).
- ☒ Wetland is NOT part of a linear riparian system or is NOT connected to the adjacent buffer areas in a manner that forms ecotones and associated habitat functions.

*Rationale for metric consideration:* Wetlands perform valued ecosystem functions, including water quality improvements, groundwater recharge, surface water storage, wildlife habitat for feeding and breeding, waterfowl and shorebird feeding and breeding, fish production, and more. In this section, we attempt to evaluate the extent any particular wetland is providing those functions expected for its hydro-geomorphic class based on structural integrity, watershed condition and the location of the wetland in that watershed, and connectivity of habitats.

## 9.5 Habitat Alteration

Human-induced stressors are capable of modifying a wetland from a pristine or nearly pristine condition through the entire disturbance gradient to a point where a site is so modified it is no longer exhibiting the defining characteristics of a wetland. For this metric, the Rater is asked to use the following list of human disturbances, past and present, to rank and score the wetland as to its degree of impairment:

Check all that apply:

- ☒ mowing
- ☒ grazing
- ☒ clear-cutting
- ☒ selective cutting
- ☒ woody debris removal

- ☞ toxic pollutants
- ☞ herbaceous or shrub vegetation removal
- ☞ sedimentation
- ☞ dredging or filling
- ☞ farming
- ☞ draining
- ☞ mining
- ☞ impoundment of water

Rank according to degree of impairment from disturbances:

- ☞ None or not apparent. Wetland is pristine or best in its class.
- ☞ Some apparent disturbances, but functions still largely intact.
- ☞ Several modifications apparent that have negative effects on wetland function
- ☞ Sever or recent alterations have occurred or will affect wetland for a long period of time

*Rationale for metric consideration:* Human disturbance is the primary factor for degradation of wetland habitat and ecosystem support functions. While there are regional differences in the key disturbances, we attempt to compile a list of the most common stressors or human activities that can be readily and accurately identified as having negative impacts on wetland condition.

## 9.6 Vegetation Community Structure

Wetland plant communities are a readily identifiable component of a wetland ecosystem, providing important physical, chemical, and biological functions. When the vegetation community structure is in good condition, many of the other expected ecosystem services are provided (from detritus production, to macroinvertebrate diversity, to wildlife support). In addition to serving as habitat for animals, vegetation can affect both the quantity and quality of water and sediment inputs to a wetland.

### 9.6.1 Wetland plant communities

In this submetric, the Rater is asked to rank all that apply from the following list of wetland vegetation community types that cover at least 0.1 hectare (or 0.25 acres) using the cover classes shown below the list of plant communities:

- ☞ Aquatic bed
- ☞ Emergent
- ☞ Submergent
- ☞ Shrub
- ☞ Forest

- ☞ Attached algae
- ☞ Open water
- ☞ Other \_\_\_\_\_

class 1: absent.

class 2: present but in low abundance or of moderate quality, or is in high abundance but poor quality.

class 3: present and significant part of plant community in moderate condition, or of high quality and making up small portion of the total vegetation.

class 4: present and of high quality and quantity.

### 9.6.2 Plan-form or horizontal interspersion

Rater is expected to rank a wetland according to a gradient of horizontal plant community interspersion from an aerial perspective. Refer to the drawing for a hypothetical ranking of wetland interspersion.

- ☞ High
- ☞ Moderately high
- ☞ Moderate
- ☞ Moderately low
- ☞ Low
- ☞ None

### 9.6.3 Invasive plant coverage

Rater will rank the degree to which the wetland is invaded by invasive exotic plant species that pose a serious or potentially serious threat to the structure, functions, and integrity of the wetland. Refer to the current CALEPPC list of Exotic Pest Plants of Greatest Ecological Concern in California.

- ☞ High. Wetland is invaded to a significant degree of areal coverage or with species that are affecting or will in the future highly modify the site by loss of important ecosystem functions. List key invasive species on CALEPPC "A List"
- 

- ☞ Moderate. Wetland is only moderately invaded or is occupied by species that are naturalized and known to have minor impacts on important ecosystem functions. List key invasive species on CALEPPC "A List"
- 

- ☞ Low to None. Wetland has only one or two invasive species which, to the present state of knowledge of the degree of invasiveness and impacts, present no particular concern. There must be no species on the CALEPPC "A List". List all others
-

☒ None

#### 9.6.4 Microtopography

This question asks the Rater to evaluate the wetland for contributions to microtopographic relief due to vegetation and physical characteristics according to the cover scale below. The attributes to be evaluated are:

- ☒ Vegetated hummocks or tussocks
- ☒ Coarse woody debris
- ☒ Standing dead trees
- ☒ Amphibian breeding pools
- ☒ “Mima” mounds
- ☒ Tidal or seasonal pannes

cover scale:

- 0 feature absent or functionally absent
- 1 feature is present in small amounts or of low quality
- 2 feature is present in moderate amounts, not of highest quality, or in small amounts of high quality habitat
- 3 present in moderate or greater amounts and is of highest quality

*Rationale for metric consideration:* The microtopography of a wetland can be integrally linked to its ability to provide certain wildlife functions in particular. From bird roosting and nesting, to nearby uplands for solitary bee nests, these microtopographic features are an important indicator of a wetland’s “intactness.”

### 9.7 Living Resources Support

Wetlands provide valuable habitat and food resources for many organisms that depend on wetlands for some part of their life cycle. The Rater is asked to evaluate the wetland for valued ecosystem functions in three categories of wildlife.

**9.7.1** Threatened and endangered species.

**9.7.2** Significant migratory songbird, waterfowl, or shorebird breeding, feeding, or roosting area.

**9.7.3** Amphibian or reptile breeding or feeding area.

*Rationale for metric consideration:* The rapid assessment approach focuses on wetland condition in part to draw inferences about wetland support for plants and other wildlife. However, there may be direct evidence of such support based on the site visits and background information searches. This metric provides a way to incorporate such direct evidence into the CRAM.

**9.8 Special Wetland**

This metric assigns or deducts up to XX points for special wetland types or for wetland characteristics that are addressed in the narrative questions. These might include:

- 9.8.1** Vernal pool
- 9.8.2** Wet meadow
- 9.8.3** Tidal marsh
- 9.8.4** Seeps and Springs (slope wetlands)
- 9.8.5** Meromictic lagoons
- 9.8.5** Regional scarcity (points may be given for other wetlands know to be regionally scarce)

**Appendices**

- 10.1 Quality Assurance Project Plan

**Table 1:** Members of the Core and Regional CRAM Teams

<b>Core Team</b>	<b>S. Cal Regional Tech Team</b>	<b>N. Cal Regional Tech Team</b>
Eric Stein (SCCWRP)	Dave Lawhead (CDFG)	Josh Collins (SFEI)
Josh Collins (SFEI)	Ken Schwarz (PWA)	Cristina Grosso (SFEI)_
Martha Sutula (SCCWRP)	Dave Z./Jesse (USFWS)	Paul Jones (USEPA)
Paul Jones (USEPA)	Mike McCann (Region 9)/Stacey B.	Don Stevens (OS) - advisory
Rich Ambrose (UCLA)	Wanda/Kelly Schmoker (Region 8)	Karl Malamud-Roam (CCMAD)
John Calloway (SFSU)	Shirley Berosik (Region 4)	John Callaway (USF)
Carl Wilcox (CDFG)	Julie Evans/alt rec (CNPS)	Carl Wilcox (CDFG)
Aaron Allen (ACOE)	Dick Zembal (OCWD)	Molly Martindale (ACOE)
Andree Breaux (RWQCB-Reg. 2)	Ruben Ramirez (Cadre)	Andree Breaux (SFBRWQCB)
Ruben Guieb (SWRCB)	Trish Chapman (CCC)	Mike Vasey (SFSU)
Ross Clark (CCC)	Spencer MacNeil (Aspen)	Janet Hansen (SFBBO)
Mary Kentula (USEPA) - advisory	SAP members (invited)	Nils Warnock, Gary Page, Nadav Nur (PRBO)

**Table 2: Draft CRAM Development Timeline**

	<b>Task</b>	<b>Who</b>	<b>Due Date</b>
1	Form CRAM Core Team and Regional Teams	Eric, Paul, Josh	Early Dec., 02
2	Compare RAMs from other states and develop conceptual CRAM model	Mary and Eric	Jan., 03
3	Survey existing studies for information relating physical or biological structure to faunal utilization	Eric and Josh	Jan., 03
4	Compile existing information on rapid methods into draft CRAM with preliminary metrics and attributes	Paul, Josh, Eric	Jan., 03
5	Hold First Core Team Workshop - review basic assumptions, models, and organization - assemble key habitat metrics and attributes	Core Team	Jan., 03
6	Develop single QAPP for EPA	Paul	Jan., 03
7	Create 1 <sup>st</sup> draft CRAM for regional reviews	Core Team	Jan., 03
8	Hold First Regional Team Workshops - S. Cal Education and outreach w/EPA - Regional team review and revise 1 <sup>st</sup> draft CRAM (Regional modification of metrics)	Regional Teams	Late Jan., to Early Feb., 03
9	Hold Second Core Team Workshop - review key metrics and attributes - discuss statistical design and level 3 issues - develop draft scoring regimes	Core Team	Mid Feb., 03
10	Create and field test 2 <sup>nd</sup> draft CRAM - Field calibration - Coordinate with CMCMP	Core Team + Regional Teams	Mar. – Apr., 03
11	Hold Second Regional Team Workshops - Finalize “home file” data types - Finalize habitat typology - Finalize key metrics and attributes - Review and revise scoring regimes	Regional Teams	April., 03
12	Create and field test 3 <sup>rd</sup> draft CRAM	Core Team	May – June, 03
13	Hold Third Regional Team workshop - review test results - recommend CRAM revisions	Regional Teams	July, 03
14	Hold Fourth Core Team Workshop - Revise CRAM for regional conditions - Modify based on field validation	Core Team	Aug., 03
15	Create 4 <sup>th</sup> draft CRAM - Develop initial CRAM documentation/users’ manual - Outside peer review.	Core Team	Sept., 03