Carr Lake Restoration Site: Pre-Implementation Condition Assessment

Final Summary Report

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

The Central Coast Wetlands Group conducted assessments of the condition of the Carr Lake restoration site in July, 2019. The California Rapid Assessment Method for Wetlands (CRAM) was used to conduct the assessments of existing vegetation and habitat at four sites on the three drainages entering the site: Hospital Ditch, Gabilan Creek and Natividad Creek.

CRAM Index scores ranged from 32 to 35, with the slightly higher score on Hospital Ditch. The "pre-implementation" average score for the restoration site is 33. This puts the condition of the riverine wetlands on the site in the lower quartile of all streams in the state. Restored streams and wetlands in close proximity to the planned restoration efforts have CRAM Index scores ranging from 56 to 73, providing context to the existing score and informing managers of what potential future condition scores are possible.

Many stressors were identified on the site during the assessments. While not factored into the CRAM scores, stressors can provide more detailed insight about what may be adversely affecting the ecological condition of the river, stream or creek. Stressors that were consistently observed on the site include:

- Non-point source discharge from agricultural areas
- Dredged channel/agricultural ditches
- Grading/Compaction and Plowing/Discing of lands adjacent to the streams.
- Vegetation management (herbicide use along waterways)
- Nutrient and pesticide impairments

Photos of the Carr Lake Restoration site assessment areas:

Hospital Ditch	
	

Gabilan Creek (upper)	
	
Gabilan Creek (central)	
	
Natividad Creek	
	

1.0 INTRODUCTION

The Big Sur Land Trust is initiating a large-scale restoration project in Carr Lake. The site includes three streams which drain different portions of the surrounding watersheds (Hospital Ditch, Gabilan Creek and Natividad Creek). The restoration project will completely redesign the portions of the streams on site, enhancing stream, wetland and upland habitat. This report can serve as baseline information on the condition of the aquatic resources associated with the restoration site.

2.0 ASSESSMENT METHOD

The California Rapid Assessment Method (CRAM) is a tool for assessing the condition of wetlands and streams at scales ranging from individual projects to watersheds, regions, and statewide. CRAM, alone or with other assessment methods, can be used to assess current conditions, understand potential factors impacting wetland/stream condition, evaluate alternative project sites and designs, and assess project performance. CRAM is based on the concept that the structure and complexity of a wetland is indicative of its capacity to provide a range of functions and services. CRAM should be regarded as an integral component of a suite of monitoring methods. CRAM, by itself, is rarely adequate to assess all the aspects of condition for any wetland or stream and cannot be used as the sole method to evaluate restoration design. CRAM is most useful when applied as part of an integrated wetland or stream assessment program that includes both rapid and detailed assessment methods. CRAM requires a team of 2-3 trained practitioners less than 3 hours to assess a representative wetland area.

CRAM is composed of four main attributes of condition:

1. **Buffer and Landscape Context** - measured by assessing the quantity and condition of adjacent aquatic areas as well as extent and quality of the buffering environment adjacent to the Assessment Area.
2. **Hydrology** - assesses the sources of water, the hydroperiod of the estuary from evidence of alterations to the mouth of the lagoon, and the hydrologic connectivity of rising flood waters in the estuary
3. **Physical Structure** - measured by counting the number of patch types[1] found within the AA and the topographic complexity of the marsh plain.
4. **Biotic Structure** - measures the site on several factors including the number of plant vertical layers[2], the number of different species that are commonly found in the marsh, the percent of the common species that are invasive, and the horizontal and vertical heterogeneity of the plant communities.

These four attributes are consistent for all wetland modules of CRAM. Each of the four attribute categories is comprised of a number of metrics and submetrics that are evaluated in the field and scored on a scale of (A)12 to (D)3. The metrics that are measured may vary between wetland types. Each of the four attribute categories are then converted to a scale of

[1] A patch is a spatially distinct structural element of a wetland system large enough to serve as a habitat for wildlife, or to serve as an indicator of spatial variations in hydrological or edaphic (soil) conditions within a wetland.
[2] Plant layer type definitions include: floating (growing on water surface); short (<0.3 m); medium (0.3 – 1.0 m); tall (1.0 – 3.0 m); and very tall (>3.0 m).

25 through 100, and the average of these four scores is the final CRAM index score, also ranging on a scale from 25 (lowest possible) to a maximum of 100.

The scale of condition categories presented in Table 1 is appropriate for the purposes of evenly distributing CRAM results into quartiles.

Table 1. CRAM condition categories and associated index scoring ranges.

Condition Category	Total CRAM Index Score Range
Excellent	82-100
Good	63-81
Fair	44-62
Poor	25-43

CCWG conducted four CRAM assessments in October 2012 and June 2015 (Figure 1).

Figure 1. CRAM Assessment Area locations (red) completed in July, 2019 within the project area (green/grey).

3.0 ASSESSMENT RESULTS

The riverine CRAM assessment of the Carr Lake restoration site showed an average condition score of 34.5 (Figure 2, Table 2). The Index Scores ranged from 34 to 35, with the range of scores all within the margin of error of the methodology.

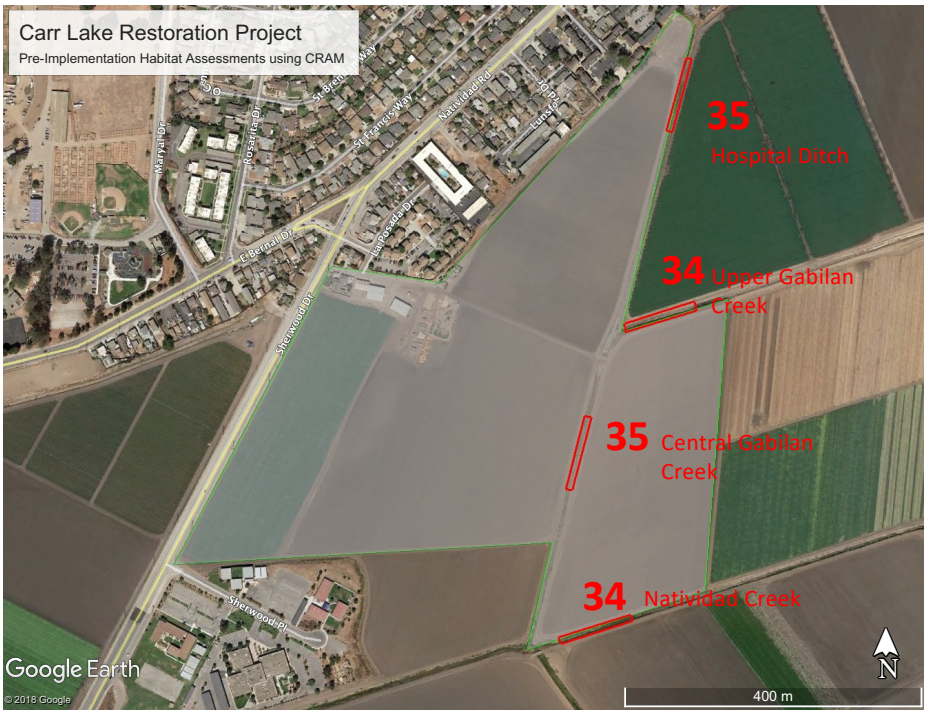

Figure 2. CRAM Index scores for each Assessment Area in the Carr Lake restoration project area. All sites scored in the "poor" category.

Table 2. CRAM Metric, Attribute and Index Scores for each Assessment Area. For metric scoring, A=12, B=9, C=6 and D=3.

	Project Name	Carr Lake	Carr Lake	Carr Lake	Carr Lake	Average Score
	Site Name	Hospital Ditch	Upper Gabilan	Central Gabilan	Natividad	
	Date of Assessment	7/29/19	7/29/19	7/29/19	7/29/19	
	Assessors	CClark, KOConnor	CClark, KOConnor	CClark, KOConnor	CClark, KOConnor	
	Wetland Class	Riverine	Riverine	Riverine	Riverine	
	Wetland Subclass (conf/nonconf)	confined	confined	confined	confined	
	CRAM Raw Attribute and Metric Scores					
Attribute	**Buffer and Landscape Connectivity**	**25**	**25**	**25**	**25**	**25**
Metric	Stream Corridor Continuity	3	3	3	3	
Metric	**Buffer Metrics**	3	3	3	3	
Metric	% of AA with Buffer	3	3	3	3	
Metric	Average Buffer Width	3	3	3	3	
Metric	Buffer Condition	3	3	3	3	
Attribute	**Hydrology**	**58**	**50**	**50**	**50**	**52**
Metric	Water Source	6	6	6	6	
Metric	Channel Stability	6	6	6	6	
Metric	Hydrologic Connectivity	9	6	6	6	
Attribute	**Physical Structure**	**25**	**25**	**25**	**25**	**25**
Metric	Structural Patch Richnes	3	3	3	3	
Metric	Topographic Complexity	3	3	3	3	
Attribute	**Biotic Structure**	**31**	**36**	**39**	**36**	**35**
Metric	PC: No. of plant layers	6	6	6	6	
Metric	PC: No. of codominants	6	6	6	6	
Metric	PC: Percent Invasion	3	9	12	9	
Metric	**Plant Community Metrics**	5	7	8	7	
Metric	Interspersion	3	3	3	3	
Metric	Vertical Biotic Structure	3	3	3	3	
Index	**Overall AA Score**	**35**	**34**	**35**	**34**	**34**

The average Buffer and Landscape Context Attribute score showed an poor condition score of 25, with all sites reporting the same score (Figure 3). This was due to the streams being located in an active agricultural setting, preventing the assessment areas from having wide buffers of wetland and upland habitat surrounding them. In addition, there is poor stream corridor continuity upstream and downstream of the assessment areas due to the lack of a riparian corridor.

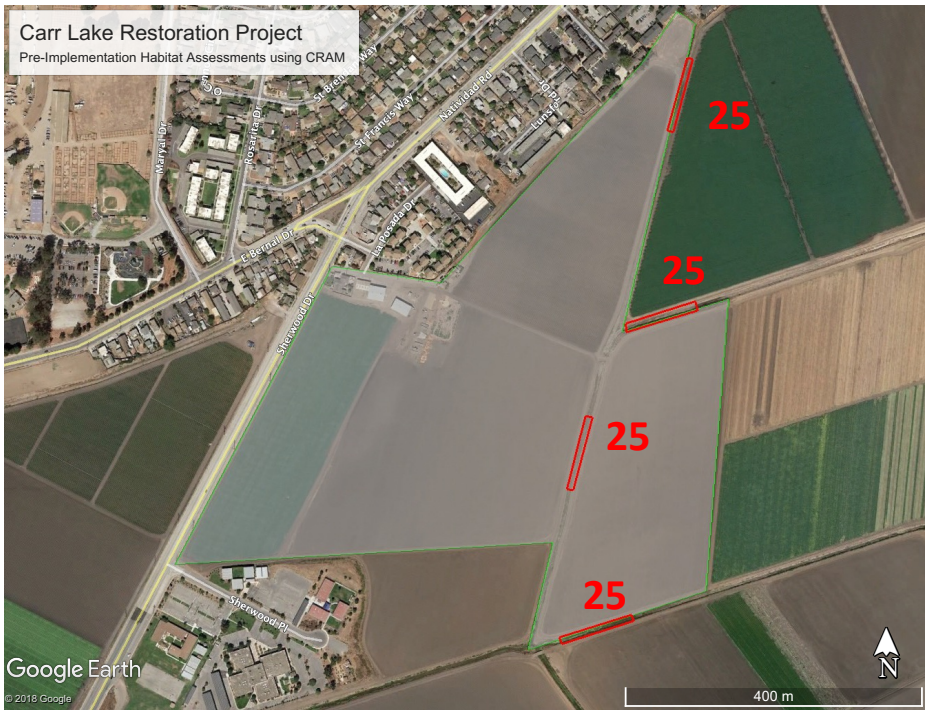

Figure 3. Buffer and Landscape Attribute scores for each Assessment Area.

All four of the assessment areas received a fair condition score of 50 or 58 for the Hydrology Attribute (Figure 4). The assessment areas scored low for the water source metric due to the high amount of agricultural land use in the immediate watershed. The Channel Stability metric, which looks at the amount of aggradation or degradation within the Assessment Area, received a low score as well. The Hydrologic Connectivity metric, which compares the bankfull with of the stream to the flood prone with of the stream, ranged from a score of C to a score of B.

Figure 4. Hydrology Attribute scores for each Assessment Area for the Salinas River lagoon.

The Physical Structure Attribute received an average score of 25, with all four sites having the same score. The sites received a score in the "poor" condition category due to due to a low number of physical patch types observed in the assessment areas and a lack of topographic complexity in the stream channels.

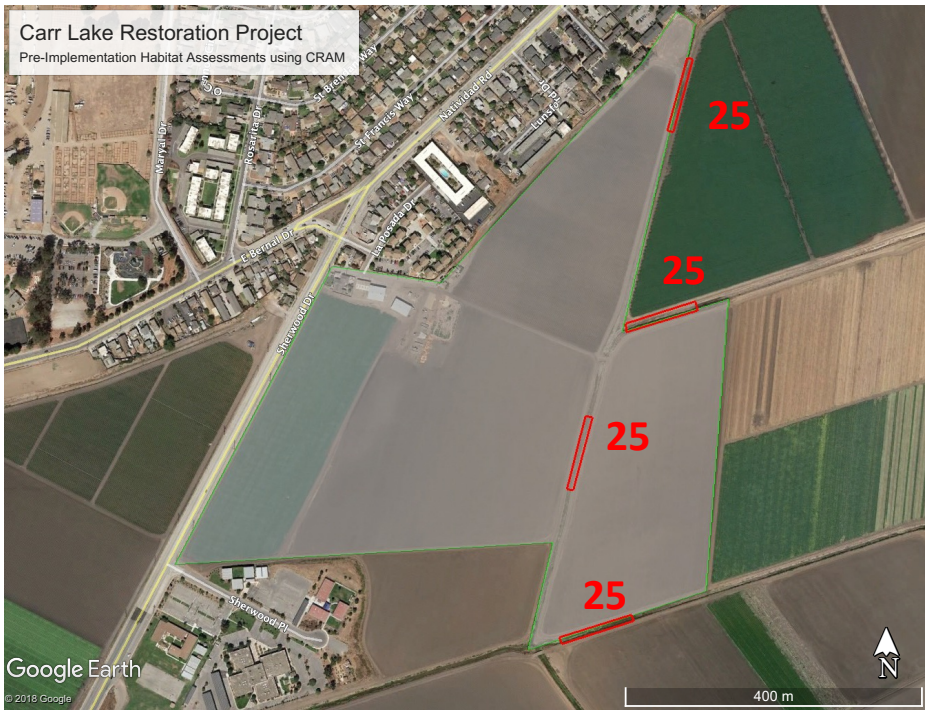

Figure 5. Physical Structure Attribute scores for each Assessment Area.

The Biotic Structure Attribute received an average condition score of 35, ranging from 31-39, and falling in the “poor” category. Three out of the four sites received the high score for lack of invasive plant species, however, all sites lacked high numbers of plant species, plant layers, interspersion of plant zones and vertical structure in the plant community. This led to overall low scores for this attribute.

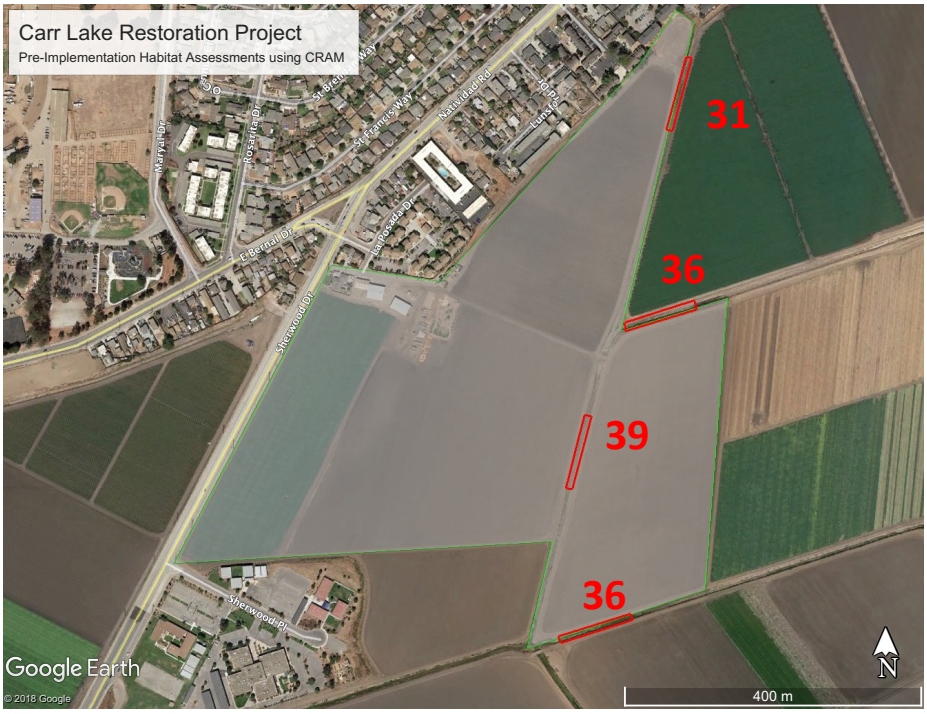

Figure 6. Biotic Structure Attribute scores for each Assessment Area.

4.0 INTERPRETATION AND REGIONAL CONTEXT

One of the main benefits of using CRAM is that it enables users to objectively compare projects to each other, to ambient conditions, and over time, based on standardized assessments of condition. CRAM can therefore be used to assess the contributions of projects to ambient conditions, evaluate different project designs and management practices, assess changes in baseline and reference conditions, compare different wetland/stream types to each other, and evaluate the efficacy of wetland and stream protection policies and programs.

The internal reference standard of CRAM enables users to compare wetlands and streams of the same or different types to each other and over time. For example, an AA having an Index Score of 50 can be interpreted as having lower functional capacity relative to another AA (of the same or different wetland type) having an Index Score of 80. A similar interpretation can be made for Attribute Scores.

The internal reference standard of CRAM also accounts for its general usefulness. Each CRAM Metric Score for each CRAM module represents a condition relative to the best condition observed statewide for that Metric. For certain applications, such as a restoration project, it may be beneficial to develop/determine regional standards, which represent the best

condition expected/observed for a specific wetland/stream type in a specific geographic region (CWMW, 2019).

For any AA, an Index Score of 100 means that the condition of the AA equals the best observed condition for every Metric of all four Attributes. As expected, perfect Index Scores are extremely rare. They have not been observed for some types of wetlands and stream, and as such, a perfect score of 100 is not necessarily the appropriate reference (or best score achievable) for specific wetland/stream types in specific geographic regions. Wetlands and streams that have the worst observed conditions have an Index Score of 25. Such very low scores are also rare. A score of 0 is not possible because all wetlands and streams have some functional capacity.

In general, the Carr Lake restoration site falls in the lower end of what is considered a “poor” condition stream in California according to CRAM. Figure 7 provides context of how the aquatic resource condition on the site (described above) currently compares to restored areas in the immediate vicinity, including stream sites along the Gabilan and Natividad Creeks as well as a pond site just upstream of the proposed restoration project. Due to the landscape setting of the site in the center of an urban area with row crop agriculture, one cannot expect an “excellent” condition stream or pond upon completion of the restoration actions, but a significant amount of functional lift can still occur.

Figure 7. Range of CRAM Index Scores at restoration sites (blue) in the immediate vicinity of the proposed restoration project (green).

5.0 REFERENCES

California Wetlands Monitoring Workgroup (CWMW). 2019. Using the California Rapid Assessment Method (CRAM) for Project Assessment as an Element of Regulatory, Grant, and other Management Programs. Technical Bulletin – Version 2.0, 85 pp

6.0 APPENDIX

1. Hospital Ditch CRAM Report
2. Gabilan Creek (Upper) CRAM Report
3. Gabilan Creek (Central) CRAM Report
4. Natividad Creek CRAM Report