

# REEF CHECK CALIFORNIA QA/QC PROCEDURES

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This document summarizes the Quality Assurance/Quality Control procedures implemented by the Reef Check California Program (RCCA). These procedures were put in place to help ensure the quality of data collected by standardizing the training, data collection and data entry processes.

## Training

All participants are required to successfully complete the RCCA Training course under the direct supervision of a certified RCCA instructor to be eligible to submit data to the RCCA Database. Participants with extensive prior scientific diving experience can opt out of the training course but must demonstrate proficiency in all components of the RCCA protocol including successfully passing both the written and field testing components under the supervision of a certified RCCA instructor before they can submit data to the RCCA database.

Requisite components of the RCCA training course are:

1. Completed reading of the Reef Check California Training Manual
2. Attendance and participation at all classroom sessions (10 hours)
3. Attendance and participation at the pool session (3 hours)
4. Attendance and participation at all field sessions (6 dives)
5. Successfully pass the written multiple choice test (85% passing score)
6. Successfully pass the species identification test (85% passing score)
7. Successfully complete the methods and species identification field practical exercises

## Data Collection

RCCA data collection methods have been designed to ensure the safety of the surveyor as the primary goal followed by the accuracy and precision of all data collected. All surveyors must follow the methods outlined in the Reef Check California Training Manual. The following items have been included in the survey protocol to increase the precision of all surveys by reducing sampler error and bias:

1. Standardized site selection and transect deployment procedures
2. Standardized time requirements, search image and flashlights use procedures for all transects and fish surveys
3. Minimum size requirements for all invertebrate and algal species to focus

- on emergent animals only
4. Grouping of species with similar morphological traits (e.g. canary and vermilion rockfishes) to reduce the likelihood of misidentification
  5. Use of size categories (i.e. bins) for fish surveys
  6. Use of two divers during fish surveys to complete redundant counts
  7. Use of standardized data notation procedures on the underwater data sheets
  8. High level of replication within a site

## Field Data Verification

Immediately following each dive, each team member must review their data sheet for completeness and legibility. The Data Captain verifies this prior to collection of each sheet and discusses any potential outliers with the team member. If a consensus on any datasheet cannot be reached, that survey will be rejected and the survey will need to be redone.

## Data Entry

The text below is provided as a guide to direct the entry of all data.

### **Materials Needed**

- Washed and dried datasheets
- Red pencil or pen
- Print out of QA/QC procedures
- Electronic copy of data entry forms called  
*DataEntryRCCA\_CenCA.xls* or  
*DataEntryRCCA\_SoCA.xls*

### **Prior to Data Entry**

- 1) Confirm all datasheets are present and accounted for. The total number of sheets will vary but you will need to make sure you can find a site descriptions sheet, fish transects 1-18, invertebrate transects 1-6, seaweed transects 1-6, and UPC transects 1-6. You also may have urchin datasheets but not always.
- 2) Review the header information of each datasheet for completeness. There may be fields which were intentionally left blank. **IF ANY FIELDS ARE BLANK, BE ABSOLUTELY SURE A CHANGE IS APPROPRIATE. VERIFY WITH THE DIVER THE CORRECT INFORMATION BEFORE YOU MAKE ANY CHANGES.** The most common omission is start and end time. If those are left blank there is no way to get that information so it will have to be left blank in the database. This is also true for start and end depth. **DO NOT MAKE UP THESE NUMBERS JUST LEAVE THEM BLANK IF THEY WERE TO BEGIN WITH.**

- 3) ALL EDITS ARE TO BE MADE IN RED PENCIL OR RED SHARPIE ON ORIGINAL DATASHEETS. The most common questions arise from not being able to determine the total counts for a species, either due to illegible writing or unfamiliar non-standardized notation (see Data sheet notation.doc). Before you change anything on the datasheet, it may be necessary to fax or scan a copy of the datasheet in question and send it to the diver to verify the edit in question. You may also call the diver but often it requires the diver to see the original before they can interpret the correct count. If you cannot figure out what to do with an entry leave it blank and flag questionable records on the datasheet with a Post-It and circle it in red on the datasheet. Be sure to include site name, date, transect type and number on Post-it.

### ***Entering Data via Excel Data Forms***

- 1) Open up the correct standardized Excel data entry form either *DataEntryRCCA\_CenCA.xls* or *DataEntryRCCA\_SoCA.xls*.
- 2) Before you begin entering the data go to “File” and on the drop down and choose “Save as.” Save the data entry sheets as *sitename\_endsurveydate(mm-dd-yy).xls* (*PtLucas\_11-11-06.xls*)
- 3) Select the “Site Description Report” tab and fill out the datasheet. Be sure to include as much information as you can in the “Comments” section describing the site both from the surface and describing the habitat below. Be sure to follow the directions outlined in the Reef Check California Training Manual and use the converter in the upper right of the sheet to convert the temperatures, distances, and depths into Celsius and meters.
- 4) Next select the “Fish\_Core” tab. Begin by entering the header information. If there are blanks in the header, leave them that way. Observer name should be entered first initial, period space and last name (e.g. J. Diver). IT IS IMPORTANT TO ENTER OBSERVER NAME EXACTLY AS DESCRIBED ABOVE TO AVOID ERRORS IN THE DATABASE! Also please be consistent with first name usage (e.g. use full legal name, no nicknames Bill Golden should be William Golden = W. Golden).
- 5) Carefully enter the observation in the Excel spreadsheets being sure to fill all fields with zeros where no species are seen. A blank in the Excel data entry form represents missing data which are **very different** from a zero. After each datasheet is entered successfully put your initials and the date in the upper right hand of the datasheet

in red.

- 6) After you finish continue by selecting “Fish\_Only” and entering the data continue in any order on to “Invert\_Core”, “Seaweed\_Core”, “UPC\_Core”, and “Urchin\_Size” if applicable repeating steps 4 and 5.

### ***Data Verification***

- 1) At this stage please do a cursory check of the data that you entered. One way to accomplish this is to randomly select a couple of datasheets and go back and make sure data entered by you matches up. Also scroll through all the tabs to make sure all the data are entered and there are no duplications especially in the header information on the “Fish\_Core” transects. Having another person look over the entries to independently verify the data entry is highly recommended.
- 2) Make sure all datasheets are accounted for and all Post-its/data flags are readable. Paperclip or staple all the datasheets together.

### ***Data Submission***

Package up the datasheets and send them to the Database Manager:

William T. Golden  
University of California Santa Barbara  
1234 Cheadle Hall  
Santa Barbara, CA 93106-2016

### ***Database Import***

Upon receipt of the original data sheets, the Data Manager will perform random spot checks of the data. The spot check procedures include:

1. Check the entire Site Info. Datasheet to ensure the data are entered correctly. If it is a site that has already been surveyed confirm the proper site name and coordinates match the report from the database.
2. Go through all original datasheets and look for post-its that need to be cleared up. Before proceeding “clear the tags” which most often is accomplished by scanning the datasheet in question sending it to the diver and communicating by email or phone with that diver to make a decision on the data in question. All changes should be made in red on the original datasheet than entered into the data entry form.
3. Spot checks should be conducted on each tab in the worksheet (Fish\_Core, Invert\_Core, etc.). On average you should be checking 10 - 20% of the dataentry cells haphazardly from each transect.

After the above spot check procedures are completed data files should be renamed with the following naming convention:

sitename\_enddateofsurvey\_dateoffinalchecksintialsofchecker.xls  
(e.g. Ft.Ross\_8.14.07\_11.27.07wtg.xls)

Prior to import, database manager will confirm all header information and rename the file (e.g. surveystartdate\_sitename = 20070812\_Ft\_Ross.xls)

This file is now ready for entry into the electronic database.

After the data are vetted, the Data Manager will perform import. The data import procedure will perform field verifications to highlight missing data and outliers. The Data Manager will archive and review the data summary report. All fields flagged by the automated validation process will be reviewed. If review of the original data sheet does not resolve the problem, the Data Manager will contact the Data Captain and surveyor to attempt to resolve the issue. All summary reports will be archived in digital and hard copy formats. Corrections are to be made in the database and notations are to be made on the original datasheet in red describing the change made. An error table will also be maintained describing any all errors fixed by the database manager and the steps taken to resolve them.