IV. Quality Assurance/Quality Control

A. Introduction

Quality assurance and control is an important part of this regional stream condition inventory. High quality data is essential for initial inventories and comparisons of the condition of a stream over time and between streams.

The goal of this Plan is to insure that high quality data are collected and recorded so that a valid inventory is achieved.

This QA/QC Plan consists of the following elements:

- Training (SCI procedures, field test)
- Pre-Survey Preparation (equipment, data forms, field gear, etc.)
- Field Oversight (crew evaluations during field season)
- Post-Survey Evaluation (review data, maps, photos, etc.)
- Data Entry (field data review, training, oversight, data entry check)
- Documentation of QA/QC

B. Training

QA/QC Form 1 – Training Documentation

Training of crews is the most important part of this plan. If crews are well trained, there is a high likelihood of successful data collection.

Training consists of both introductory and refresher sessions. Introductory sessions, for employees new to SCI work, consist of a combination of classroom discussion and field practice, often over a 3-day period. Refresher sessions are for personnel who have done SCI but who have not measured a reach in at least two years. Refresher sessions are usually one day in the field at an established SCI reach.

Introductory training includes office and fieldwork in SCI attribute measurement, sampling strategy (reaches, passes, and systematic and random selections), and data form management. Refresher training includes fieldwork only.

Training can be conducted on each forest or at locations where employees from several forests travel to a training site. Trainers usually consist of biologists and hydrologists well experienced in SCI measurements.

During or following training, a field test is conducted for introductory training. It is held at an established SCI reach, where new surveyors conduct SCI on part of the reach. All SCI attributes are measured on this test reach and compared with data for the reach that has been collected by experienced surveyors. New surveyors are evaluated on their performance so that any corrections can be made before conducting actual surveys.

C. Pre-Survey Preparation and Post-Survey Evaluation

QA/QC Form 2 – Survey Check List

This is a simple but necessary step to assure that fieldwork will begin and progress successfully. It consists of acquiring, organizing and checking serviceability of field equipment and data forms before starting fieldwork.

This step includes reviewing data sheets, maps, photos, etc. The Crew Leader should review all material at the completion of each reach so that data are accurate before starting a new reach.

D. Field Oversight

QA/QC Form 3 – Field Oversight

This is an essential phase of the QA/QC Plan because it tests if crews are conducting SCI properly. There are two periods of the field season that oversight should be conducted: during the first SCI reach and mid-season. Oversight by experienced surveyors during the first reach is important because field variables and questions may arise that were not discussed in training. It is best to address those issues as soon as possible. The mid-season oversight check is to assure the crew is successfully following procedures.

E. Data Entry

QA/QC Form 4 – Data Entry Check List

Data entry consists of training in the applicable database(s), oversight during data entry, and a spot check following completion of data entry. The spot check should be done as soon as possible when all or most of the data have been entered.

F. Documentation of QA/QC

QA/QC documentation forms are used to track QA/QC actions. This creates a record to help insure the goal of the QA/QC Plan has been accomplished. Forms are completed annually and stored on the Forest with SCI data.

G. Quality Assurance & Quality Control (QA/QC) Form Instructions and Sample Forms

QA/QC Form 1 – Training Documentation

Responsibility: SCI Field Trainer/Forest SCI Coordinator

This form provides documentation of formal crew training. Documentation of training is very important and serves as a record to show consistency of data collection.

Each participant in the training should enter their information on the form. In the Personnel Information block participants print their first and last name and forest name (3 letter abbreviation), and check the box for either trainee or trainer. In the Training Information block enter forest name, stream name where training occurred, and legal description. Also check either the Introductory (Intro) or Refresher (Refresh) training type.

QA/QC Form 2 – Survey Checklist

Responsibility: Crew Leader

This form documents field and field related activities for each crew, and is to be turned into the Forest SCI Coordinator at the end of the field season with all completed forms from each reach.

To complete the header block, print each crew member's first initial and last name and the forest they are conducting the survey on.

The Pre-survey Preparation block is a check list to be completed by the crew members involved in preparing the equipment and supplies needed for the survey. Print names and dates of preparation, and initial the field equipment and forms box for each activity accomplished. Add comments as necessary.

In the Post-survey Evaluation block the crew leader is to review all data sheets, maps, photos, etc. and document the review by initialing each section. Include the reach number, stream name, and date the review was completed. This form can be used for up to five reaches.

QA/QC Form 3 – Field Oversight

Responsibility: SCI Field Trainer/Forest SCI Coordinator

This form is essential for documentation of crew performance. The reviewer is to complete one form per crew for both the First Reach and the Mid-season Reach.

To complete the header block, print each crew leader/members and reviewers first initial and last name and the forest they are conducting the survey on.

The SCI Attributes and Protocol block is listed by form number. Review each form and check for accuracy. Indicate if the form was satisfactorily completed or not. If not, document the discrepancy and corrective measures in the Needs Improvement column (comments may be added for satisfactory work also). Include reach ID number, stream name and the date the review was completed.

The Field Procedures block is to be completed the same as above.

QA/QC Form 4 – Data Entry Checklist

Responsibility: Data Entry Person and Data Entry Trainer/Forest SCI Coordinator

The Data Entry Check List is to document SCI data entered into the NRIS database and the review of the data entered.

The Data Entry block is to be completed by the person entering the data. Print first initial and last name, stream name and reach ID number. Enter the form numbers and date completed (you can list more than one form number if they are completed on the same day).

Training Documentation

Personnel Information				Training Information			
Print Name	Forest	Trainee	Trainer	Date(s)	Location (forest/stream/legal)	Training Type	
						Intro	Refresh
A. DUMOS	STF	X		June 22, 04	STF/Clark Fork/ T6N, R20E, SEC 5		X
A. ANDAZOLA	STF	X		June 21-22, 04	STF/Clark Fork/ T6N, R20E, SEC 5	X	
A. BURNS	STF	X		June 21-22, 04	STF/Clark Fork/ T6N, R20E, SEC 5	X	
J. Frazier	STF		X	June 21-22, 04	STF/Clark Fork/ T6N, R20E, SEC 5	—	—

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USDA Forest Service Pacific Southwest Region **QA/QC Form #2**
Stream Condition Inventory (SCI)

Survey Checklist

Crew Leader:	A.DUMOS
Crew Member(s):	A. ANDAZOLA, A. BURNS
Forest:	TAHOE N. F.

Pre-Survey Preparation (Crew/Crew Leader)			
Name(s): A. ANDAZOLA, A. BURNS			Date(s): 7/6/04
Activity	Field Equipment	Forms	Comments
Acquire:	X	X	
Organize:	X	X	
Check Serviceability:	X		

Post-Survey Evaluation (Crew Leader)			
Reach ID Number: 17025			Date: 7/9/04
Stream Name: PACIFIC CREEK			
X	Data Sheets	X	Photos
X	Maps		Other:
Comments:			
Reach ID Number:			Date:
Stream Name:			
	Data Sheets		Photos
	Maps		Other:
Comments:			
Reach ID Number:			Date:
Stream Name:			
	Data Sheets		Photos
	Maps		Other:
Comments:			
Reach ID Number:			Date:
Stream Name:			
	Data Sheets		Photos
	Maps		Other:
Comments:			
Reach ID Number:			Date:
Stream Name:			
	Data Sheets		Photos
	Maps		Other:
Comments:			

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Field Oversight

Crew Leader:	A.DUMOS
Crew Member(s):	A. ANDAZOLA, A. BURNS
Reviewer(s):	J. FRAZIER
Forest:	TAHOE N. F.

SCI Attributes & Protocols

Forms	First Reach		Mid-season Reach	
	Reach ID Number: 17025		Reach ID Number: 17027	
	Stream Name: PACIFIC CREEK		Stream Name: Mill Creek	
	Date: 7/9/04		Date: 8/5/04	
	Satisfactory Yes/No	**Needs Improvement (comment required)**	**Satisfactory Yes/No**	**Needs Improvement (comment required)**
Form 1: Sensitive Reach Layout	yes		yes	
Form 2: Macroinvertebrates Data/Sketches	yes		yes	
Form 3: Particle Count	no	remember to sum the data in each row	yes	
Form 4: Cross-section & Width-to-Depth Candidate Sites & LWD	yes		yes	
Form 5: Cross-section Data & Water Surface Gradient	no	re-check banfull locations. X-section areas inconsistent in reach	yes	very good, consistant x-section data
Form 6: Cross-section Diagram & Location Sketch	yes		yes	
Form 7: Width-to-Depth/Entrenchment Ratios	yes		yes	
Form 8: Pools/Pool Tail Fine Sediment	no	review pool definition criteria	yes	pool identification very good
Form 9: Streambank Attributes & Aquatic Fauna	yes	very good	yes	
Form 10: Photo Log & Comments	yes		yes	

Field Procedures

Step	First Reach		Mid-season Reach	
	Satisfactory Yes/No	**Needs Improvement (comment required)**	**Satisfactory Yes/No**	**Needs Improvement (comment required)**
Conduct Reach Reconnaissance	yes		yes	
Document start of the Sensitive Reach	yes	very good	yes	
Monumenting Cross-sections	yes		yes	

USDA Forest Service Pacific Southwest Region **QA/QC Form #4**
Stream Condition Inventory (SCI)

Data Entry Checklist

Data Entry				Data Review	
Data Entered By	Stream Name & Reach ID #	Form #(s)	Date Completed	Reviewer Name	Date
A. BURNS	17025	1-3	9/3/04	J. Frazier	9/10/04
A. BURNS	17025	4-8	9/4/04	J. Frazier	9/10/04
A. BURNS	17025	8-10	9/7/04	J. Frazier	9/10/04
A. BURNS	17026	1-4	9/9/04		
A. BURNS	17026	5-10	9/10/04		

QA/QC Form #4 - Version 0.5 - July 2005