

ECOLOGICAL ASSESSMENT TRAINING

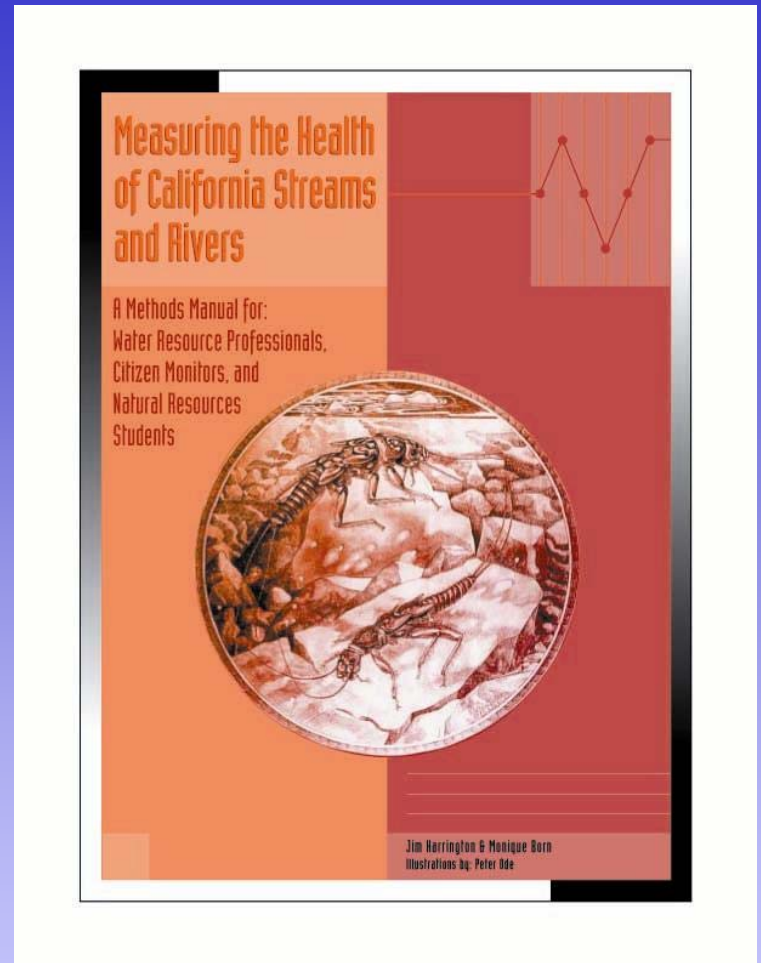


sustainable land stewardship institute
www.slsii.org

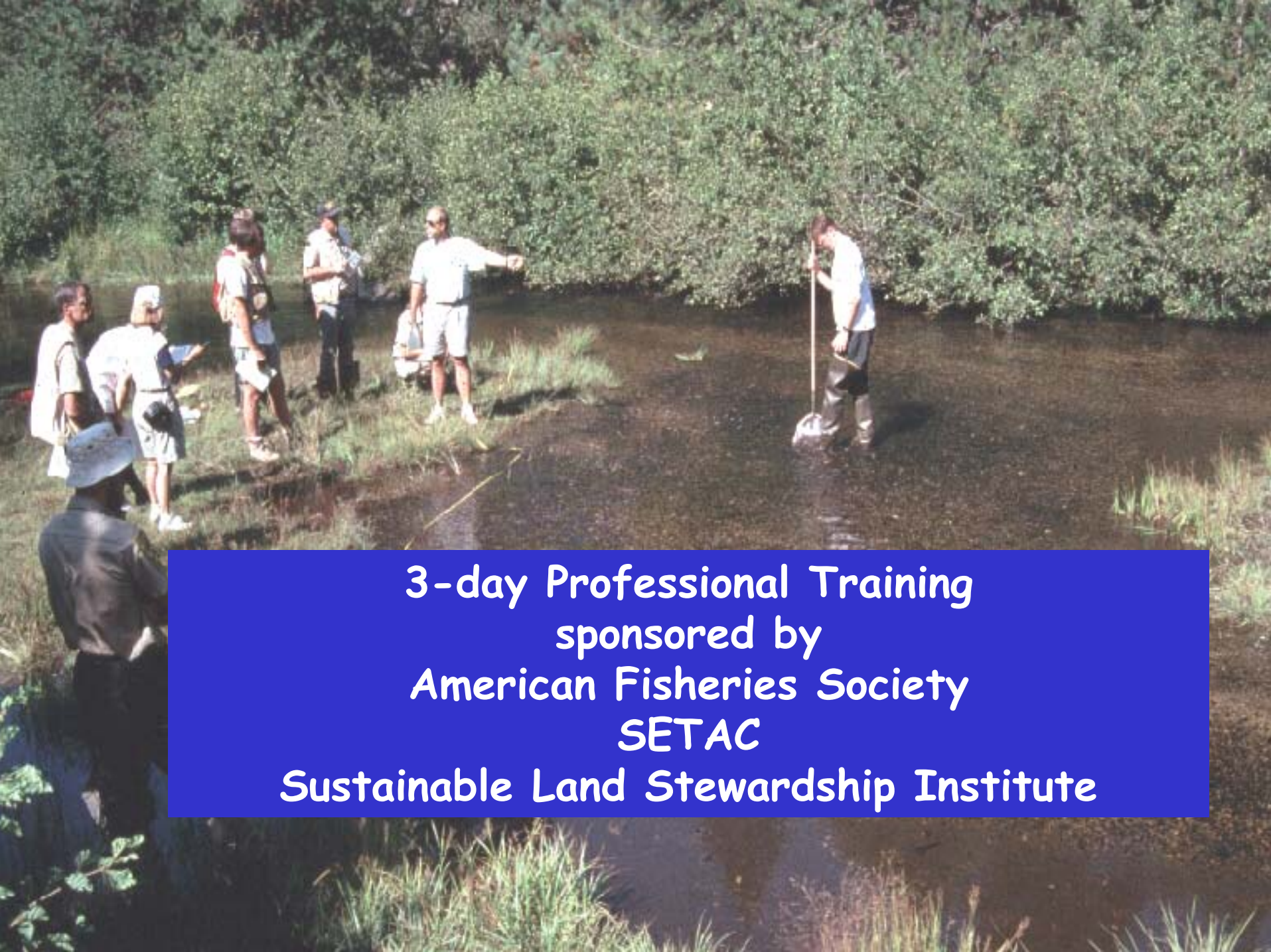
Measuring the Health of California Streams and Rivers

A Methods Manual for:
Water Resource Professionals,
Citizen Monitors, and
Natural Resources Students

www.slsii.org



Jim Harrington & Monique Born
Illustrations by Peter Ode



**3-day Professional Training
sponsored by
American Fisheries Society
SETAC
Sustainable Land Stewardship Institute**

Professional 3-day Workshops

CalNeva American Fisheries Society 12

Humboldt Chapter AFS 2

Society of Environmental Restoration 2

NorCal SETAC 6 **Part 2 UCD Dec 19-21**

SocCal SETAC 2

Professional 3-day Workshops

EPA Sponsored Tribal Training 3

State of Nevada 3

Custom Bioassessment Professional Training and Audits

Marin County Stormwater

Ventura County Stormwater

LA Sanitation District

Santa Clara Water District

Use of Citizens Monitors in Watershed Assessment and Monitoring



SLSI Training

*BMI Sampling

*Family Level
Taxonomy

*SOP QAPP

*How to Work
with Government

*Scientifically
Sound
Environmental
Activism

Citizen Monitors 3-day Workshops

Friends of

Grant Mandated Projects

319h Grant Funded Program (Placer RCD)

Resource Conservation Districts

High School

Total of 47 since 1996

AQUATIC ECOLOGICAL ASSESSMENT WORKSHOPS

PART 1 AGENDA

- Day 1 - Designing Freshwater Ecological Assessments
- Rapid and Fully Integrated Approach**
- Day 2 - Physical/Habitat Assessments for
Water Quality Projects**
- Day 3 - Sampling Biotic Communities in California
Rivers and Streams**

Rapid Biological Assessment

California Stream Bioassessment Procedure



**Benthic
Macroinvertebraes**



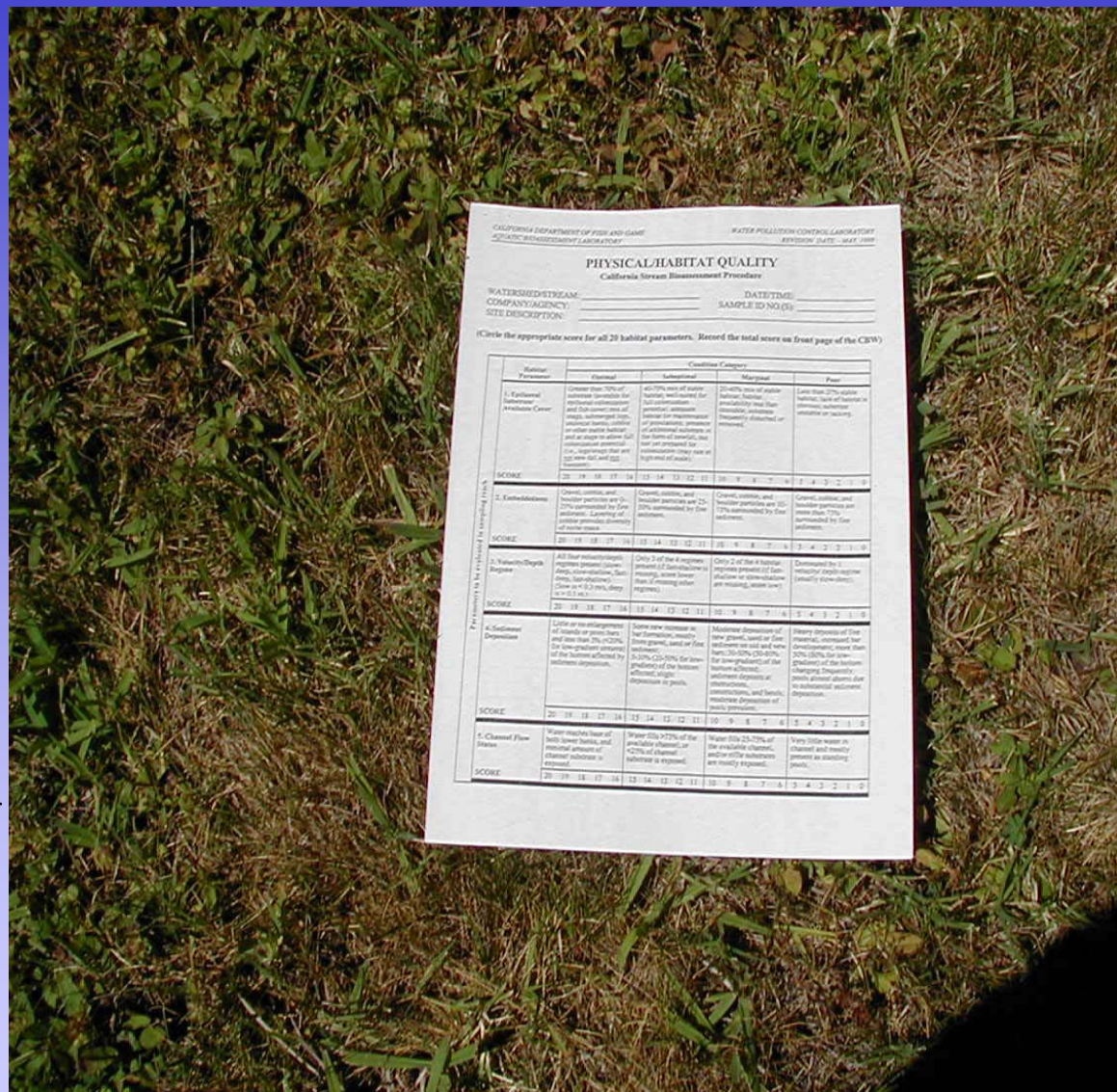






EPA RBP P/hab Quality (Barbour et al. 1999):

- 1 Epifaunal Substrate
- 2 Embeddedness
- 3 Velocity/Depth
- 4 Sediment Deposition
- 5 Channel Flow Status
- 6 Channel Alteration
- 7 Frequency of Riffles
- 8 Bank Stability
- 9 Vegetative Protection
- 10 Riparian Vegetation Zone Width



A group of five people are standing on a dirt path in a forest. They are dressed in outdoor gear, including jackets and hats. Some are holding papers or notebooks, and one person in the foreground is looking at a clipboard. The background is filled with tall, thin trees, creating a dense forest environment.

**Measuring
Physical/Habitat
Condition**

Fall 2004 Started
Teaching New P/Hab
Protocols



Professional Level
LASAN, Low Gradient

Citizen Monitor Level
SYRCL, FODC, others

AQUATIC ECOLOGICAL ASSESSMENT WORKSHOPS

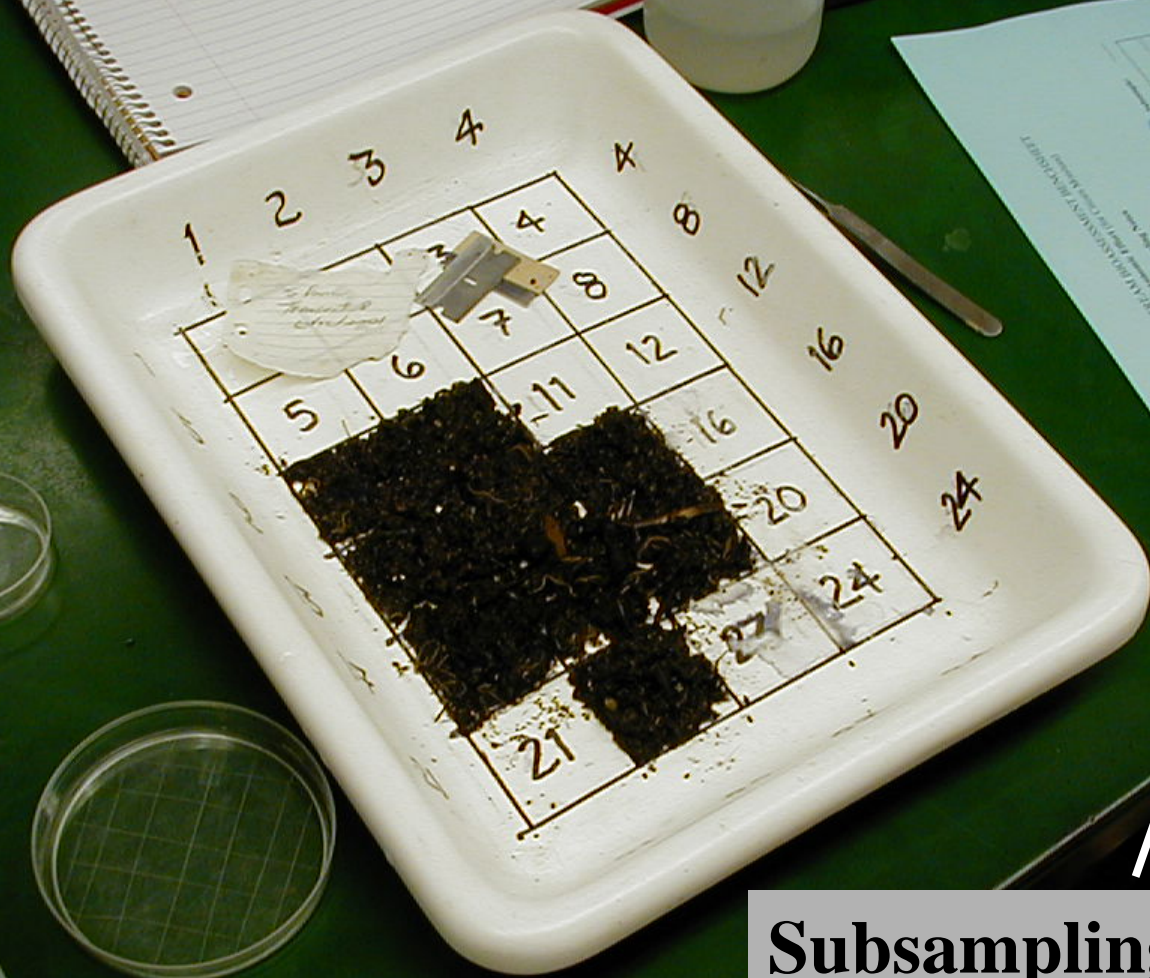
PART 2 AGENDA

- Day 1 - Family-Level Taxonomic Identification of Freshwater Invertebrates
- Day 2 - Continuation of Invertebrate Taxonomy, Insuring Quality Data and Calculating Biological Metrics
- Day 3 - Interpreting Biological Metrics and Current Topics on the Use of Freshwater Ecological Assessments in Water Quality Regulation

6 Teams for the 6 Samples

Step 1 – Subsampling and Sorting





CLIPPER'S SPECIAL INVESTIGATION AND ANALYSIS REPORT

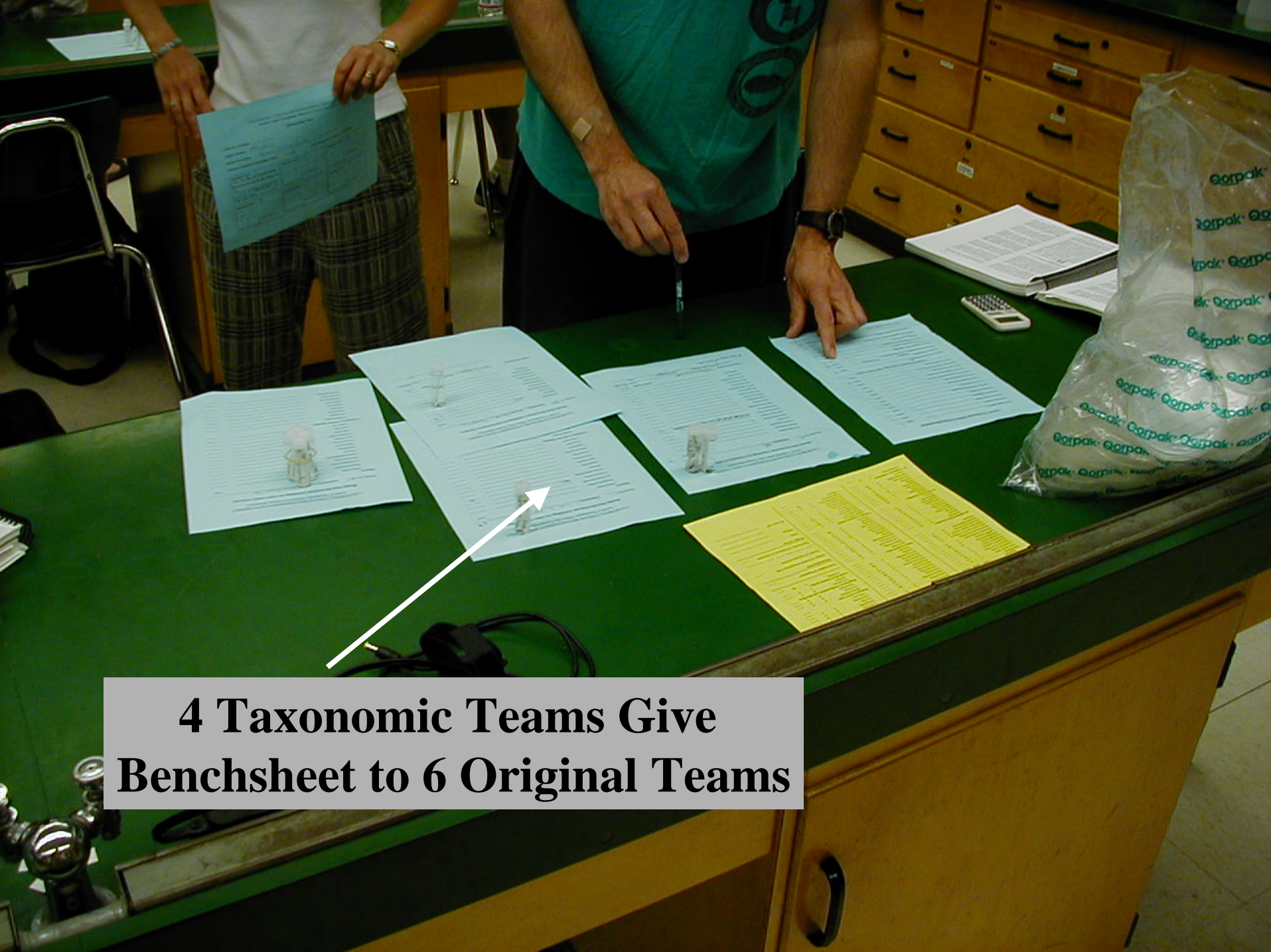
Case No.	Date	Time	Location	Officer
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

**Subsampling and
Sorting Benchsheet**



**4 Teams for Major
Taxonomic Groups**

**Final Taxonomic ID
To Family Level**



**4 Taxonomic Teams Give
Benchsheet to 6 Original Teams**

6 Original Teams Calculate Biological Metrics



MONITORING DATA SHEET - LEVEL 2 TAXONOMIC EFFORT

WATERSHED/STREAM:

 Oregon
 More enrichment
 in this creek

DATE/TIME:

 More sediment
 in this creek

MONITORING GROUP:

Biological Metrics	UPPER RIFLE / CONTROL			LOWER RIFLE		
	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 1	SAMPLE 2	SAMPLE 3
Richness Measures	SR1	SR2	SR3	MR1	MR2	MR3
Taxa Richness	1	8	9	12	9	13
Ephemeroptera Taxa	1	1	1	1	1	1
Plecoptera Taxa	0	0	0	0	0	0
Trichoptera Taxa	1	2	1	2	2	2
EPT Taxa	2	3	2	3	3	3
Composition Measures						
EPT Index	51	84	78	65	88	62
Sensitive EPT Index	0	1	0	0	11	8
Percent Hydropsychidae	0	78	22	27	51	26
Percent Baetidae	0	6	28	36	21	28
Tolerance/Intolerance Measures						
Tolerance Value	5.2	4.4	4.8	4.7	4.0	4.7
Percent Intolerant Organisms	0	1	0	0	0	0
Percent Tolerant Organisms	10	7	17	2	58	6
Percent Dominant Taxa	47	78	52	36	51	28
Functional Feeding Groups						
Percent Collectors (CG)	39	16	28	63	32	50
Percent Filterers (FC)	47	78	55	21	63	40
Percent Scrapers (SC)	6	2	2	2	0	3
Percent Predators (P)	9	4	5	2	5	7
Percent Shredders (SD)	0	0	0	0	0	0
Final Count	105	90	98	85	75	96
Abundance	420	1296	463	1968	1064	1150

 Biological and Habitat Assessment Training for Citizen Monitors
 HARTINGTON AND BURN

- SLR1 -

June, 1999

MONITORING DATA SHEET - LEVEL 2 TAXONOMIC EFFORT

WATERSHED/STREAM:

Dry Creek near Roseville

MONITORING GROUP:

Dry Creek Conservancy

DATE/TIME:

June 17, 2001

Biological Metrics	Secret Ravine			Miners Ravine		
	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 1	SAMPLE 2	SAMPLE 3
Richness Measures						
Taxa Richness	19	8	9 (9)	32	8	13 (13)
Ephemeroptera Taxa	1	1	1 (1)	1	1	1 (1)
Plecoptera Taxa	0	0	0 (0)	0	0	0 (0)
Trichoptera Taxa	1	2	1 (1)	2	2	2 (2)
EPT Taxa	2	3	2 (2)	3	3	3 (3)
Composition Measures						
EPT Index	31	84	78 (71)	65	88	67 (71)
Sensitive EPT Index	0	1	0 (0)	0	11	8 (8)
Percent Hydropsychidae	47	78	52 (59)	27	51	26 (21)
Percent Baetidae	4	6	28 (12)	36	21	28 (28)
Tolerance/Intolerance Measures						
Tolerance Value	5.2	4.4	4.8 (4.8)	4.7	4.0	4.7 (4.7)
Percent Intolerant Organisms	0	1	0 (0)	0	0	0 (0)
Percent Tolerant Organisms	10	7	17 (11)	2	58	6 (6)
Percent Dominant Taxa	47	78	52 (59)	36	51	28 (28)
Functional Feeding Groups						
Percent Collectors (CG)	39	16	38 (31)	63	32	50 (50)
Percent Filterers (FC)	47	78	55 (60)	21	63	40 (40)
Percent Scrapers (SC)	6	2	2 (2)	2	0	3 (3)
Percent Predators (P)	9	4	5 (5)	2	5	7 (7)
Percent Shredders (SD)	0	0	0 (0)	0	0	0 (0)
Final Count	105	90	98	85	75	96
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June, 1999



Chapter 11

Insuring Quality Data

Field and Laboratory SOPs

Quality Assurance Project Plan (QAPP)
EPA 841-B-96-003 for Citizen Monitors

Frequent Certified Training

Annual Field Audits and Laboratory
Validation

The background of the slide is split into two vertical panels. The left panel shows a person in a patterned shirt and dark pants, seen from behind, holding a long-handled net over a rocky stream. The right panel is a close-up, top-down view of a stainless steel water fountain with a single water droplet suspended in mid-air above the spout.

Chapter 9

Citizens BMI Laboratory

5 Steps in Starting a Successful
Citizen Laboratory

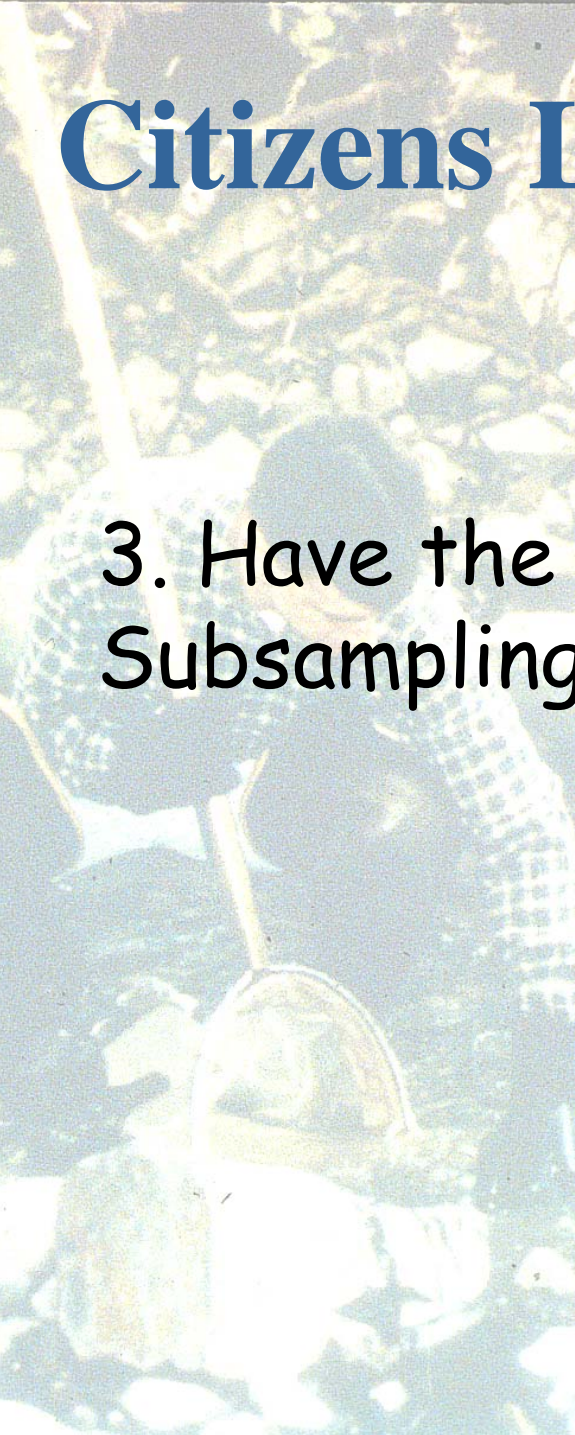
Evolving Citizen Laboratory

Citizens Laboratory Alternatives

1. Emphasize the Sampling and P/Hab Quality Portion of the CSBP and Send BMI Samples to a Professional Laboratory
2. Have Citizens Work on One Set of Duplicate Samples While Another Set From the Same Reach Is Sent to A Professional Laboratory

Citizens Laboratory Alternatives

3. Have the Citizens Perform Only the
Subsampling and/or Sorting Portion



QA/QC Requirements for Bioassessment Contracts

Require Field and Laboratory SOPs

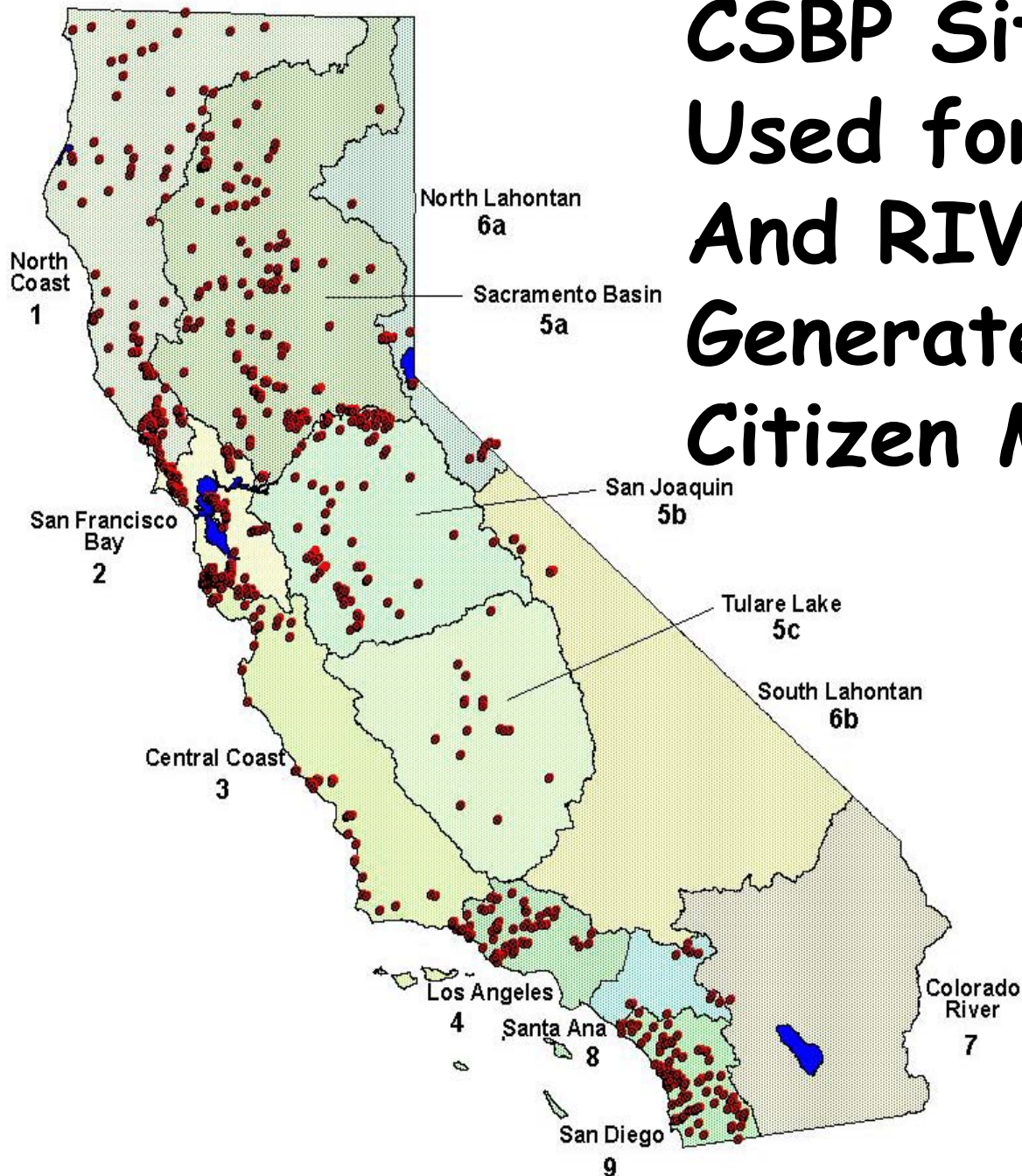
Require Proof of Certified Training

Review Internal Documentation of Field
and Laboratory QA/QC

Require 10 - 20% External QA/QC

CAMLnet Standardized Taxonomy and
Certification

CSBP Sites Used for IBI And RIVPACS Generated by Citizen Monitors





**So, No Worries
About Bioassessment
Conducted by
Volunteers**

**Just Need Funding
For Laboratory
Analysis, Training
And Audits**