Assessing the Effect of Marijuana Activity on the Biotic Integrity of Streams in Northern California

Patricia Bratcher, Harvest Vieria and Jim Harrington
California Depart of Fish and Game

AFRP

U.S. FISH & WILDLIFE SERVICE

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

Is Marijuana Cultivation a Significant Water Quality Problem for Northern California Streams and Rivers

Photos courteousy of Gregory A. Giusti, U.C. ANR Cooperative Extension

Assessing the Effect of Illegal Marijuana Activity on the Biotic Integrity of Streams in Northern California

Step 1: Develop the information and tools needed to define the potential stressors caused by marijuana production using the EPA's Causal Analysis or another comparable procedure to analyze all available data in specific northern California stream systems. Ultimately, the study plan including this non-biased analysis will compare the threats of marijuana cultivation relative to historic and present land-use activities in the watershed.

Fully Funded and Work Already Started

Assessing the Effect of Illegal Marijuana Activity on the Biotic Integrity of Streams in Northern California

Task 1 - assemble a monitoring committee of people interested in the goals of this project and with resources to contribute to its success.

Task 2 – compile all available information on impacts of marijuana cultivation to date and make it easily available to monitoring committee members.

Products: List of committee members, their role; meeting notes Annotated bibliography of information; electronic copies of information and an on-line method to access information.

Let us know if you want to contribute

Assessing the Effect of Illegal Marijuana Activity on the Biotic Integrity of Streams in Northern California

Task 3 – select the watershed(s) that will be used to monitor the effects of marijuana cultivation. With assistance from Law Enforcement and GIS staff, develop map of marijuana cultivation sites and overlay map with resource of interest.

Additional Selection Criteria

Anadromous fish presence

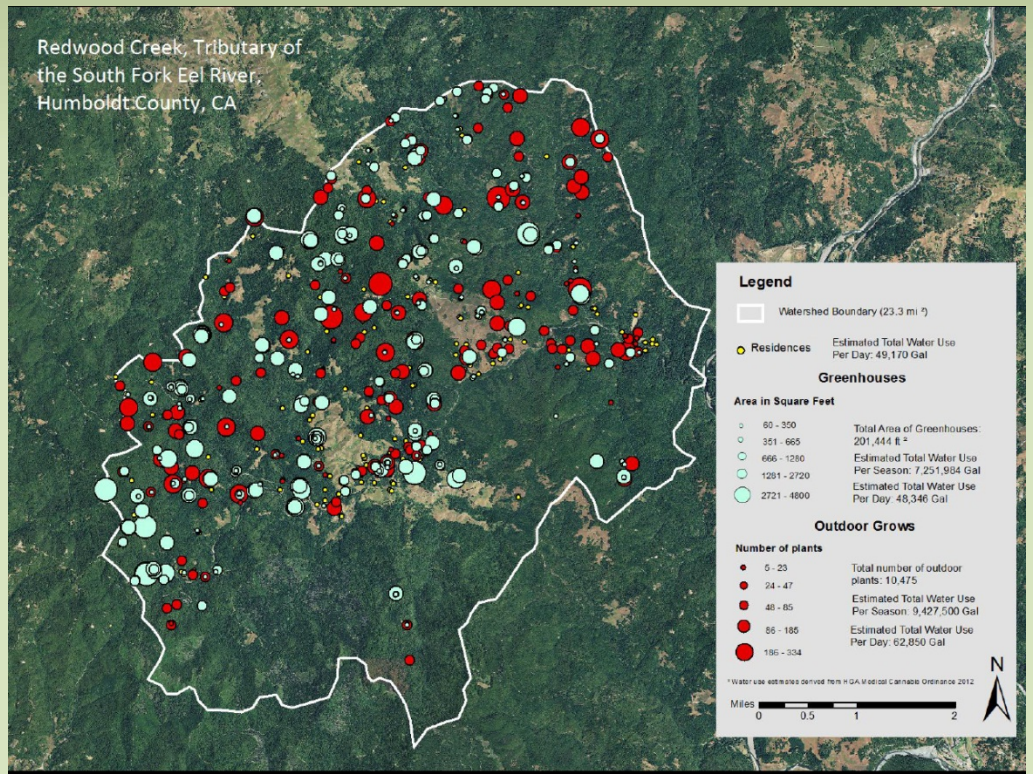
Special status species

Special habitats

Land ownership

Other water quality issues

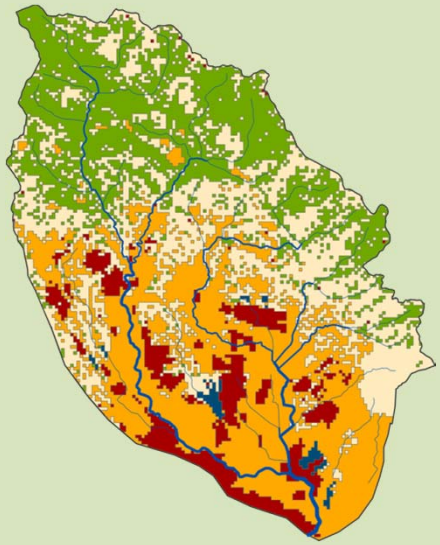
More?

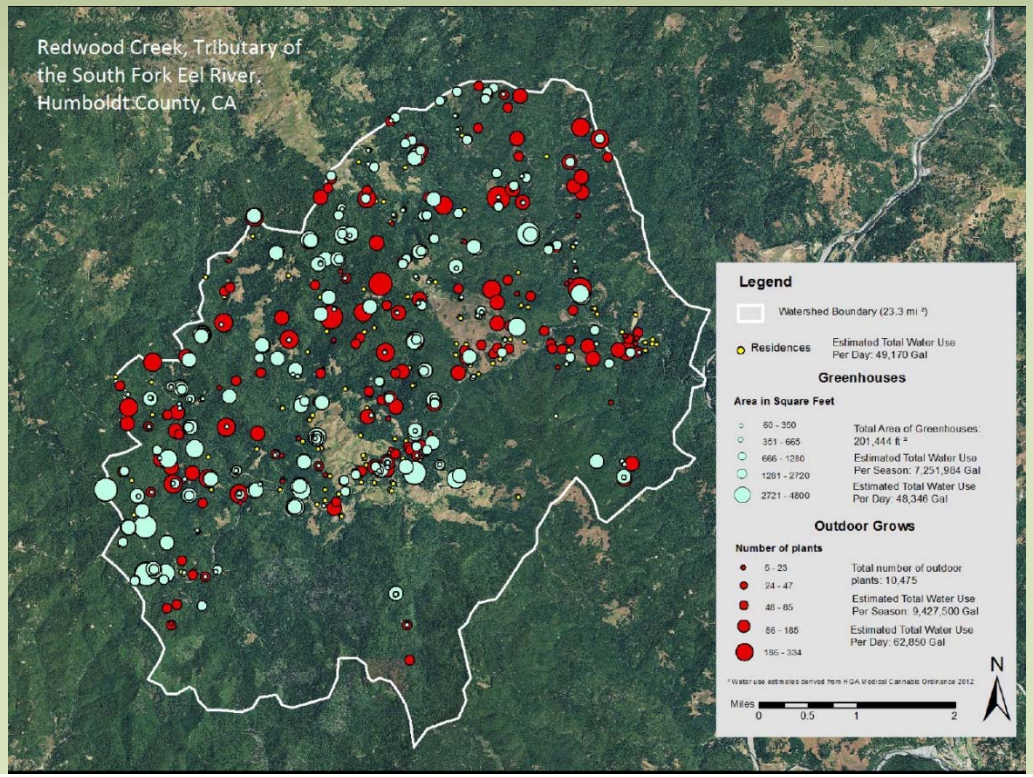


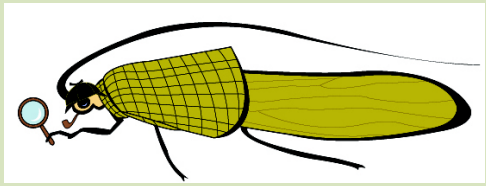
Assessing the Effect of Illegal Marijuana Activity on the Biotic Integrity of Streams in Northern California

Task 4 – construct detailed maps of known and potential marijuana cultivation sites (MCS) for the selected watershed that will be monitored using procedures developed by CDFW Region 1 (Scott, Jenn and Adam).

Task 5 – determine other land-uses in the selected watershed.



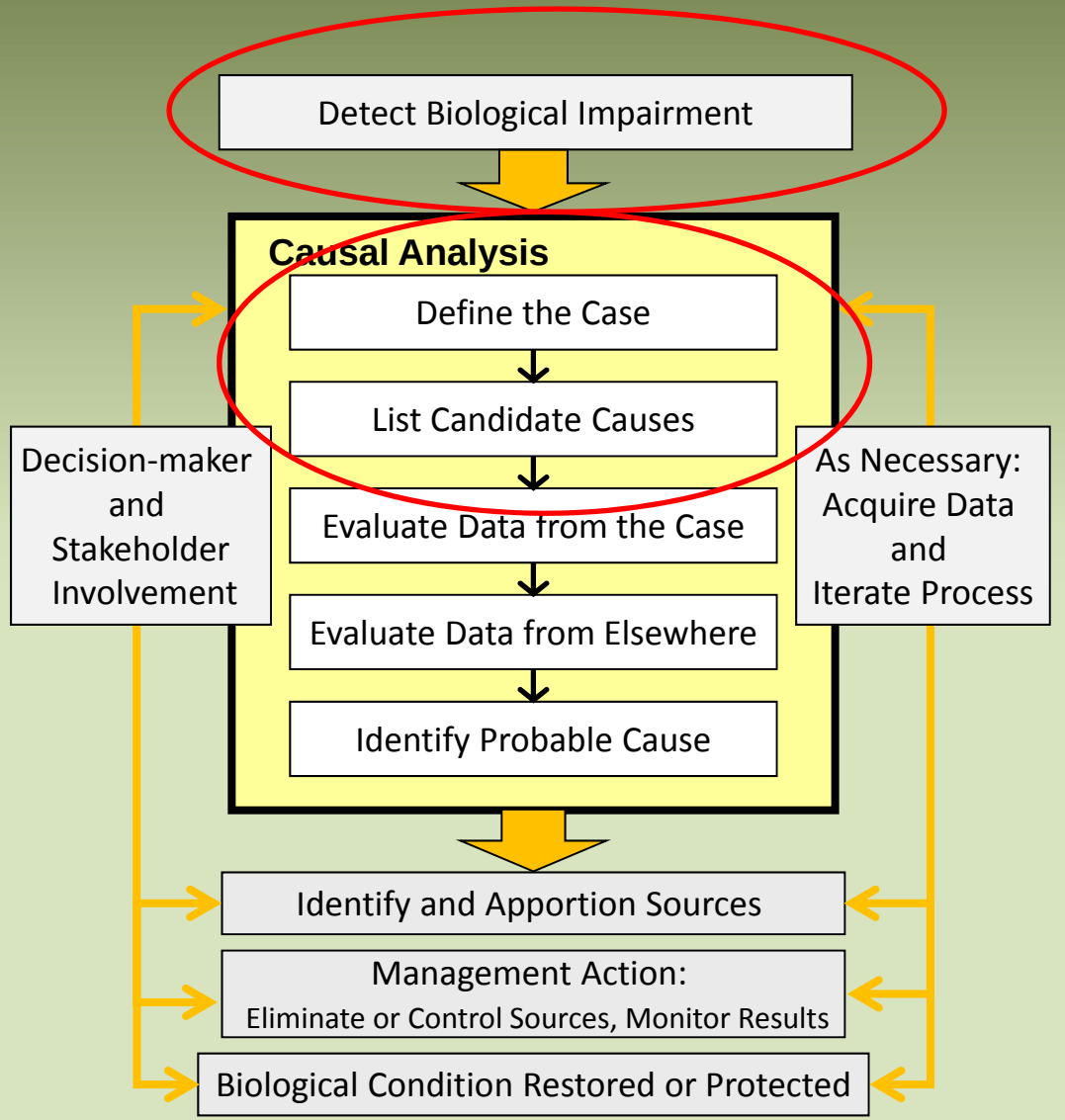




EPA

www.epa.gov/caddis

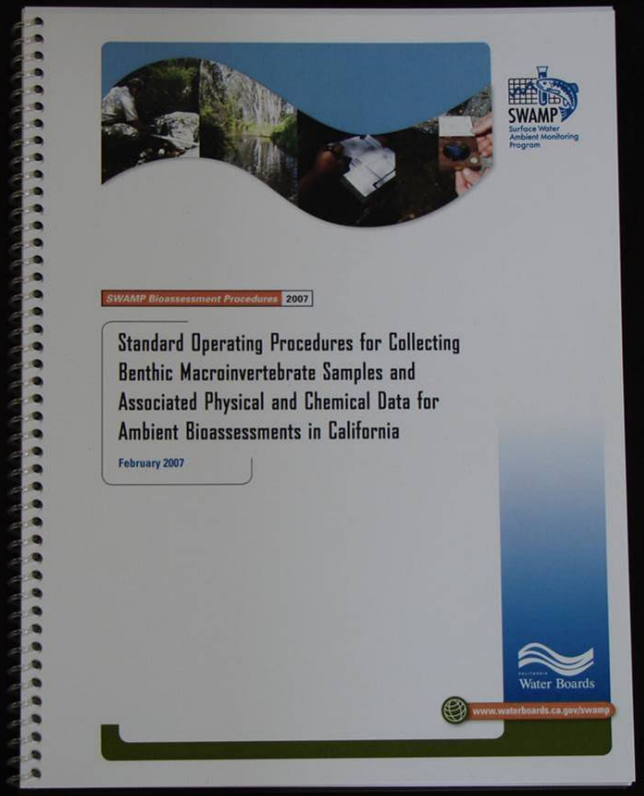
Task 6 – Complete steps one and two of the Causal Analysis or comparable analysis technique



Assessing the Effect of Illegal Marijuana Activity on the Biotic Integrity of Streams in Northern California

Task 7 – describe sampling procedures for assessing the biotic condition of wadeable stream reaches above and below MCS and targeted reaches throughout the watershed. The procedures will be largely based on standard bioassessment procedures developed by CDFW for the State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP).

SWAMP Biossessment Procedures



Collect BMIs

Measure Phab

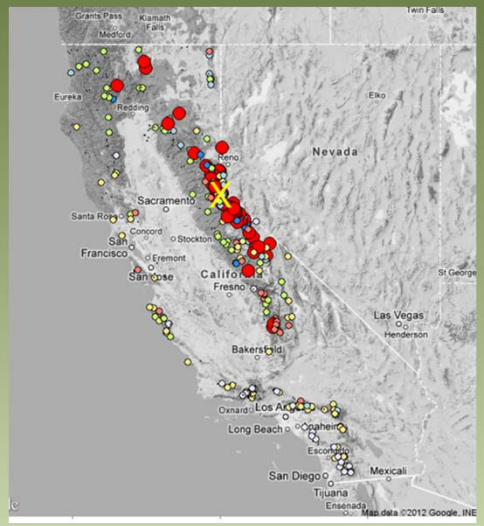
Measure Basic Chemistry

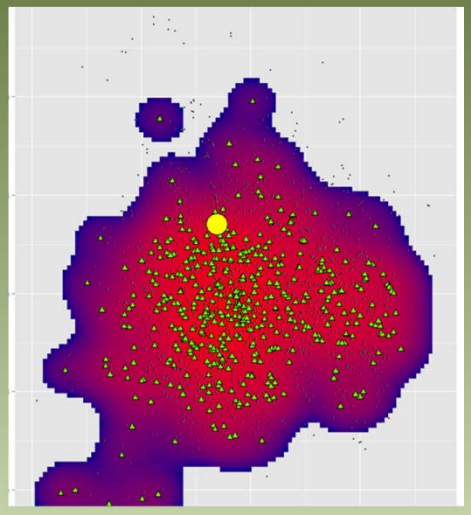
California Stream Condition Index (CSCI)

SWAMP Technical Infrastructure

Quality Assurance Infrastructure

- **Indicators**
  - BMIs
  - Algae
  - Habitat
- **Reference Condition Management Program**
- **Data Management Tools**
- **Methods (field/lab)**





Component	Obs	Expect
CSCI	0.65	1
O/E	0.49	1
O	7	14.1
MMI	0.81	1

Metric	Obs	Expect
% Coleoptera taxa	3	4
Diptera taxa	5	5.3
% EPT taxa	24	63
% Intolerant	5	36
% Non-insect	35	3
% Predator taxa	65	26
% Scraper taxa	0	10
% Shredders	0	10
Simpson's diversity	0.90	0.84
Tolerant taxa	6	5

Observed taxa	Missing taxa
Micrasema	Hydropsyche
Sweltsa	Diamesinae
Paraleptophlebia	Fallceon
Oligochaeta	Epeorus
Baetis	Rithrogena
Chironominae	Ameletus
Acari	Cinygmula
Orthocladiinae	Zapada
	Serratella
	Tanypodinae
	Rhyacophila
	Simulium
	Drunella

Assessing the Effect of Illegal Marijuana Activity on the Biotic Integrity of Streams in Northern California

Will Start but Needs Future Funding

Step 2: Conduct monitoring activities within the selected watershed and at secured marijuana fields following law enforcement activities.

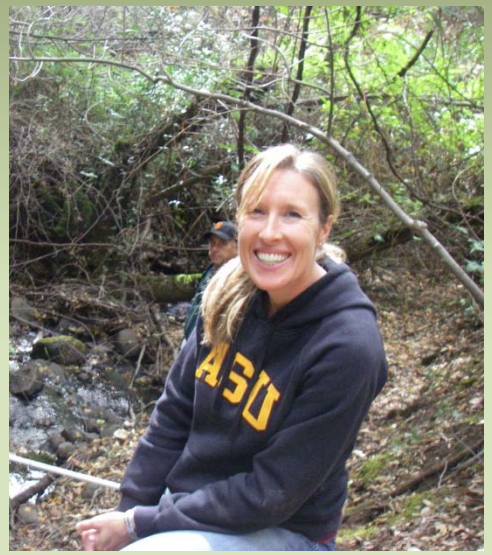
Step 3: Finalize two sampling protocols; one for evaluating targeted reaches and watershed condition affected by MCSs and one for determining impacts of marijuana cultivation on specific sites. The later protocol will provide data for prosecuting individual cultivators committing environmental crimes.

Step 4: Produce a report to communicate the effects of marijuana cultivation on biotic integrity and anadromous fish; identify and prioritize areas to protect and/or restore; and develop a process and/or data that can be used to quantify those effects.

Assessing the Effect of Illegal Marijuana Activity on the Biotic Integrity of Streams in Northern California

Scheduled of Work for the Project

TASK	Brief Task Description	Primary Lead	Secondary Lead	October 2013	November 2013	December 2013	January 2014	February 2014	March 2014	April 2014	May 2014	June 2014
Step 1 Task 1	Assemble monitoring team; meeting	Vieira	Bratcher, Harrington									
Step1 Task 2	Create living bibliography	Vieira	Bratcher								Biblio update	
Step 1 Task 3	Watershed Selection - GIS	Vieira	Bratcher									
Step 1 Task 4	Watershed Data Collection/detailed map - GIS	Vieira	Bratcher									
Step 1 Task 5	Report, Land Uses	Bratcher	Vieira									
Step 1 Task 6	Causal analysis, Steps 1 and 2	Harrington	Vieira									
Step 1 Task 7	Describe sampling procedures/QAPP	Harrington	N/A									
Step 2 Task 1	Site Selection and Baseline field data collection	Harrington	N/A									



California Department of Fish and Wildlife
Northern Region
Timberland Conservation Planning
Email: Harvest.vieira@wildlife.ca.gov
601 Locust Street
Redding, CA 96001
Work: (530) 225-2504

Patricia (Tricia) Bratcher
Habitat Restoration Coordinator, Sacramento River Watershed
California Department of Fish and Wildlife
Email: Patricia.Bratcher@wildlife.ca.gov
601 Locust Street
Redding, CA 96001
Work: (530) 225-3845