

Environmental Impacts of Marijuana  
Cultivation -  
A Water Quality Perspective

Stormer Feiler

Environmental Scientist

North Coast Regional Water Board

October 8, 2013

# Introduction

- Regulatory Authority
- Environmental Effects
- The Impacts (Case Studies)
- Collaborative Enforcement
- Regional Water Board Response
- What We Can Do Together
- Conclusion

# Regulatory Authority

- Federal Clean Water Act
- Porter Cologne Water Quality Control Act
- Non Point Source and Point Source Pollution
- Prohibitions, Waste Discharge Requirements (WDR), Waivers of WDRs, NPDES Permits
- Enforcement (CAO, CDO, TSO, NOV, ACLC, ACLO)
- Total Maximum Daily Loads as a result of 303(d) Listings of Impaired Waters
- Mission: To preserve, enhance, and restore the beneficial uses of water

# Environmental Effects

## Overview of The Problem

- Exponential increase in number and size of grow operations
- Water diversions appear to decrease summer base flows
- Habitat loss /fragmentation/discharges
- Operations typically involve violations of environmental laws administered by multiple state and local agencies

# Significant Environmental Issues Related to Cultivation

- Erosion, grading and road construction
- Conversion of riparian and forested areas
- Diversion and use of stream flow
- Pesticides, herbicides
- Fertilizers, soil amendments
- Hazardous materials storage and use (oil, diesel, gasoline)
- Human waste, garbage, trash
- Threats to public health and safety

# Result in Impacts to Beneficial Uses

Factors	Beneficial Use Impacted
Erosion and Sedimentation	MUN, COLD, RARE, MIGR, SPWN, COMM, WQE,, FRSH, GWR, FISH REC 1 & 2 , WILD, AGR , EST, CUL
Fertilizer use and eutrophication	MUN, REC 1 & 2, MUN, COLD, RARE, MIGR, SPWN, COMM, WQE, FRSH, GWR, FISH REC 1 & 2 , WILD, EST, CUL
Oils and fuels	MUN, COLD, RARE, MIGR, SPWN, COMM, WQE,, FRSH, GWR, FISH REC 1 & 2 , WILD, AGR , EST, CUL
Pesticides	MUN, COLD, RARE, MIGR, SPWN, COMM, WQE,, FRSH, GWR, FISH REC 1 & 2 , WILD, AGR , EST. CUL
Water use and diversions	MUN, COLD, RARE, MIGR, SPWN, COMM, WQE,, FRSH, GWR, FISH REC 1 & 2 , WILD, AGR , EST, CUL
Forestland conversions	MUN, COLD, RARE, MIGR, SPWN, COMM, WQE,, FRSH, GWR, FISH REC 1 & 2 , WILD, AGR . EST, CUL

# Potential Biological Effects on Beneficial Uses

- Reduced habitat complexity in stream linear length, cross sectional area, and riparian vegetation
- Increases in water temperatures, algal blooms, changes in DO
- Decreased food supply for aquatic life
- Increased physiologic stress (breathing, food availability, feeding, increased parasitism, etc.)
- It gets harder to live and there is less living space
- Increased costs for potable water, and reduced water supplies for other Beneficial Uses.

# Case Studies and Observed Effects





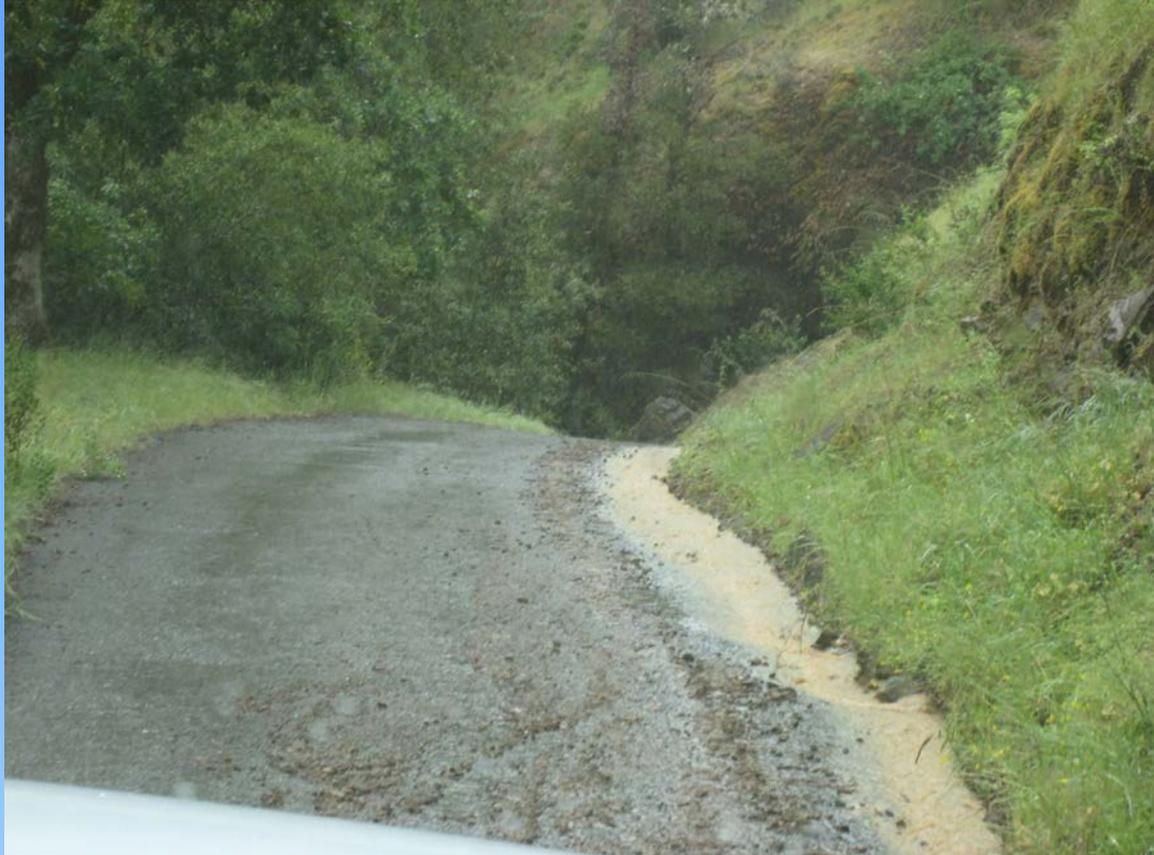
## **Site 1 - Road Construction next to a fish stream**

**An ECTF investigation resolved through joint agency enforcement and prosecution by the Circuit Prosecutor working for the local DA-Note the road construction and perhaps dam construction placed fill in the stream causing the collapse of a tree and sediment discharge.**



## **Site 1- Sediment in the Stream**

**Fine grained sediment deposits**



**Site 1-Road surface runoff**

**1/10th of an inch of rain on day of inspection**



## **Site 1- Runoff delivering to fish-bearing stream**

**Delivery point from previous runoff photo- an example of turbidity which causes gill damage, reduction in feeding efficiency, and predator avoidance, chronic inputs slow growth and increase mortality. There are also potential impacts to downstream domestic water supplies, pumps, and intakes.**

# It can be repaired, but at a cost

**Before court-ordered remediation**



**After court-ordered remediation**





## **Site 2- Large-scale grading to install truck boxes**

**An ECTF investigation which resulted in CAO from the RWB, and enforcement responses from participating agencies. Followed by prosecution by the Env. Crimes Circuit Prosecutor under authority of the local DA. The Landowner rented a bulldozer and ran it for 640+ hours in 2 months- buried small streams, and heavily graded 6 acres of steep ground –12 acre conversion area**



## **Site 2- Grading and truck box**

**Exposed soils and removed stumps de-stabilizing slopes and streams- also trimmed trees to resemble palm trees**



## **Site 2-Winter always comes**

**Extreme sedimentation in the form of a liquid mud flow**



**Site 2- Runoff**

# Site 2- Restoration Results

**First winter**



**Second winter after restoration**





**Site 3 - Dam installed on a seasonal stream**



### **Site 3- It rains the dam erodes**

**The sediment deposit in the foreground is from erosion of the dam's surface**



### **Site 3-After enforcement the dam is removed and the stream restored**

**An ECTF investigation resulting in a CAO, which required removal of the dam and restoration of the stream in conjunction with enforcement by multiple agencies (CDF, DFG, the County). The landowner paid for the cleanup.**



#### **Site 4- Recreational bulldozing perhaps for a pond**

**A Tractor was stuck in a fish-bearing stream; the fuel spilled out into the stream due to the angle of the tractor. In addition, the instream and near stream heavy equipment work resulted in the delivery of about 200 cubic yards of sediment to the stream. The landowner was also prosecuted for grand theft. Meth precursors were found on site.**



## Site 5- Removal of old forests

At this site the removed trees ranged from 36-48 inches dbh. Approximately 4 acres of forested ground were cleared and three streams filled, with one stream the site of an instream pond.



**Site 5-In stream pond constructed without engineering or spillway**



**Site 5-Logs, brush, trees, and earthen debris are graded into streams**

**An ECTF investigation resulting in a CAO from the RWB- clean up is ongoing.**



## **Site 6- Transport of potting soils and native soils**

**We have been finding that vermiculite and perlite are good indicators of potting soil and potentially fertilizer transport into the aquatic environment.**

# Collaborative Enforcement

- Multi-agency Enforcement Response (ECTF)
- Pace of conversion exceeds ability to respond
- Existing sites vs. new conversions
  - We need to get at the existing environmental issues and engage with those planning new conversions to reduce potential impacts
- Issues encountered-
  - Local DA may not want to prosecute
  - Different inspection authorities can create more work for us during case development

# Regional Water Board Response Complaints

- 481 Complaints as of 8-13-2013
- Marijuana complaints are about 50% of our unregulated complaints involving sediment discharge (57/115)
- We also receive referrals from other agencies directly and through the ECTF's.

# Enforcement

## Arising From Complaints

- 17 Cleanup Orders (12 marijuana-related)
- 8 Notices of Violation (2 marijuana-related)
- 8 Admin. Civil Liability (1 marijuana-related)
- 10 Insp. report (referral) (7 marijuana-related)
- 5 staff enforcement letters
- 40+ cases receiving technical/compliance assistance
- 22 Marijuana cases – all cases included violations of multiple environmental laws
- Marijuana enforcement cases generally result in compliance, although compliance is often slow.

# What We Can Do

- ECTF forum of agency interaction works
- Consider joint prosecution agreements with other agencies, prosecution through the AG, and legislation to increase civil and criminal prosecution opportunities.
- Work on integrating language into inspection or search warrants ensuring full prosecution potential for attending agencies
- Work together to make the most of each opportunity- ECTF can work and pays off
- Press releases for successful actions

# Conclusion

- Enforcement of environmental laws costs us all, both as taxpayers and as members of communities that rely on the earth's natural resources.
- The environmental resource damage costs are undetermined.
- Marijuana cultivation often occurs in our headwaters and thus affects the full length of streams.
- Many of these streams are already listed as impaired for sediment and temperature and other pollutants (CWA Sec. 303(d)).
- Cumulative ecological impacts to natural resources have long-term consequences for all of us, our children and grandchildren.
- An unregulated industry has a business advantage over a regulated industry- consider how to address this discrepancy.