



---

# Update on the Status of Addressing Lily Bulb Operations in the Smith River Plain

---

Item 5

North Coast Regional Water Quality Control Board

Clayton Creager

Ben Zabinsky

February 20, 2019



# Presentation Topics

---

---

- Background
- Water Code Section 13267 request
- Smith River Plain Water Quality Management Plan
- Activities to Date
- SRPWQMP Elements Under Development
- Petition to the State Board
- Next Steps



# Background

---

---

- Limited staff resources for agricultural lands discharge program
- Surface Water Ambient Monitoring Program monitoring study conducted from 2013-2017
- March 2017 Regional Water Board meeting
  - ✓ Staff presented on status of development of discharge permits for agricultural lands
  - ✓ Regional Board directed staff to focus on a permit for discharges from vineyards and orchards
  - ✓ Regional Water Board monitoring study would inform next steps to address discharges in the Smith River Plain



# SWAMP Smith River Plain Monitoring Study

---

---

- Regional Water Board led sampling from 2013-2017
- Purpose of monitoring was to screen for presence of chemicals and toxicity in the Smith River Plain
- Results documented in a January 2018 report
- Documented presence of 17 pesticides and chemicals of which 5 exceeded water quality thresholds
- Documented copper toxicity in Delilah Creek
- Report concludes that pollutants are being delivered by runoff from lily bulb fields during rain events



# April 2018 Regional Board Meeting Summary

---

---

- Staff presented results of 2013-2017 monitoring study
- NOAA Fisheries presented research on the effects of copper on salmonids
- Growers described the steps they have been taking to address results of study
- Regional Board heard input from stakeholders and the public
- Staff recommended development of a plan to address discharges associated with lily bulb operations
- Staff outlined a potential public process to develop the plan



# April 2018 Regional Board Meeting Summary

---

---

- Regional Board discussed options to address results of the monitoring study
- Regional Board provided following direction:
  - ✓ Executive Officer to issue a California Water Code 13267 request
  - ✓ Work with growers, agencies, and the Tolowa Dee-ni' Nation
  - ✓ Develop a plan to protect water quality
- Growers committed to implementing measures in the interim while plan is being developed



# Water Code Section 13267 Request

---

---

- Regional Water Board Executive Officer issued information request on October 2<sup>nd</sup>, 2018
- Information requested of growers includes:
  - ✓ Description of operations
  - ✓ Existing and planned best management practices
  - ✓ Method of reporting (implementation monitoring)
- Information submittal due February 1, 2019
- Regional Board staff will work with growers to incorporate information into SRPWQMP



# Smith River Plain Water Quality Management Plan

---

---

- Information submitted by growers will be used to develop the Smith River Plain Water Quality Management Plan (SRPWQMP)
- SRPWQMP will be developed by Regional Water Board staff with input from growers and :
  - ✓ California Department of Fish and Wildlife
  - ✓ NOAA Fisheries
  - ✓ Tolowa Dee-ni' Nation
- Draft available for stakeholder input and written comment in summer of 2019
- After comment period, the Plan will be approved by EO or Regional Board





# SRPWQMP Table of Contents (Draft)

1) Watershed & Resource Overview	Regional Water Board, NOAA Fisheries, CDFW, Tolowa Dee-ni' Nation, Smith River Alliance
2) Description of Agricultural Operations	Lily Bulb Growers, Natural Resources Conservation Service (NRCS), Del Norte Resource Conservation District (RCD), Regional Water Board
3) Potential Impacts to Water Quality	Regional Water Board, NOAA Fisheries, CDFW, NRCS, RCD
4) Description of Current and Planned Water Quality Management Practices	Lily Bulb Growers, NRCS, RCD, Regional Water Board
5) Implementation Monitoring and Reporting	Regional Water Board, Lily Bulb Growers, NRCS, RCD
6) Status and Trends Monitoring	Regional Water Board, NOAA Fisheries, CDFW, Tolowa Dee-ni' Nation
7) Agency and Stakeholder Coordination	Regional Water Board



## Activities to Date

---

---

- Meetings with growers, agencies, and Tribes
- Lily bulb growers implementation of BMPs
- Outreach to Smith River Alliance
- Collection of information for agency portions of SRPWQMP
- Background work on status and trends water quality monitoring plan, implementation monitoring plan, assessment endpoints, BMP refinement (e.g. buffer strip width)



# Field Tour of Lily Bulb Operations

---

---

- Regional Water Board staff toured lily bulb operations in November 2018 & January 2019
- Documented changes to management practices since the release of the January 2018 monitoring report
- BMPs implemented by growers include: directional tilling, buffer strips, inter-row planting, modified spray practices, and isolation planting
- SRPWQMP will document and finalize recommended BMPs

# Lily Bulb Fields



Fields are vulnerable to erosion during the cultivation process

# Growers are Employing a Variety of BMPs



Inter-row barley planting with buffer strip – November 2018 site visit

# Directional Tilling and Buffer Strip



Agencies working on tools to more objectively estimate necessary buffer width

# Variable Buffer Widths



Regional Water Board will develop guidance to more objectively estimate buffer width requirements

# Example of Isolated Field



Surrounding pastures may limit the need for additional buffers





# SRPWQMP Elements Under Development

---

---

- Water Quality Status and Trends Monitoring Program
- Implementation Monitoring
- Landowner Reporting Requirements
- Buffer Strip Widths
- Assessment Endpoints – Copper Toxicity Criteria



# Status & Trends WQ Monitoring

---

---

- Team is composed of Regional Water Board, Tolowa Dee-ni' Nation, NOAA, CDFW
- Monitoring Objectives:
  - ✓ Standardized methods and protocols
  - ✓ What are background concentrations of copper in the Smith River Plain?
  - ✓ Is the BMP program successfully reducing copper concentrations?
  - ✓ Are fish being exposed to toxic concentrations of copper - – data for Biotic Ligand Model
- Consulting with owners and others on locations and access protocol
- Extent and timeframe of monitoring currently being developed by the monitoring group

# Smith River Plain Proposed Monitoring Locations

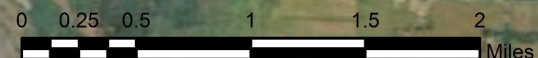
## Biotic Ligand Model Constituents

1. Copper
2. pH
3. Sulfate
4. Sodium
5. Calcium
6. Chloride
7. Alkalinity
8. Potassium
9. Magnesium
10. Temperature
11. Dissolved Organic Carbon

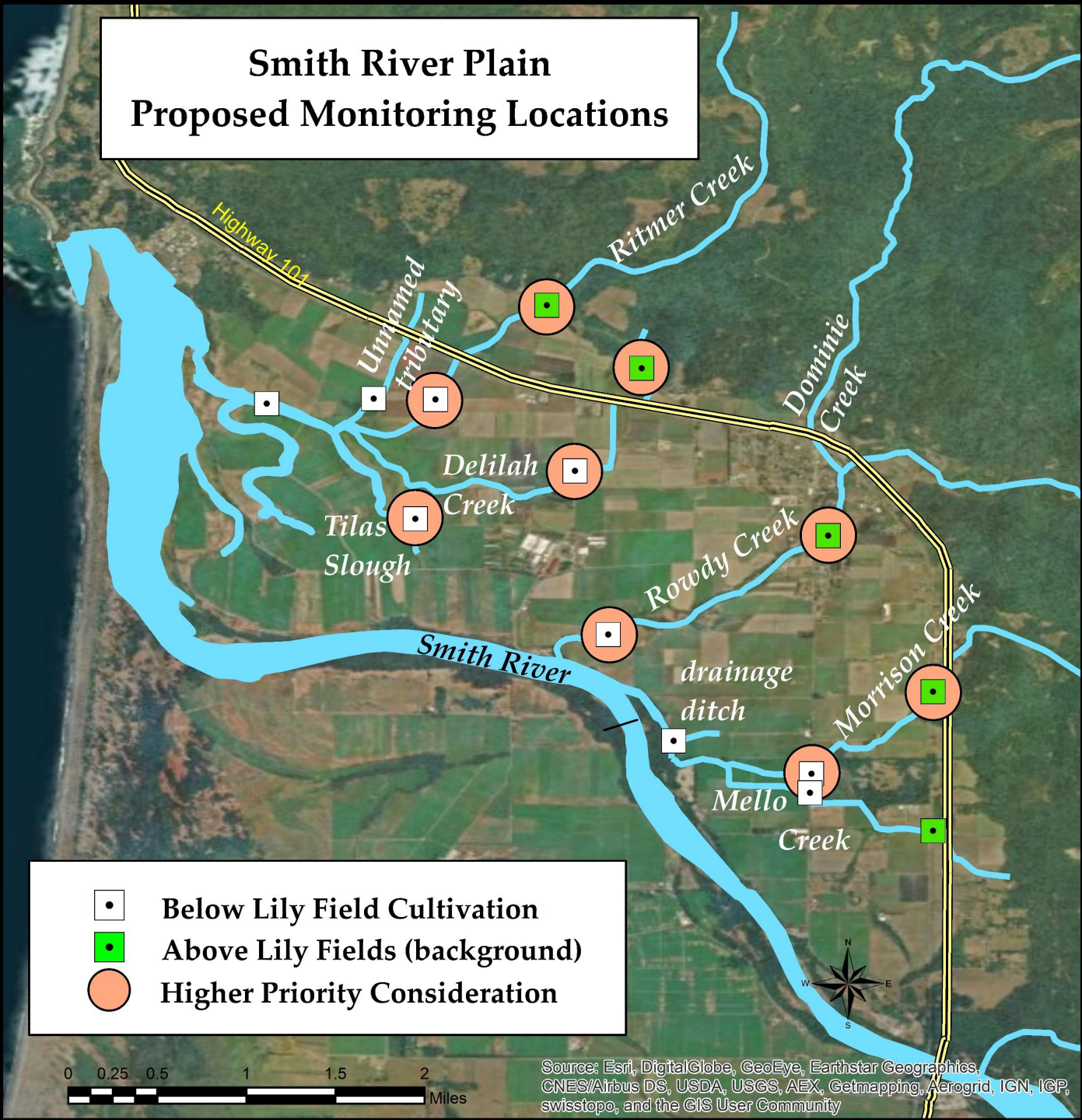
 Below Lily Field Cultivation

 Above Lily Fields (background)

 Higher Priority Consideration



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community





## Recommended Components of Implementation Monitoring & Reporting

---

---

- Document management measures taken to improve water quality
- Growers will update implementation report each year to be consistent with field rotations
- Photo documentation of BMPs will be included in reports to Board and public
- Summary of BMP implementation statistics providing cumulative coverage by BMP type
- All monitoring data will be included in annual report to the Board and public.



# Toxicity Assessment Endpoints

---

---

- Basin Plan Chapter 3 WATER QUALITY OBJECTIVES  
Section 3.3.16 Toxicity
  - ✓ Waters shall not contain toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
- Basin Plan provides general guidance on how to determine toxicity.
- Applying the Biotic Ligand Model is consistent with EPA criteria development and is the preferred approach with metals in natural waters.



# How does Copper Affect Aquatic Life?

---

---

- In low concentrations, copper is an essential nutrient promoting the growth and metabolism of all living organisms
- At elevated concentrations copper can become toxic, especially to aquatic organisms
- Acute effects can include mortality while chronic exposures to increased concentrations of copper can lead to adverse effects on survival, growth, and reproduction as well as alterations of brain function, enzyme activity, blood chemistry, and metabolism



# Biotic Ligand Model (BLM)

---

---

- The (BLM) is a metal 'bioavailability' model that explicitly accounts for individual water quality variables that effect toxicity
- The Biotic Ligand Model (BLM) allows for mechanistic predictions of bioavailability and copper toxicity
- Ultimately, the concentration of copper, on a total recoverable or dissolved basis, that may present toxicity to aquatic life is highly variable among sites
- Regulatory criteria that do not account for the key factors affecting metal bioavailability could greatly over- or under-protect the aquatic life uses that they are intended to protect
- Status and trends water quality monitoring data collected for the SRPWQMP will support use of the BLM to develop toxicity assessment endpoints



# Estimating Buffer Widths

---

---

- SFEI Riparian Zone Estimation Tool or RipZET
  - ✓ Digital elevation model or DEM, derived from LiDAR
  - ✓ Hydrography (i.e. lines or polygons for streams, wetland, etc.)
  - ✓ Vegetation maps
- USDA Agricultural Conservation Planning Framework (ACPF) Toolbox
  - ✓ Digital elevation model or DEM, derived from LiDAR
  - ✓ Hydrography
  - ✓ Boundaries for agricultural fields
  - ✓ Land use or crop maps
  - ✓ Soil survey or mapping information





# Next Steps - SRPWQMP Development

---

---

- Compile information from 13267 response and work with growers to ensure the information is complete
- Work with growers, agencies, and Tolowa Dee-ni' Nation to develop public draft of SRPWQMP
- Meet with stakeholders and conduct public review process to receive input from the public and stakeholders on draft SRWQMP
- Complete draft SRPWQMP by the end of 2019
- Propose a timeline for permit development when the SRPWQMP is finalized



# Petition to State Board

---

---

- Petition to State Water Resources Control Board
  - ✓ Environmental Law Foundation
  - ✓ Pacific Coast Federation of Fishermen's Associations
  - ✓ Institute for Fisheries Resources
- November 1, 2018 letter sent with petition expressed concerns with the Regional Board's approach to regulating lily bulb operations
- November 30, 2018 letter
  - ✓ clarified concerns and requests
  - ✓ supportive of the ongoing process
  - ✓ appreciative of recent implementation measures taken by growers



# Response to Petition

---

---

- Regional Water Board's December 2018 response confirmed the following:
  - ✓ Provide written comment opportunity on draft SRPWQMP
  - ✓ Develop a timeline by the end of 2019 for General Waste Discharge Requirements or a conditional waiver (permit)
  - ✓ Continue to work with growers on implementation measures and monitoring effectiveness
  - ✓ Keep petitioners updated on SRPWQMP, permit development, monitoring, and interim measures by growers
- Petition currently in abeyance until January 29<sup>th</sup>, 2021



# Next Steps

---

---

- Lily Bulb Growers
  - ✓ Continue to implement interim measures while SRPWQMP is under development
  - ✓ Report on implementation to the Regional Water Board
- Agency/Tribal Team
  - ✓ Develop and implement status & trends water quality monitoring (2019 – 2020)
  - ✓ Contribute to development of SRPWQMP
- Regional Board staff
  - ✓ Finalize and implement status and trends monitoring plan
  - ✓ Develop draft SRPWQMP
  - ✓ Provide progress updates



# Acknowledgements



# Questions and Comments