Tahoe Keys Lagoons Aquatic Weed Control Methods Test

TRPA Governing Board
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Introduction

- Aquatic Invasive Species
- The Problem
- Proposed Project
- Tahoe Keys History
- Collaborative Approach
- Comments
- Breakouts
Aquatic Invasive Species

- Eurasian Watermilfoil
- Curlyleaf Pondweed
- Control Actions
  - Localized Eradication
The Problem

- **Tahoe Keys**
  - 30x larger than any other project to date
  - Tried and true methods are likely not feasible
    - Organic layer at bottom
    - Poor visibility
Proposed Project

- Collaboratively developed
- Demonstrate safety, efficacy and utility of proposed methods
- Test methods independently and in combination
- Enhance water quality and minimize re-infestations
- Large scale treatment and localized treatment
18 test sites
- 3 control
- 28 acres / 17% of total area
- Triplicate testing of methods
Proposed Project

Project Goals

- Reduce target aquatic weed infestations as much and as soon as feasible to help protect Lake Tahoe.
- Bring target aquatic weed infestations to a manageable level.
- Improve water quality of the Tahoe Keys lagoons.
- Reduce the potential for target aquatic weed re-infestation after initial treatment.
Performance Measures

- Determine the effect on water quality in the Tahoe Keys lagoons through monitoring.
- Achieve and maintain at least 75% reduction of target aquatic weed biomass in test locations from baseline (from summer 2019 surveys).
- Achieve and maintain a minimum 3 feet of vessel hull clearance within navigation channels year-round to maintain beneficial uses and prevent weed fragment generation and dispersal.
Proposed Project

Next steps

- Extensive water quality and biological data currently being collected
- Spread preventive measures and test
  - Boat back-up station
  - Bubble curtain & sea bins
  - Laminar Flow Aeration
- Scoping period ends August 2, 2019
Presentation Outline

Tahoe Keys Aquatic Weed Control Methods Test
Lahontan Regional Water Quality Control Board
CEQA Scoping Meeting

1) California Water Boards Overview
2) Lahontan Regional Water Quality Control Board Role
3) Past & Current Water Quality Permitting
4) Key Regulatory Considerations
5) Lahontan Water Board Consideration
California Water Boards Overview

- State Water Resources Control Board
- Nine Regional Water Quality Control Boards
- Region 6 - Lahontan Regional Water Quality Control Board (Lahontan Water Board)
  - 7 Board Members

Region 6 Area:
- East slope of Sierras,
- Oregon Border to South of Victorville

Offices:
- South Lake Tahoe
- Victorville
Lahontan Water Board Role

- **Water Quality Planning**
  - “Water Quality Control Plan for the Lahontan Region” (Basin Plan)
  - Beneficial Uses
  - Water Quality Objectives
  - Discharge Prohibitions & Exemptions
  - Triennial Reviews

- **California Environmental Quality Act (CEQA) Lead Agency**
  - CEQA Triggered by Need for Exemption to the Basin Plan Prohibition on Discharge of Pesticides

- **Federal and State Permitting Authority**
  - National Pollutant Discharge Elimination System (NPDES) Permits Under Clean Water Act
  - Waste Discharge Requirements (WDRs) Under Porter-Cologne Water Quality Control Act
  - 401 Water Quality Certifications
Past & Current Water Quality Permitting

- Five NPDES Permits Issued 1975 To 2014
  - Included Coverage for Water Treatment Plant and Water Circulation System

- Waste Discharge Requirements (WDRs) Issued 2014-current
  - Key Finding in WDRs:
    “Excessive growth of aquatic plants within the Facility impairs beneficial uses of water, such as Cold Freshwater Habitat (COLD), Navigation (NAV), Water Contact Recreation (Rec-1), Non-contact Water Recreation (Rec-2) and possibly Rare, Threatened, or Endangered Species (RARE).”
Past & Current Water Quality Permitting (Cont’d)

- Waste Discharge Requirements (WDRs): Order R6T-2014-0059
  - Integrated Aquatic Plant Management Plan
  - Nonpoint Source Plan
  - Public Education and Outreach
  - Aquatic Plant Monitoring
Key Regulatory Considerations

- Exemption to Basin Plan Prohibition on Pesticide Discharges
- Antidegradation Policy for Outstanding National Resources Waters - Tier III Waters
- Basin Plan Water Quality Objectives (WQOs)
Key Regulatory Considerations (Cont’d)

- Exemption to the Basin Plan Prohibition On Pesticide Discharges:
  - Project Description, Purpose & Goals Statement
  - Proposal Consistent with Adopted Aquatic Invasive Species Management Plan
  - Coverage Under NPDES Permit
  - **Demonstrate Minimum Discharge of Chemical Substances for Effective Treatment**
  - Best Management Practices Plan with Measures to limit the effects of the pesticide to the shortest time and within the smallest area necessary for project success
  - Communication & Notification Plan
  - **Description of the Failure of Non-Chemical Measures to Effectively Address the Target Plants**
  - Environmental Impact Report per CEQA
  - Compliance with Antidegradation Policies
  - Monitoring & Reporting Plan (MRP)
  - **Peer Reviewed Pre-Project Biological MRP and Monitoring, Reporting and Mitigation Program**
Key Regulatory Considerations (Cont’d)

- Antidegradation Policy For Tier III Waters
  - Lake Tahoe - Outstanding National Resource Waters (ONRW)-Tier III, Designated for Outstanding Ecological and Recreational Value
  - No Long-Term Degradation of Tier III Waters Allowed as Result of Project
  - Short-Term Degradation Allowed In Application And Treatment Areas
  - Duration of Degradation of Water Quality and Aquatic Life Resulting from Discharge to be Informed by Environmental Review and Antidegradation Analysis
Lahontan Water Board Consideration

- **Consideration for Adoption** of:
  - Final CEQA Document,
  - Basin Plan Exemption to Prohibition on Discharge of Pesticides,
  - Individual NPDES Permit for the Project, and
  - 401 Certifications for the Project.

- Lahontan Water Board to **Specify “Short-Term” and “Long-Term” Durations**

- Current EPA Guidance – Short-Term is “**Weeks to Months, Not Years**”
Tahoe Keys Lagoons Aquatic Weed Control Methods test

Historical Perspective and Site-Specific Conditions

Application for Approval to Reduce Target Aquatic Weeds
Outline

• Tahoe Keys
  • Summary of Development
  • Scale and Perspective
  • History of Weed Management Actions
  • Existing Conditions (the Challenge we have today)
Main Points

• This has been an issue for a long time (since the 1970s)
• Size or Scale is THE controlling factor
• Field trials and other studies have been conducted since the 1980s
• Preference is for selective removal of Target Aquatic Weeds, not complete die-off of all species
Tahoe Keys – Summary of Development

- Constructed in 1960s
- Permitted by City of South Lake Tahoe
- 372 acres, ~170 acres of waterways
  - Main (West) Lagoon
  - Marina (East) Lagoon
  - Lake Tallac
- 1,529 homes and townhomes
  (1970 agreement allowed up to 2,500)
- Marina and commercial center
Tahoe Keys – Summary of Development
Tahoe Keys – Scale and Perspective

• **~170 acres of waterways in the Keys**

• Comparison with other marinas around Lake Tahoe
  
  • ~30 other enclosed marinas - 20-30 acres total *(shown in Yellow)*
  
  • Tahoe City (2\textsuperscript{nd} largest after Keys): 6 acres
  
  • 80\% of all other marinas are smaller than Keys west channel entrance *(1 acre – in Red)*
  
  • 50\% are 0.5 acre or less
  
  • Ski Run (LFA): 0.5 acre *(shown in Green)*
  
  • TKPOA (LFA): 6 acres *(shown in Blue)*
  
  • Lakeside (UV): 0.9 acre *(shown in Orange)*

• Difficult to scale between Tahoe Keys and other locations around Lake Tahoe
Tahoe Keys – Scale and Perspective
Tahoe Keys – Existing Conditions

- April 2018
- Hydro-acoustic scan
- All species
Tahoe Keys – Existing Conditions

- July 2018
- Hydro-acoustic scan
- All species
Tahoe Keys – History of Weed Management Actions

1970 – Water circulation & treatment system to remove P and 1st weed harvester purchased

1983 – Replaced first harvester

1988 – Rotovating field trial

1995 – Applied to LRWQCB for small scale herbicide test

2000, 2001 – First mesocosm studies [Photo on next slide]

2000s – degree of infestation increases appreciably

2010s – curlyleaf pondweed becomes established
Mesocosm Study Tank
History of Weed Management Actions

2014 – Waste Discharge Requirements (WDRs)

- **Non-Point Source (NPS) Plan**
  - Phosphorus fertilizer ban
  - Homeowner education
  - “Lunch and Learn”

- **Integrated Management Plan (IMP)**
  - Evaluation of approved methods (harvesting, barriers, divers)
  - Testing of new methods
  - Monitoring and reporting (water quality, sediment)
  - Education and outreach

- **Annual Updates**

- **End of Season Reports**
  - bottom barriers, backup station, harvesting
History of Weed Management Actions

- **2013-2017** – Significant research and outreach effort
  - Convened expert panel
    - Joel Trumbo – *Sr Env Scientist, Cal Fish & Wildlife*
    - Dr. Kurt Getsinger – *Team Lead, US Army Corps of Engineers (Vicksburg, MS)*
    - Dr. Pat Akers – *Supervising Scientist, Aquatic Weed Eradication, CA Dept of Food & Agriculture*
    - Dr. Sudeep Chandra - *Assoc Prof of Limnology, UNR*
    - Dr. Joe DiTimaso – *Dept of Plant Sciences, UC Davis*

- **2015** - Presented findings at Public Meeting at STPUD office
  - Stakeholders meetings
History of Weed Management Actions

2013-2017 – Significant research and outreach effort

- Bottom barriers
  - Large-scale test
  - Individual homeowners
- Dye studies (multiple years - began in 2010)
- Channel dredging
- Bench and mesocosm studies
- Additional review of rotovating
- Additional review of rotovating
- Greenhouse Gas Emissions study
- Goose Droppings nutrient study
- Atmospheric Deposition of nutrients study
- Benthic Macro-Invertebrates (BMI) study (worms, snails, etc in the sediment)
History of Weed Management Actions

- **2013-2017** – Significant research and outreach effort
  - Weed fragment production study: pre/post harvesting
  - Seasonal weed surveys
    - Hydro Acoustic Scans
    - Species-specific abundance
  - Water Quality Monitoring
    - 15 parameters, 13 sites, 5 depths
    - At least monthly April-October
  - Boat Backup Station
  - Bubble Curtain and Sea Bins
  - 6-acres Laminar Flow Aeration test
  - Invested over **$3.7 million** to date (not including harvesting)
  - Special Assessment for $2.5 million more – on hold
Tahoe Keys Lagoons Restoration Project

Overview

1. Problem has been developing for over 50 years
2. Testing of alternatives has occurred since at least the 1980s
3. Key to successful restoration is selective treatment and maintenance of native plant species and BMI
4. TKPOA has conducted substantial research and testing
5. Target Aquatic Weed growth has accelerated in the last 15-20 years
   • Curlyleaf pondweed presents a new threat
Multiple Means for Engagement and Input

- Public Workshops - Scoping + Draft phase
- Project website: tahoekeysweeds.org
- Stakeholder Consultation Circle – partners in implementation
- Stakeholder Committee
Most Useful Input During Scoping

• What do you want included/considered in analysis?

• Information and questions that help define the scope of this study
Tahoe Keys Lagoons Aquatic Weeds Control Methods Test (CMT) Project Review Timeline

November 2018-June 2019 Planning

- Application Submittal
- Pre-EIS/EIR Planning & Stakeholder Assessment
- Notice of Preparation Released
- Scoping Period: Public Workshops & Comment Period
- Scoping Summary Report
- Draft Environmental Impact Report (DEIR & DEIS) and Alternatives Analysis
- Notice of Availability of DEIR/DEIS
- DEIR/DEIS Public Meetings & Comment Period
- Final EIR (FEIR) Formulated with Response to Comments

June 2019-March 2021 Environmental Analysis

March 2021-April 2021 Final Review

April 2021 Implementation

Aquatic Weed Control Methods Testing & Mitigation Monitoring (Pending Approval)
Scoping Considerations

We are Seeking Public Comments and Input On:

1. **Control Methods Selection, Alternatives & Method & Alternative Selection Criteria**

2. **Scope of Environmental Review for EIR/EIS**
   - Range of Actions, Alternatives to be Considered,
   - Mitigation Measures, and
   - Significant Effects Including to:
     - Hydrology and Water Quality,
     - Biological Resources,
     - Human Health
     - Hazards and Hazardous Materials
     - Recreation
     - Geology and Soils
     - Land Use and Planning
     - Public Services
     - Greenhouse Gas Emissions
     - Global Climate Change
Scoping Considerations (Cont’d)

- **Treatment Approach**
  - Treat Early:
    - Hydraulic Gradients are Pushing Water Into the Tahoe Keys Lagoons from The Lake
    - Target Aquatic Weed Biomass is Low
  - Treat Large Areas Rapidly (Group A Method) to Gain Control
  - Spot Treat Throughout Remainder of Growing Season to Maintain Control (Group B methods)
  - Employ Fragment Control to Prevent New Infestations and Re-Infestation of Treated Areas
  - Employ Long-Term Methods that Shift Sediment and Water Quality Conditions to be Less Favorable to Target Aquatic Weed Growth
Control Methods

We are Seeking Public Comments and Input On Methods Selection:

- **Group A & B Treatment Methods** Initial Menu Includes:
  - Large-scale UV-C Light Treatment
  - Aquatic Herbicide Treatment
  - Spot Treatment With UV-C Light
  - Bottom Barriers
  - Hand Pulling
  - Other Methods via Scoping Input?
Control Methods (Cont’d)

We are Seeking Public Comments and Input On Methods Selection:

- **Long-Term Methods** that Shift Sediment and Water Quality Conditions:
  - Laminar Flow Aeration
  - Floating Island Wetlands
  - Targeted Water Circulation
  - Other Methods via Scoping Input?

- **Fragment Control Methods**
  - Bubble Curtains
  - SeaBins
  - Boat Backup Stations
  - Other Methods via Scoping Input?
Alternatives & Selection Criteria

We are Seeking Public Comments and Input On Alternatives Selection:

• **Alternatives**

  • No Project – Existing Management Activities

  • Two or More Pairings of Group A and B Methods for Evaluation in the Environmental Review Process
Alternatives & Selection Criteria

We are Seeking Public Comments and Input On Method & Alternative Selection Criteria:

- **Alternatives**
  - Alternatives to pesticide use must be thoroughly evaluated and implemented when feasible, “Feasible” = CEQA Guideline 15364
  - Non-Target Impacts
  - Duration of WQ Degradation
  - Other Alternative Selection Criteria via Scoping Input?

- **Methods**
  - “Feasibility”
  - Non-Target Impacts
  - Duration of WQ Degradation
  - Other Method Selection Criteria via Scoping Input?

*Feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.*
Alternative Example

• Example of Combination Treatment

![Diagram of dock-zone herbicide plus UV C light treatments](image-url)
Thank You!

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Photo credit: Drone Promotions