Diamond Lake

Water Quality
TMDL Recommendations
Curly-leaf Pondweed
Schultz, Wheeler, Hubbard – Chain of Lakes project
Water Quality

Diamond Lake Annual Ave TP Readings 2004-2014

TP (ug/L)

Year


91 81 80 61 48 34 90 56 55 46 63

R² = 0.2678
Diamond Lake: Accomplishments

• **Total Maximum Daily Load**
  - The study allows for the identification of likely sources of nutrients
  - Develop implementation plan to address nutrient loading into Diamond Lake

• **Plan to address nutrient loading**
  - Connect to Green Lake Regional Wastewater Treatment System
  - Fish Barrier – control rough fish population in chain of lakes
  - Implement Lakeshore Best Management Practices (ongoing)
  - Implement Agriculture Conservation Practices (ongoing)
  - Educate Lakeshore Property Owners to Reduce Phosphorus (ongoing)
  - Control Curly Leaf Pondweed
  - Upstream Lake Management
Curly Leaf Pondweed

- Curly leaf pondweed actively grows during winter months
- Reaches maximum density in late spring
- Dies back in mid-summer
- Turions (germinating portion of plant) are produced in late spring
Diamond Lake Current Conditions

▲ Total Area:
• 1,607 Acres

▲ Littoral Area
• 648 Acres

▲ Curly Leaf Area
• 150 acres
• (~23% of littoral area)
Project Feasibility

▲ Determine feasible options
  • Past management by the Diamond Lake Area Recreational Association (DLARA)
  • Past management activities include chemical and mechanical treatments

▲ Expansion of management operations feasible
  • Cost constraints
  • Equitable distribution of costs
Alternative Analysis

▲ Curly-leaf pondweed typically grows between 3 and 10 feet
  • These areas will be targeted during the treatment process

▲ Target areas where Curly-leaf abundance is high
  • Small areas greater than 10 ft may be treated if Curly-leaf abundance is high

▲ 15 year project life cycle

▲ Present value calculations for cost estimate

▲ Based on costs quotes from herbicide applicators and harvesting operators
## Herbicide and Harvesting Costs

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
<th>Acres</th>
<th>Total Life Cycle Cost</th>
<th>Average Annual Cost¹</th>
<th>Cost/Acre/Year</th>
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<tr>
<td>1</td>
<td>Invasive Contract Harvest</td>
<td>86</td>
<td>$968,410</td>
<td>$64,561</td>
<td>$482</td>
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<td>Invasive Contract Herbicide</td>
<td>86</td>
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</tbody>
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¹Each annual cost adjusted to inflation and summed to obtain a total lifetime cost.

(* Area in parenthesis is the area designated for spot treatments.)
Curly-leaf Management Timeline

▲ Gather feedback from Diamond Lake Area Recreational Association

▲ Present final alternative decision to Lake Association

▲ Incorporate feedback into management alternatives

▲ Present recommendations to Middle Fork Crow River Watershed District Board

▲ Provide preferred approach to viewers for incorporation in benefits assignment

▲ Hold Public Hearing
Schultz, Wheeler, Hubbard
Chain of Lakes Total Phosphorus

State standard
Phosphorus Reduction

• Reduce the average annual Total Phosphorus load to Diamond Lake by 335 kg/year (738 lbs).

*8.2 semi-trailers of algae!
Schultz, Wheeler, Hubbard: Timeline
• Meeting at Harrison Township Hall
• Public Hearing (District Office)
  • Capitol Project Establishment Hearing
• Present project Kandiyohi County Board of Commissioners MFCRWD
• Open House/Informational meeting: Riparian Landowners
• 103G Hearing (DNR Public Hearing)
  • Required for water level management
• Kandiyohi County Commissioners – Outlet Permit: Public Hearing