Ham Lake

Towards a Common Understanding of Ham Lake
Why Plan:

1. Lakes Don’t Manage Themselves

2. Ham Lake has some Problems & Opportunities
Planning Goals and Process

Goals

1. Facilitate a common understanding of the lake, how it works and the roles and goals of people and organizations involved with Lake Management

2. Identify concerns the lake users and agencies feel are important and need to be addressed

3. Set realistic goals, objectives and actions

4. Identify needed funds and personnel

Process

- **Oct**
  - Assess Lake Character

- **Dec**
  - ID Concerns & Opportunities

- **Jan**
  - Set Goals, Objectives & Actions

- **Feb**
  - ID Funding Needs, Sources & Personnel
Step 1: Towards a Common Understanding of the Lake

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3. Social Characteristics 40
4. Management Characteristics 46
Physical Characteristics

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• Hydrologic.......Page 13
• Chemical.........Page 20
• Biological.........Page 26
Geographic Characteristics of Ham Lake

1. Location
2. Landscape Setting
3. Soils & Slope
4. Lake Characteristics
1. Location of Ham Lake

- Located in the central portion of Anoka County, approx. 25 miles North of the Minneapolis/St. Paul area.

- Lake is wholly contained within the City of Ham Lake and the Coon Creek Watershed District

- Designated as **Public Water 02-0053-00** by the Minnesota Department of Natural Resources (MNDNR).
2. Landscape Setting

Midwest Broadleaf Forest

Subsection - Anoka Sand Plain
Land Type Association: Anoka Lake Plain

Land Types
3. Soils and Slopes

- Glacial Lake Hugo geomorphic land type
- Undulating sand plain of rolling dunes and small flats in the upland, and low-lying depressions and flats.
- Elevation range from 930 to 840 feet above sea level
- Average slope of 0.95%
- 75% of soils are very well drained.
4. Lake Characteristics

- Surface Area = 206 Ac
- Average Depth = 6.6 ft
- Max Depth = 22 ft
- Volume = 1,353 ac-ft
  - 440,846,637 Gallons
- Littoral Zone = 191 Ac
  - 92% of Lake
- Shore Length = 3.4 mi
5. Substrate

- Generally Sandy
- Small areas of muck & detritus
Hydrological Characteristics

1. Watershed Boundary
2. Water Source
3. Water Courses and Surface Water Delivery to the Lake
4. Lake Outlet
5. Lake Water Levels
1. Watershed Boundary

- Watershed is 633 acres in size
- Comprised of 9 subwatersheds

<table>
<thead>
<tr>
<th>Subwatershed</th>
<th>Area acres</th>
<th>Subwatershed</th>
<th>Area acres</th>
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<tr>
<td>HL-1</td>
<td>132</td>
<td>HL-P12</td>
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<tr>
<td>HL-P2</td>
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<td>HL-P18</td>
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<td>HL-P10</td>
<td>54</td>
<td><strong>Total</strong></td>
<td><strong>633</strong></td>
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</table>
2. Water Source

Ham Lake Water Inputs

Surface Water

Ground Water
3. Inlets & Watercourses within Lake Drainage Area

- Water runoff delivered by
  - 1.3 mi of private ditch
  - 1.6 miles of pipe
4. Lake Outlet

- Concrete with Stop logs
- Elevation = 861.3
5. Water Levels

- Highest recorded: 897.53 ft (06/20/2014)
- Lowest recorded: 892.73 ft (10/26/2000)
- Recorded range: 4.8 ft
- Last reported reading: 896.78 ft (04/25/2016)
- Ordinary High Water Level is 897.2 ft
## Runoff

<table>
<thead>
<tr>
<th>Category</th>
<th>Acres</th>
<th>Pct of Tot</th>
<th>Pct Imperv</th>
<th>CN</th>
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<tr>
<td>Agricultural</td>
<td>32.94</td>
<td>4%</td>
<td>5%</td>
<td>85</td>
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<tr>
<td>Commercial</td>
<td>10.91</td>
<td>1%</td>
<td>85%</td>
<td>98</td>
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<tr>
<td>Industrial</td>
<td>46.04</td>
<td>6%</td>
<td>95%</td>
<td>98</td>
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<tr>
<td>Major Highways</td>
<td>24.57</td>
<td>3%</td>
<td>95%</td>
<td>98</td>
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<tr>
<td>Multifamily Residential</td>
<td>2.67</td>
<td>0%</td>
<td>70%</td>
<td>74</td>
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<tr>
<td>Parks/Recreation</td>
<td>118.65</td>
<td>14%</td>
<td>5%</td>
<td>84</td>
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<tr>
<td>Public/Semipublic</td>
<td>22.98</td>
<td>3%</td>
<td>5%</td>
<td>84</td>
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<tr>
<td>Single Family Residential</td>
<td>162.47</td>
<td>19%</td>
<td>25%</td>
<td>74</td>
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<tr>
<td>Vacant</td>
<td>233.47</td>
<td>28%</td>
<td>5%</td>
<td>60</td>
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<tr>
<td>Water</td>
<td>180.68</td>
<td>100%</td>
<td>100%</td>
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Chemical Characteristics

1. Water Clarity
2. Phosphorus Budget & Trends
3. Chlorophyll-a
4. Water Quality Report Card
5. Subwatershed Loadings
1. Water Clarity

- 1975: 0.86 m
- 1985: 1.48 m
- 1990: 1.8 m
- 1995: 2.02 m
- 2000: 1.15 m
- 2005: 1.47 m
- 2008: 1.79 m
2. Phosphorus Budget & Trends

![Phosphorus Budget Pie Chart]

- Internal: 15 lbs (7%)
- Drainage Area: 132 lbs (68%)
- Atmosphere: 49 lbs (25%)

![Phosphorus Trends Graph]

- Measurements over years from 1984 to 2014

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Water Quality/Lake Management Plans/Ham Lake Management Plan/Existing Conditions
3. Chlorophyll – a (Cl-a)

- Long term trend of improvement
4. Water Quality Report Card

- **Trophic State Index (TSI):** A
- **Transparency:** = B
- **Chlorophyll-a** = A
- **Total Phosphorus** = A
5. Subwatershed Loadings

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<td>HL-P2</td>
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<td>5.4</td>
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<td>11.8</td>
<td>5.5</td>
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<td>37</td>
<td>2.0</td>
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<td>7.4</td>
<td>2.4</td>
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<td>1.0</td>
<td>0.7</td>
<td>2.1</td>
<td>3.4</td>
<td>1.2</td>
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<td>7.6</td>
<td>6.0</td>
<td>12.1</td>
<td>14.2</td>
<td>7.0</td>
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<tr>
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<td>12.3</td>
<td>15.3</td>
<td>7.3</td>
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<td>34.4</td>
<td>26.9</td>
<td>55.8</td>
<td>67.0</td>
<td>33.6</td>
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<tr>
<td>HL-P17</td>
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<td>4.2</td>
<td>3.2</td>
<td>6.2</td>
<td>6.7</td>
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<tr>
<td>HL-P18</td>
<td>35</td>
<td>3.2</td>
<td>2.4</td>
<td>5.6</td>
<td>7.0</td>
<td>3.4</td>
</tr>
<tr>
<td>HL-1</td>
<td>132</td>
<td>40.4</td>
<td>33.4</td>
<td>57.3</td>
<td>76.0</td>
<td>34.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>633</strong></td>
<td><strong>105.3</strong></td>
<td><strong>83.9</strong></td>
<td><strong>165.2</strong></td>
<td><strong>208.8</strong></td>
<td><strong>98.0</strong></td>
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</table>
Biological Characteristics

1. Fish Populations
2. Aquatic Vegetation
3. Exotic and Invasive Species
4. Threatened and Endangered Plants, Animals and Natural Communities
Fish Populations

Fish Species:
1. Black bullhead,
2. Black crappie,
3. Bluegill,
4. Brown bullhead,
5. Green sunfish,
6. Hybrid sunfish,
7. Largemouth bass,
8. Northern pike,
9. Pumpkinseed,
10. Yellow bullhead,
11. Yellow perch,
12. White sucker,
13. Banded killifish,
14. Golden shiner,
15. Iowa darter
16. Johnny darter
Fish Spawning Conditions

- Black Crappie
- Bluegill
- Largemouth Bass
- Northern Pike

- Fair to Good
- Generally firm sandy bottom with vegetation in north central and east shores
Aquatic Vegetation

- Most recent survey & assessment: 9/14/2015
- Approx. 20 aquatic plant species present
- Good diversity

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Frequency of Occurrence in Littoral Zone</th>
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<tbody>
<tr>
<td></td>
<td>July 2014</td>
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<tr>
<td><strong>NATIVE</strong></td>
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</tr>
<tr>
<td>Coontail</td>
<td>67%</td>
</tr>
<tr>
<td>Muskgrass/Stonewort</td>
<td>17%</td>
</tr>
<tr>
<td>Canadian waterweed</td>
<td>13%</td>
</tr>
<tr>
<td>Northern watermilfoil</td>
<td>22%</td>
</tr>
<tr>
<td>Naiad</td>
<td>8%</td>
</tr>
<tr>
<td>Large-leaf pondweed</td>
<td>9%</td>
</tr>
<tr>
<td>Variable-leaf pondweed</td>
<td>2%</td>
</tr>
<tr>
<td>Illinois pondweed</td>
<td>0%</td>
</tr>
<tr>
<td>White-stem pondweed</td>
<td>12%</td>
</tr>
<tr>
<td>Small pondweed</td>
<td>18%</td>
</tr>
<tr>
<td>Fern pondweed</td>
<td>3%</td>
</tr>
<tr>
<td>Flat-stem pondweed</td>
<td>60%</td>
</tr>
<tr>
<td>Whate water crowfoot</td>
<td>2%</td>
</tr>
<tr>
<td>Sago pondweed</td>
<td>5%</td>
</tr>
<tr>
<td>Comon bladderwort</td>
<td>32%</td>
</tr>
<tr>
<td>Small bladderwort</td>
<td>0%</td>
</tr>
<tr>
<td>Water celery</td>
<td>0%</td>
</tr>
<tr>
<td>Bullhead pond lily</td>
<td>2%</td>
</tr>
<tr>
<td>White water lily</td>
<td>11%</td>
</tr>
<tr>
<td><strong>NON-NATIVE</strong></td>
<td></td>
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<tr>
<td>Eurasian watermilfoil</td>
<td>22%</td>
</tr>
<tr>
<td>Curlyleaf pondweed</td>
<td>2%</td>
</tr>
</tbody>
</table>

*Cattails (emergent) & Forked duckweed (free-floating) were also present.*
*Needle spikerush, Water stargrass, and Clasping-leaf pondweed were observed in low numbers outside of sampling locations*
Exotic and Invasive Species

- Eurasian Water Milfoil
- Curly Leaf Pondweed
Threatened and Endangered Plants, Animals and Natural Communities

- Black Huckelberry
- Cross Leaf Milkwort
- Lance Leaf Violet
- Long bearded Hawkweed
- Twisted Yellow-Eye Grass
- Plains Hognose Snake
- Blanding's Turtle
- Low Shrub Poor Fen
- Dry Barrens Prairie
Land Use Characteristics

<table>
<thead>
<tr>
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<th>Page</th>
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<tbody>
<tr>
<td>Historical</td>
<td>33</td>
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<tr>
<td>Current</td>
<td>34</td>
</tr>
<tr>
<td>Future</td>
<td>36</td>
</tr>
</tbody>
</table>
Historical Land Use Characteristics

[Map showing land use characteristics with different colors for various years of construction.]
Current Land Use

- Agricultural: 5%
- Commercial: 2%
- Industrial: 7%
- Major Highways: 4%
- Multifamily Residential: 0%
- Parks/Recreation: 18%
- Public/Semipublic: 3%
- Single Family Residential: 25%
- Vacant: 36%
Shoreline Characteristics

- **5 to 10% Impervious:** 11%
- **11 to 25% Impervious:** 16%
- **26 to 50% Impervious:** 6%
- **51 to 75% Impervious:** 1%
- **76 to 100% Impervious:** 4%
- **Short Grasses:** 1%
- **Agricultural Land:** 4%
- **Maintained Tall Grasses:** 1%
- **Forest:** 20%
- **Wetland Forest:** 13%
- **Wetland Shrub:** 6%
- **Wetland Emergent Veg:** 13%
- **Dry Tall Grasses:** 1%
- **Wetland Open Water:** 1%
- **Open Water:** 0%

Water Quality/Lake Management Plans/Ham Lake Management Plan/Existing Conditions

Date: 1/5/2017
Future Land Use

- **Apartment**: 0%
- **Golf Course**: 4%
- **Tax Exempt**: 20%
- **Industrial**: 12%
- **Residential**: 49%
- **Seasonal Recreational**: 12%
- **Tax Forfeit**: 3%

Water Quality/Lake Management Plans/Ham Lake Management Plan/Existing Conditions

1/5/2017
Zoning

Water Quality/Lake Management Plans/Ham Lake Management Plan/Existing Conditions

1/5/2017
Land Values

- Total Value = $43,656,600
Market Values
Social Demographic Characteristics

1. Population 41
2. Lake Dependent Economic Activities 42
3. Recreational Uses 43
4. Lake User Attitudes & Perceptions 45
Population

Water Quality/Lake Management Plans/Ham Lake Management Plan/Existing Conditions
Lake Dependent Economic Activities

- Fishing
- Ham Lake Camp Ground
- Parks and Recreation

- Approx. 160 camp sites
Recreational Uses

- Fishing
- Boating
- Camping
- Swimming

![Water Quality/Lake Management Plans/Ham Lake Management Plan/Existing Conditions](image-url)
Recreational Uses

Fish Houses

Resident Watercraft

- Canoe: 13%
- Fishing Boat: 36%
- Pontoon: 22%
- Paddleboat: 14%
- Runabout: 7%
- Wind Surfboard: 5%
- Jetski: 3%

Water Quality/Lake Management Plans/Hand Lake Management Plan/Existing Conditions
Lake User Attitudes & Perceptions

1. You like the abundant wetlands and attractive large lot rural character

2. You feel Connected to the Natural Environment of the Lake

3. You cherish autonomy, and independence

4. You like things small local, simple.
# Management Characteristics

<table>
<thead>
<tr>
<th>Topic</th>
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<tbody>
<tr>
<td>Aquatic Plants</td>
<td>47</td>
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<td>Fisheries</td>
<td>48</td>
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<tr>
<td>Lake Level</td>
<td>49</td>
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<td>Land Use</td>
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<td>Invasive Species</td>
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<td>Shoreline</td>
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<td>Storm Water</td>
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<tr>
<td>Water Quality</td>
<td>55</td>
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</table>
Aquatic Plant Management

**Feature**
- Cattail Removal
- Aquatic Plant Management
- Invasive Species Treatment (EWM, CLP)

**Agency & Method**
- DNR Permit
- DNR (6280.0350) - Pesticide control of aquatic macrophytes on all public waters and watercourses
- DNR Permit (Limited to 15% of littoral zone unless a LVMP on file + variance approved)
Fisheries Management

Feature

- Surveys & Investigations
- Stocking

Agency & Method

**DNR**


**DNR:**

Stocking 1954-1978

- Fgl
- Yrl
- Adl

Water Quality/Lake Management Plans/Exist Lake Management Plan/Existing Conditions
Lake Level

Feature
• Lake Elevation

Agency & Method
• DNR: Constructed dam
• Coon Creek WD & ACD: Monthly Lake level monitoring
<table>
<thead>
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<th>Feature</th>
<th>Agency &amp; Method</th>
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<tbody>
<tr>
<td>Planning &amp; Zoning</td>
<td>City of Ham Lake Planning Commission &amp; City Council</td>
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<tr>
<td>Stormwater/Water Quality Protection</td>
<td>City of Ham Lake-Ordinance</td>
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<tr>
<td></td>
<td>Coon Creek Watershed District-Rules</td>
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</table>
Invasive Species

Feature

• Prevention

• Early Detection & Monitoring

• Rapid Response & Eradication

• Long-Term Control & Management

• Education & Outreach

Agency & Method

• Anoka County – Education
• DNR-Education + Inspection Program
• Coon Creek WD-Education

• Coon Creek/ACD- Early Detection Monitoring (2X/yr)

• DNR+Coon Creek WD- EDRR Program
• DNR Rapid Response Program

• Ham Lake Lake Assoc- Contract Treatments

• Anoka County – Education
• DNR-Education + Inspection Program
• Coon Creek WD-Education
Recreational Use

Feature

• Public Access

• Water Quality Classification

Agency & Method

• DNR - Access

• City of Ham Lake – Park

• MPCA: Ham Lake is a Class 2B shallow lake with the following standards for aquatic life/recreation:

<table>
<thead>
<tr>
<th>Component</th>
<th>Standard</th>
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<tbody>
<tr>
<td>Phosphorus, Total</td>
<td>&lt;60 mg/L</td>
</tr>
<tr>
<td>Chlorophyll-a</td>
<td>&lt;20 mg/L</td>
</tr>
<tr>
<td>Secchi disk transparency</td>
<td>&gt;1.0 meters</td>
</tr>
</tbody>
</table>
### Shoreline

<table>
<thead>
<tr>
<th>Feature</th>
<th>Agency &amp; Method</th>
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</thead>
<tbody>
<tr>
<td>• Assessment of Condition</td>
<td>• DNR-Fisheries: Done as part of a lake survey</td>
</tr>
<tr>
<td></td>
<td>• ACD: Done periodically or at the request of another unit of government or homeowners group</td>
</tr>
<tr>
<td>• Excavation Of Public Waters</td>
<td>• DNR-Waters (MR 6115.0200) Limit the excavation of materials from the beds of public waters</td>
</tr>
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</table>
Storm Water

Feature

• Standards

• Planning, Regulation, Maintenance, Monitoring & Public Education

Agency & Method

• MPCA – NPDES Program

• City of Ham Lake – SWPPP
• Coon Creek WD - SWPPP
Water Quality

<table>
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<th>Feature</th>
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<tr>
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<td>MPCA – Water Quality Standards</td>
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<tr>
<td>Monitoring</td>
<td>Metropolitan Council – TMDL development</td>
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<td>MPCA – EQuIS Water Quality Data Base</td>
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