Agenda - DRSCW Activities Update

• Monitoring and Analysis – *Ongoing*
• The Preserve at Oak Meadows, Post Project Monitoring – *Complete*
• Springbrook Phase 2 Stream Restoration and Arrow Road Dam Removal – *Complete*
• Fawell Dam Modification – *Ongoing*
• Master Plan for Salt Creek at Fullersburg Woods - *(Motion)* – *Ongoing*
• East Branch DuPage River Stream Restoration Project – *in planning*
• West Branch DuPage River Stream Restoration Project – *in planning*
• Hammel Woods Dam Removal (Lower DuPage Watershed Coalition) – *Ongoing*
• Chloride Reduction and Trends Study – *Ongoing*
• Identification & Prioritization System Model – *Complete*
• Nutrient Implementation Plan – *Ongoing*
On-going basin assessments and analysis

• Rolling 4 year assessment of in-stream biology, habitat and water chemistry:
  o 2019 & 2023 – East Branch
  o 2020 & 2024 – West Branch
  o 2021 & 2025 – Salt Creek
  o 2022 & 2026 – No assessment

• Additional parameters (FOG, Fecal Coliform) collected to support MS4 reporting
DRSCW Projects

1. Oak Meadows
2. Fullersburg Woods
3. Fawell Dam
4. Lower East Branch
Project completed in 2016

• Mean QHEI increased from 57.25 pre-project to 69.3 in 2017, 70 in 2018 and 71.25 in 2019.
• Mean mIBI increased from 23.6 pre project (based on 2013 data) to 33.2 in 2017 to 34.9 in 2018 and to 40.85 in 2019.
• 13 of the 21 high value rheophilic taxa identified at the site were only identified post-project.
Distribution of Aquatic Invertebrate Biodiversity on Salt Creek

Habitat Ratings
- Excellent
- Good
- Fair

AQUATIC INSECTS
- Oak Meadows Dam
- Graue Mill Dam

Direction of Flow
Spring Brook (Wheaton Illinois, – Completed 2020
Spring Brook – 2018 Pre Project Data

Direction of Flow
Fish Species DuPage River, Mainstream (2012) & West Branch, fish species limited

- **Spring Brook (Arrowhead Dam)**.
- **Fawell Dam influence** – 12 fish species.
- **Hammel Woods Dam influence** – 5 fish species.
- **Channahon Dam influence** – 19 fish species.
Fish Index of Biotic Integrity

Fish Communities as Scored by FIBI, West Branch Dupage River 1983, 2006, 2009 and 2012

Fawell Dam Modification

Hanover Park MWRDGC
Hanover Park
Bartlett
West Chicago
Wheaton

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification

Fawell Dam Modification
Fawell Dam

GATES AT UPSTREAM END
DOWNSTREAM END OF BARRELS
LOOKING DOWNSTREAM
FISH LADDER SYSTEM
FISH LADDER SYSTEM

- Conceptual Cost: $250K - $400K

- Final Outlet Location TBD
- Debris Diverter / Protective Barrier
- Removable Section
- Fish Ladder Mounted to Wingwall
Fullersburg Woods and the Graue Mill Dam
Water Quality Issues at Fullersburg Woods

Salt Creek is listed as impaired by the Illinois Environmental Protection Agency and is not meeting Clean Water Act requirements.

• The dam blocks 16 native fish species populating the watershed upstream of the dam.
• Lowest dissolved oxygen levels on Salt Creek are found behind the dam.
• Poor in-stream and riparian habitat conditions due accumulated sediment are found in the impoundment.
Master Plan for Salt Creek at Fullersburg Woods

• Improve environment in Salt Creek by establishing fish passage, improving aquatic habitat, and improving the water quality of Salt Creek
• Protect taxpayers through adopting cost-effective and environmentally effective solutions
• Increase access to recreation and education opportunities along Salt Creek
• Preserve the historic Graue Mill and operation of the grist mill
2018-19 Public Opinion Research

- 2018-19 Telephone and Online Survey (615 responses)
  - Additional In-depth Interviews & a Focus Group

- Support dam modification to improve water quality: 81%
- Support dam modification to save taxpayers money: 79%
## Advertising Tactics for the Concept Master Plan

<table>
<thead>
<tr>
<th>Awareness</th>
<th>Education</th>
<th>Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Notice</td>
<td>RestoreSaltCreek.org</td>
<td>Virtual Open Houses</td>
</tr>
<tr>
<td>News coverage</td>
<td>Background videos</td>
<td>Stakeholder follow up</td>
</tr>
<tr>
<td>Newsletters</td>
<td>Fact sheets</td>
<td>Public comment form</td>
</tr>
<tr>
<td>Social Media</td>
<td>Stakeholder meetings</td>
<td></td>
</tr>
<tr>
<td>Email campaigns</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MASTER PLAN FOR SALT CREEK AT FULLERSBURG WOODS

HISTORY OF THE GRAUE MILL DAM AT FULLERSBURG WOODS

The Graue Mill Dam is located on Salt Creek adjacent to Graue Mill in the Fullersburg Woods Forest Preserve in the Village of Oak Brook. The dam is owned by the Forest Preserve District of DuPage County (FPDPC).

In the 1820s a brushwood dam was constructed on this site. This dam was destroyed a few years later by trunking (EAWE 1821-23). A log dam replaced the brushwood dam in 1854, which in turn was replaced by a plank and crib dam in 1876. The planks and cribs were washed away in 1876.

In 1933, the site was purchased by the FPDPC and in 1934 the Civilian Conservation Corps built the much shorter concrete dam that exists at the site today. The dam has a crest length of 112 ft. (34 m) and is 2 ft. (0.6 m) high. The impoundment created by the dam spans 15 acres and is approximately 1,400 linear feet in length. The current dam is not a recreation of an earlier period dam nor is it formally sized to power the mill which it still does.

The adjacent mill was originally constructed in 1852 and was totally refurbished by the Civilian Conservation Corps in 1934 (WHRM 1941). Since 1942, additional work has occurred at the mill including converting the grist mill operations to electricity.

DID YOU KNOW...

The Graue Mill grist mill still operates today, but it does not rely on the watershed for power. Instead, the internal gear and millstones are turned by an electric motor.
Open Houses and Comment Period

• Two Virtual Open Houses
  o July 7, 2020 at 7pm (78 attendees)
  o July 9, 2020 at 11am (71 attendees)
  o 120 views of the recorded webinars

• 30-Day Public Comment Period
  o 172 total responses received
  o Individuals were from 43 municipalities in Cook and DuPage Counties, 4 from out of state
  o 96 additional thoughts
Public Comment Results

- 91% of commenters support the Master Plan, (86% strongly support)
- Matches FPDDC 2019 Master Plan findings- “90% of respondents believe the protection of natural areas is the most important purpose of the Forest Preserve District”.

Rate your support for the Master Plan

- Strongly support: 86%
- Support: 5%
- Oppose: 1%
- Strongly oppose: 8%
License Agreement with FPDDC & Next Steps

- October 6, 2020: License Agreement for a Concept Master Plan for Salt Creek at Fullersburg Woods between the FPDDC and DRSCW
- October 2020 to December 2020: Solicitation of SOIs and RFPs and selection of Hey and Associates, Inc for Final Design and Preparation of Bid Documents
  - A motion is needed to increase the approved amount for the final design and preparation of contract bid documents for the Concept Master Plan for Salt Creek at Fullersburg Woods by $40,489 for a new total of $290,489.00.
- January 2021 to March 2022: Preparation of Construction Bid Documents and Bidding
  - In negotiations with MWRDGC to lead the bidding and construction phase of the project
- Spring/Winter 2022: Start of Construction
East Branch and West Branch DuPage River

• East Branch- SOI issued and complete, RFP to be issued in March

• West Branch – Projects under review
Hammel Woods Dam Removal (Lower DuPage)
2020 Deicing Workshops

Two Public Roads Deicing Workshops, Oct. 1 & Oct. 14 Polling results: Minimum of 470 attendees

One Parking Lots & Sidewalks Deicing Workshop, Oct. 8 Polling results: Minimum of 123 attendees


Webinars were attended by staff in DuPage, Will, Kane, Kendall, Lake, McHenry and Cook counties.

Fortin Consulting, Inc. presented the material.
The IPS utilizes watershed data at a regional scale and produces refined thresholds & other IPS factors, thus strengthening the overall assessment and WQ management process.

IPS Model Update

Merging Routine Watershed Monitoring & Assessment with IPS Tool and Model Development

Rotating Watershed M&A

Stressor Identification Process: Biocriteria Impairment with Stressor Threshold Analyses

Likely Causes & Sources of Impairment Identified

Implement Management Actions: TMDL NPDES Planning Stormwater Habitat Other
IPS Distribution of Sample Points

Watersheds
- Des Plaines
- Fox River
- Kishwaukee

Sources
- IEPA
- Lower DuPage Coalition
- DRSCW
- DRWW

Legend
- IEPA Sites selection
- DRWW Sites
- DRSCW
- LDPCWC
- County Boundaries
Landuse Datasets

CMAP Land Use Inventory

NRCS Soils Data

NLCD Imperviousness

DuPage ROW Data
QHEI Sensitive Fish Species

\[ y = -1.39 + 0.106x \quad R^2 = 0.965 \]

QHEI Sensitive Fish Species

\[ y = -2.5 + 0.187x \quad R^2 = 0.981 \]

**Stream Size**

<table>
<thead>
<tr>
<th>Aq. Life Use</th>
<th>IBI Biocriteria</th>
<th>Ref Values Median (IQR)</th>
<th>Threshold Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Headwater</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EWH</td>
<td>50</td>
<td>68 (64.5-74.0)</td>
<td>77.35</td>
</tr>
<tr>
<td>WWH</td>
<td>40</td>
<td></td>
<td>59.79</td>
</tr>
<tr>
<td>MWH</td>
<td>24</td>
<td></td>
<td>31.69</td>
</tr>
<tr>
<td>V. Poor</td>
<td>18</td>
<td></td>
<td>21.15</td>
</tr>
<tr>
<td><strong>Wadeable</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EWH</td>
<td>50</td>
<td>73.5 (67.5-80.0)</td>
<td>78.45</td>
</tr>
<tr>
<td>WWH</td>
<td>40</td>
<td></td>
<td>60.41</td>
</tr>
<tr>
<td>MWH</td>
<td>24</td>
<td></td>
<td>31.56</td>
</tr>
<tr>
<td>V. Poor</td>
<td>18</td>
<td></td>
<td>20.74</td>
</tr>
<tr>
<td><strong>Boatable</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EWH</td>
<td>48</td>
<td>83.5 (77.25-84.75)</td>
<td>76.65</td>
</tr>
<tr>
<td>WWH</td>
<td>38</td>
<td></td>
<td>60.06</td>
</tr>
<tr>
<td>MWH</td>
<td>24</td>
<td></td>
<td>36.83</td>
</tr>
<tr>
<td>V. Poor</td>
<td>18</td>
<td></td>
<td>26.88</td>
</tr>
</tbody>
</table>

**QHEI Stressor Rank:**

*QHEI* Stressor Rank:
<table>
<thead>
<tr>
<th>Stressor</th>
<th>FIT Score</th>
<th>Stressor</th>
<th>FIT Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious Land Use (500m)</td>
<td>0.01</td>
<td>Copper (Wat.)</td>
<td>1.75</td>
</tr>
<tr>
<td>QHEI Embeddedness Score</td>
<td>0.03</td>
<td>Lead (Wat.)</td>
<td>2.11</td>
</tr>
<tr>
<td>Urban Land Uses (WS)</td>
<td>0.03</td>
<td>Zinc (Sed.)</td>
<td>2.22</td>
</tr>
<tr>
<td>QHEI Overall Score</td>
<td>0.04</td>
<td>Benzo (g,h,i)perylene</td>
<td>2.32</td>
</tr>
<tr>
<td>QHEI Substrate Score</td>
<td>0.04</td>
<td>Indeno(1,2,3-cd)pyrene (Sed.)</td>
<td>2.41</td>
</tr>
<tr>
<td>QHEI Good Attributes</td>
<td>0.04</td>
<td>Copper (Sed.)</td>
<td>2.42</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>0.04</td>
<td>Benzo(b)fluoranthene (Sed.)</td>
<td>2.51</td>
</tr>
<tr>
<td>Impervious Land Use (30m)</td>
<td>0.04</td>
<td>Turbidity</td>
<td>2.61</td>
</tr>
<tr>
<td>Impervious Land Use (30m Clipped)</td>
<td>0.04</td>
<td>Nickel (Sed.)</td>
<td>2.67</td>
</tr>
<tr>
<td>Conductivity</td>
<td>0.05</td>
<td>Manganese (Wat.)</td>
<td>2.74</td>
</tr>
<tr>
<td>QHEI Channel Score</td>
<td>0.07</td>
<td>Benzo(a)pyrene (Sed.)</td>
<td>2.85</td>
</tr>
<tr>
<td>QHEI Silt Cover Score</td>
<td>0.07</td>
<td>Pyrene (Sed.)</td>
<td>2.85</td>
</tr>
<tr>
<td>Developed Land Use (WS)</td>
<td>0.07</td>
<td>Voluble Suspended Solids</td>
<td>2.81</td>
</tr>
<tr>
<td>Minimum D.O.</td>
<td>0.10</td>
<td>Lead (Sed.)</td>
<td>3.01</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>0.10</td>
<td>Nickel (Wat.)</td>
<td>3.26</td>
</tr>
<tr>
<td>Impervious Land Use (WS)</td>
<td>0.10</td>
<td>Benzo(a)anthracene (Sed.)</td>
<td>3.48</td>
</tr>
<tr>
<td>Hydro-QHEI Depth Score</td>
<td>0.11</td>
<td>Chrysene (Sed.)</td>
<td>3.51</td>
</tr>
<tr>
<td>QHEI Poor Habitat Attributes</td>
<td>0.12</td>
<td>Fluoranthene (Sed.)</td>
<td>3.91</td>
</tr>
<tr>
<td>Hydro-QHEI Overall Score</td>
<td>0.13</td>
<td>Strontium (Sed.)</td>
<td>4.44</td>
</tr>
<tr>
<td>Zinc (Wat.)</td>
<td>0.13</td>
<td>Dibenzo(a)anthracene (Sed.)</td>
<td>4.57</td>
</tr>
<tr>
<td>Hydro-QHEI Current Score</td>
<td>0.14</td>
<td>Agricultural Land Use (WS)</td>
<td>4.82</td>
</tr>
<tr>
<td>TKN</td>
<td>0.14</td>
<td>Anthracene (Sed.)</td>
<td>5.10</td>
</tr>
<tr>
<td>QHEI Pool Score</td>
<td>0.15</td>
<td>Phenanthrene (Sed.)</td>
<td>5.10</td>
</tr>
<tr>
<td>Heavy Urban Land Use (WS)</td>
<td>0.17</td>
<td>Arsenic (Sed.)</td>
<td>6.21</td>
</tr>
<tr>
<td>Chloride</td>
<td>0.17</td>
<td>Chromium (Sed.)</td>
<td>6.29</td>
</tr>
<tr>
<td>QHEI Cover Score</td>
<td>0.17</td>
<td>Sulfate</td>
<td>6.49</td>
</tr>
<tr>
<td>BOD (5-Day)</td>
<td>0.21</td>
<td>Manganese (Sed.)</td>
<td>7.08</td>
</tr>
<tr>
<td>QHEI Riffle Score</td>
<td>0.27</td>
<td>Silver (Sed.)</td>
<td>7.11</td>
</tr>
<tr>
<td>Total Ammonia</td>
<td>0.28</td>
<td>Aluminum (Sed.)</td>
<td>8.26</td>
</tr>
<tr>
<td>Nitrate</td>
<td>0.29</td>
<td>Barium (Sed.)</td>
<td>8.88</td>
</tr>
<tr>
<td>Sodium</td>
<td>0.29</td>
<td>Arsenic (Wat.)</td>
<td>9.19</td>
</tr>
<tr>
<td>QHEI Gradient Score</td>
<td>0.31</td>
<td>Potassium (Wat.)</td>
<td>10.13</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>0.32</td>
<td>Cadmium (Sed.)</td>
<td>11.00</td>
</tr>
<tr>
<td>Maximum D.O.</td>
<td>0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadmium (Wat.)</td>
<td>0.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arsenic (Sed.)</td>
<td>1.26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Permittee shall submit a NIP for the DRSCW watersheds that identifies *phosphorus input reductions* by point source discharges, non-point source discharges and other measures necessary to remove DO and offensive condition impairments and meet the applicable dissolved oxygen criteria in 35 IL Adm. Code 302.206 and the narrative offensive aquatic algae criteria in 35 IL Adm. Code 302.203.

The NIP shall also include a schedule for implementation of the phosphorus input reductions and other measures.

The Permittee may work cooperatively with the DRSCW to prepare a single NIP that is common among DRSCW permittees.

The NIP shall be submitted to the Agency by December 31, 2023.
NARP Essential Elements

- Watershed group or participating members
- Impairments or Risk of Eutrophication factors identified
- Phosphorus input sources identified, along with land use and acreage
  - Majors
  - Minors
  - MS4s
  - Industrial Stormwater Permittees
  - Non-point sources
- Effluent/stream monitoring
- Modeling used and findings
NARP Essential Elements

- Supported by data and sound scientific rationale
- Must cooperate with and work with other stakeholders in the watershed
- Target Levels
  - Recommendations by the Nutrient Science Advisory Committee – Dec 2018
  - Develop its own watershed-specific target levels
- Identify phosphorus input reductions from point sources and non-point sources
- Schedule for implementation
- Provisions for water quality trading
DRSCW/LDWRC NIP Concepts

• Data Driven
• Consistent with our Biodiversity Approach
• Consistent with our existing Adaptative Management Approach for TMDL Implementation
• Expanded beyond just nutrients to include all impairments
DRSCW/LDWRC NIP Components

• Identification and Prioritization System (IPS)
• QUAL2Kw models for DuPage River and Salt Creek watersheds
• NPS Feasibility Analysis
  - Leaf Litter and Street Sweeping
• Nutrient Trading Program
  - Point Source to Point Source
  - Stream Restoration Crediting
• Chloride Reduction
• Expanded DO Monitoring & chlorophyll A monitoring
QUAL-2Kw Modeling

Objective: Simulate the transport and fate of water quality parameters (DO, temp, nutrients, CBOD, algae) in the Upper and Lower DuPage River and Lower Salt Creek. Models will be used to evaluate and prioritize projects (scenarios) based on their impact on water quality.

2020 Activities
-- Data Collection
-- Calibration, validation, and sensitivity analysis of East Branch DuPage and Salt Creek models

2021 Work Plan
-- Calibration, validation, and sensitivity analysis of Lower DuPage River and West Branch DuPage models
-- Scenario Runs
Nonpoint Source Feasibility Analysis

**Objective:** To identify and quantify nutrient inputs from nonpoint sources (NPS). Identify potential projects aimed at the reduction of NPS nutrients and other pollution.

**2020 Activities**

-- Developed spatial file of intersection of canopy and transportation network to identify areas of high potential for leaf litter debris in streets. (Thanks to V3 for pro bono assistance)

**2021 Work Plan**

-- Assess NPS reductions from leaf litter and street sweeping through a member survey
Nutrient Trading Program

Objective: To analyze the feasibility (supply-demand) of nutrient trading that:

1) Focus on nutrient trading viability among POTWs
   - Results: Variation in TP removal costs indicates the potential for trading within and between each subwatershed
   - Completed in 2018/2019

2) Analysis of stream restoration crediting
   - Multiple meetings between MBI and Trading Team in 2020 to discuss the use of IPS
   - Proposed scope changes to be discussed with Special Condition Permit Holders in March 2021
Expanded DO Monitoring Program

**Objective:** To evaluate the degree of nutrient enrichment effects in streams and calibration/validation of QUAL2Kw models

**Program Description:**
-- Minimum 4 day effort per site
-- Continuous sampling (every 15 minutes) of DO, pH, conductivity, temperature, chlorophyll A, and turbidity
-- Water quality sampling (1 composite samples per site)
-- Benthic algae sampling (1 sample per site)
-- Flow sampling (1 cross section per site)
-- Samples collected immediately downstream of POTWs, headwaters, and major tributaries

**Work Plan (coordinated with Bioassessment):**
2019: East Branch DuPage River
2020: West Branch DuPage River
2021: Salt Creek & Lower DuPage River

<table>
<thead>
<tr>
<th>Water Quality Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 day BOD</td>
</tr>
<tr>
<td>5 day CBOD</td>
</tr>
<tr>
<td>TSS</td>
</tr>
<tr>
<td>TDS</td>
</tr>
<tr>
<td>Chloride</td>
</tr>
<tr>
<td>Conductivity</td>
</tr>
<tr>
<td>Total Organic Carbon</td>
</tr>
<tr>
<td>Total Dissolved Carbon</td>
</tr>
<tr>
<td>Ammonia</td>
</tr>
<tr>
<td>N-NO2</td>
</tr>
<tr>
<td>N-NO3</td>
</tr>
<tr>
<td>TKN</td>
</tr>
<tr>
<td>TP</td>
</tr>
<tr>
<td>Orthophosphate</td>
</tr>
<tr>
<td>Total dissolved phosphorus</td>
</tr>
<tr>
<td>Chlorophyll A</td>
</tr>
</tbody>
</table>
Question & Answer