Headwater Assessment
Perspectives from Halton and Beyond

Nyssa Clubine, M.Sc
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Flow Direction

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• Project Initiation
  – Case Study: Premier Gateway

• The Upstream Extent
  – Case Study: North Oakville
  – Case Study: Barrie Annex Lands

• Data Collection
  – Case Study: Ninth Line Lands

• Data Management
Organization and Coordination

Headwater assessments need:

- Mapping / Aerial Images
- ArcHydro modelling
- Landowner Permission
- A responsive field crew
- Good organization, and
- Co-ordination
Case Study: Premier Gateway

Premier Gateway Lands

Halton Hills

Approximately 3km²

Sixteen Mile Creek Watershed
Case Study: Premier Gateway

1. Timing
2. Project initiation delays
3. Site access / Landowner permission
4. Seasonality
5. Project team co-ordination
The Age Old Question

Where does it begin?
Locating the Upstream End

- Locate during Site Visit 1
- Start with ArcHydro mapping or air photo locations
- Document the location with a UTM and photos
- Remember, these are dynamic features!
- Agency confirmation
Case Study: North Oakville

North Oakville
Approximately 31km²
Sixteen Mile Creek Watershed
Case Study: North Oakville

- Multiple consulting firms
- Red, blue, green ranking system
- Locating the upstream extent was important
- Site visits and agency confirmation
Case Study: Barrie Annex Lands

Barrie Annex Lands - Salem
Approximately 15km²
Lake Simcoe and
Nottawasaga River
Watersheds

Barrie Annex Lands – Hewitt’s
Approximately 9km²
Lake Simcoe Watershed
Case Study: Barrie Annex Lands

- Similar format to North Oakville
  - Multiple consulting firms
  - Red, blue, green ranking system

- Similar results

- Site visit to confirm upstream extent
Data Collection

- Multiple consultant teams
- Coordinated effort for site visit 1
- Changes in feature type
  - Significant changes between site visits
Case Study: Ninth Line Lands

Ninth Lands
Mississauga
Approximately 3km²
East Lisgar Branch
Sixteen Mile Creek Watershed
Case Study: Ninth Line Lands

- Co-operative data collection
- Limited results
Data Management

• Needs to start at the very beginning of a project:
  - Establish a database,
  - Pre-label features where possible
  - Assign a data manager

• The more headwaters the more difficult data management can be
Data Management

- Stream Code
- Feature Code
- Field Crew
- Consultant
- Date of Fieldwork
- Direction of Assessment
- Site Visit Number
- Flow Influence
- Segment Code
- Start, End, or Transition Point
- Waypoint (GPS Coordinate)

- Waypoint ID
- Feature Type
- Feature Modifier
- Flow Condition
- Sediment Transport from Adjacent Lands
- Sediment Transport from Valley
- Sediment Deposition
- Feature Vegetation
- Riparian Vegetation 0-1.5m
- Riparian Vegetation 1.5-10m
- Riparian Vegetation 10-30m

- Feature Width
- Bankfull Width
- Channel Depth
- Width Measurement Type
- Flow Estimate when >0.5L/s
  - Hydraulic Head
  - Distance by Time
  - Volume by Time
  - Estimated Discharge

- Point Features
  - Waypoint (GPS Coordinate)
Final Thoughts

• Need standardized protocol

• Integration of definitions

• Need to be included in all environmental processes

• Headwaters are connectors and require an holistic approach
Final Thoughts

• Common sense and an open mind

• Meeting objectives requires unique solutions

• Management requires unique engineering solutions