Opportunities under the Drainage Act

Frank Jonkman, Past President
Drainage Superintendents Association of Ontario
Past practice, we knew how to drain land...

- The Drainage Act provides landowners with a means to implement land drainage

- Drainage channels were often constructed as a straight trapezoidal channel, removing water from the landscape quickly

- Field tiles often use these channels as outlet

- It was a Point A to Point B process

- Straight channel design accelerated nutrient and sediment run-off
Drainage Act defines “drainage works” as:

• a drain constructed by any means,
• including the improving of a natural watercourse,
• and includes works necessary to regulate the water table or water level within or on any lands
• or to regulate the level of the waters of a drain, reservoir, lake or pond,
• and includes a dam, embankment, wall, protective works or any combination thereof
So... What can we do collectively?

- What can be done?
- Where does restoration make sense?
- Where can natural channel designs and habitat improvements be included into and protected by the drain?
- Is there opportunity to improve water quality?
Buffers slow water runoff, trap sediment, and enhance filtration within the buffer

Improve water quality by removing sediment, fertilizers, pesticides, pathogens, and other potential contaminants from runoff

Enhance fish and wildlife habitat

Reduce flooding

Improve soil quality

Control soil erosion by both wind and water, thus reducing drain maintenance costs
Design features that can work...two stage channel design

- A drainage design by observing the natural processes of stable streams and rivers that could relieve erosion and scouring that conventional ditches may cause.

- This design allows the water to have more area to spread out on and decreases the velocity - or energy - of the water. This design can actually increased the amount of water that the ditch can process by constructing the benches, or floodplain area. This not only improves the water quality, but also improves the biological conditions.

- This design, as part of a drainage channel will benefit both agriculture and the environment.
Design features that can work... Newbury Weir

- Helps control the flows in the drain, which will reduce scouring and erosion
- These structures can change drain morphology characteristics
- Retains water on the landscape for longer periods of time
- Riffles provide oxygenation
- Can provide fish passage and be used for grade control
- Can also be used for low level crossings

Bertie ROW, Fort Erie
Design features that can work...water control structures

- The water control structures restoring the wetland have legal existence under the Drainage Act and are operated and maintained by the local municipality.
- Water levels are controlled, allowing a wetland to be restored without impact to agricultural activity.
- Improved surface and groundwater storage, discharge and recharge functions during dry periods.
- Improved agro-ecosystem health with the coexistence of wetlands and municipal drains and established buffer zones between natural areas and agriculture.

Dry Creek, Norfolk County
Design features that can work...habitat features, Vernal Pool

- A Vernal Pool under construction as part of a municipal drain, including littoral shelves, gravel substrates and root boles.
- These ephemeral wetlands are seasonally flooded and generally isolated from stream systems. These pools become dry annually, or at regular intervals and are generally absent of fish.
- Pool is online during peak flows and offline during low flow periods.
- Provision and support of fish and wildlife habitats.

Bertie ROW, Fort Erie
Design features that can work...natural channel design

- Uses natural stabilization methods such as large boulders and woody structures that support vegetation and do not need to be replaced.
- Takes into consideration sediment transport and tries to balance erosion and depositional forces so that the stream is stable over time.
- Lower initial cost and lower maintenance cost if specific criteria are met.

Beaver Creek, Fort Erie
Bertie ROW, Fort Erie
...practical considerations...

- Land use through reach of the drain including impact to existing drainage and tiled systems
- That not all components will work in all systems
- Changes to an existing drain will require a new engineering report
- All work performed under the Drainage Act is assessed as a ‘user pay’ to the benefitting landowners. What is the societal benefit of environmental enhancements and how should these costs be addressed?
- Projects should be scoped as part of the design process, participation and constructive input is needed
“We are made wise not by the recollection of our past, but by the responsibility for our future.”

-George Bernard Shaw