

---

# Dam Removal in Ontario: Successes and Challenges

Instream Barrier Removal Workshop – November 29, 2023  
Tiffin Center for Conversation – NVCA – Utopia, Ontario  
Sponsored by the American Fisheries Society Ontario Chapter

Presented by Jeff Graham, P. Eng. President  
GSS Engineering Consultants Ltd.  
Owen Sound, Ontario



# Why Remove Dams?

- Reduce chance of human injury or death
- Improve fish passage
- Reduce summer warming and winter cooling
- Restore sediment transport
- Restore natural stream habitat
- Climate Change – reduce chance of catastrophic failure during a major flood
- Climate Change – reduce super heating of water under Heat Dome conditions

# Dam Removal Considerations

- Permitting – what permits required? How long will it take to get permits?
- Water management – how do you avoid working in the water as much as possible?
- Sediment management – How much? What kind? Contaminant analysis? What to do with sediment and how to remove – where to dispose of.
- Site Access – can you access both sides of dam? Or do you have to remove dam from one side?
- Final site condition – how should the site look after dam is gone? New recreational opportunities?
- Shoreline stabilization – how much rip rap and size? What local shore features are at risk?
- Remove the whole dam – or just partial removal?
- Funding – how much will project cost? What funding is available?

## Example Dam Removal Projects by GSS Engineering

- The following pages highlight 10 dam removal projects completed (or in progress) by GSS Engineering since 2015.
- All of the dams were quite old, and most were in poor structural condition. None of the dams were still used for the original purpose.
- In most cases the Owner wanted the dam removed to reduce liability and maintenance costs.
- Most of the projects featured different challenges in regard to site access and water management.
- Sediment volumes and depths varied significantly at each dam site.
- The projects ranged from smaller, cold water brook trout streams to larger, warm water rivers.
- Six of ten dam removals featured improved access for migratory trout and salmon from Lake Huron or Georgian Bay.
- Earlier projects were funded in part by the DFO's former Recreational Fisheries Conservation Partnership Program

# Lockerby Dam Removal – North Saugeen River near Paisley (2015)



- Minimum sediment at this location
- Site access on far side of dam a challenge – required private property access arrangements

# Haines Dam Removal – Beaver River in Clarksburg (2016)



- Significant volume of coarse, cobble sediment stored in head pond. Some removed
- Very significant volume of large rip rap placed along west side to protect river front homes
- Remnants of dam on east side of the river left in place as no easy access on east side.

## Hamel Dam Removal – Otter Creek in Mildmay (2016)



- Minimal head pond sediment as head pond largely drained previously
- Portion of former head pond filled with pit run gravel/topsoil/seeded etc. for new park land
- Remnant of dam base left in place to control upstream head cutting of remaining sediment

## Rotary Park Dam Removal – Armstrong Creek in Markdale (2017)



- High-quality, cold-water stream with native brook trout.
- Project to remove former on line swimming pond led by local Rotary Club
- Fortunately, existing bypass pipe was in place which allowed dam removal, and construction of new stream channel, to be done “in the dry”



# Truax Dam Removal – Saugeen River in Walkerton (2019)



- Minimal sediment upstream of dam due to high flood flow energies through head pond.
- Access on south side a major challenge. New gravel access road built to avoid driving on flood berm.
- Partial dam removal created new, elevated public space in corner of former head pond.

## Town Pond Dam Removal – Armstrong Creek in Markdale (2020)



- Partial dam removal in order to store sediment in residual head pond
- Series of set pools through based of former dam has created a major, scenic waterscape feature
- New nature and interpretative trail has been built on former head pond sediment for entire length of head pond.

## Gorrie Dam Removal – North Maitland River in Gorrie (2021)



- Earthen berm portion of dam had failed twice previously during June 2017 flood and February 2018 high water event
- Project included new low flow channel design downstream of dam site
- Overall project featured significant landscaping of entire site including site drainage

## Park Head Dam Removal – Sauble River in Park Head (2021)



- Dam had failed at west end – the flanking flood flows seriously eroded the adjacent private property and risked destroying a residential home.
- During design and permitting process, owner of dam died. MNRF would not issue LRIA permit to the estate of the deceased. The estate trustee reluctantly agreed to be the LRIA applicant.

## Adam Street Dam Removal – Otter Creek in Mildmay (2022/2023)



- This dam featured 400 m long head pond that was full of sediment to 8' deep.
- While sediment plan established, effective sediment management proved to be very difficult.
- Bypass pipe installed to allow sediment work to be done “in the dry” but bypass pipe installs are very complicated.

## Howson Dam Removal (proposed) – North Maitland River in Wingham (in progress)



- Project still in permitting phase. Two permit applications took almost 1.5 years
- Permitting on this project has now expanded to 5 federal and provincial ministries/departments
- Conversely, no significant sediment upstream of dam and very good dam access both sides.

## Howson Dam Removal (proposed) – North Maitland River in Wingham (in progress).....continued



- South part of dam (left above) has been structurally condemned and could fail anytime.
- Structural reports - completed 40 years ago – concluded there was no compressive concrete strength in south part of dam. South part of dam is over 100 years old.
- North part of dam added more recently but is still 57 years old.

## Howson Dam Removal (proposed) – North Maitland River in Wingham (in progress).....continued



- Pictures of June 2017 flood caused by non forecasted “training” thunderstorms. Up to 150 mm in short period.
- Env Can flow gauge upstream estimated flow as 410 cms.
- Spillway capacity of dam close to exceedance during event. Large trees or debris did not partially block the spillways but could have.



**THANK YOU!**

Questions and Comments