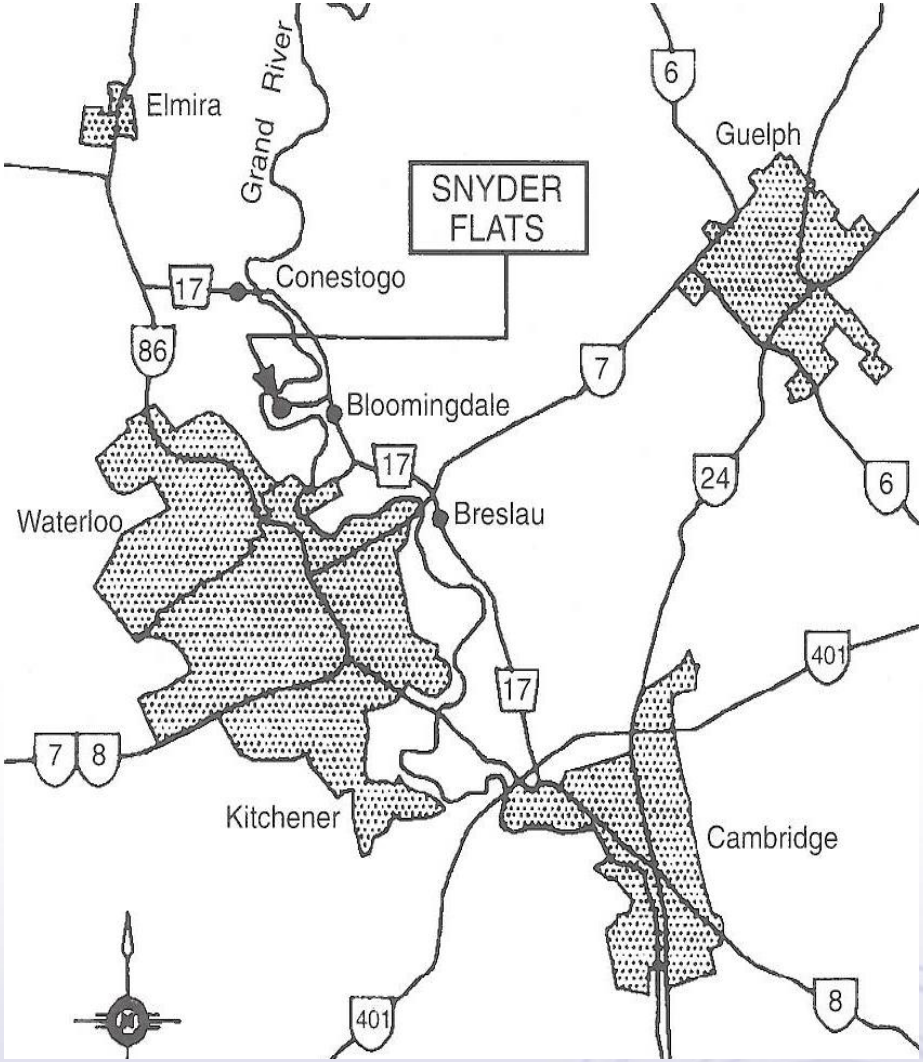
Once Upon a Gravel Pit: Reconnecting Floodplain through Aggregate Extraction

5th International Conference
on Natural Channel Systems
September 26, 2016

The Story of Snyder's Flats



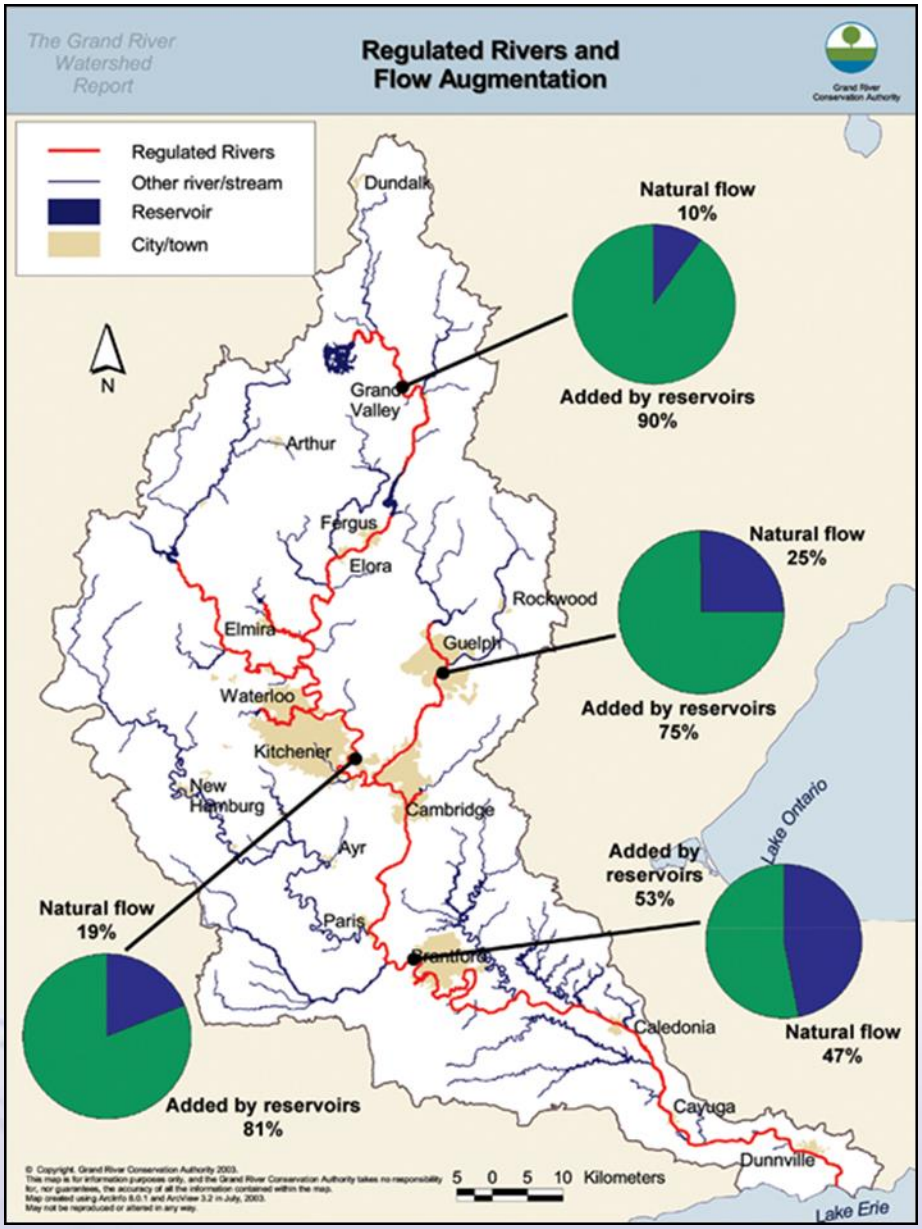
- Historical influences on the site
- Identifying gravel and proposing a model for environmentally friendly aggregate extraction
- Restoration beyond the floodplain
- 25 years later – Snyder's Flats Management Plan

Historical Influences

- Retreat of the Laurentide Ice Sheet altered the landscape and meltwater channels deposited well-sorted cobbles, gravels and sands
- Settle in 1807 by Jacob Snyder, gradually cleared and remained mix farming until 1960s

Historical Influences

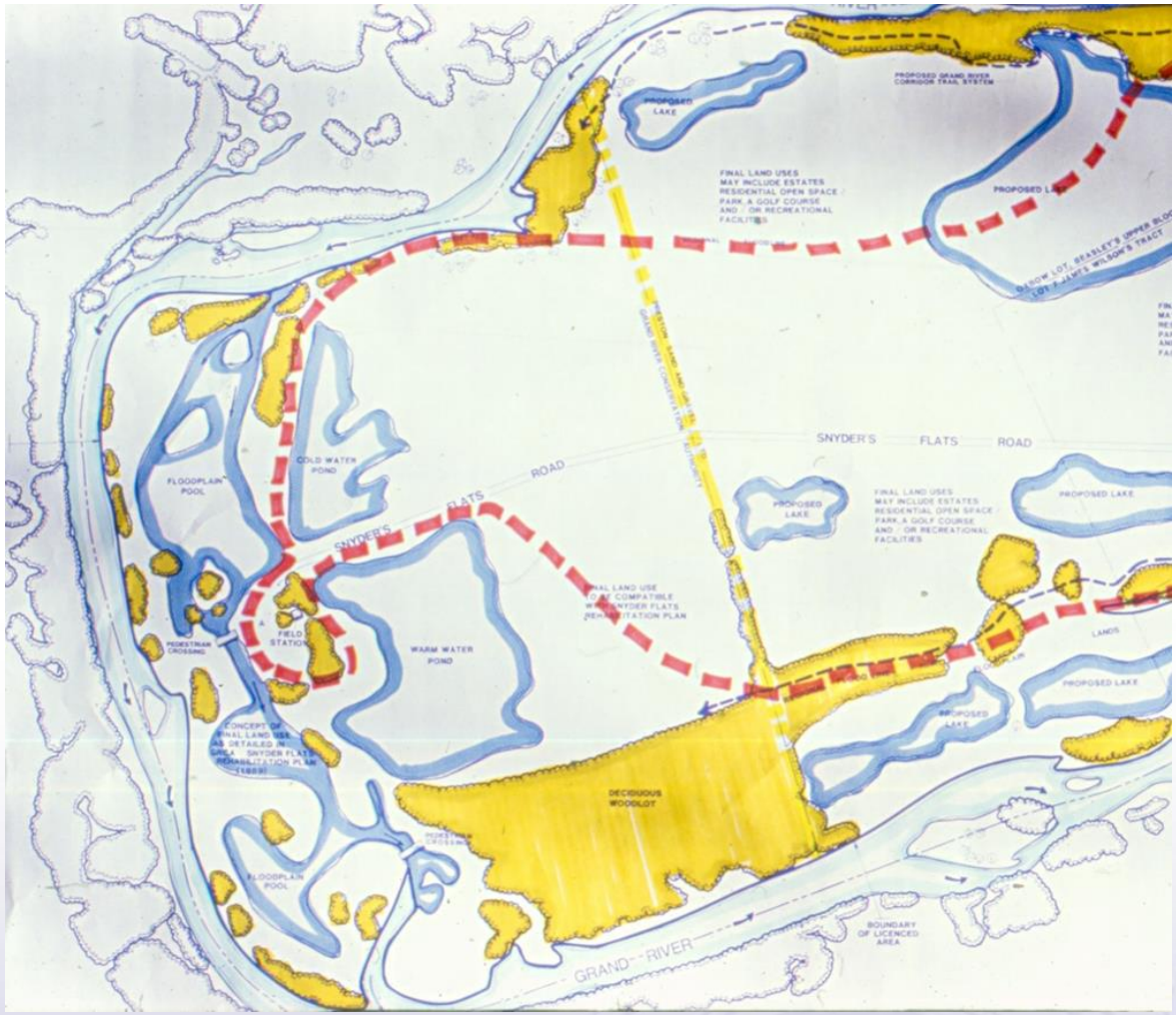
- Between 1942 and 1976 the GRCA built seven multi-purpose reservoirs for flood damage reduction low-flow augmentation
- In 1969, the GRCA purchased the flats as part of the K-W Valley Lands Acquisition Program to reduce flooding & erosion risks.

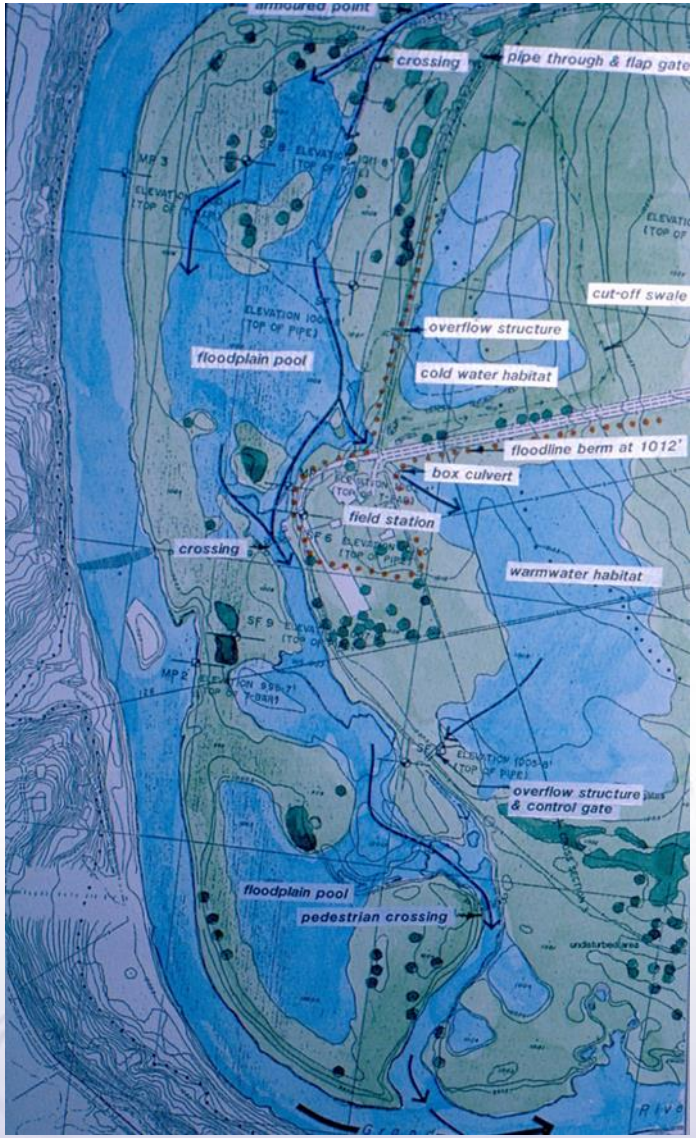


Identifying the Aggregate Resource

- Beginning in 1979, the GRCA worked with Preston Sand & Gravel to extract gravel with the vision of modeling an “environmentally friendly” approach
- Extensive below the water table resources confirmed in 1987 creating an opportunity to prepare a site plan for enhancing local aquatic and wildlife habitats

The Design Concept





The Big Dig (1988-1990)

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Reconnecting the Floodplain

The Early Years (1990 – 1996)

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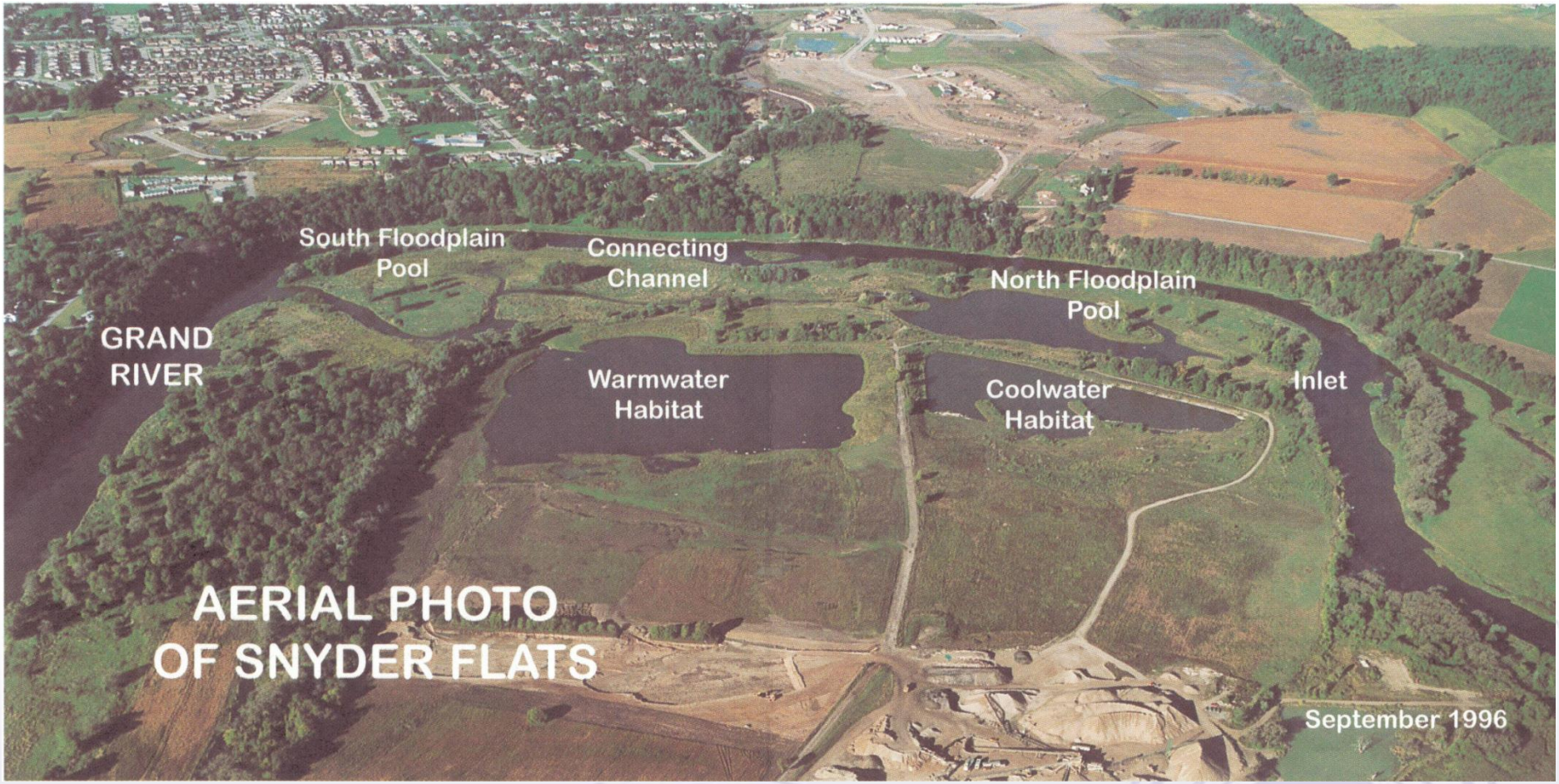
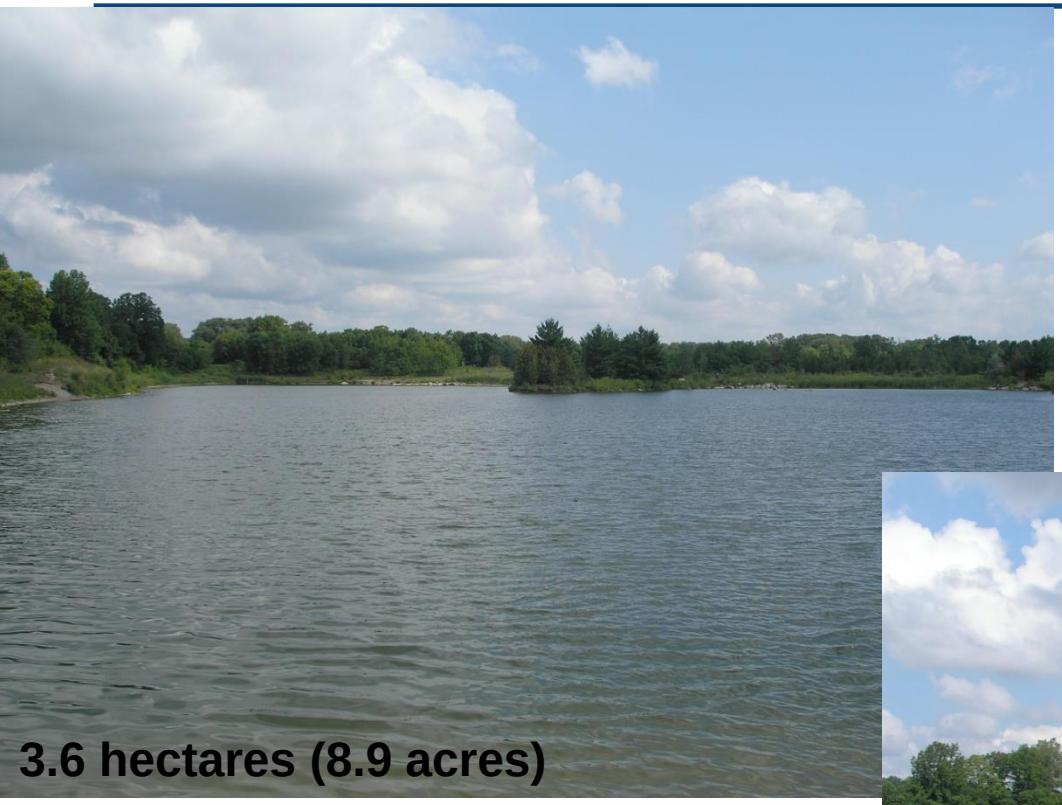


Snyder's Flats – Present Day

The Warmwater Habitat

- Pond depths range between 0.2m to 7m providing spawning and nursery habitat

Snyder's Flats – Present Day



The Coolwater Habitat

- Pond depths range between 0.6m to 6m
- Design includes vegetated finger projections to minimize thermal mixing caused by wind gusts

Snyder's Flats – Present Day

Flood Plain Pools & Connecting Channel

- Riffles oxygenate water and contribute to sustaining aquatic life

Restoration Beyond the Floodplain

Year 1, 2009
-16,000 trees planted
-1st Kiosk
-Project launch

Year 2, 2010
-20,000 trees planted
-Prescribed burn & seeding
-Trail design & construction
-Installation 2nd kiosk and benches

Year 3, 2011
-7,100 trees planted
-2,500 trees replanted
-5,000 trees tended
-Trail upgrades continued
-Interpretive signage
-Ongoing monitoring

2012 - 2016
- Invasive plant control
-Trail maintenance
- Tree Maintenance & Tending
- Adaptive infill tree planting
- Approx. 1000 trees/year

Management Plan update

- **In response to growing public recreational usage of the property, an update to the Snyder's Flats Conservation Area Management Plan was completed in 2015**
- **Restoration objectives were reviewed and the following monitoring was carried out:**
  - Fisheries surveys
  - Breeding bird surveys
  - Amphibian surveys
  - Incidental Wildlife Observations
  - Completion of ELC mapping for vegetation communities
- **Summarize 25 years of restoration efforts**

Historical Fisheries

- **1966: *Biological Survey of the Grand River and its Tributaries* identifies 8 species of fish in the Grand River in the vicinity of Snyder's Flats**
- **1988: 8 species of fish identified**

Extraction of gravel and development of ponds

- **1991-1996: over 5 years a total of 26 species of fish identified in the new aquatic habitat features**

Fisheries Results in 2015

Fisheries monitoring confirmed 33 species of fish including Silver Shiner a provincially threatened species at risk

Was it a Happy Ending?

- From farmland to aggregate pit to valuable wildlife habitats – evolved into diverse ecological landscape
- Demonstrated environmentally friendly approach to gravel extraction
- 92 hectares of passive recreation area
- Creation of 17 hectares of pond & floodplain habitat
- 1000's of trees planted and early succession transition habitat establishing
- Generated approximately $2.4 M

To Learn More

- Snyder's Flats Management Plan is available online at www.grandriver.ca

- GRCA Natural Heritage department, Crystal Allan callan@grandriver.ca

- Visit the conservation area – access via Snyder's Flats Rd near the village of Bloomingdale