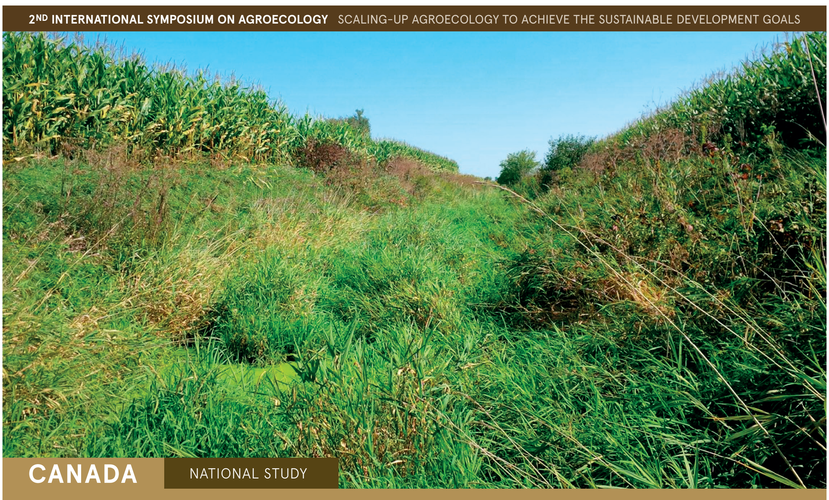


CANADA NATIONAL STUDY

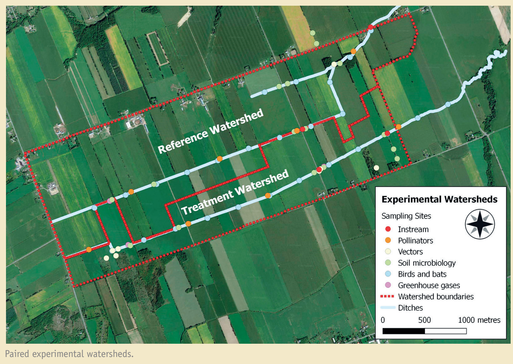
AGROECOLOGY RESEARCH BY AGRICULTURE AND AGRI-FOOD

IMPACTS OF STREAM DREDGING AND RIPARIAN ZONE CLEARING

In many regions of Canada,the footprint of agriculture is increasing. This often results in excessive losses of wildlife habitat and biodiversity, increases in GHG emissions and carbon losses, and degradation of water quality and soil resources. This project aims at conserving, protecting and valuing natural features, such as riparian zones, wetlands, woodlots and vegetated fence lines, in order to make agro-ecosystems more resilient to environmental and anthropogenic changes.

PROBLEM

In many regions of Canada, the footprint of agriculture is increasing. This often results in excessive losses of wildlife habitat and biodiversity, increases in GHG emissions and carbon losses, and degradation of water quality and soil resources. For an agro-ecosystem to be resilient to environmental and anthropogenic changes, natural features, such as riparian zones, wetlands, woodlots and vegetated fence lines should be conserved, protected and valued for the services they provide both the agricultural sector and receptors of ecological concern.



Paired experimental watersheds.

EXPERIMENTAL WATERSHEDS

- South Nation river basin: eastern Ontario, Canada
- Paired experimental watersheds; livestock cropping
- BACI experimental design: 2-4 years before-treatment monitoring; 5-8 post treatment monitoring
- Treatment watershed: clear/ dredge linear riparian features
- Sub-sites shaded and not shaded by trees

WATERSHED MONITORING

- Water monitoring of nitrogen, carbon, phosphorous, pesticides, pathogens, total suspended solids, aquatic invertebrates and vertebrates and hydrology
- Beneficial insect trapping, bird and bat monitoring
- Carbon store characterization and vegetation diversity
- Mosquito sampling and habitat monitoring

CURRENT AND PROJECTED FINDINGS

The recovery timeline for a selection of environmental and agronomic targets:

- Less than 3 years after intervention
  - Recovery of natural pollinators and beneficial insects
- Between 3 and 10 years after intervention:
  - Pesticide dissipation in the stream
  - Nutrient transport abatement
  - Partial recovery of aquatic invertebrates
  - Reduced waterborne pathogen exposure to livestock
  - Reduction of sediment and soil loss
  - Control of instream flood
- After 10 years after intervention
  - Partial recovery of terrestrial vertebrates
  - Recovery of woody carbon and carbon storage
  - Recovery of shelterbelt services
  - Increase of GHG emissions

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