

COMMON REED (*Phragmites australis*) in freshwater marshes: 'biological deserts' revisited



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LAVAL

Delaware Bay (NJ, USA): common reed stands



St. Lawrence River (QC, CAN): common reed stands



Îles-de-Boucherville National Park (Montréal, QC, CAN)

Common reed stands, September 2010

(remote sensing)



Îles-de-Boucherville National Park



May 2010

Common reed: perception (sobriquets)

North American newspapers, 1989 to 2012

(Eureka search engine; n = 125)



Common reed: perception (impacts on biodiversity)

North American newspapers, 1989 to 2012

(Eureka search engine; n = 125)

- **Detrimental to WETLANDS (habitats, hydrology): 76**

Dries marshes, reduces tidal inundation, chokes pools...

- **Detrimental to PLANTS: 51**

Chokes native vegetation, creates monocultures, reduces plant diversity...

- **Detrimental to ANIMALS: 32**

Squeeze out mammals, creates poor nesting sites for birds or second choice fish habitat...

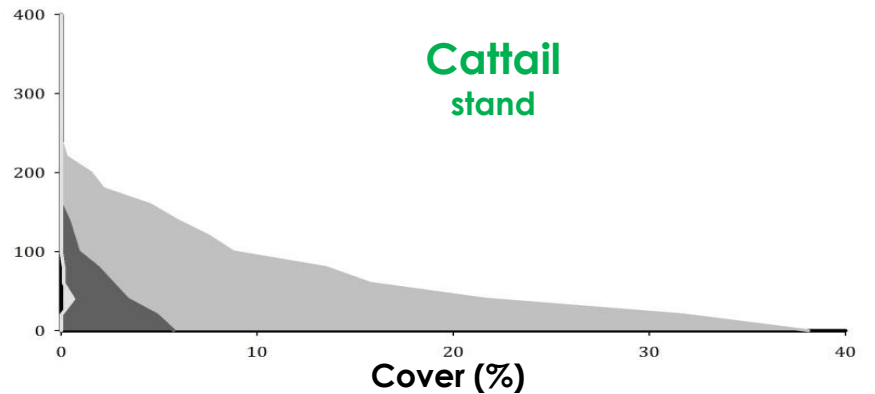
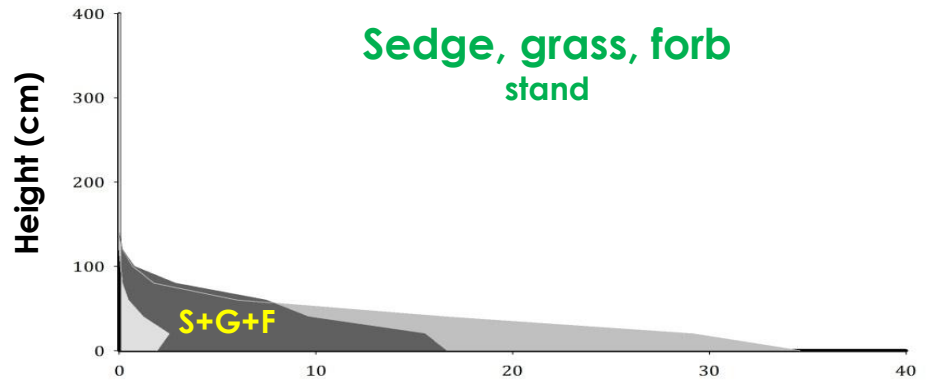
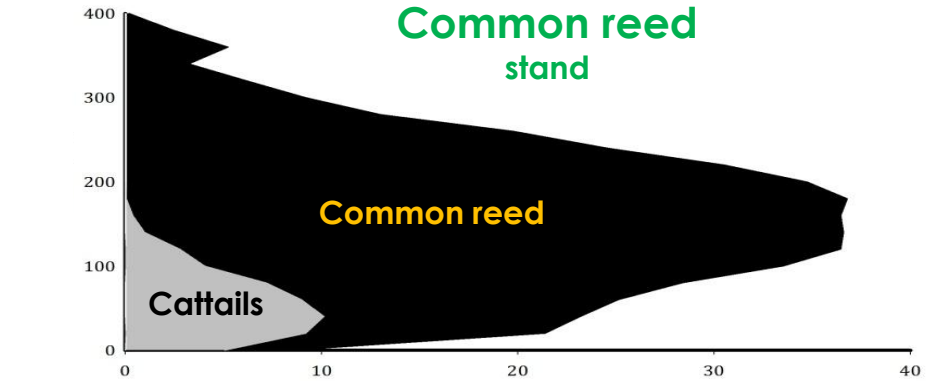
- **Detrimental to ECOLOGICAL FUNCTIONS
and BIODIVERSITY (*sensu lato*): 10**

Threatens biodiversity, lowers ecological values...

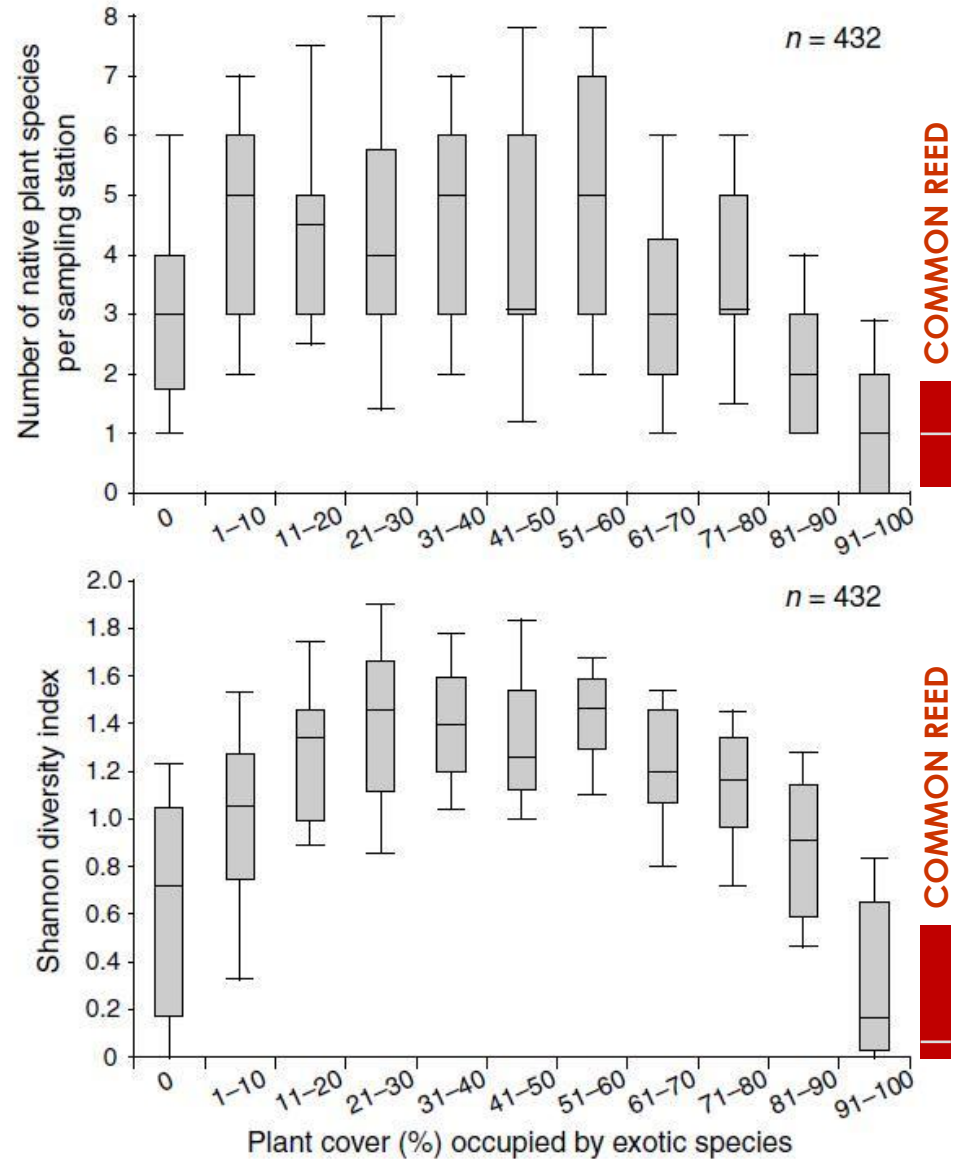
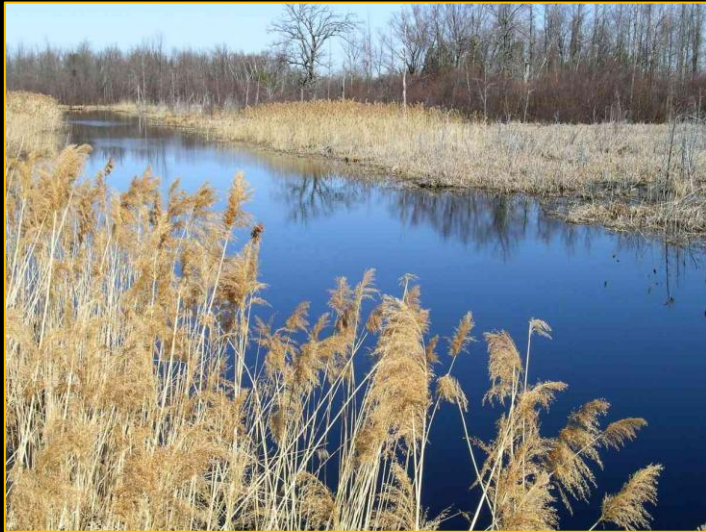
- **Beneficial to ANIMALS: 12**

Creates crab and mosquito habitats, creates screens for wildlife, provides shelter for birds...

Vegetation structure, marshes of southern QC



Vegetation richness and diversity, marshes of southern QC



Journal of Biogeography, 30, 537–549



Exotic plant species of the St Lawrence River wetlands: a spatial and historical analysis

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Common reed: impact on fishes



Common reed: impact on Northern Pike reproduction

2009



3× fewer eggs
in common reed
stands
(cf. control)

2010



2× more eggs
in common reed
stands
(cf. control)



Common reed: impact on Northern Pike growth



Site	Vegetation	Length (mm)		Mass (g)	
		Mean (SD)	Growth (per day)	Mean (SD)	Growth (per day)
Ruisseau Lafleur	Common reed	58 ± 19	1.53	1.64 ± 1.27	0.09
	Control	59 ± 13	1.36	1.50 ± 1.08	0.10
Îles de Boucherville	Common reed	39 ± 14	1.20	0.55 ± 0.59	0.05
	Control	39 ± 11	1.10	0.48 ± 0.44	0.04

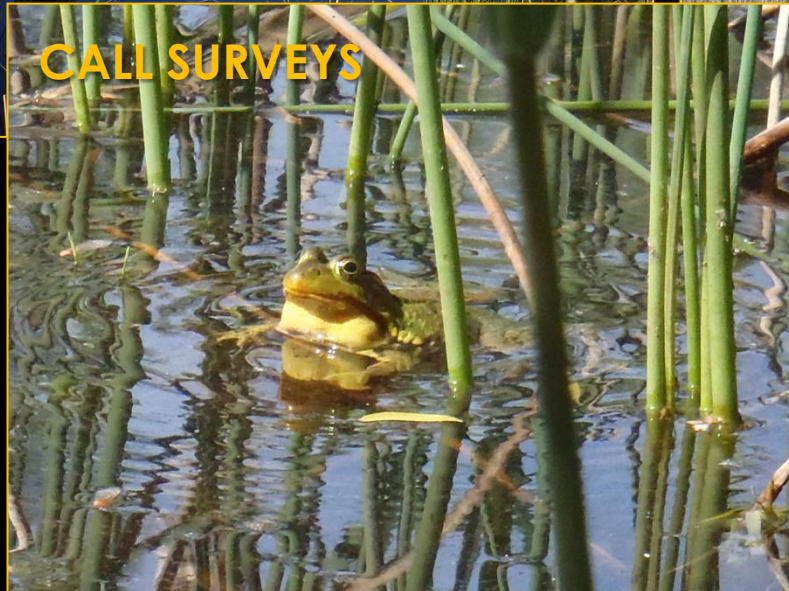
Common reed: impact on amphibians



Common reed: impact on amphibians

Study area: Montréal

50 wetlands, with a common reed cover of 0 to 64 %



Common reed: impact on amphibians

Abundance

POSITIVE effect of reed cover on amphibian abundance (all species considered), but landscape variables had more weight in the models

Occupancy



Neither vegetation nor landscape variables influenced amphibian occupancy

Common reed: impact on birds



Common reed stands: used by nesting birds



Common reed stands: used by threatened bird species



Least bittern

Common reed: impact on birds (abundance)

All species

Variable	Impact	
	2009	2010
Vegetation type	NS	NS
Water level	+	+
Presence of water without plant cover	+	+



Common reed: impact on birds (occupancy)



Generalist species

Variable	Impact	
	2009	2010
Vegetation type	NS	NS
Water level	—	—
Presence of water without plant cover	NS	NS






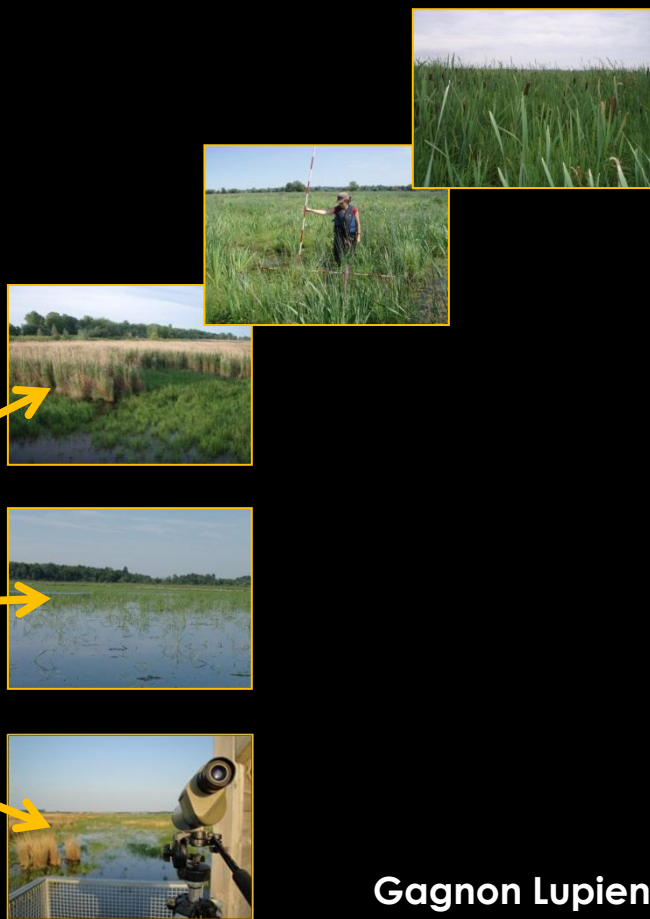
Common reed: impact on birds (occupancy)



MARSH WREN: significantly MORE abundant in common reed stands

Wetland specialist species

Variable	Impact	
	2009	2010
Vegetation type	NS	NS
Water level	NS	NS
Presence of water without plant cover	 	



Common reed: impact on birds (abundance)



Rails

Variable	Impact	
	2009	2010
Vegetation type	NS	NS
Water level	NS	+
Presence of water without plant cover	—	NS

DRY YEAR



In other words...

Common reed stands in freshwater marshes are by no means 'biological deserts'

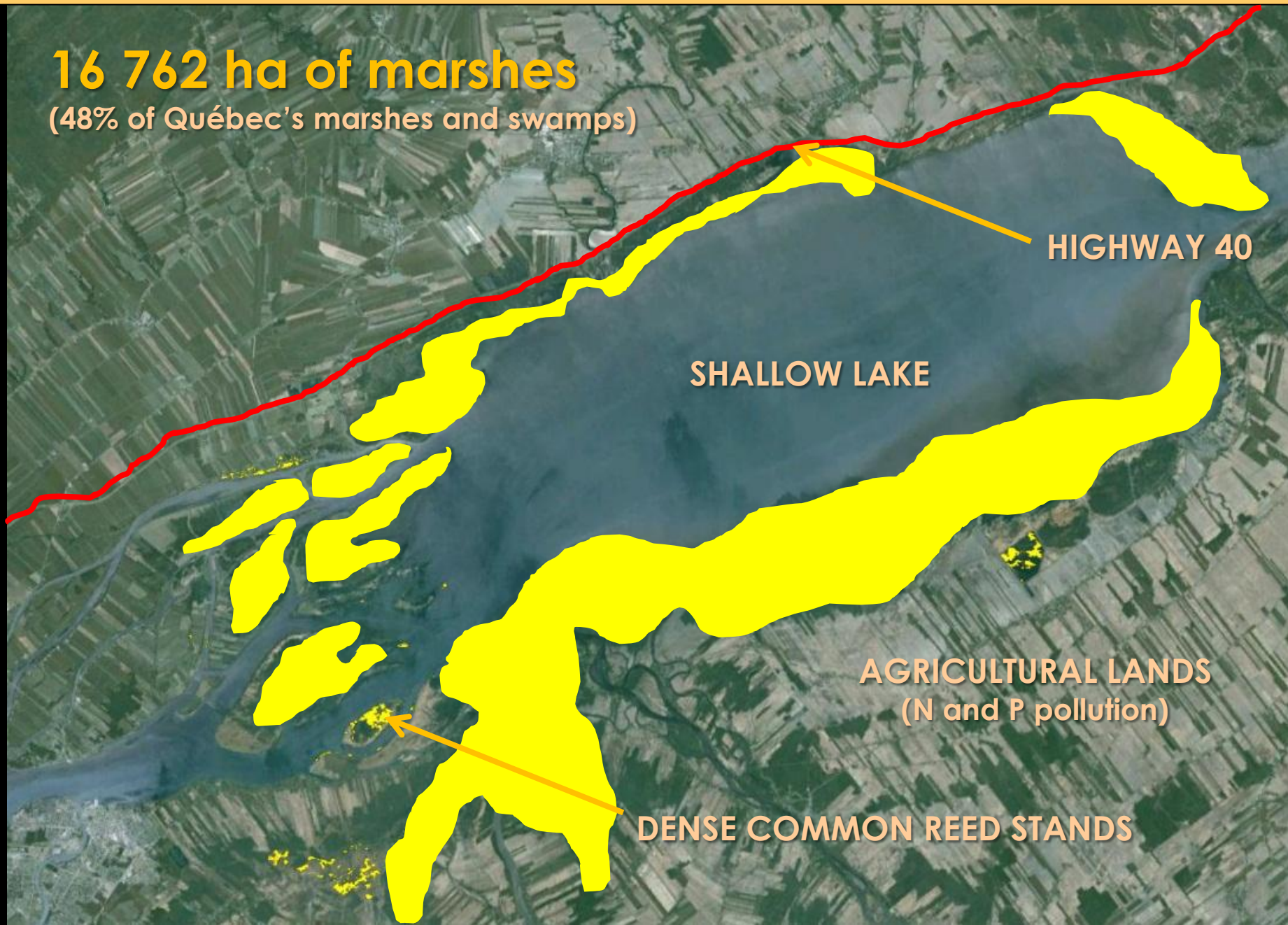
A marsh with some common reed stands is OK, but a marsh with ONLY common reed stands is another story...



St. Lawrence River, Lake St. Pierre

16 762 ha of marshes

(48% of Québec's marshes and swamps)



HIGHWAY 40

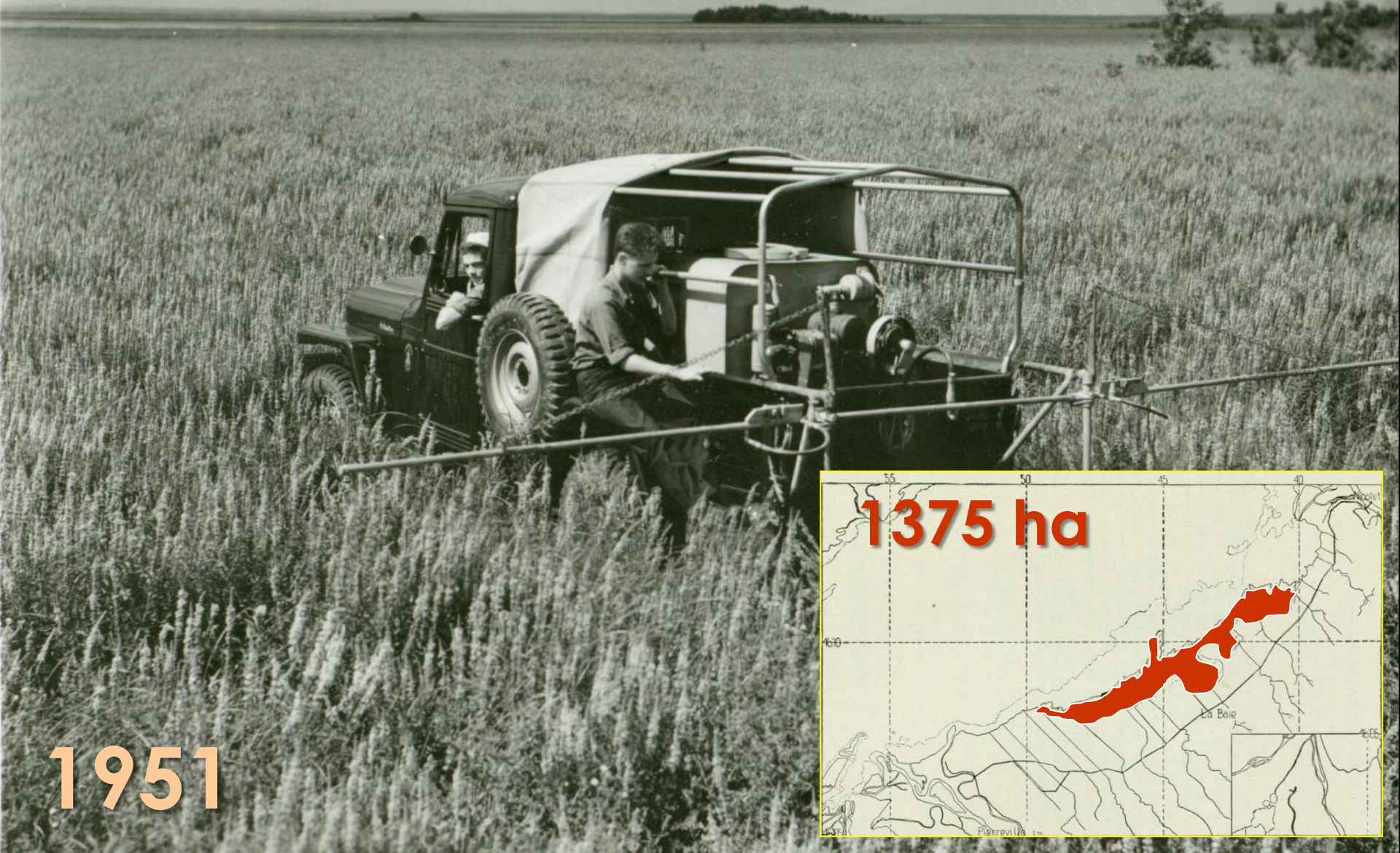
SHALLOW LAKE

AGRICULTURAL LANDS
(N and P pollution)

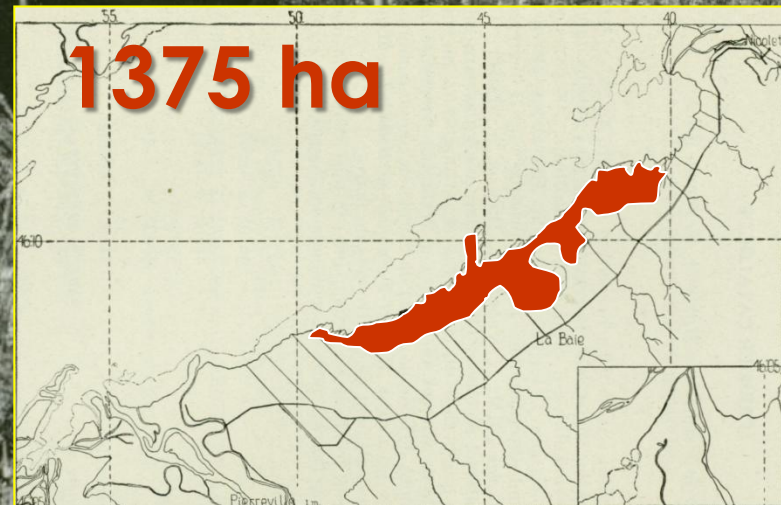
DENSE COMMON REED STANDS

Lake St. Pierre: an old invasion... no longer present!

Purple loosestrife



1951



PHRAGMITES

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phragmites.crad.ulaval.ca

The invasive common reed (*Phragmites australis*) is presently spreading in marshes and along roads of Canada .

The common reed is a grass that usually forms dense populations in marshes and drainage ditches with a water level appropriate for its establishment and growth. The high biomass production of the plant represents a potential threat for the preservation of ecological functions of marshes, and for the survival of a diverse flora and fauna. The PHRAGMITES Research Group (founded in 2003) studies the dispersal modes of the common reed, and develops fundamental and applied research projects to respond to several questions associated with this invasive species. For instance, what is the relative contribution of vegetative and sexual reproduction for the spread of the invasive genotype of the common reed in marshes? What is the real impact of the common reed on the biodiversity of freshwater marshes? Is this impact important enough to justify restoration measures of wetlands? The PHRAGMITES group does not only work on fundamental issues associated with the common reed; it also develops, with the collaboration of several partners, control methods to prevent the spread of the plant along roads or in marshes.



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