Integrated Watershed Management for Aquatic Ecosystem Health

Rhonda McDougal
Director, Planning and Coordination,
Ecological Services Division,
Manitoba Water Stewardship

November, 2008

Manitoba

Manitoba's *Water Protection Act*

Water Protection

Watershed Management Planning

The *Water Protection Act* recognizes that:

- Clean, abundant water is a prerequisite to health, food production, economic and social prosperity
- Comprehensive water and land planning on a watershed basis is essential
- Clean drinking water requires source protection
- Decisions must be based on sound science
- Riparian areas, wetlands and sensitive landscapes must be protected
- Financial incentives for water protection are important

Manitoba

Water Policy Challenges for MB

- Threats to water quality and quantity exacerbated by climate change
- Increasing pressure on and potential conflicts over freshwater supply
- The need to maintain minimum in-stream flow needs for aquatic ecosystem health
- Lack of adequate scientific understanding of our groundwater resources
- Chronic and systemic undervaluation of water and water services

Manitoba

Water Policy Challenges for MB

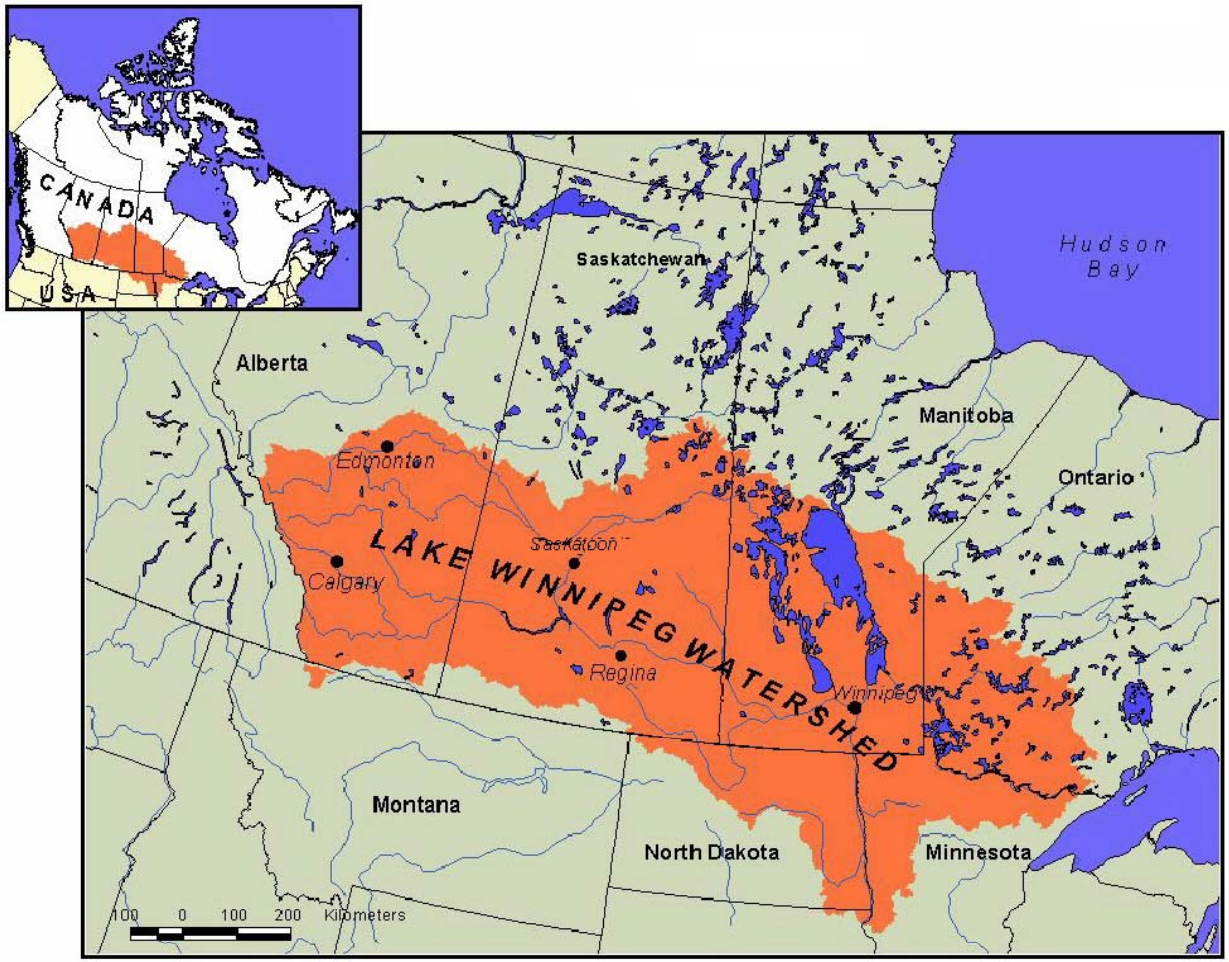
- Need for integration of water and land-use planning (agricultural, urban, traditional use, and industrial)
- Need for basin-level drought management planning
- Need to develop new technologies and new policy instruments (market-based instruments for ecosystem services)
- Lack of communication and coordination among “The Players” (Province, Conservation Districts, First Nations, Municipalities, and the Federal Government)
- Inadequacy of resources for climate change adaptation in the face of competing short term priorities

Manitoba

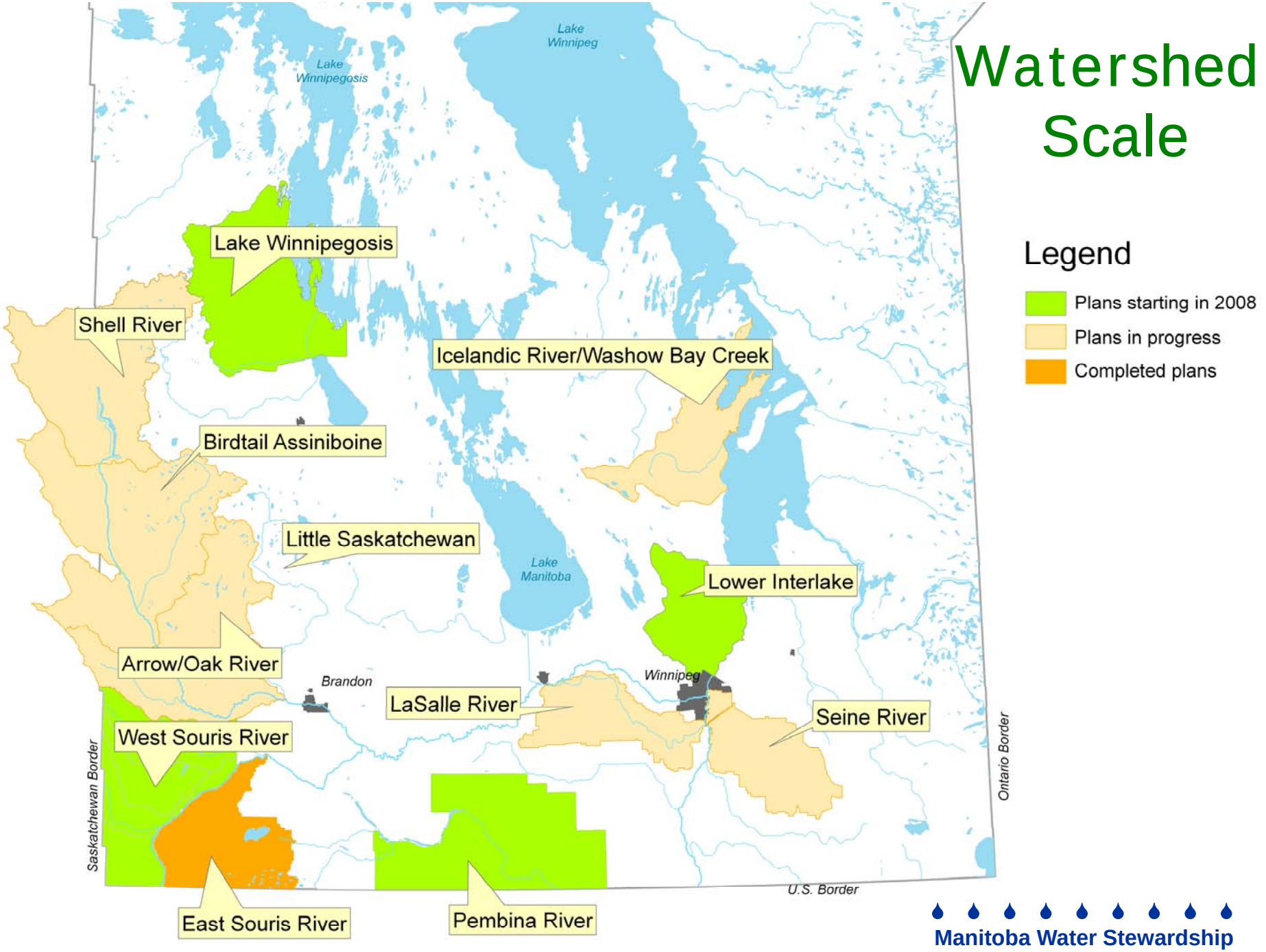
Lake Winnipeg Eutrophication

Manitoba

Watershed Scale



Watershed Scale



Manitoba Water Stewardship

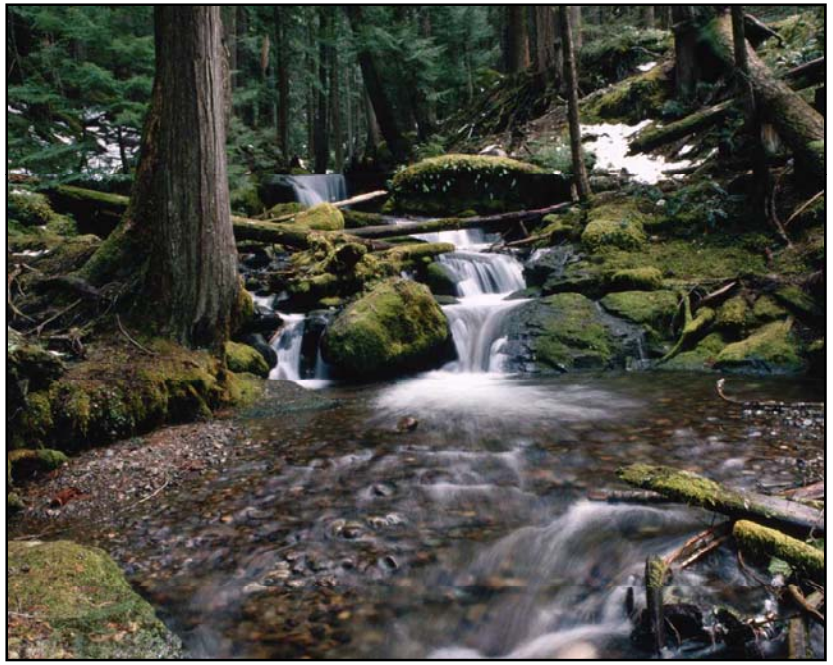
Water Action in Manitoba

- Integrated Watershed Management Planning
- Wetland Restoration Incentive Program
- Riparian and wetland perpetual easement program
- New Basin and Aquifer Planning unit
- Nutrient Regulation and Water Quality Management Zones
- Initiation of long-term drought planning strategy
- Drainage licencing and enforcement changes

Manitoba

Integrated Watershed Management Planning (IWMP)

A planning process to facilitate a better understanding of the impacts of human activity on the watershed and to outline a framework to make decisions about water and land use within the watershed.



An IWMP ensures that water and related land-use management are **integrated** to provide for the environmental, social, and economic well-being of the entire watershed.

IWMP: The "Players"

- Engaging in informed and appropriate human action:
  - Provincial Government and Manitoba Conservation Districts
  - Municipal Councils and First Nations governments
  - Federal Departments (EC, AAFC-PFRA, DFO, NRCAN)
  - ENGOs and other basin and watershed groups
  - Local watershed stakeholders and communities

Integrated Watershed Management Planning (IWMP)

- IWMP helps to target limited resources
- Based on watershed boundaries, not political boundaries
- Watershed plans are for watershed residents, stakeholder agencies, not just government
- Purpose is to focus programming, build multi-organizational and agency connections to meet watershed targets, better understand watershed health and community priorities

IWMP and Climate Change

- An IWMP:
- Provides an integrated context for drainage, irrigation, and water allocation decisions
- Identifies and supports practices to counteract impacts of drought and variable water supply
  - Community water conservation programs
  - Beneficial management practices for agriculture
  - Snow management
  - Preservation and restoration of wetlands
- Can make climate change adaptation strategies **explicit**, rather than **implicit**

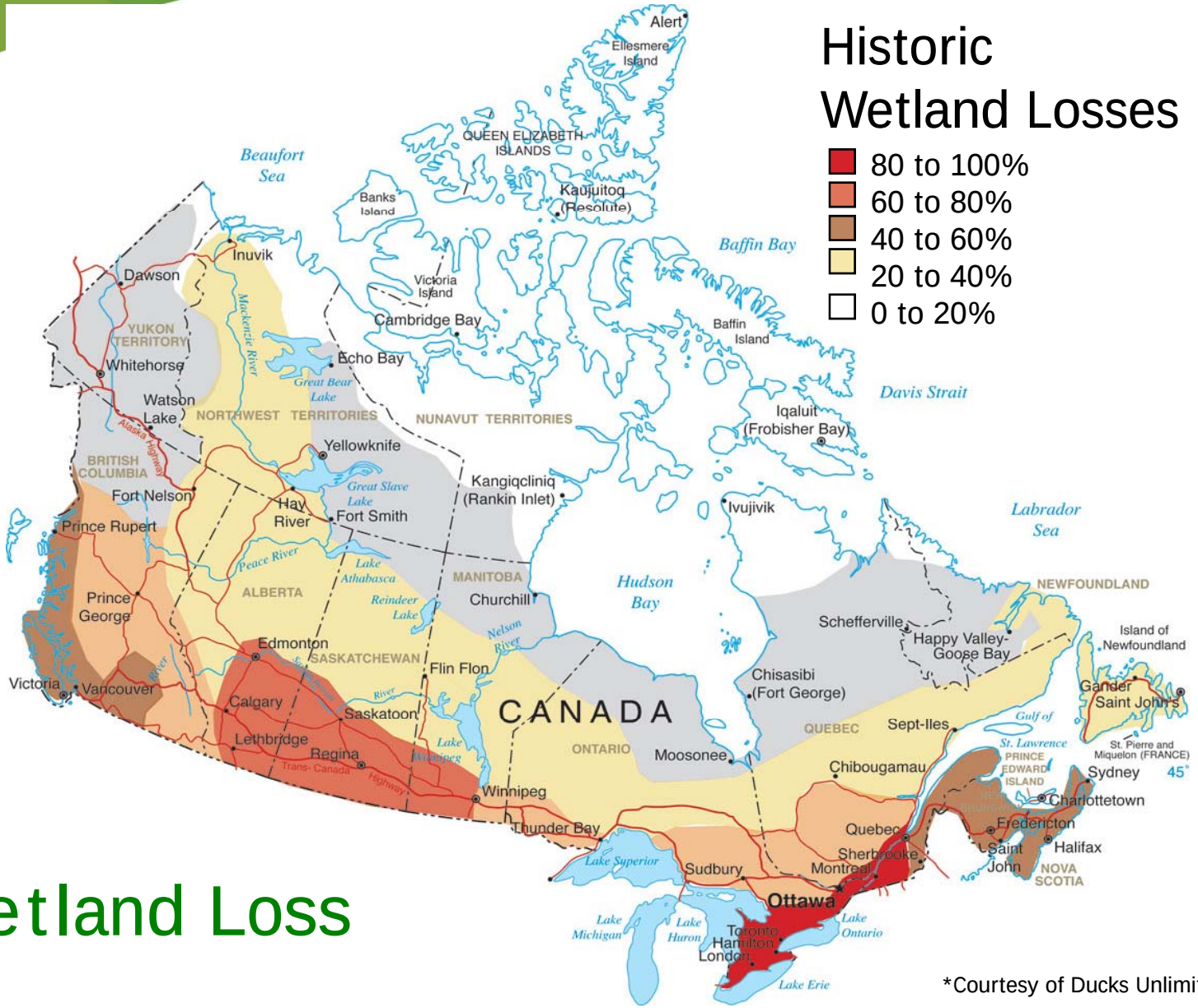
Manitoba

Opportunities for Coordinated Action Among "The Players"

- Similar needs to prepare for increasingly complex environmental challenges
- Pooling of resources and expertise – we all have capacity issues
- Synergies from bringing differing perspectives to the same table
- Streamlining and coordination of research, monitoring and program delivery
- Communication reduces redundancy and duplication

Manitoba

Wetland Loss



*Courtesy of Ducks Unlimited Canada

Manitoba

The Current Status of Wetlands: The Need for a Comprehensive Policy

- Manitoba has one of the highest densities of wetlands of any Canadian province.
- It has been estimated that 70% of the wetlands in south-western Manitoba have been lost entirely or severely degraded.
- Historically, policy was driven by incentives that promoted the drainage of wetlands to promote economic development.
- Wetland conservation is a complex issue that involves a wide variety of players.

Manitoba

Wetlands, Biodiversity and Species at Risk

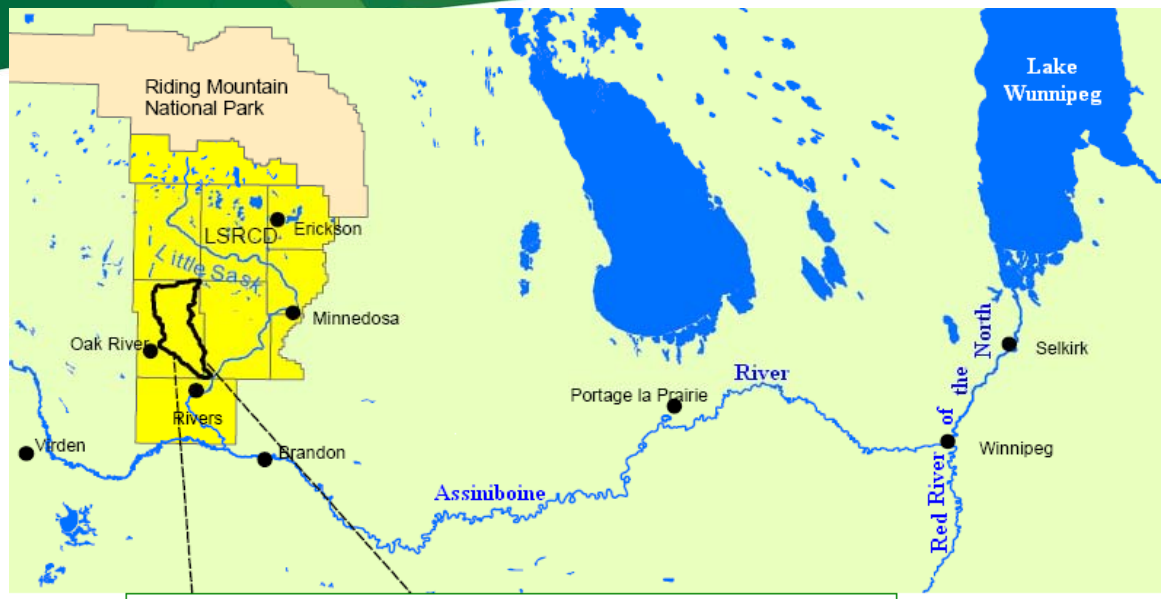
- Water-land interfaces provide zones of very high biodiversity and resilience
- Many species at risk are dependent on wetlands for all or part of their lifecycle
- Of species at risk (SAR) in Canada, these are wetland dependent.
  - **8.6% of mammalian SAR**
  - **40.8% of bird SAR**
  - **55.6% of reptilian SAR**
  - **94.1% of amphibian SAR**
  - **14.5% of fish SAR**

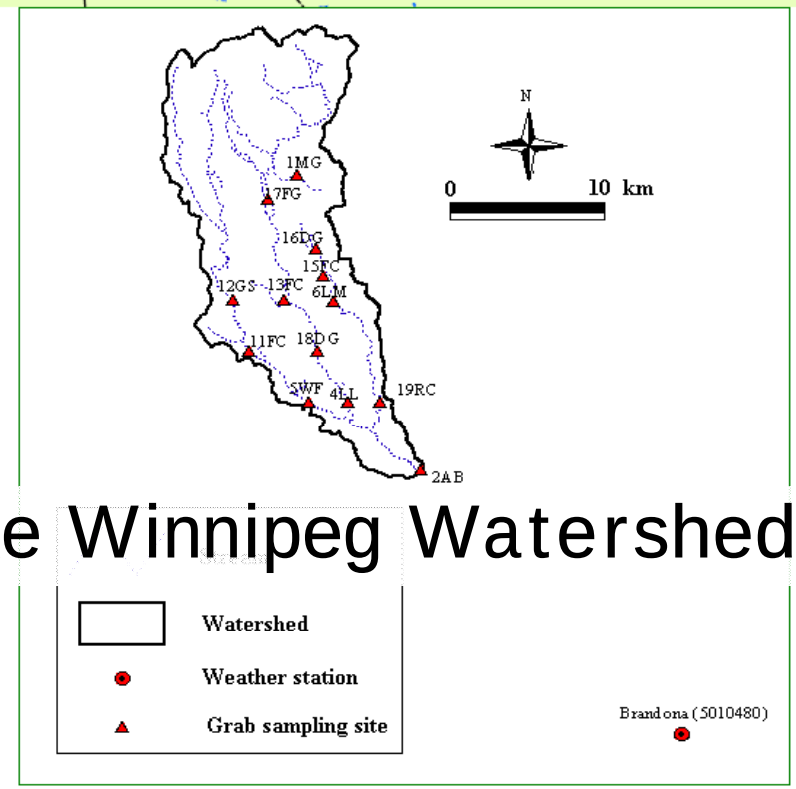
Past Policy - Adverse Effects

- Crow Rate
  - Subsidy of grain transportation rates on prairies
  - Narrow range of grain and oilseeds produced with economic and environmental implications
- Quota System for Grain Sales
  - More land under production – more grain eligible to sell
- Other Wetland Drainage Incentives – Homestead Act
- Water Control Structures
  - Implications for wetlands and ecological goods and services

The Broughton's Creek Watershed

- RM Blanshard
- 25,139 hectares
- 74 % agriculture
- 11 % rangeland
- 10 % wetland
- 4 % forest



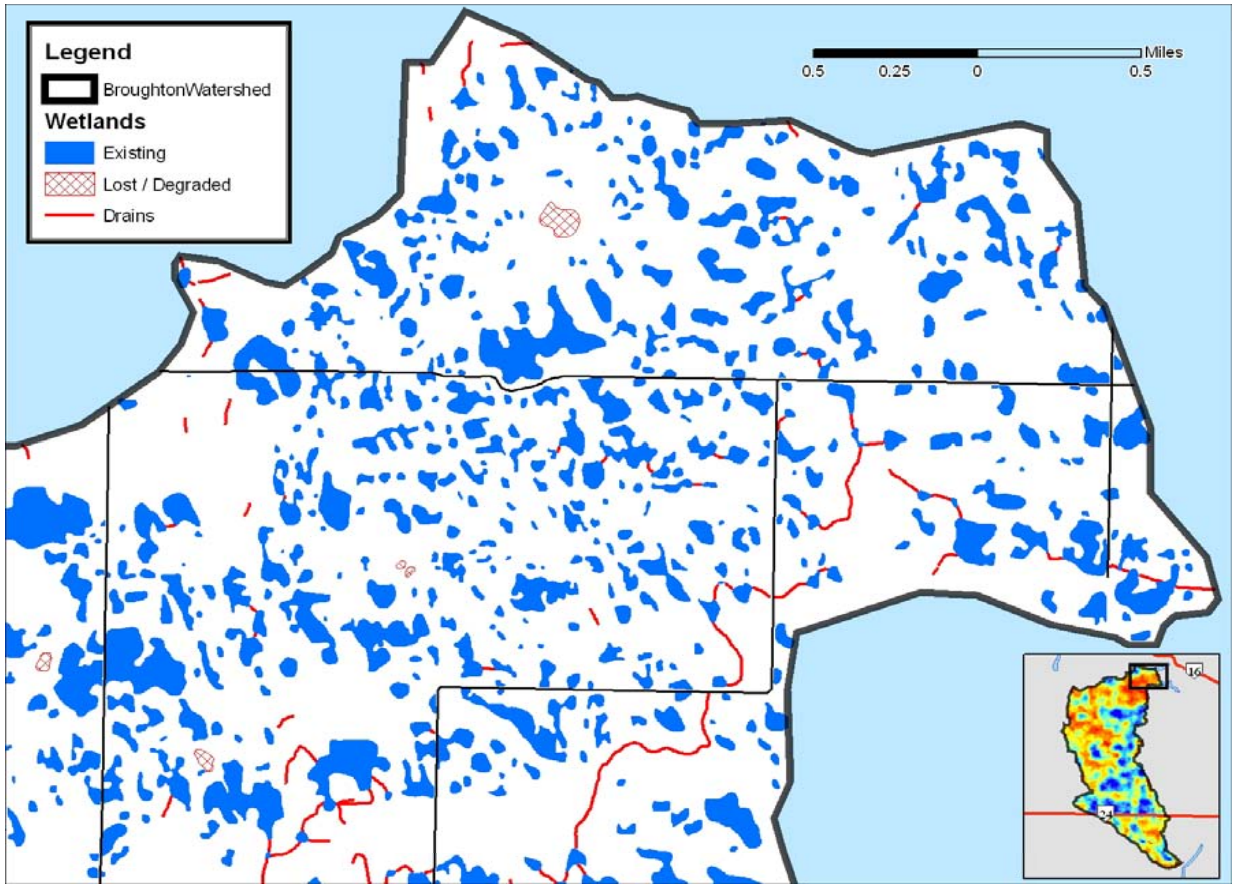


Application to Lake Winnipeg Watershed

*Courtesy of Ducks Unlimited Canada

Manitoba

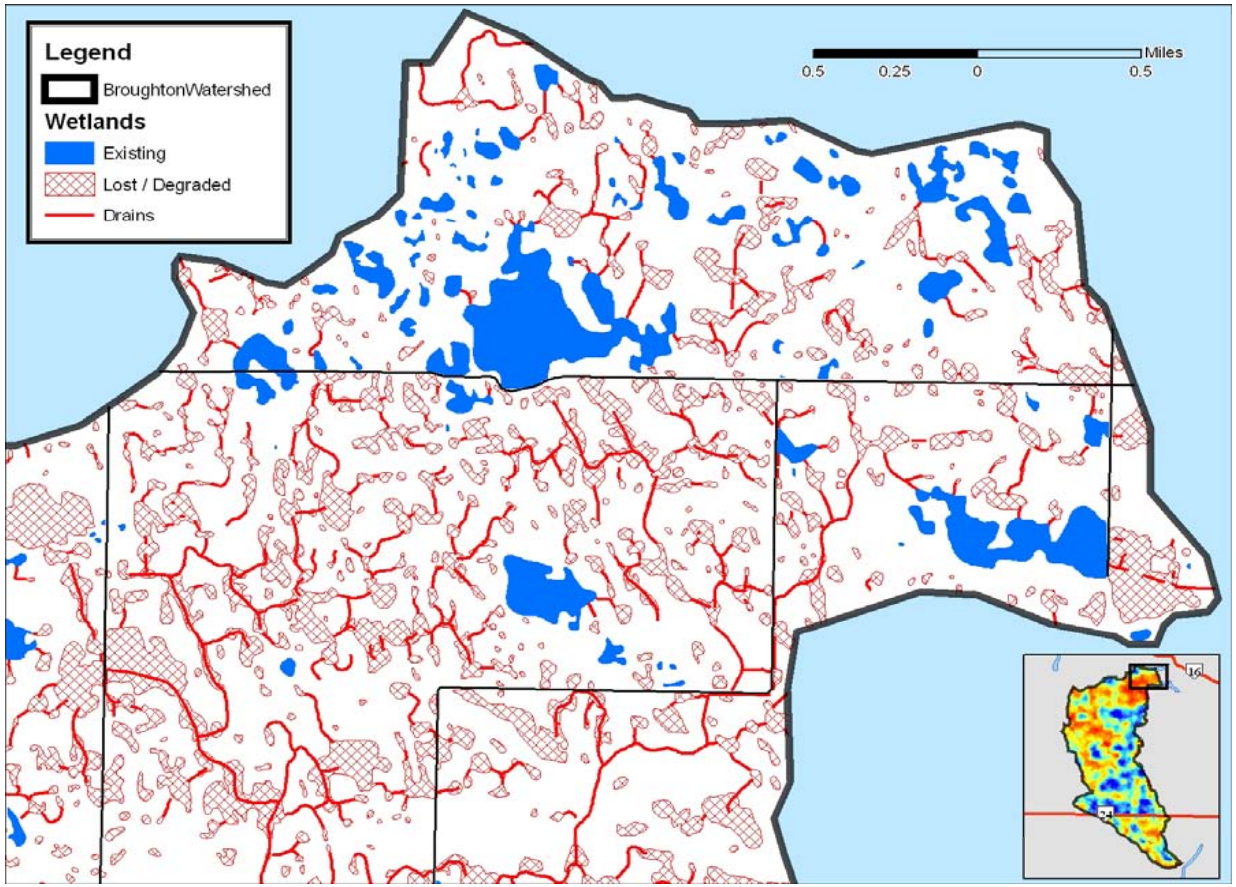
1968



*Courtesy of Ducks Unlimited Canada

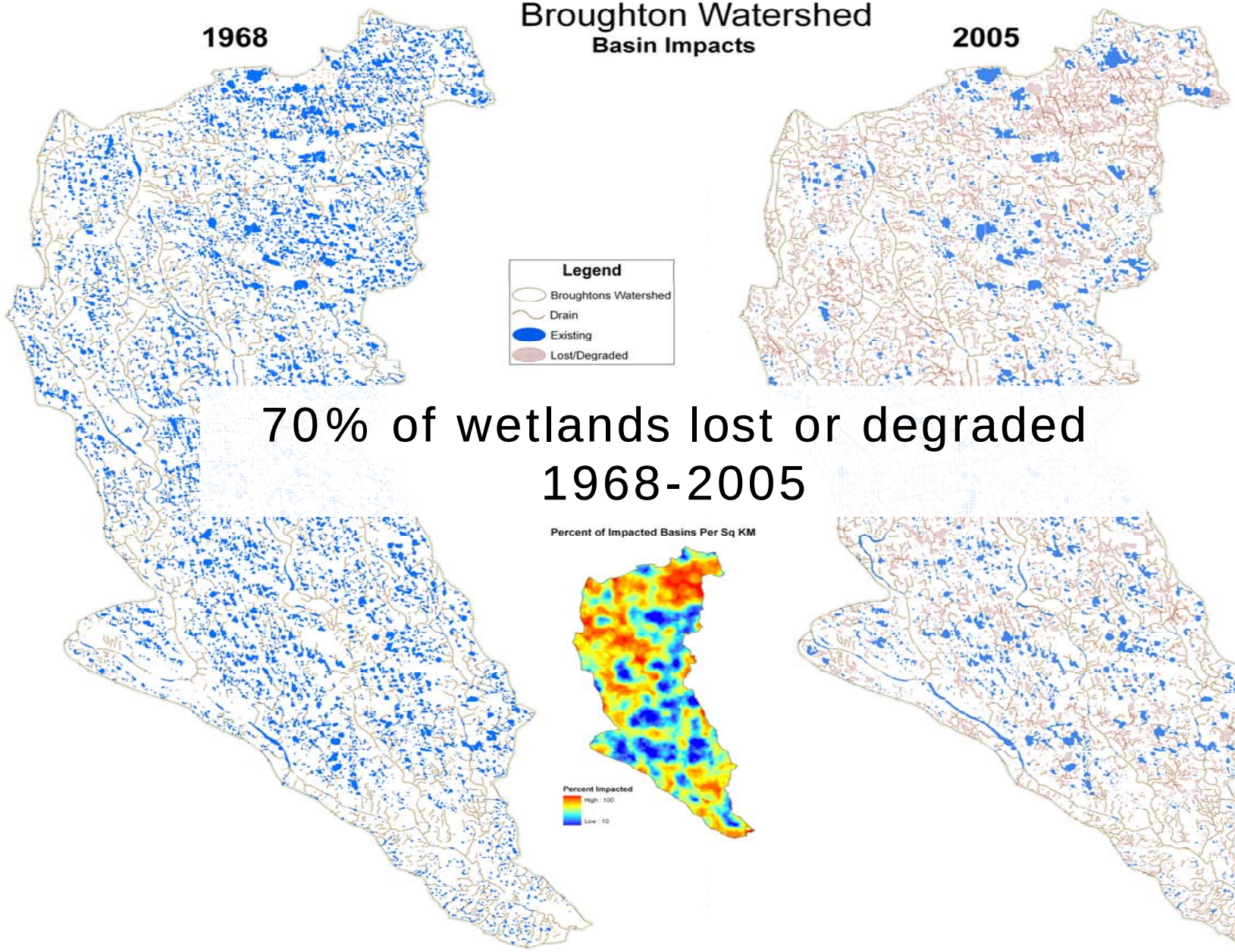
Manitoba

2005



*Courtesy of Ducks Unlimited Canada

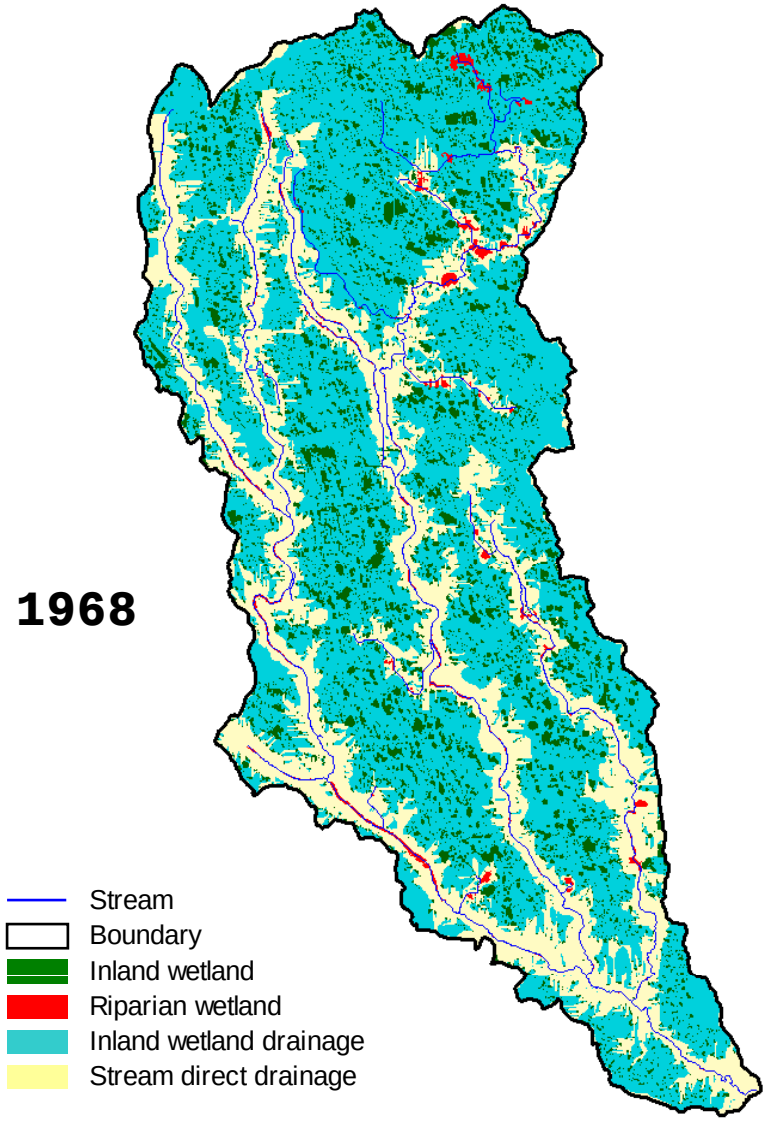
Broughton Watershed
Basin Impacts

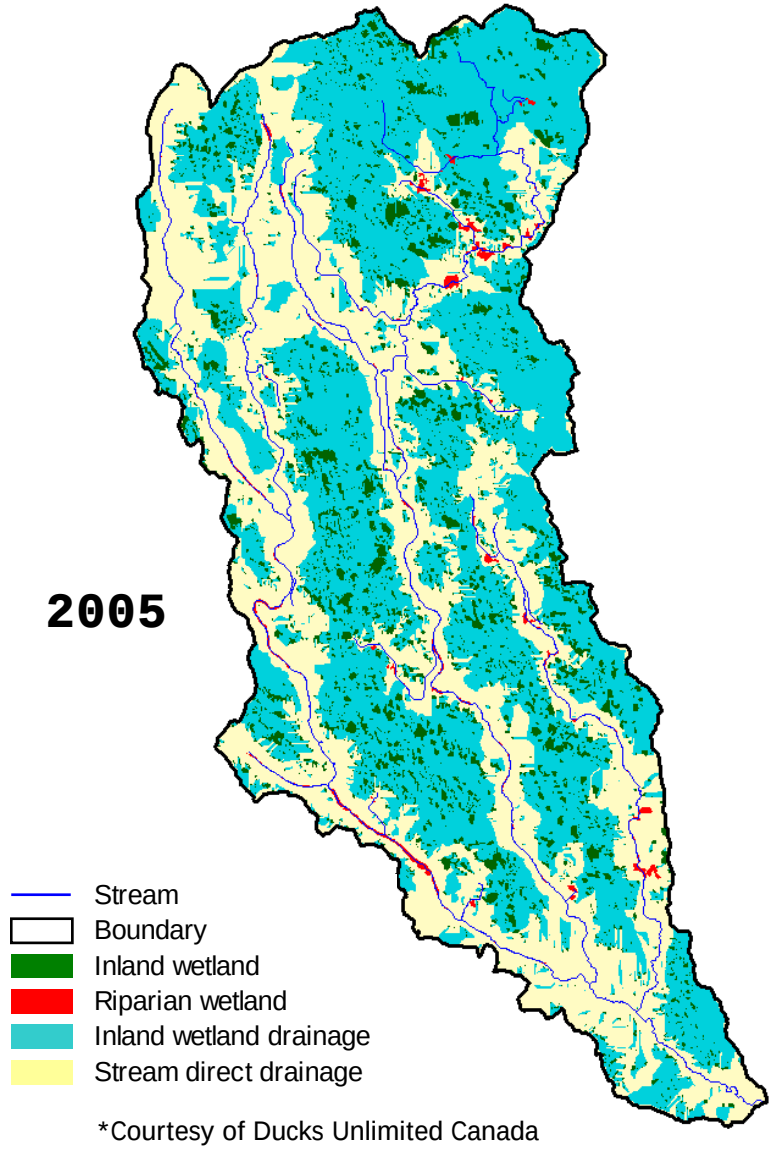


70% of wetlands lost or degraded 1968-2005

*Courtesy of Ducks Unlimited Canada

Drainage Area Changes





*Courtesy of Ducks Unlimited Canada

Implications of Wetland Loss in Broughton's Creek Watershed

- 31 % increase in area draining downstream
- 18 % increase in peak flow following rainfall
- 41 % increase in sediment loading
- 31 % increase in nitrogen and phosphorus load from the watershed to downstream water bodies
- 28 % decrease in waterfowl production
- Release of approximately 34,000 tonnes of carbon, equivalent to the annual emissions from about 23,000 cars

*Courtesy of Ducks Unlimited Canada

Implications of Continued Wetland Loss for Manitoba

- If wetland loss continues at the present rate, phosphorus export from Manitoba's agricultural landscape will increase by 41% by 2020, equivalent to dumping 10 semi loads of agricultural fertilizer directly into Lake Winnipeg every year.

- Prairie wetland ecosystems are second only to tropical rainforests in range of biodiversity – where will all our species go?

*Courtesy of Ducks Unlimited Canada

Manitoba

A Wetland Policy for Manitoba

- Current protection is incidental
- Ensure the social, economic and inherent environmental values of wetlands are recognized and protected.
- Encourage and facilitate partnerships
- Provide watershed-based framework for decision making
- Provide the tools needed for the protection of wetland resources (incentives + regulations)

Manitoba

Moving Forward: Water Policy and Climate Change

- Communities and ecosystems are vulnerable to climate change if they are in poor health and are slow to change or adapt
- The best way to reduce vulnerability is by increasing adaptive capacity, thereby increasing resilience within the system
- **Resilience** at the watershed and the local community level is provided by:
  - **Healthy aquatic and terrestrial ecosystems**
  - **Informed and appropriate human action**
  - **Robust policy and planning tools**