

# NatureServe Canada

Towards a Quebec  
Biodiversity Observation  
Network

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Executive Director



NatureServe Canada

# Overview

About NatureServe Canada

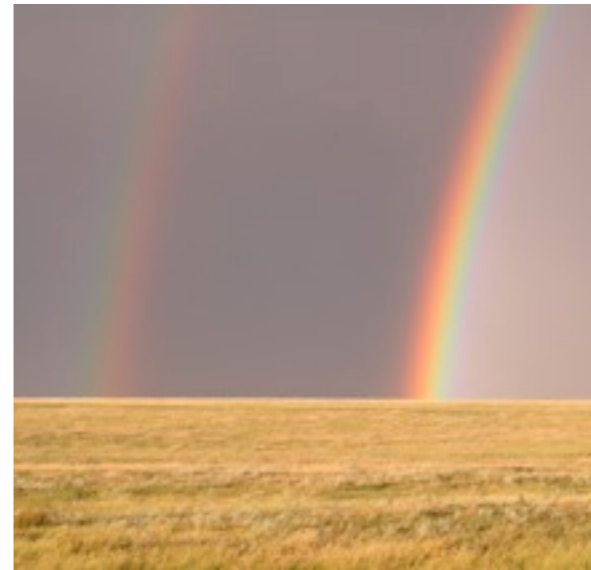
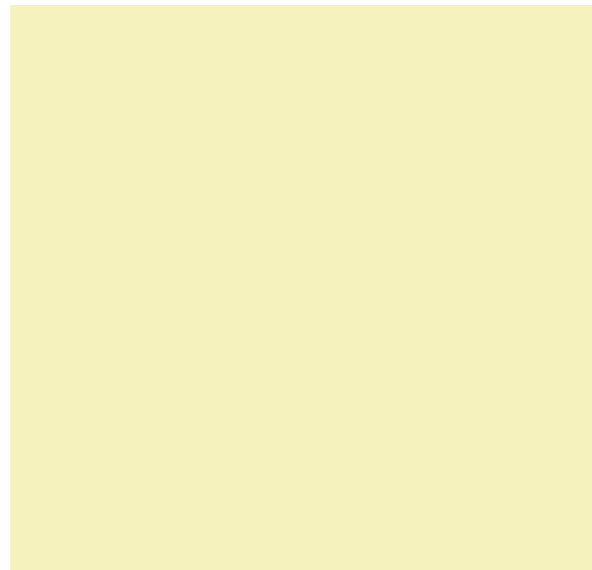
About the CDPNQ

Opportunities for Collaboration





# NatureServe Canada Canada's CDC network





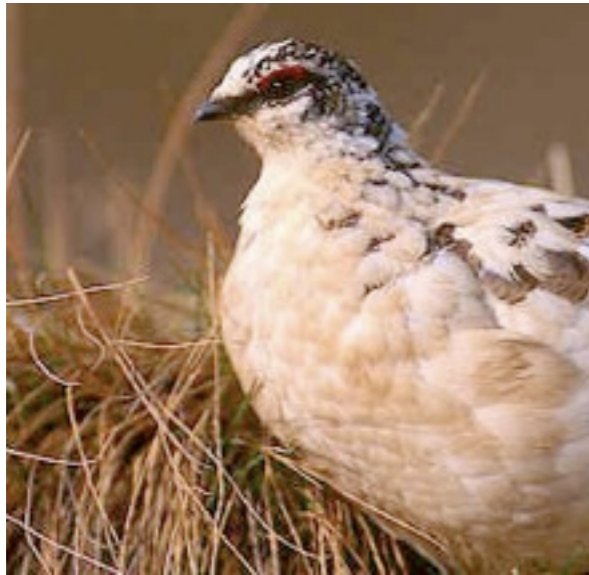
# Who We Are

NatureServe Canada is a network of 9 (10?) conservation data centres

- ▶ Part of an international network (NatureServe)
- ▶ Experts committed to a consistent set of science-based methods and standards
- ▶ These support the collection, processing and sharing of biodiversity information
- ▶ This information informs decisions and supports conservation action



*NatureServe Canada supports international vegetation classification standards.*



# Conservation Data Centre Activities

- ▶ Coordinate and conduct field surveys and inventories for rare and threatened species and ecological communities
- ▶ Collect, manage, analyze and distribute detailed locality and status data
  - ▶ Some programs directly manage natural areas information, invasive alien species information
- ▶ Act as primary data custodians
  - ▶ Provide data access for provincial/territorial uses
  - ▶ Support environmental reviews, assessments (COSEWIC and General Status) and planning



# Natural Heritage Methodology



## Start

List of known biodiversity elements  
(species, community)

Assess relative risk to determine  
conservation status and set  
priorities

Provide access to data  
and information (status)

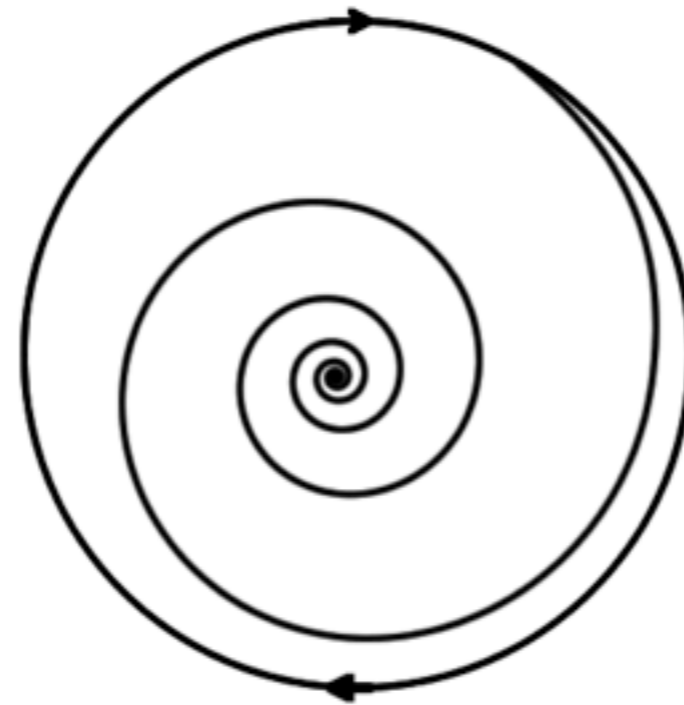
Gather information from  
known sources for priority  
elements

Share and analyze data  
collected to refine  
conservation status

Conduct field inventories as  
needed to enhance knowledge

Process and manage all data  
collected using standards  
(location, condition, and  
conservation needs)

**A continuous process of  
discovery and refinement**





# What is an Element?

Typically, elements of biodiversity can include landscape, ecosystem, ecological community, species, population and gene

NatureServe elements chosen based on **suitability for inventory** and ability to establish a conservation status rank

CDCs in Canada focus on species and community elements

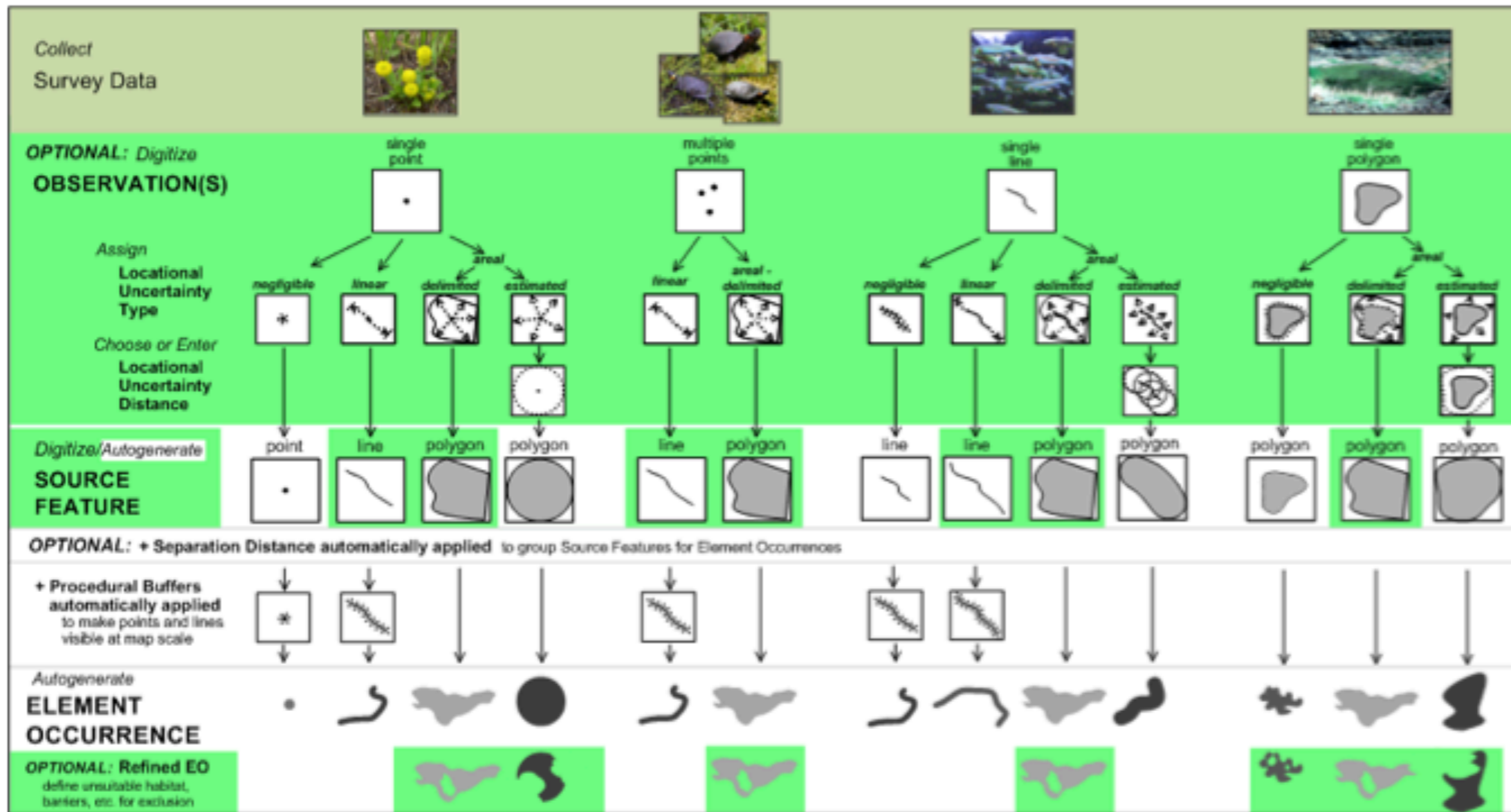
# About our data

- ▶ More than 50,000 species elements and 1,500 community elements in our system nationally
  - ▶ Of these 12,000 are actively tracked (spatial and other data)
  - ▶ Focus on species of conservation concern, including candidate species, provincially listed species
- ▶ Approximately 125,000 element occurrences nationally
  - ▶ Each EO can represent one to **thousands** of specimen/observation records





# NatureServe Spatial Methodology



# What is an Element Occurrence (EO)?

- ▶ An EO is a locational record representing a single extant habitat which sustains or otherwise contributes to the survival of a population or self-sustaining example of a particular Element
- ▶ Developed through a process which defines/refines the meaning of an observation or observations
  - ▶ Assess locational uncertainty (what exactly was the observation - )
  - ▶ Explore separation distance (what does the observation mean - a distinct population?)
- ▶ Requires documented source for the observation (as a “source feature” - only need information about the survey, nothing else)



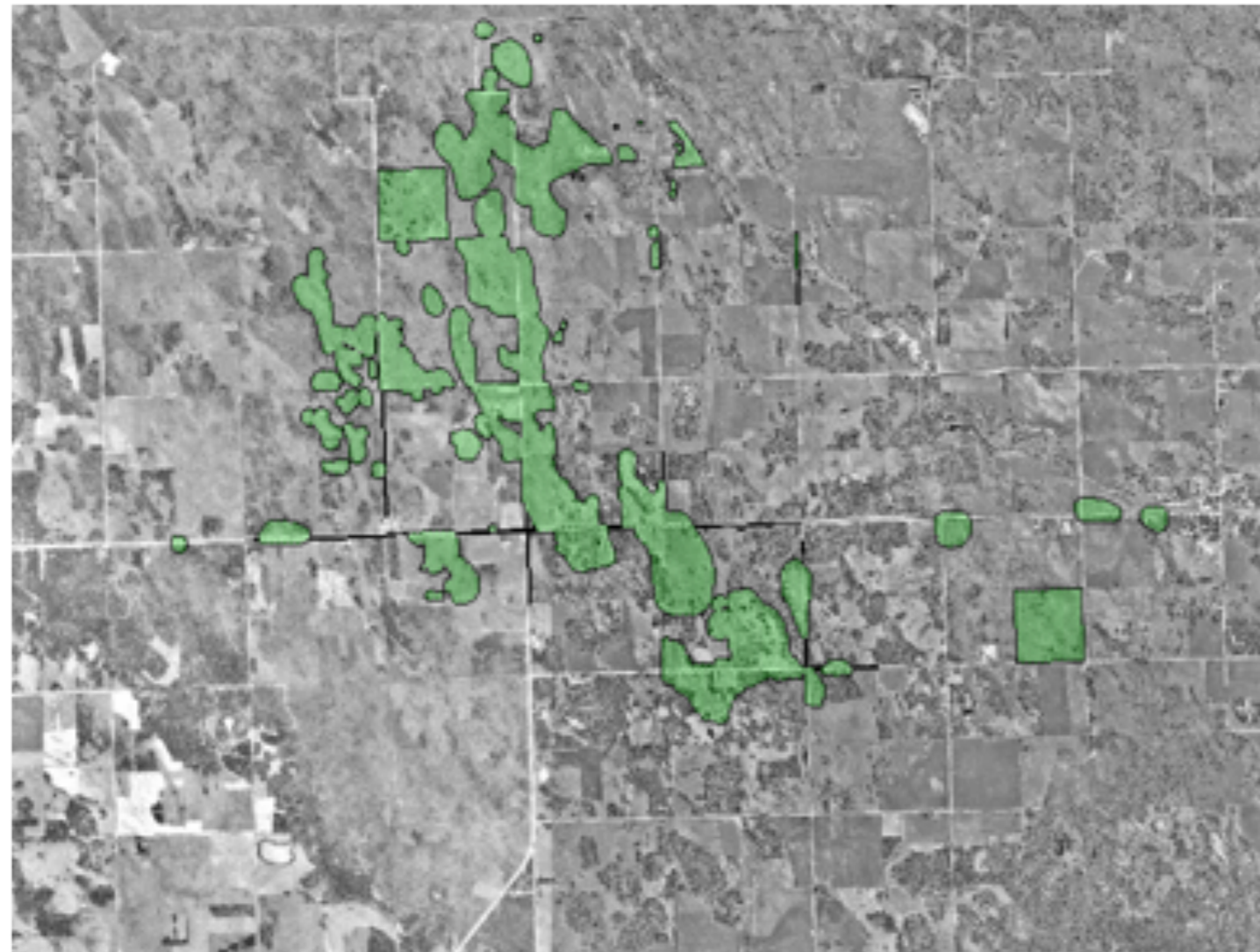
# EO Refinement



1. Historical record
2. EO - locational uncertainty high, no consideration of separation distance (single record)
3. New observations - locational uncertainty lower, no consideration of separation distance
4. New observations, locational uncertainty lower, consideration of separation distance (based on EO specifications)
5. Documentation of source features
6. Biodiversity in flux - Ongoing refinement



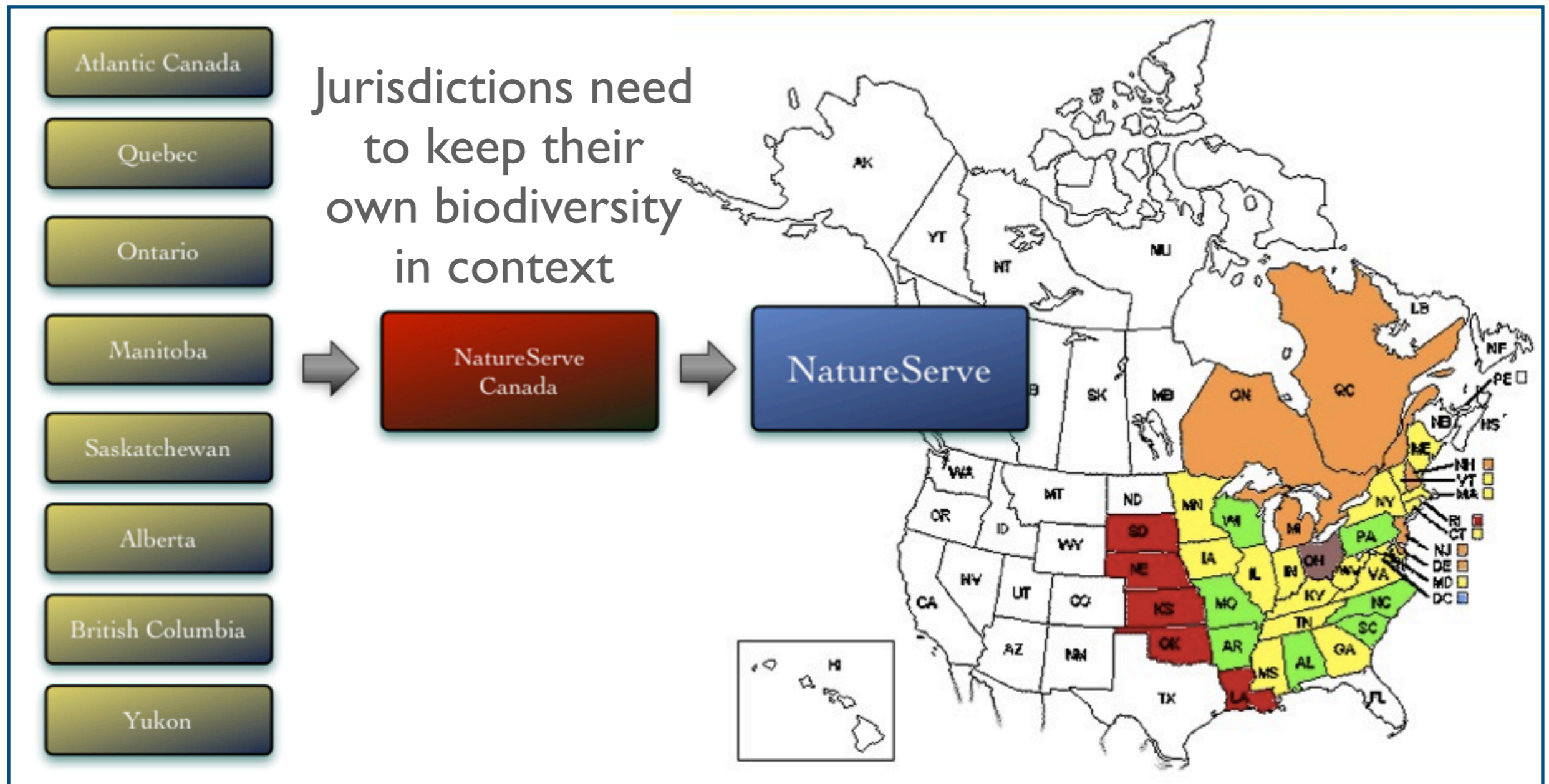
# Prairie White-fringed Orchid



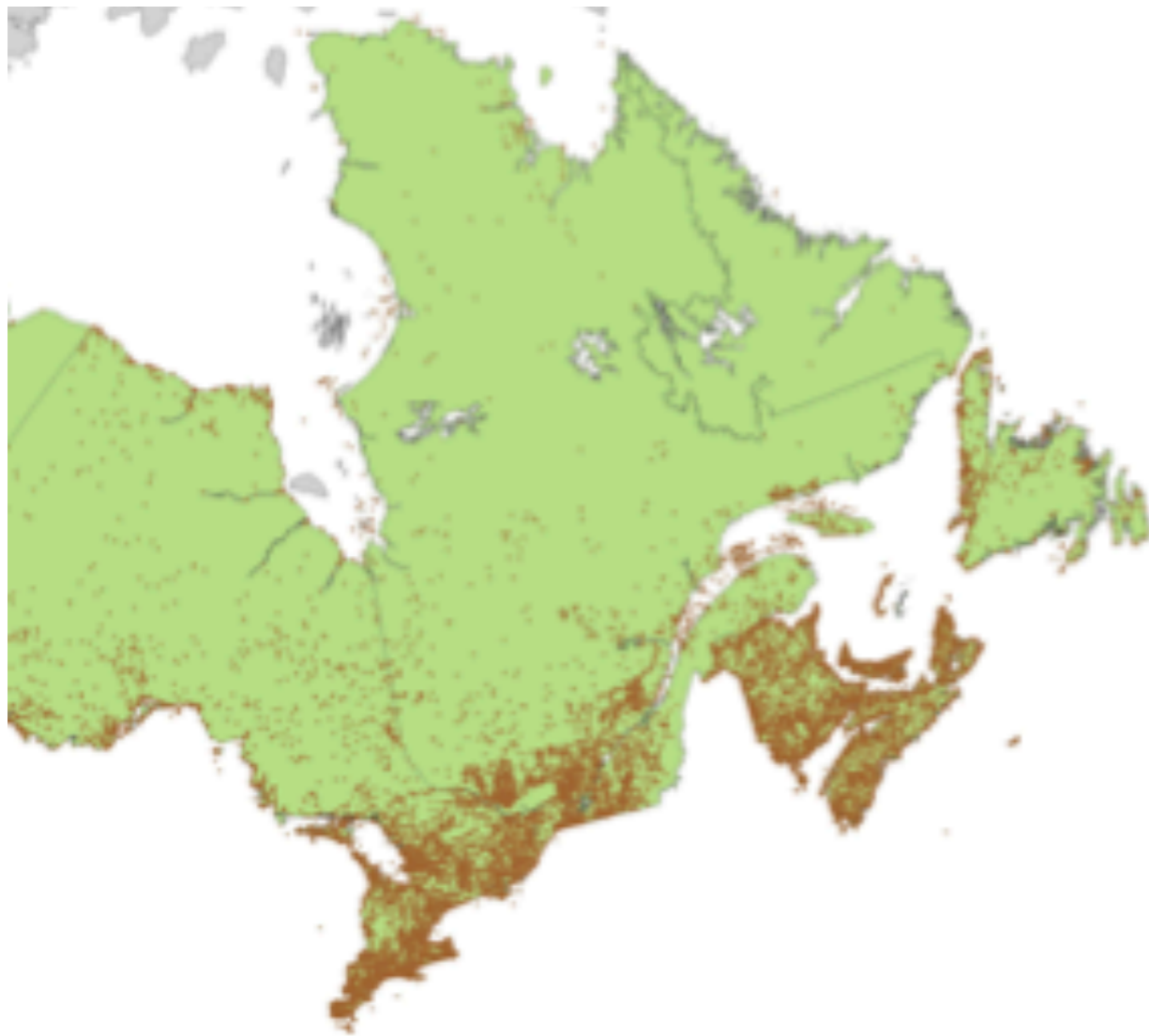
Source features mapped as polygons and EOs created using EO specs/separation distances

Sources represent occupied habitat where species has been observed (except where detailed surveys not completed)

# Data Exchange



## Distribution of Element Occurrences in eastern Canada (2006)



Network data coverage for some species in some areas is high

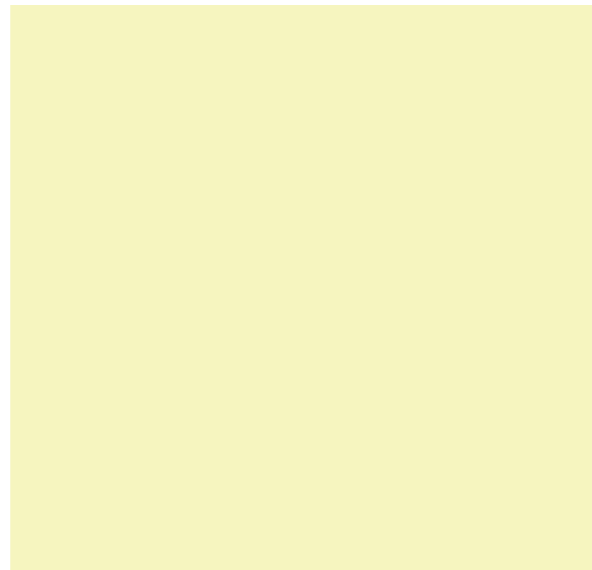
Ongoing survey work needed for priority species across estimated range to enhance coverage (thresholds for modelling)

EO quality affected by age of supporting observational data - need ongoing investments in surveys and inventories





# About the CDPNQ



# CDPNQ

- Centre de données sur le patrimoine naturel du Québec
- A collaboration among Environment Canada (CWS), le ministère du Développement durable, de l'Environnement et des Parcs, et le ministère des Ressources naturelles et de la Faune
- Collects and processes data on migratory birds, flora and fauna of Quebec
- Also classifies and maps ecological communities





# Other Partners



Association des entomologistes amateurs du Québec

Biodôme de Montréal

Conservation de la nature Canada - Québec

Flora Quebeca

Fondation de la faune du Québec

Fondation pour la sauvegarde des espèces menacées

Ministère des Ressources naturelles et de la Faune – Secteur Forêts

Parcs Canada

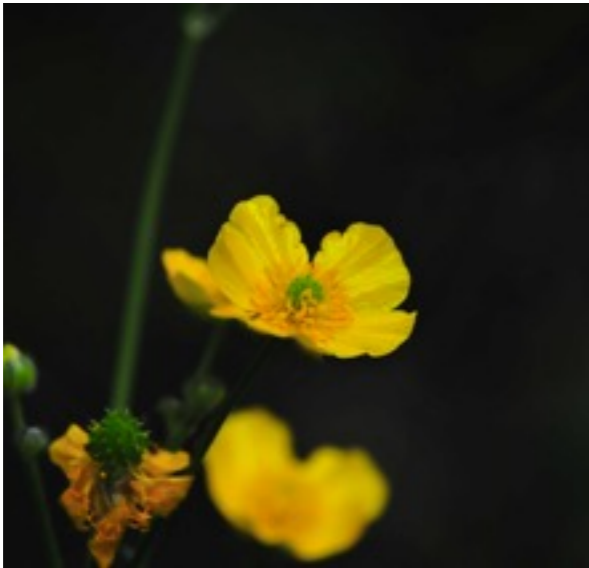
Regroupement Québec Oiseaux (RQO)

Société d'histoire naturelle de la vallée du Saint-Laurent

Société Provancher d'histoire naturelle du Canada

Institut québécois de la biodiversité (IQBIO)





# Core Data

- Observation data includes:
  - Scientific name of species
  - Geocode of observation - preferably latitude and longitude (at a minimum)
  - Additional details (zone/easting/northing)
  - Precision of the geocode, typically radius in metres, may be a grid block; specify GPS coordinate precision if used (15 – 100 metres)
- Date of the observation

# Other key details



Written Locality

Common name

Name of the collector/observer

Survey method and survey effort

Number of individuals counted

Reliability of the observation, e.g. confirmed, doubtful, backed by voucher specimen

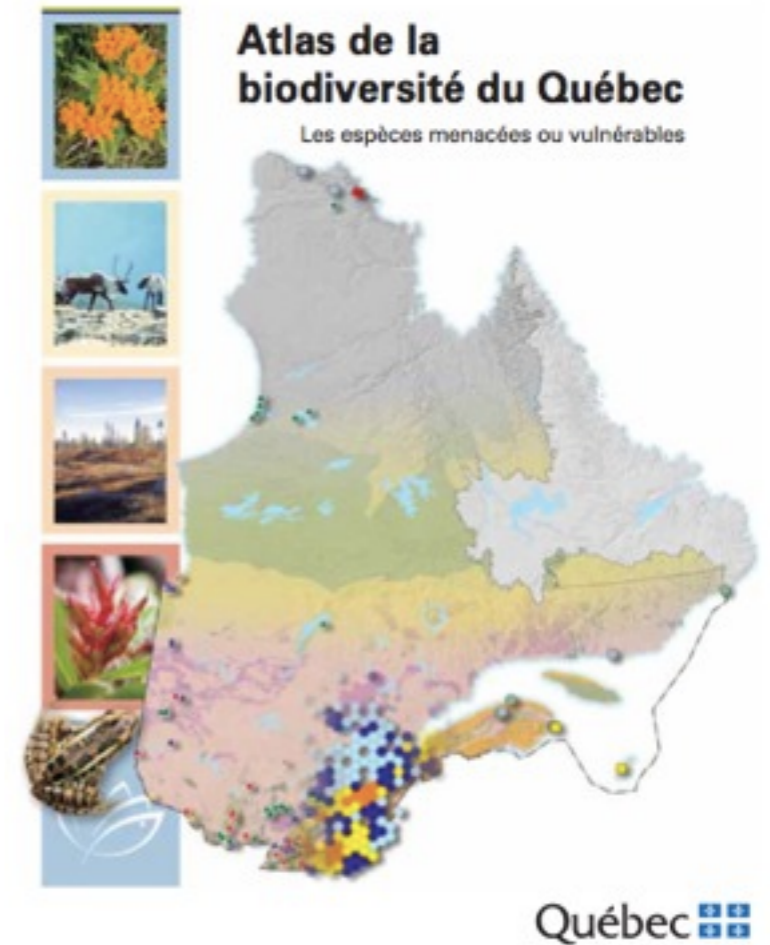
Data source and record identifier - to distinguish data collated from other sources

Target species NOT observed



# Examples of CNPNQ Reports

- ▶ Liste des espèces fauniques vertébrées suivies au CDPNQ
- ▶ Liste des espèces fauniques invertébrées suivies au CDPNQ
- ▶ Les plantes vasculaires menacées ou vulnérables du Québec
- ▶ Other publications on Quebec Biodiversity



*NatureServe Canada  
supports international  
vegetation classification  
standards.*

# Observational Data

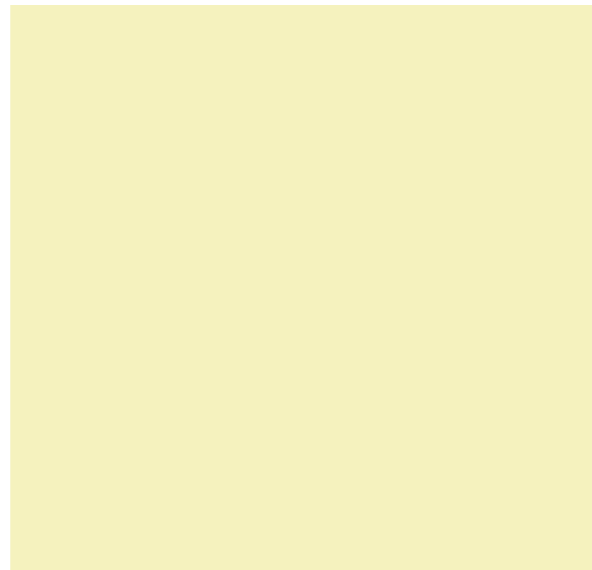


- ▶ CDPQN
  - ▶ Data captured in 5 individual data management systems
  - ▶ Observational data complies with NatureServe Observational Data Standard
  - ▶ Extends Darwin Core
- ▶ Filter out data
  - ▶ Focus on published data, known experts (documented as source features - references)
  - ▶ Focus on species ranked as of conservation concern
  - ▶ Roughly 150,000 direct high quality observational records of species at risk

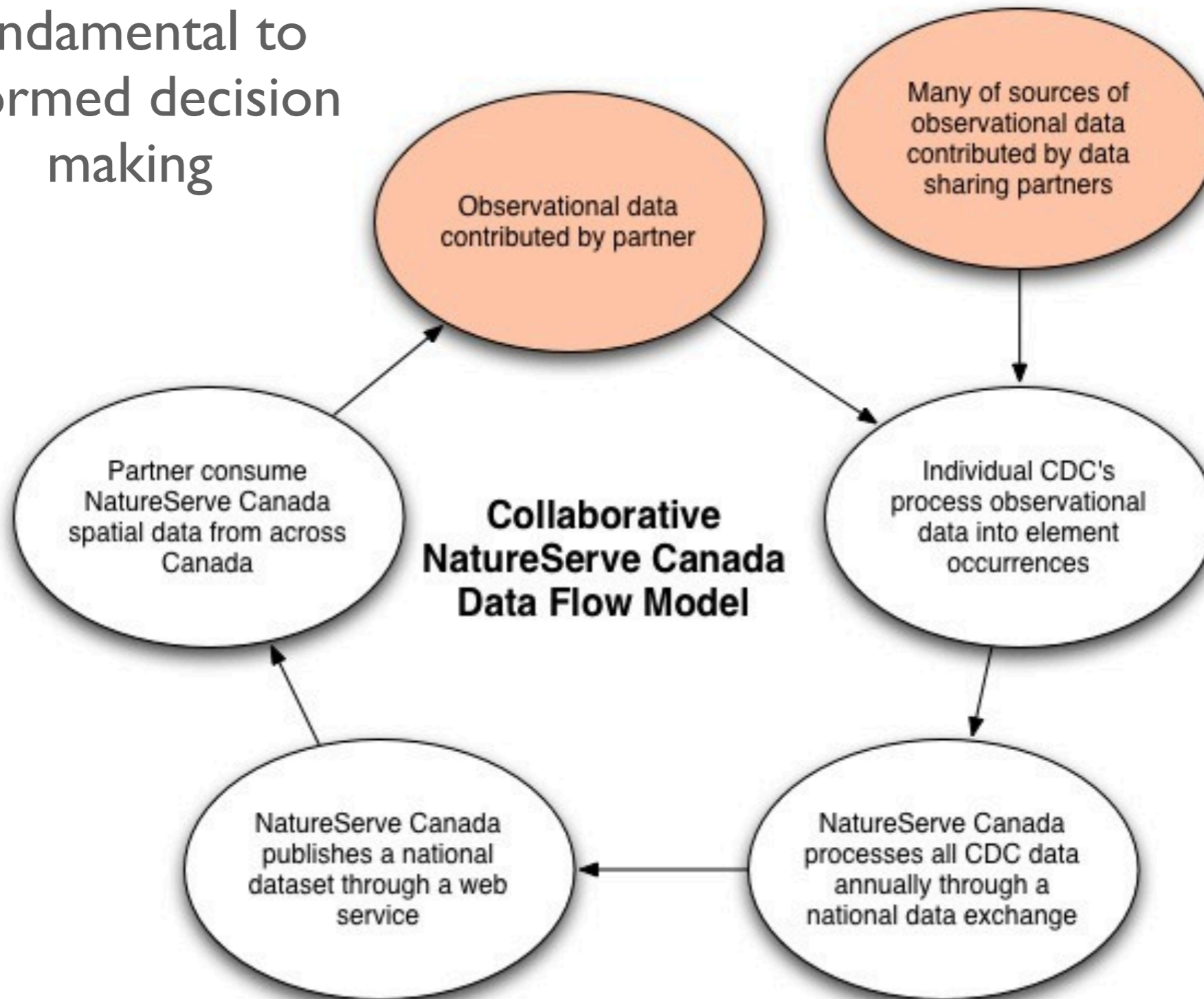




# Opportunities for Collaboration



# Data sharing fundamental to informed decision making

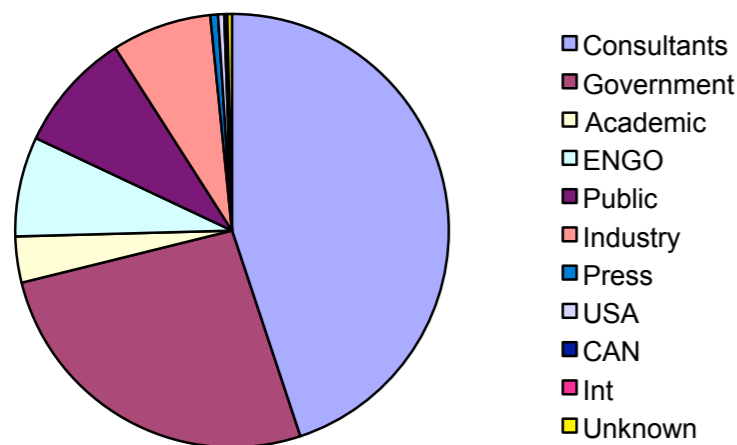




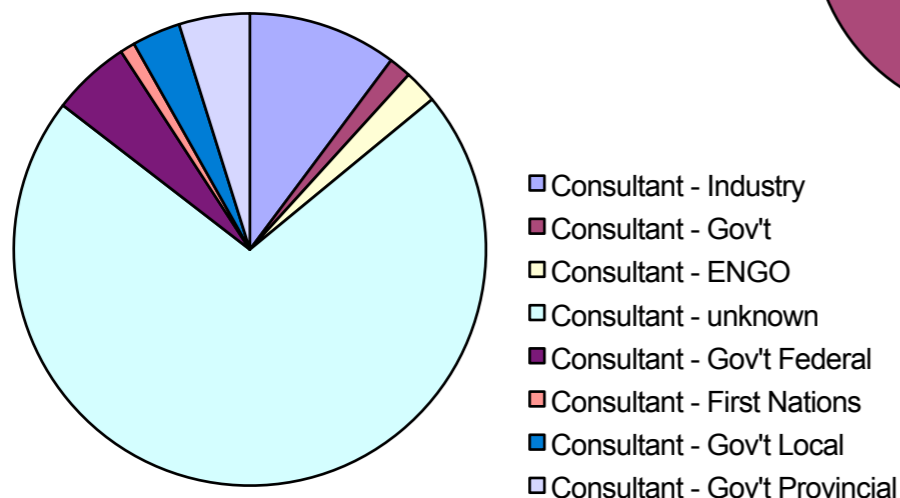
# Enhancing IMPACT: Storefront for data requests



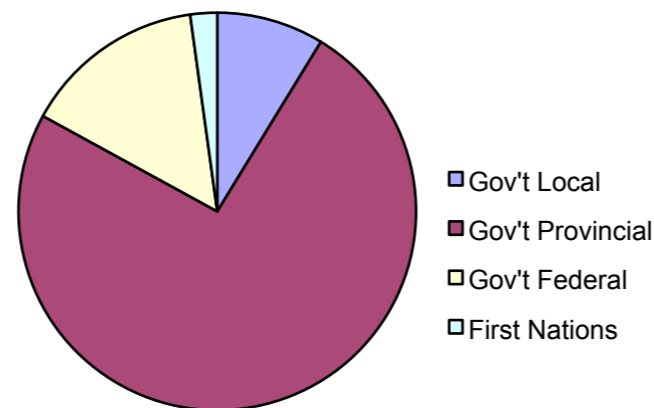
Total Data Requests



Requests: Consultant Breakdown



Requests: Government Breakdown



- ▶ Roughly 1 million queries per month
- ▶ Typical CDC reports direct client requests ~ 900 per year (typical)
- ▶ Response time from 6.5 to 2.7 days since 2004
- ▶ Time to process requests from 0.5 hours in 2004 to 0.25 hours in 2008

# Survey approaches

Should consider the site and species in question

Can range from:

- mapping vegetative communities
- broad-based “bioblitz”
- targeted survey for species
- single or multi-species monitoring

Caution about “negative data”

Expert is key to effectiveness





# Survey Priorities

- ▶ Need to work collaboratively to determine
  - ▶ What species, ecological communities
  - ▶ Where (can be driven by government or business priorities - funding?)
- ▶ CDPNQ
  - ▶ Can assist with both
  - ▶ Can also assist with survey methods, tools to gather and process data



# Trapping Observational Data: Kestrel



**Observations DMS** NatureServe

Change Password Log Out nsc

Canada Organization

**Observation Template**

- Banff Mortality Observation Template
- Bruce Peninsula Fathom Five Observation Template
- Cape Breton Highlands Observation Template
- CBH Plant Records Observation Template
- Critical Habitat Template
- Darwin Core Observation Template
- GNP Wildlife Observation Template
- Mortality Observation Template
- NatureServe Observation Standard
- Newfoundland Martin Telemetry Observation Template
- Ontario NHIC Observation Template
- Pacific Rim Egg Case Observation Template
- Pacific Rim Elasmobranch Observation Template
- Parks Canada Standard Observation Template
- Riding Mountain NP Faunal Observation Template
- Sage Grouse Leks Observation Template
- Telemetry Observation Template
- Wapusk Incidental Observation Template

Authorized Users

Save & Close

Save & Close Cancel

Roles For Selected User

- Administrator
- Contributor
- Viewer
- Access Sensitive Observations



# Mobile Data Collection System

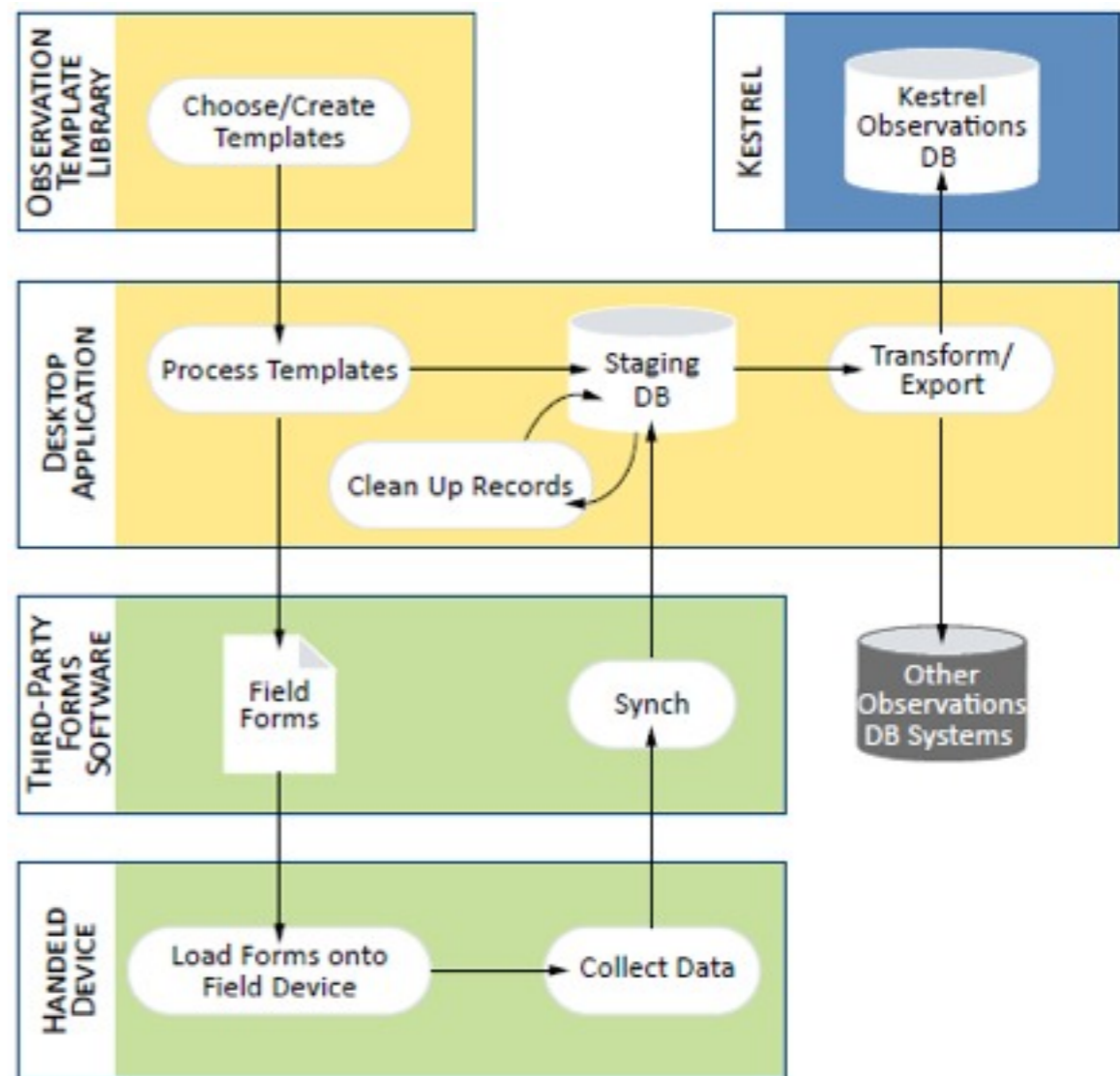


Handheld system allows:

User created templates (mapped against standards like Darwin core)

Cleanup and validation

Export to Kestrel and other systems



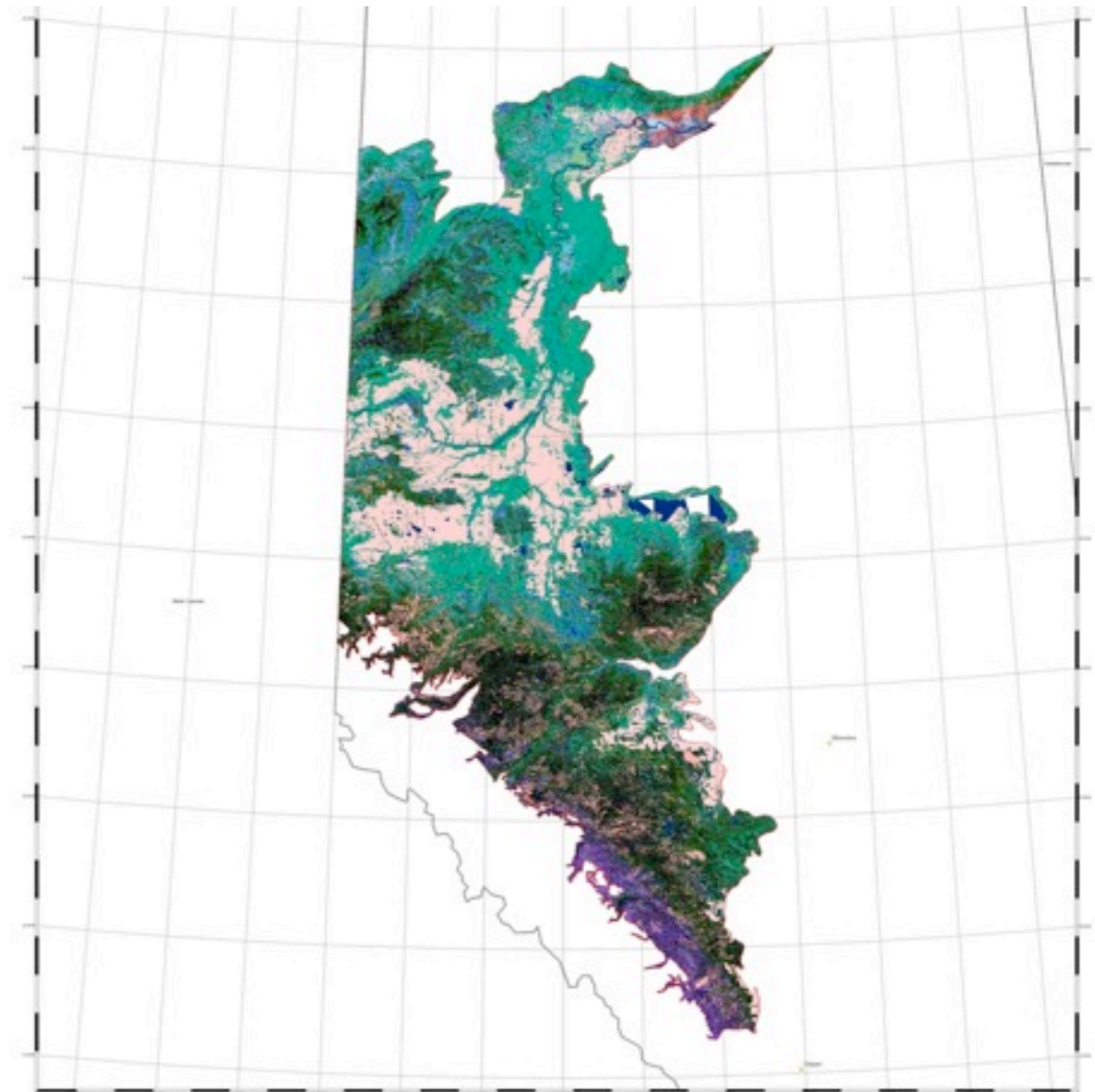
# Mapping ecological communities

Effort in Quebec underway

Example of result from Alberta to the community level

Inform modelling, fire and pest management, other biodiversity management

NatureServe capacity development to complete maps elsewhere



## Results



Projection: WGS\_1984\_UTM\_Zone\_11N  
Datum: D\_WGS\_1984  
1:1,302,756  
40 20 0 40 80 120





# Other Possibilities

Emerging NatureServe Canada  
academic grants program - access  
to limited funding and our data

Naturally Connected - an effort to  
enhance and expand citizen  
science in Canada

Climate change vulnerability index  
- towards using biodiversity as a  
tool to monitor climate change

Tools to facilitate range mapping -  
how to deal with limited  
information, and the role of  
expertise; modelling



# The State of Biodiversity Information



in Canada



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Thank you!  
Questions?

