


NATURE CANADA

The Role of Citizen Science in Impact Assessment

Perspectives of a national organization

OAIA Conference 2013

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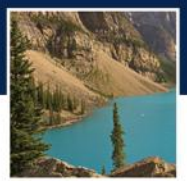
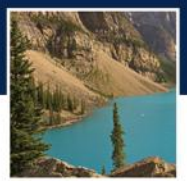


Nature Canada in brief

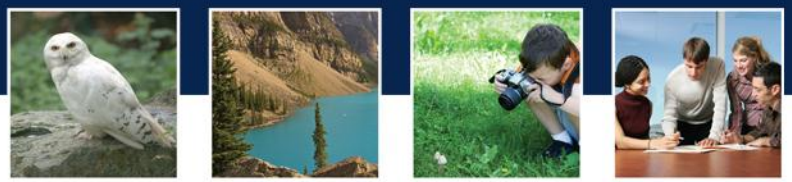
- Charitable ENGO with 40,000 supporters, Ottawa-based
  - ***Mission:*** *To protect and conserve wildlife and habitats in Canada by engaging people and advocating on behalf of nature*
- **BirdLife International** in Canada (co-partner)
  - Oversee almost 600 Important Bird Areas (IBAs) in Canada
- Coordinate *NatureWatch* suite of programs
- Leading the *Naturehood* initiative to connect Canadians to nature

What is Citizen Science (CS)?

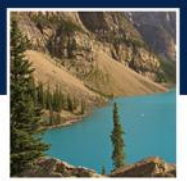
→Voluntarily collected and shared observational data, typically curated and validated by experts…

- →Crowd-sourced, open participation
- →Limited to observable phenomena
- →Verifiable and reproducible
- →Quantitative or qualitative, or both
- →Regular, stochastic, or combination of both
- →Specific to one phenomenon or taxon, or more general
- →Protocols or reporting standards in place
- →Peer review exists, but neither blind nor unbiased



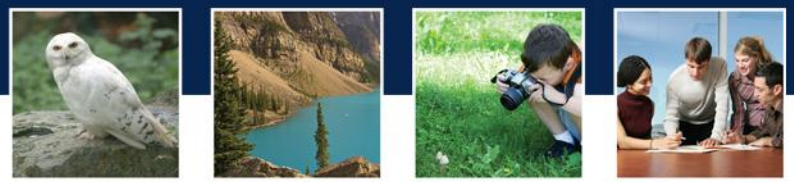
Citizen Science in Impact Assessment

- How can CS assist?
  - Proponents (i.e., consultants) need to know environmental liabilities, trends, baselines
  - Communities need to know about s-t/l-t impacts
  - Governments need to see s-t/l-t legal compliance
  - Public interest groups focus on the latter two…
- CS can provide answers to some of these questions

Examples of CS in Impact Assessment?

- Many examples in Canada
  - Trans-Labrador Highway (NL)
  - White's Point Quarry proposal (NS)
  - Mackenzie Gas Project (NWT)
  - Northern Gateway Pipeline (BC)
  - Ostrander Point Wind Energy Project (ON)
  - Just to name a few…
- And we've entered a new era in CS
  - "Web 2.0" and the "Mobile Web"



Citizen Science in Impact Assessment

- Numerous CS tools available, including volunteer & academic projects
- A growing list just for biota/species occurrences:

Web 2.0/Mobile Web

- Online databases: eBird, eButterfly,
- APIs & mobile apps: Ontario Herp Atlas, eBird, NatureWatch, Nature apps
- NatureServe
- Canadensys explorer (ROM, universities, etc.)
- GBIF/CBIF
- MNR's Natural Heritage Information Centre

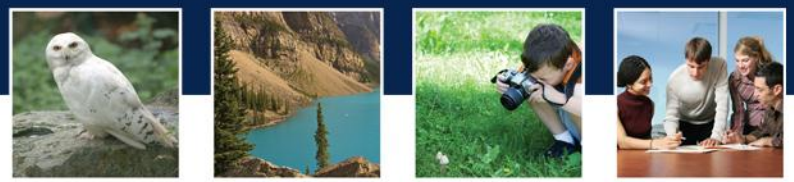
Online/Offline Databases

- Breeding Bird Atlas, Breeding Bird Survey programs
- Nocturnal Owl Survey, Canada Lakes Loon Survey, Project NestWatch, SwiftWatch, FalconWatch, Great Backyard Bird Count.
- IBA Canada program and database
- Hard-copy and digital naturalist club records




But *which* data are needed for IA?

- Example: Considerations when assessing potential impacts on birds
  - Migratory Birds Convention Act (1994)
  - Species At Risk Act (2003)
  - Ontario Endangered Species Act (2007)
  - Ontario Fish and Wildlife Conservation Act (2012)
- Consultants need to know…
  - Which species are found in the project area, when/how long, and why?
  - Potential interaction between activities and bird species?



CS tools useful for assessing potential bird impacts

Combine "Confirmed" occurrence data w/ **site inventories**

- eBird
- Breeding Bird Atlas
- Breeding Bird Survey
- Project NestWatch
- IBA Canada database

+

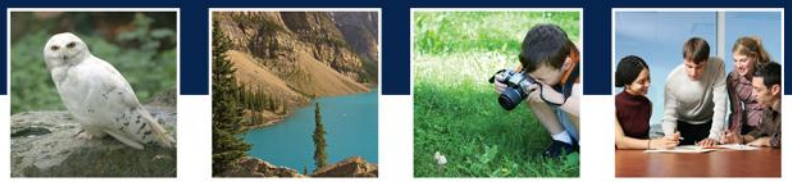
Policy/legal protections

- E.g., F/P threatened migratory bird species

→

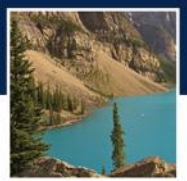
Determine potential impacts in the project area:

- Preclude certain activities on-site or change their timing
- Define a baseline for VECs;
- Better focus info gaps for further site inventories; or,
- may justify monitoring and impact avoidance.



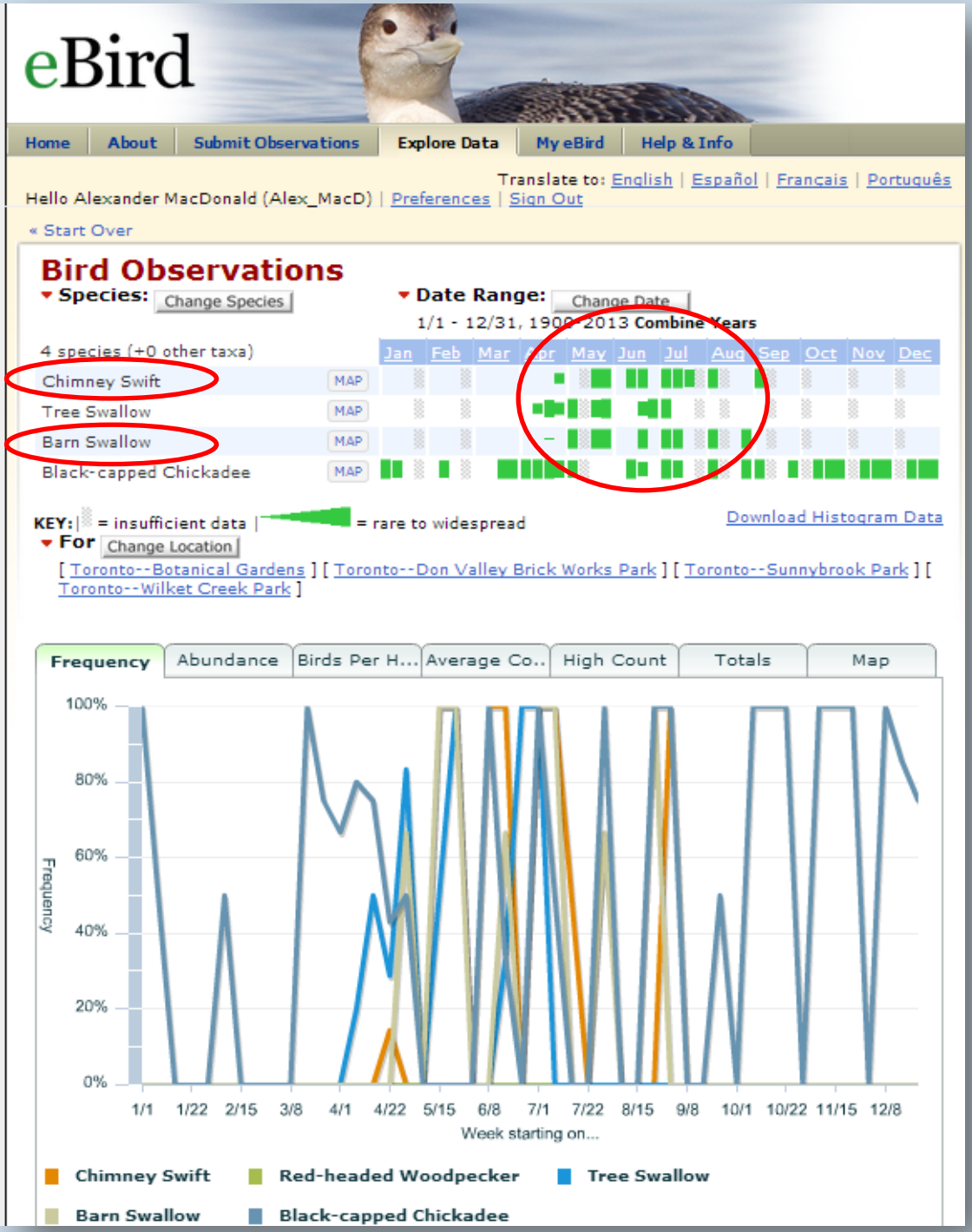
An example using eBird

- Project description
  - Proposed conversion of nearby parks/green spaces into commercial and residential space
- Impacts
  - Removal of extensive wildlife habitat over a 12-month period
  - Removal of habitat for ESA-listed species
  - No habitat offsets proposed

An example using eBird

- Explore local eBird records
  - Species-specific searches, e.g., listed species
  - Explore data for 'hotspots' around the OSC
  - Look at sighting frequency, abundance, rate, high counts, total counts and mapped points

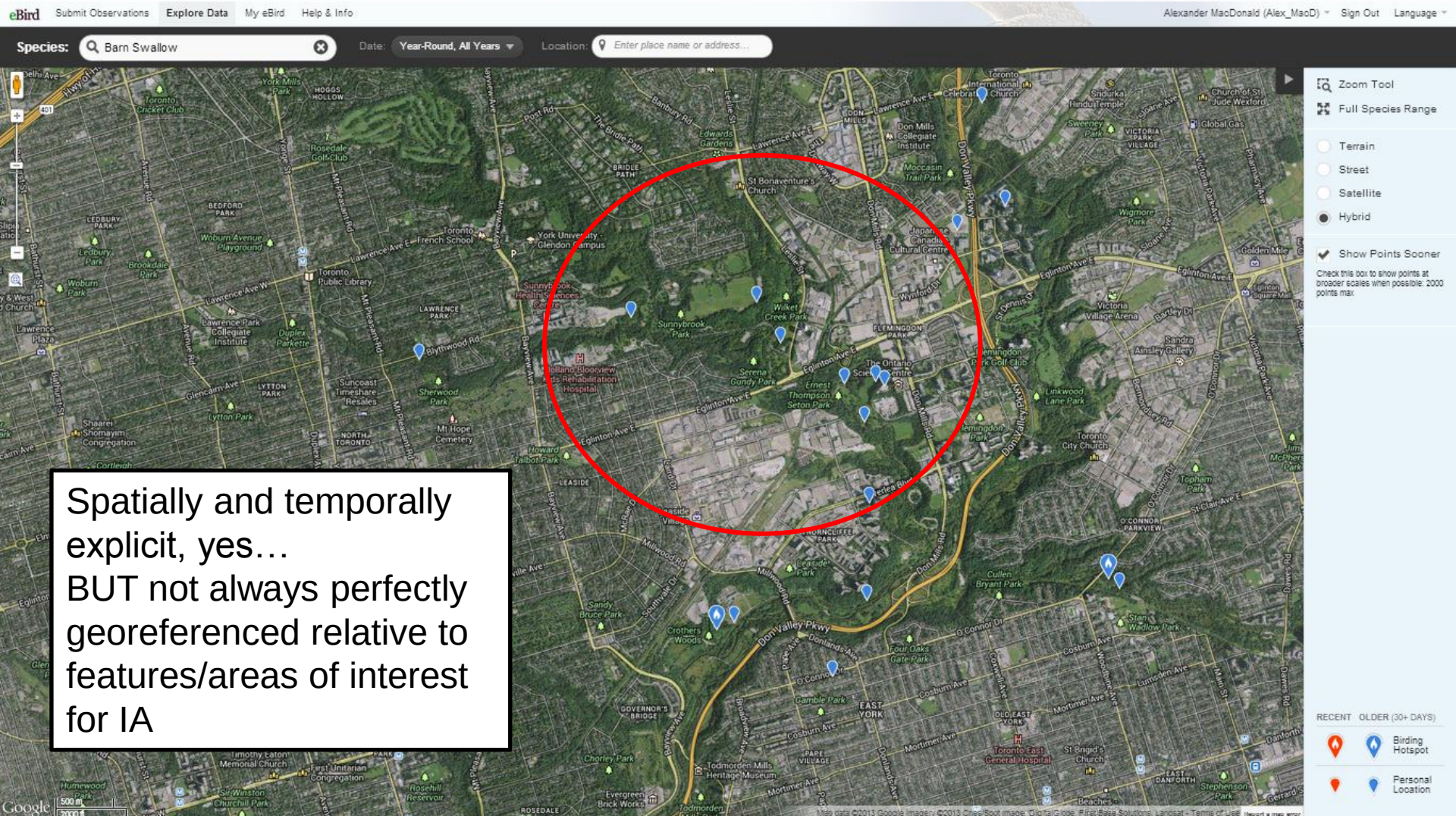


Presence data recorded at local eBird hotspots

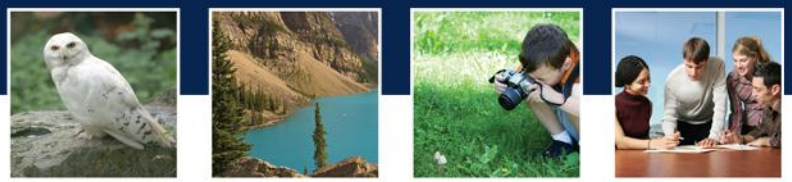
- Frequency distributions of sightings
- Aggreg. of 100 years
- Data gaps also obvious
- Numerous compilers
- Controlled for effort
- Temporally and spatially explicit




Georeferenced Barn Swallow observations



Spatially and temporally explicit, yes…
BUT not always perfectly georeferenced relative to features/areas of interest for IA



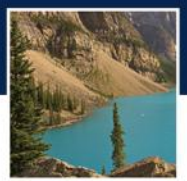
Then, the legal ‘stuff’

- Barn Swallow, Chimney Swift are listed species
- “Activities generally not compatible within described habitat”:
  - “Significant modifications to structures such as buildings and bridges where nests are found, which would render the nesting habitat unsuitable.”
  - “Development activities that result in significant fragmentation or removal of large tracts of suitable habitat.”



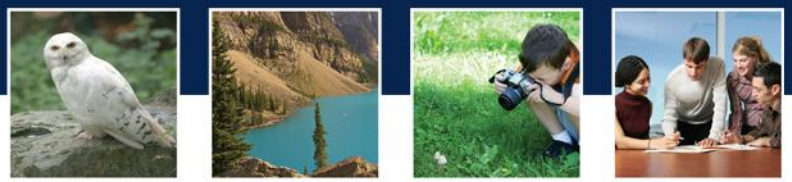

And the final guidance for the client

- CS tools nicely complement site inventories to address information gaps/data deficiencies and regulatory requirements
- Legal/regulatory parameters provide context for how data is relevant
- But for biotic inventories, CS isn't yet a silver-bullet

Value, benefits of CS in IA?

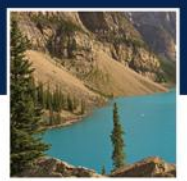
- Another source of information – and it's **free**
  - Publicly accessible so provides another level of public transparency
  - Almost entirely third-party managed
  - Using citizens' own data may improve social license for proponents
  - Opportunity to ID additional third-party experts at local level
- Should offer greater temporal and spatial coverage
  - Ongoing initiatives with growing data archives and participants
- Increasingly used as data sources in peer-reviewed academic literature.
- Largely non-governmental, so less focus on 'red flag' species



Weaknesses, pitfalls of CS in IA?

- Biased toward observation ‘hotspots’ and best observation periods
- Effort is skewed toward populated areas, protected areas
- Data are validated but this involves review time
- Not perfectly spatially explicit
- Presence data only in many cases
- How valid is it?

Thank you!

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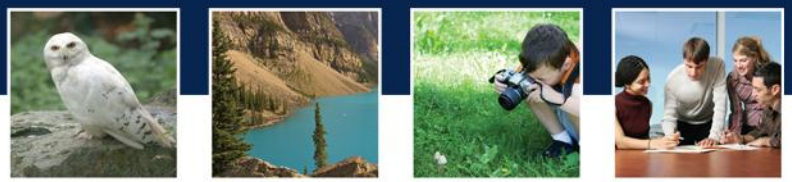
Connecting people to nature!



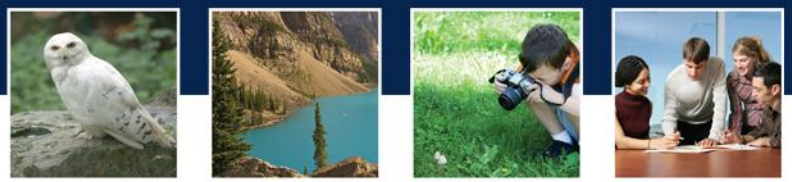
Definition: “citizen science”?

The Cornell University Lab of Ornithology says:

> “… typically refers to research collaborations between scientists and volunteers, particularly (but not exclusively) to expand opportunities for scientific data collection and to provide access to scientific information for community members.”

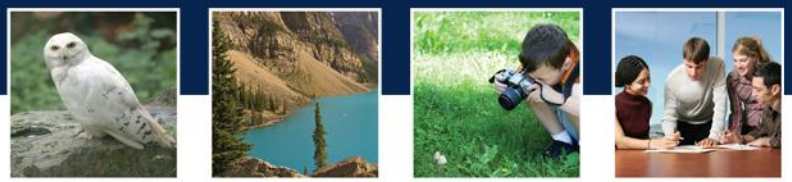
or

“projects in which volunteers partner with scientists to answer real-world questions.”



Definition: “community knowledge”?

- But what about community knowledge, aka ‘traditional knowledge’?
- If it has been recorded and ‘validated’ by other community members, is it any less important as empirical evidence?



Citizen Science in Impact Assessment

- Recent example of where citizen science data combined with policy made a difference?
  - Ostrander Point Wind Energy Project
  - Project rejected at Ontario ERT on grounds it would cause significant irreversible impacts on the endangered Blanding's Turtle, and bird data also figured prominently
    - eBird observations, long-term field naturalist records, IBA Canada database
    - Combined with empirical evidence from academic and expert opinion