



NATURE
CONSERVANCY
C A N A D A



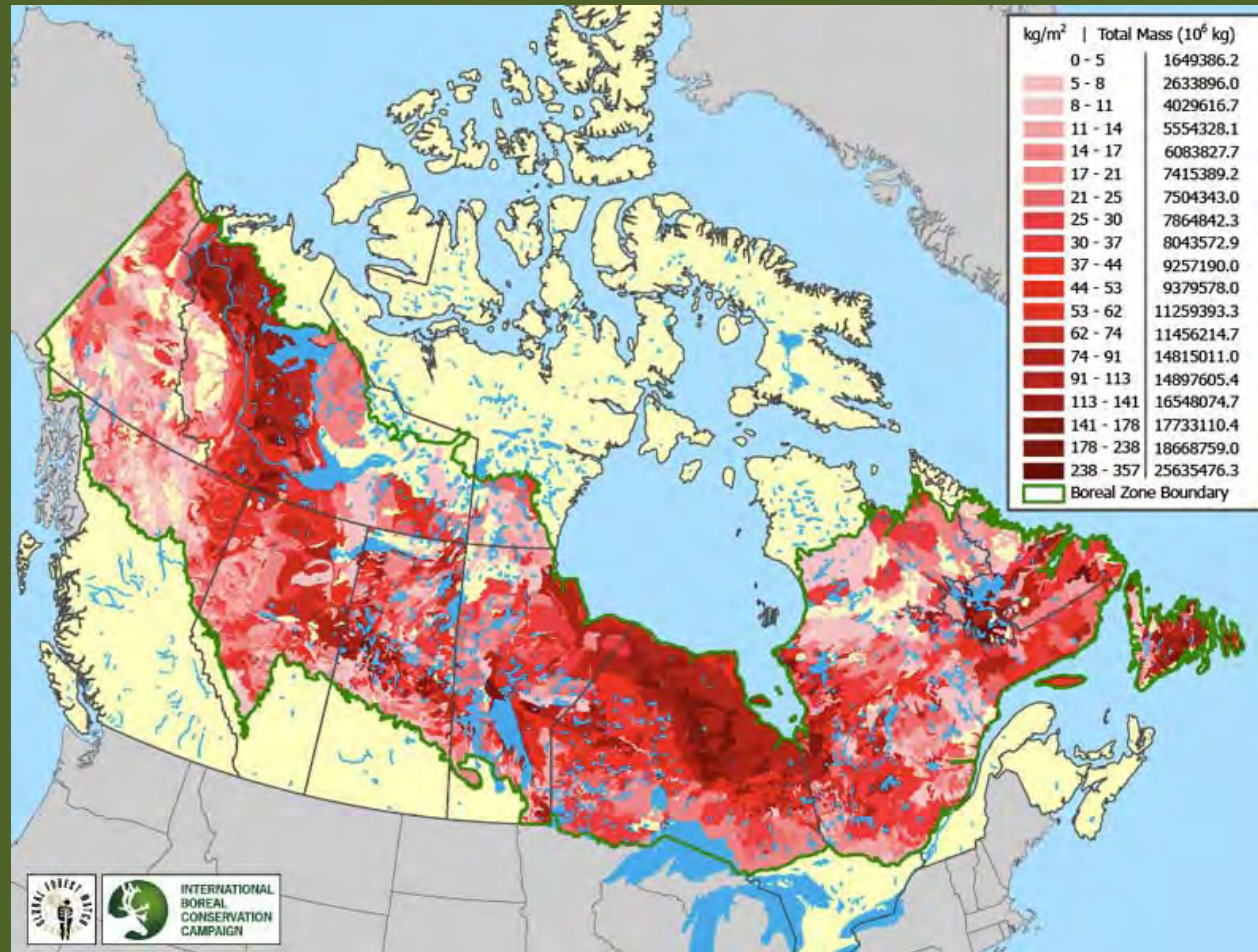
CONSERVATION
DE LA NATURE
C A N A D A



Private conservation lands: climate change adaptation and mitigation

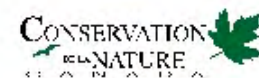
John L. Riley

Carbon Storage in Canada's Boreal



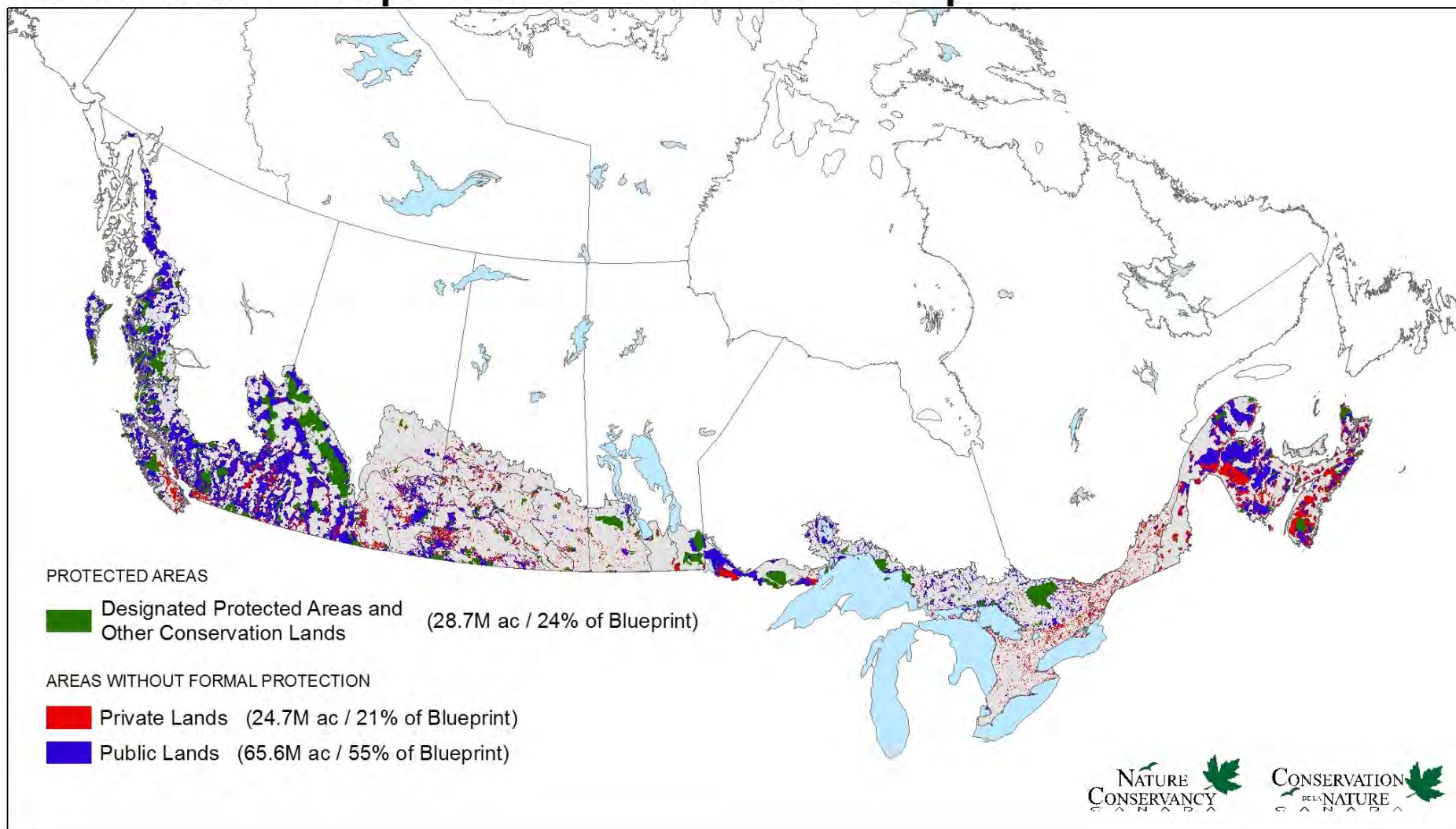


- | | | | |
|---|--|--|--|
|  Coastal Forests and Mountains of S.E. Alaska and B.C. |  Central Interior |  Moist Mixed Grassland |  Superior-Lake of the Woods |
|  Northern Cascades and Pacific Ranges |  Muskwa-Kechika |  Mixed Grassland |  Great Lakes |
|  Pacific Northwest Coast |  Canadian Rocky Mountains |  Cypress Upland |  St. Lawrence Lowland |
|  Puget Trough-Willamette Valley-Georgia Basin |  Aspen Parkland |  Northern Tallgrass Prairie |  Northern Appalachians-Acadia |
|  Okanagan | | | |



Data Sources:
NCC 2010; ESRI 2007

Conservation Blueprint Core Lands - Ownership



- **Adaptation**

- Theory
- Practice

- **Taking Climate to Market**

- Pilot project

Theory

- Increase extent, frequency, density and connectedness of conserved natural ecosystems
- Improve the representation of the ecotones; moisture, temperature, substrate, elevation, aspect
- Plan for adaptation corridors (in space and time), and stepping stones, and refugia
- Steward to enhance ecosystem functions and services
- Document changes in populations and occurrences of species and ecosystems (& rare species and invasives); correlate them with climate change; adapt to findings
- Enhance landscape permeability to species movement
 - Assist migration of desirables, resist migration of undesirables

Assisted Migration

The “nature” of the future is the one growing now

- There has been an accepted insistence that the best conservation is “conservation *in situ*”
- This is true but it is not enough anymore
- What else to recommended to landowners...
 - such as through Environmental Farm Plans, etc?
 - Planting north? Growing north? Restoring north?
 - Still considered oddities...

Adaptation Data Centres

- Like other Conservation Data Centres, or invasives data centres, etc...
- Track “species recovery plans,” all of which should deal with climate change
- Track “assisted migration” efforts
- Track shifts in distribution of native and invasive species

“Temporal Corridors”

Nancy-Anne Rose and Phil Burton, BC

- Ecosystems adapt, expand & contract , appear & disappear, whether “protected” or not
- QUESTION: What parts of the landscape will experience the least climate change?
- METHOD: Identify climate “envelopes” of present ecosystems , and predict where each envelope will be in 2020, 2050, 2080; and the areas of most “persistent climate” (=“temporal corridors”)
- **Tool for selecting sites for persistence & slow change**

NCC's Carbon Footprint

- NCC's "carbon footprint" was calculated in 2008 for 182 staff, offices, goods and transportation
- Estimated footprint was 449 tCO₂e per year, less than 0.5% of the annual carbon sequestered on NCC lands, e.g., 121,000 tCO₂e per year from NCC forest lands alone
- We are now learning that the sequestration rates are likely four times this much

NCC Approach

- **Ecoregional assessments** of
 - the full array of biodiversity “targets”
 - major “threats”, of which climate change and invasives are the most predictably cited
 - land-conservation solutions to conserve the targets and mitigate the threats
 - 16 ecoregions assessed so far from coast to coast
- Natural area conservation plans (NACPs)
- Project stewardship plans (PMPs)

NCC Approach

- Ecoregional assessments...
- **Natural area conservation plans** that
 - focus on particular high-biodiversity landscapes or remnant natural areas
 - identify priority actions
 - set work plans, budgets, funding, etc.
 - 80 of these now completed across Canada
- Project stewardship plans (PMPs)

NCC Approach

- Ecoregional assessments
- Natural area conservation plans
- **Project management plans**
 - Detailed work plans tracking activities, budgets, etc. against goals
 - Embed plans in financial systems and the NCC Land Stewardship System

In practice – what is NCC doing?

- ✓ Increase the size, frequency, density & connectedness of conserved natural ecosystems?
- ? Improve representation of ecotones?
- x Plan for adaptation corridors, stepping stones, and refugia
- ✓ Steward to enhance ecosystem functions and services
- ✓ Document changes in occurrences and populations of species and ecosystems
- ? Correlate with climate change; adapt to findings
- x Enhance landscape permeability to species movement

A few discussion points...

- How to build adaptation into site selection, securement, stewardship, land-use planning, and land-based activities
- Most PA selection frameworks already stratify for climate. **If** they were implemented at appropriate scales, the systems would be pre-selected to adapt proportionately to climate change. However, they are **not** yet at scale.
- How to select innovations that improve on current practice?

Taking Climate to Market

- Of “ecosystem services,” carbon has been monetized faster than others
- In place - compulsory & voluntary carbon markets, certification protocols & methods
- So - buying and reducing the forest harvest at a site (to maximize biodiversity) gives rise to saved carbon - “additional” carbon
- There are no voluntary sales yet in Canada of natural-ecosystem carbon, so a major investment is needed for any such project

Pilot Project – Darkwoods, BC

- 136,000 acres of southern Selkirk Mountains
- Owned by logging company; bought NCC by 2007
- Biodiversity-first stewardship requires a lighter harvest; this “additional” carbon is in range of 300,000 tonnes sequestered each year
- No BC-forest-specific certification protocols in place, so NCC has had to develop them
- Market value +/- \$5 per tonne carbon

Draft NCC Rules of Engagement

- Biodiversity first – no compromises
- Voluntary markets only
- Full chain-of-control
- Meet international certification standards
- Only sell carbon already sequestered (*ex post*)
- Buffer sales to technical & precautionary limits
- Sales must cover all project costs (pre-planning, implementation, and permanence costs)

AND yield significant premium to fund additional conservation work

CARBON IN NATURAL ECOSYSTEMS

- Carbon in natural ecosystems is
 - a huge contributor to climate stability but is not marketable except if it is privately owned and at threat, or is in a developing country
 - a still uncalculated net benefit without recognition or value unless owners put the carbon at risk
- *For Indonesia to properly preserve its peatlands, the world has to provide incentives, because we know that peat absorbs carbon more than anything else in the world,"* Wahjudi Wardoyo, Indonesia's Forestry Ministry
- 2010 Ecuador threat to cut its forests if not compensated

Private lands – Part of a “made-in-Canada” response to global warming?

- On private lands, land trusts and individuals, by conserving large, connected natural areas, help ensure that native species persist and adapt to climate change, and ecological systems re-organize, in as natural a manner as possible
- By maintaining the integrity of natural ecosystems, these sites conserve large and increasing stocks of carbon that would otherwise be emitted as greenhouse gas, thus offsetting Canada’s economic activities

A photograph of a frog, likely a common frog, sitting on a bed of pine needles and green leaves. The frog is the central focus, with its body and head clearly visible. The background is a dense layer of pine needles and some green foliage, creating a natural, somewhat blurred environment. The lighting is soft, highlighting the texture of the frog's skin and the surrounding vegetation.

Thank you

History will end in ecology, or nothing

Stan Rowe. 1990. *Home Place*