Conserving Large Landscapes in a Disconnected World

Presented by: Gary M. Tabor VMD MES
President, Center for Large Landscape Conservation
Bozeman, Montana, USA
gary@largelandscapes.org

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Halifax, Nova Scotia

CENTER for LARGE LANDSCAPE CONSERVATION

CONNECTIVITY CONSERVATION Specialist Group

REVIEW

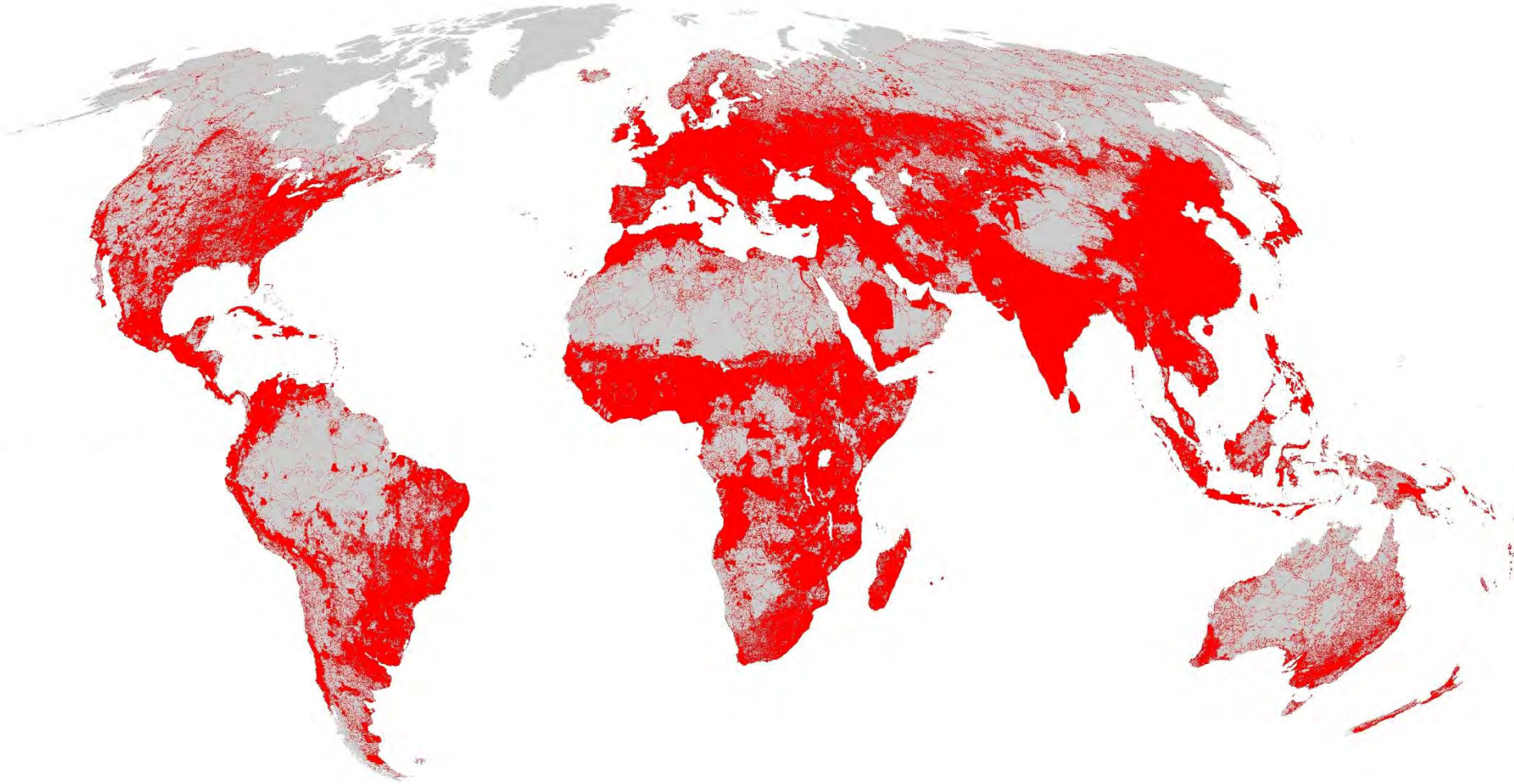
doi:10.1038/nature11018

Approaching a state shift in Earth's biosphere

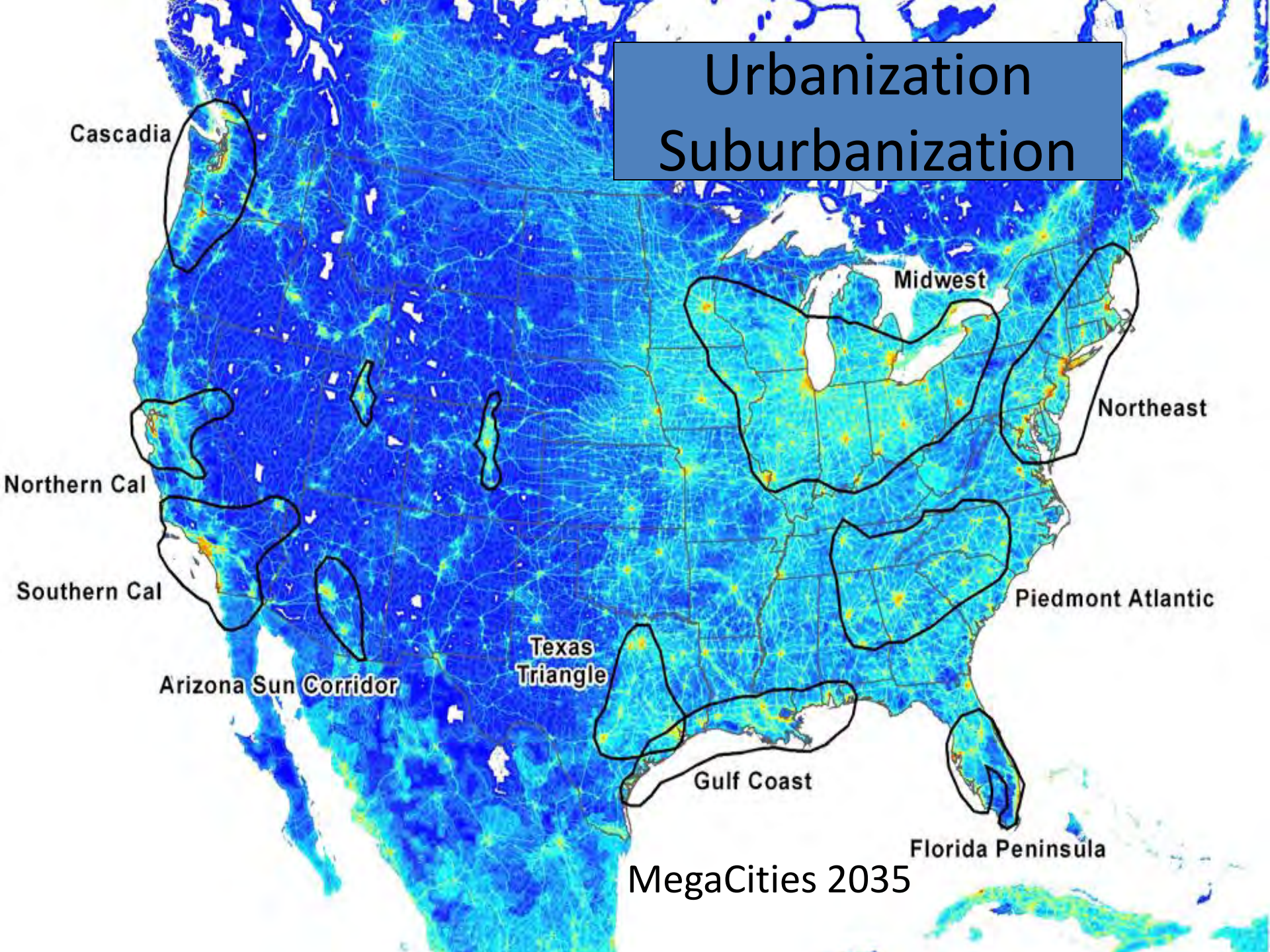
Anthony D. Barnosky[1,2,3], Elizabeth A. Hadly[4], Jordi Bascompte[5], Eric L. Berlow[6], James H. Brown[7], Mikael Fortelius[8], Wayne M. Getz[9], John Harte[9,10], Alan Hastings[11], Pablo A. Marquet[12,13,14,15], Neo D. Martinez[16], Arne Mooers[17], Peter Roopnarine[18], Geerat Vermeij[19], John W. Williams[20], Rosemary Gillespie[9], Justin Kitzes[9], Charles Marshall[1,2], Nicholas Matzke[1], David P. Mindell[21], Eloy Revilla[22] & Adam B. Smith[23]

Localized ecological systems are known to shift abruptly and irreversibly from one state to another when they are forced across critical thresholds. Here we review evidence that the global ecosystem as a whole can react in the same way and is approaching a planetary-scale critical transition as a result of human influence. The plausibility of a planetary-scale 'tipping point' highlights the need to improve biological forecasting by detecting early warning signs of critical transitions on global as well as local scales, and by detecting feedbacks that promote such transitions. It is also necessary to address root causes of how humans are forcing biological changes.

More than 50% of the Planet is Now Human Dominated Landscapes



Watson et al. 2016, *Conservation Letters*

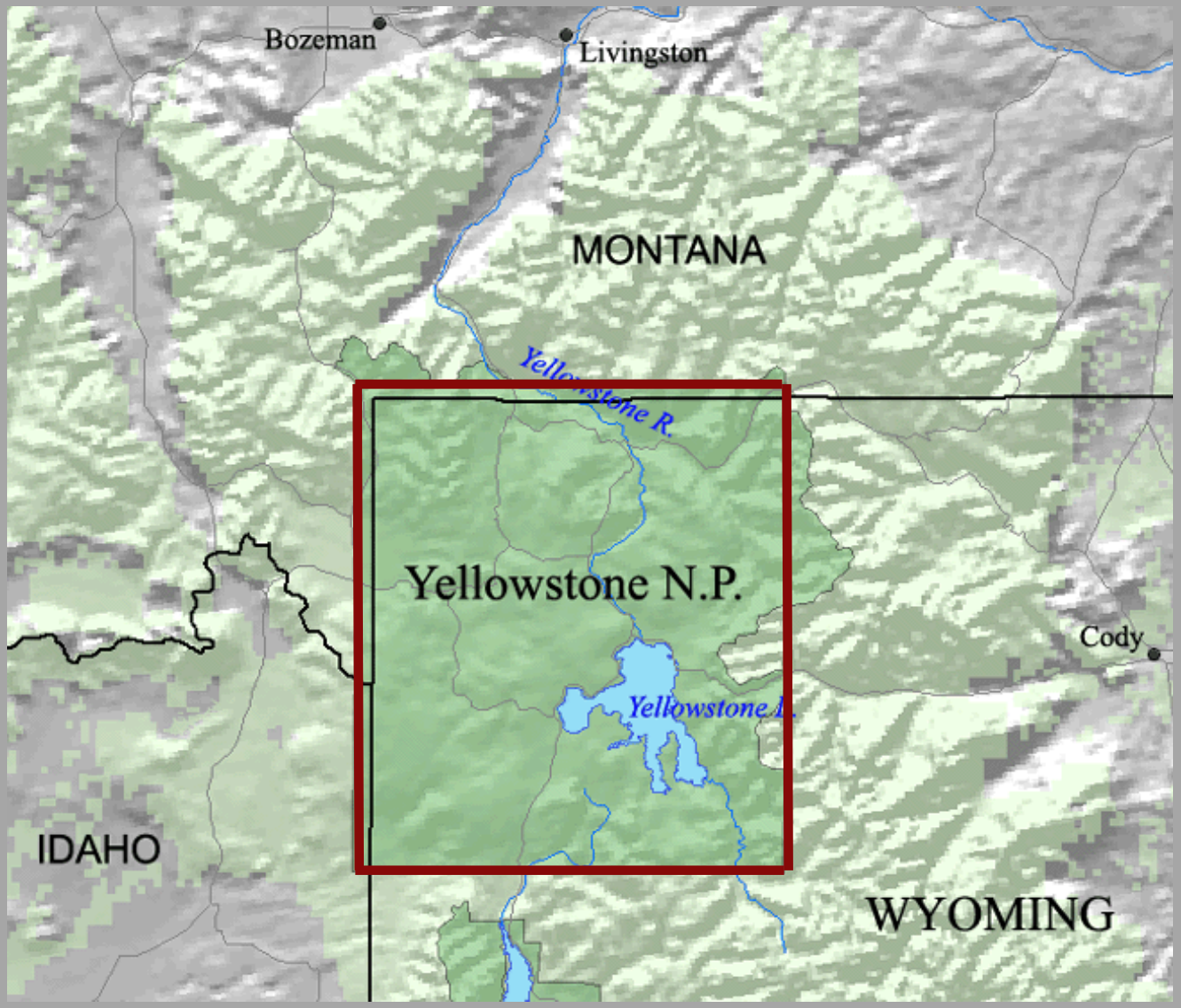

Urbanization
Suburbanization
Cascadia
Midwest
Northeast
Northern Cal
Southern Cal
Piedmont Atlantic
Texas
Triangle
Arizona Sun Corridor
Gulf Coast
Florida Peninsula
MegaCities 2035

America's Greatest Idea – National Parks

Thinking Outside the Box

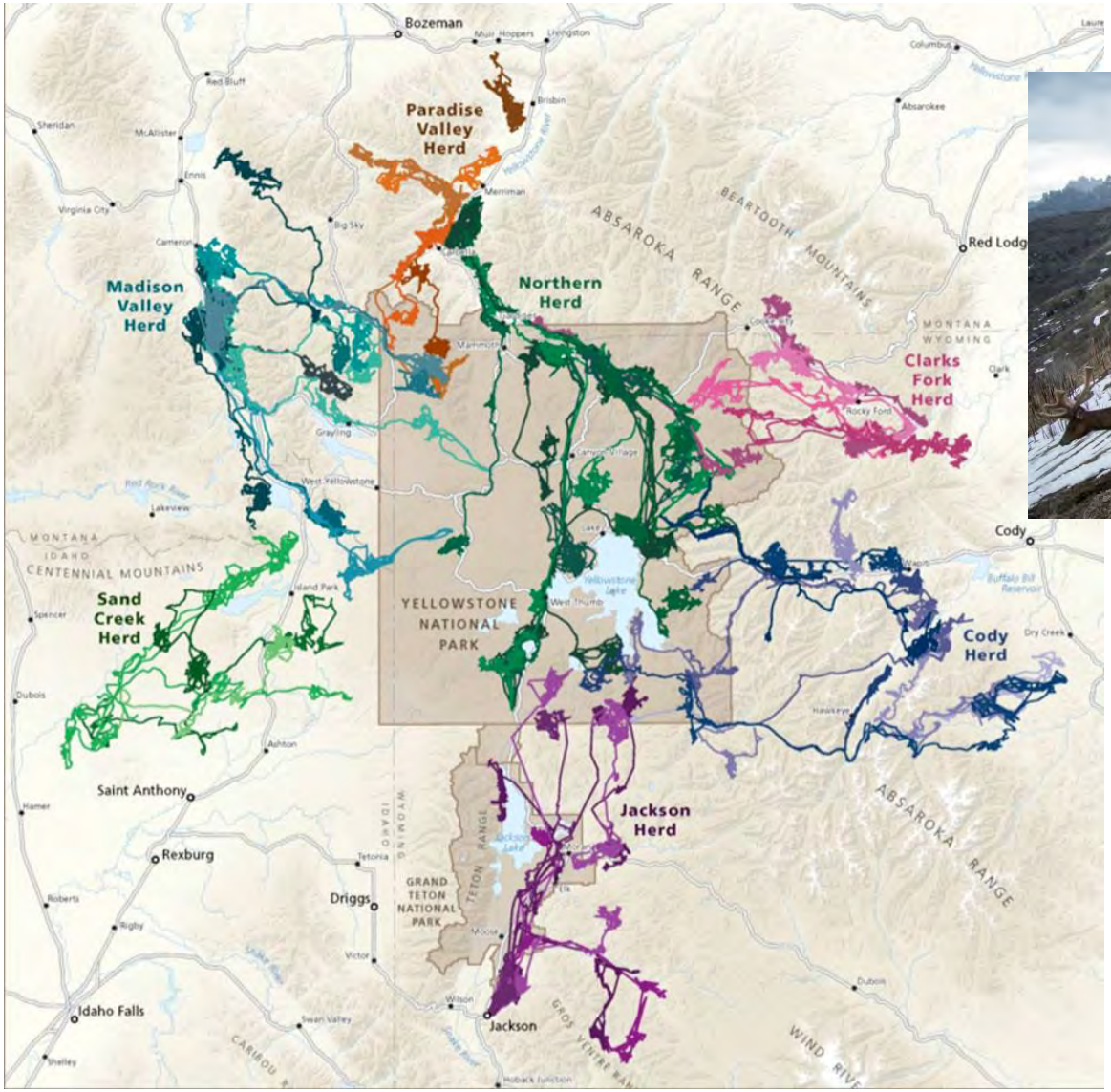
1872 Solution For Conservation

Yellowstone National Park



When you think like a box this is how you manage nature

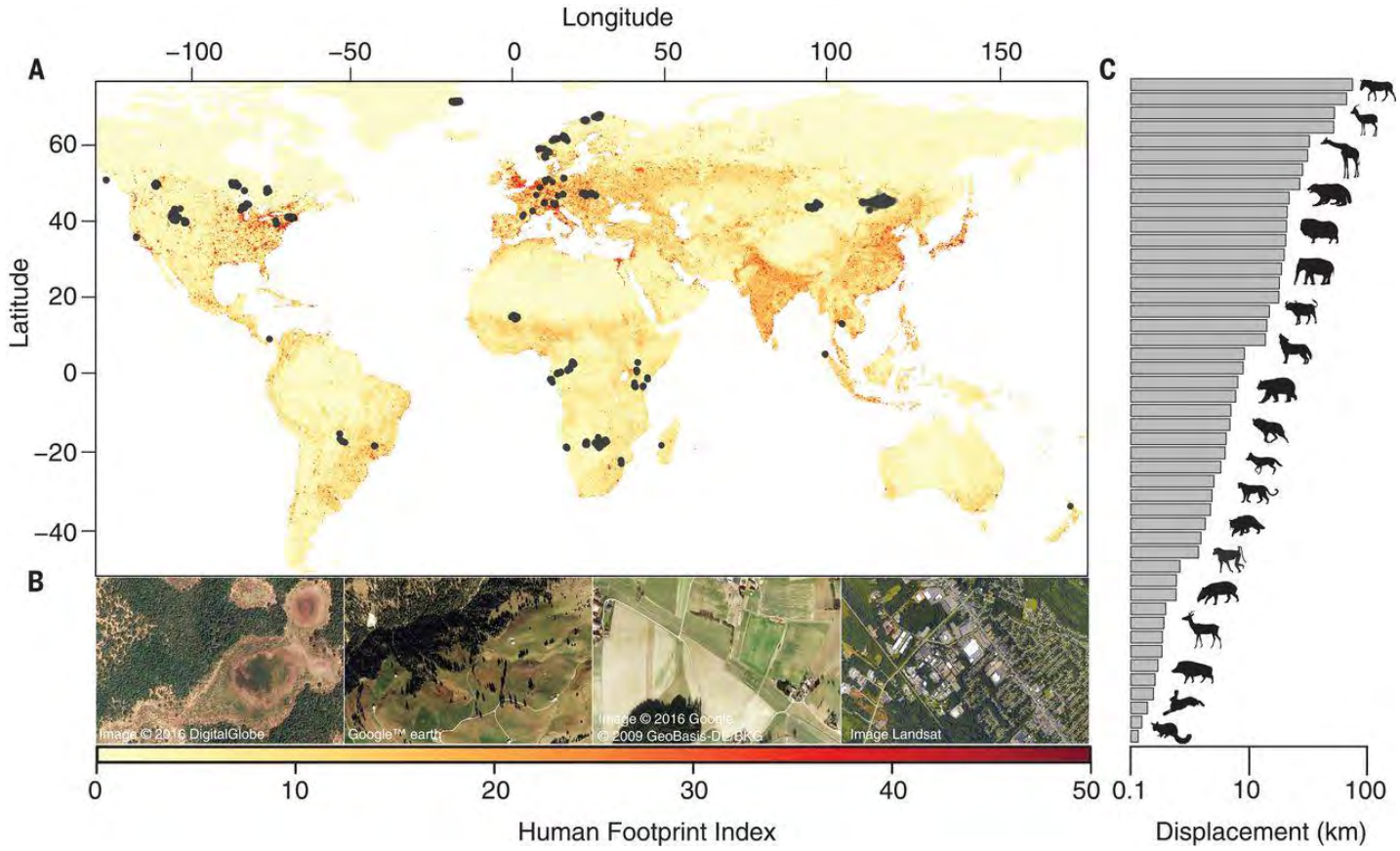
Elk Migration in the Greater Yellowstone Ecosystem



National Geographic Society
Wyoming Migration Initiative
Photo courtesy: Joe Riis

Moving in the Anthropocene: Global reductions in terrestrial mammalian movements

Fig. 1 Locations from the GPS tracking database and the Human Footprint Index.



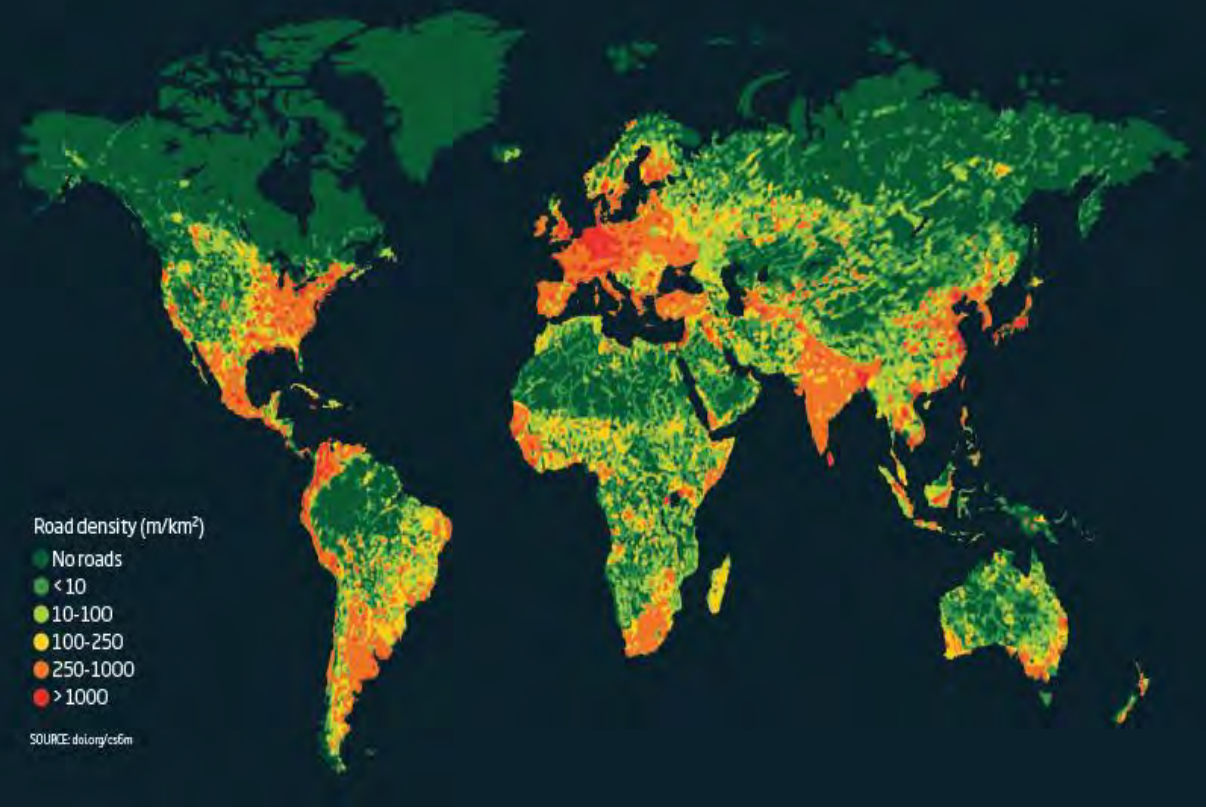
Marlee A. Tucker et al. Science 2018;359:466-469

12 million km roads built since 2000
25 million km roads projected by 2050

38 | NewScientist | 1 September 2018

PAVED PLANET

Large infrastructure programmes threaten biodiversity across the globe – with China's Belt and Road Initiative a new threat



835 TIMES AROUND THE EARTH, OR TO THE MOON AND BACK 43 TIMES

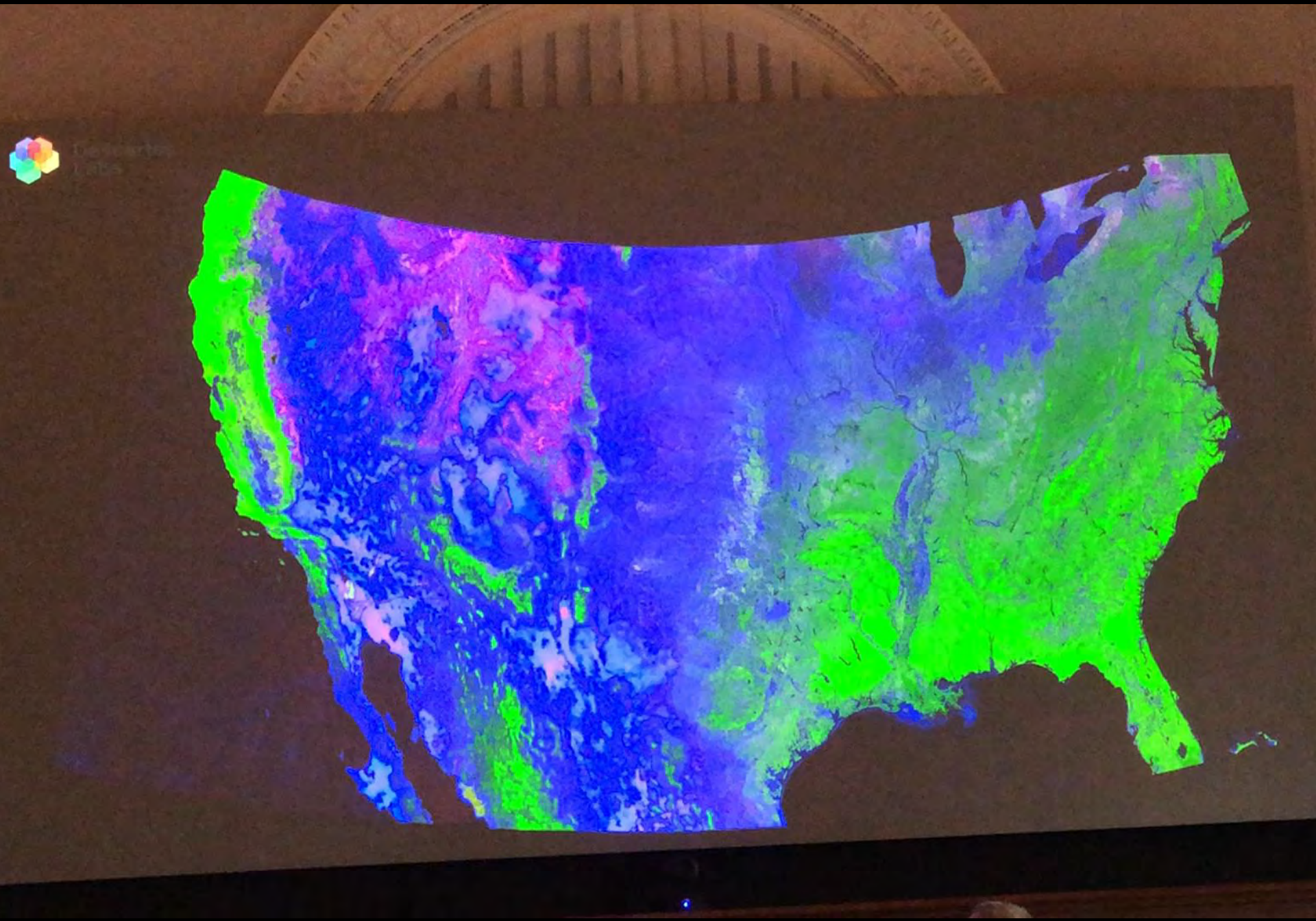
CIA. The World Factbook. www.cia.gov/library/publications/the-world-factbook/rankorder/2085rank.html

Emergence of Connectivity Conservation Practice

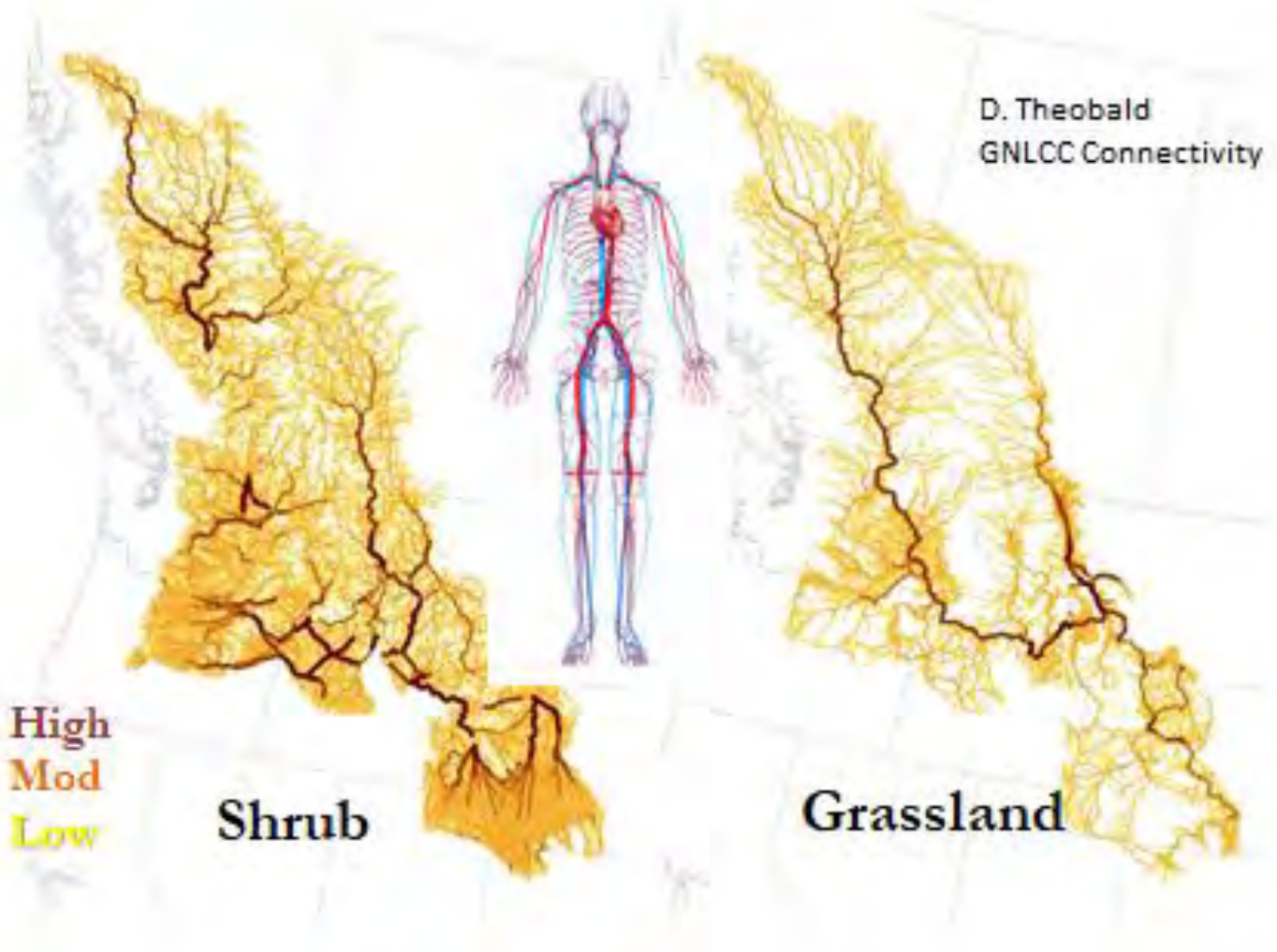
- **19th Century – National Park**
- **20th Century – Ecosystem Conservation**
- **21st Century – Process Conservation**

Process Conservation

- **Wildlife corridors**
- **Natural Disturbance Regimes**
- **Fire Ecology**
- **Hydrology**
- **Water Catchment**
- **Migration**
- **Dispersal**
- **Pollination**
- **Resilience**



Connectivity = Circulatory System of Nature



World Business Council
for Sustainable Development

World Business Council for Sustainable Development

A CEO-led coalition of some 200 international companies (35 countries, 22 sectors) with a shared commitment to sustainable

Connected Landscape Structure = Higher Levels of Ecological Function

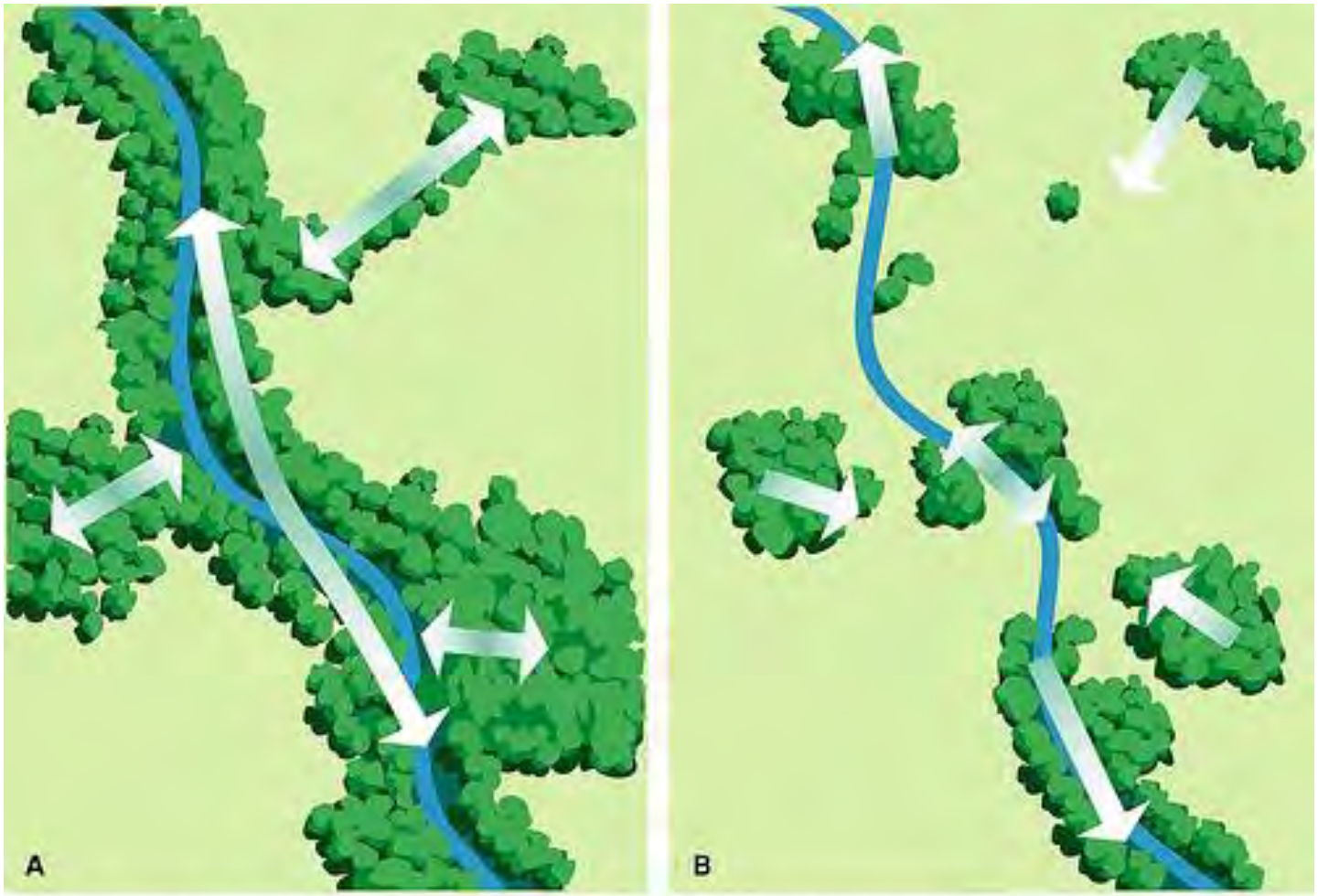


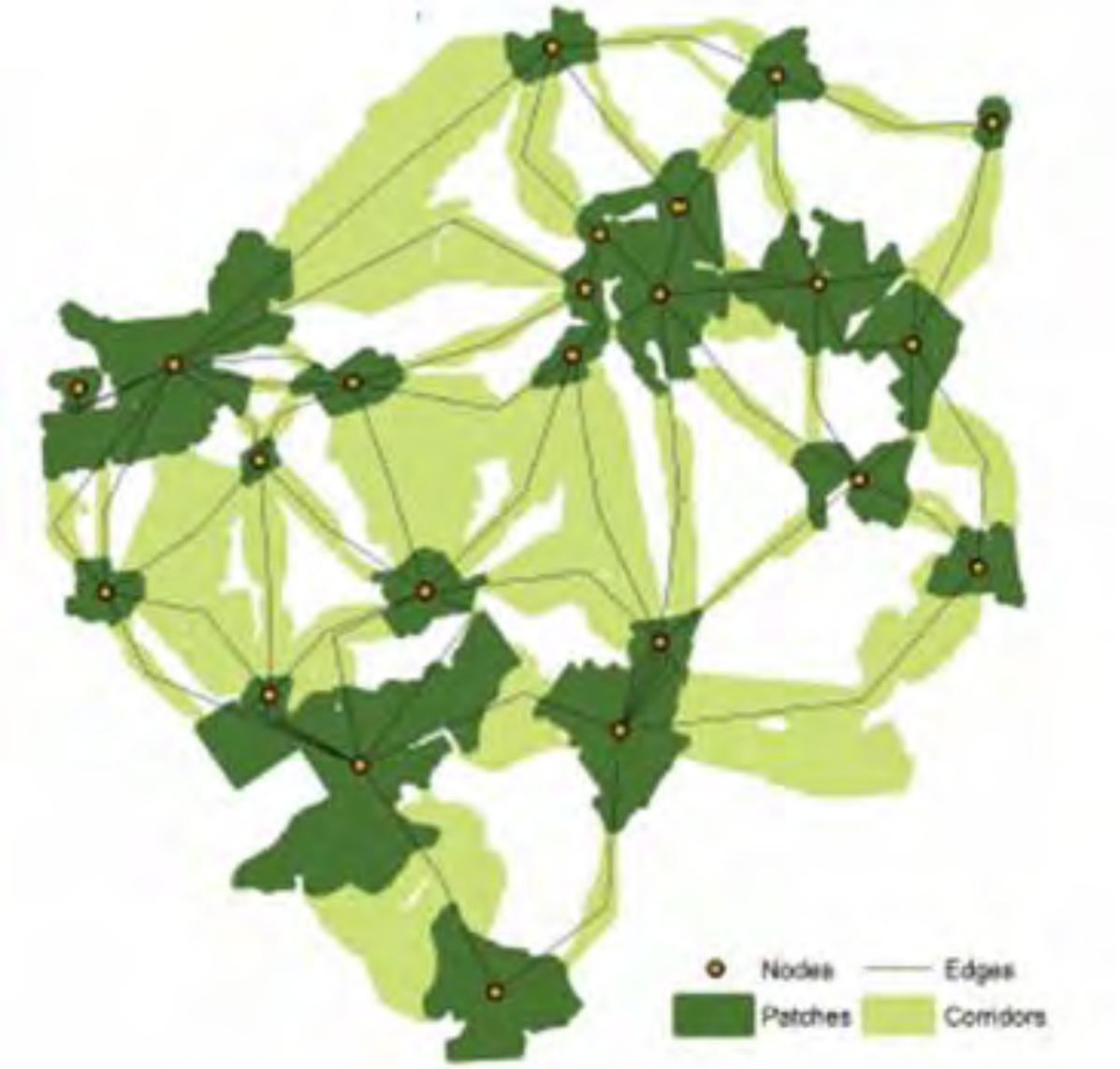
Fig. 2.38 -- Landscapes with (A) high and (B) low degrees of connectivity. A connected landscape structure generally has higher levels of functions than a fragmented landscape.
In Stream Corridor Restoration: Principles, Processes, and Practices (10/98)
by the Federal Interagency Stream Restoration Working Group (FISRWG) (15 Federal agencies of the U.S.)

Advancing Conservation Outside of Protected Areas – Known as the "Matrix"

Image Courtesy of Australia Ministry of Environment and Energy

Connectivity = Climate Change Adaptation

Terrestrial Ecological Connectivity



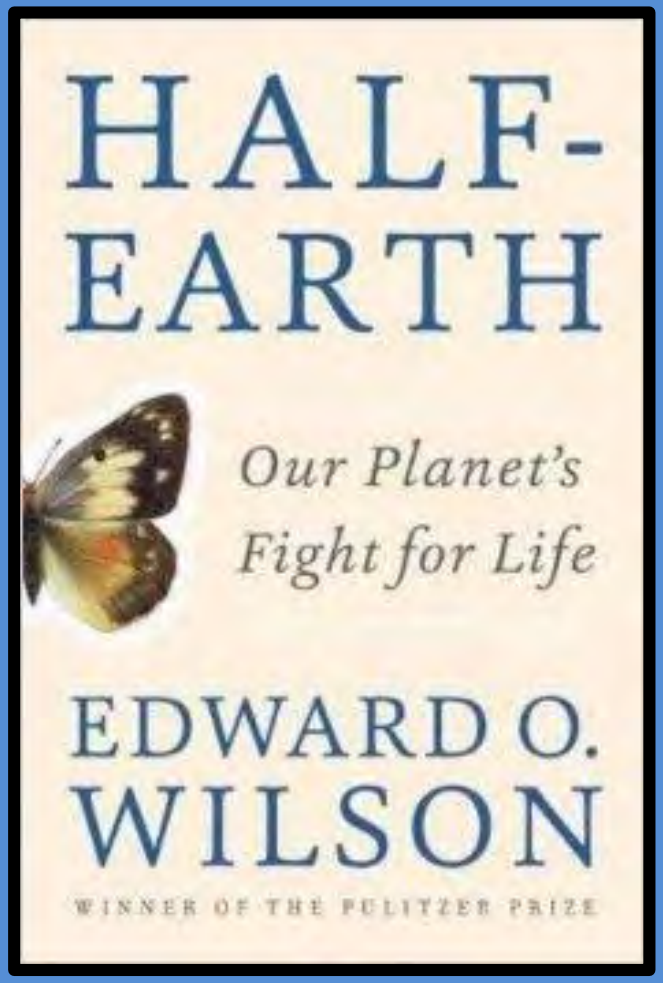
Rudnick, Deborah, et al, Iissues in Ecology (2012)

Can We Save Nature in a Crowded World?

Nature Needs Half™

50% by 2050

NATIONAL GEOGRAPHIC

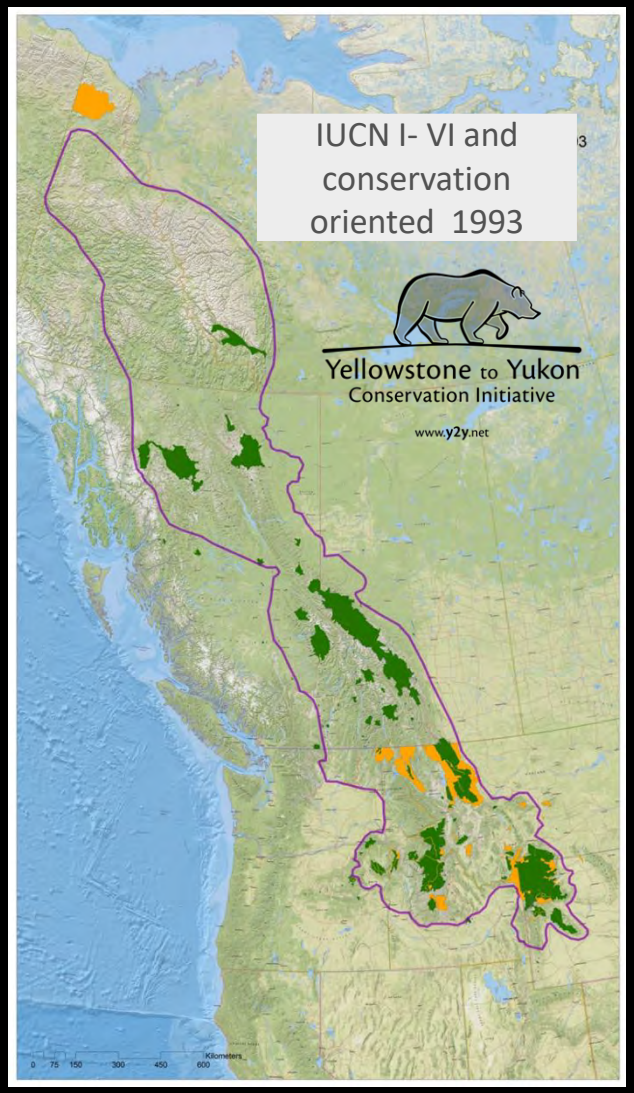


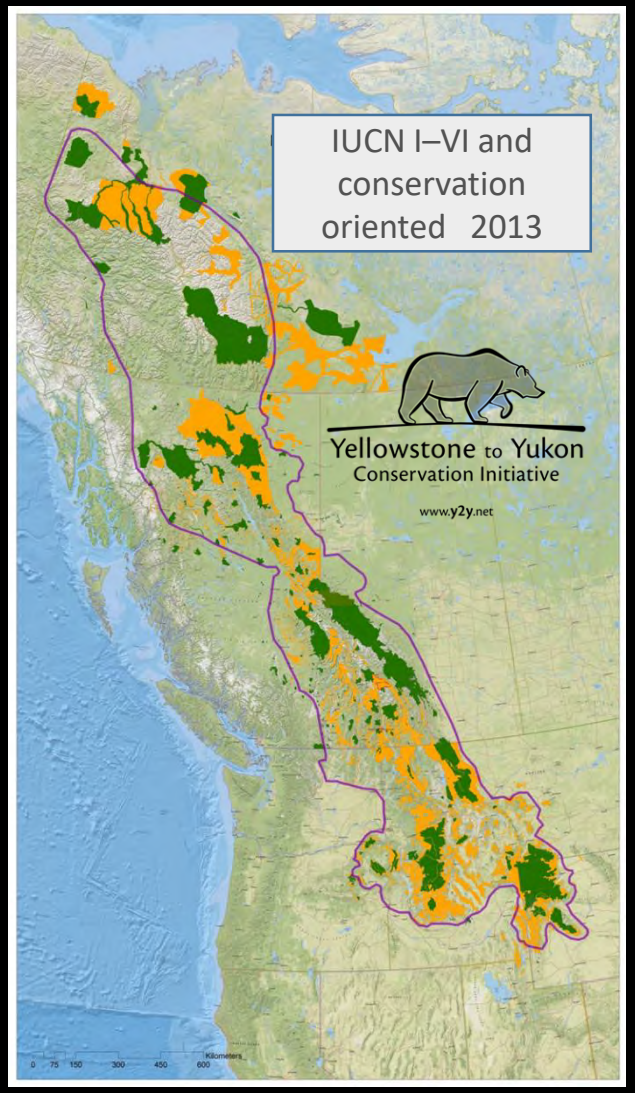

yellowstone to yukon
Fort Good Hope
Great Bear Lake
Northwest Territories
Greater Mackenzie Mountains
Yukon
Whitehorse
Upper Liard River
Great Slave Lake
Fort Nelson
Muskwa-Kechika Ecosystem
Stikine-Nass-Skeena Headwaters
Birch Mountains
Fort McMurray
Fort St John
Alberta
Peace River Break
Rocky Mountain Foothills
Graham Island
Prince George
Edmonton
Saskatoon
British Columbia
Fraser Plateau
Central Canadian Rocky Mountains
Queen Charlotte Sound
Calgary
Whistler
Crown of the Continent
Vancouver Island
Cabinet-Purcell Mountain corridor
Vancouver
Montana
Spokane
Seattle
Washington
High Divide
Salmon-Selway-Bitterroot
Greater Yellowstone Ecosystem
Idaho
Oregon
Cascade Range
Pacific Ocean
Wyoming


HISTORIC RANGE
1922 RANGE IN U.S. ONLY
CURRENT RANGE


CALIFORNIA REPUBLIC

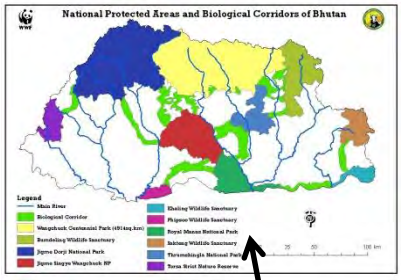

CALIFORNIA REPUBLIC

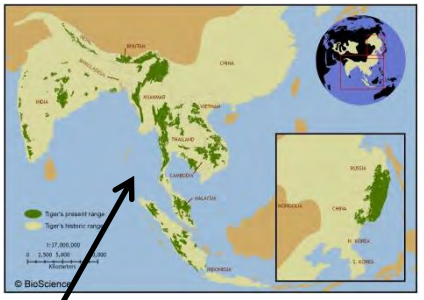

IUCN I- VI and conservation oriented 1993
Yellowstone to Yukon
Conservation Initiative
www.y2y.net


IUCN I–VI and conservation oriented 2013
Yellowstone to Yukon
Conservation Initiative
www.y2y.net


Existing reserves
Proposed corridor
FRANCE
Bordeaux
ITALY
Massif Central
Cantabrian mountains
Western Alps
Pyrenees
Barcelona
SPAIN


european greenbelt
Barents Sea
Norway
Finland
Russian Federation
Baltic Sea
Poland
Germany
Ukraine
Romania
Bulgaria
Black Sea
Turkey


National Protected Areas and Biological Corridors of Bhutan
WWF
Legend
Main River
Biological Corridor
Wangchuck Centennial Park (4914sq.km)
Bumdeling Wildlife Sanctuary
Jigme Dorji National Park
Jigme Singye Wangchuck NP
Khaling Wildlife Sanctuary
Phipsoo Wildlife Sanctuary
Royal Manas National Park
Sakteng Wildlife Sanctuary
Thrumshingla National Park
Toroa Strict Nature Reserve

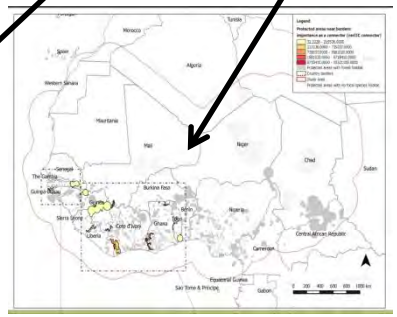

BHUTAN
CHINA
INDIA
MYANMAR
VIETNAM
THAILAND
CAMBODIA
MALAYSIA
INDONESIA
PHILIPPINES
RUSSIA
MONGOLIA
N. KOREA
S. KOREA
Tiger's present range
Tiger's historic range
© BioScience

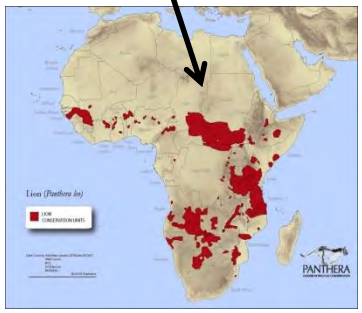

Yellowstone to Yukon Region
NUNAVUT
YUKON TERRITORY
NORTHWEST TERRITORIES
ALBERTA
BRITISH COLUMBIA
MONTANA
WASHINGTON
OREGON
IDAHO
WYOMING
YELLOWSTONE TO YUKON


Belmopan
Guatemala
Honduras
San Salvador
Nicaragua
Managua
San José
Panama


Forests, woodlands and shrub lands of the Great Eastern Ranges
Great Divide
Great Escarpment
Cairns
Brisbane
Sydney
Canberra
Melbourne
Kilometres


PANTHERA
JAGUAR CORRIDORS
JAGUAR POPULATIONS


Morocco
Algeria
Western Sahara
Mauritania
Mali
Niger
Chad
Sudan
Guinea
Burkina Faso
Nigeria
Cameroon
Central African Republic
Liberia
Ghana
Togo
Benin
Sierra Leone
Côte d'Ivoire
Equatorial Guinea
Gabon
Sao Tome & Principe


Lion (Panthera leo)
PANTHERA


Kalgoorlie
Perth
Margaret River
Esperance
Albany
Gondwana Link

Helping communities and organizations make better conservation decisions at the scale nature functions.

Tee Shirt Size Chart of Landscapes

Size	Acres	Hectares	Landscape Example
Small	100,000+	45,000+	Ted Turner's Ranch Montana
Medium	500,000+	225,000+	Great Smokey Mountain NP
Large	1,000,000+	450,000+	Yellowstone National Park US
XLarge	10,000,000+	4,500,000+	Greater Yellowstone Ecosystem US
XXLarge	50,000,000+	22,500,000+	NZ or all of US National Parks
XXXLarge	100,000,000+	45,000,000+	Yellowstone to Yukon US CA

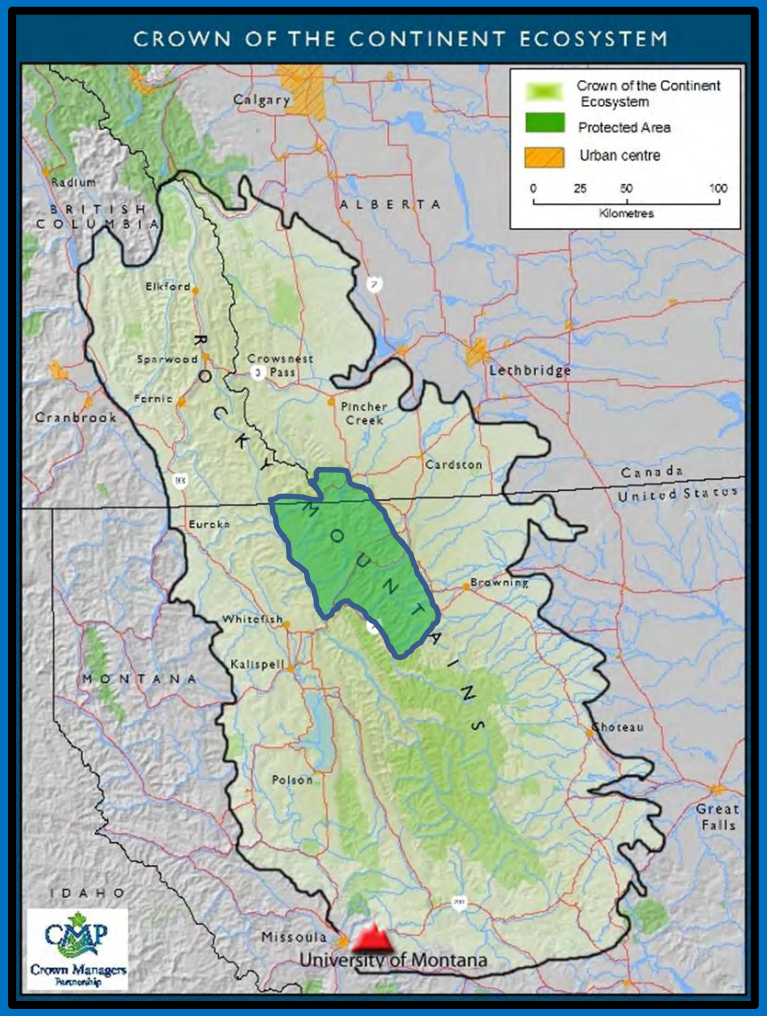
Connecting Social Scale with Ecological Scale

How can we scale up

Large landscape conservation is about –
getting people to conserve land at larger ecologically meaningful scales

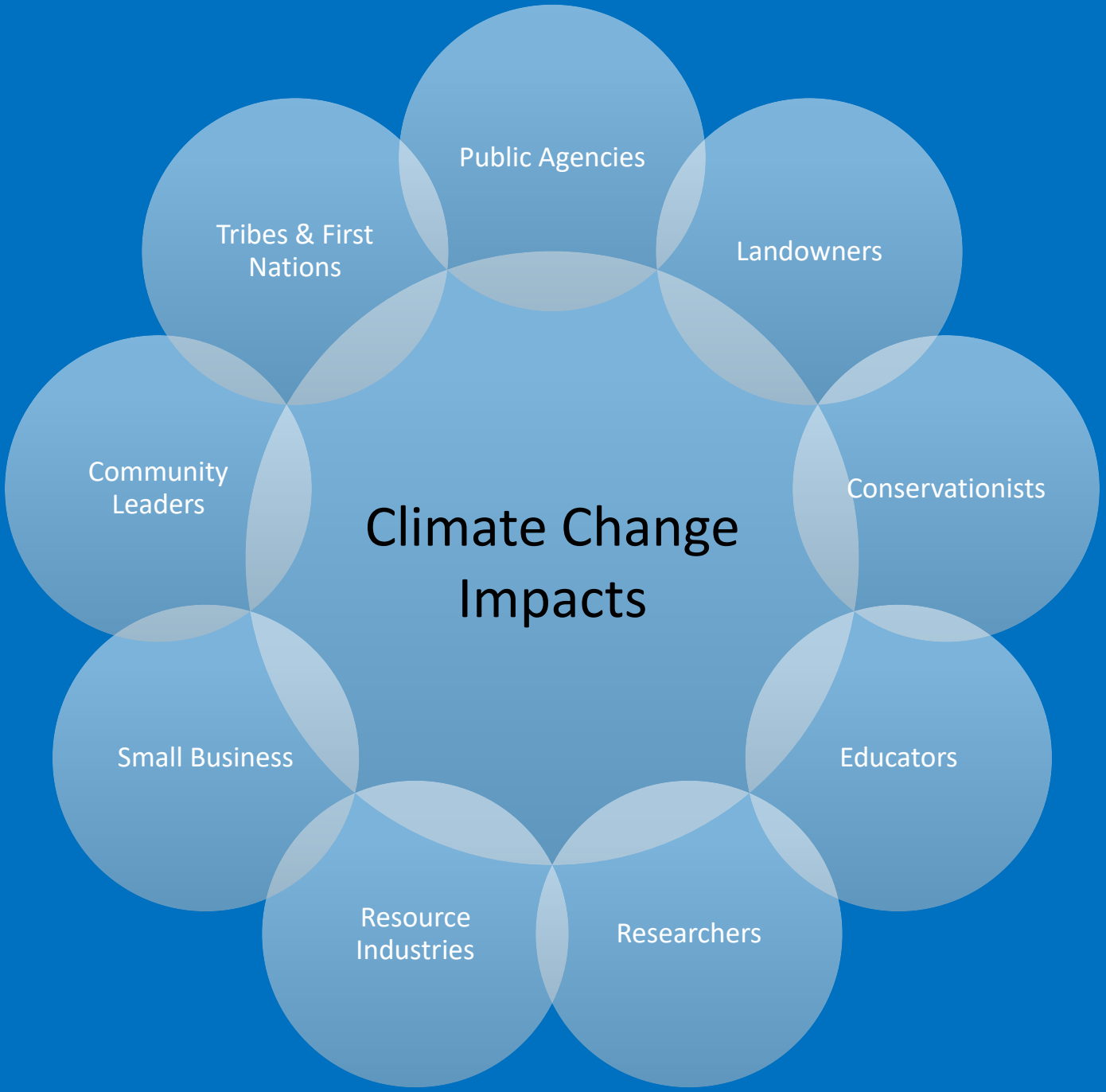
Building Social and Institutional Networks

Backbone Organization



Waterton-Glacier International Peace Park

Grinnell Glacier


Public Agencies
Landowners
Conservationists
Educators
Researchers
Resource Industries
Small Business
Community Leaders
Tribes & First Nations
Climate Change Impacts

Roundtable on the Crown of the Continent:

Connecting People to Sustain and Enhance Culture, Community, and Conservation

One example of linking social scale to ecological scale in addressing climate impacts

NATIONAL *fish, wildlife & plants* CLIMATE ADAPTATION STRATEGY

2016 BROAD PARTNERSHIP RECIPIENT
Roundtable on the Crown of the Continent
The State of Montana; British Columbia and Alberta, Canada

2017 and 2018 TRIBAL INDIVIDUAL
Michael Durglo Jr, Confederated Salish and Kootenai & Gerald Wagner, Blackfeet Nation


HEART OF THE ROCKIES INITIATIVE
A Land Trust Partnership
FIVE VALLEYS LAND TRUST
THE CONSERVATION FUND
Lemhi Regional LAND TRUST
JACKSON HOLE LAND TRUST
INLAND NW LAND CONSERVANCY
FLATHEAD LAND TRUST
Conserving Our Legacy of Land and Water
PRICKLY PEAR LAND TRUST
Connecting Land and People
NATURE CONSERVANCY CANADA
PALOUSE LAND TRUST
GALLATIN VALLEY LAND TRUST
TRAILS & CONSERVATION
KANIKSU Land Trust
THE TRUST for PUBLIC LAND
TETON REGIONAL LAND TRUST
The Nature Conservancy
Protecting nature. Preserving life.™
Rocky Mountain ELK FOUNDATION
sagebrush steppe LAND TRUST
BITTER ROOT LAND TRUST
WOOD RIVER LAND TRUST
Protecting the Heart of the Valley Now and for the Future
VITAL GROUND
WYOMING STOCK GROWERS LAND TRUST

Heart of the Rockies Initiative

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Montana Wilderness Association
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Our Service Area

Heart of the Rockies Member Land Trusts

Bitter Root Land Trust – Hamilton, MT
Five Valleys Land Trust – Missoula, MT
Flathead Land Trust – Kalispell, MT
Gallatin Valley Land Trust – Bozeman, MT
Inland Northwest Land Conservancy– Spokane, WA
Lemhi Regional Land Trust – Salmon, ID
Jackson Hole Land Trust – Jackson, WY
Kaniksu Land Trust – Sandpoint, ID
Nature Conservancy of Canada - BC, AB
Palouse Land Trust – Moscow, ID
Prickly Pear Land Trust – Helena, MT
Rocky Mountain Elk Foundation
Sagebrush Steppe Land Trust – Pocatello, ID
Teton Regional Land Trust – Driggs, ID
The Conservation Fund
The Nature Conservancy – Idaho
The Nature Conservancy – Montana
The Nature Conservancy – Wyoming
Trust for Public Land
Vital Ground Foundation – Missoula, MT
Wood River Land Trust – Hailey, ID
Wyoming Stock Growers Land Trust – Cheyenne ,WY

WWW.HEART-OF-ROCKIES.ORG

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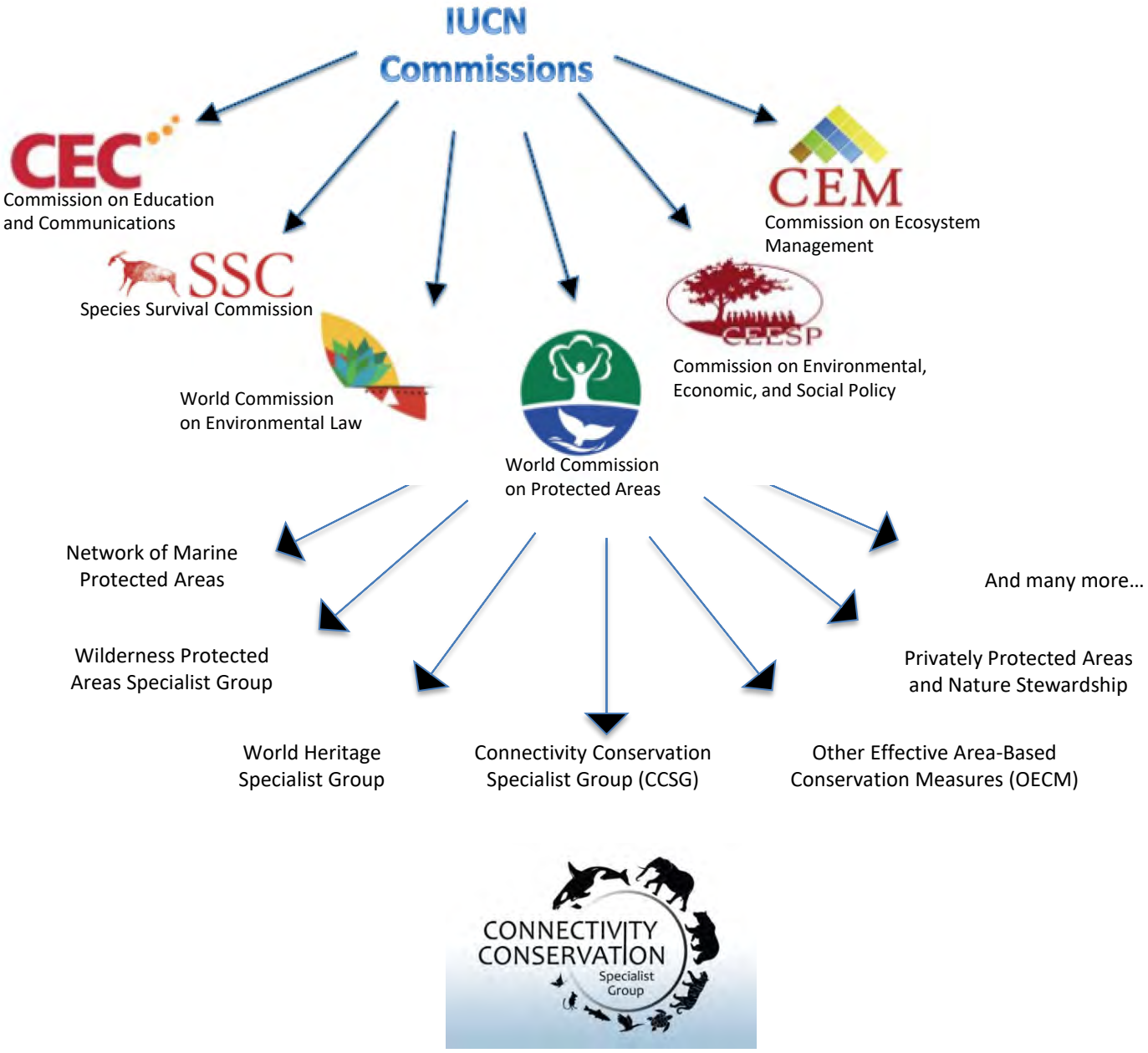
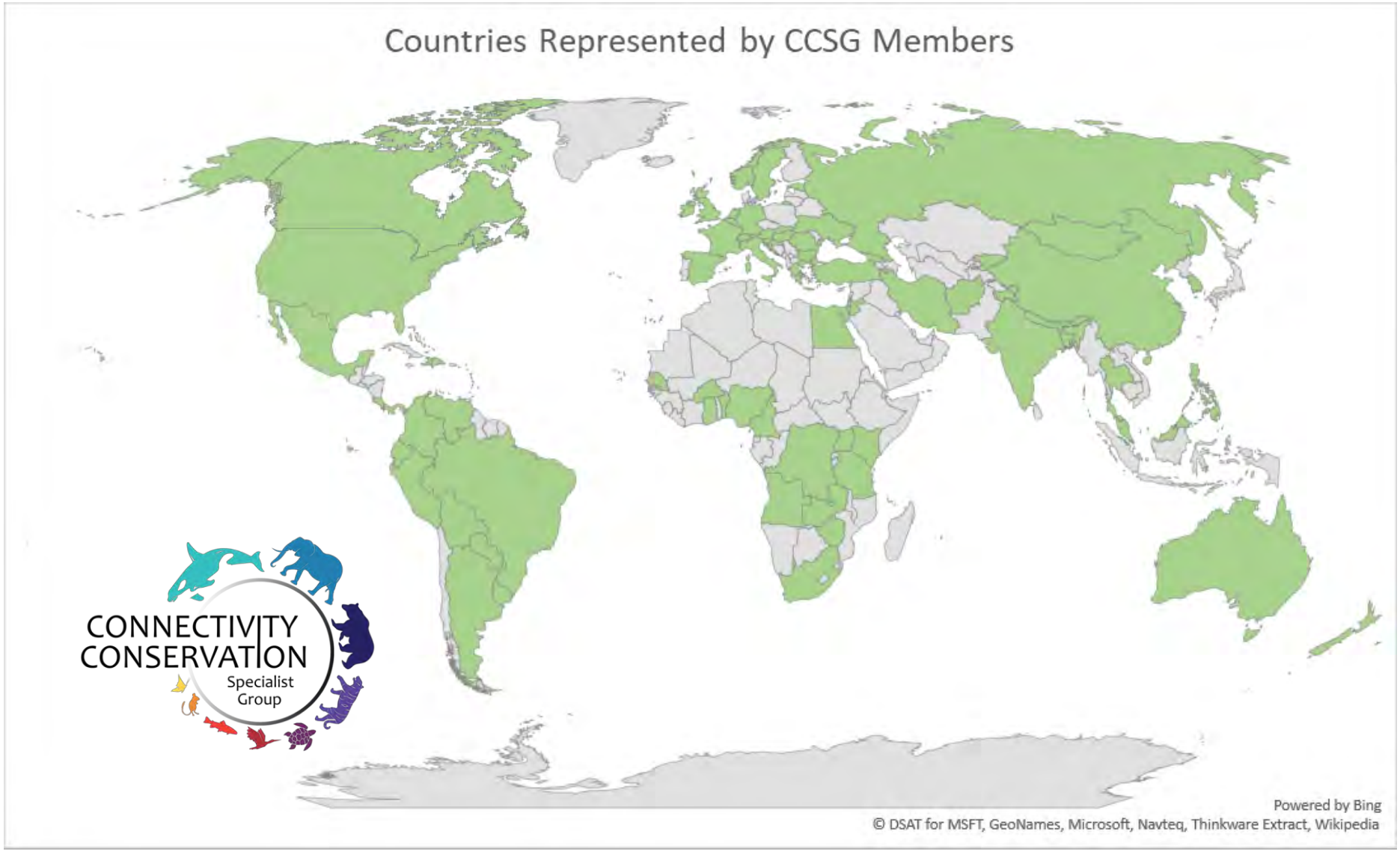

IUCN
Commissions
CEC
Commission on Education
and Communications
CEM
Commission on Ecosystem
Management
SSC
Species Survival Commission
CEESP
Commission on Environmental,
Economic, and Social Policy
World Commission
on Environmental Law
World Commission
on Protected Areas
Network of Marine
Protected Areas
And many more…
Wilderness Protected
Areas Specialist Group
Privately Protected Areas
and Nature Stewardship
World Heritage
Specialist Group
Connectivity Conservation
Specialist Group (CCSG)
Other Effective Area-Based
Conservation Measures (OECM)
CONNECTIVITY
CONSERVATION
Specialist
Group

900 Members in 85 Countries



CONNECTIVITY
IS THE SAFETY NET OF NATURE

What is connectivity?

Connectivity is the degree to which landscapes and seascapes allow species movement and natural ecological processes.

What does connectivity do?

Allows species to migrate or disperse to feed, breed, and respond to climate change. Allows natural communities to thrive by maintaining ecosystem functions like pollination and stream flows.

What do we want?

Connected lands and waters: wildlife corridors, landscape linkage areas, free flowing and connected rivers, interconnected coastal and marine zones, and climate-resilient ecosystems.

Why do we care?

Connected lands and waters benefit nature and people. As the climate changes and development increases, we must act now to save and restore natural connections across all lands and waters.

LEARN MORE:
conservationcorridor.org/ccsg

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पारिस्थितिकिय जोड
प्रकृतिसाठी एक सुरक्षा जाळी

पारिस्थितिक जोड म्हणजे काय?

एखाद्या जमीनी किंवा समुद्री भुभागात विविध प्रजातिंच्या हालचालींसाठी आणि नैसर्गिक प्रक्रिया पार पडण्यास प्रदान केलेल्या सहजतेचे प्रमाण म्हणजे पारिस्थितिक जोड.

पारिस्थितिक जोड काय करतात?

जीव-जंतुंच्या प्रजातिंच्या खाद्य व प्रजनन ह्यांसारख्या गरजा पूर्ण करण्यासाठी तसेच हवामान बदलामुळे त्यांना स्थलांतर करण्यास हे जोड कामी येतात. परागीकरण आणि जल प्रवाह ह्यांसारख्या नैसर्गिक प्रक्रिया अबाधित ठेवण्यात व त्या बदल्यात स्थानिक नैसर्गिक समुदायांचे पोषण करण्यास सहायता करतात.

आपल्या सर्वांना काय हवे आहे?

अबाधित भू-जल क्षेत्र : वन्यजीव संचारमार्ग, संलग्न भूभागीय क्षेत्र, आपसात जुळलेले समुद्र आणि समुद्र तट, अबाधित प्रवाह असलेल्या आणि आपसात जूळलेल्या नद्या आणि हवामान बदलाला झूंज देण्यास सक्षम असा निसर्ग.

आम्हाला चिंता का असावी?

अबाधित भू-जल क्षेत्र निसर्ग व मनुष्य दोन्हींसाठी हितकारक आहेत. जसे जसे हवामान बदल आणि विकास ह्यांचे प्रमाण वाढेल, तसे तसे आपल्या सर्वांना संपूर्ण भू-जल क्षेत्रांमधे हे नैसर्गिक जोड क़ायम ठेवण्यासाठी व त्यांचे स्वास्थ्य टिकवुन ठेवण्यासाठी कार्य करावे लागेल.

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LEARN MORE:
conservationcorridor.org/ccsg

What is Needed - Consistent Practice Measurable Targets

Defined Targets – Spatially Explicit

Standards of Practice

Planning Frameworks

Incentive Based Approaches

Recognition for Best Practice

Learning Community

CONSERVATION CORRIDOR

Connecting Science to Conservation

Search ...

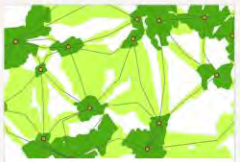
Home | About Corridors | Digests | Corridor Toolbox | Resources | About | CCSG

Connecting science to conservation

Our mission is to bridge the science and practice of conservation corridors. Learn more.

Learn More About Corridors and Their Role in Conservation Efforts

CORRIDORS



Learn More About Connectivity Programs and Tools

TOOLBOX

CONNECTIVITY CONSERVATION Specialist Group

Connectivity Conservation Specialist Group

LEARN MORE

Recent Digests

Annual Digest Summary – 2018

Need to catch up on Digests or read one again? Check out our list of all Digests published in 2018.

American Prairie Corridor: a vision for grassland connectivity

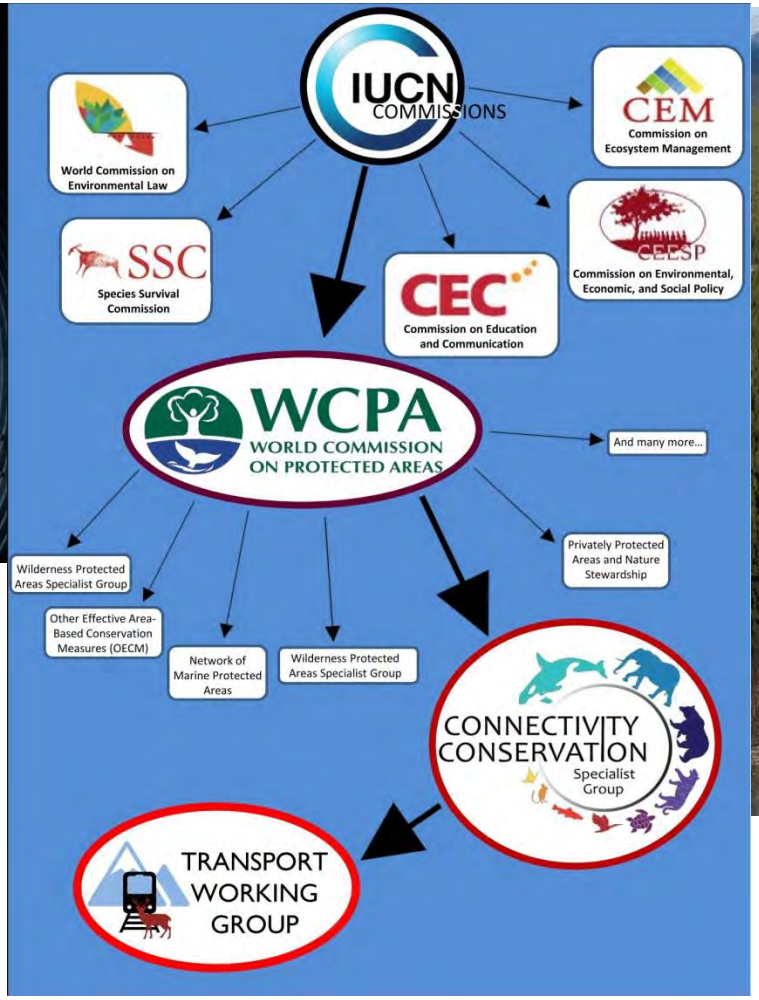
Are umbrella species effective for connectivity conservation?

IUCN WCPA WORLD COMMISSION ON PROTECTED AREAS

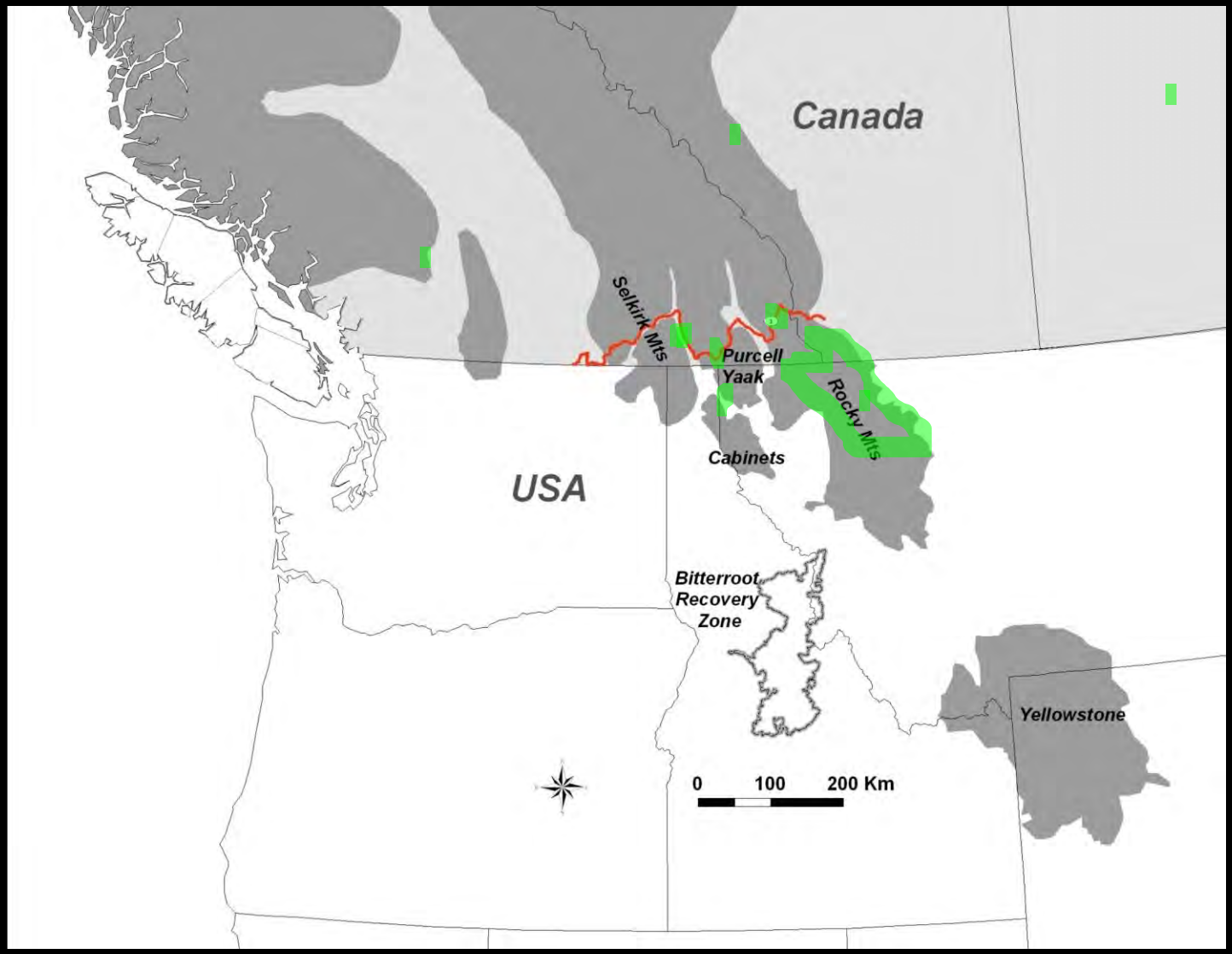
THE CENTER FOR LARGE LANDSCAPE CONSERVATION

TRANSPORT Working Group

Improving Transport Systems for Species and Ecosystems



CONNECTIVITY CONSERVATION Specialist Group


Canada
Selkirk Mts
Purcell
Yaak
Rocky Mts
Cabinets
USA
Bitterroot
Recovery
Zone
Yellowstone
0
100
200 Km

IUCN WCPA WORLD COMMISSION ON PROTECTED AREAS

THE CENTER FOR LARGE LANDSCAPE CONSERVATION

Terrestrial Ecological Networks:
Malaysia's Central Forest Spine (CFS)

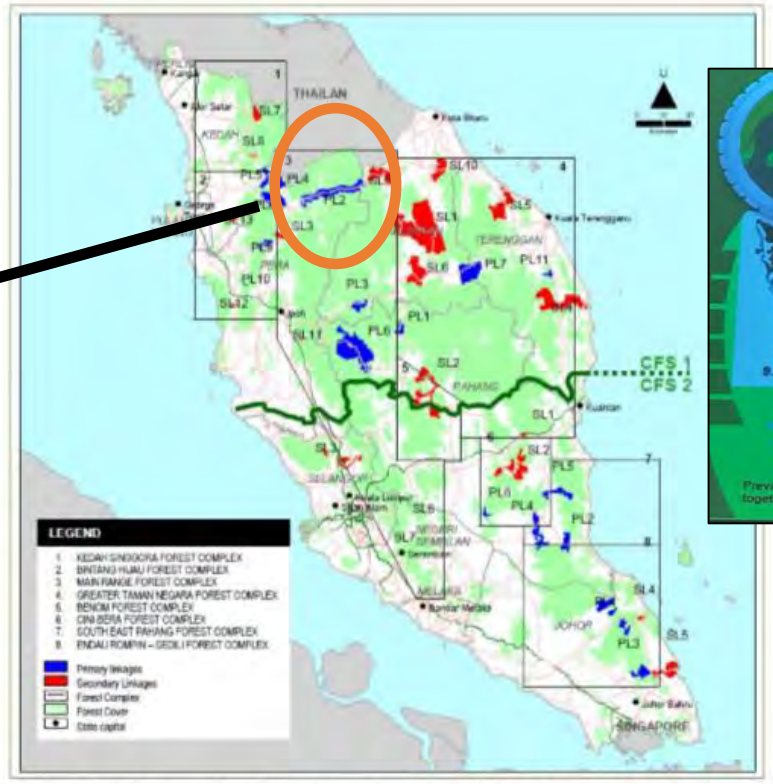
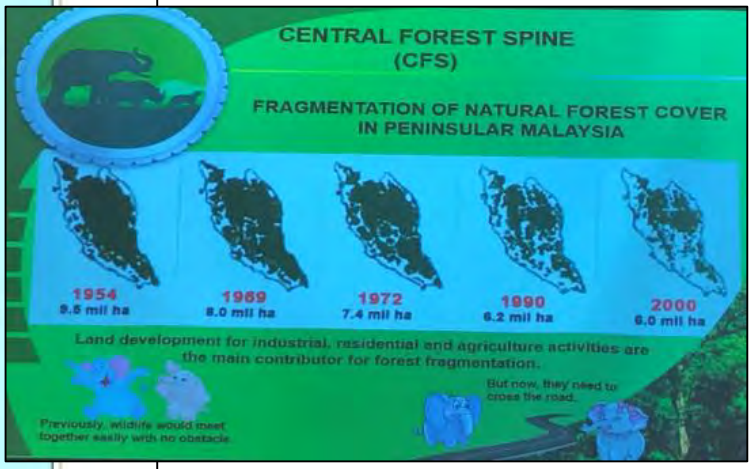


Figure 1: Primary and secondary linkages in the Central Forest Spine Master Plan. Obtained from Central Forest Spine 1 Master Plan. [2]



Courtesy: Malaysian Public Works Department)

Courtesy: Wild Asia (Malaysia) and Management & Ecology of Malaysian Elephants (MEME)

CONNECTIVITY CONSERVATION Specialist Group

Malaysia's Central Forest Spine (CFS)

Gerik-Jeli Highway and Wildlife Passage Viaduct (Perak State, Malaysia)

Courtesy: Aaron Laur (CLLC)

Courtesy: MEME

Courtesy: bbc.com

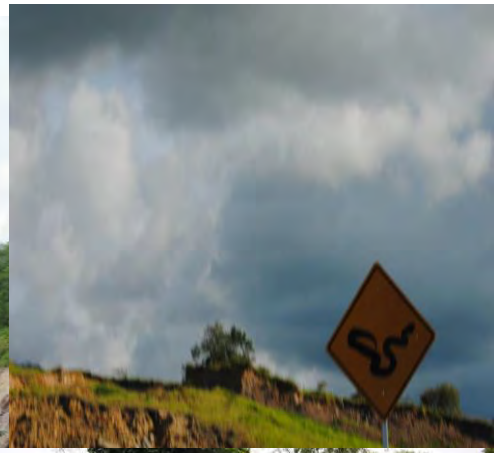
Courtesy: freemalaysiatoday.com

Why Wildlife Crossings?

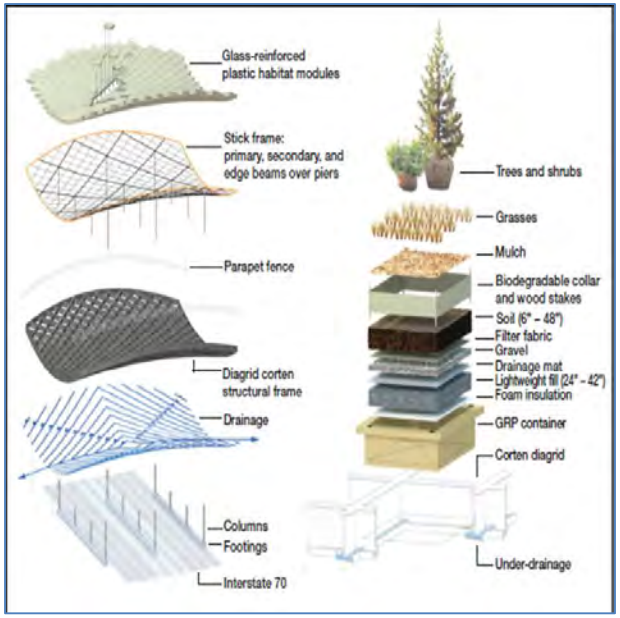
Mitigation Measure	Cost ($/km/yr)	% DVC Reduced
Deer reflectors and mirrors	$495	0%
Deer whistles	$23.5	0%
Standard warning signs	$18	0%
Seasonal wildlife warning signs	$27	26%
Vegetation removal	$500	38%
Fence with gap and crosswalk	$5,585	40%
Population culling	$2,508	50%
Relocation	$10,260	50%
Anti-fertility treatment	$61,702	50%
Animal detection systems (ADS)	$31,300	82%
Fence (including dig barrier)	$3,760	87%
Fence with gap and ADS	$9,930	82%
Fence with underpasses	$5,860	87%
Fence with overpasses	$26,485	87%
Fence with under- and overpasses	$7,510	87%
Long tunnels or long bridges	$1,500,000	100%

Huijser, M.P., Duffield, J.W., Clevenger, A.P., Ament, R.J. and P. T. McGowen. 2009. Cost-benefit analyses of mitigation measures aimed at reducing collisions with large ungulates in North America; a decision support tool. Ecology and Society 14 (2):15.

Colombia: New Highways in Andes



Greener Road, Rail, Canal Designs



Myanmar-China Border Crossing

- A different kind of wildlife crossing!

Creating a Global Connectivity Policy Standard

Solve for X (PAs + OECMs + X = CN)

- Given that **Protected Areas** are a defined IUCN spatial defined regions
- Given that **OECMs** (Other Effective Conservation Measures) now referred to as Conserved Areas (spatially defined regions that act as protected areas but are not)
- Given that PAs and OECMs are critical elements of conservation networks (CN)
- What conservation element is missing in the design and establishment of conservation networks?

AREAS OF CONNECTIVITY CONSERVATION

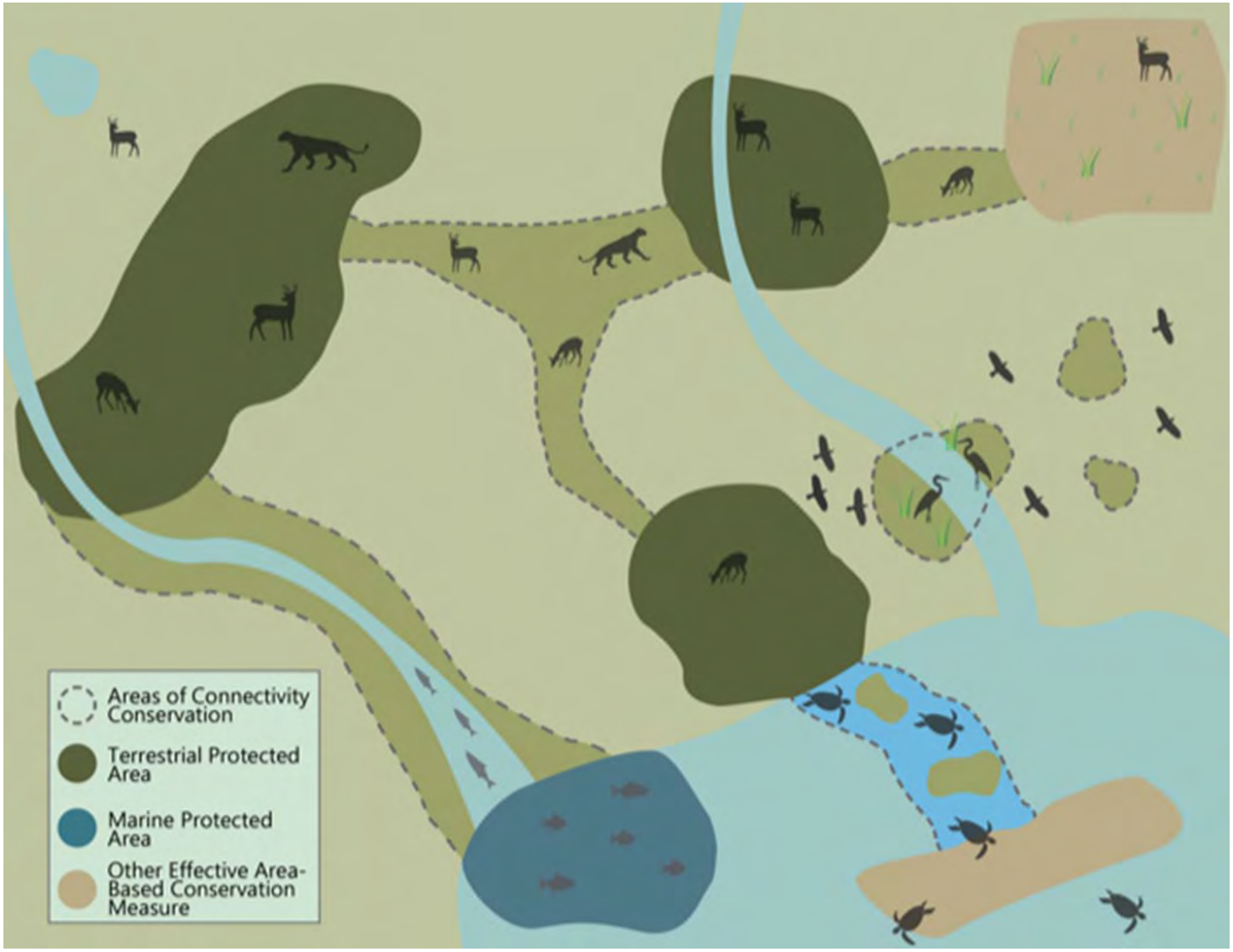
GUIDELINES FOR RECOGNISING AND REPORTING AREAS OF CONNECTIVITY CONSERVATION

IUCN

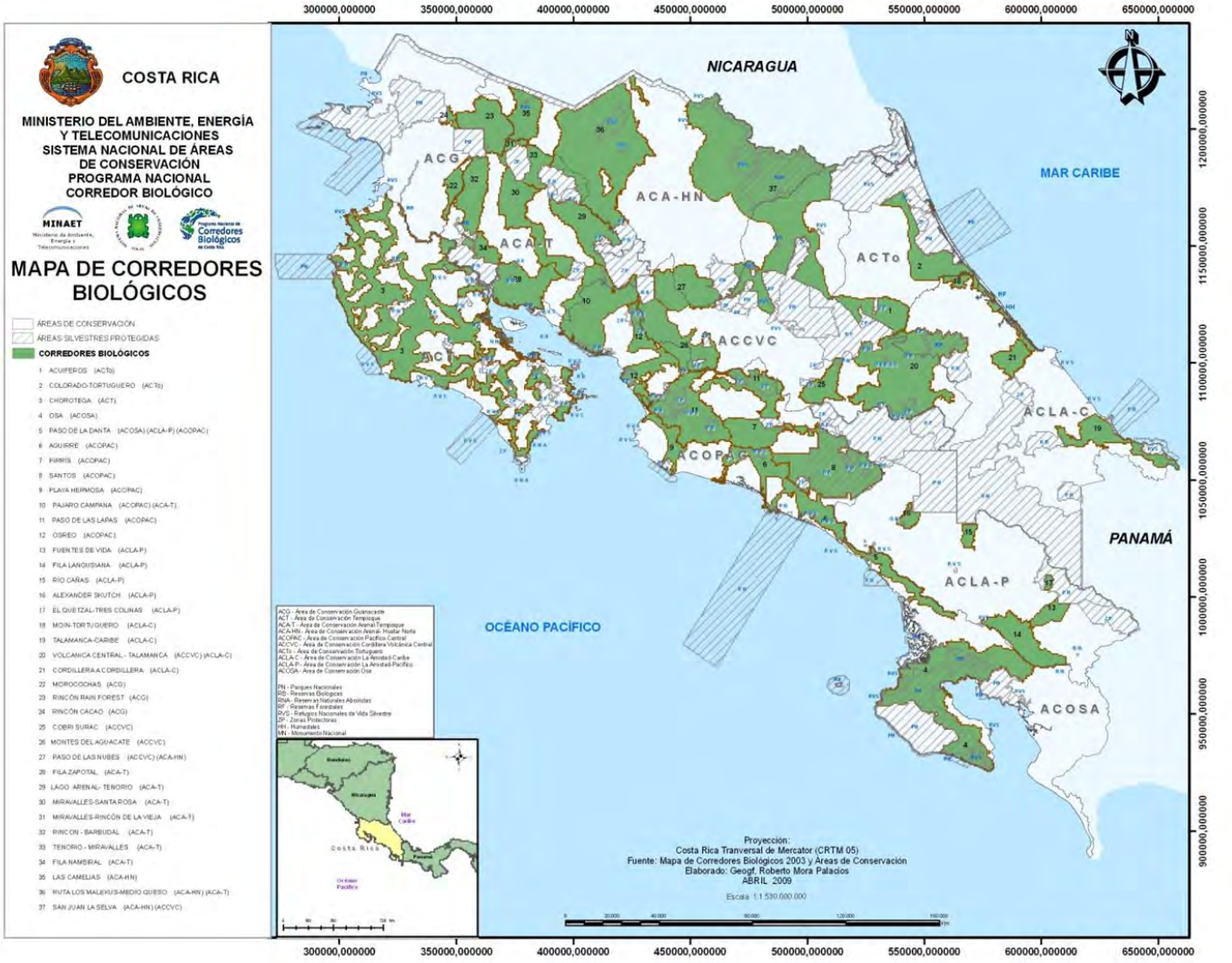
WCPA
WORLD COMMISSION ON PROTECTED AREAS

CONNECTIVITY CONSERVATION
Specialist Group

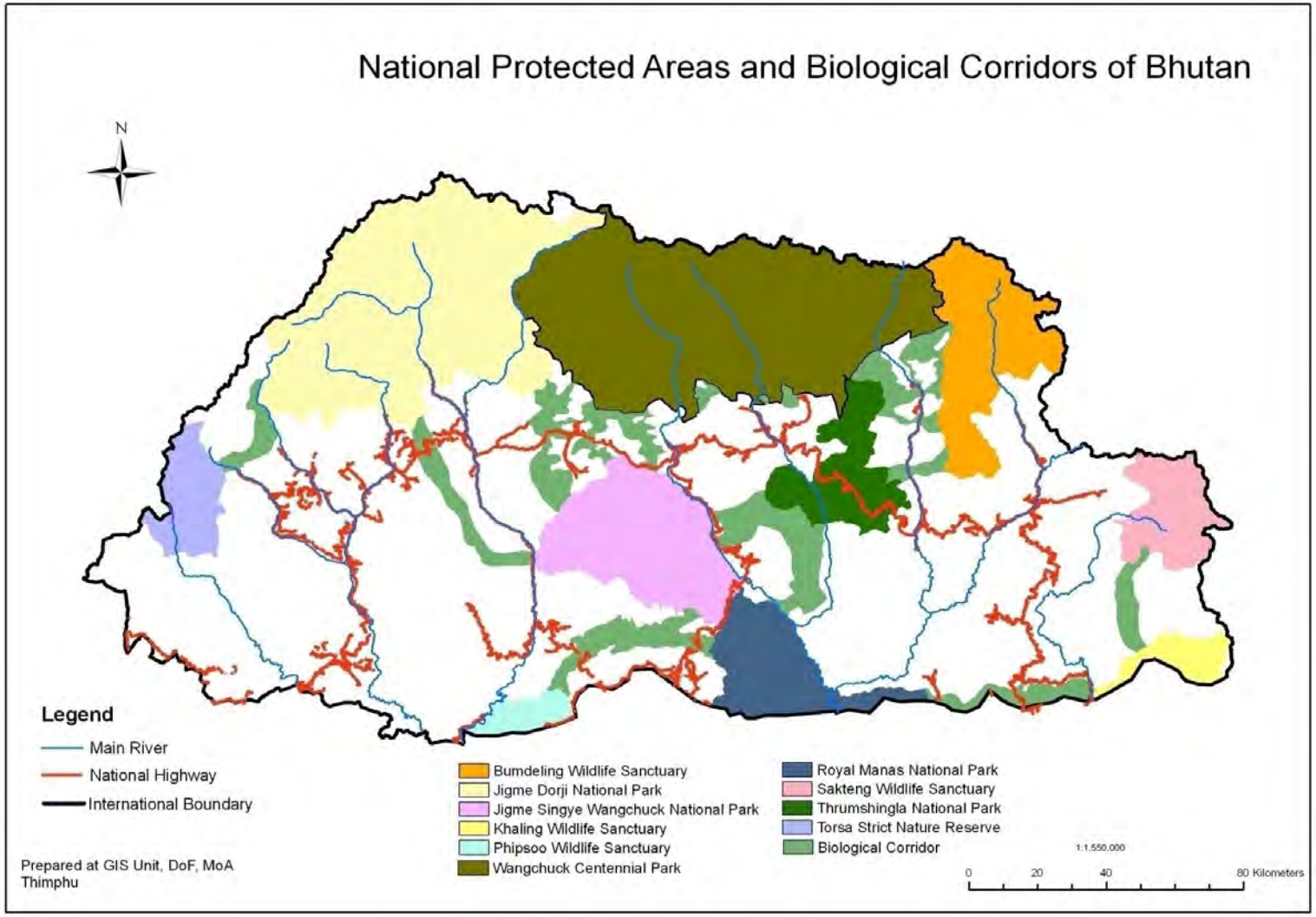
Areas of Connectivity Conservation (ACCs) for Ecological Networks



National Legislative: Costa Rica



http://www.sinac.go.cr/EN-US/correbiolo/Pages/default.aspx


National Protected Areas and Biological Corridors of Bhutan
N
Legend
Main River
National Highway
International Boundary
Bumdeling Wildlife Sanctuary
Jigme Dorji National Park
Jigme Singye Wangchuck National Park
Khaling Wildlife Sanctuary
Phipsoo Wildlife Sanctuary
Wangchuck Centennial Park
Royal Manas National Park
Sakteng Wildlife Sanctuary
Thrumshingla National Park
Torsa Strict Nature Reserve
Biological Corridor
1:1,550,000
0
20
40
80 Kilometers
Prepared at GIS Unit, DoF, MoA
Thimphu

National Legislative: Tanzania

Tanzania

THE WILDLIFE CONSERVATION ACT

(Cap. 283)

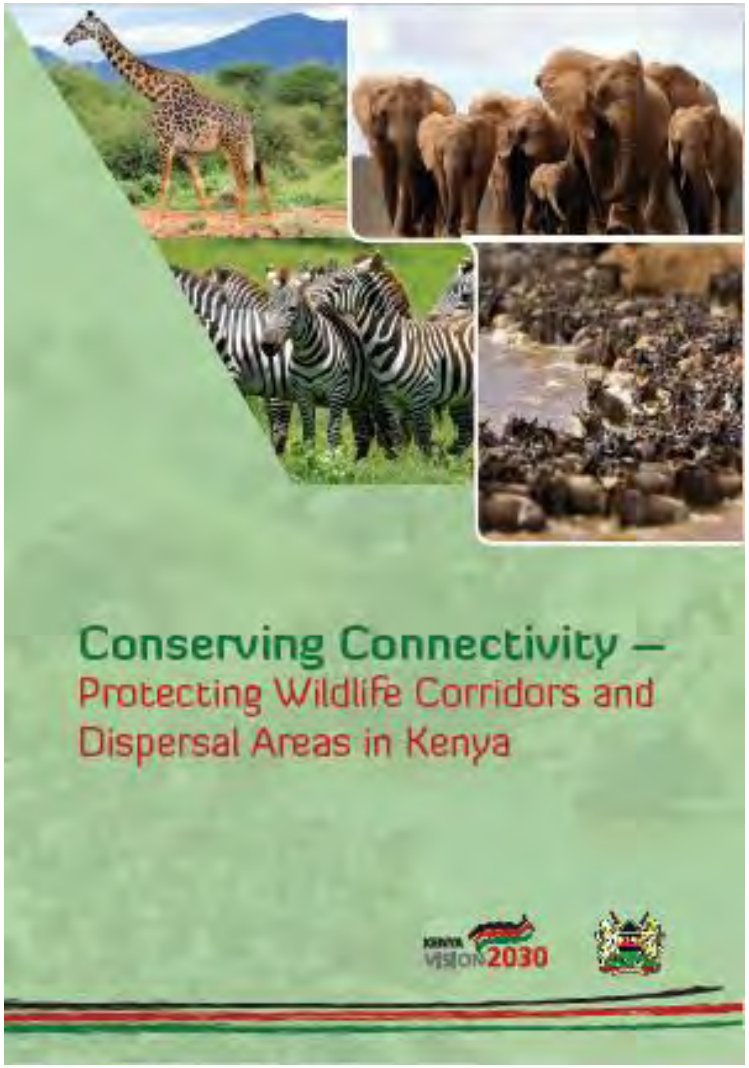
REGULATIONS

(Made under section 22(2) and 121(f))

THE WILDLIFE CONSERVATION (WILDLIFE CORRIDORS, DISPERSAL AREAS, BUFFER ZONES AND MIGRATORY ROUTES) REGULATIONS, 2017

http://www.wildlife-baldus.com/download/Wildlife%20Conservation%20Act%20Tanzania.pdf

National Adminstrative: Kenya
Vision 2030: Conserving Connectivity



http://www.kws.go.ke/file/2517/download?token=7GvgxEkX

Australian Government
Department of the Environment and Energ

TOPICS | ABOUT US | GRAN | CON

THE GREAT EASTERN RANGES
connecting people…connecting nature

Home / National Wildlife Corridors Plan

National Wildlife Corridors Plan

About the Plan | Wildlife corridors | Declaratio

> *Diverse, connected and healthy landscapes that support and sustain biodiversity, communities and wellbeing*

Nomination, assessment and declaration of National Wildlife Corridors

It is anticipated that a National Wildlife Corridors Committee will be appointed by the Environment Minister in 2013. The Committee will report to the La advice to the Minister on the implementation of the National Wildlife Corridors Plan.

The National Wildlife Corridors Plan will support the development of an enduring network of wildlife corridors. This network will be underpinned by the Minister for the Environment, to create major links in the Australian landscape to support our biodiversity and its adaptation to a changing climate

Biolinks Alliance
Connecting Central Victoria

Hinterland Bush Links
connecting restoring protecting

JALIIGIRR Biodiversity Alliance

Hunter Valley Partnership

Slopes to Summit

Illawarra to Shoalhaven

Southern Highlands Link

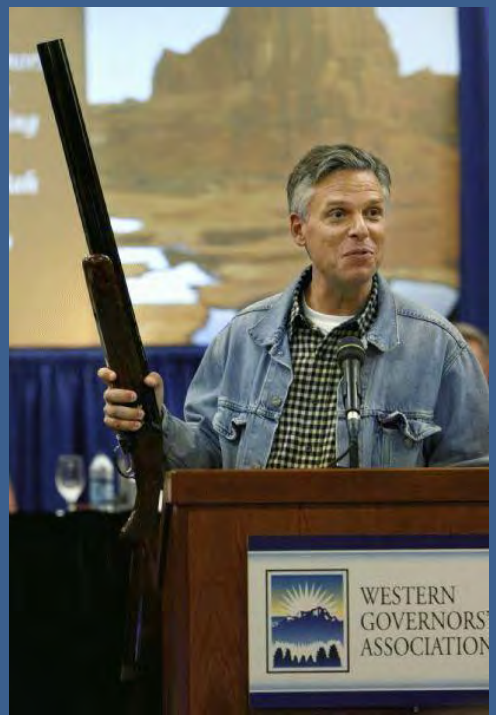
Kanangra-Boyd to Wyangala Glideways

Kosciuszko2Coast
LANDHOLDERS - LINKS - LANDSCAPES

Border Ranges Alliance

Brazil completes largest corridor forest restoration effort in the world in the Mata Atlantica

Western Governors Association Wildlife Corridor Initiative



2008-2014

Western Governors Association Logo

US: Path of the Pronghorn, Wyoming

2018 -Secretarial Order 3362
Secretary Zinke Prioritizes Conservation & Big Game Migration Corridors
Elk, Mule Deer, Bighorn Sheep

Signs Order Directing More Resources Toward Habitat Restoration, Conservation, Collaboration and Research

USA Legislative

115TH CONGRESS
2D SESSION

H. R. 7232

To establish a National Wildlife Corridors Program to provide for the protection and restoration of certain native fish, wildlife, and plant species, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

DECEMBER 10, 2018

Mr. BEYER introduced the following bill; which was referred to the Committee on Natural Resources, and in addition to the Committees on Armed Services, Agriculture, and Transportation and Infrastructure, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

---

A BILL

To establish a National Wildlife Corridors Program to provide for the protection and restoration of certain native fish, wildlife, and plant species, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Wildlife Corridors Conservation Act of 2018".

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

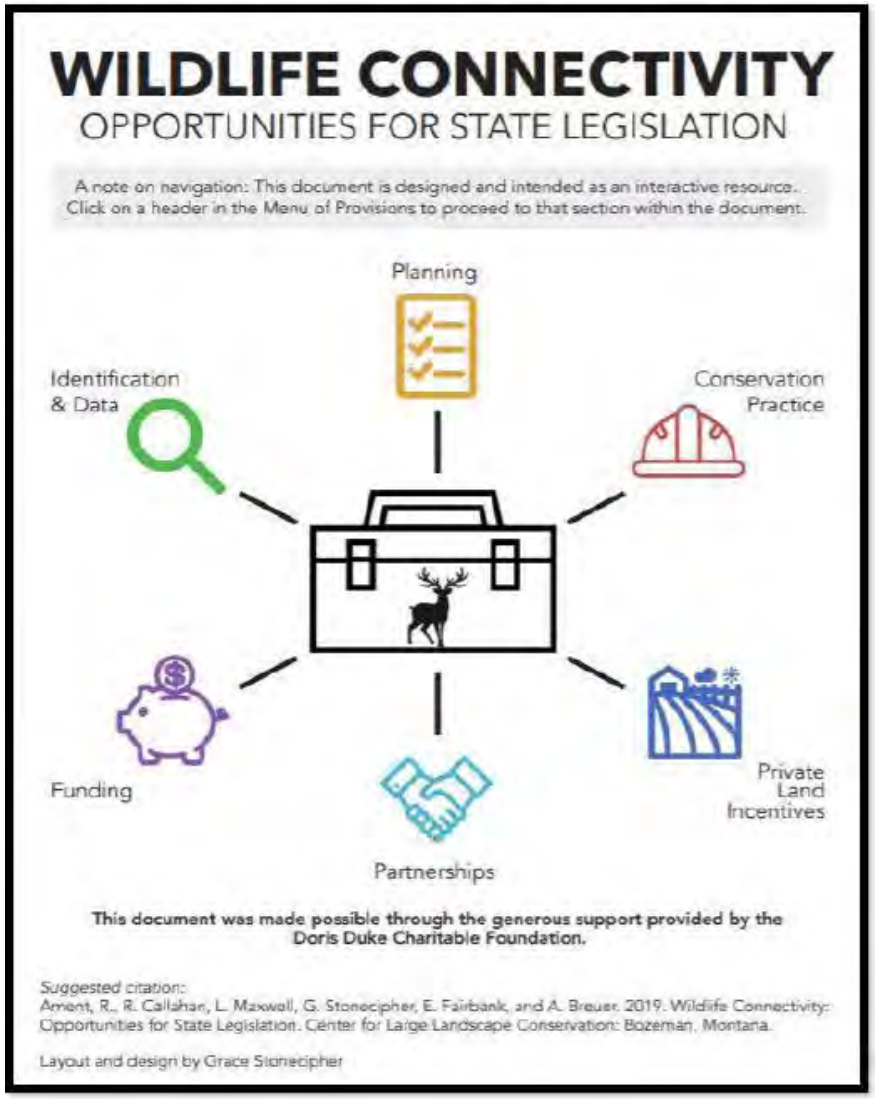
A BILL

To establish a National Wildlife Corridors Program to provide for the protection and restoration of certain native fish, wildlife, and plant species, and for other purposes.

https://www.congress.gov/115/bills/hr7232/BILLS-115hr7232ih.pdf

State Connectivity Policy

- California
- Maine
- Mississippi
- Nevada
- New Hampshire
- New Mexico
- Oregon
- Pennsylvania
- Vermont
- Virginia
- Washington
- Wyoming



Global Assessment of 550 Connectivity Plans (effective n=279)

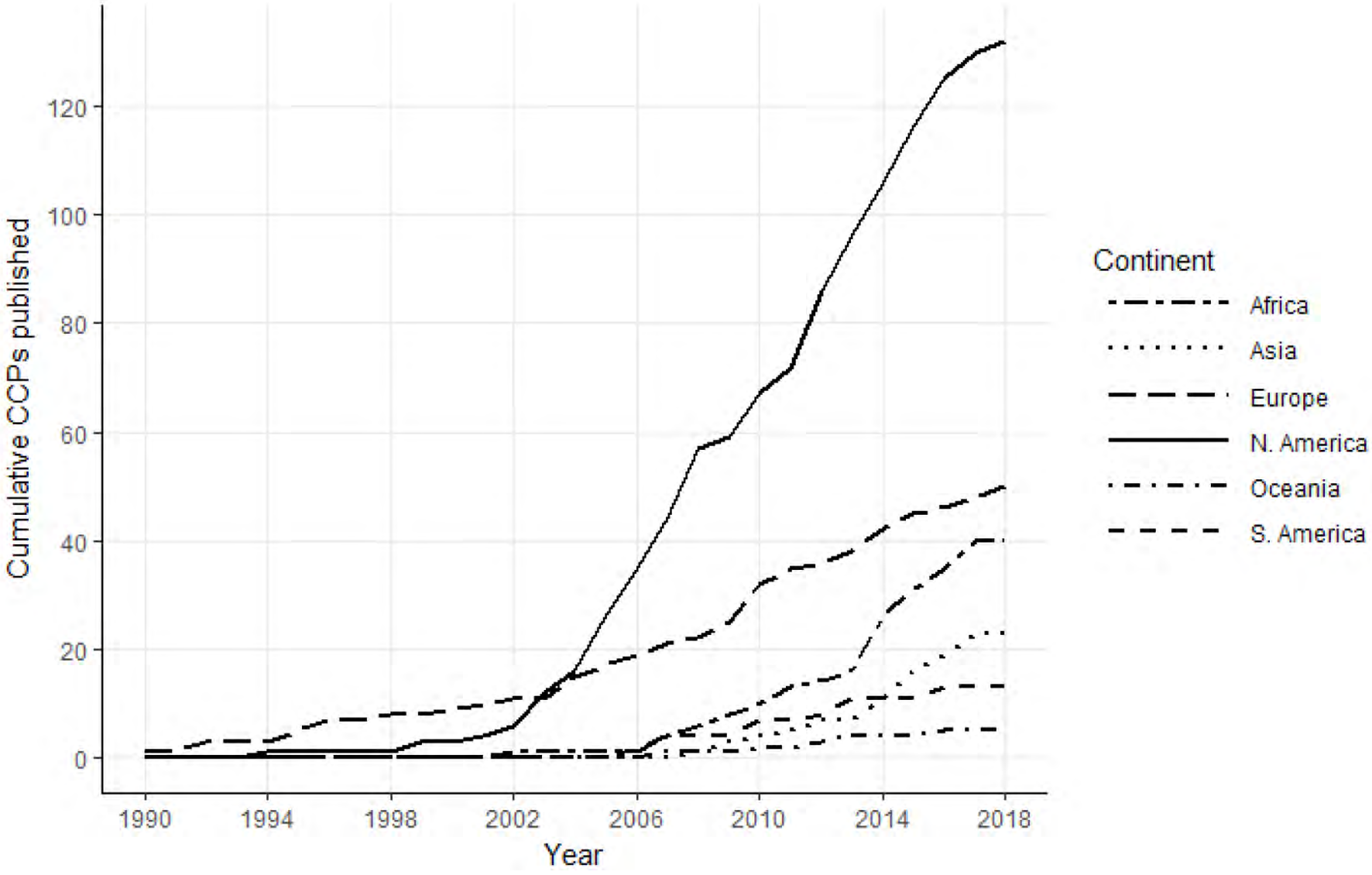
CONNECTIVITY CONSERVATION Specialist Group

THE CENTER FOR LARGE LANDSCAPE CONSERVATION

NORTHERN ARIZONA UNIVERSITY

UNIVERSITY OF CALIFORNIA BERKELEY

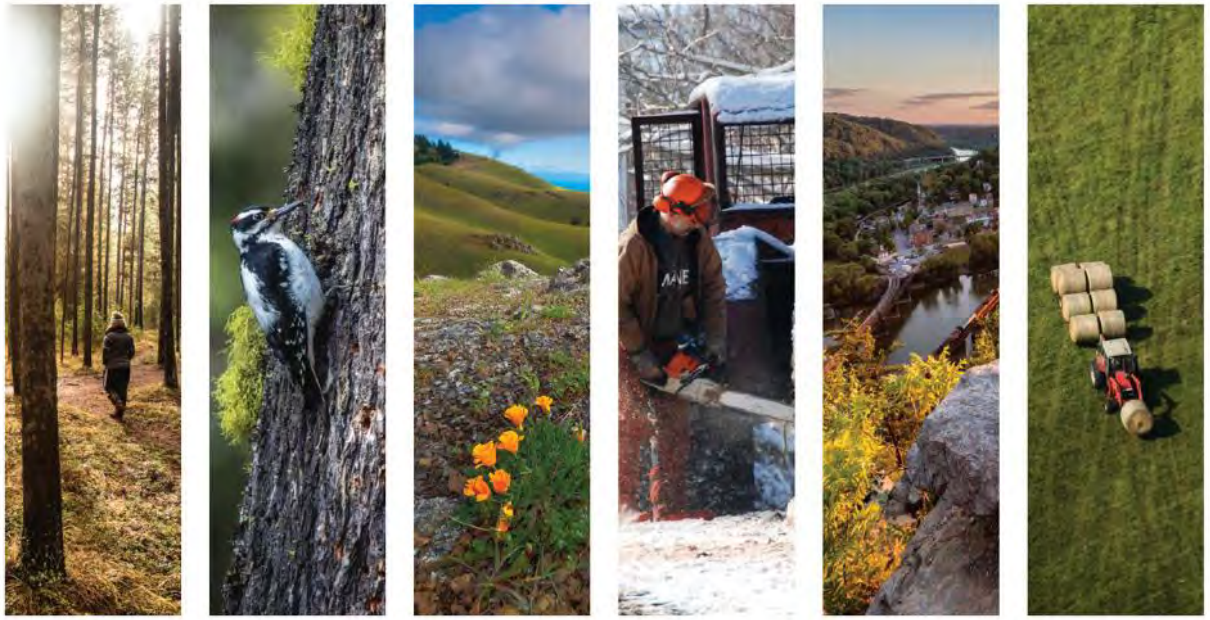
WAGENINGEN UNIVERSITY & RESEARCH


Cumulative CCPs published
120
100
80
60
40
20
0
1990
1994
1998
2002
2006
2010
2014
2018
Year
Continent
Africa
Asia
Europe
N. America
Oceania
S. America

Eight factors for a successful plan

- **Geography** - those geographies with a large community of planners share best practices more intimately.
- **Leadership continuity** – where leadership was steady from conception to implementation
- **Partnership** – the more partners involved, the more chance of success
- **Focal Species** – those plans that identified focal species were more successful
- **Funding** – where funding was available, success followed
- **Enabling Policy** -- policy included subnational, national and regional policy – segmented in certain sectors such as transportation policy, wildlife policy and local/subnational/regional/national land-use/environment planning policy
- **Public Outreach** – those efforts that had outreach strategies to stakeholders were more likely to succeed
- **Recommendations** – the more specific the recommendation of the plan, the more likely the plan achieved its goals.

Network for Landscape
CONSERVATION

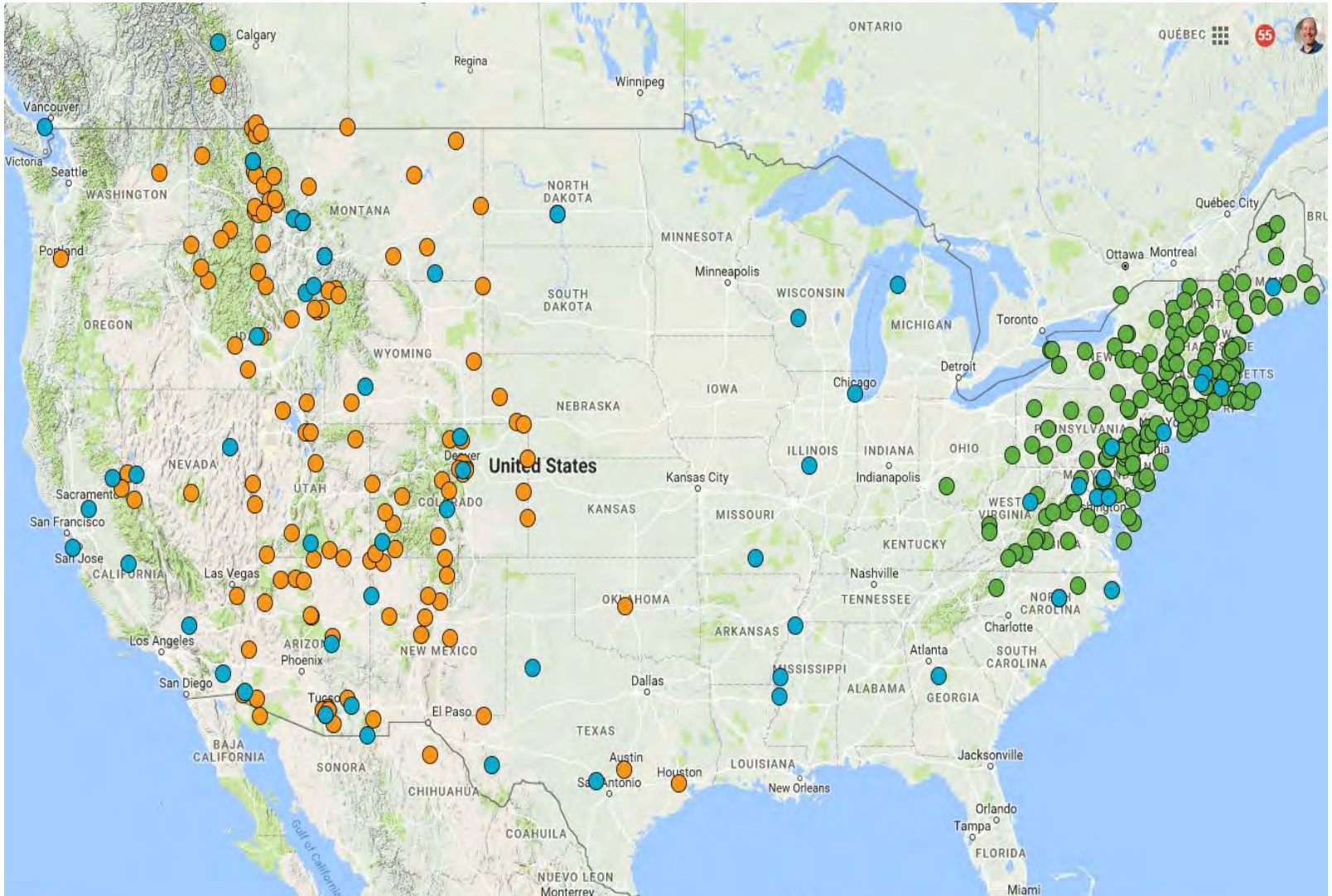


Connecting Large Scale Conservation Initiatives

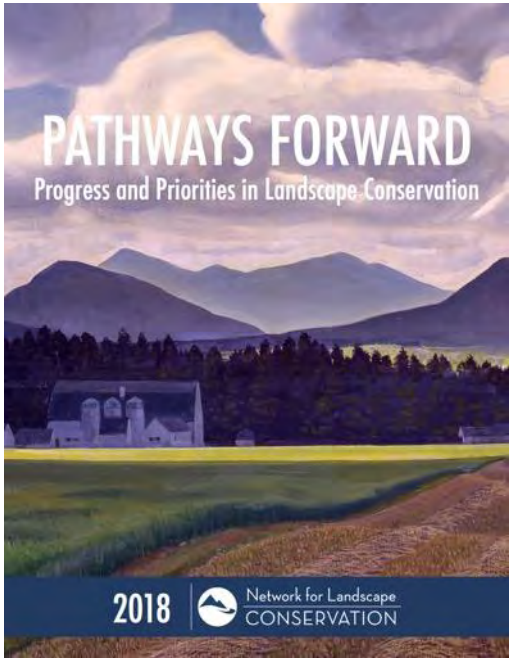
Network for Landscape CONSERVATION

Advancing the Practice of Conservation at the Landscape Scale

www.largelandscapenetwork.org



Pathways Forward: Progress and Priorities in Landscape Conservation



Released August 2018

Emerged from the November 2017 National Forum on Landscape Conservation.

Highlights current state of landscape conservation practice, and where we can go moving forward.

The Landscape Conservation Catalyst Fund 2019 - 2023

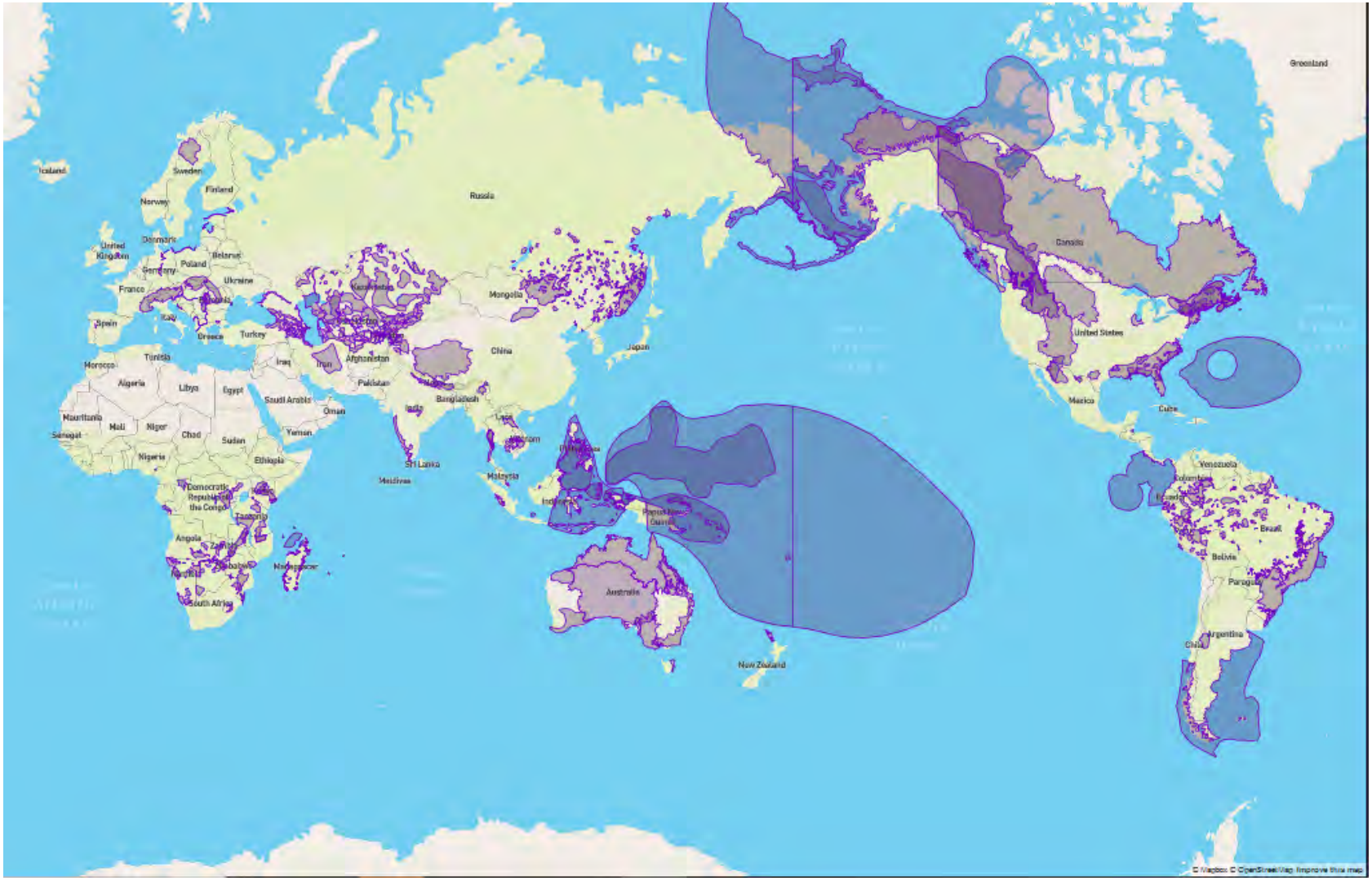
The purpose of the Landscape Conservation Catalyst Fund is to accelerate the pace and effective practice of place-based, collaborative landscape conservation across the United States.

DORIS DUKE CHARITABLE FOUNDATION

WILLIAM + FLORA Hewlett Foundation

Globescapes.org

Over 150 large landscape/seascape conservation initiatives



http://globescapes.org/

Saving the Planet – by connecting One Large Landscape at a time

Pathway to Canada Target 1

http://www.conservation2020canada.ca/

COLLABORATIVE ACTION TOWARDS A TERRESTRIAL NETWORK OF PROTECTED AND CONSERVED AREAS THROUGHOUT CANADA

Connectivity in the Canadian (Bureaucratic) Context

Quttinirpaaq National Park
Photo by Ryan Bray, © Parks Canada

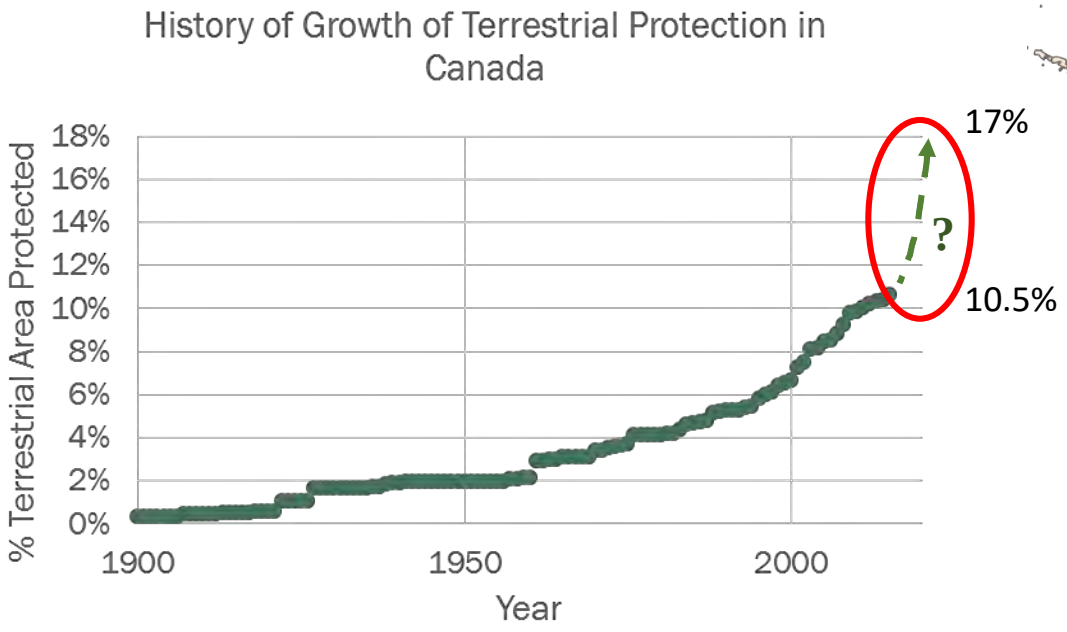
Richard Pither & Andrea Clouston,
Environment & Climate Change Canada

International and Domestic Commitments

- **Aichi Target 11** - 2010 Conference of the Parties for the Convention on Biological Diversity:
  - *By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.*

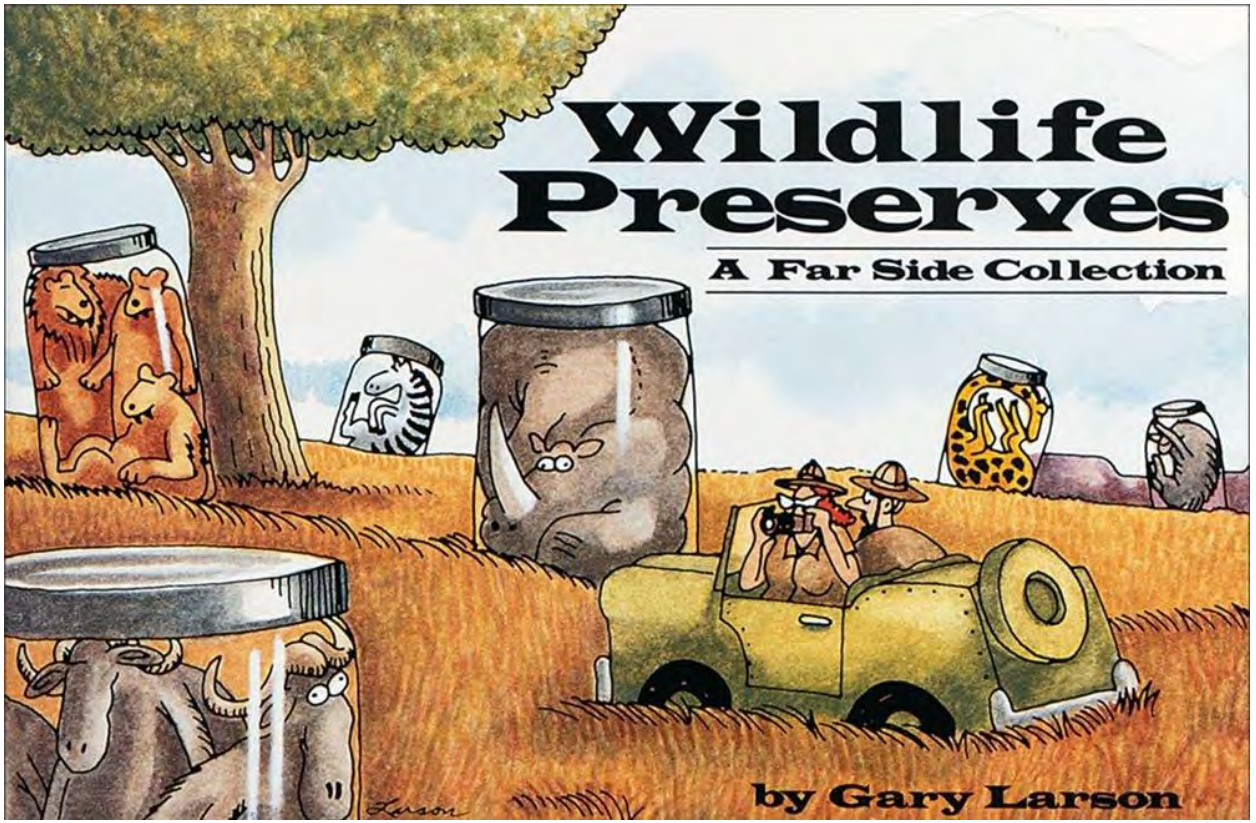
- **Canada Target 1 -** 2020 Biodiversity Goals and Targets for Canada (2015):
  - *By 2020, at least **17%** of terrestrial areas and inland water, and 10% of coastal and marine areas, are conserved through **networks** of protected areas and other effective area-based conservation measures …. Eh?*

Current Status in Canada

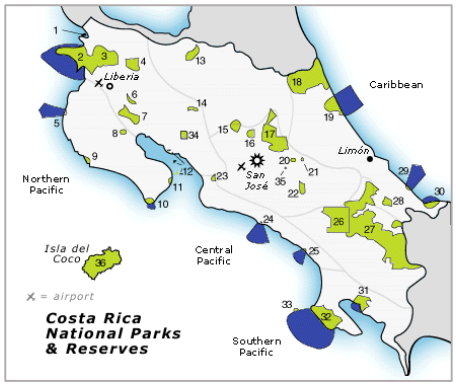


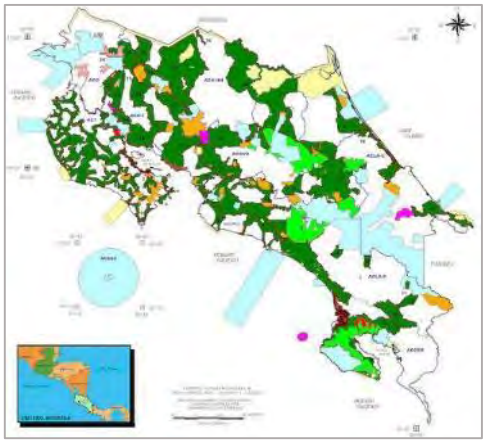
Another **6.5%** needed, ~ equivalent to the size of Alberta or Texas

Conservation is About More Than Just a Number



Aichi Target 11 / Canada Target 1





http://newscenter.nmsu.edu/Articles/view/9703/statistics-professor-helps-costa-rican-researchers-improve-their-study-methods

© Richard Pither

HOW MUCH
- > 17%

+

WHERE

Areas important for
- Biodiversity,
- Ecosystem services,
- Ecological representation,
- Connectivity

+

HOW
- Managed effectively,
- Managed equitably,
- Integrated into wider landscape

=

CONSERVATION OF BIODIVERSITY

Pathway to Canada Target 1

Japer National Park
Photo by Ryan Bray
© Parks Canada

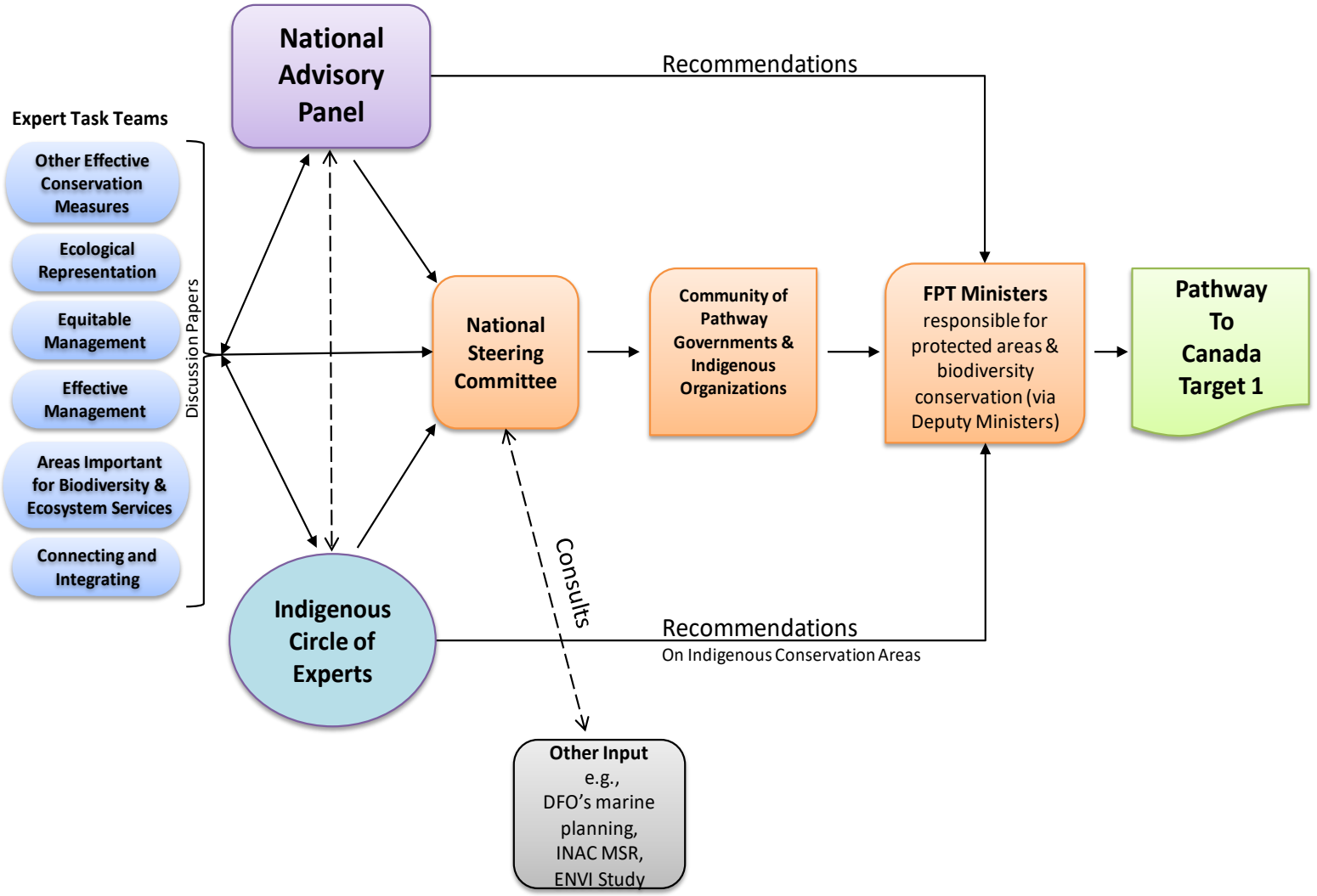
Goal:

- In **partnership** with Indigenous Peoples and relevant sectors of Canadian society, produce a pathway, grounded in science and Indigenous knowledge systems, to establish a coordinated and connected network of parks and conservation areas throughout Canada that will serve as the cornerstone for biodiversity conservation for generations to come.

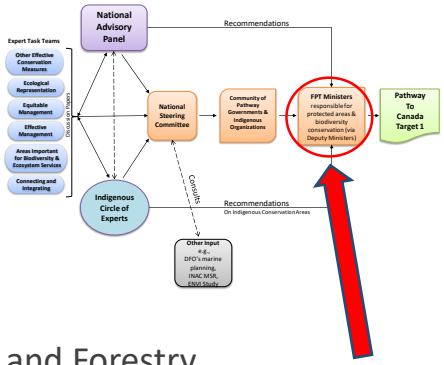
Principles:

- **Reconciliation**; Respect; **Inclusiveness and collaboration**; Transparency; Innovation and creativity; Evidence-based decision making, grounded in science & Indigenous knowledge systems

Pathway: Bureaucratic Connectivity



Community of Ministries (+) Responsible for Pathway



- Alberta:
  - Environment and Parks
- British Columbia
  - Environment
- Manitoba
  - Sustainable Development
- New Brunswick
  - Tourism, Heritage and Culture
  - Energy and Resource Development
  - Environment & Local Government
- Newfoundland & Labrador
  - Environment & Climate Change
- Northwest Territories
  - Industry, Tourism and Investment
  - Environment and Natural Resources
- Nova Scotia
  - Natural Resources
  - Environment
- Nunavut
  - Environment
- Ontario
  - Natural Resources and Forestry
- Prince Edward Island
  - Economic Development and Tourism
  - Communities, Land and Environment
- Saskatchewan
  - Parks, Culture & Sport
  - Environment
- Yukon
  - Environment
- Canada
  - Parks Canada
  - Environment and Climate Change Canada
- Assembly of First Nations
- Métis National Council
- Municipalities

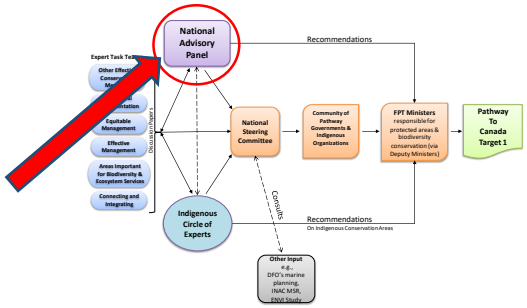
*Québec does not participate directly but contributes to the pan-Canadian effort by achieving an identical target for the creation of protected areas on its territory and its inland water by 2020.

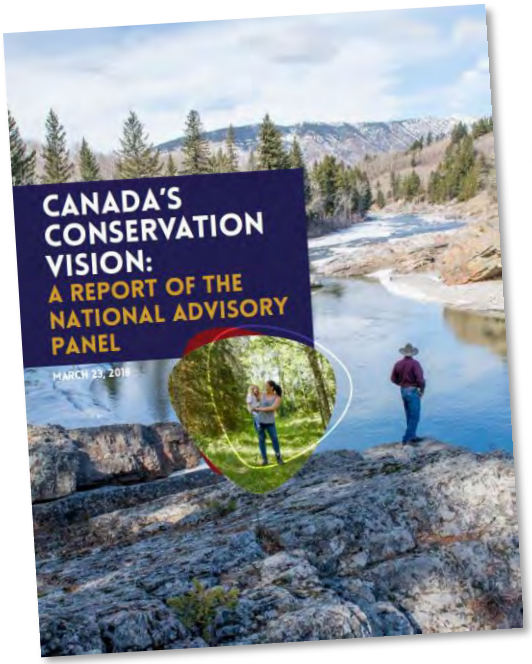
Indigenous Circle of Experts

- ICE calls on federal, provincial, territorial and Indigenous governments to endorse the concept of **IPCAs**. IPCAs are lands and waters where Indigenous governments have the primary role in protecting and conserving culture and ecosystems through Indigenous laws, governance and knowledge systems. Culture and language are the heart and soul of an IPCA.
- ICE recommends that federal, provincial and territorial governments take a **more integrated approach** to conservation and biodiversity that is consistent with Indigenous worldviews and tailored to what the land and water need locally and regionally.

March 2018

National Advisory Panel



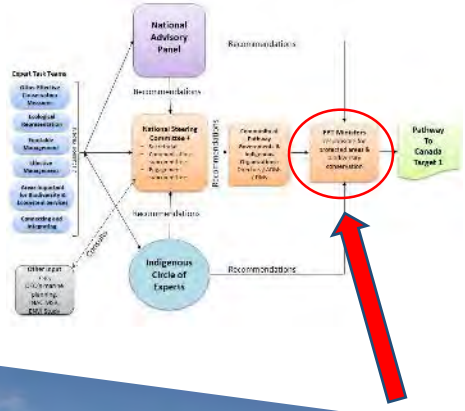


June 2018

- Develop a **nationwide ecological connectivity strategy**.
- Define measures and standards for assessing connectivity at multiple scales.
  - Use **structural connectivity** indicators at the national scale to evaluate the current network and to plan for new protected areas and OECMs.
  - Elaborate **functional connectivity** indicators for focal species to establish management targets at regional and local scale.
- Identify & prioritize opportunities for landscape-level conservation in areas of national and hemispheric importance to conservation and connectivity, such as … the **Northern Appalachians-to-Nova Scotia** region.

One With Nature

A Report of Canada's Federal, Provincial and Territorial Departments Responsible for Parks, Protected Areas, Conservation, Wildlife and Biodiversity



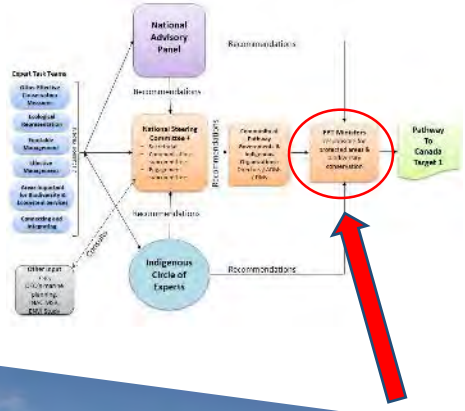
- Work together to design and implement coordinated, **connected**, representative and effective **networks** of protected and conserved areas throughout Canada, recognizing that this will be a long-term endeavour and will not be complete by 2020.

- Develop pan-Canadian criteria and **indicators** for monitoring, tracking and reporting progress on the qualitative elements of Canada Target 1. This priority will address representative terrestrial, freshwater and wetland ecosystems throughout Canada.

February 2019

One With Nature

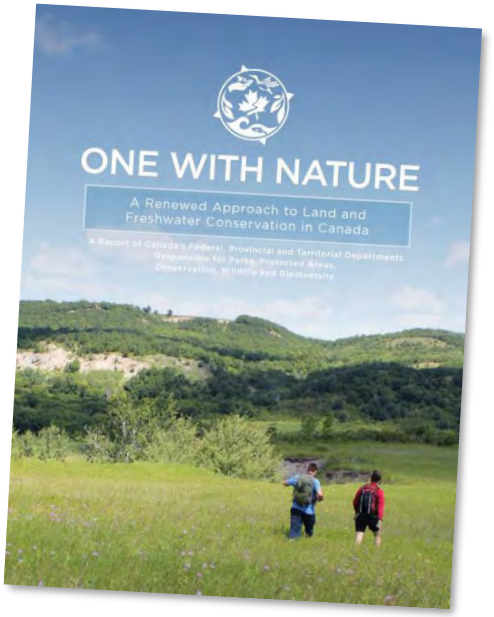
A Report of Canada's Federal, Provincial and Territorial Departments Responsible for Parks, Protected Areas, Conservation, Wildlife and Biodiversity



- Work together with partners, including non-governmental organizations (NGOs), to develop a "**conservation toolbox**" that comprises best practices, planning tools, methods and technologies that can be shared broadly to promote biodiversity conservation throughout Canada.

- Work together and within each jurisdiction to **identify and address barriers** and gaps to achieving the qualitative elements of Canada Target 1. Collaborative efforts to address these barriers and gaps will consider biodiversity conservation needs at a range of scales.

Pathway 2.0



In addition to the effort to achieve 17% target, the National Steering Committee selected three qualitative elements as priorities for 2019:

- Areas important for biodiversity
- Ecological representation
- **Ecological connectivity**

The other qualitative elements will be worked on in the future:

- Areas important for ecosystem services
- Integration of protected & conserved areas into the wider landscape
- Equitable Management
- Management Effectiveness

A Nature Legacy For Canada

The Government of Canada invested an historic **$1.35 billion** in Budget 2018 to support work with other governments, Indigenous groups, non-profit organizations and others to continue to work together and find new ways to protect our lands, waters and wildlife.

Key Commitments:

- Conserve and protect at least **17%** of our land and freshwater, especially within **connected networks of protected areas**
- **Transform approaches to recovery of species at risk** through multi-species and ecosystem-based strategies focussed on priority species, places and threats
- Do so in ways that **advance reconciliation** by supporting Indigenous leadership and responsibilities in land and wildlife stewardship and related cultural activities

https://www.canada.ca/en/services/environment/conservation/nature-legacy.html

Nature Legacy: Nature Fund

- **$500 million** to support the partners' protection and conservation of Canada's ecosystems, landscapes and biodiversity including species at risk. This funding will be matched by philanthropic foundations, corporate, not-for-profit, provincial, territorial and other partners who will contribute at least an additional $500M to raise a total of **$1 billion** for conservation action

Spaces Stream

Protected & Conserved Areas (ECCC)

1. Quick Start
2. **Challenge Fund**

Private Lands (ECCC)

3. Natural Heritage Conservation Program – in development summer 2019

Species Stream

Terrestrial (ECCC)

1. Priority Places
   - Priority Places – Directed funding
   - Community-nominated Priority Places – Call for proposals
2. Priority Species – Directed funding
3. Priority Threats & Sectors – Directed funding

Aquatic (DFO)

4. Priority Places & Threats
   - Canada Nature Fund for Aquatic Species at Risk – Call for proposals

A Nature Legacy: ECCC – Science

The Nature Legacy supports the implementation of the Pathway initiative through new resources for ECCC, including funds to support:

- **Landscape assessment** to enable evidence-based design of connected & resilient network of existing & future protected areas
  - Application of landscape & population ecology
  - Consolidation & analysis of biophysical spatial data
  - Development of scenario modelling to reserve design & planning to incorporate climate change

https://www.canada.ca/en/services/environment/conservation/nature-legacy.html

Pathway Connectivity Working Group (CWG)

The Pathway NSC established a subcommittee to help advance work on connectivity as part of the Pathway initiative.

Disclaimer: Images may not be accurate

Members:

- Dave MacKinnon (Nova Scotia)
- Steve Gordon (New Brunswick)
- Ryan Fisher (Saskatchewan)
- Tina Leonard (Newfoundland & Labrador)
- Jason Kelly (Manitoba)
- Claude Samson (Parks Canada Agency)
- Simon Paquin, Edith Leclerc, ZuZu Gadallah (ECCC/CWS)
- Roxanne Comeau, Richard Pither, Scott Moran and Andrea Clouston (ECCC/S&T)

Partners (thus far):

- Academia (e.g., U of T, Guelph U, UBC-O)
- NGOs (e.g., NCC, CPAWS, Nature Canada)

Pathway Connectivity Work

Deliverables:

- **National-scale connectivity indicators** for measuring **structural** connectivity among protected and conserved terrestrial and freshwater areas throughout Canada.
  - **Terrestrial** indicator (ECCC-S&T led)
  - **Freshwater** indicator (External expert)

These indicators will be used for:

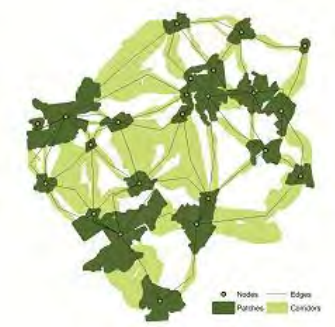
- Measuring progress towards achieving connectivity nationally
  - Will also likely be used to measure connectivity for each protected area
- National and international reporting purposes, and
- Encouraging conversation about connectivity within governments.

Pathway Connectivity Work

- **Material for a conservation toolbox**, such as best practices, implementation guidance, planning tools, methods and technologies that can be shared broadly.
  - Toolbox will likely provide links to the existing sources in addition to hosting new content developed through the Pathway initiative.

- **Identifying and addressing barriers and gaps** to implementing ecological connectivity throughout Canada with an emphasis on connectivity between protected and conserved areas
  - Dr.'s Christopher Lemieux & Paul Gray have been contracted to produce a report in consultation with Pathway partners.

Pathway Connectivity Work

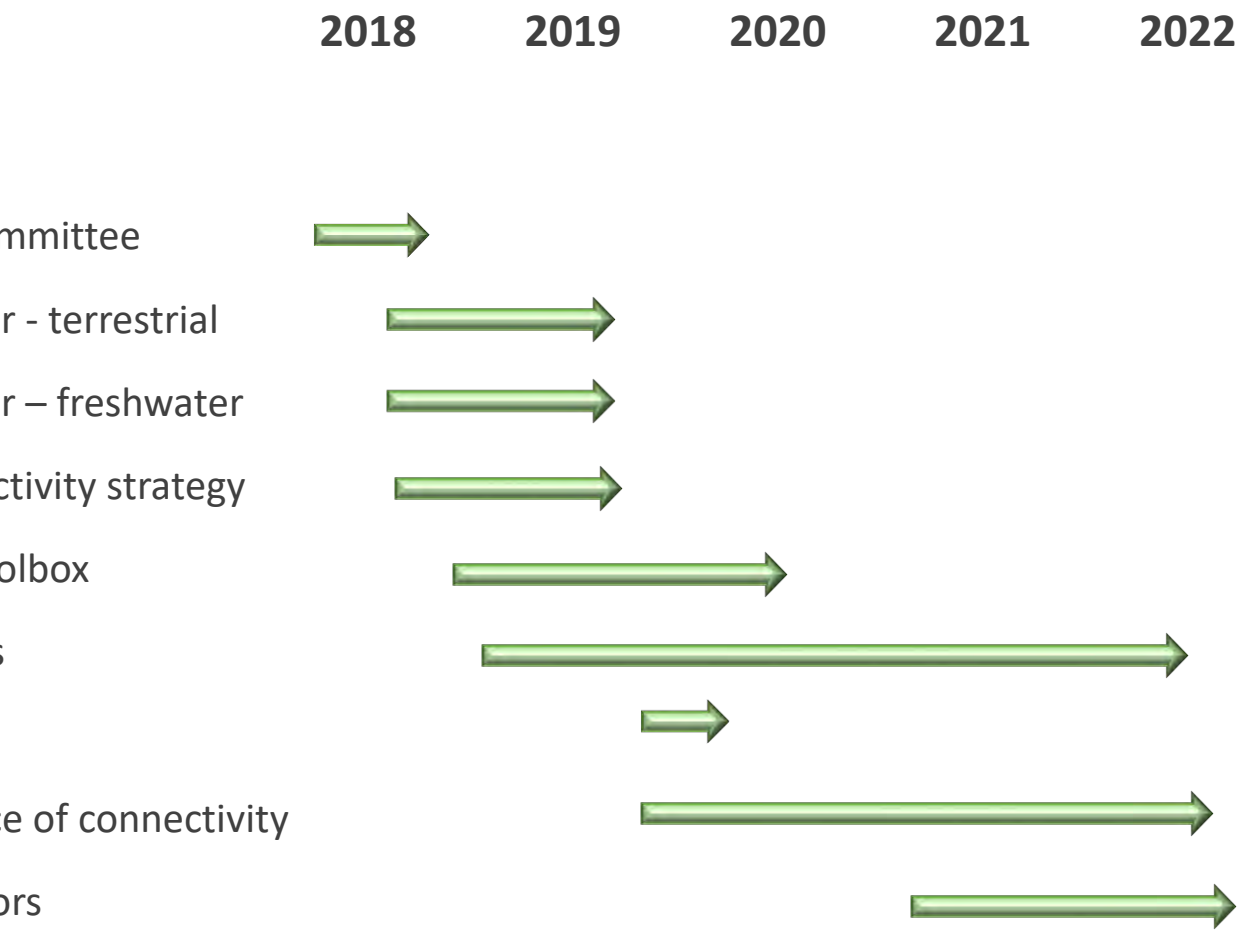


Esa.org

- **Workshop** to discuss gaps in connectivity science
  - Experts in connectivity analysis will be invited to attend a workshop that will discuss **gaps** in the scientific knowledge & the research needed to address the gaps (details TBD, including date)
- Future ECCC - S&T research will be guided by workshop results, engagement with partners, and from discussions at conferences including this one.

- Apply new science to **regional-scale connectivity indicators** for measuring **functional connectivity** among and between terrestrial and freshwater protected and conserved areas, that can be adjusted to reflect species of local interest.

Pathway 2.0 Connectivity Timelines



ECOLOGICAL CONNECTIVITY

- Established Pathway subcommittee
- National structural indicator - terrestrial
- National structural indicator – freshwater
- Options for national connectivity strategy
- Content for connectivity toolbox
- Collaboration with partners
- Science gaps workshop
- Research to advance science of connectivity
- Regional functional indicators

Pathway to Canada Target 1

- Questions?

Ten Years of Landscape-Scale Collaboration:

The Staying Connected Initiative

Canadian Maritimes Ecological Connectivity Forum

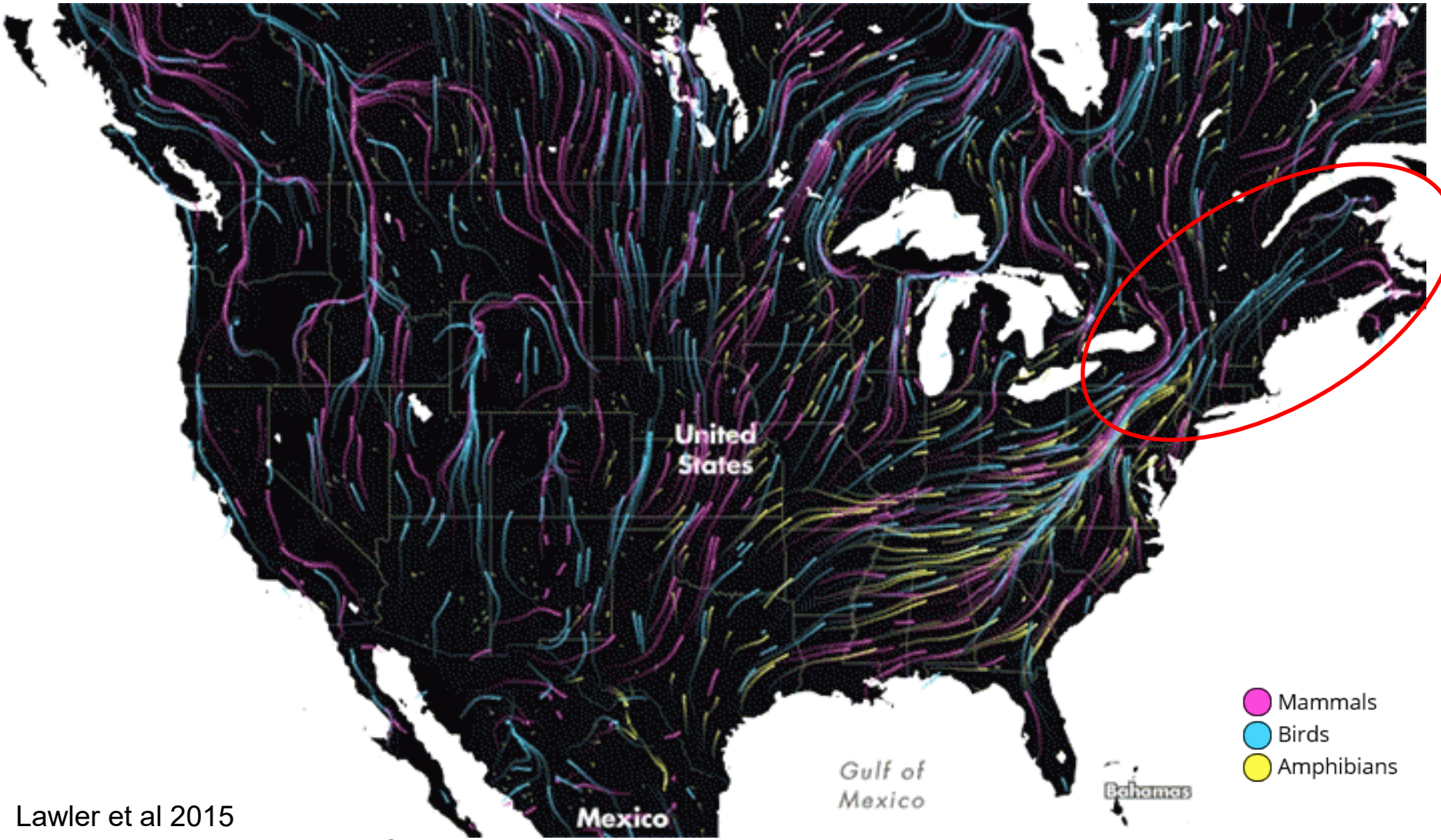
April 25, 2019

Jessie Levine & John Austin

Overview

- Northern Appalachian-Acadian region
- Staying Connected Initiative approach:
  - Multiple scales
  - Multiple partners
  - Multiple strategies
- Lessons learned
- SCI in Vermont
- Questions

Climate change and connectivity



Lawler et al 2015
Animation by Dan Majka, TNC

CONNECTIVITY
IS THE SAFETY NET OF NATURE

What is connectivity?

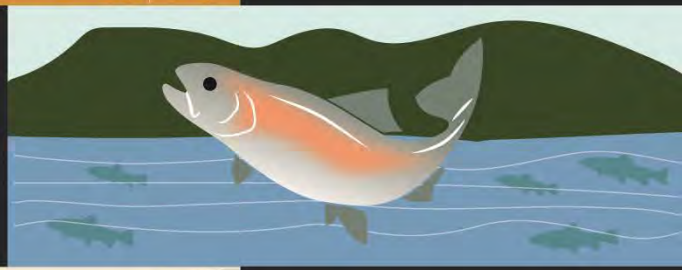
Connectivity is the degree to which landscapes and seascapes allow species movement and natural ecological processes.

What does connectivity do?

Allows species to migrate or disperse to feed, breed, and respond to climate change. Allows natural communities to thrive by maintaining ecosystem functions like pollination and stream flows.

What do we want?

Connected lands and waters: wildlife corridors, landscape linkage areas, free flowing and connected rivers, interconnected coastal and marine zones, and climate-resilient ecosystems.



Why do we care?

Connected lands and waters benefit nature and people. As the climate changes and development increases, we must act now to save and restore natural connections across all lands and waters.

IUCN

WCPA
WORLD COMMISSION ON PROTECTED AREAS

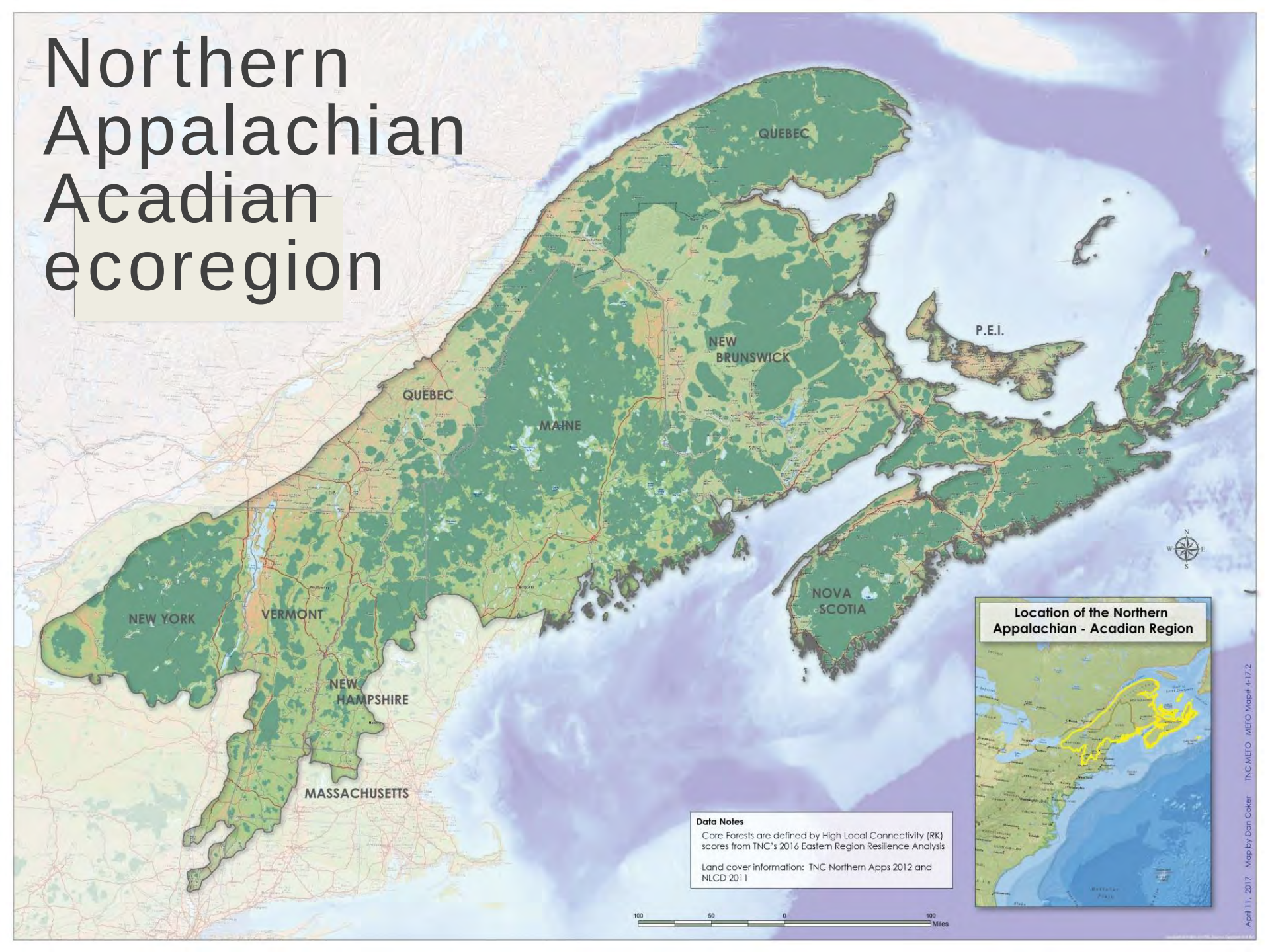
CONNECTIVITY CONSERVATION
Specialist Group

LEARN MORE:
conservationcorridor.org/ccsg

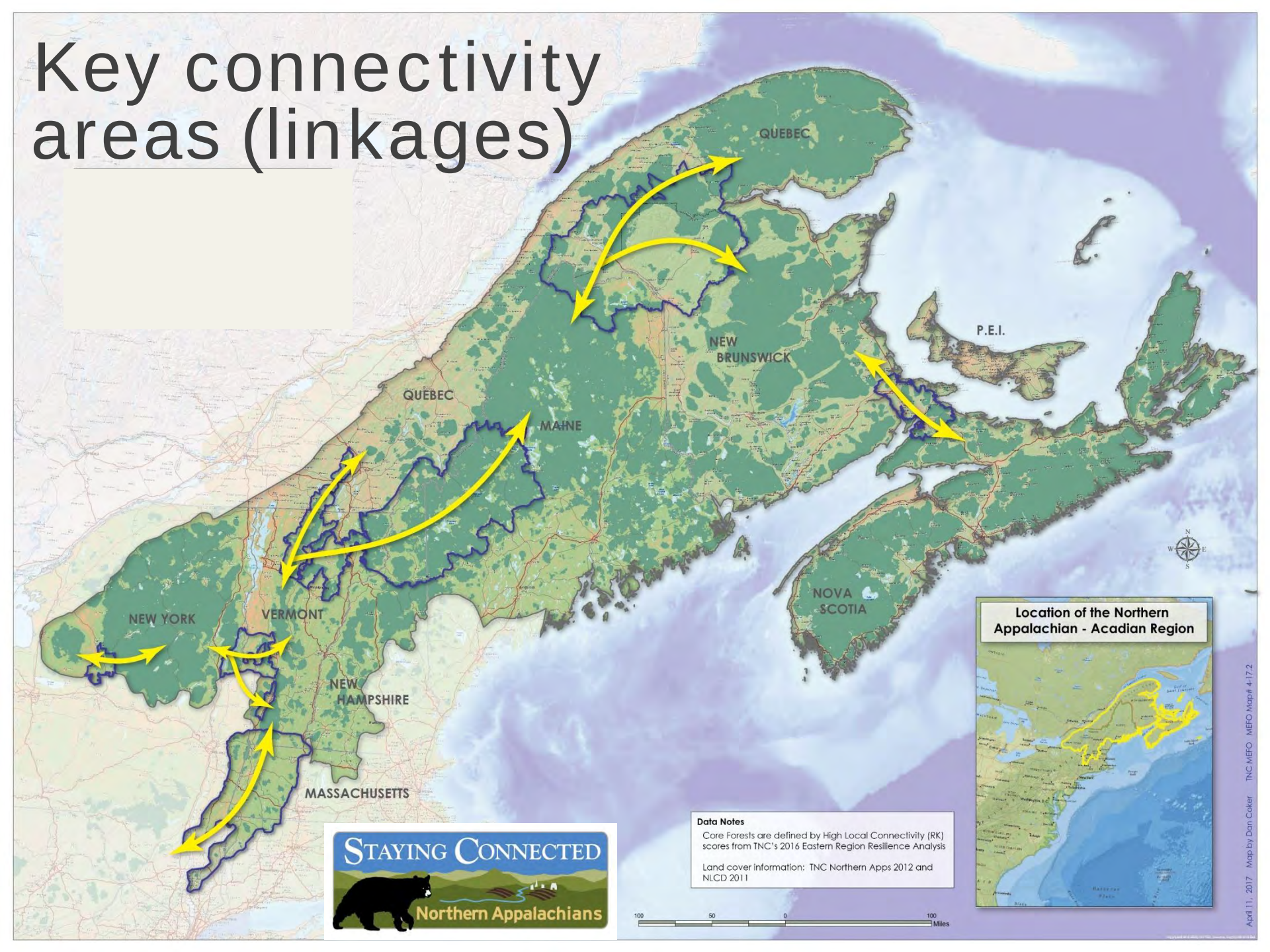
Temperate deciduous and mixed forests

Northern Appalachian-Acadian ecoregion

Northern Appalachian Acadian ecoregion



Key connectivity areas (linkages)




In partnership


Our collective mission is to sustain, conserve, and restore a connected forested landscape for nature and people

The Nature Conservancy

VTrans Working to Get You There — Vermont Agency of Transportation

USDA Vermont — United States Department of Agriculture, Natural Resources Conservation Service

Northern Stewards

National Wildlife Federation — Since 1936

Ontario Road Ecology Group

LightHawk — Conservation Flying

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

VNRC Vermont Natural Resources Council

Northeast Wilderness Trust

USDA Forest Service — U.S. Department of Agriculture

Forests, Parks & Recreation Vermont — Agency of Natural Resources

Horizon-Nature — Bas-Saint-Laurent

Corridor appalachien — Appalachian Corridor

Nature United

New York State Tug Hill Commission

Tug Hill Tomorrow Land Trust

Vermont Fish & Wildlife

Vermont Land Trust — Conserving Land for the Future of Vermont

The University of Vermont

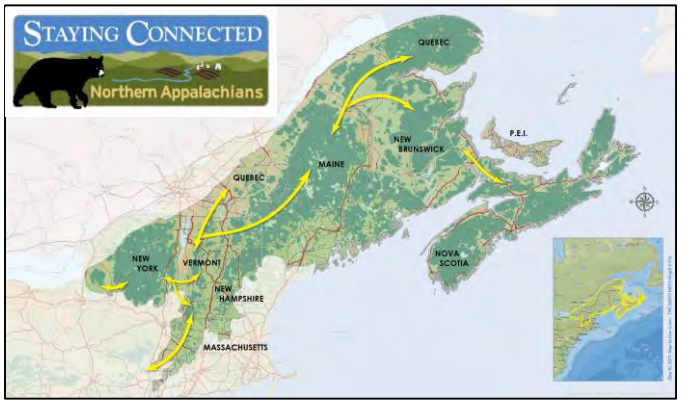
Centre de la science de la biodiversité du Québec — Quebec Centre for Biodiversity Science

Cold Hollow to Canada

NEW YORK STATE OF OPPORTUNITY. | Department of Transportation

Nature Conservancy Canada — Conservation de la nature Canada

Fondation de la faune du Québec



Adirondack Land Trust

Mohawk Hudson Land Conservancy

New Brunswick Nouveau Canada

CPAWS — Canadian Parks and Wilderness Society

Wildlands Network

Center for Large Landscape Conservation

UNESCO — United Nations Organization for Education, Science and Culture; Organisation des Nations Unies pour l'éducation, la science et la culture

Fundy Biosphere Reserve — Réserve de la biosphère de Fundy

Nature NB

Open Space Institute

ARC — New Thinking • New Methods • New Materials • New Solutions

massDOT — Massachusetts Department of Transportation, Highway Division

New Hampshire Fish & Game

The Trust for Public Land

Nova Scotia

Massachusetts Division of Fisheries & Wildlife — Est. 1866

Hilltown Land Trust — An Affiliate of The Trustees

University of Massachusetts Amherst

Mass Audubon

Dalhousie University 1818 2018

Two Countries One Forest — Deux Pays Une Forêt

New Hampshire DOT — Department of Transportation

Maine Appalachian Trail Land Trust

Maine Mountain Collaborative

Kestrel Land Trust

BEAT — Berkshire Environmental Action Team

HVA — www.hvatoday.org

Litchfield Hills Greenprint Collaborative

NH Audubon

Maine Dept. of Inland Fisheries and Wildlife

MaineDOT

Maine Audubon


Multiple scales:
local to regional

Multiple strategies:
Our work to conserve connectivity

- Conservation science
- Land protection
- Land use planning
- Local engagement
- Transportation
- Policy

Guided by science

Priority connectivity areas between habitat nodes, where land protection and/or landowner outreach will produce the biggest benefit for maintaining habitat connectivity.

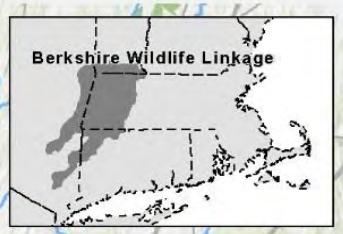
Priority road segments that are barriers to wildlife movement, where transportation strategies will have the biggest benefit to habitat connectivity.

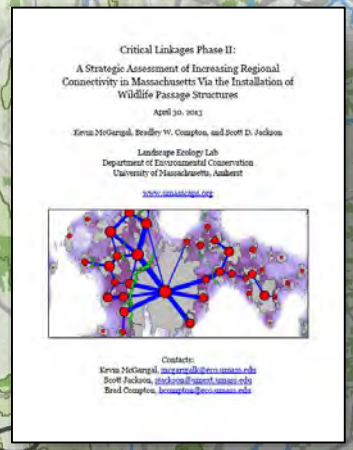
Protected open space

Habitat nodes

N

5 Miles





Critical Linkages Phase II:

A Strategic Assessment of Increasing Regional Connectivity in Massachusetts Via the Installation of Wildlife Passage Structures

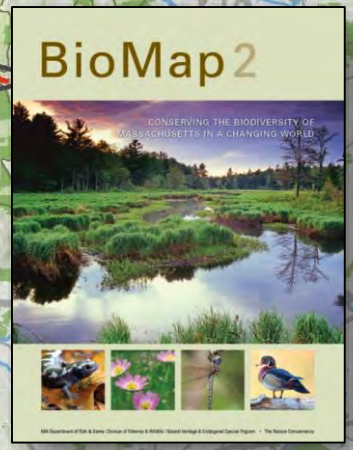
April 30, 2013

Kevin McGarigal, Bradley W. Compton, and Scott D. Jackson

Landscape Ecology Lab
Department of Environmental Conservation
University of Massachusetts, Amherst

www.umasslcpi.org

Contacts:
Kevin McGarigal, mcgarigal@eco.umass.edu
Scott Jackson, sjackson@sunset.umass.edu
Brad Compton, bcompton@eco.umass.edu



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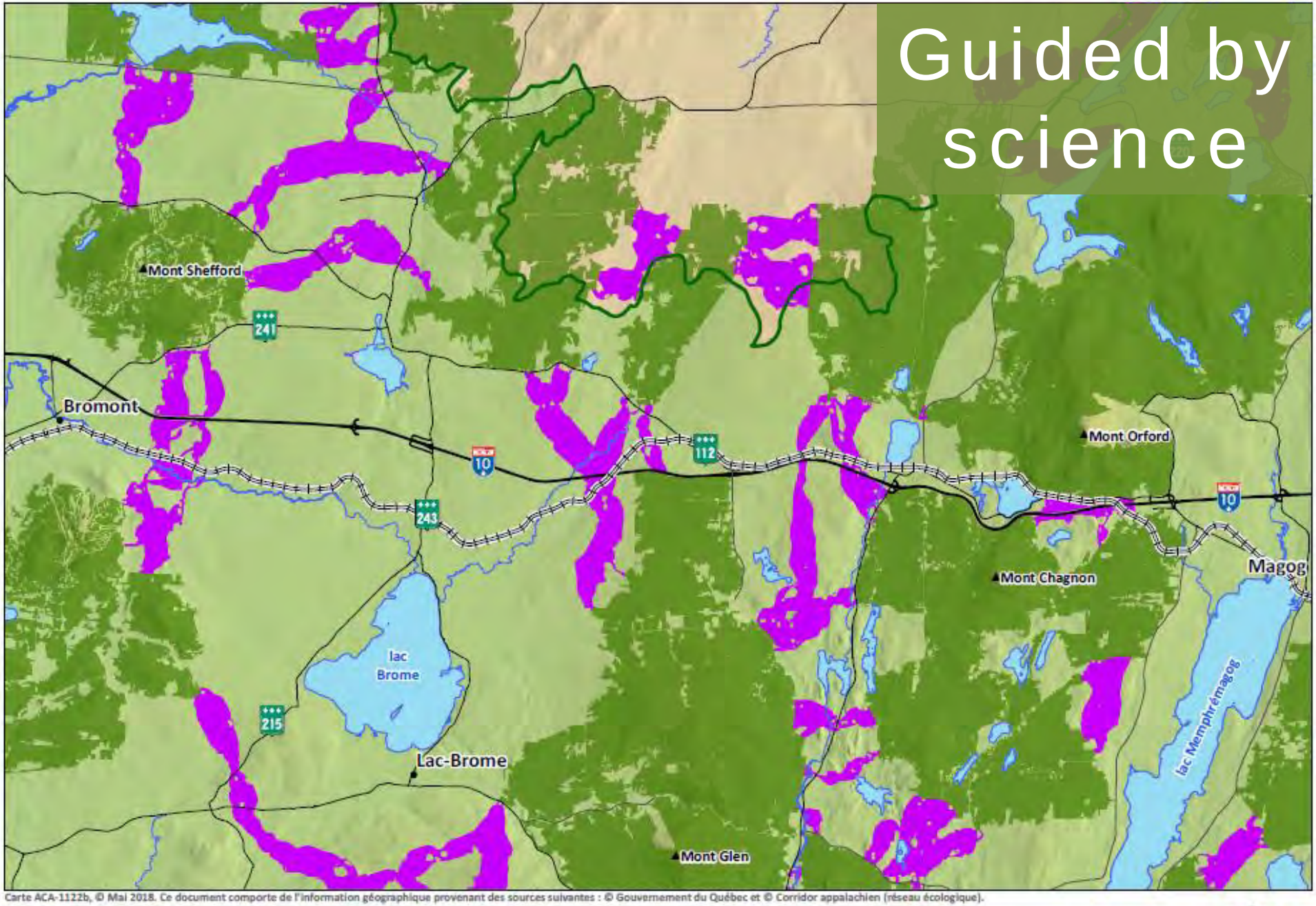


Carte ACA-1122b, © Mai 2018. Ce document comporte de l'information géographique provenant des sources suivantes : © Gouvernement du Québec et © Corridor appalachien (réseau écologique).

Noyau forestier
Corridor naturel
Territoire du Corridor appalachien
Réseau ferroviaire
Autoroute
Route nationale ou régionale
Route locale

0 2 4 6 km

N

Corridor appalachien
Appalachian Corridor

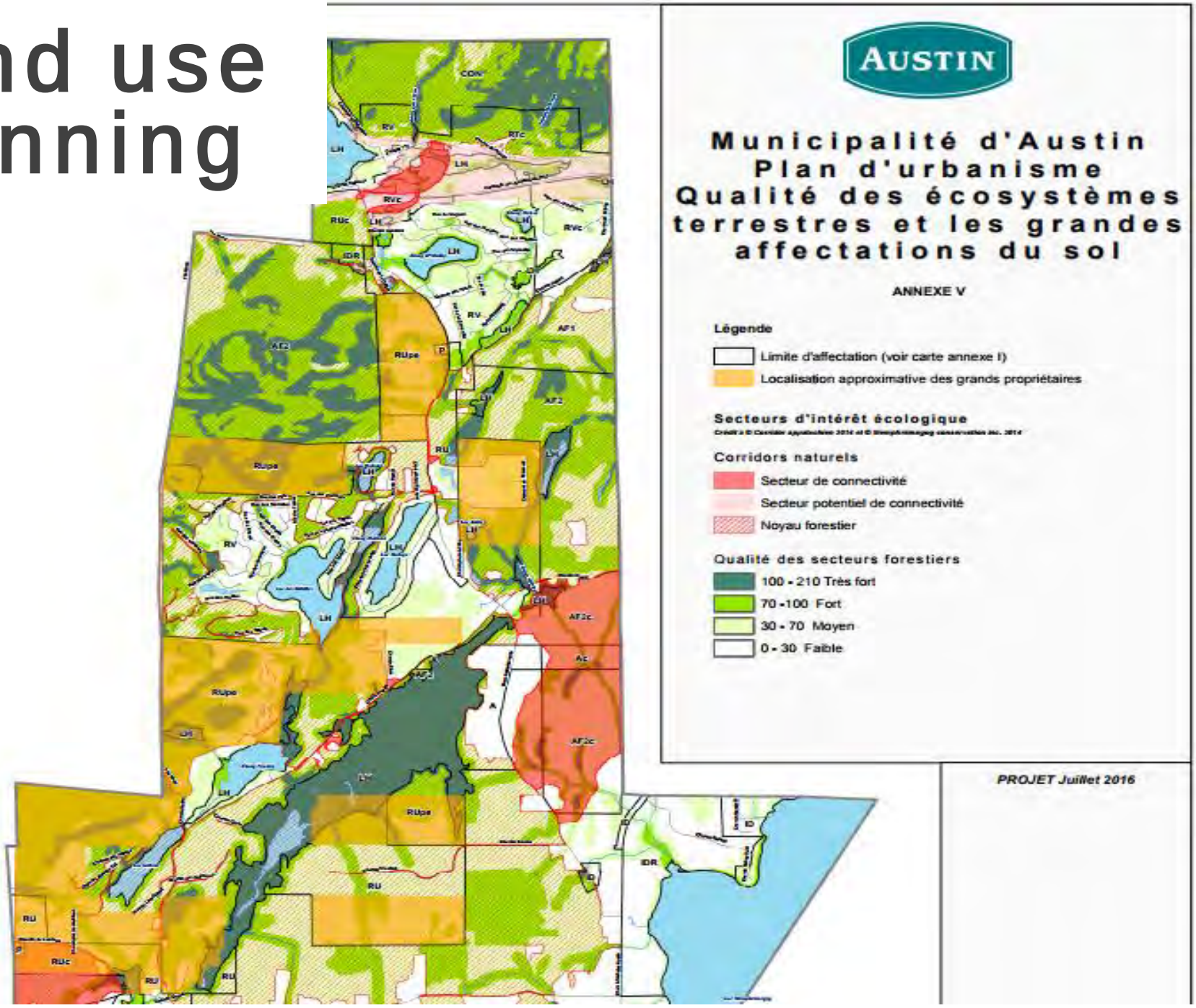

Field science

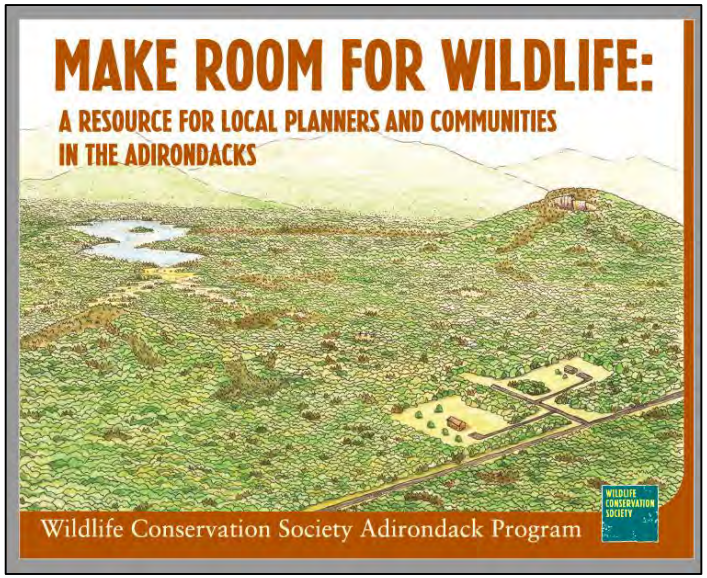

Land protection
© Appalachian Corridor

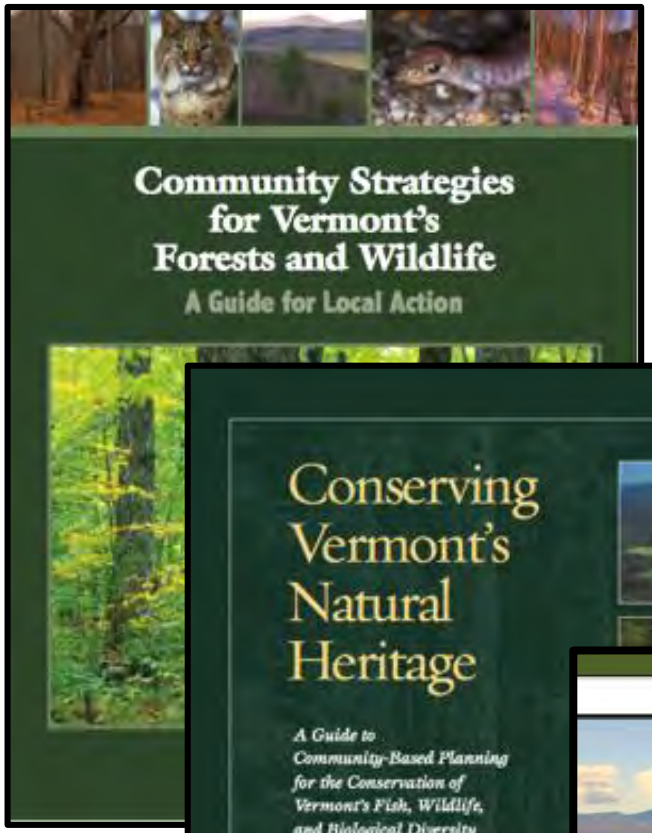
Land protection

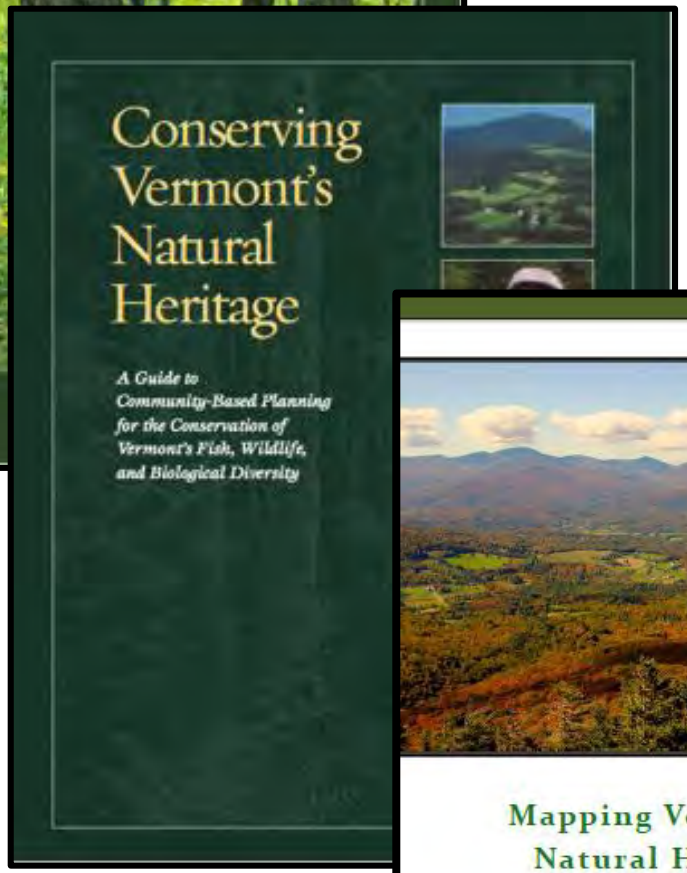
Land use planning

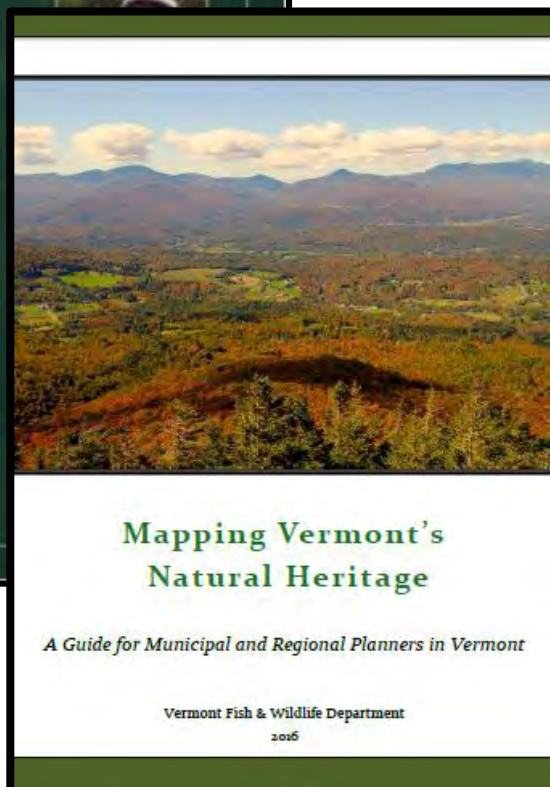
Land use planning

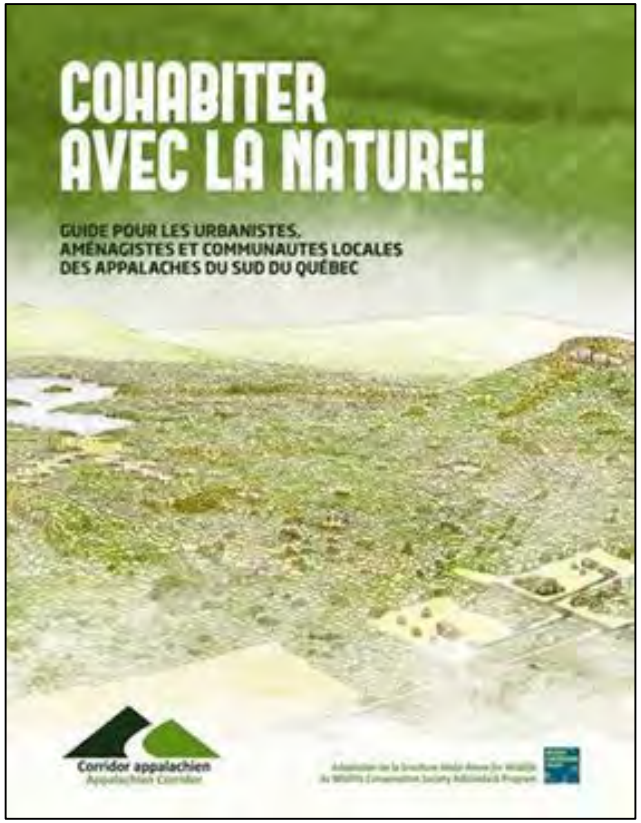



MAKE ROOM FOR WILDLIFE:
A RESOURCE FOR LOCAL PLANNERS AND COMMUNITIES IN THE ADIRONDACKS
Wildlife Conservation Society Adirondack Program


Community Strategies for Vermont's Forests and Wildlife
A Guide for Local Action


Conserving Vermont's Natural Heritage
A Guide to Community-Based Planning for the Conservation of Vermont's Fish, Wildlife, and Biological Diversity


Mapping Vermont's Natural Heritage
A Guide for Municipal and Regional Planners in Vermont
Vermont Fish & Wildlife Department
2016


COHABITER AVEC LA NATURE!
GUIDE POUR LES URBANISTES, AMÉNAGISTES ET COMMUNAUTÉS LOCALES DES APPALACHES DU SUD DU QUÉBEC
Corridor appalachien
Appalachian Corridor

Local engagement

Local engagement

Transportation

- Field science
- Implementation
- Sharing best practices


Field science
© Appalachian Corridor

Field science

Reducing Wildlife Mortality on Roads in Vermont: Documenting Wildlife Movement near Bridges and Culverts to Improve Related Conservation Investments

September 30, 2016

Paul Marangelo, The Nature Conservancy, Vermont Chapter
Laura Farrell, Phd.

Camera Trapping to Advance Wildlife Connectivity Implementation in Coos County, NH

A report to the SCC Conservation Grant Program

April 22, 2016

Conducted by:

Peter Steckler, The Nature Conservancy, NH Chapter
Arianna Spear & Timothy Norton, University of New Hampshire Interns

This project is supported by funds from the sale of the Conservation License Plate (Moose Plate) through the NH State Conservation Committee grant program.


2014-07-30 10:43:07 AM M 3/3 67°F
53
2017-10-08 3:09:30 AM M 1/3 66°F
RECONYX


2015-02-26 10:14:04 PM M 1/3 -3°F
53
2015-09-10 2:18:24 PM M 3/3 74°F
RECONYX


C114
RECONYX


C86
RECONYX

About

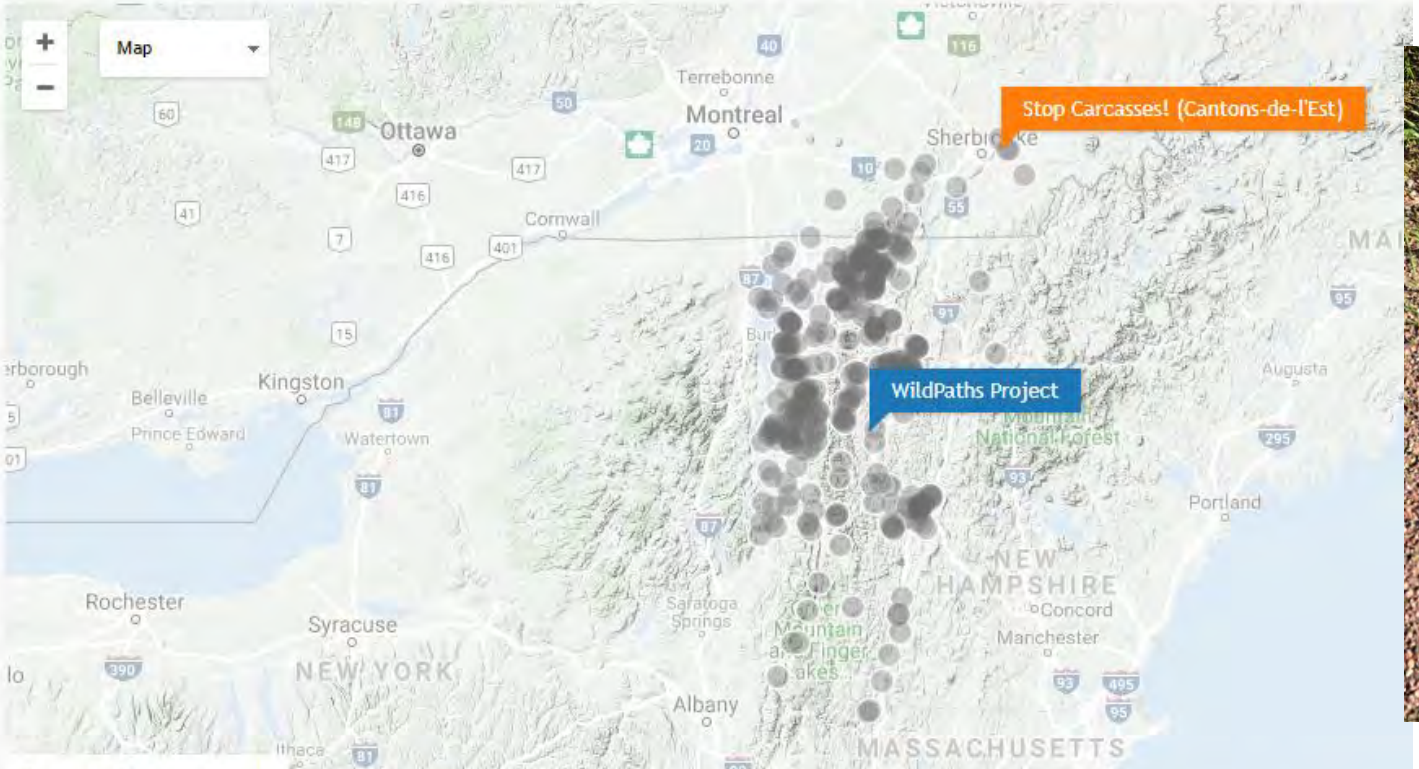
Followers 1

These are a set of projects documenting successful & unsuccessful wildlife crossing roadways. These projects are managed by organizations that are part of the Staying Connected Initiative which focuses on wildlife connectivity in the Northern Appalachians.

Read More ›

NEWS

Map of Observations



Implementation: cost-effective solutions

Power of partnership

U.S.News

'Critter Shelf' Project Aims to Help Wildlife Cross NY Roads

In this undated photo, a critter shelf is installed in a culvert near Boonville, N.Y., that helps small wildlife such as bobcats safely cross a busy highway to access habitat. (Kurt Gardner/The Nature Conservancy via AP) The Associated Press

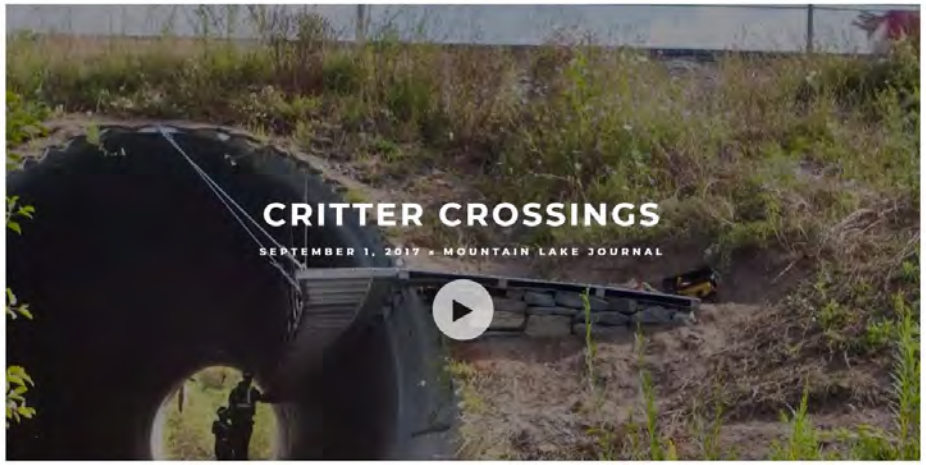
AP

BOONVILLE, N.Y. (AP) — The New York state Department of Transportation and The Nature Conservancy are testing a new "critter shelf" installed in a highway culvert to help wildlife cross safely.

The structure was installed this summer inside a 138-foot-long, 14-foot-tall culvert south of Boonville, in central New York. The steel walkway suspended above water in the culvert allows bobcats and other animals that don't swim to safely cross the busy highway.

Mountain Lake PBS

WATCH SCHEDULE READ LEARN EVENTS SUPPORT TRENDING



NEW YORK STATE

Services News Government Local Search Location

Department of Transportation

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NEWS & EVENTS

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- Traveler Advisories
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- Video Library
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Press Releases

News Releases: 2018 2017 2016 2015 2014 2013 2012 2011 2010 2009 2008 2007 2006 2005 2004 2003

Contact: Joseph Morrissey, (518) 457-6400
Release Date: September 21, 2017

NEW YORK STATE DOT AND THE NATURE CONSERVANCY PILOTING A "CRITTER SHELF" FOR WILDLIFE

First-of-its-kind structure will help protect wildlife from automobile collisions

The New York State Department of Transportation and The Nature Conservancy are piloting the state's first-ever "critter shelf" for wildlife. Installed this summer inside a large culvert under State Route 12, south of Boonville, in the Black River Valley, the suspended walkway provides a two-foot wide platform for wildlife to scurry through the culvert instead of crossing over the busy road. It is attached to one side of the corrugated steel culvert with brackets and cables.

While Route 12 is a vital travel corridor, it can also be a dangerous obstacle for wildlife. Alternatively, wildlife attempting to cross also pose danger to drivers. The Route 12 culvert carries a stream that averages about three feet in depth under the road. The new shelf sits above water level while not impeding water flow, or compromising structural integrity. At 138 feet, it runs along the full length of the culvert and expands the potential for use by wildlife by providing dry passage for bobcats and other wildlife that don't swim.

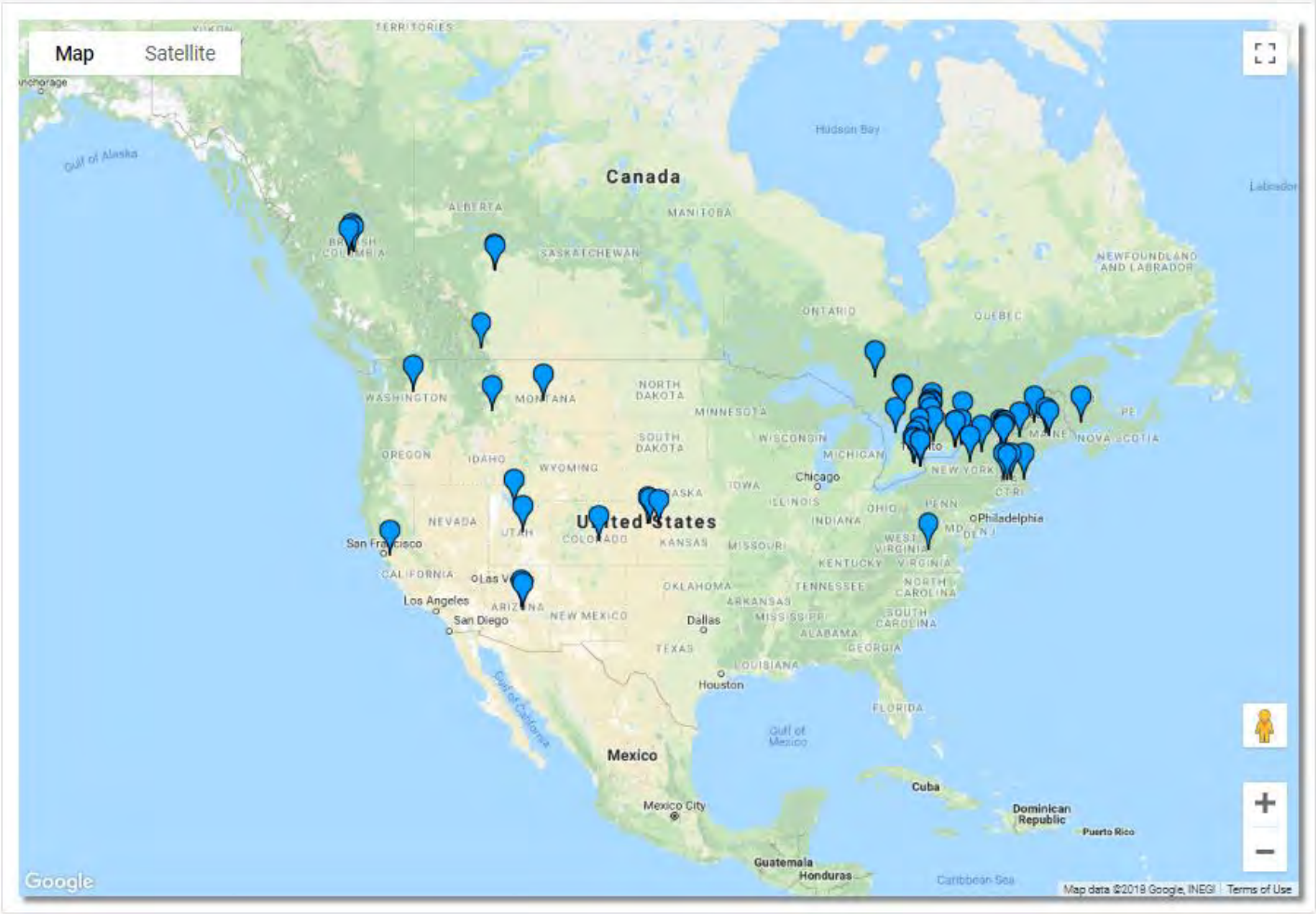
The test site was selected based on several factors. Scientists have identified the 650,000-acre Black River Valley—a patchwork of forests, farms, businesses and residential communities—as an important linkage area for wildlife. Enhancing wildlife pathways in this area gives animals a chance to move between the core forests of the Adirondacks and the Tug Hill, which is important for finding food and mates, adapting to climate change, and preventing populations from becoming isolated.

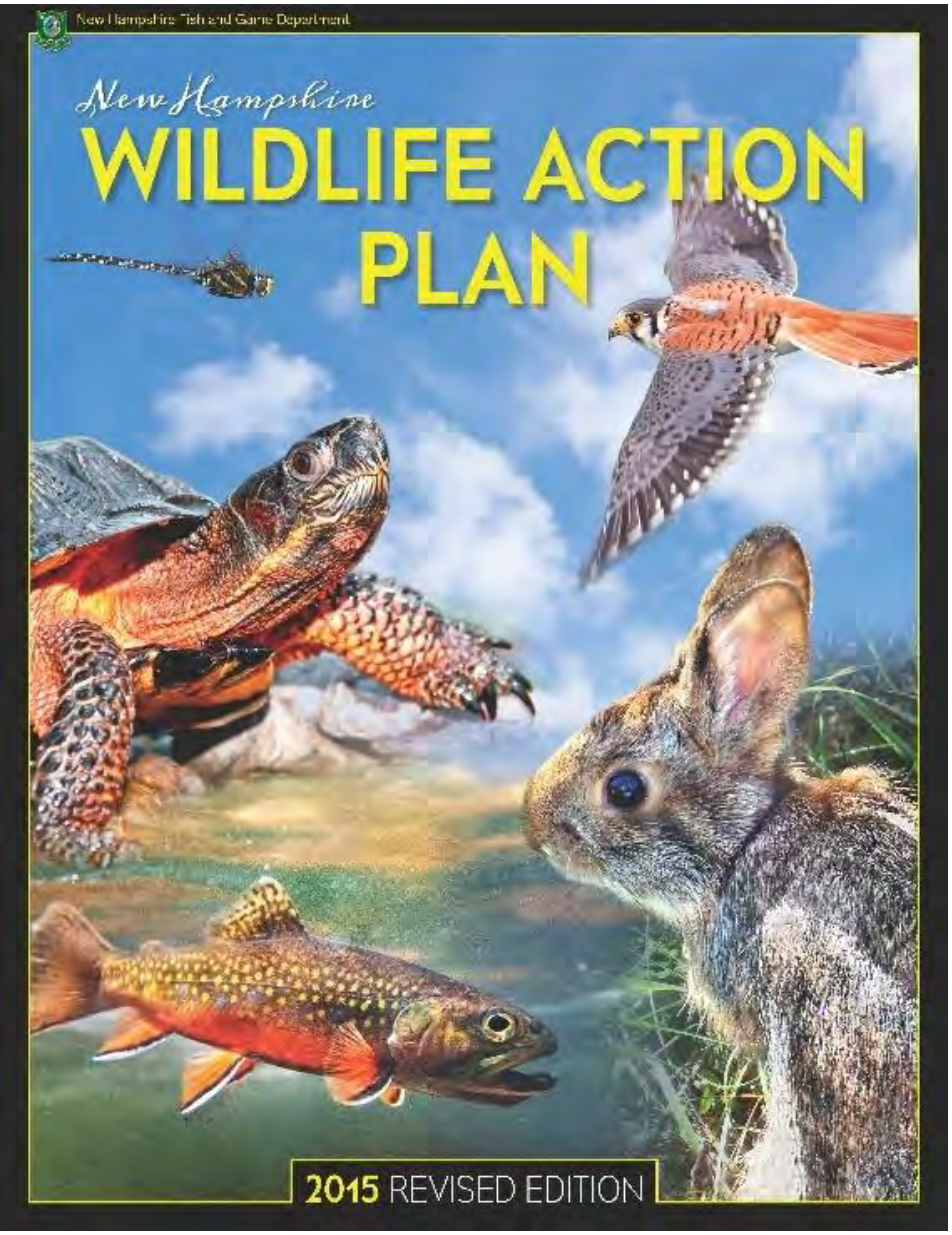
Through wildlife tracking and computer models, Route 12 was identified as a significant barrier to wildlife movement. The culvert

Implementation

Sharing best practices

Click on an icon to view the document title and then click the view info new link to go to document page.




New Hampshire Fish and Game Department
New Hampshire
WILDLIFE ACTION PLAN
2015 REVISED EDITION


NEW YORK
STATE OF OPPORTUNITY.
Department of Environmental Conservation
Parks, Recreation and Historic Preservation
Department of State
Agriculture and Markets
Department of Transportation
2016
NEW YORK STATE
OPEN SPACE CONSERVATION PLAN
www.dec.ny.gov

New England Governors and Eastern Canadian Premiers Resolution 40-3

NEG ECP
GN-A PMEC

40th Annual Conference of New England Governors and Eastern Canada Premiers • Boston, Massachusetts 2015
40e Conférence annuelle des gouverneurs de la Nouvelle-Angleterre et des premiers ministres de l'Est du Canada

RESOLUTION 40-3

RESOLUTION ON ECOLOGICAL CONNECTIVITY, ADAPTATION TO CLIMATE CHANGE, AND BIODIVERSITY CONSERVATION

WHEREAS, the New England Governors and Eastern Canadian Premiers have shown international leadership through their collective action to address environmental protection and climate change, especially through work to expand use and production of renewable energy and other efforts to reduce greenhouse gas emissions; and

WHEREAS, the region's economy, culture, and identity are closely tied to and dependent upon its forests and water resources; and

WHEREAS, the region's cities and towns, infrastructure, and natural ecosystems are vulnerable to adverse impacts from climate change. Jurisdictions region-wide are taking steps to adapt to a changing climate, by making communities, infrastructure, and public investments more resilient; and

WHEREAS, the New England Governors and Eastern Canadian Premiers recognize the inherent connection between the region's forested landscape and its forest products economy, and the important role that private forest landowners play in the health and condition of its forests; and

WHEREAS, the Northern Appalachian-Acadian forest is globally significant as the most intact, contiguous temperate broadleaf forest in the world. The Northeastern coastal forest, including the coastal plain, and the Gulf of Saint Lawrence lowland forest provide a vital link for neotropical migrants of global significance. Boreal forests are globally important for millions of resident and migratory birds, including songbirds which depend on Boreal forests during different stages of their lifecycles. Together, these forests span portions of all six New England states and five eastern Canadian provinces. Global climate change is a prominent threat to the long-term health of these vital ecosystems. The spread of invasive species and wildlife disease, often exacerbated by global climate change, is another key threat; and

WHEREAS, Indigenous people historically have a strong connection to the land, and in the present day continue to recognize the traditional importance of a healthy environment to the social well-being and economic prosperity for future generations; and

WHEREAS, maintaining and restoring ecological connectivity is an important strategy for boosting the resilience of the region's native ecosystems and biodiversity, as well as its economy and human communities. Connected habitats provide the natural pathways necessary for fish, wildlife, and plants to move to meet their life needs and to find suitable habitat as climate conditions change. Intact

Leadership and engagement

CONNECTIVITY CONSERVATION
Specialist Group

NORTHEASTERN TRANSPORTATION and WILDLIFE CONFERENCE
September 8 - 12, 2018
UMass Amherst
Amherst, MA

Network for Landscape CONSERVATION

Colloque sur l'écologie routière et l'adaptation aux changements climatiques : de la recherche aux actions concrètes

Northeast Association of Fish & Wildlife Agencies

Connecting the Landscape So Wildlife and People Can Thrive

Elements of success

- Common vision, guided by science
- Diverse partners & expertise
- Culture of trust
- Multiple tactics on the ground
- Working at site to regional scales
- Sharing best practices


Learn more and join us:
stayingconnectedinitiative.org
jlevine@natureunited.ca

The Vermont Experience

Building a Culture of Collaboration

John Austin, Director of Land Conservation
New England Governors and Eastern Canadian Premiers Working Group Co-Chair

Staying Connected Initiative

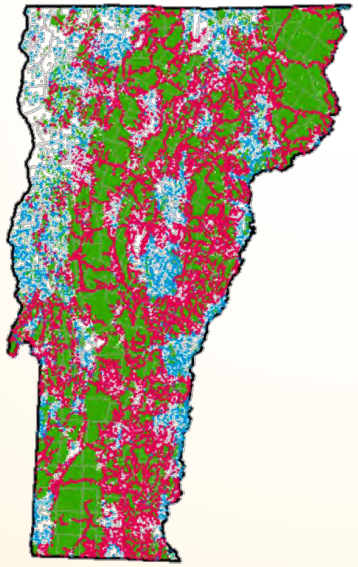
- Became an SCI partner in 2009
  - Vermont Fish & Wildlife Department
  - Vermont Agency of Transportation
  - The Nature Conservancy
  - Vermont Natural Resources Council
  - Vermont Land Trust
  - National Wildlife Federation
  - Trust for Public Land
  - Northeast Wilderness Trust
  - U.S. Forest Service
  - U.S. Natural Resources Conservation Service
  - The Conservation Fund
  - Vermont Department of Forests, Parks, & Recreation
  - Department of Environmental Conservation

January 2019, "Intro to Staying Connected Initiative Field Trip" - sub-zero wind chill!

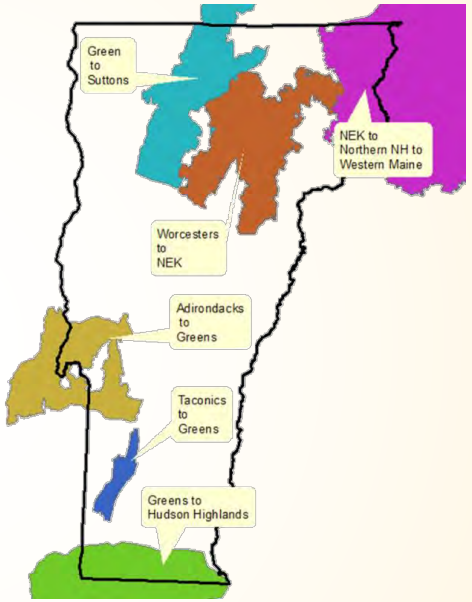
Road Ecology Trainings with Vermont Agency of Transportation

Collaborative Framework

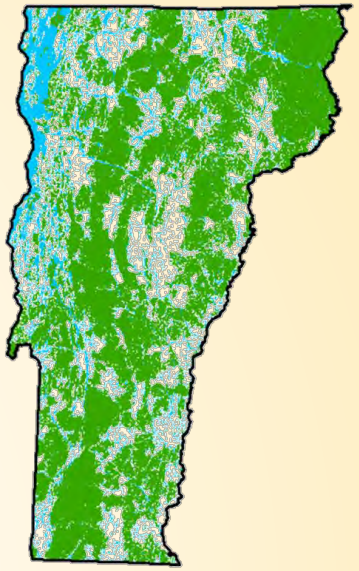
- Nested Scales of Priority
- Different mix of partners at each
  - Statewide
  - Linkages
  - Sites



SITES
Wildlife Road Crossings



LINKAGES
Staying Connected



STATEWIDE
VT Conservation Design

A Multi-Pronged Approach

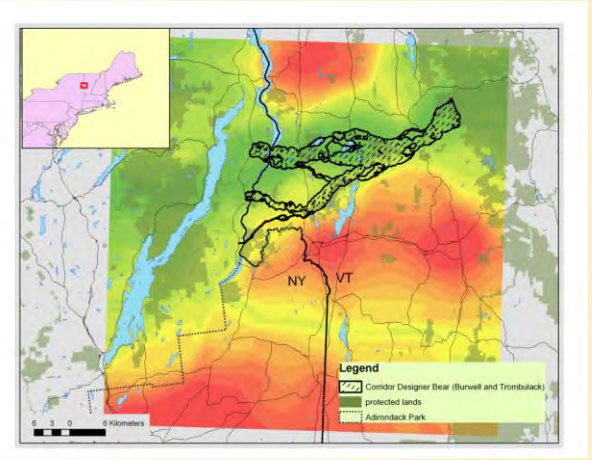
- Conservation science & planning
- Land protection
- Technical assistance for land use planning
- Making key roads more wildlife-friendly
- Local outreach & engagement

Mix of elements tailored to each linkage

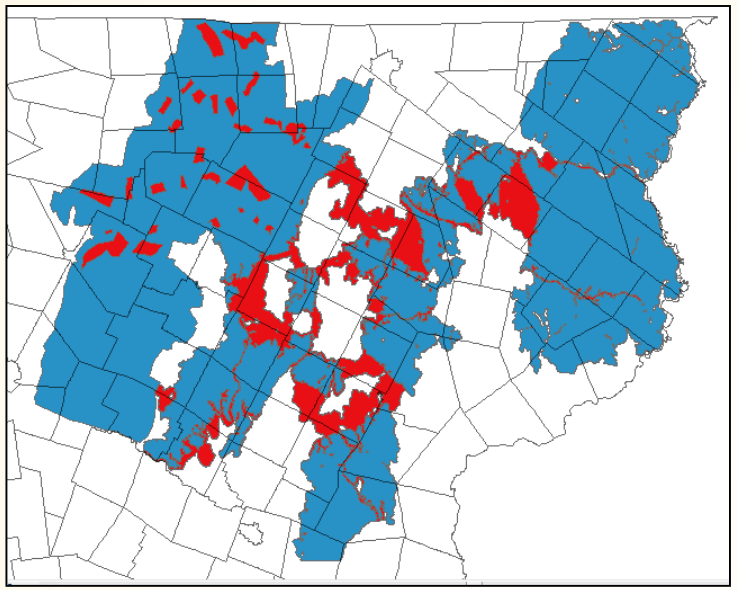
Different partners take lead for different parts

Conservation Science

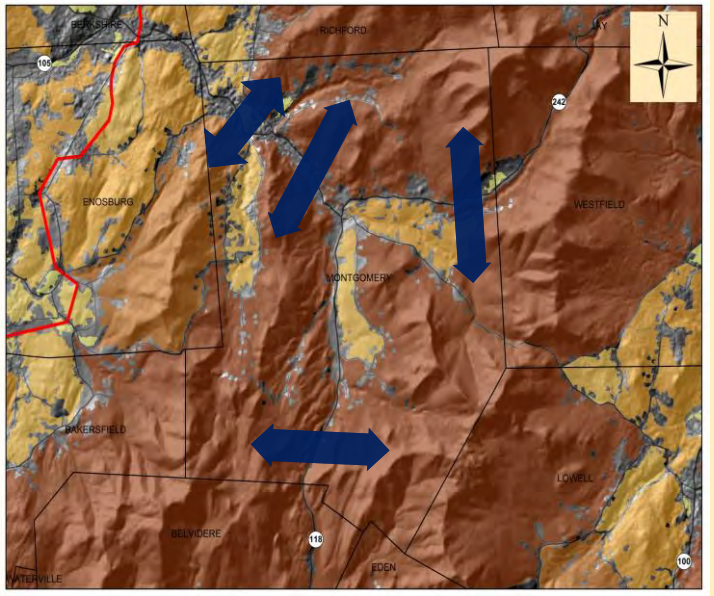
- Linkage-specific GIS modeling
- Wildlife tracking
- Game cameras
- Citizen science
- Sharing results
- Measures framework & baseline



Different Science at Different Scales



Worcesters to Kingdom Linkage – used Least Cost Path Analysis



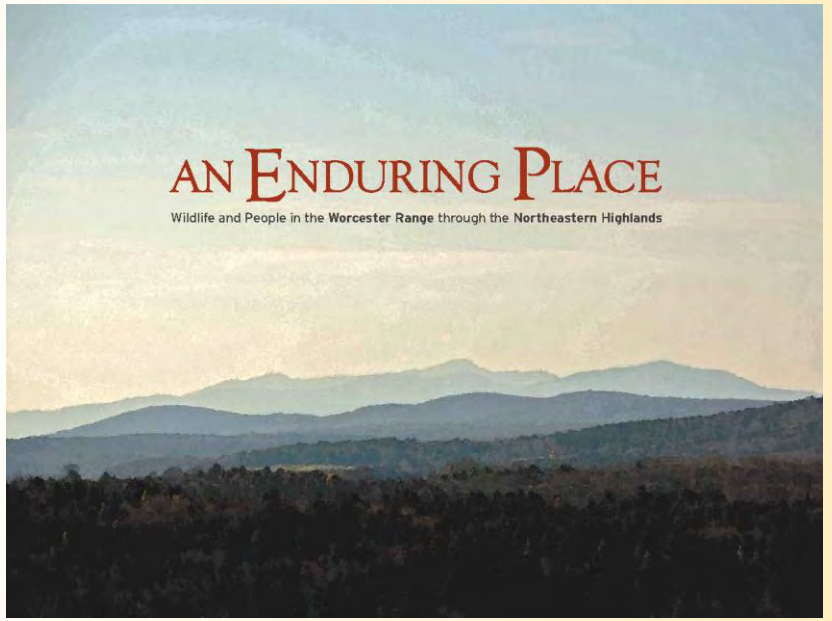
Scaled-down & refined output for local decision making

Regional Vision - Local Empowerment

YOU decide what connectivity looks like in your town

Celebrating PLACE

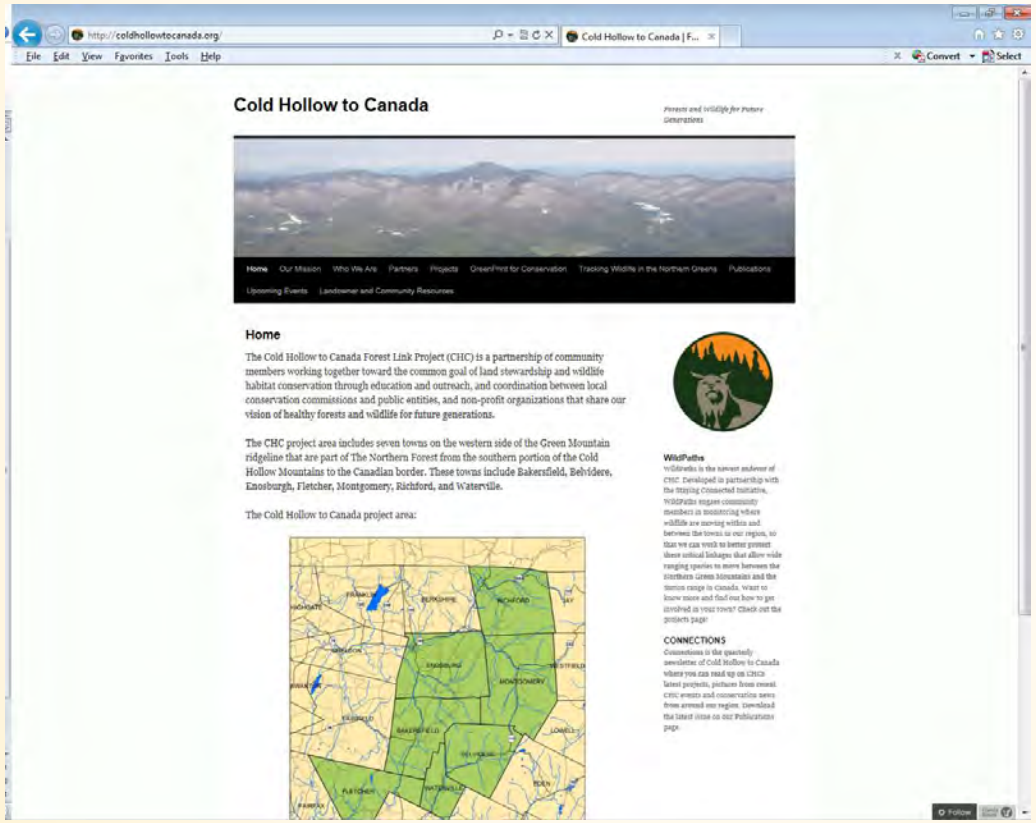
Local presentations, hikes, walks, paddling, wildlife tracking & more!

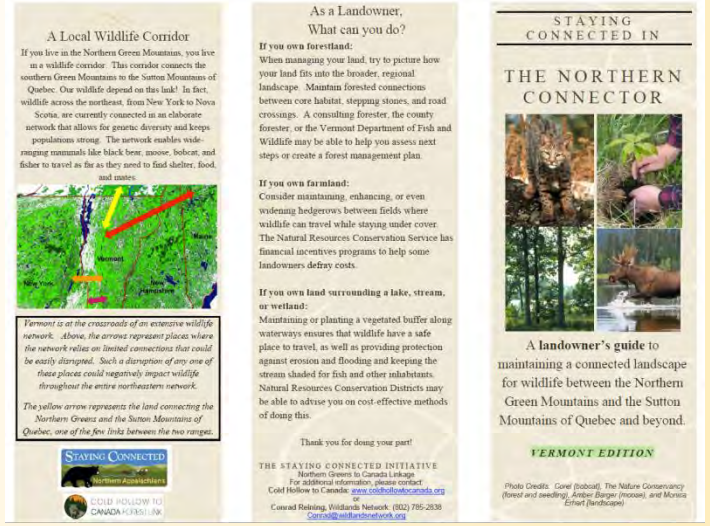


This publication makes connections between wildlife, ecology, economy and local culture

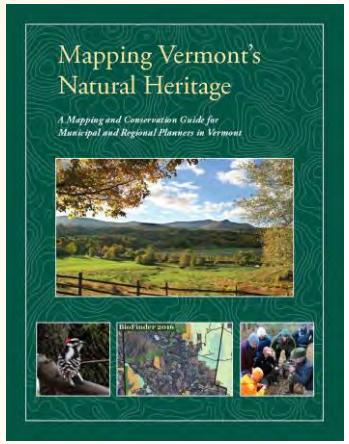
Local Engagement

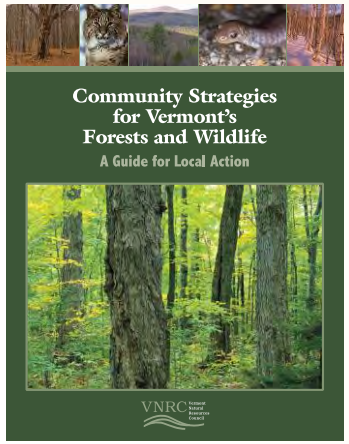
- Cold Hollow to Canada (CHC)





Land Use Planning





How-to Guides

BioFinder™

Online Mapping

Community Wildlife Program – Technical Assistance

Community Value Mapping

Land Protection

- 80+ permanent protection projects completed - > 300,000 acres
- Model easement provisions
- Connectivity in criteria for federal cost-share programs (VT)

Jackson Valley – 936 ac Trust for Public Land project in Jay, VT on the U.S. / Quebec border

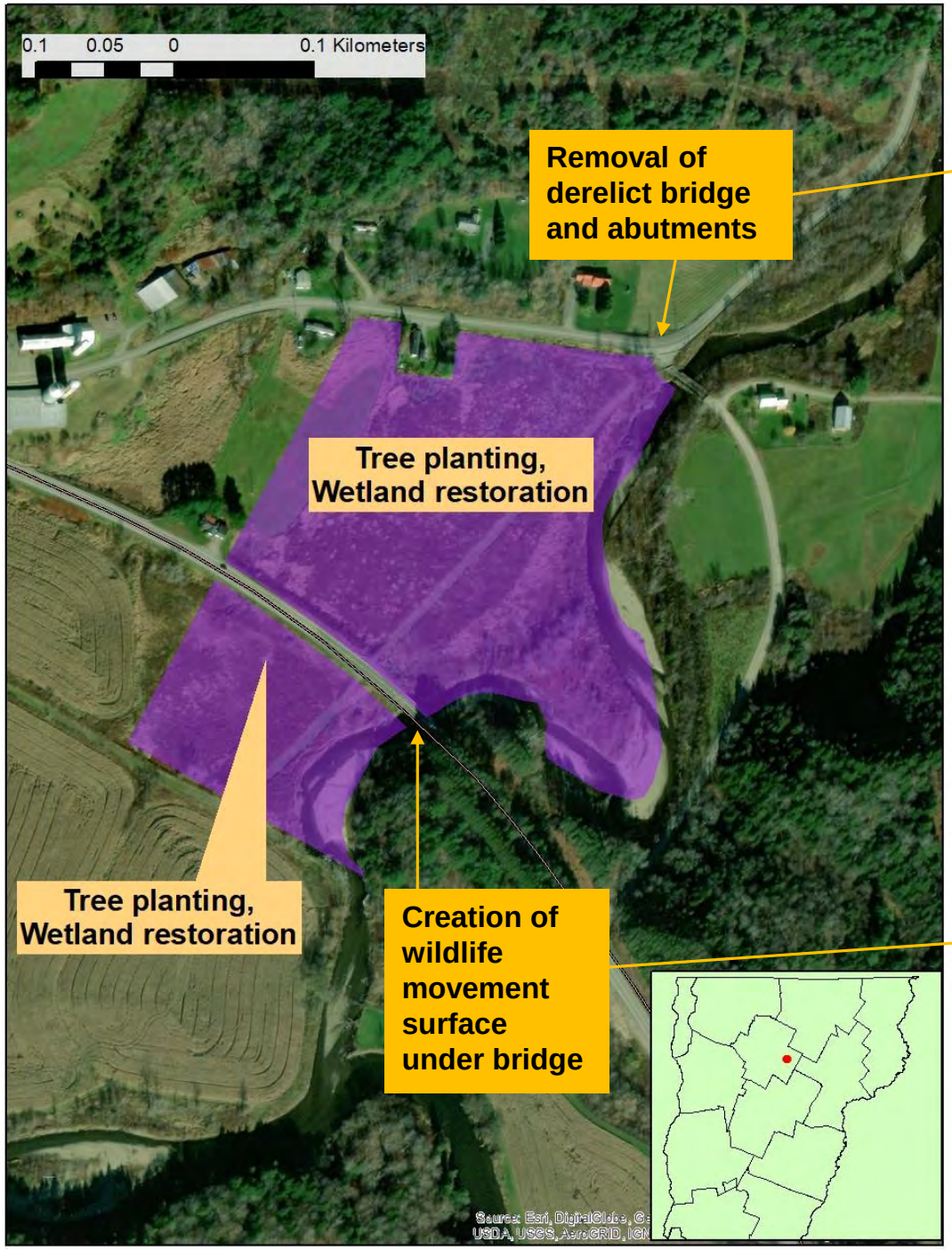
Making Roads More Wildlife-Friendly

- Identification of priority road segments
- Wildlife tracking & camera monitoring
- Data sharing
- VT Transportation and Connectivity Guidance Document
- Trainings for DOTs
- Northeast Transportation and Wildlife Conferences

Lynx using an Underpass in Searsburg 2018

Culvert Assessments

Implementation




Working in partnership
LCPC
Seth Jensen
The Nature
Conservancy
Phil Huffman
Fish & Wildlife Dept.
Pete Emerson
VTRANS
James Brady
VTRANS Secretary
Joe Flynn
ANR Secretary
Julie Moore
Governor
Phil Scott
Lamoille County
Planning Commission
Rob Moore
D.E.C.
Staci Pomeroy
Wolcott Wildlife Shelf Project
2018

A Public-Private Partnership

- Benefits to State Agencies
  - Expands capacity of technical assistance & land protection
  - Expands spectrum of activity (through multi-pronged approach)
  - Provides eco-regional context
  - Encourages local empowerment

Celebrating More Than a Decade of Success!

STAYING CONNECTED
Northern Appalachians

Thank You!

stayingconnectedinitiative.org