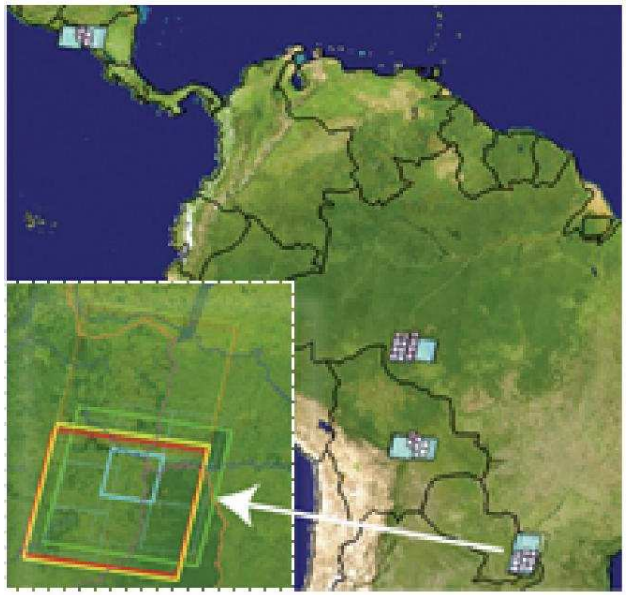
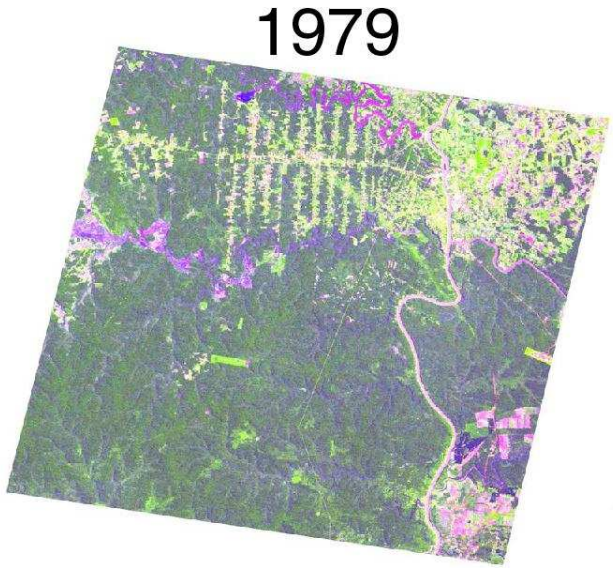
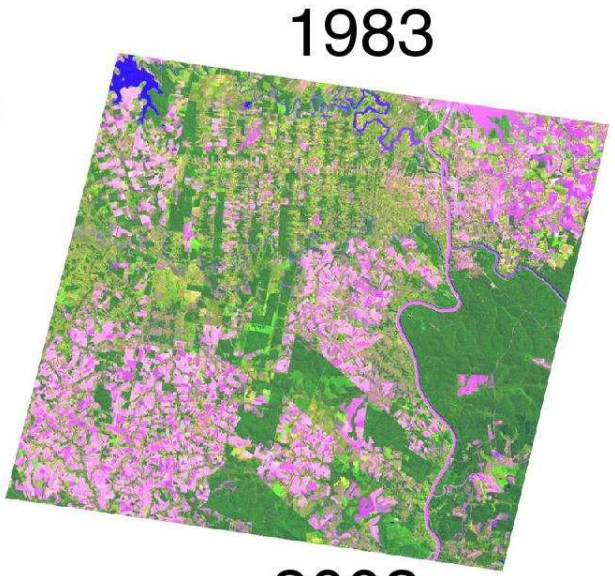
Protected areas and climate change:
Resilience through spatial and sectoral integration

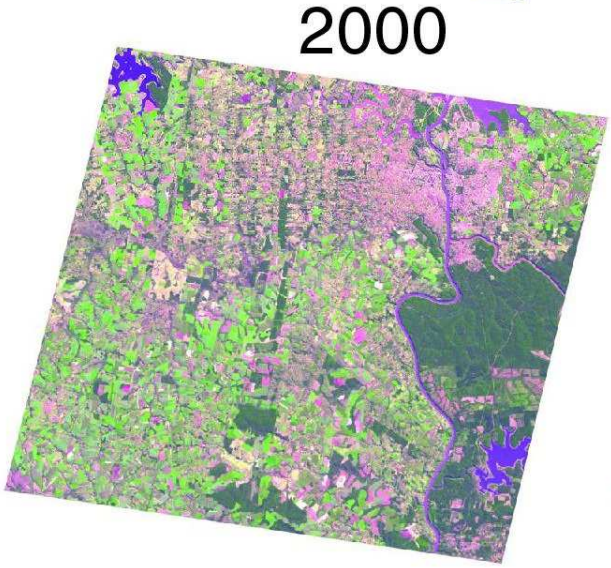
Jamison Ervin, UNDP Senior Advisor

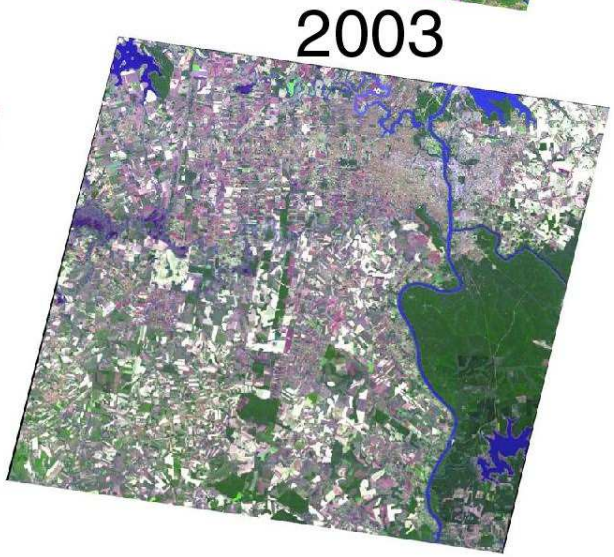
WHY INTEGRATE PROTECTED AREAS?











WHY INTEGRATE PROTECTED AREAS?

Protected areas alone will not be enough to conserve biodiversity into the future…

WHY INTEGRATE PROTECTED AREAS?

…especially under climate scenarios….

WHY INTEGRATE PROTECTED AREAS?

….we need to look at broader landscapes, seascapes and sectors to create climate-resilient landscapes

BUT WHAT DOES PROTECTED AREA INTEGRATION MEAN?

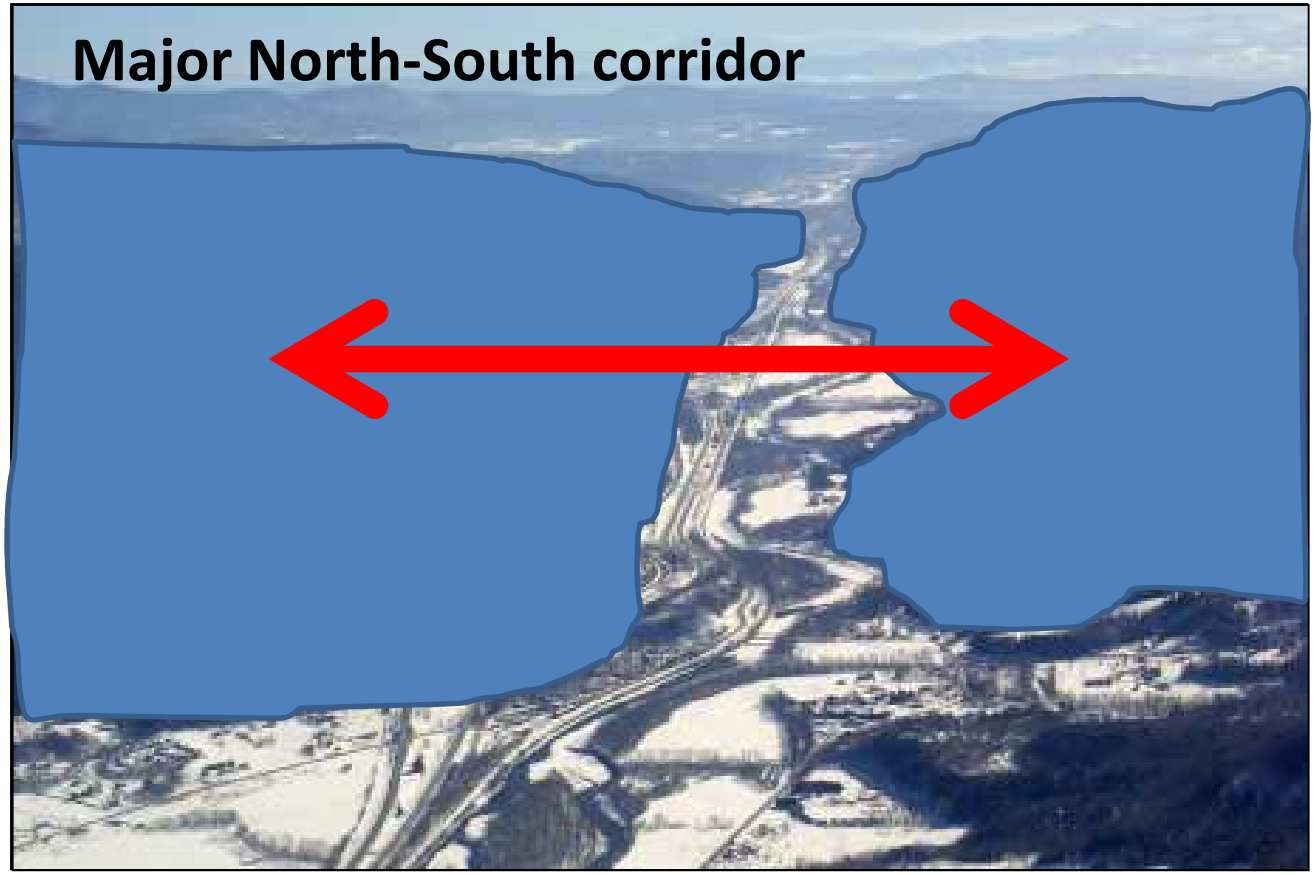
1. Spatial integration
2. Sectoral integration

WHAT DOES PROTECTED AREA INTEGRATION MEAN?

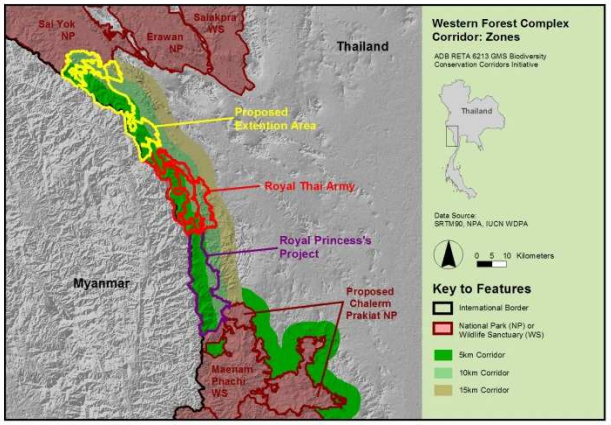
1. **Spatial integration**
2. Sectoral integration

SPATIAL INTEGRATION

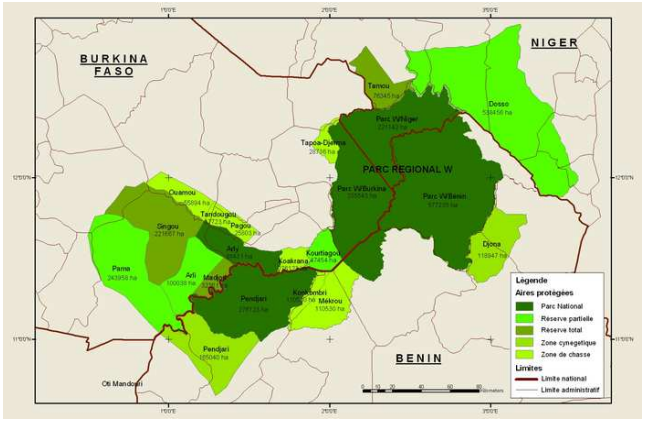
Ensuring that ecological processes, such as migration, can occur at landscape-level scales



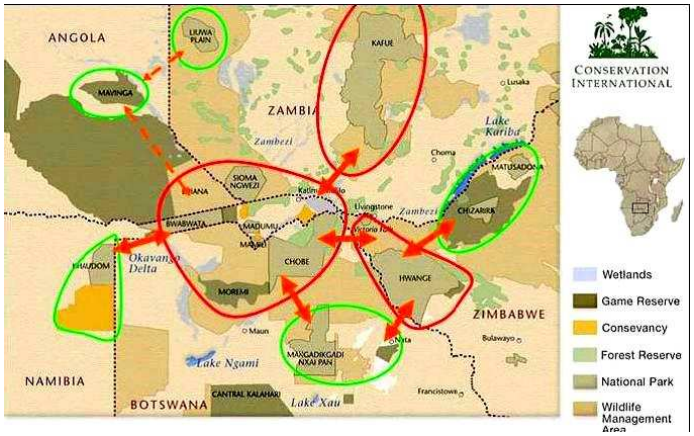
Protected area spatial integration



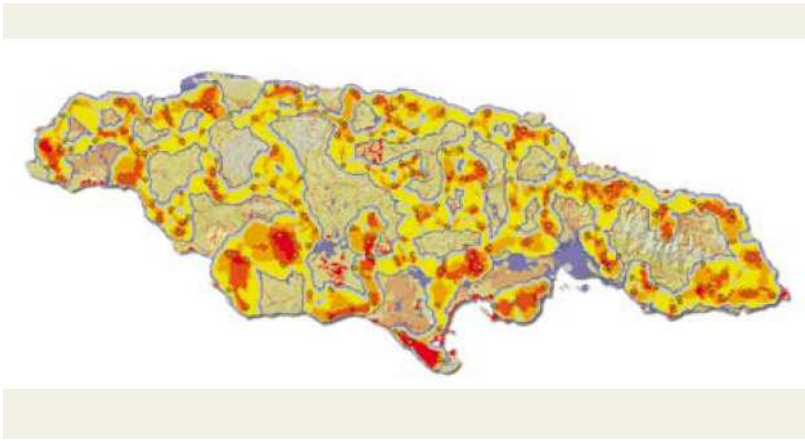
Connectivity corridors



Transboundary areas

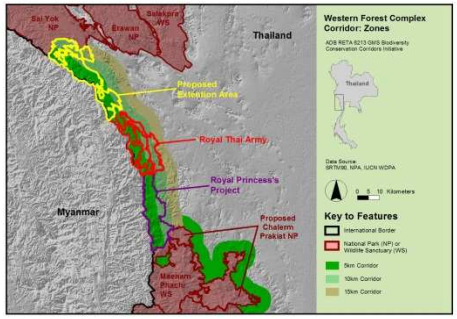


Regional networks



Improved gap assessments

Strengthening climate adaptation by incorporating resilience principles into:



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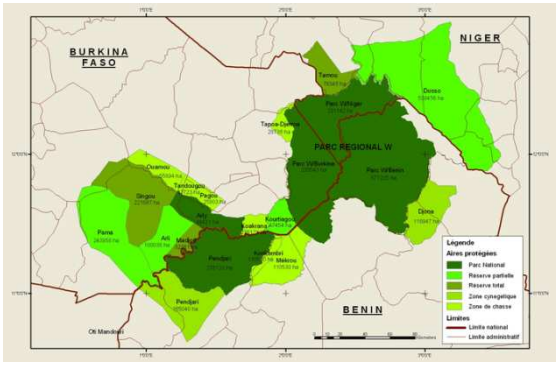

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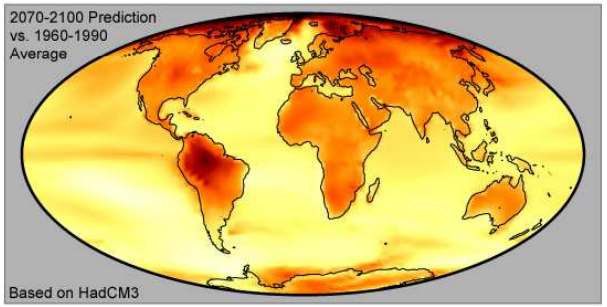

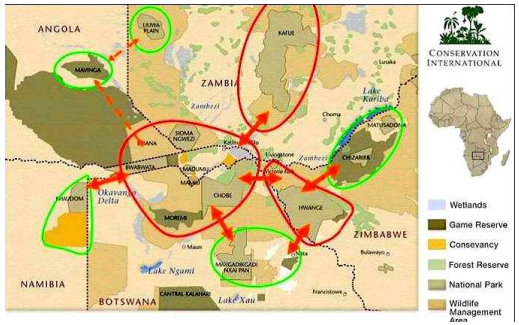

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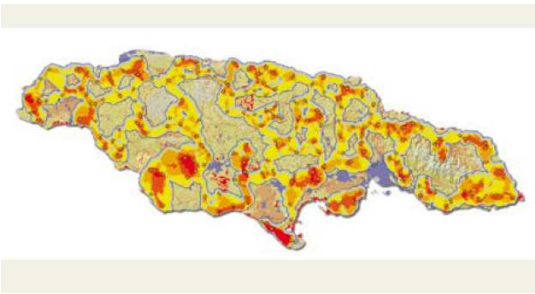
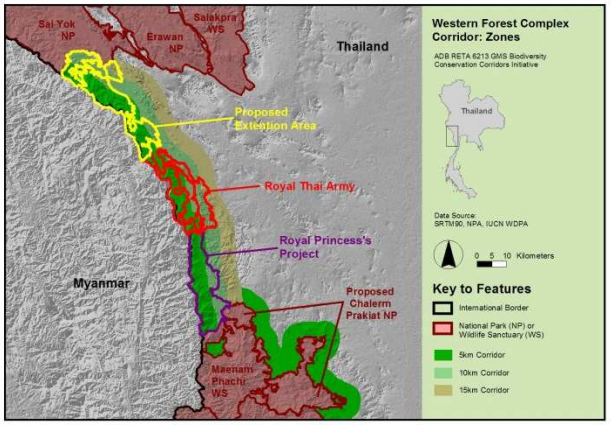


Improved gap assessments

Protected area spatial integration



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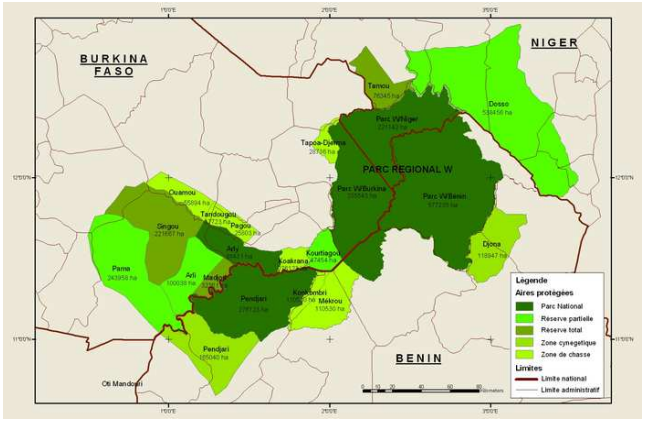

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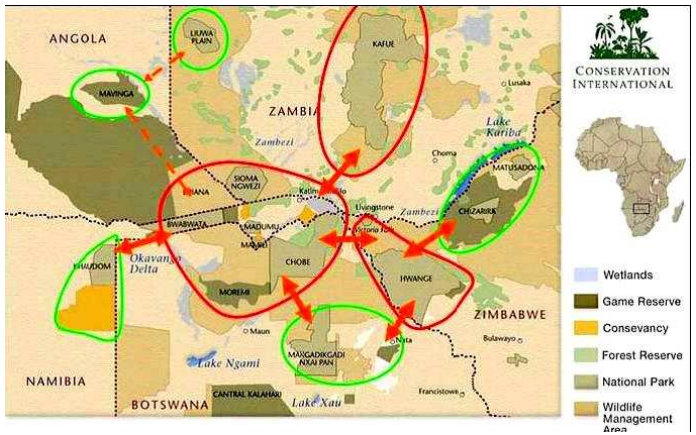

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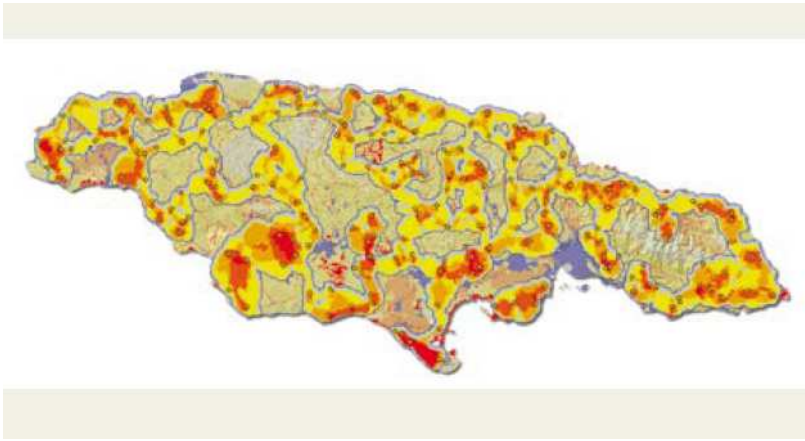
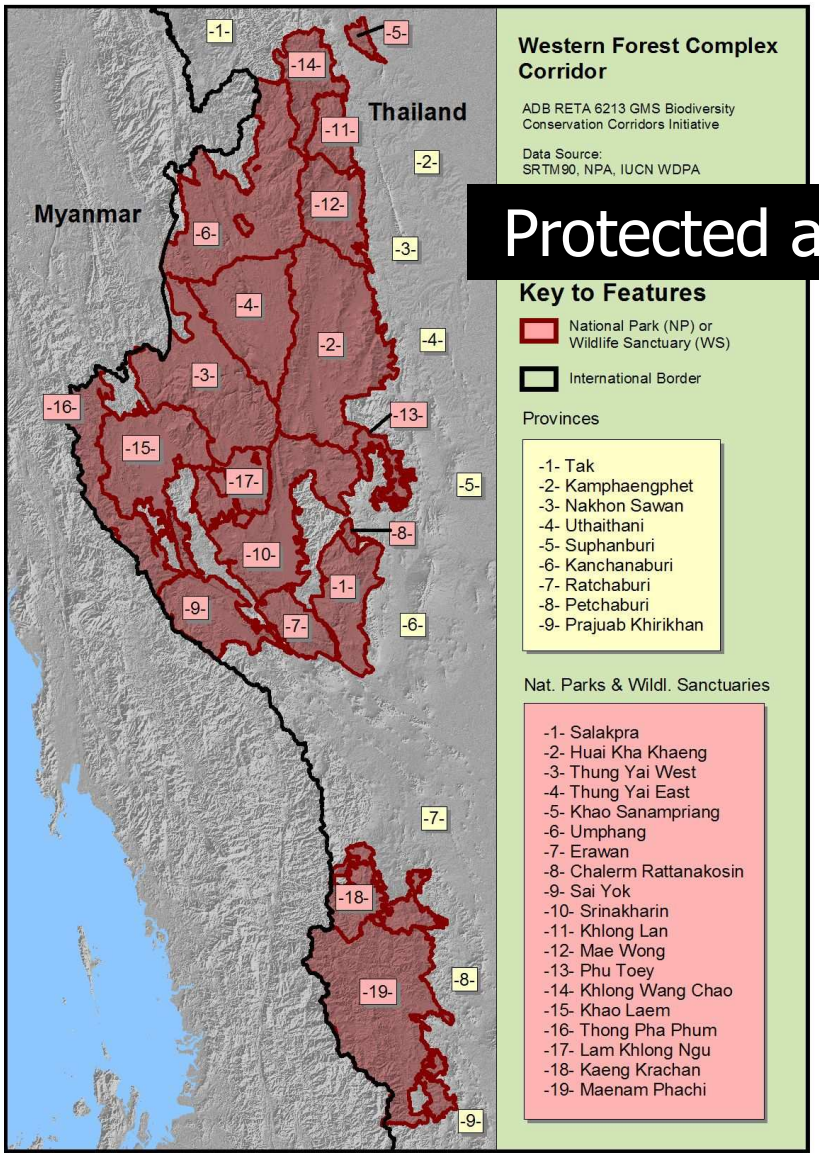


Improved gap assessments

Tenasserim – Western Forest Complex



Protected areas



Western Forest Complex Corridor

ADB RETA 6213 GMS Biodiversity Conservation Corridors Initiative

Data Source: SRTM90, NPA, IUCN WDPA

Key to Features

- National Park (NP) or Wildlife Sanctuary (WS)
- International Border

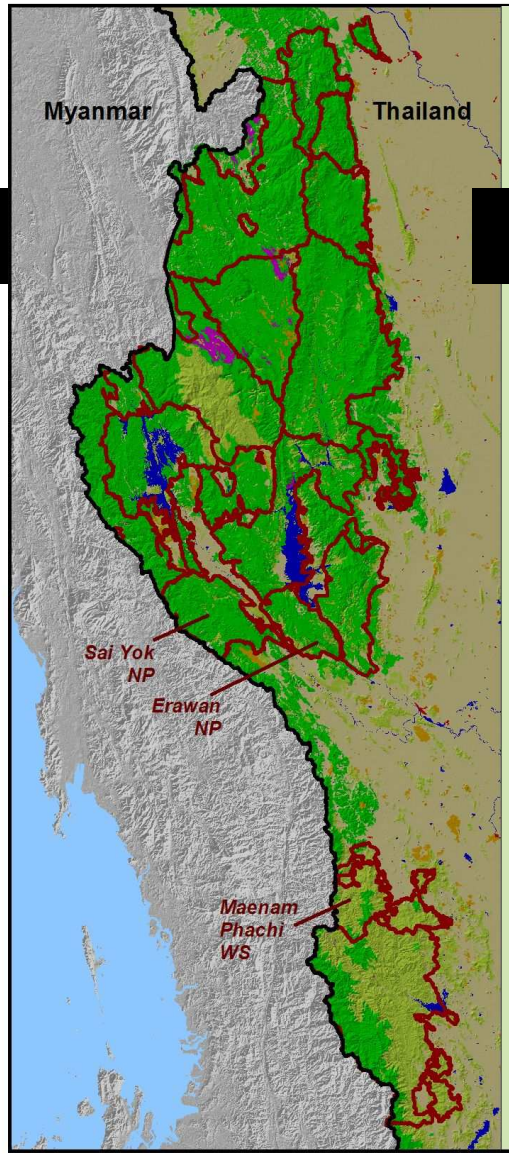
Provinces

-1- Tak
-2- Kamphaengphet
-3- Nakhon Sawan
-4- Uthaithani
-5- Suphanburi
-6- Kanchanaburi
-7- Ratchaburi
-8- Petchaburi
-9- Prajuab Khirikhan

Nat. Parks & Wildl. Sanctuaries

-1- Salakpra
-2- Huai Kha Khaeng
-3- Thung Yai West
-4- Thung Yai East
-5- Khao Sanampriang
-6- Umphang
-7- Erawan
-8- Chalerm Rattanakosin
-9- Sai Yok
-10- Srinakharin
-11- Khlong Lan
-12- Mae Wong
-13- Phu Toey
-14- Khlong Wang Chao
-15- Khao Laem
-16- Thong Pha Phum
-17- Lam Khlong Ngu
-18- Kaeng Krachan
-19- Maenam Phachi

Land Cover



Western Forest Complex Corridor: Land Cover

ADB RETA 6213 GMS Biodiversity Conservation Corridors Initiative

Data Source: SRTM90, NPA, IUCN WDPA

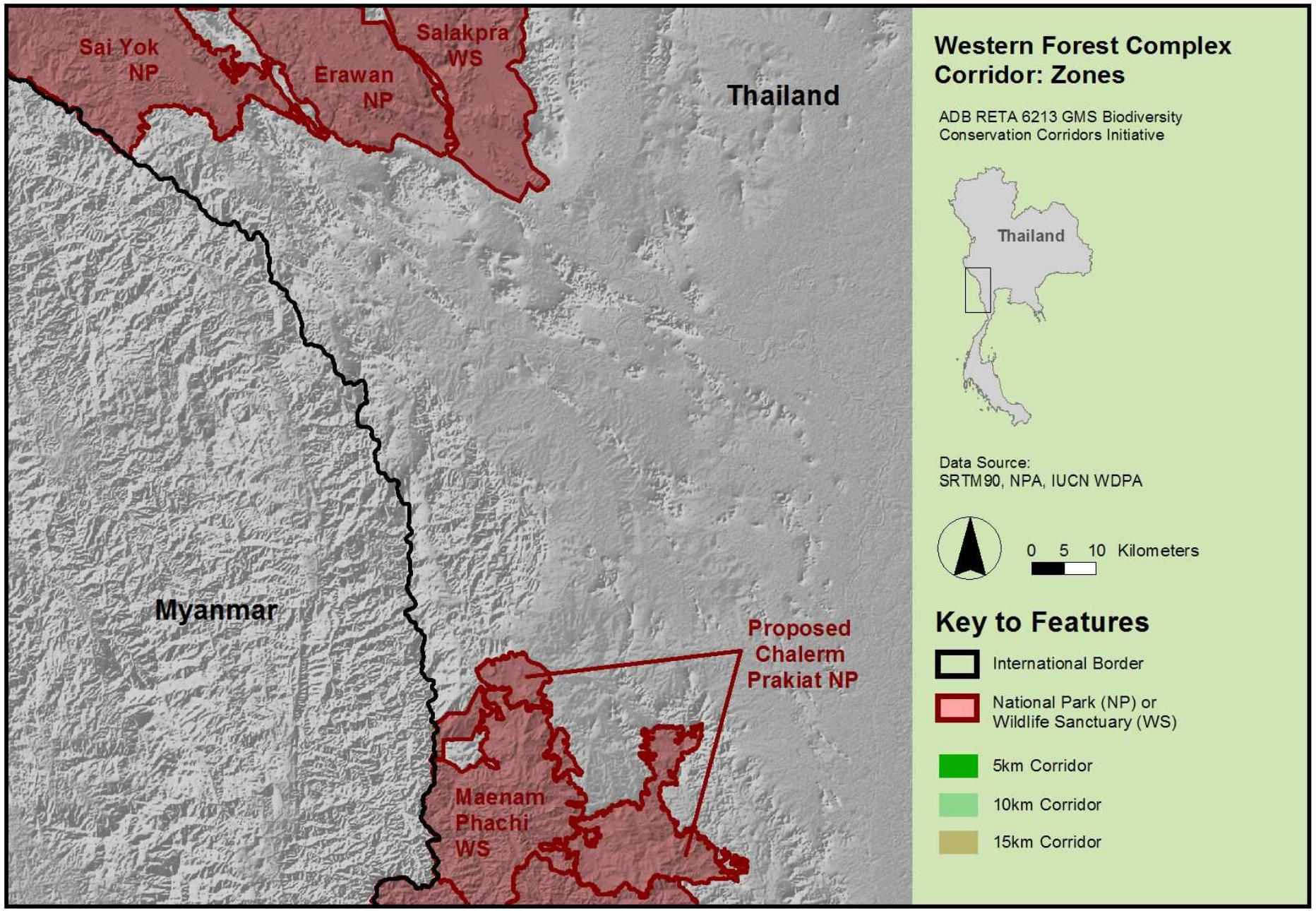
0 15 30 Kilometers

Key to Features

- National Park (NP), Wildlife Sanctuary (WS),
- International Border

Land Cover

- Evergreen Forest
- Drought-Deciduous Forest
- Plantation/Regrowth
- Agriculture
- Urban
- Waterbody


Sai Yok NP
Erawan NP
Salakpra WS
Thailand
Myanmar
Proposed Chalerm Prakiat NP
Maenam Phachi WS
Western Forest Complex Corridor: Zones
ADB RETA 6213 GMS Biodiversity Conservation Corridors Initiative
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SRTM90, NPA, IUCN WDPA
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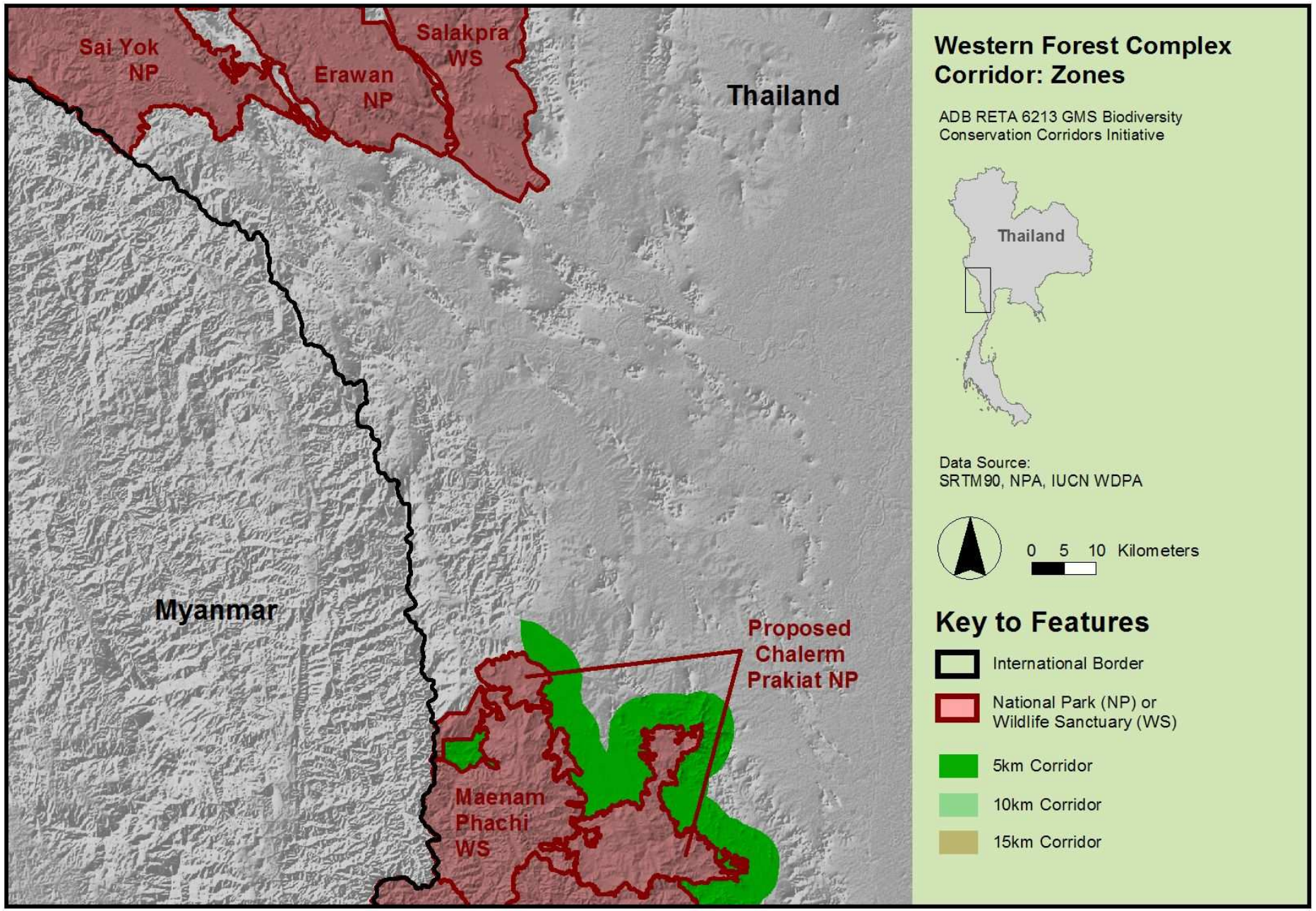
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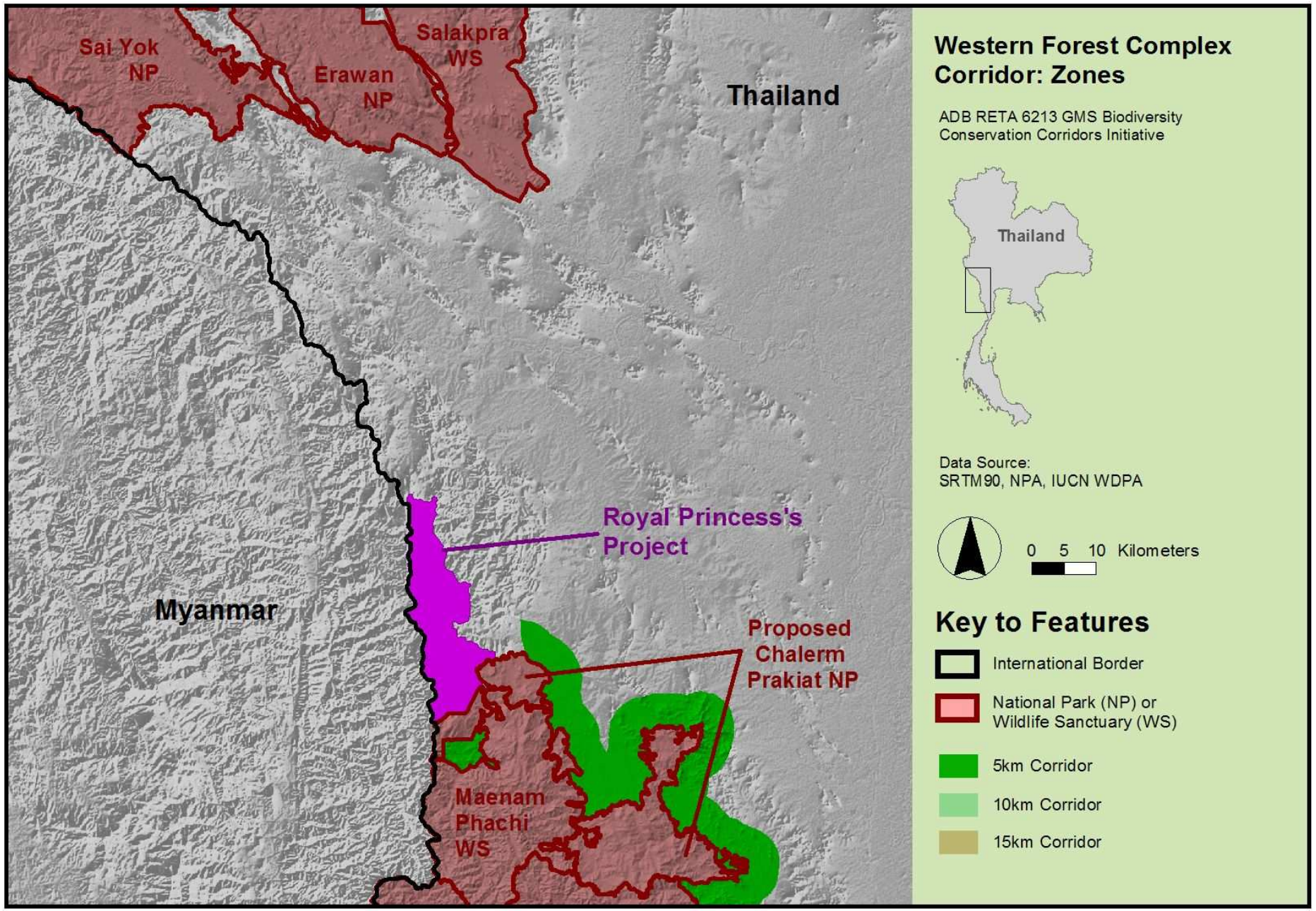
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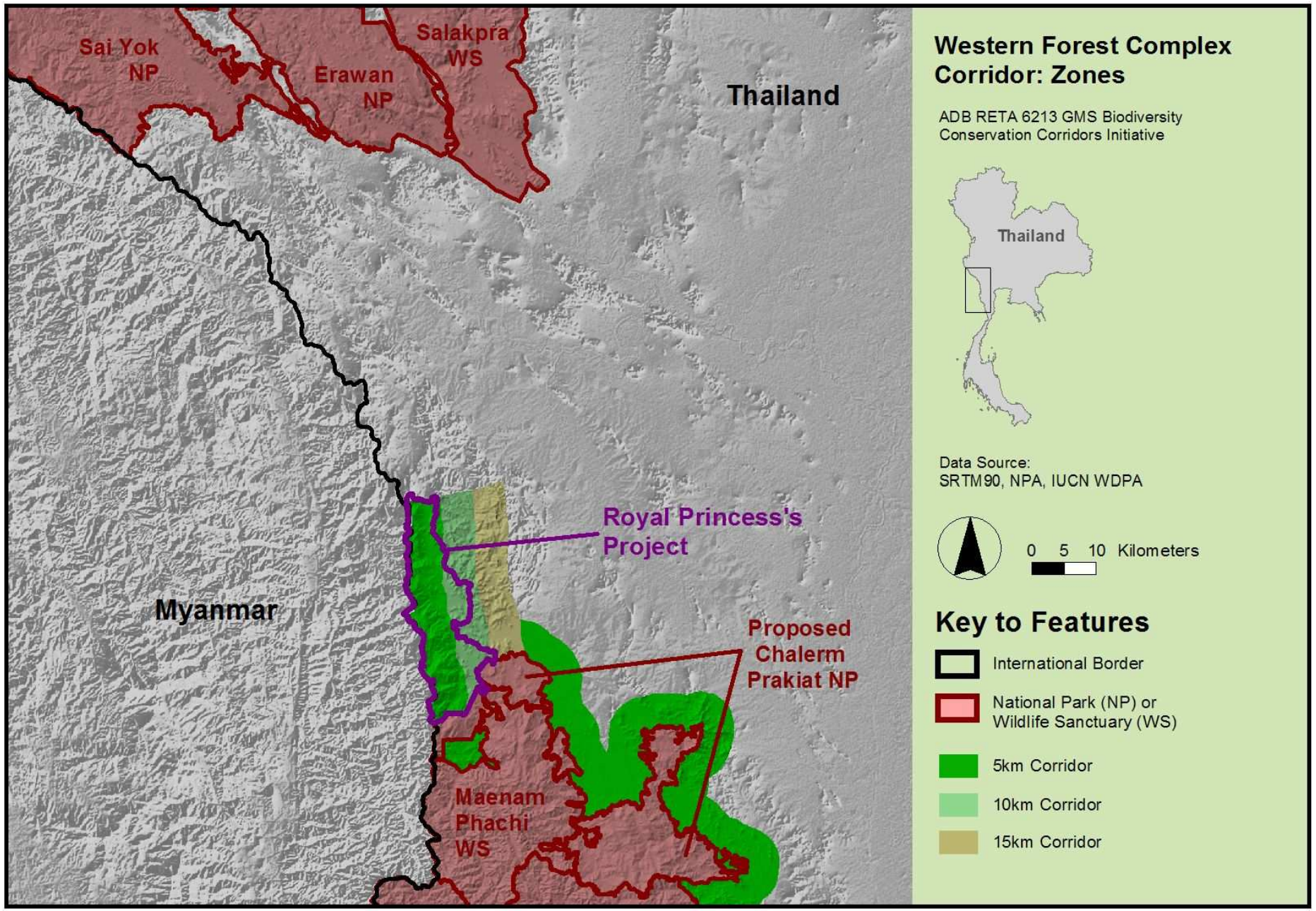
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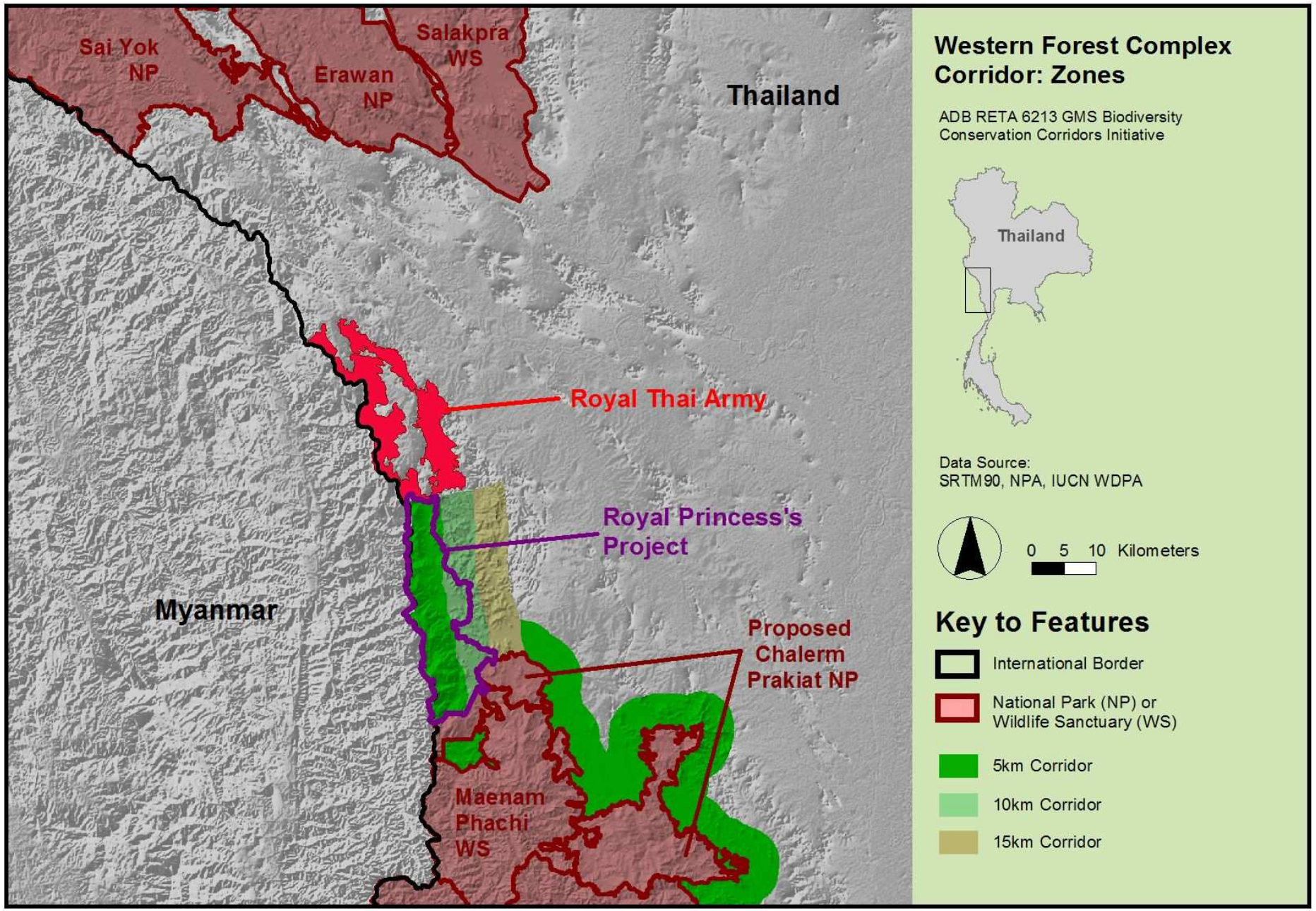
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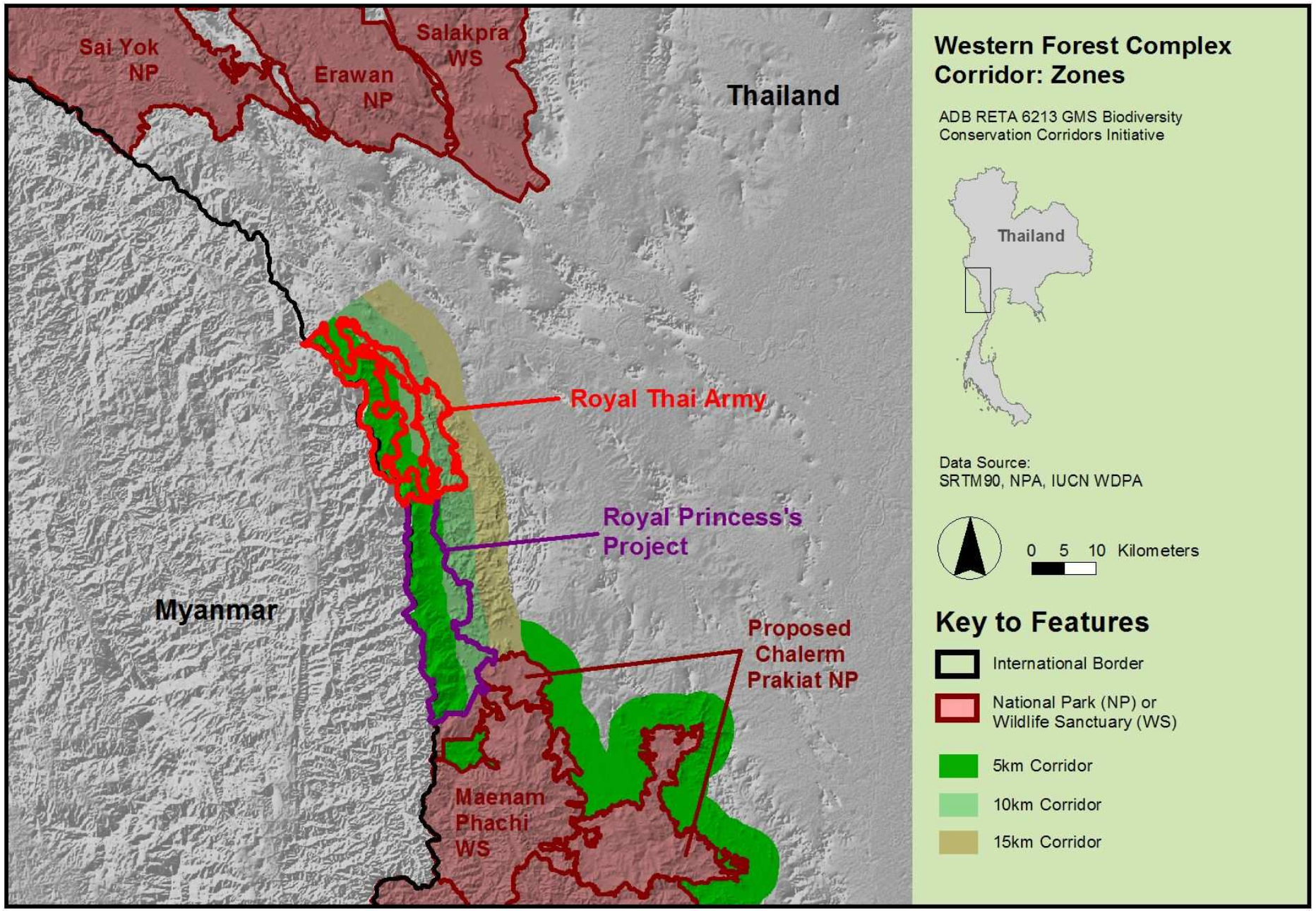
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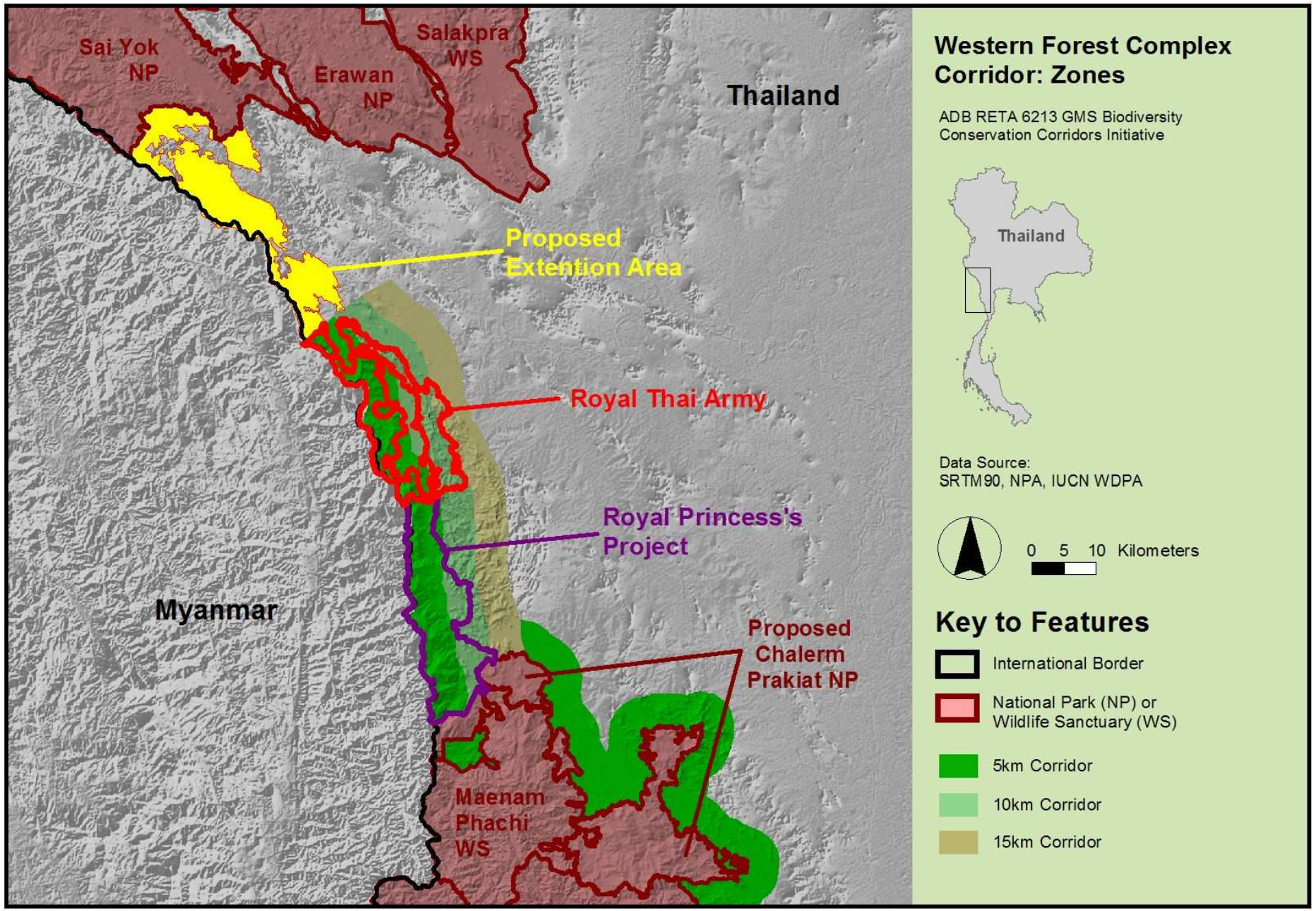
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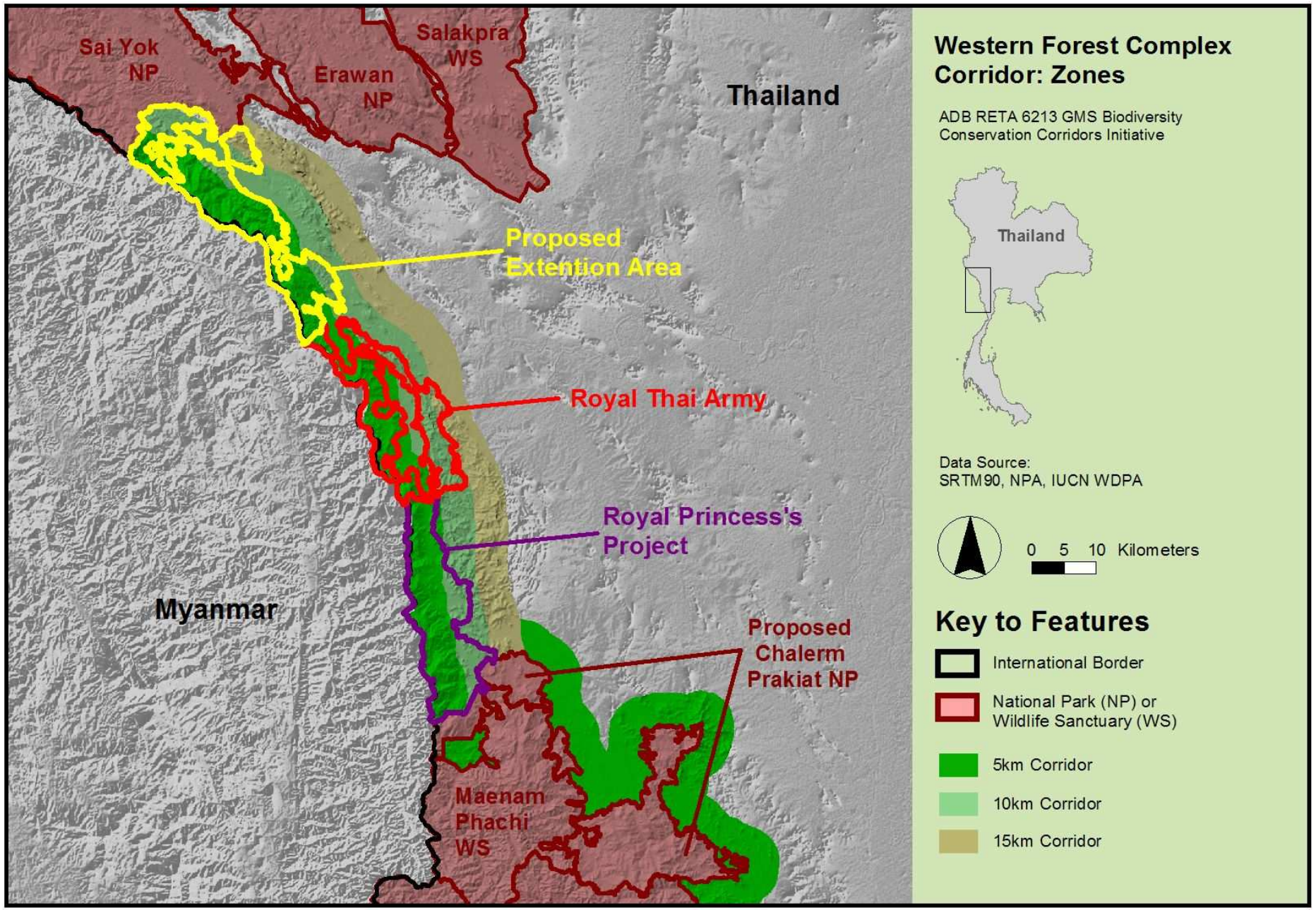
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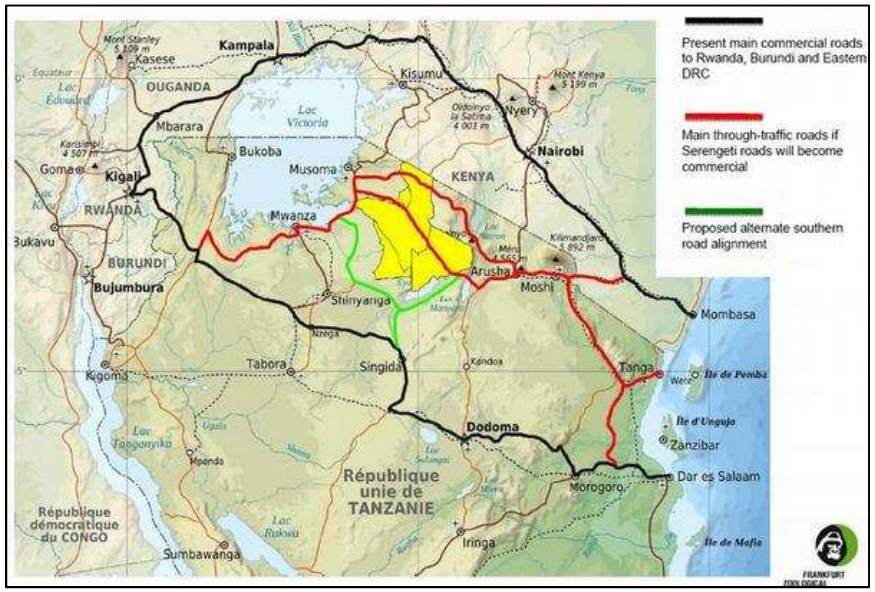
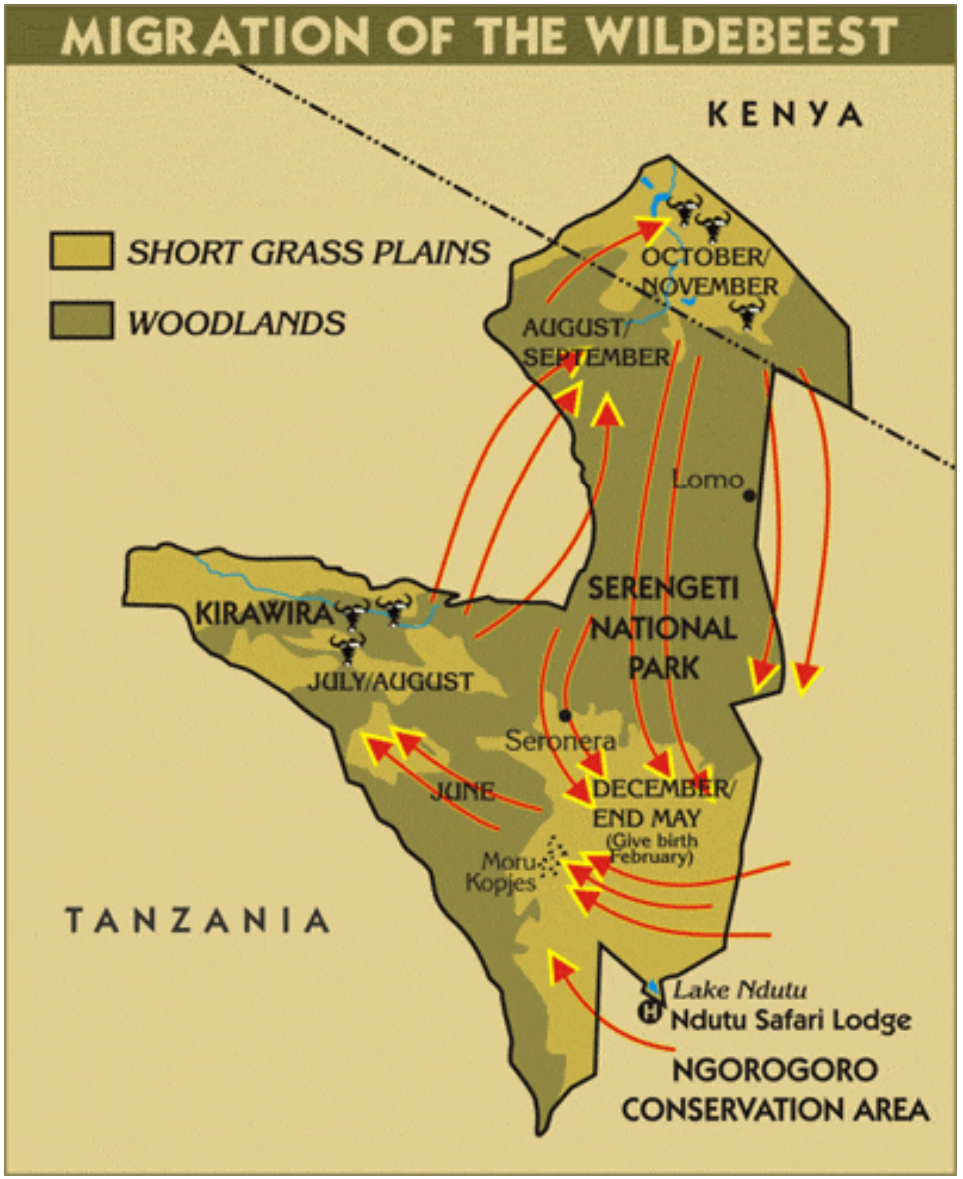
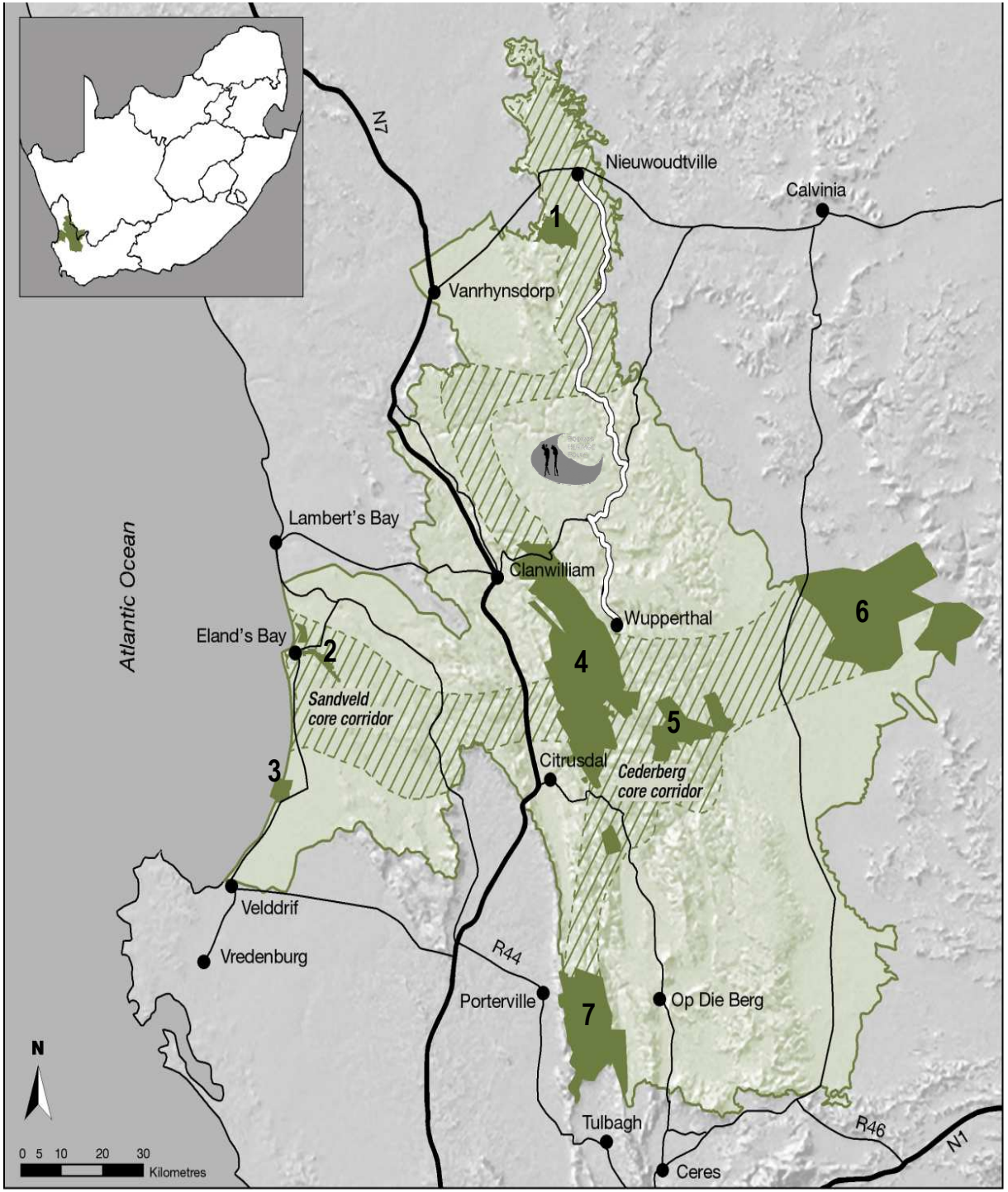
Migratory paths: from Khram Island
Thailand
Cambodia
Vietnam
Malaysia
Indonesia

Migratory paths: from Huyong Island

EXAMPLE OF MIGRATORY ROUTE

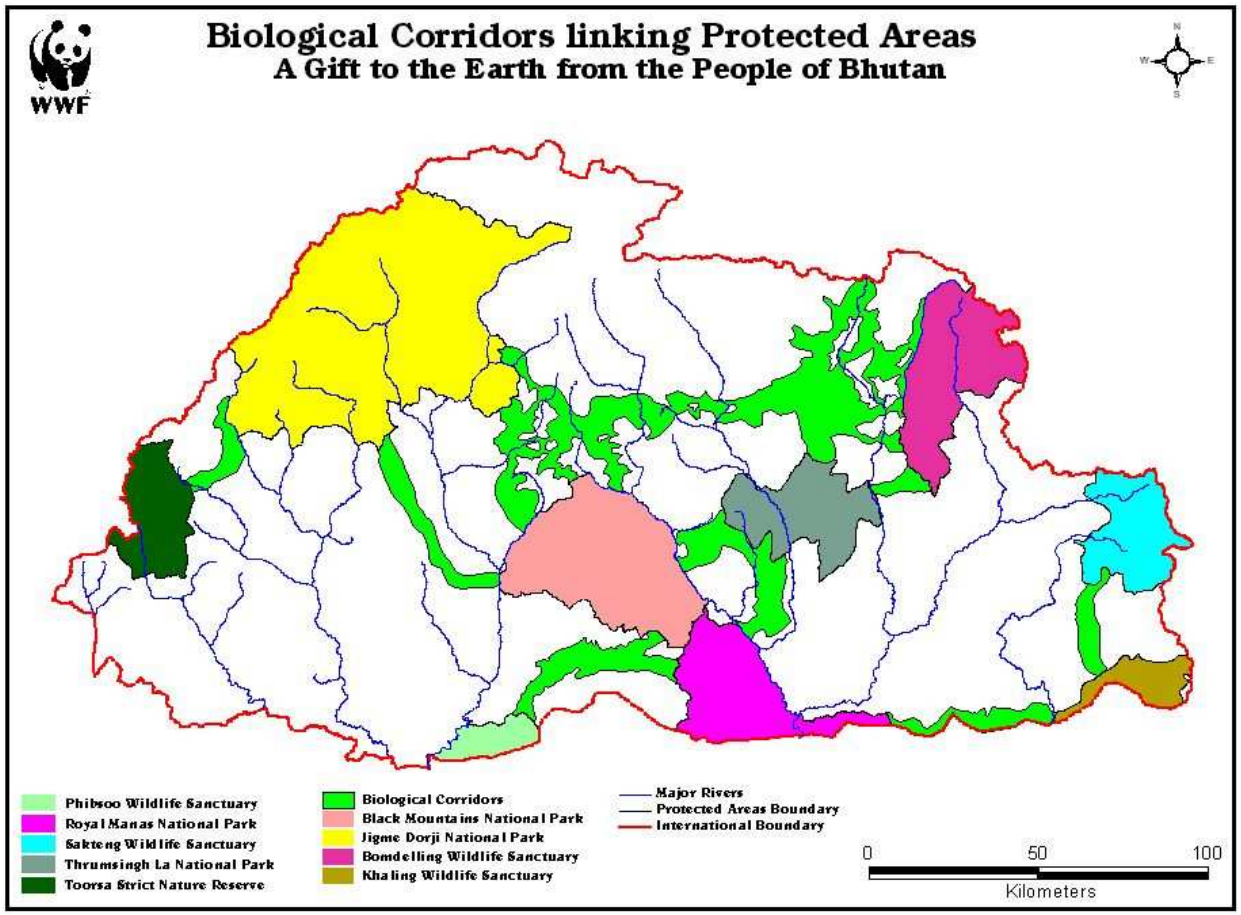




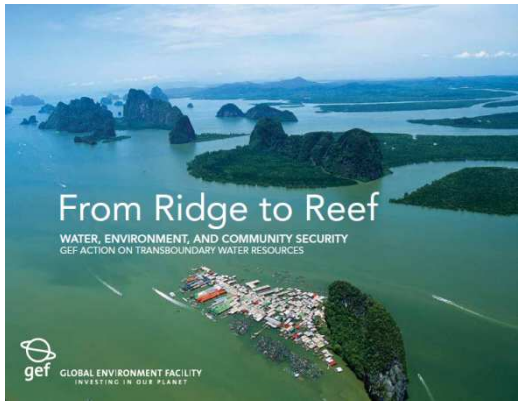


Example of climate adaptation corridors in South Africa

Corridors can be at landscape, national and regional levels



Strengthening climate adaptation by taking a “Ridge to Reef” approach:



Ridge to Reef

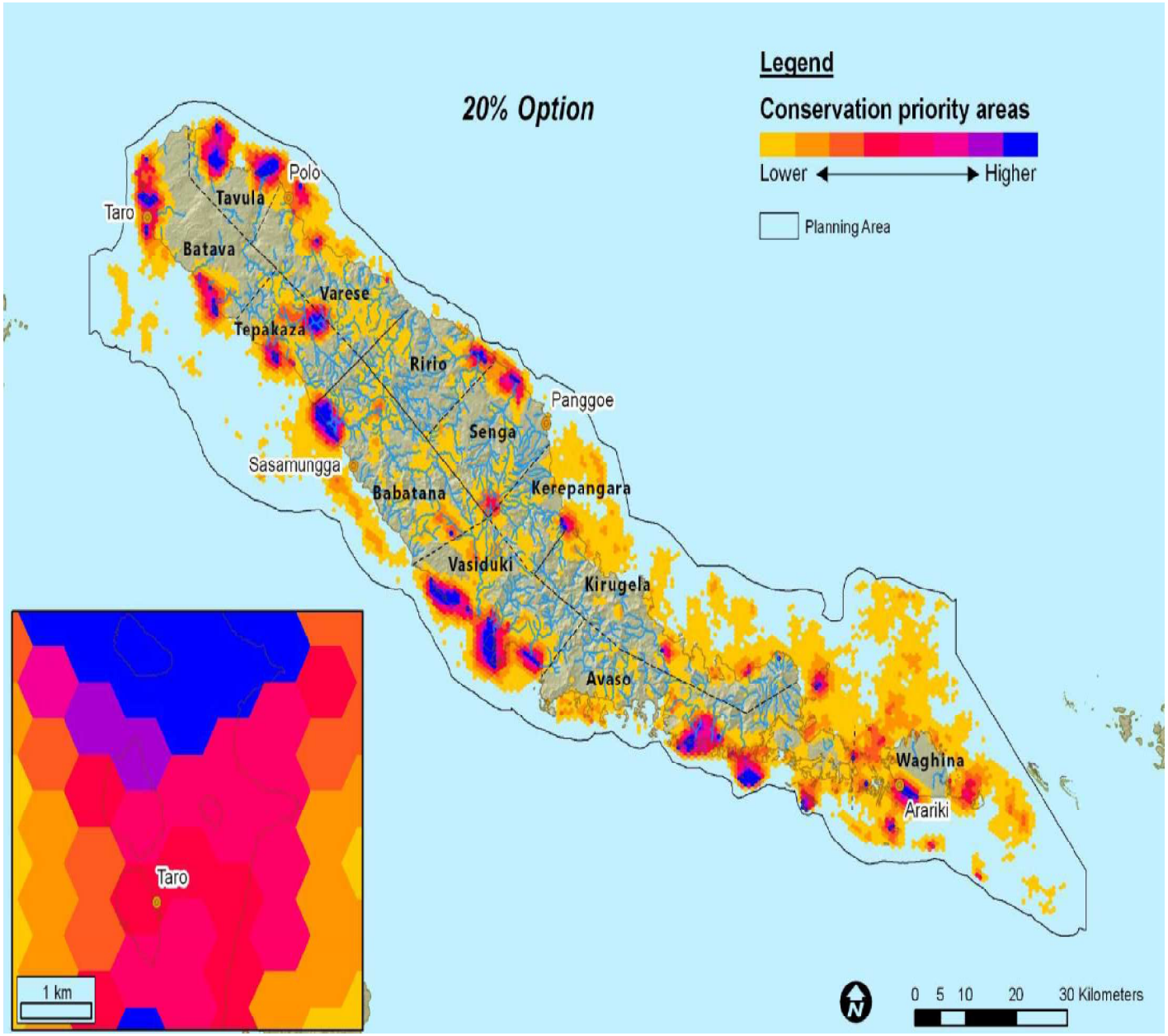
Example of a Ridge to Reef Approach

Elements of a Ridge to Reef Approach

- Considers the entire island, coast, near shore and ocean as one entity
- Focuses on the overall resilience of the entire set of ecosystems
- Examines upstream impacts on downstream and coastal processes

Ridge to Reef Approach in Japan

Ridge to Reef Approach in Pacific Islands



Ridge to Reef Approach in Madagascar

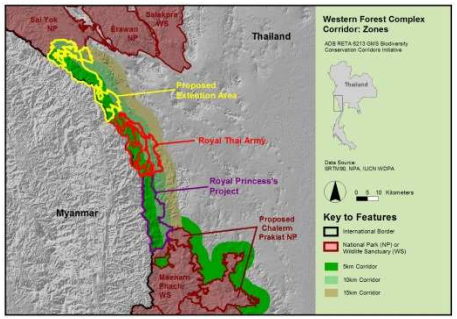
Antongil Bay:

- Conflicts occur between poor artisanal fishers and industrial fleets

- Fish populations and their habitats have been damaged by destructive fishing, loss of habitat

- A ridge-to-reef approach creates a platform for dialogue and creates an environment that encourages stakeholders to work together

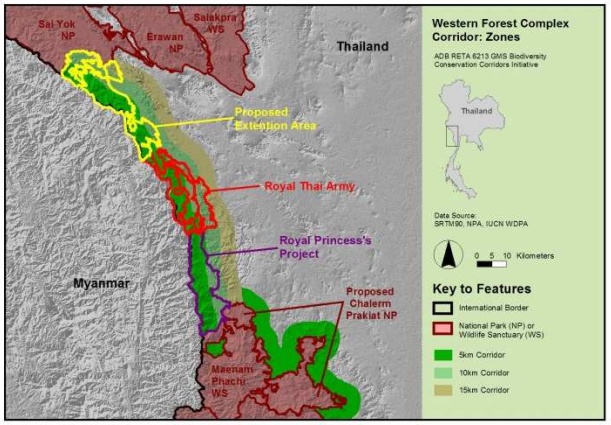
Strengthening climate adaptation by incorporating resilience principles into:



Connectivity corridors

- Identify climate-related bottlenecks
- Orient corridors to facilitate climate connectivity
- Locate corridors in ecotones (areas of transition)
- Include climate-resilient patches within corridors
- Link national corridors with regional corridors
- Take a ‘ridge to reef’ approach

Protected area spatial integration



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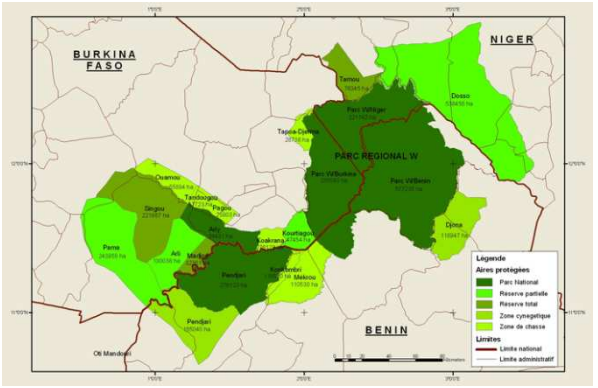
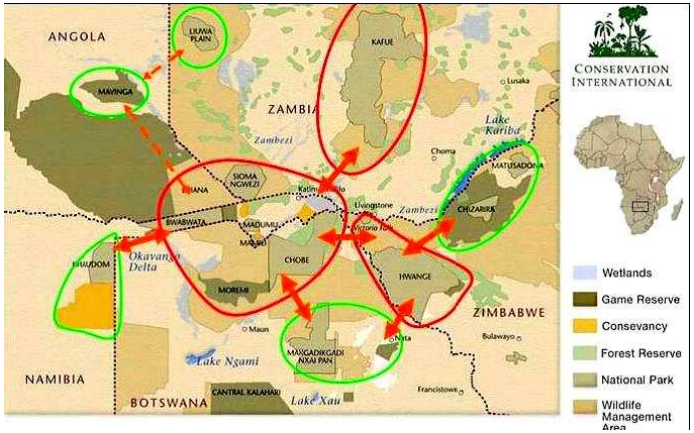
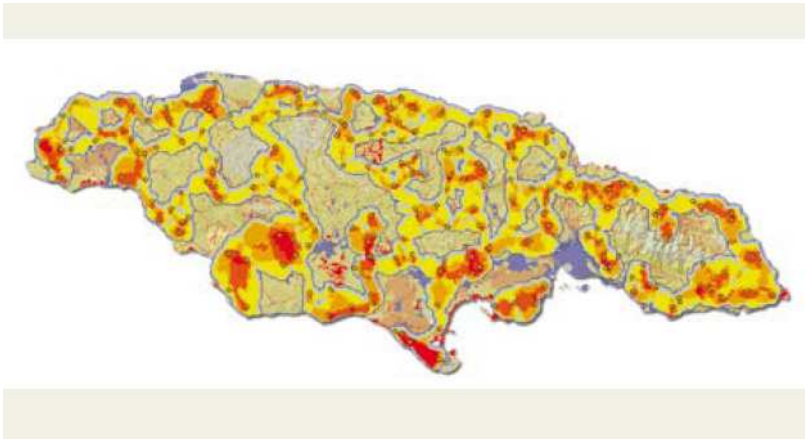


Transboundary areas

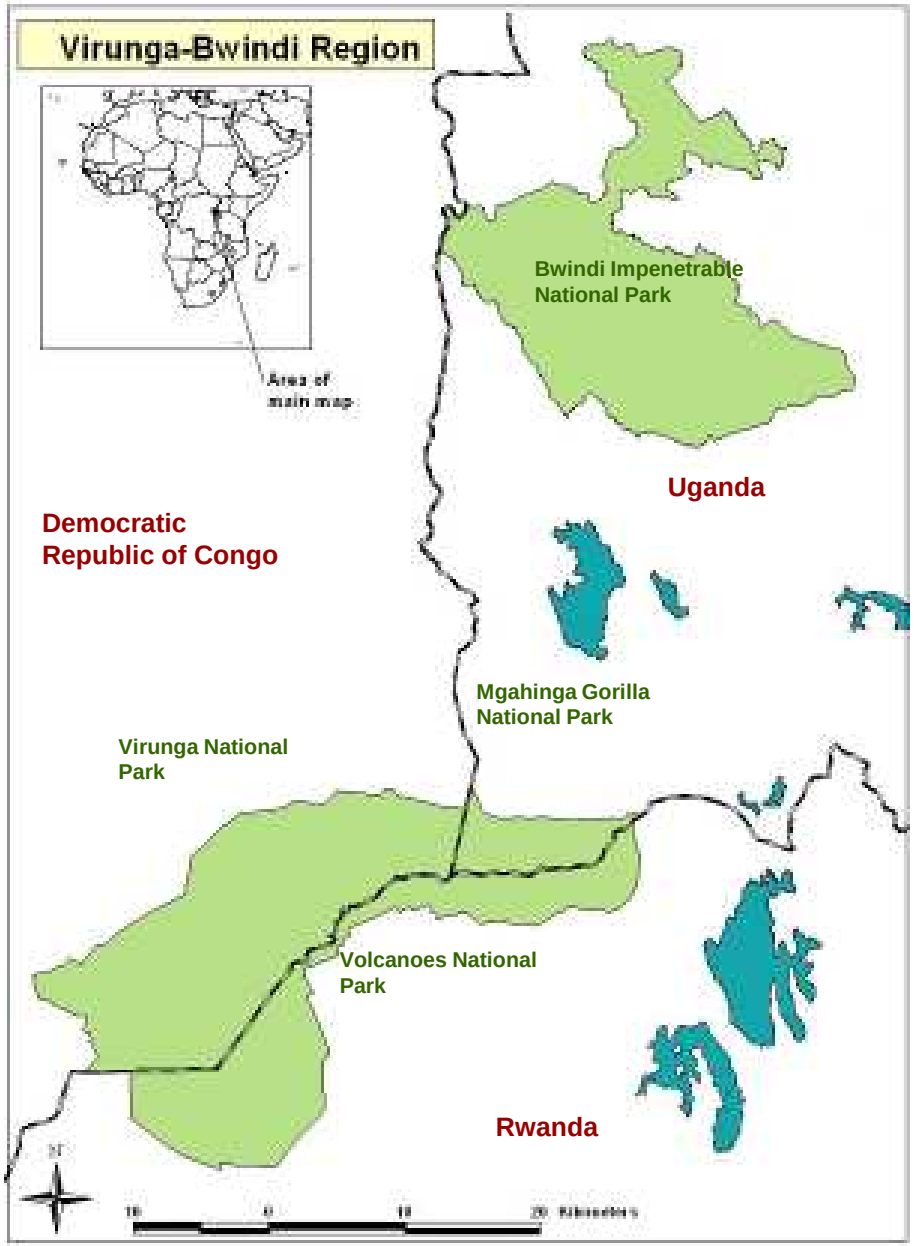


Regional networks



Improved gap assessments

Transboundary protected areas in Africa



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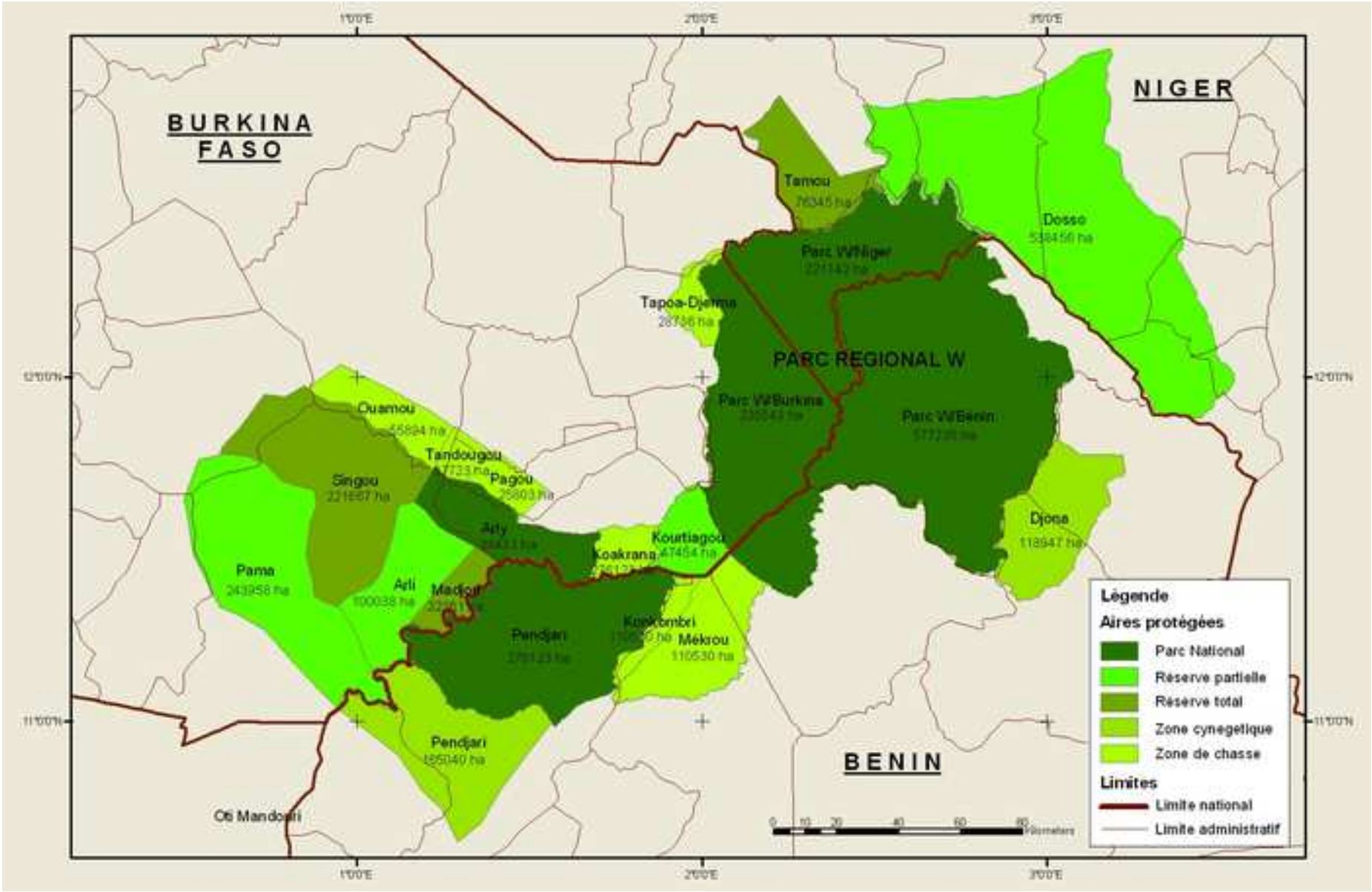

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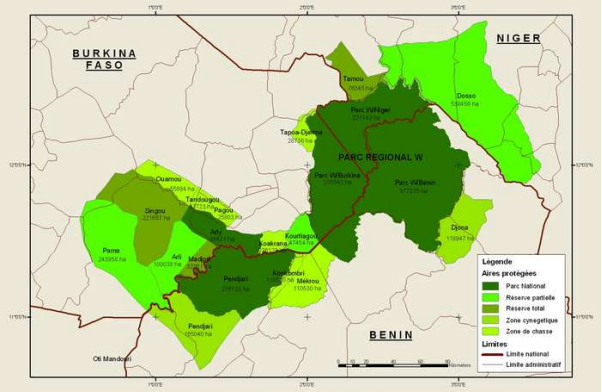
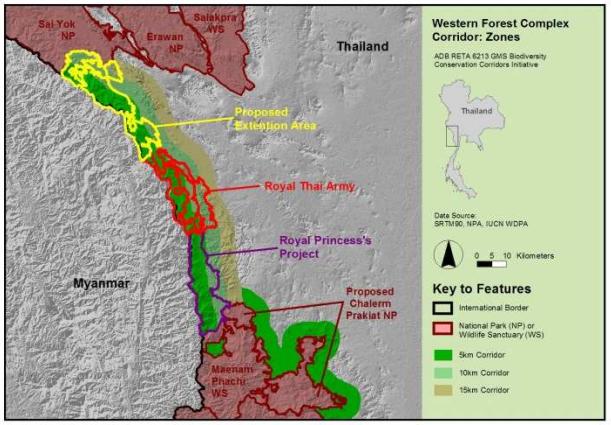


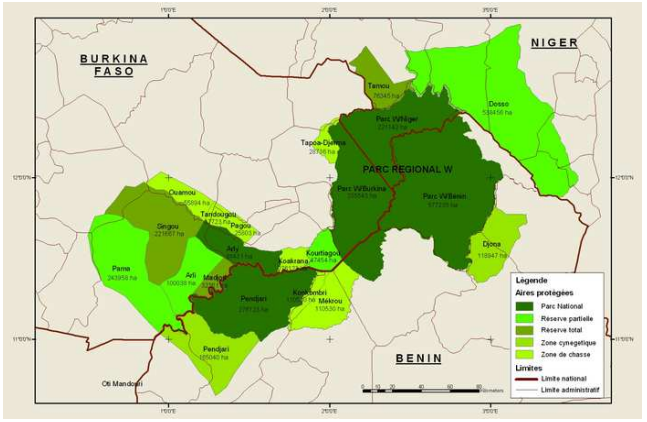
Transboundary areas

- Share national climate adaptation plans across boundaries, and incorporate into transboundary management
- Collaborate on translocation of species across boundaries
- Manage transboundary areas for the maintenance of vulnerable ecosystem services
- Collaborate in transboundary restoration in key areas

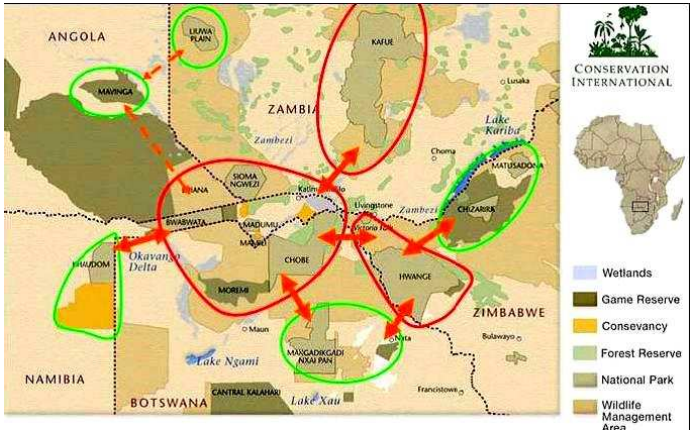
Protected area spatial integration



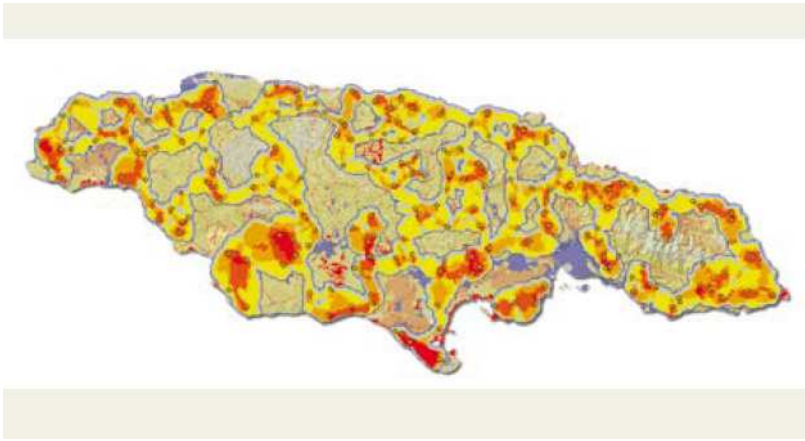
Connectivity corridors



Transboundary areas



Regional networks

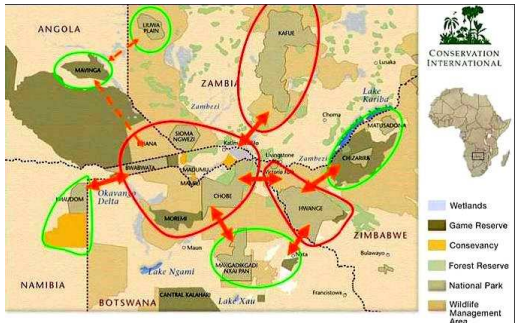


Improved gap assessments


Mesoamérica
¨Áreas Naturales Protegidas ¨
LEYENDA
Corredores Actuales
en Gestión Julio 2006
Corredores Propuestos
Áreas Protegidas
Cuerpos de Agua
Límite Internacional
Capital
Ciudad
ESCALA
200
0
200
400 Kilometers
Cancun
Merida
Campeche
Villahermosa
Belize City
Flores
Tuxtla Gutierrez
GUATEMALA
HONDURAS

Regional networks in Africa

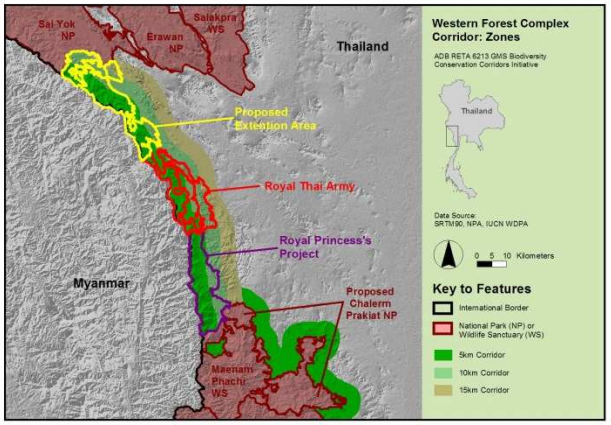
Strengthening climate adaptation by incorporating resilience principles into:



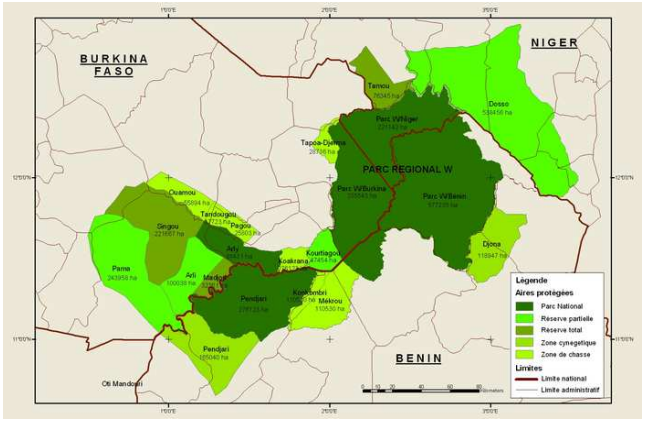
Regional networks

- Plan regional networks at landscape, national and regional scales
- Focus on protecting large, intact functioning ecosystems that will remain as biodiversity sources even under climate change
- Include pockets of refugia (e.g., north-facing slopes)

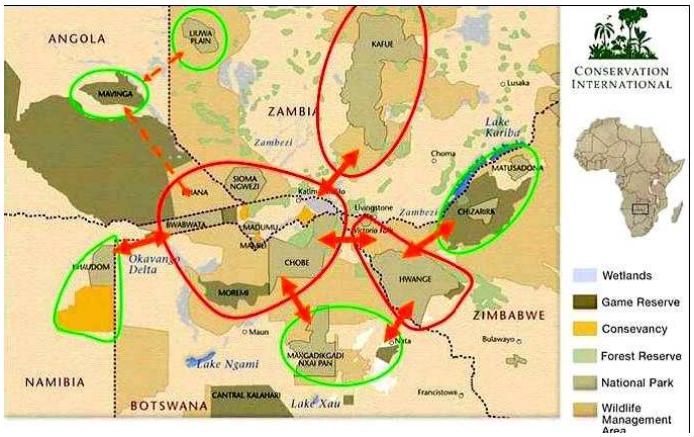
Protected area spatial integration



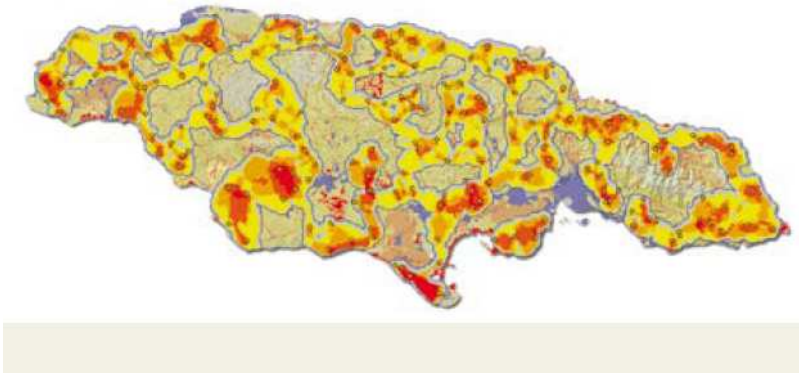
Connectivity corridors



Transboundary areas



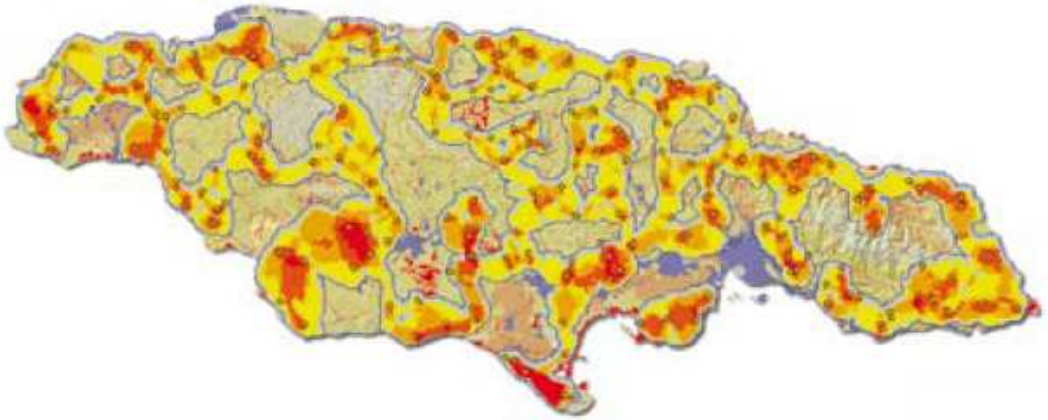
Regional networks



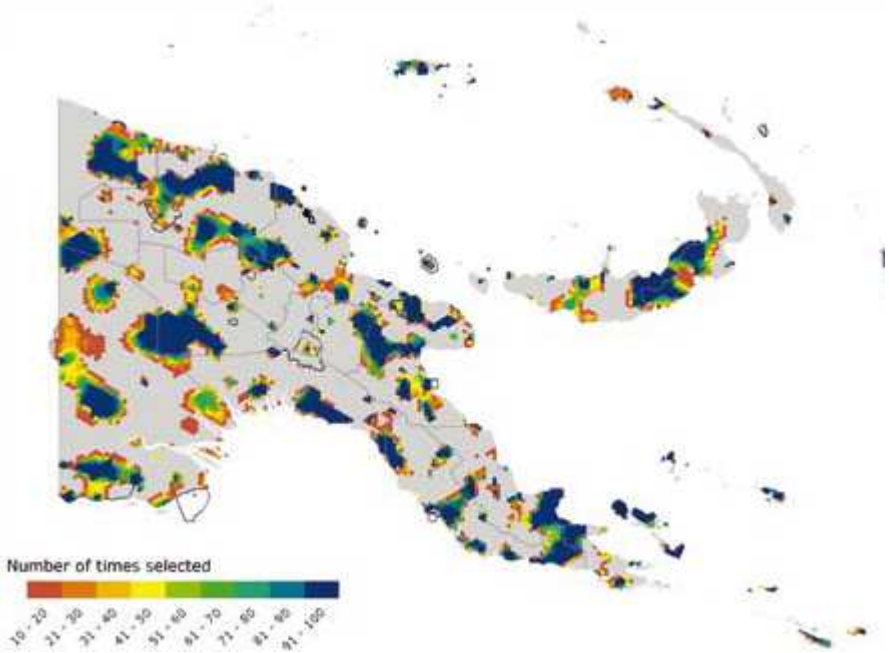
Improved gap assessments

Improved gap assessments

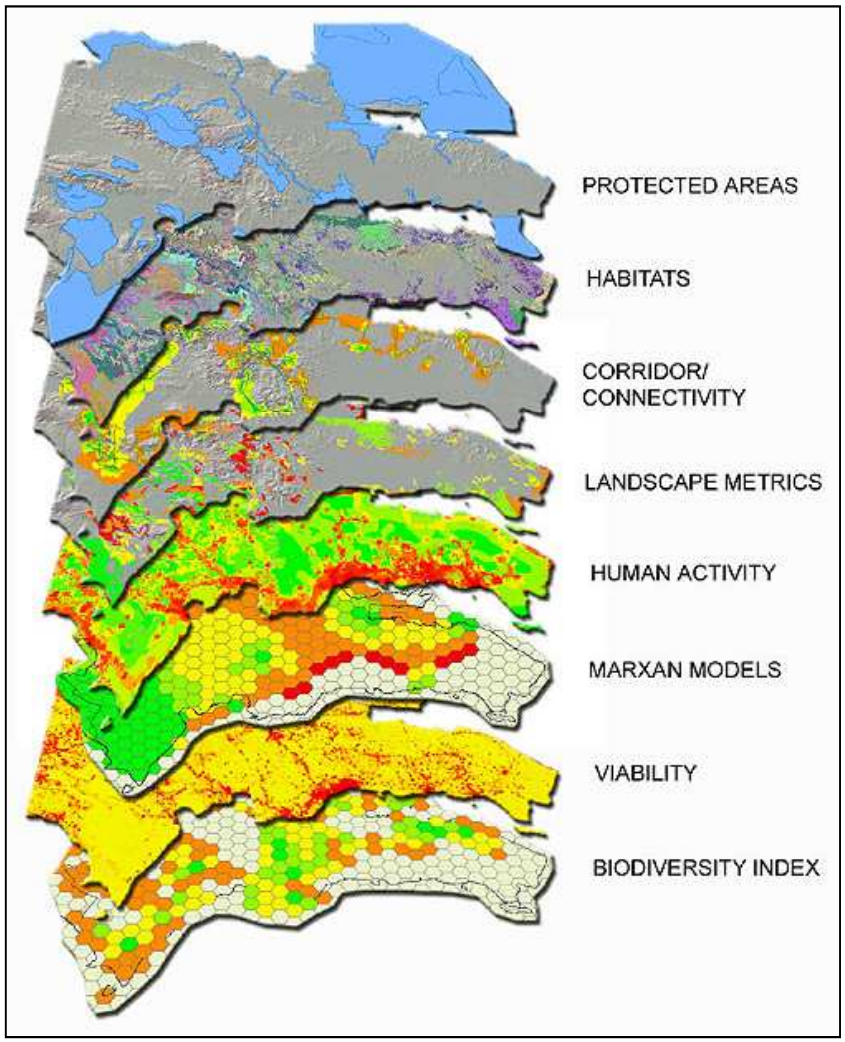
Jamaica



Papua New Guinea



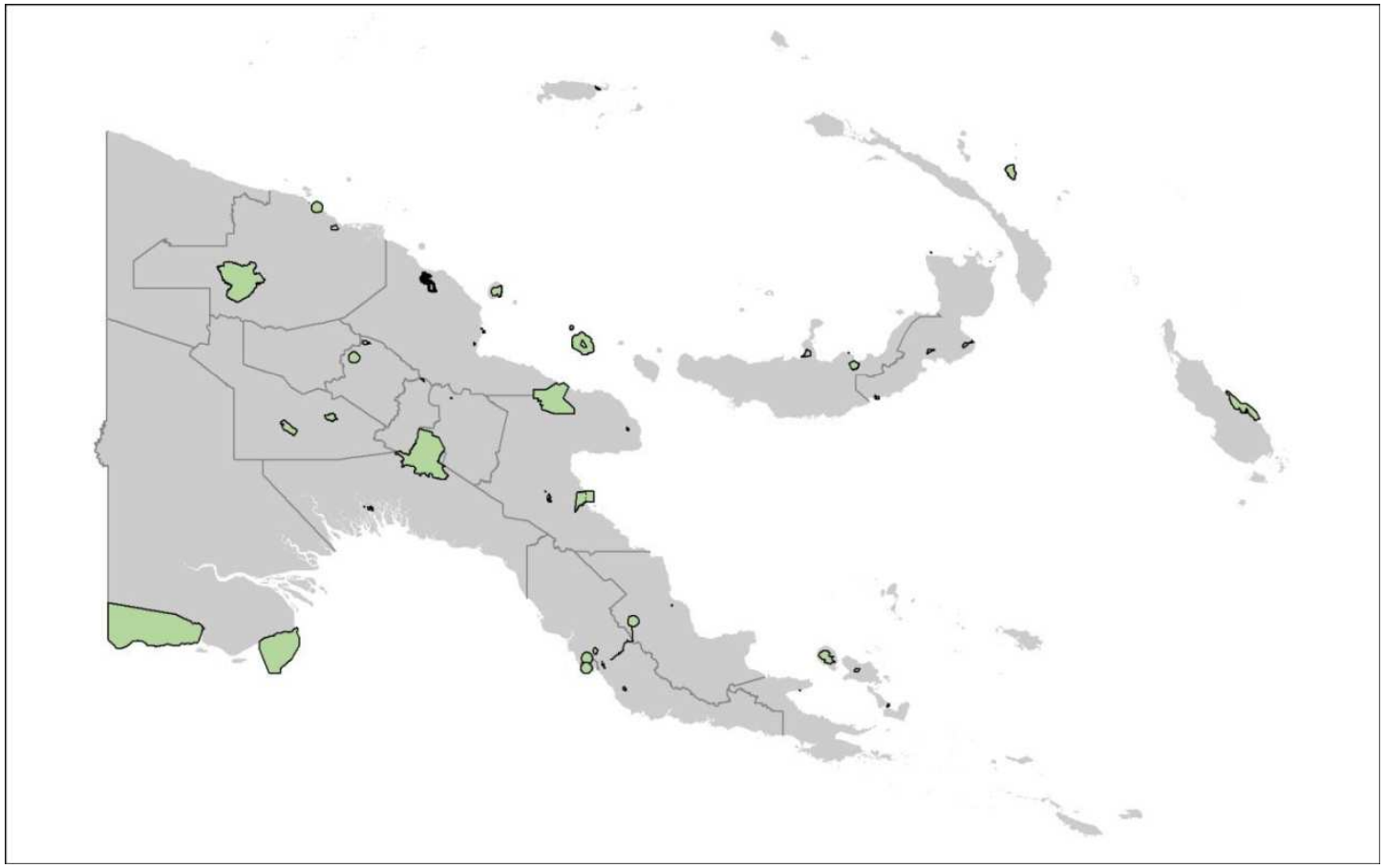
Incorporating resilience principles into ecological gap assessments:



GAP ASSESSMENT:

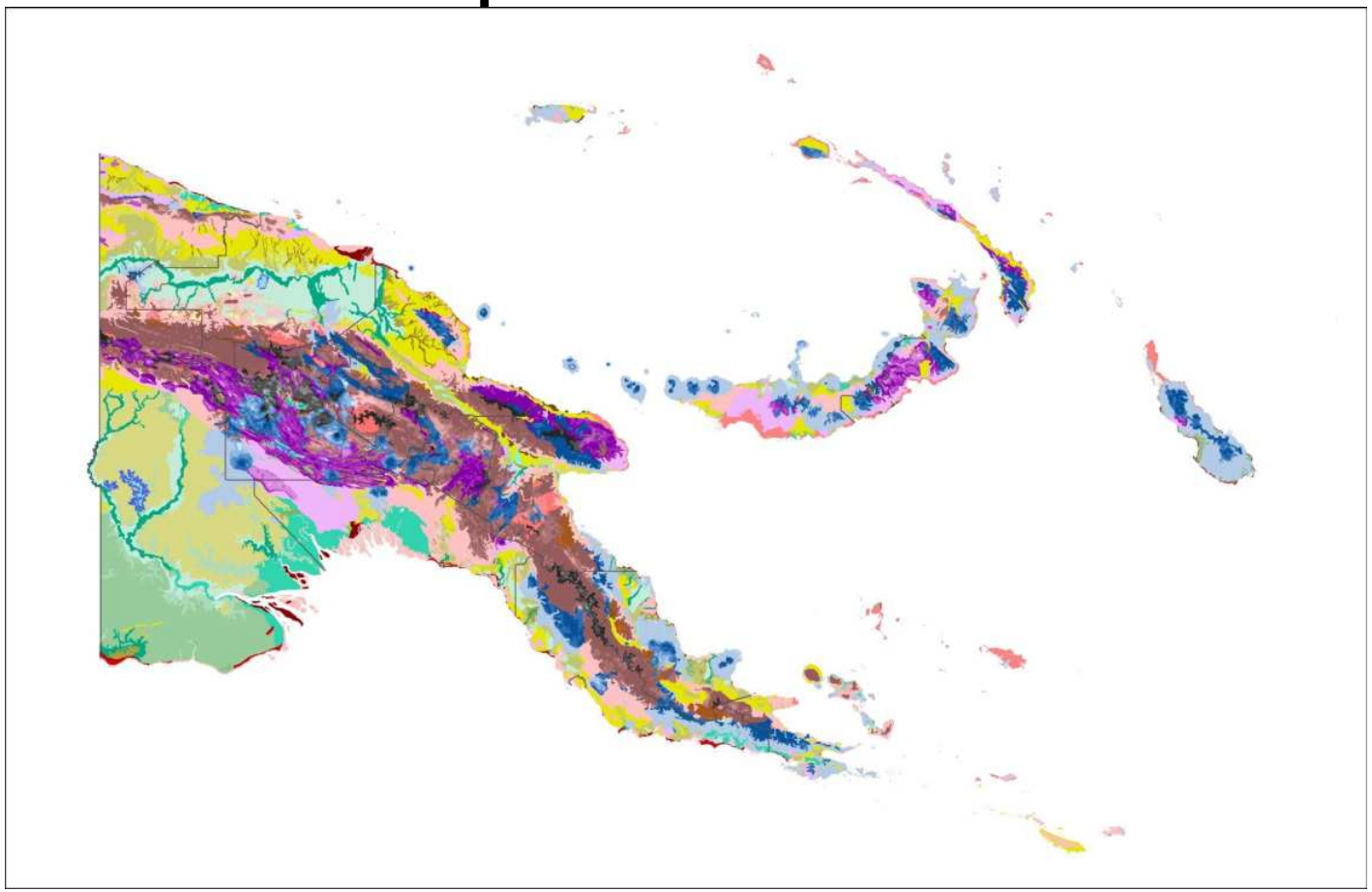
A comparison between the status of **biodiversity** and the status of **protection** within a country

Climate-Ready Ecological Gap Assessment in Papua New Guinea



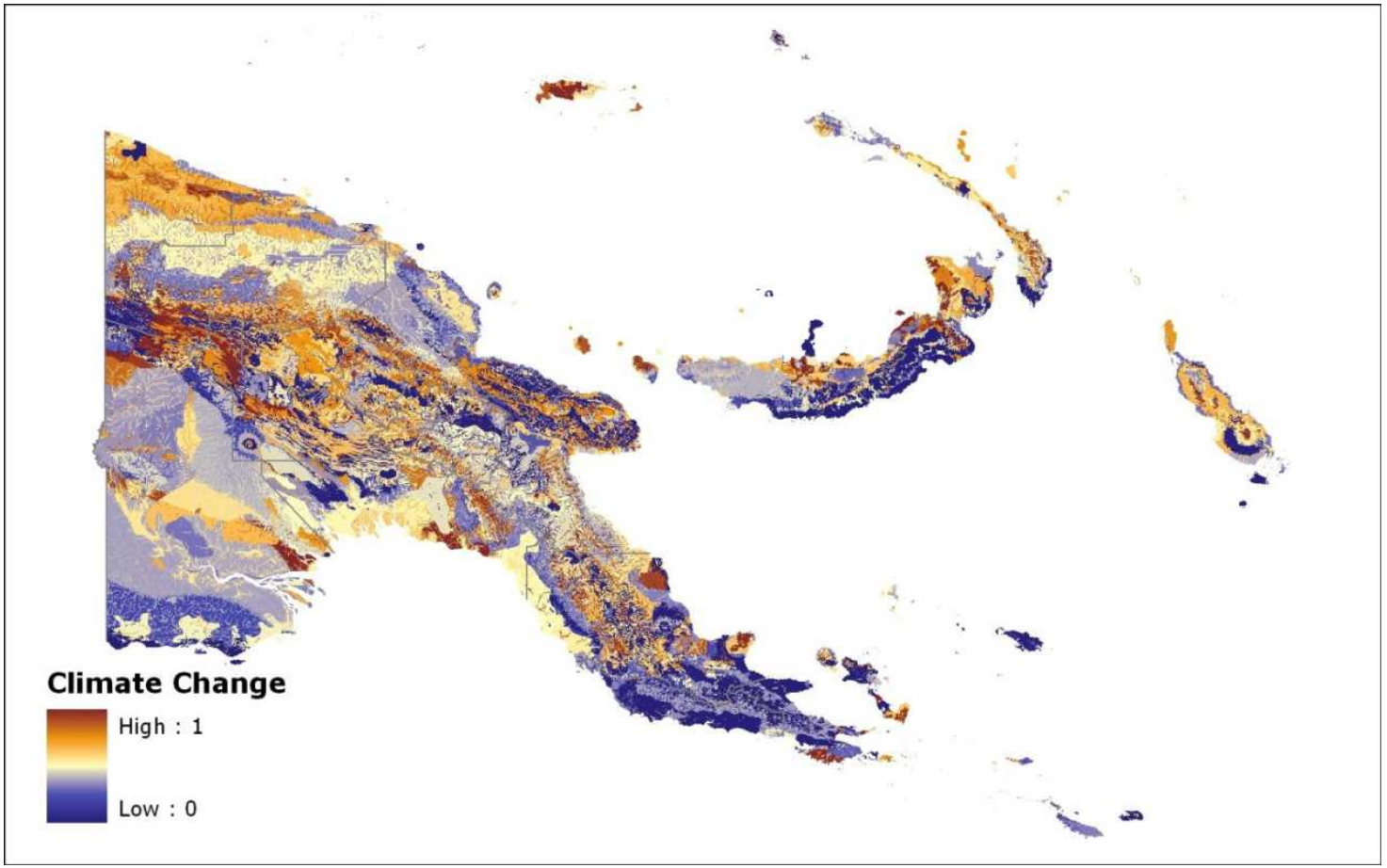
Existing protected areas

Climate-Ready Ecological Gap Assessment in Papua New Guinea



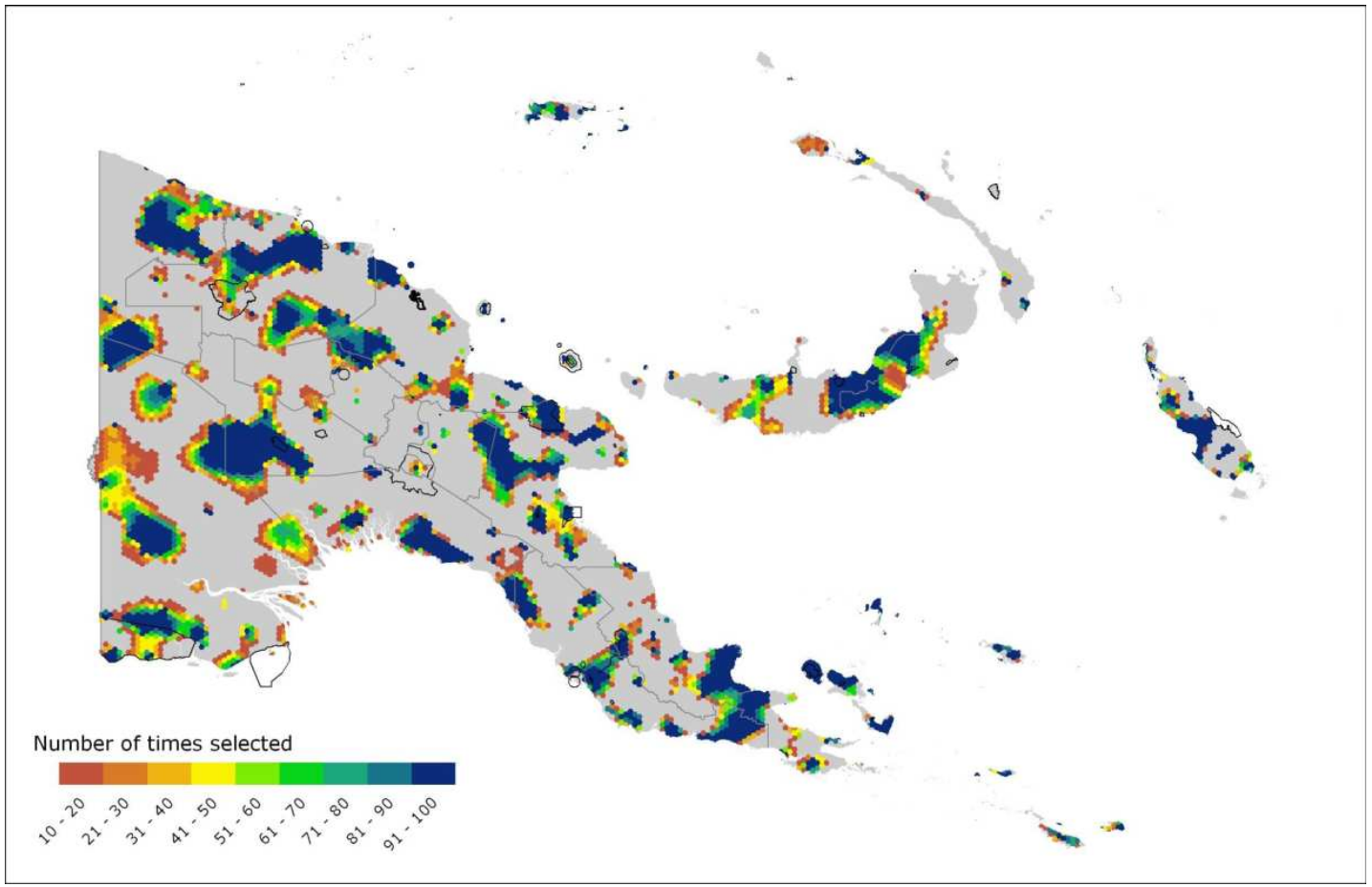
Land systems

Climate-Ready Ecological Gap Assessment in Papua New Guinea



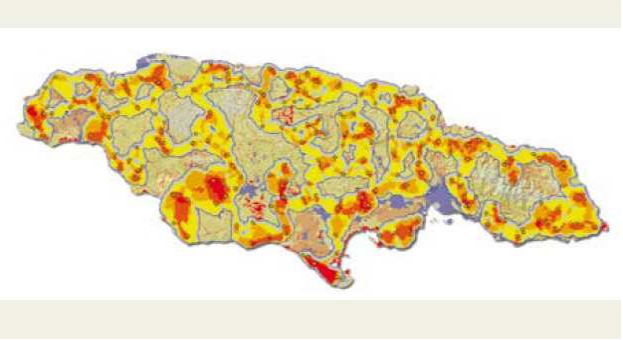
Climate impacts

Climate-Ready Ecological Gap Assessment in Papua New Guinea



Resulting analysis of climate-ready gap assessment

Strengthening climate adaptation by incorporating resilience principles into:



Improved gap assessments

- Focus on underlying features (bedrock, slope, aspect, soils)
- Include species and ecosystems most vulnerable to climate change
- Include species and ecosystems most resistant to climate change
- Incorporate predictive modeling into gap assessment
- Include climate-related connectivity in gap assessment

Questions for Reflection

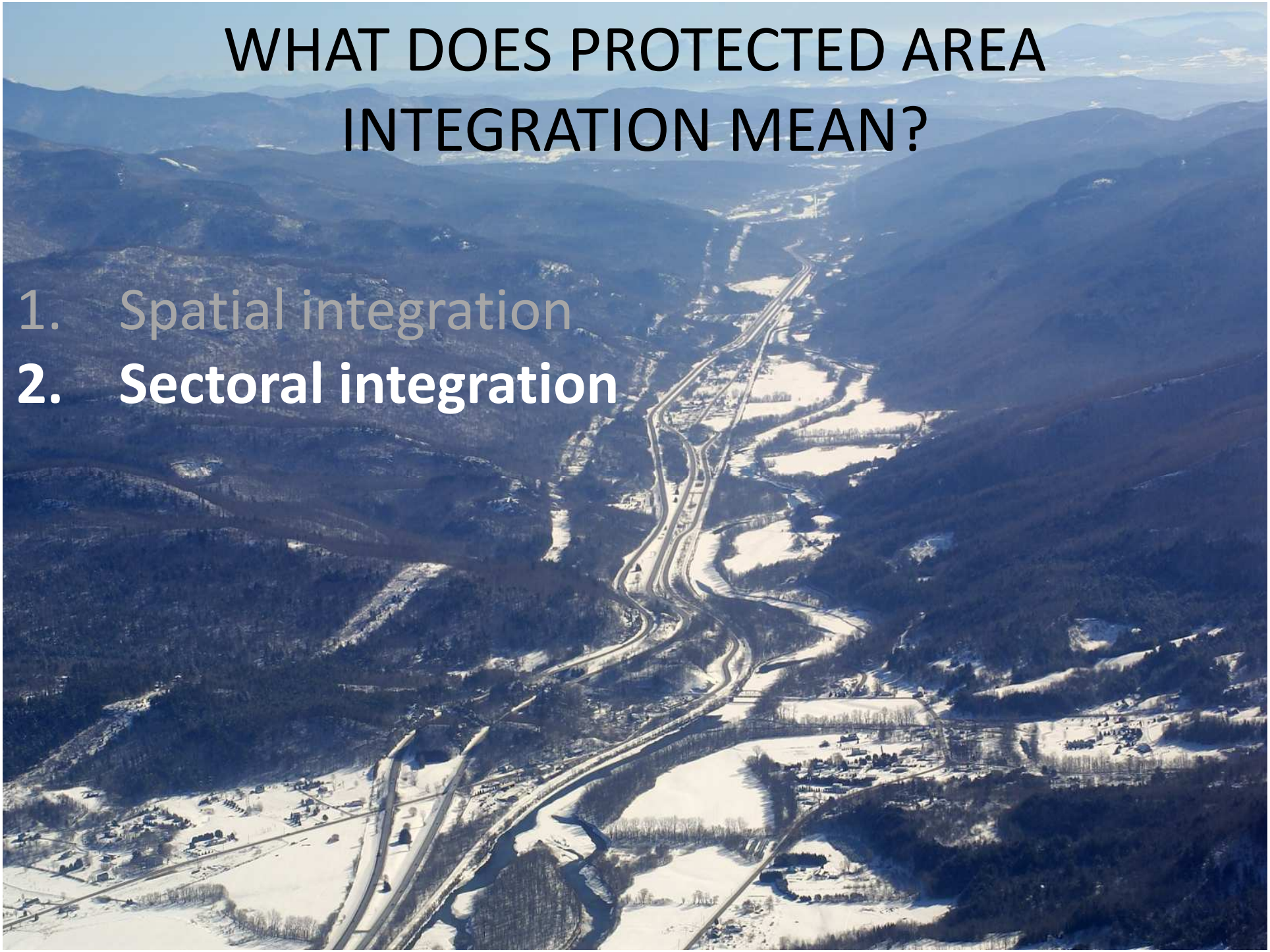
1. What are some opportunities for improving spatial connectivity for climate resilience in your country?

2. What are some good examples?

3. What are some barriers and obstacles for improving connectivity?

WHAT DOES PROTECTED AREA INTEGRATION MEAN?

1. Spatial integration
2. **Sectoral integration**



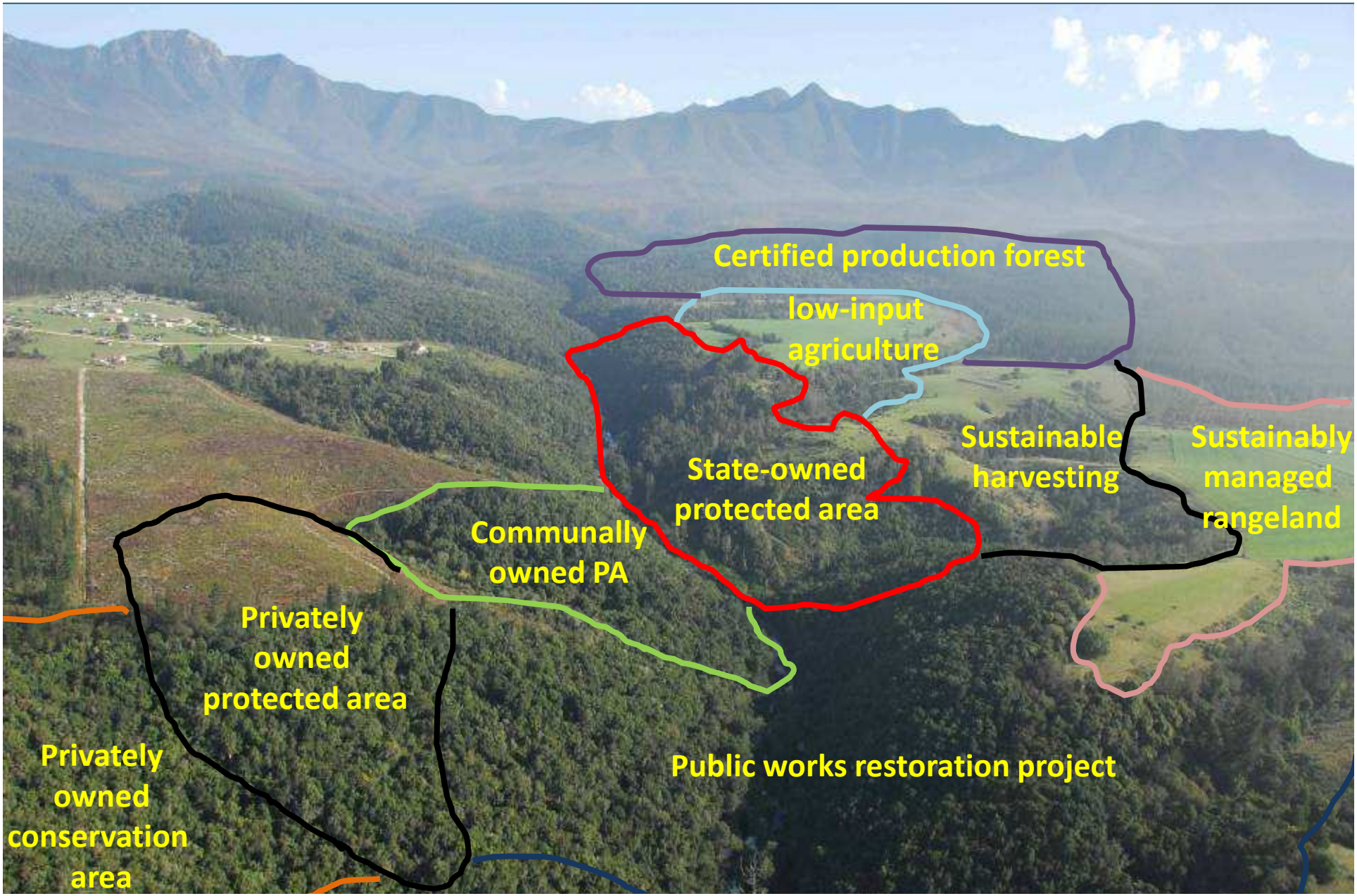
SECTORAL INTEGRATION

Ensuring that related sectors minimize impacts on biodiversity within protected areas….

…involving many key sectors….

Land use planning	Agriculture	Waste management
Transportation	Grazing	Invasive species policies
Energy	Forestry	Legal environment
Tourism	Agroforestry	Water management
Wildlife policies	Fisheries	National security

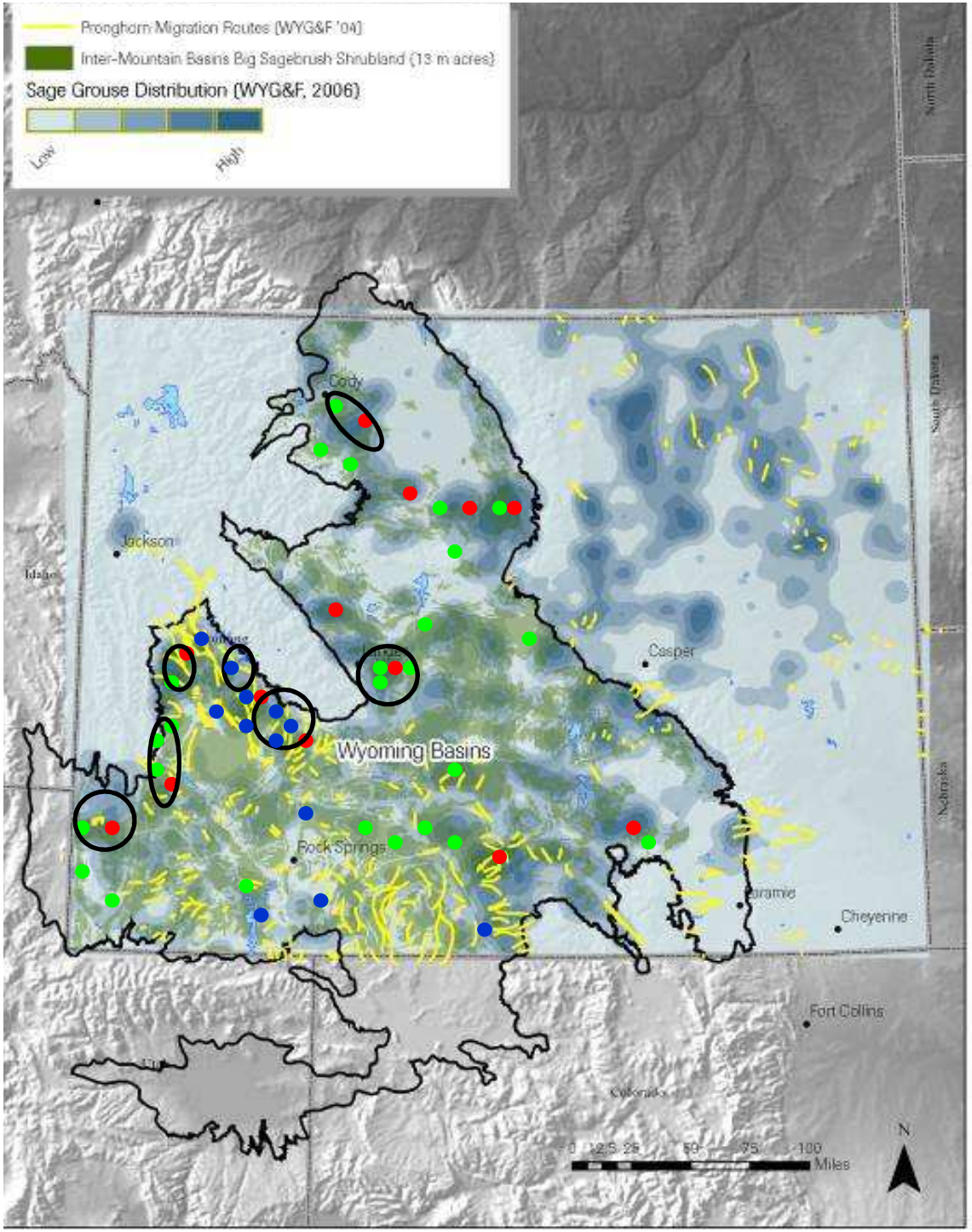
…to create a climate-resilient landscape



What is mainstreaming?

DEFINED AS:

The internalization of biodiversity conservation goals into economic and development policies and programs, so that they become an integral part of the functioning of these sectors.



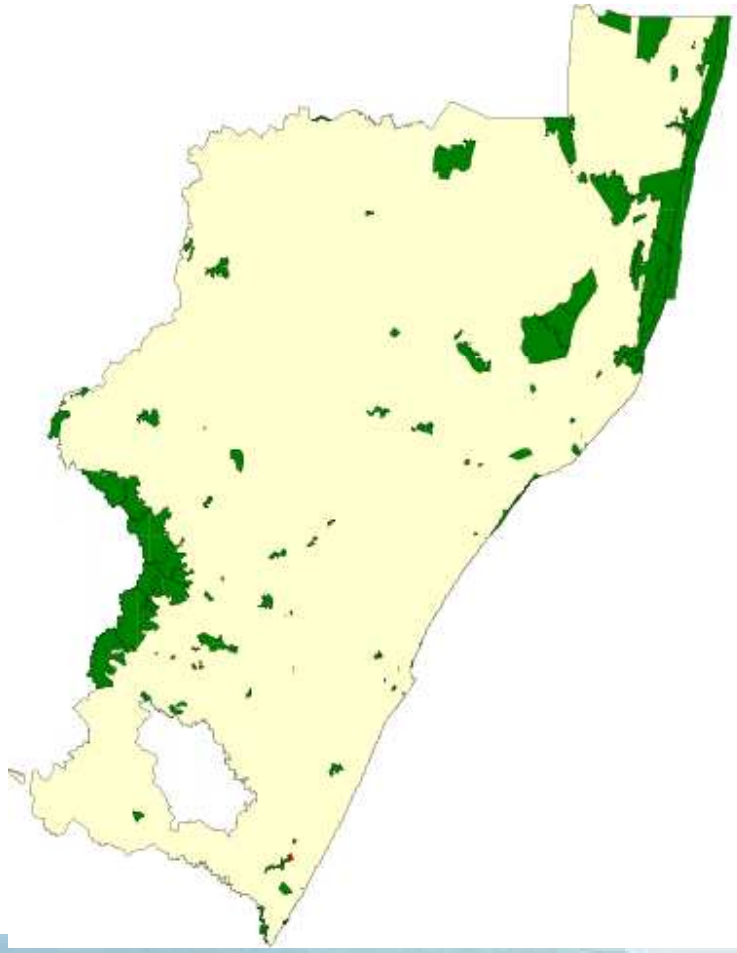
Mainstreaming biodiversity into the energy sector in Wyoming, U.S.

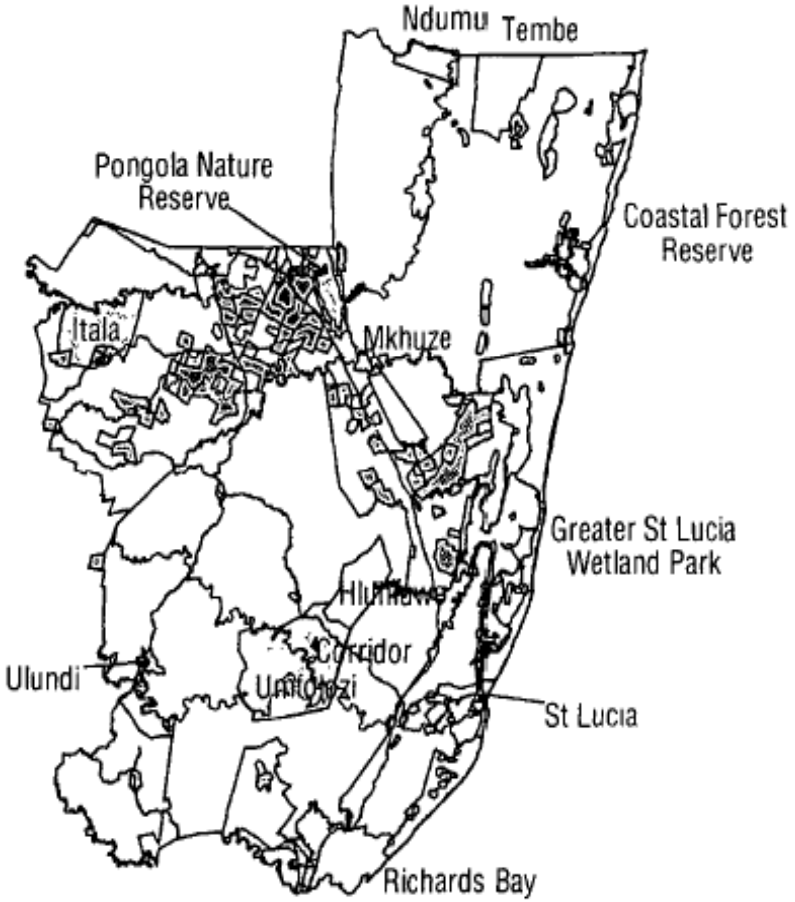
Example 1: Wyoming

- An NGO shared information with BP on areas of high biodiversity value
- BP developed a voluntary biodiversity offset program
- BP incorporated connectivity and biodiversity issues into environmental assessments and standard operating procedures
- BP paired with the NGO to measure and mitigate impacts on biodiversity

Mainstreaming biodiversity into game ranches in South Africa

The importance of game reserves in KZN



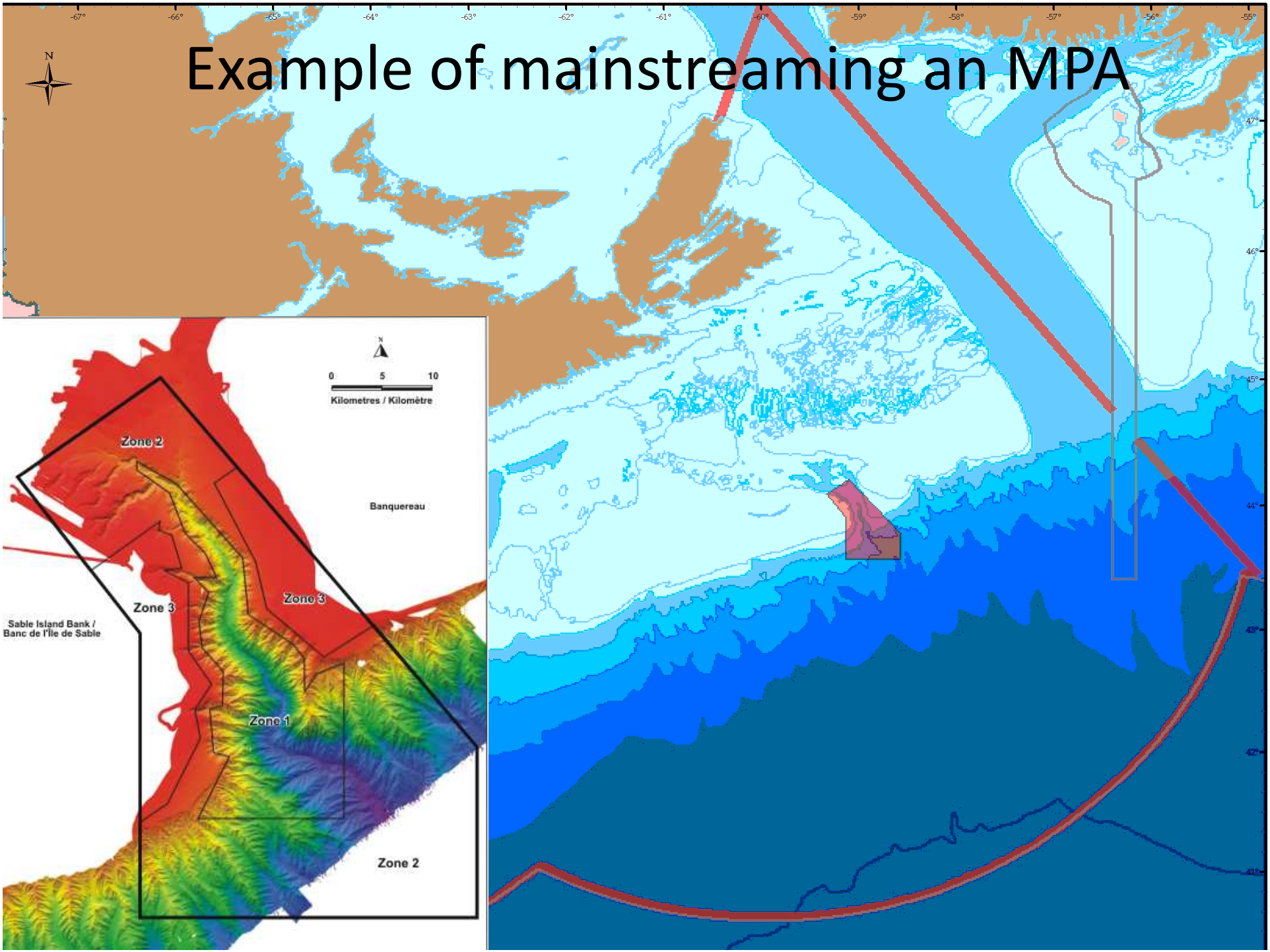


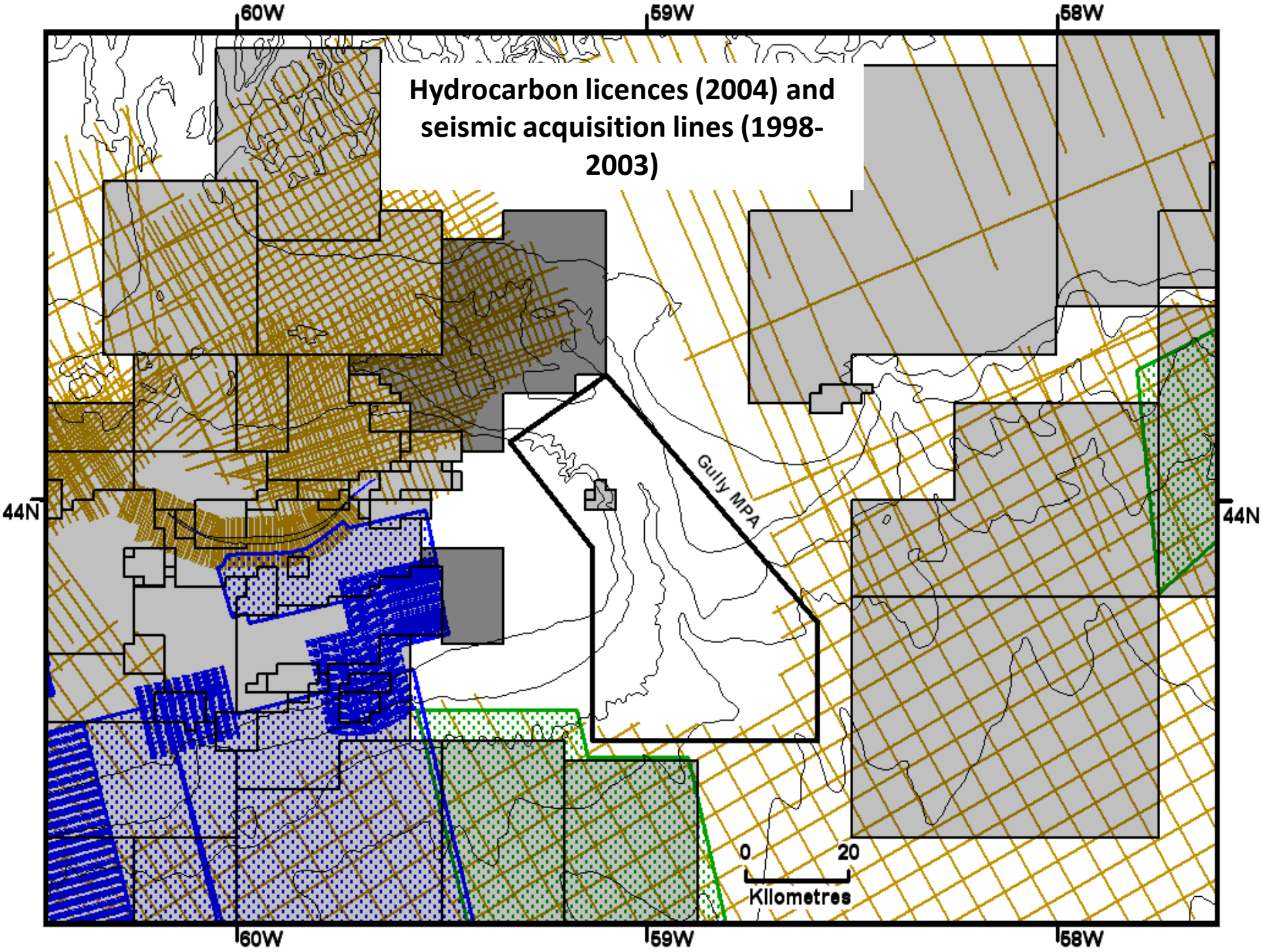
Example 2: KwazuluNatal

- The focus was on developing a game ranchers' association
- KZN helped create a legal framework to support private ownership of land and wildlife
- They provided technical support to ranchers
- They provided financial incentives for private game ranches
- Ranchers used sales from ranches to help fund protected areas
- KZN helped to remove physical barriers between reserves

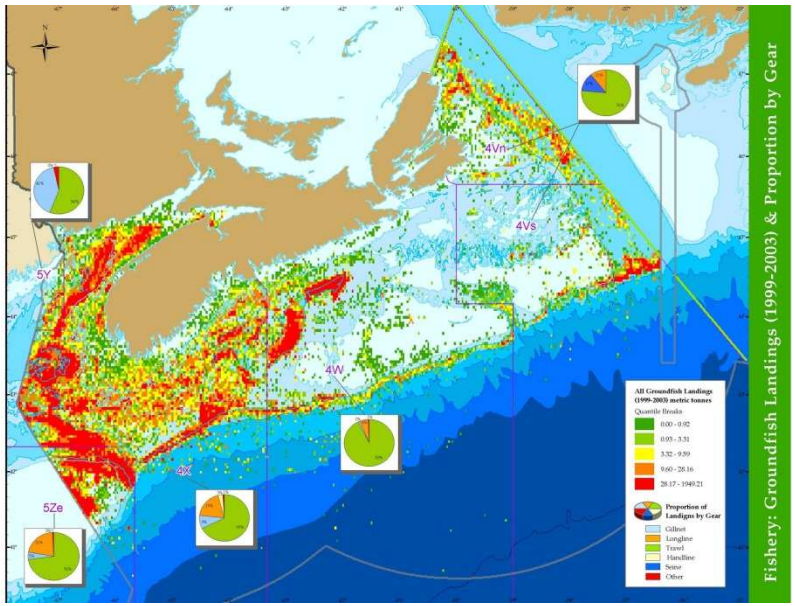
MAJOR OPPORTUNITY:
Landscape linkages between formal protected areas and private game ranches

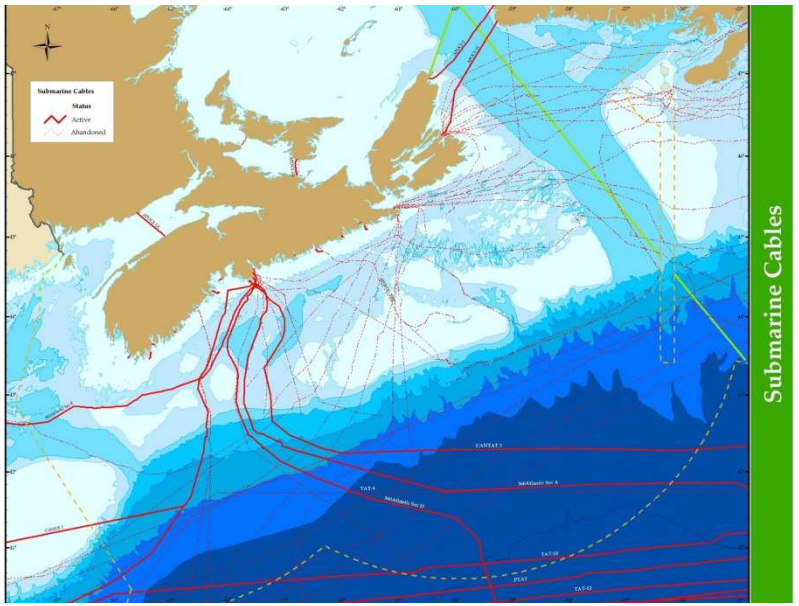
Example of mainstreaming an MPA

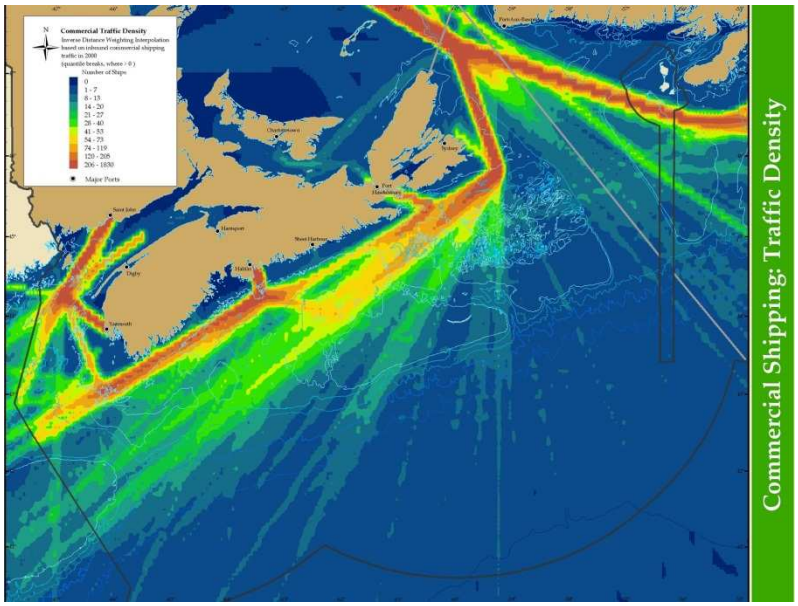


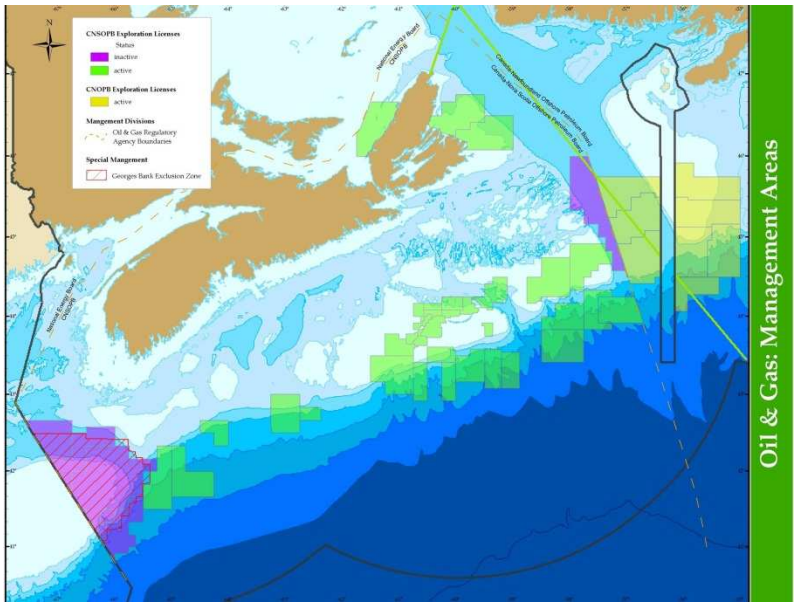

Hydrocarbon licences (2004) and seismic acquisition lines (1998-2003)
60W
59W
58W
44N
Gully MPA
0
20
Kilometres

Example of mainstreaming an MPA

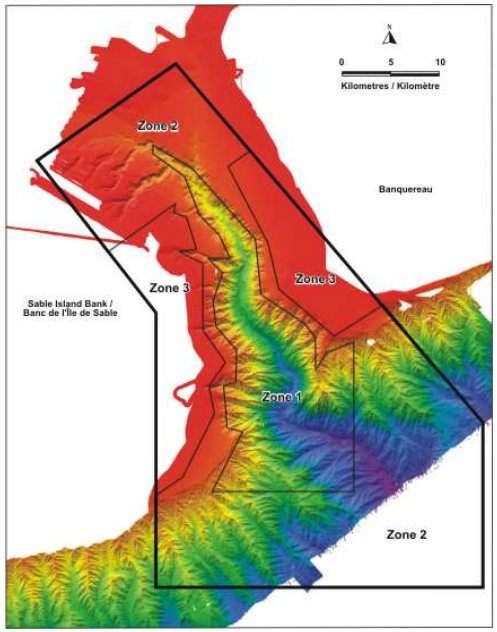








Example of mainstreaming an MPA



Transportation: New regulations on ballast water exchange; Coast Guard guidance on MPA avoidance, mammals, discharges

Oil and Gas: Adjacency protocols, voluntary codes of conduct, collaborative research

Fisheries: Automatic detection of unauthorized fishing

Climate Change Adaptation through PA Sectoral Integration and Mainstreaming

Revise sectoral policies

Revise PA valuation studies

Integrate into NAPAs

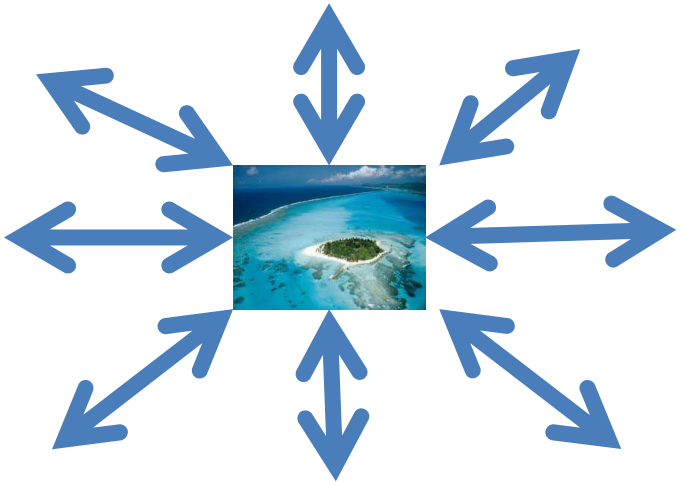
Include in threats assessment

Climate Change Adaptation through PA Sectoral Integration and Mainstreaming

1. Revise sectoral policies

- Develop payment for ecosystem services for water to incorporate PA values into economy
- Develop biodiversity offset policies for the energy sector
- Develop land use policies that protect coastal areas important for fisheries and storm buffers

Multiple Opportunities for Mainstreaming

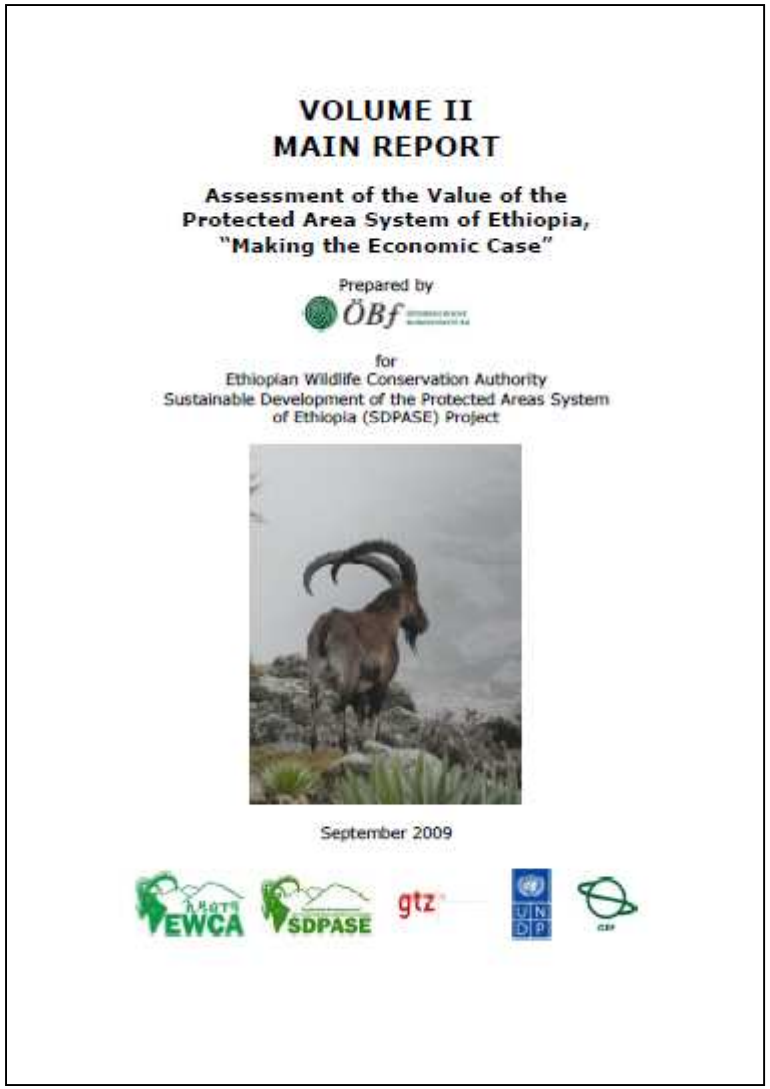


Climate Change Adaptation through PA Sectoral Integration and Mainstreaming

2. Incorporate climate-related issues in PA **VALUATION STUDIES**

- Incorporate food security
- Incorporate water security
- Incorporate carbon storage
- Incorporate human health
- Incorporate national security issues

Integrating climate into PA valuation studies

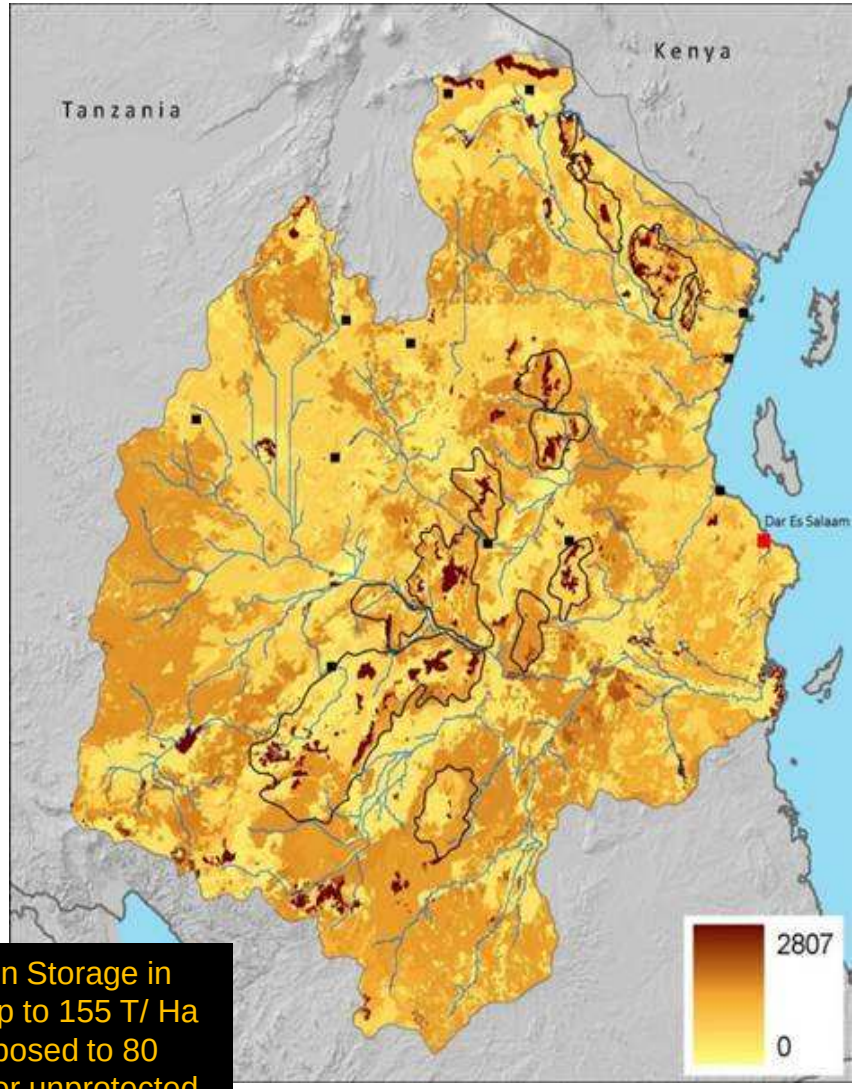


EXAMPLE OF ETHIOPIA

Assessed the value of protected areas for:

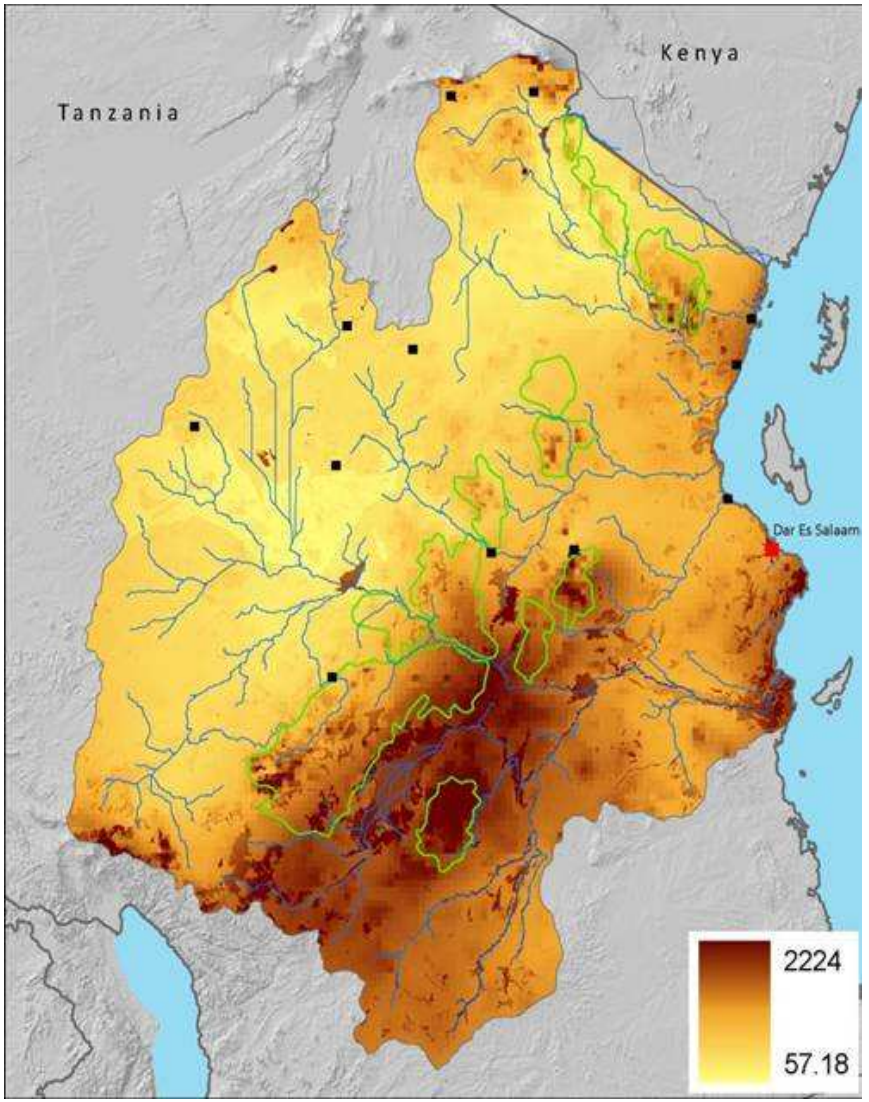
- Carbon sequestration and carbon stocks
- Food security and wild food protection
- Water supplies in drought conditions
- Erosion control

Integrating climate into PA valuation studies



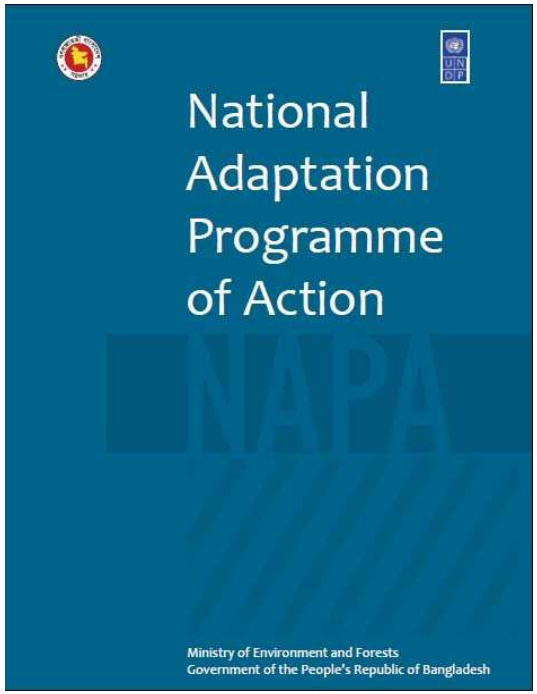
Carbon Storage in PAs up to 155 T/ Ha as opposed to 80 tons for unprotected

- Carbon Storage in Forests



Water Yield

Climate Change Adaptation through PA Sectoral Integration and Mainstreaming



3. Incorporate into PAs into NAPAs

RANGE OF ADAPTATION ACTIONS:

- Health
- Early warnings
- Food security
- Infrastructure
- Insurance
- Tourism
- Energy
- Ecosystem-based management

Integrate protected areas into NAPAs

- Percentage of all 434 actions that are ecosystem-based: <25%
- Percentage of strategies that reference protected areas: <8%
- Percentage of total budget for protected area actions: <4%

Types of ecosystem-based NAPA actions:

- Establish new forest reserves
- Create buffer zones and corridors
- Restore and protect critical fisheries habitat
- Eradicate invasive species likely to exacerbate climate impacts
- Expand existing protected areas

Integrate protected areas into NAPAs

Bangladesh: Reduction of climate change hazards through coastal afforestation with community participation – $23,000,000 (25%)

Types of ecosystem-based NAPA actions:

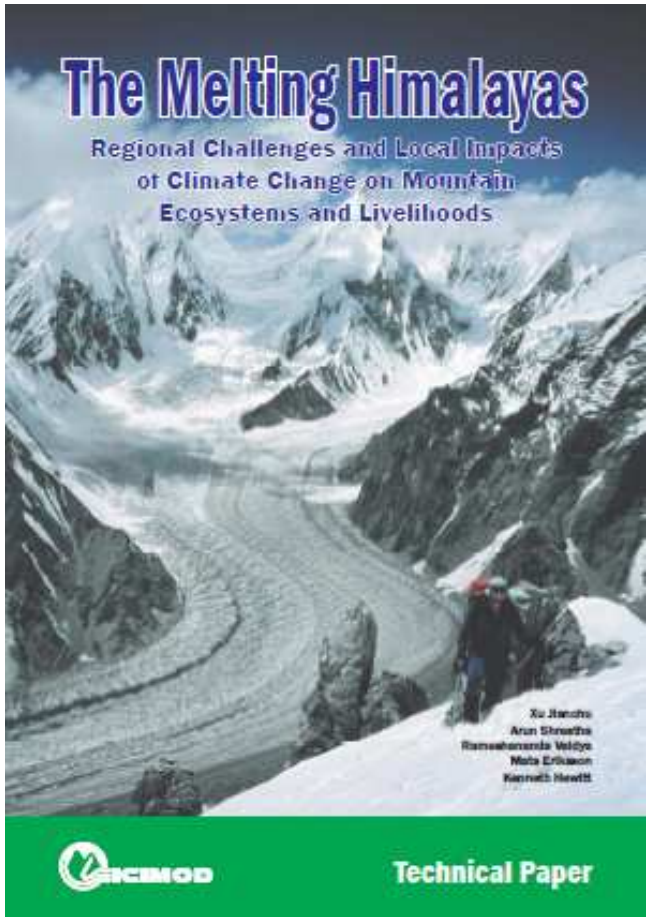
- Establish new forest reserves
- Create buffer zones and corridors
- Restore and protect critical fisheries habitat
- Eradicate invasive species likely to exacerbate climate impacts
- Expand existing protected areas

Climate Change Adaptation through PA Sectoral Integration and Mainstreaming

4. Incorporate climate into PA and biodiversity **threat assessments**

- Include an assessment of threat synergies with climate change (e.g., fire, invasives, logging)
- Include an assessment of ecosystem services vulnerable to climate impacts
- Incorporate climate into environmental impact assessments (EIAs) and strategic environmental assessments (SEAs)

Incorporate climate into PA and biodiversity threat assessments



A regional threat assessment in the Himalayas incorporated climate issues:

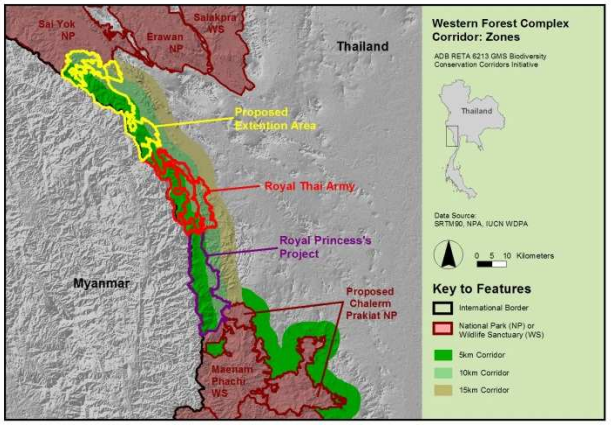
- Water supplies, floods, drought
- Impacts on livelihoods
- Changes in invasive species distribution
- Changes in ecosystem health
- Protected area implications

Questions for Reflection

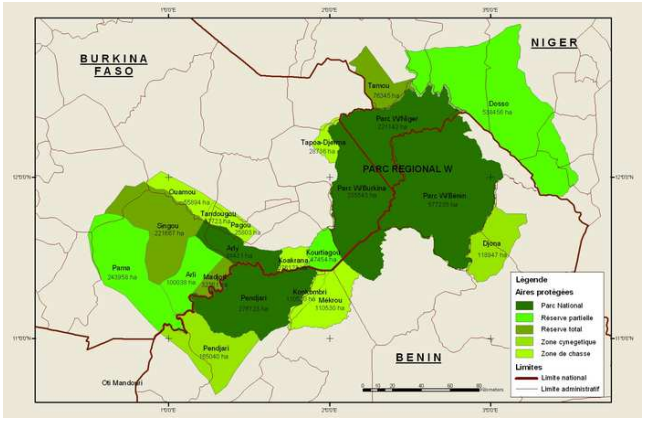
1. What are some opportunities for sectoral integration and mainstreaming in your country?

2. What are barriers and obstacles for sectoral integration and mainstreaming of protected areas?

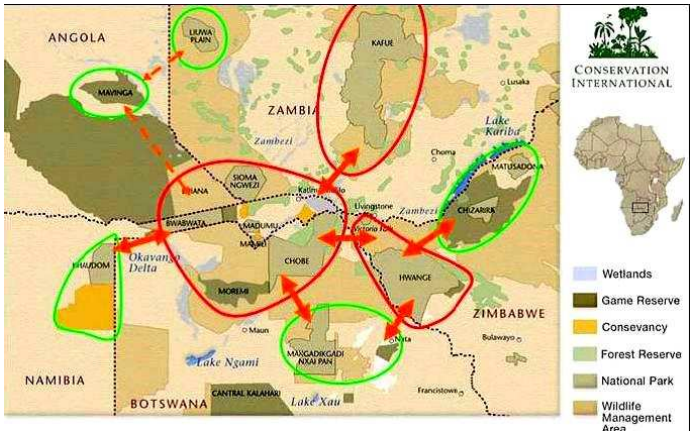
Climate resilience through protected area spatial integration



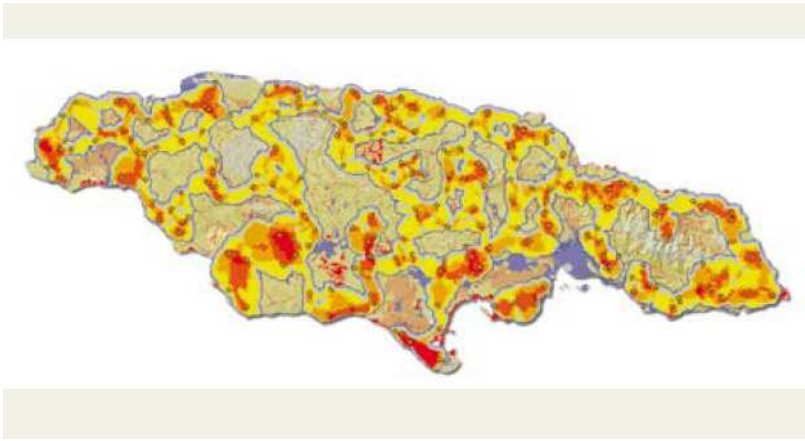
Connectivity corridors



Transboundary areas



Regional networks



Improved gap assessments

Climate resilience through PA sectoral integration and mainstreaming

Revise sectoral policies

Revise PA valuation studies

Integrate into NAPAs

Include in threats assessment

INSTRUCTIONS

1. For each level of planning, identify at least one strategy that is relevant for your country.
2. Using the template, describe your strategy.
3. Next, develop national targets and indicators based on the strategy or strategies that you have chosen.
4. Post your strategies, targets and indicators on the wall

1. Pour chaque niveau de planification, d'identifier au moins une stratégie qui est pertinente pour votre pays.
2. En utilisant le modèle, décrivez votre stratégie.
3. Ensuite, élaborer des cibles et des indicateurs nationaux basés sur la stratégie ou les stratégies que vous avez choisi.
4. Message vos stratégies, objectifs et indicateurs sur le mur