Balancing Africa's Economic growth, Food Security, and Conservation using "Development by Design"

Dr. Anne Trainor
Smart Growth Director
Africa Program

The Nature Conservancy
Africa

Photo: Karine Anger

Uncoordinated
landscapes


Photo: Sierra Club

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Coordinated
landscapes

Photos: Brian Richter, Stephen Robinson

Uncoordinated
landscapes

Photo: Sierra Club

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Sustainable Growth in harmony with nature and people

Smart Growth via Development by Design

Photo: David Banks

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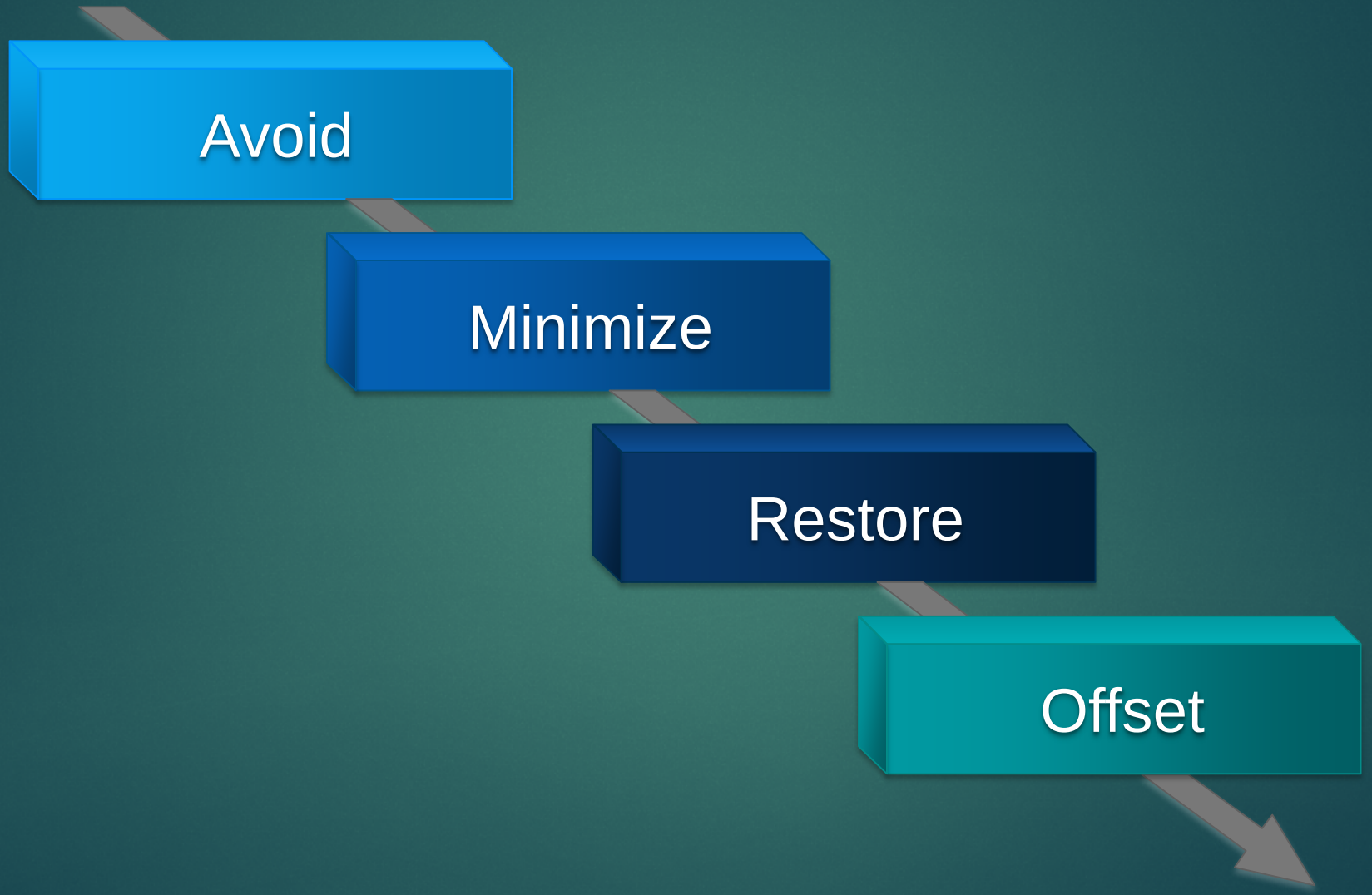
Development by Design



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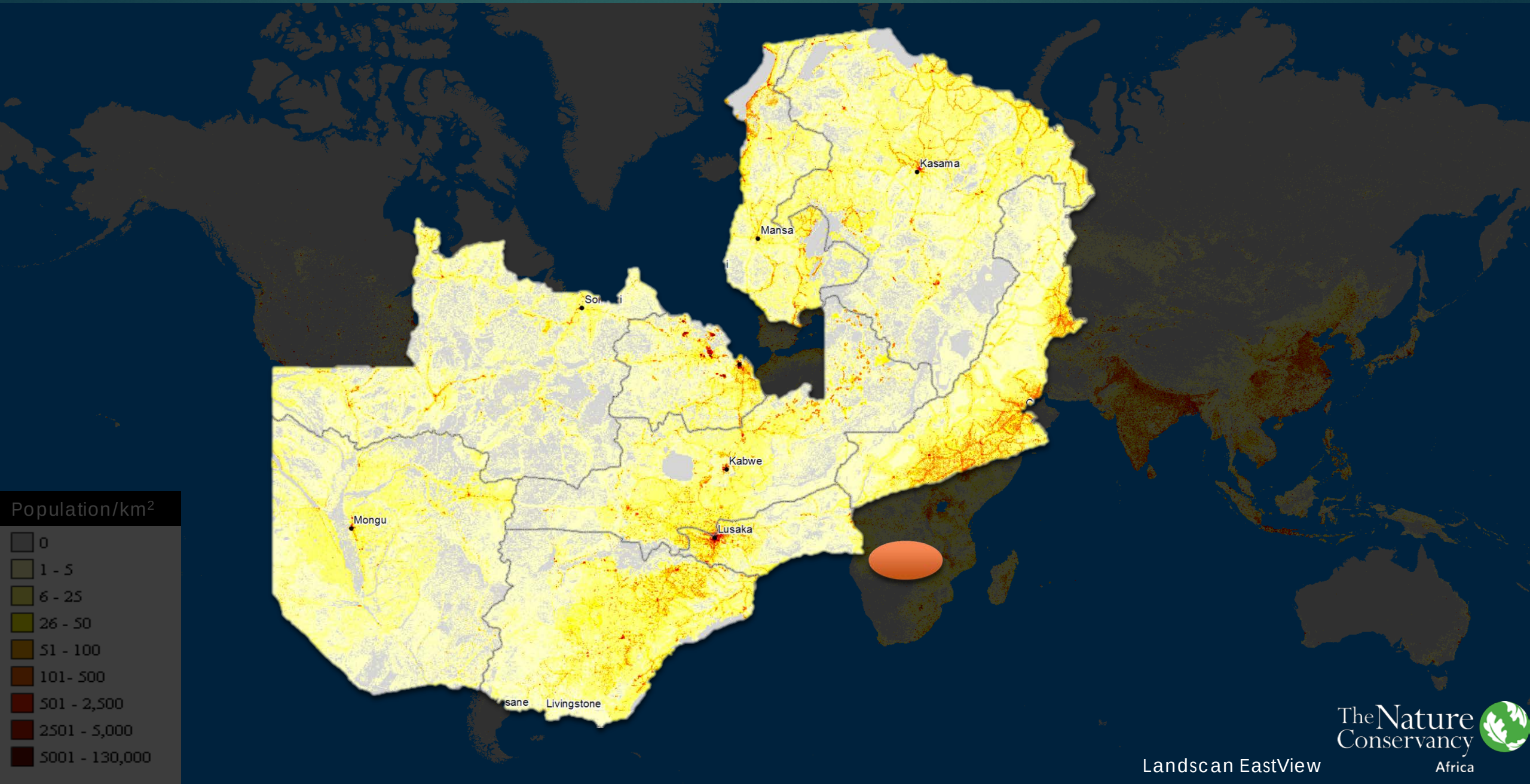
One Zambia, expanding human population



Landscan EastView

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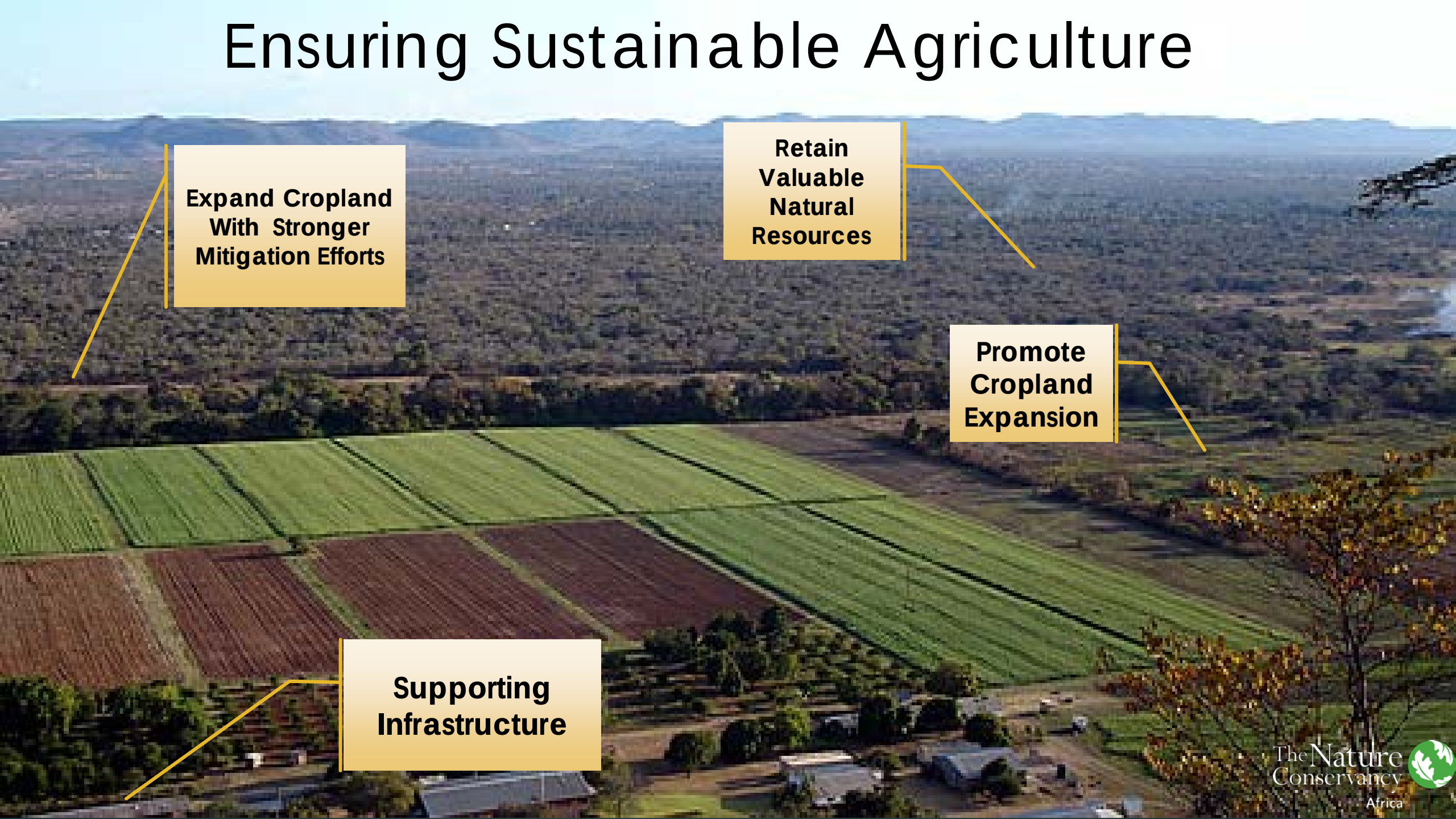
Ensuring Sustainable Agriculture



Spatial Tools: Balance economic growth, food security & conservation

Conservation Value Map

Human Influence Map

Crop Suitability Map

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Nature

Protect large, intact, natural landscapes

Protect Biodiversity

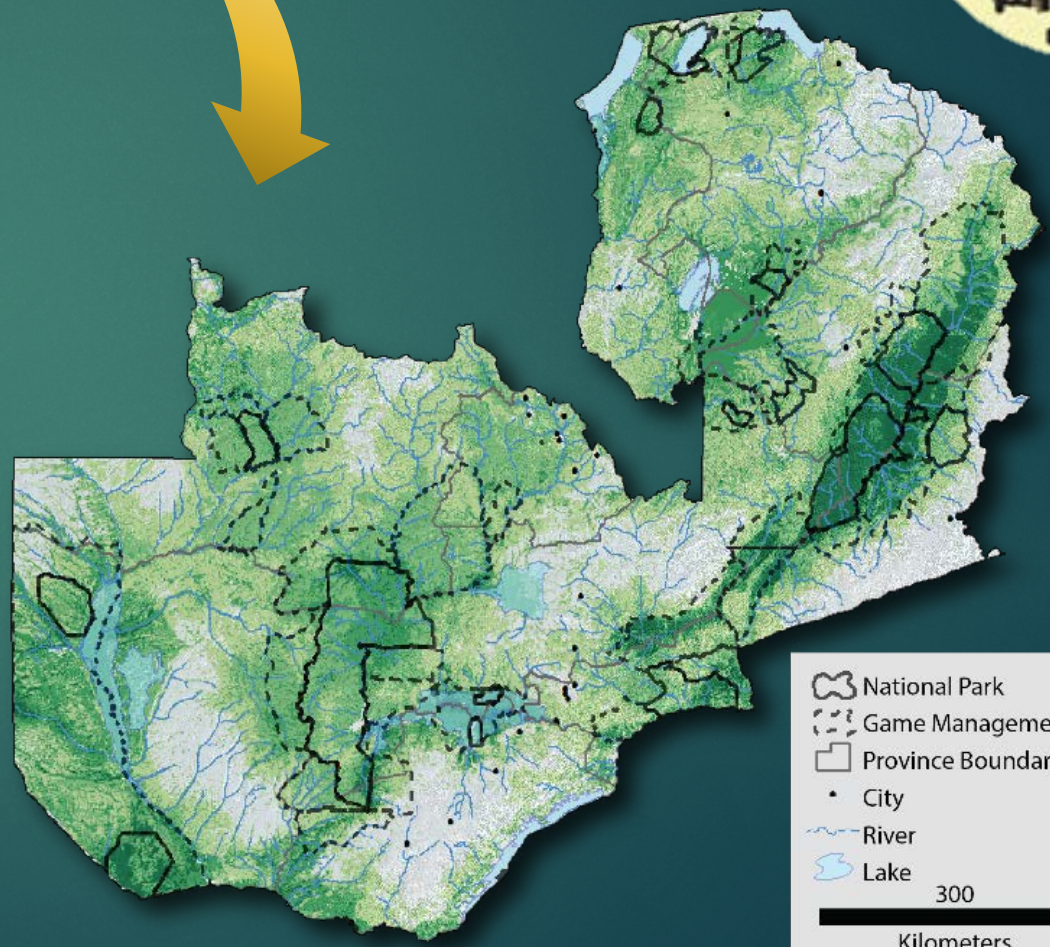
Maintain and restore connectivity

Maintain Ecosystem Function

Protect Carbon Storage

Conservation Value

Lower — Higher



National Park
Game Management Area
Province Boundary
City
River
Lake
300
Kilometers
N

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Infrastructure

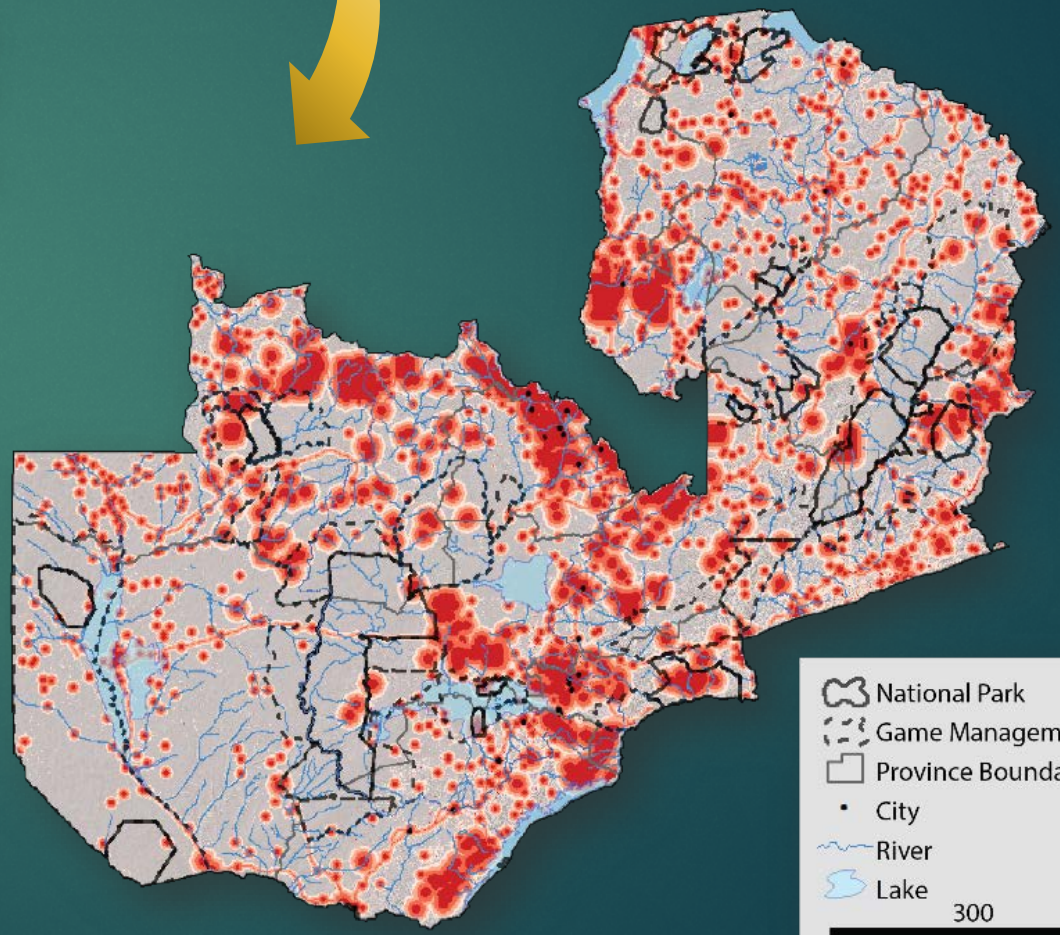
Transportation

Urbanization

Communites

Human Influence Value

Lower — Higher



National Park
Game Management Area
Province Boundary
City
River
Lake
300
Kilometers
N

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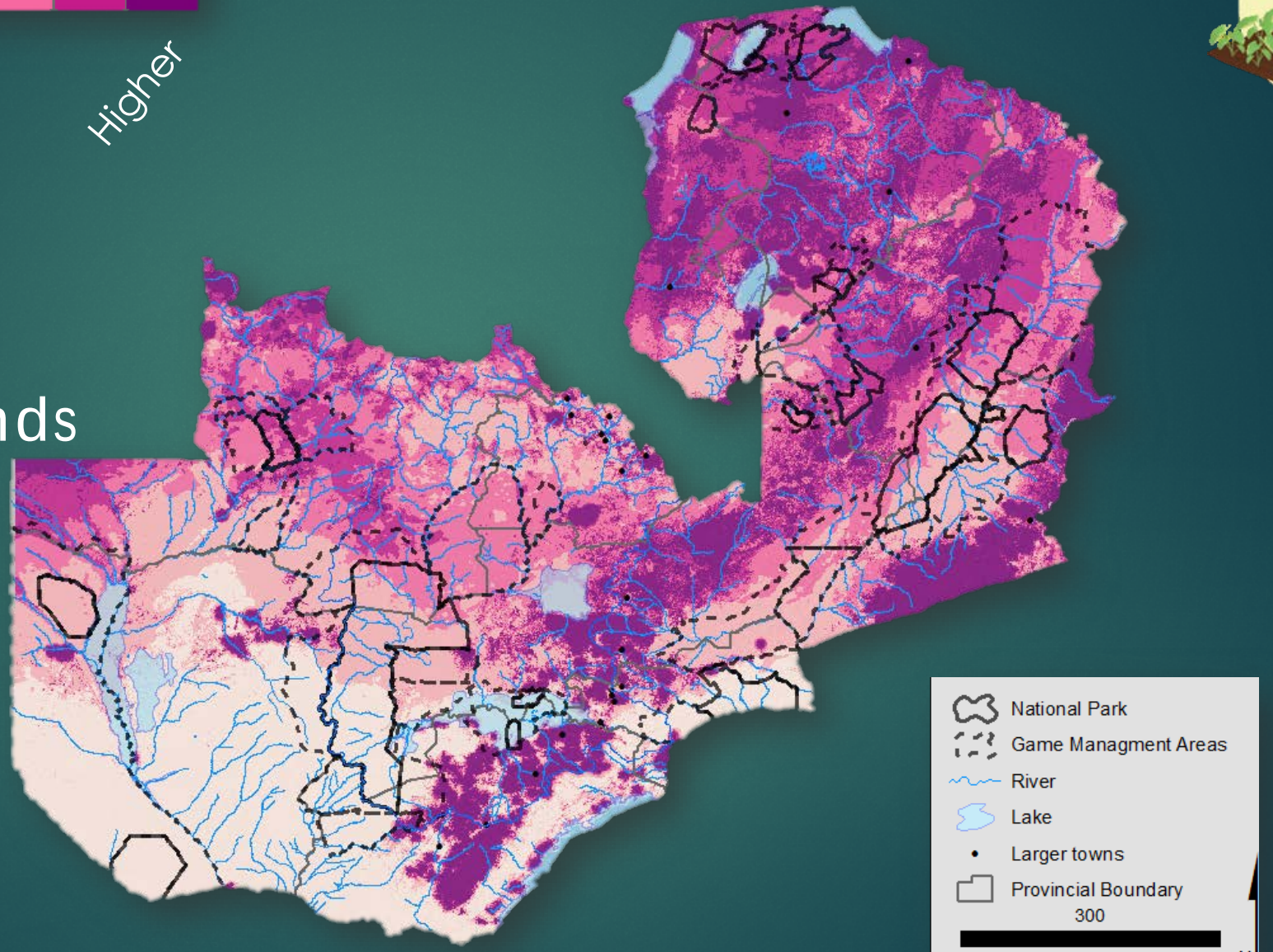
Agriculture Potential

Lower

Higher

- Maize Yields
- Soy Bean Yields
- Current Croplands



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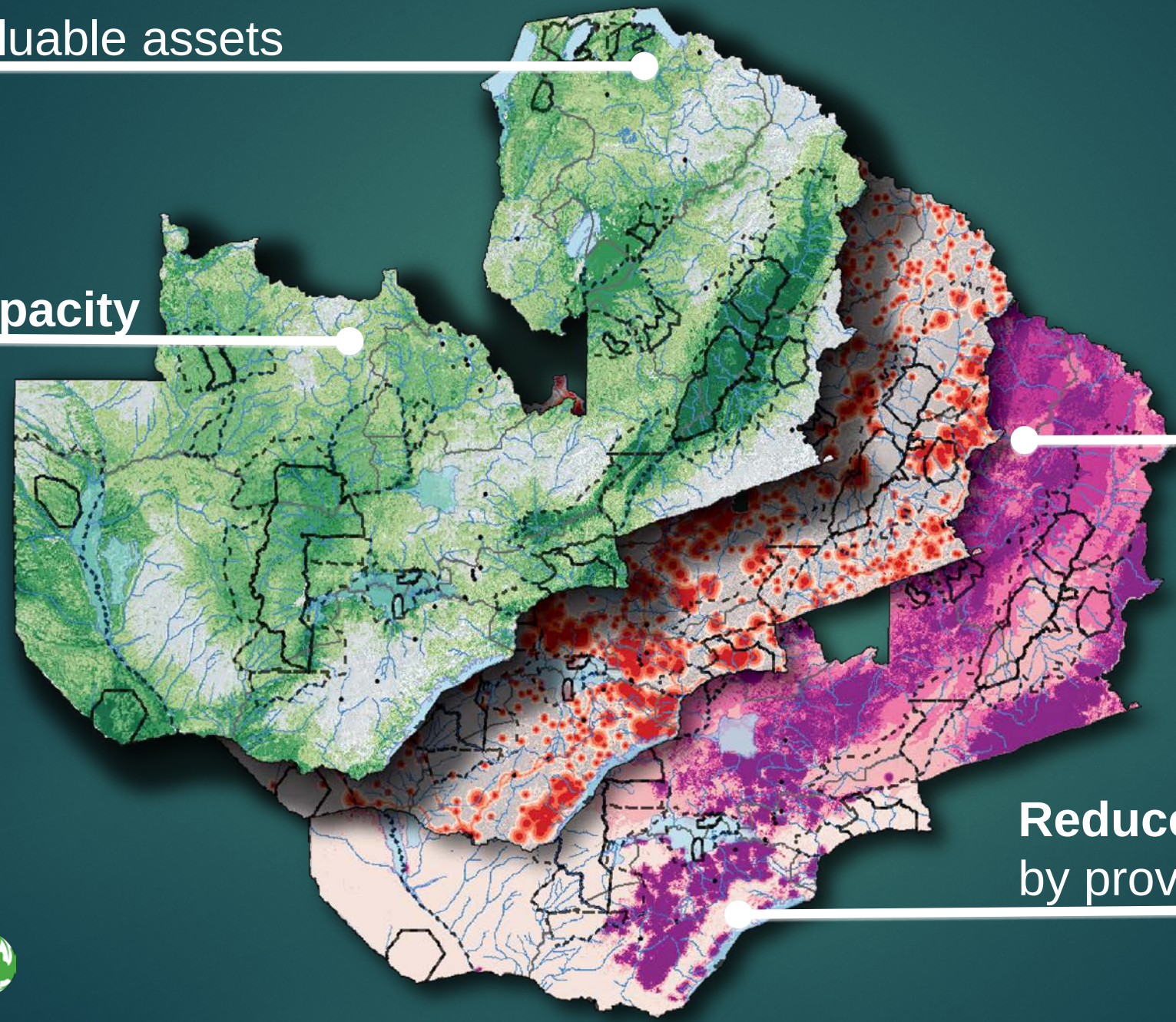
Increase awareness of valuable assets

Build Capacity

Enhance efficiency and transparency

Reduce conflict by providing "early warnings"



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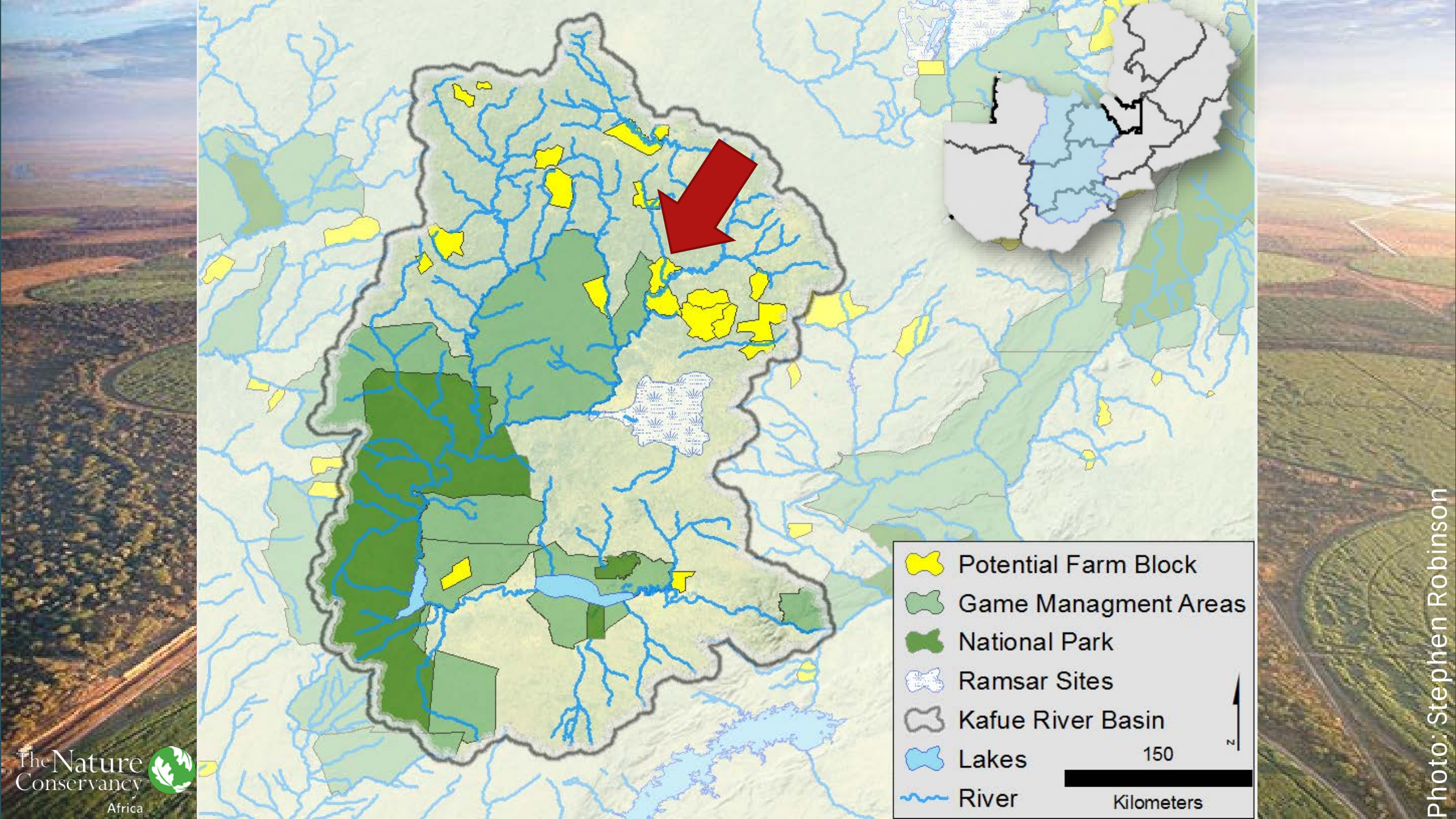

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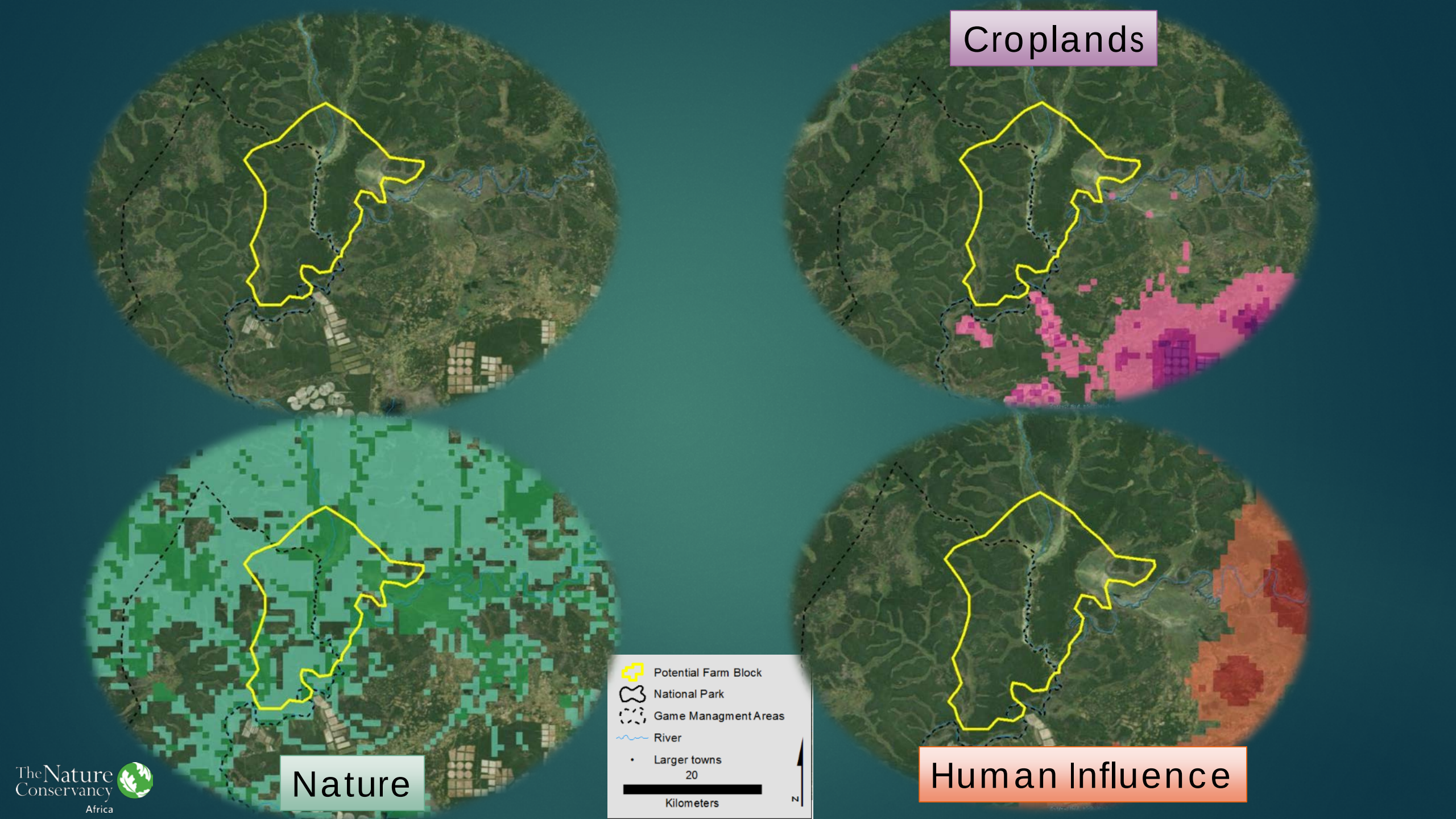
Photo: Stephen Robinson


Croplands
Nature
Human Influence
Potential Farm Block
National Park
Game Managment Areas
River
Larger towns
20
Kilometers
N
The Nature Conservancy
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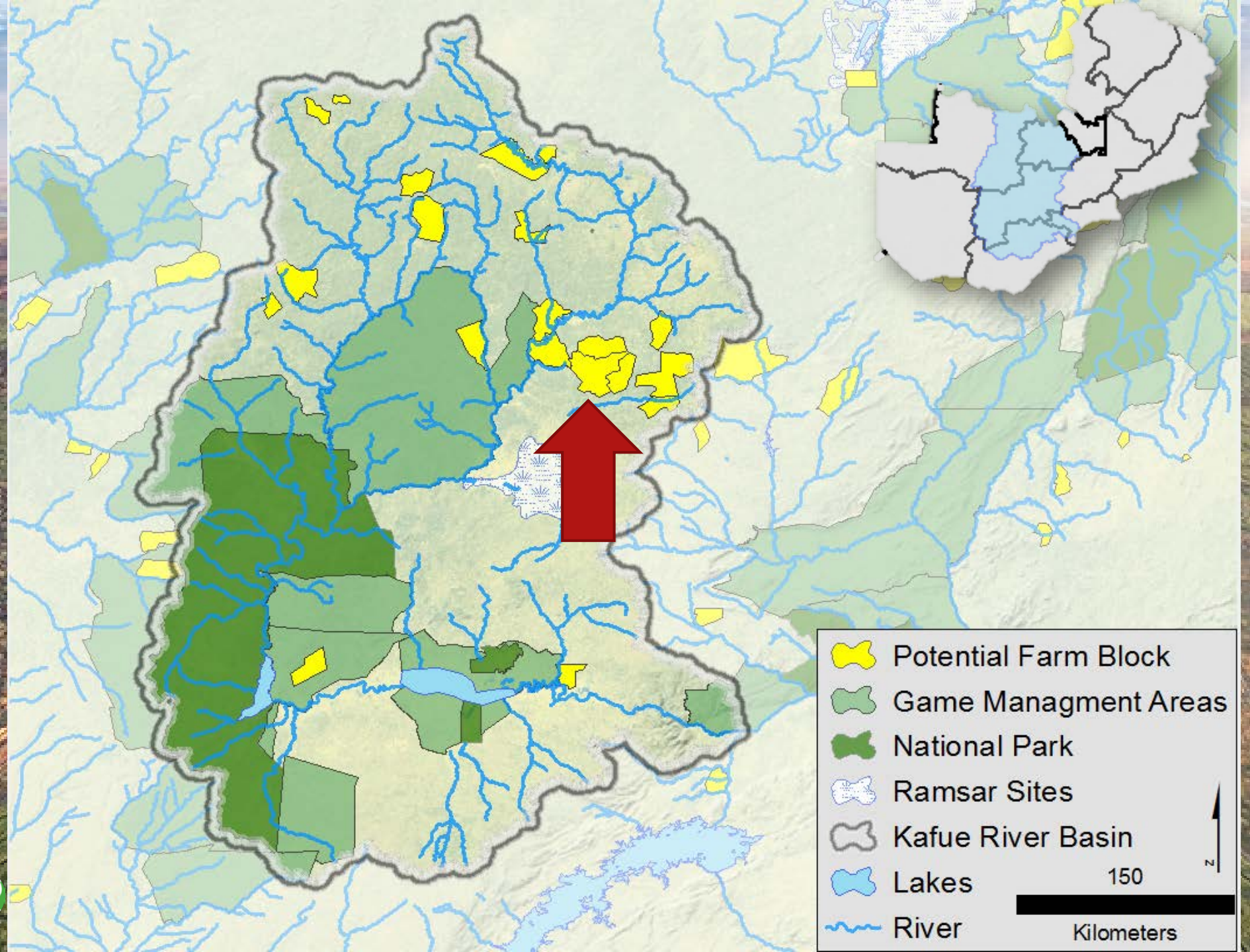

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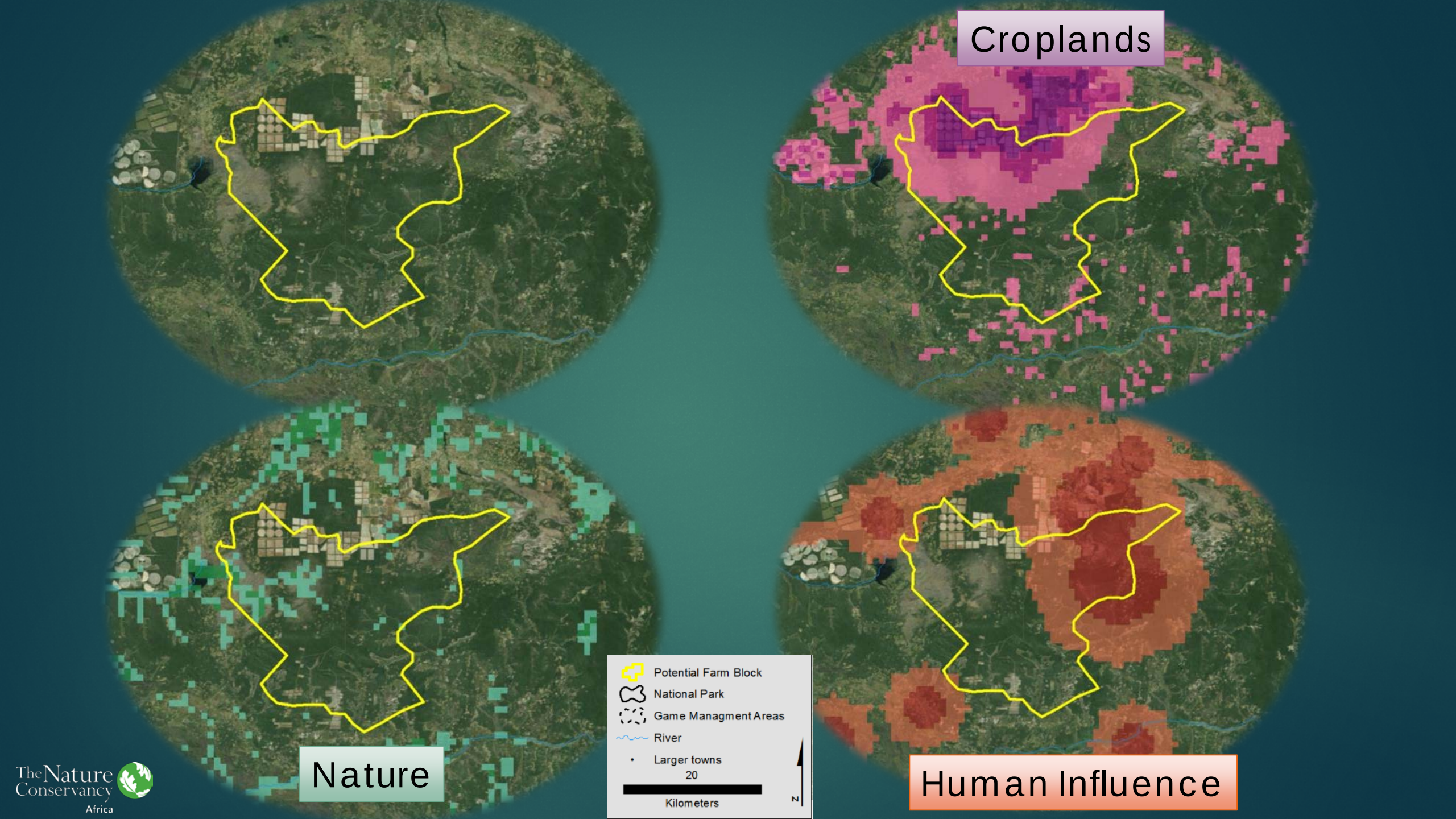
Photo: Stephen Robinson


Croplands
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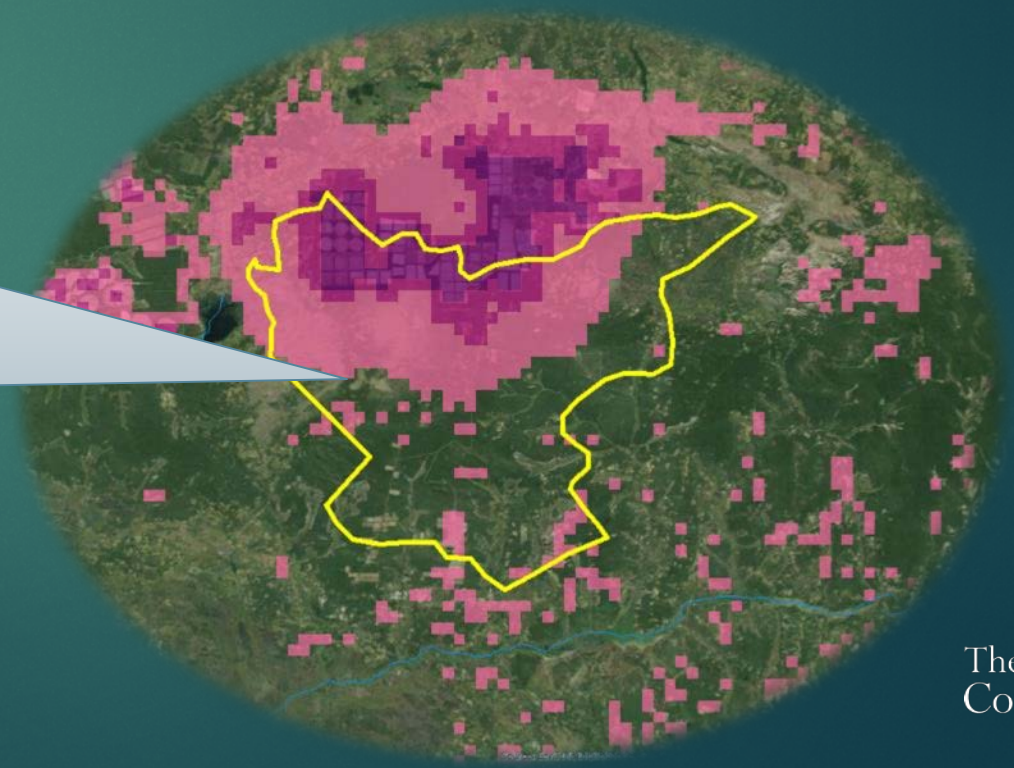
- 50% Extremely valuable Natural Resources (~200 km^2)
- Limited Crop Potential
- Limited nearby infrastructure

- <10 % Extremely valuable Natural Resources (~50 km^2)
- Great Crop Potential (>50%)
- Nearby existing crops and infrastructure for housing and transport



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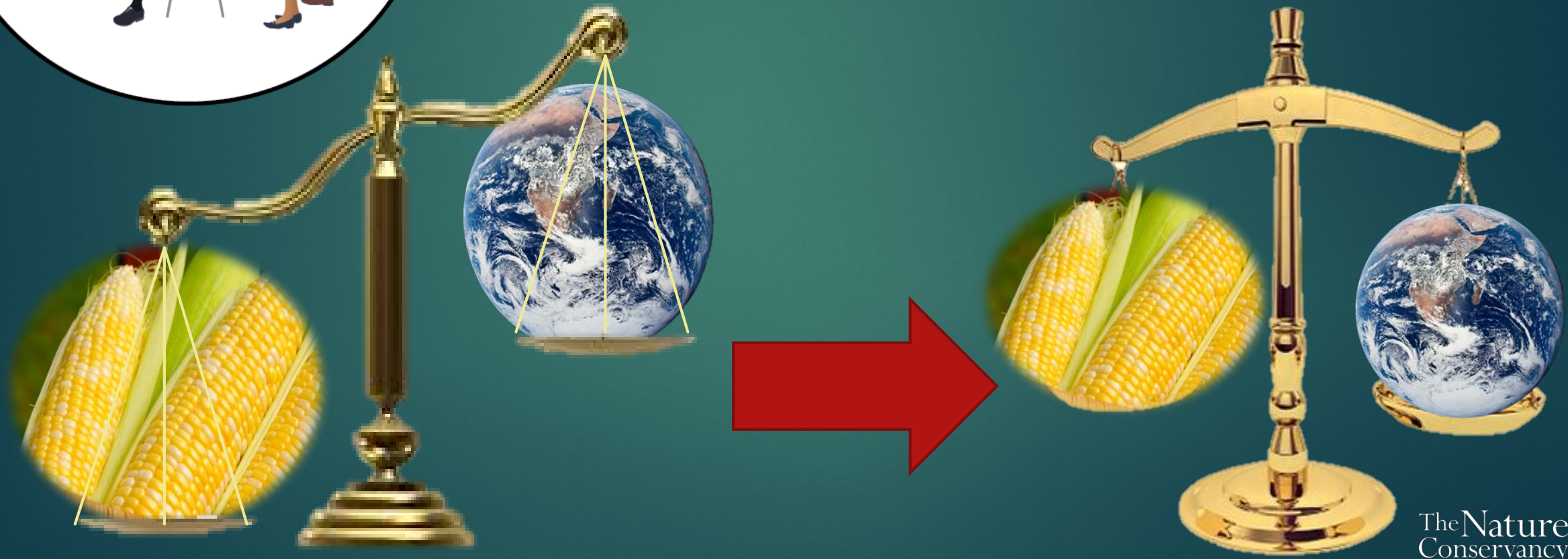
- Reconcile potential conflicts with trade-offs
- Explore implications of policies and land allocation
- Identify sites with the greatest likelihood of success



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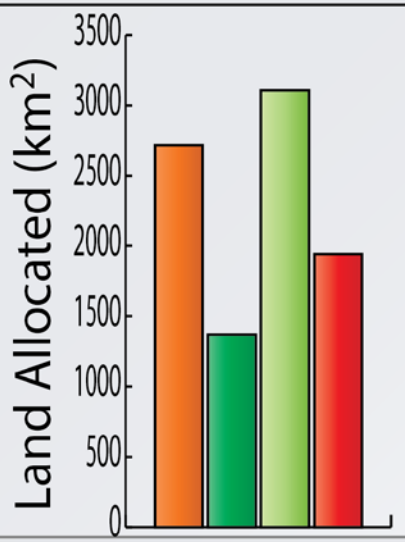
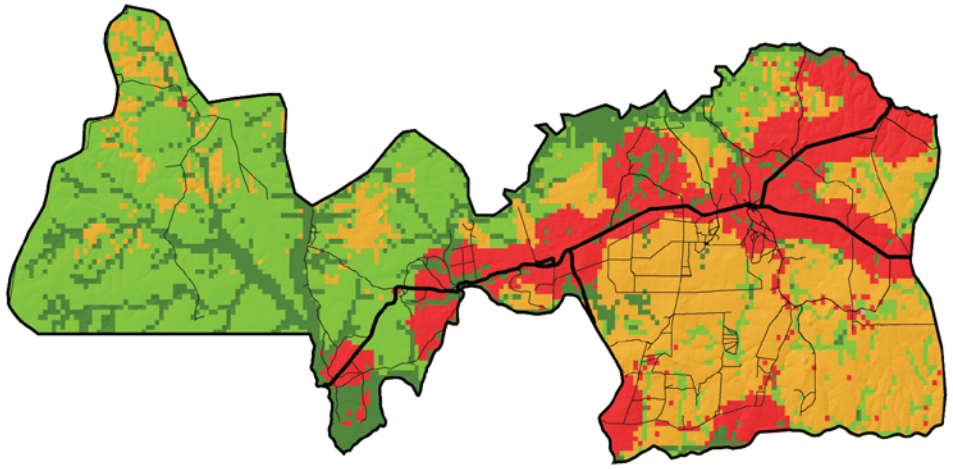
What are the Activities?

- Promote Crop Expansion
- Crops with Stronger Mitigation
- Retain Natural Resources
- Supporting Infastructure

How much land to allocate to each activity?

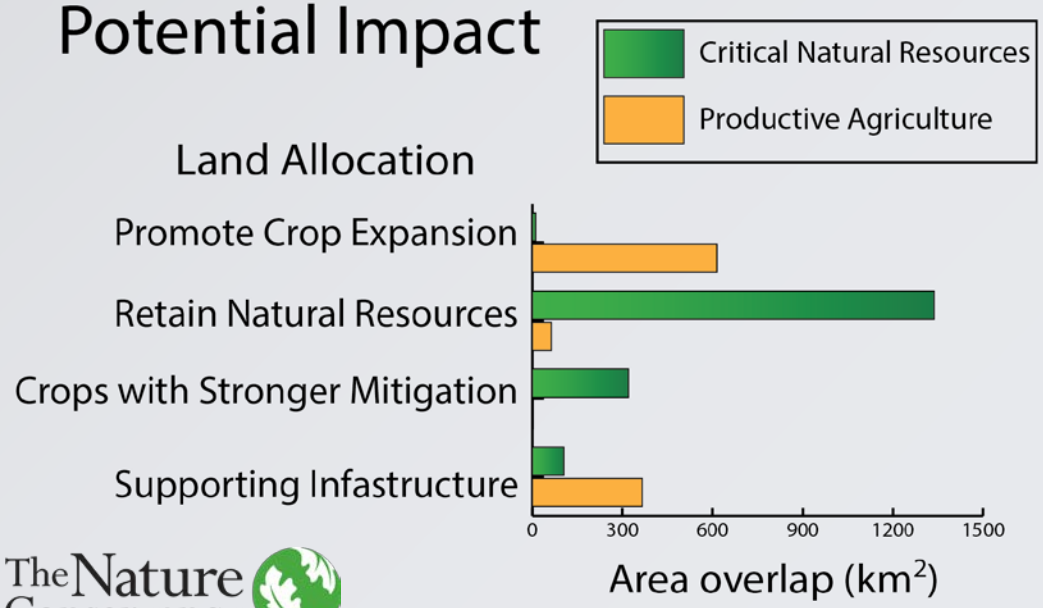




Best likelihood of success for each activity

Roads
- Dirt
- Paved

Potential Impact



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Valuable Natural Resources Retained

667 km² Riverine Ecosystem

Potential Habitat for 17 out of 20 species modeled
- Vulnerable: Ground Hornbill, Hippopotamus
- Near Threatened: Zebra, Duiker, Puku

Ecosytems Remain Intact
- 117 km² Chipya Woodland
- 487 km² Miombo Woodland
- 488 km² Grasslands

Offsets: Demonstrate how to implement offset process

Offsets:

Self-sustaining activities arriving at no net loss to natural resources or livelihoods

Photo: David Banks

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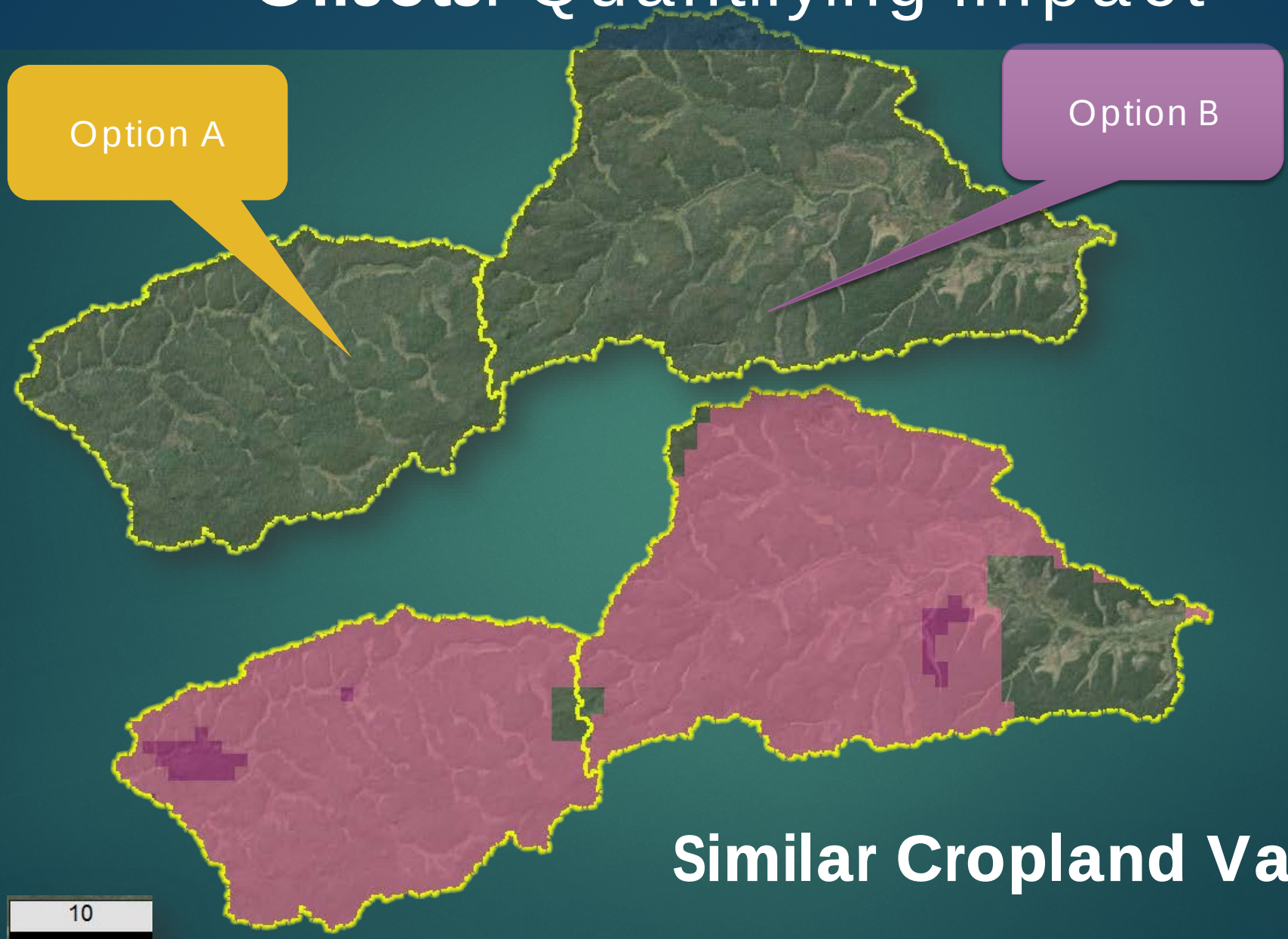
Offsets: Quantifying Impact



Similar Cropland Value

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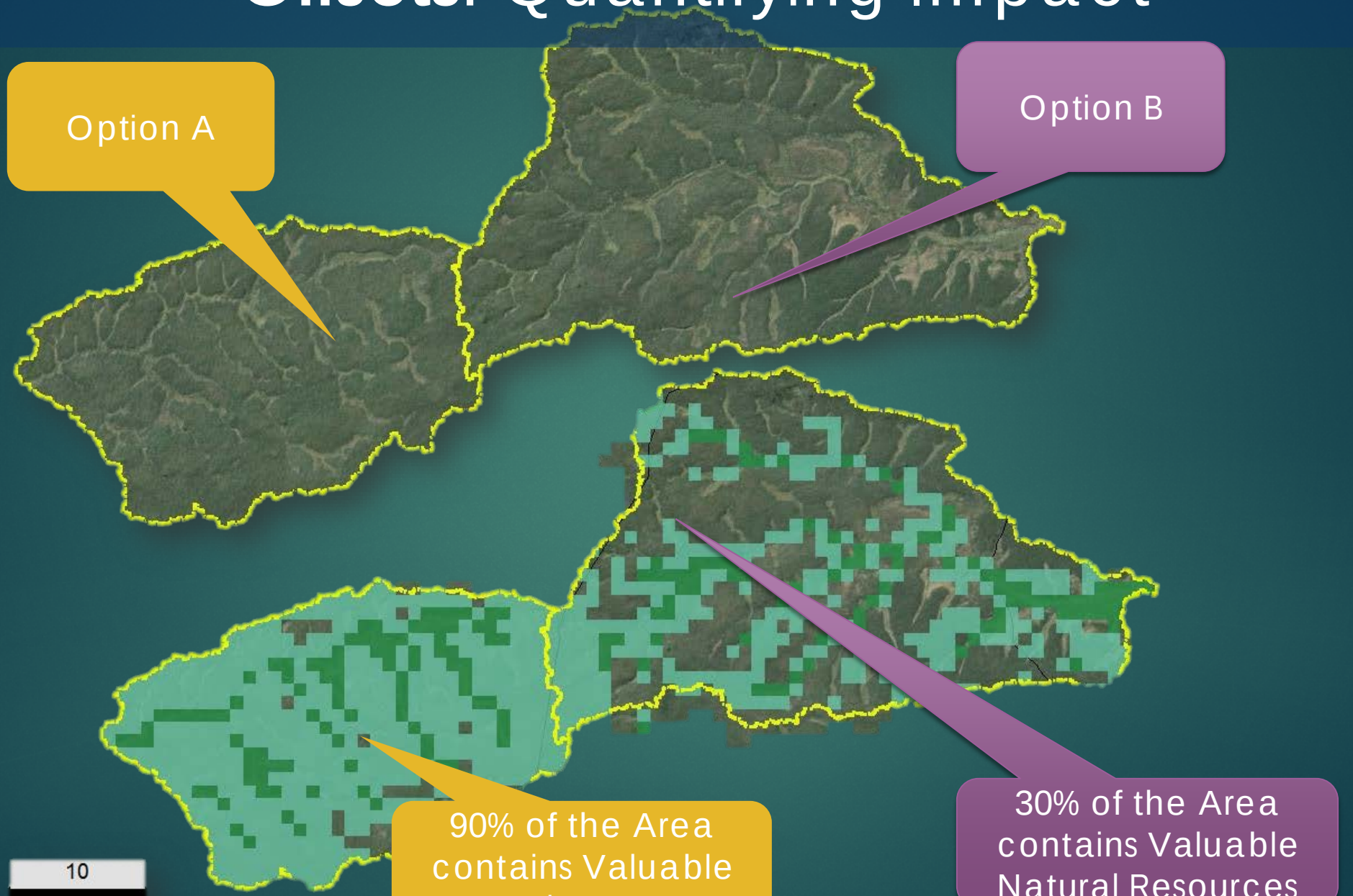
Offsets: Quantifying Impact



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Offsets: Quantifying Impact

- FarmField
- OfficeFacilities
- PivotField
- PowerPlant
- ProcessingFacilities
- Reservior
- Storage
- WaterTreatment
- Riverway

- Pipeline
- Dirt Road
- Paved Road

20

Kilometers

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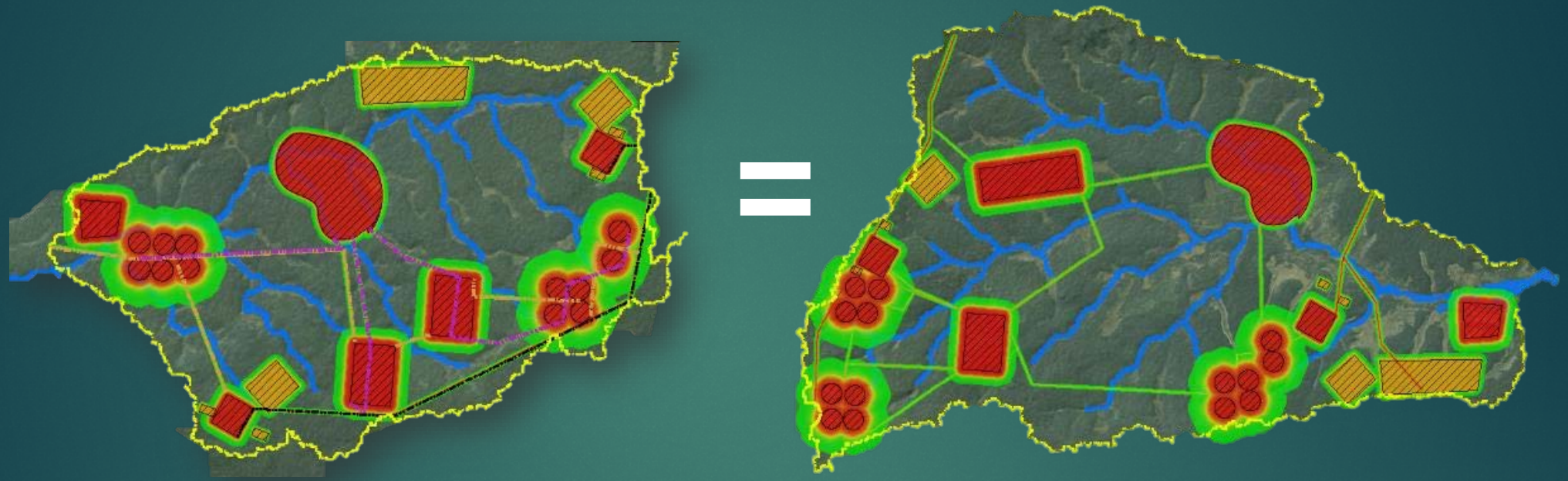
Offsets: Quantifying Impact

Option A

Option B



Quantify Direct and Indirect Impacts
Equal Amount of Land Disturbed

Direct Footprint

Land Disturbance

High

Low

Riverway

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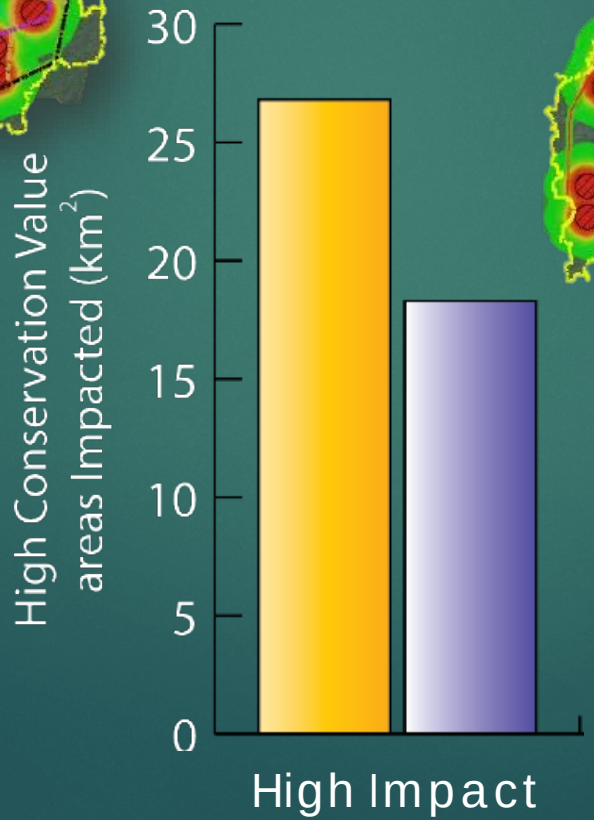
Offsets: Quantifying Impact

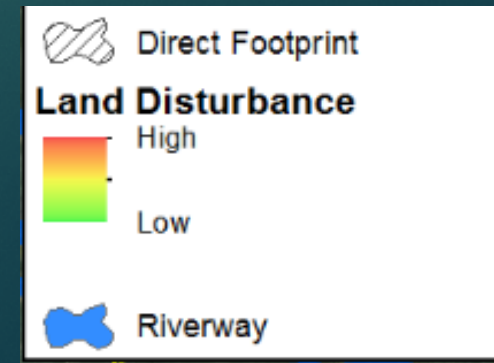
Option A

Nature

Option B

Greater Impact On Nature





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Offsets: Calculating Offset Cost

Amount Impact

Impact Severity

Offset Rates

offset Units

Cost/Unit

Total Offset Compensation

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Offsets: Compensation

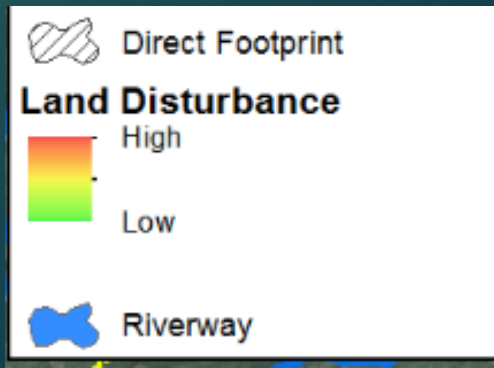
Option A

Option B

Offset Cost

$62,000

$3,000



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Endeavors in Zambia

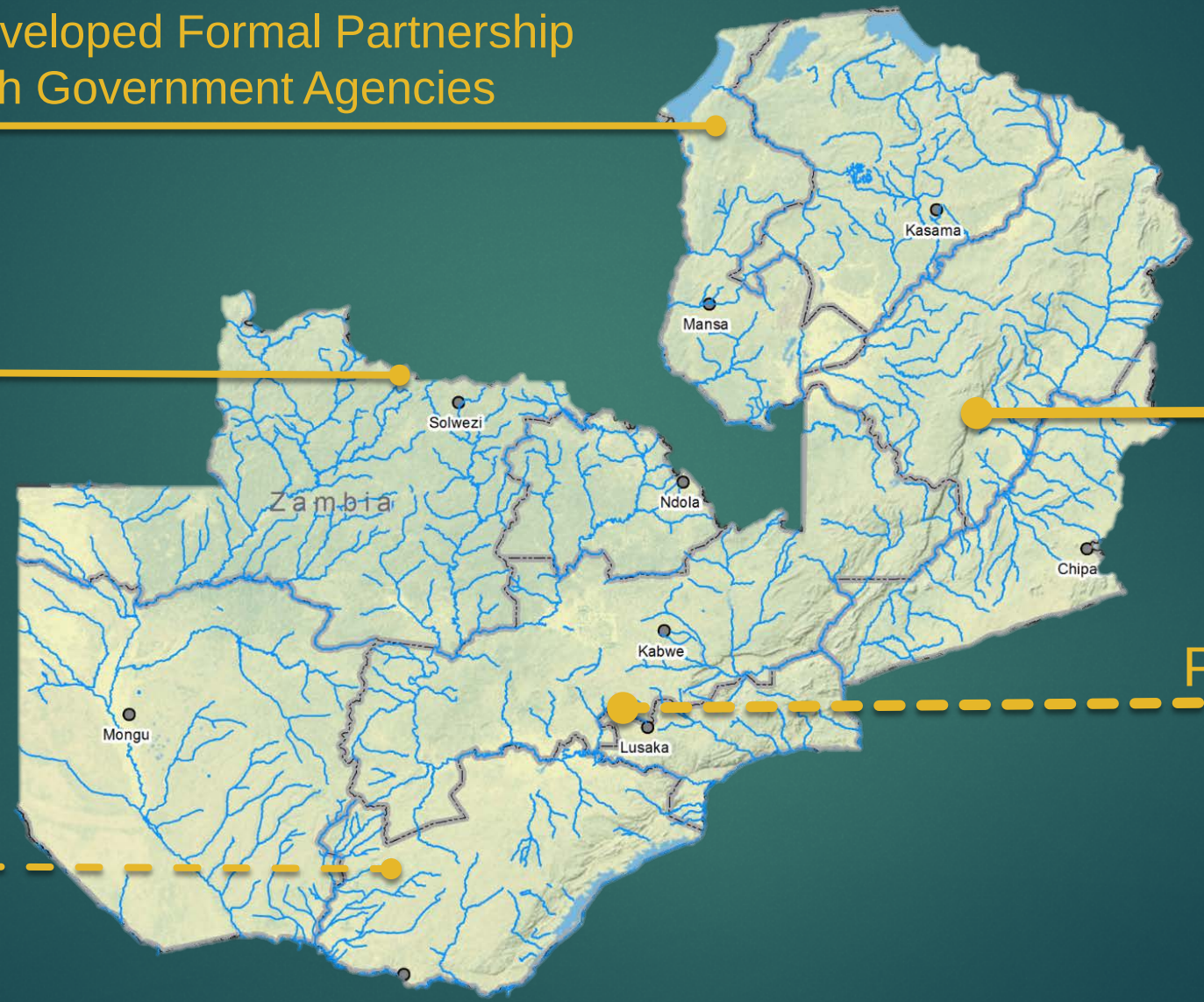
Developed Formal Partnership with Government Agencies

Identified Policies Align with DbD

Created & Vetted Spatial Products

Illustrate DbD Planning Process

Refine Regulations



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Development By Design: Creating Win-win situations

- **Science to better** inform decision makers
- **Offer** a self-sustaining solution to Protect Natural Capital
- **Aligning** economic & social value of planned development with conservation

Photo: Timothy Boucher

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QUESTIONS

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Photo: Timothy Boucher

For More Information

- Smart Growth/Development by Design
  - www.nature.org/ourinitiatives/urgentissues/land-conservation/smart-development
- Zambia Program, The Nature Conservancy
  - www.nature.org/ourinitiatives/regions/africa/wherewework/zambia.xml
- Kenyan Program, The Nature Conservancy
  - https://www.nature.org/ourinitiatives/regions/africa/wherewework/kenya.xml
- The Nature Conservancy
  - www.nature.org

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