

An aerial photograph showing a wide, winding river with a light-colored, silty water flow. The river meanders through a landscape of agricultural fields, some of which are vibrant green, while others are brown or tan, suggesting different crops or stages of land use. The fields are separated by thin lines of roads or fences. In the background, there are rolling hills and some clouds in the sky. The overall scene is a rural, agricultural landscape.

Diagnostic Screening for Prioritizing
Water Fund Investments:
Introduction and Discussion of Models and
Ranking Approaches As Tools

The Role of Diagnostic Screening

Where are good places to start new water funds?
Where are good places to invest within a fund?

Which are the best places to invest in first?



The Role of Diagnostic Screening

Where are good places to invest within a fund?

Which are the best places to invest in first?



The Role of Diagnostic Screening

Where to do *what things*?

Where would the best places be to protect?

Where would the best places be to restore?

Where would the best places be to educate?

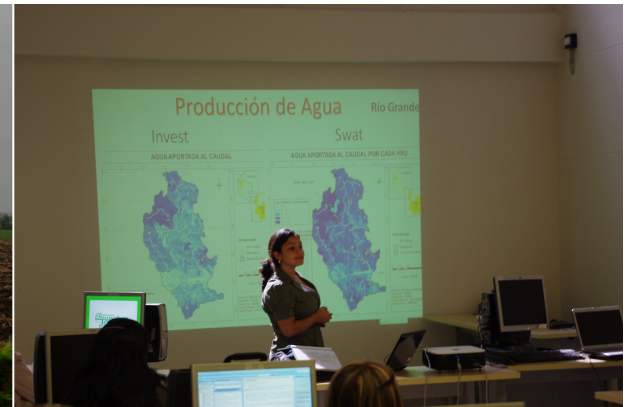
The Role of Diagnostic Screening

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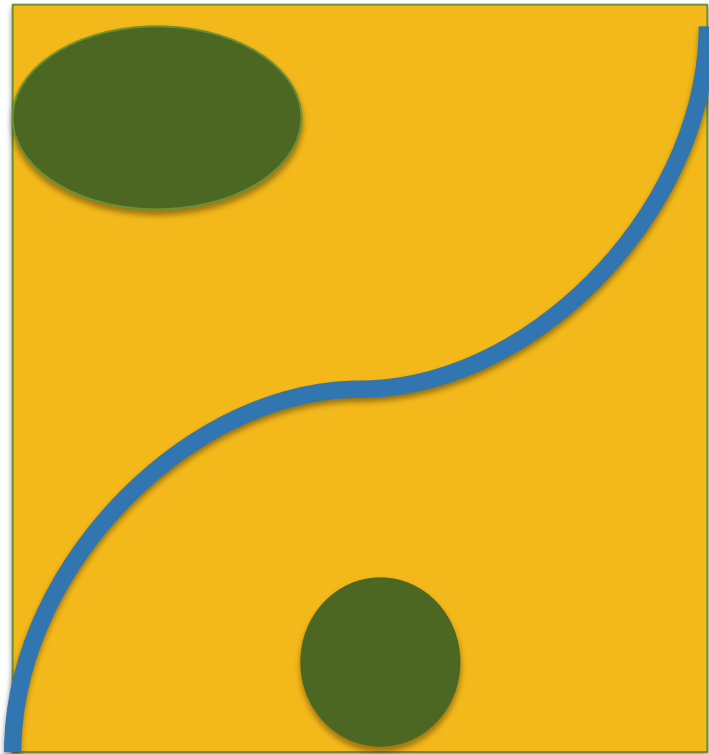
Where would the best places be to educate?



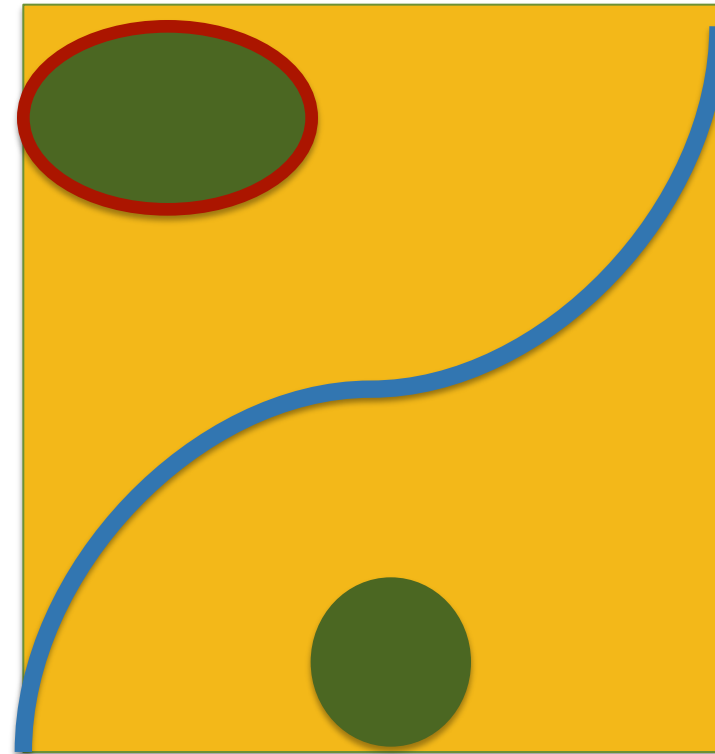
The Role of Diagnostic Screening

Protection keeps the landscape the same: current is good

Current Habitat



Protect Current Habitat

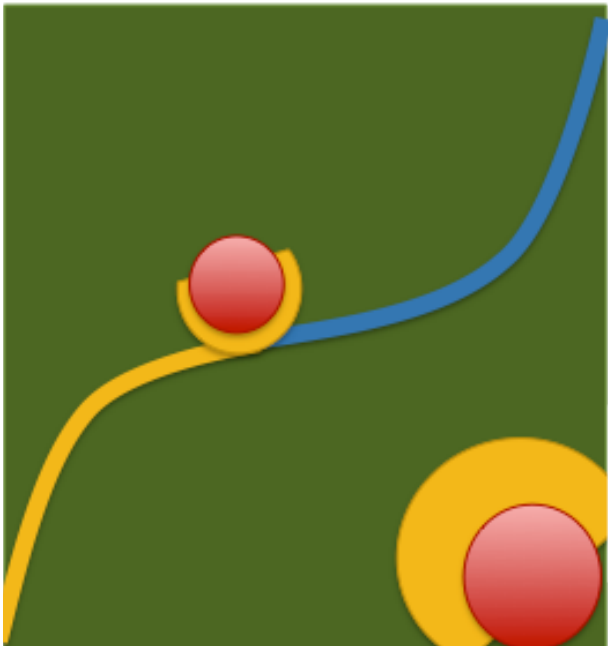


The Role of Diagnostic Screening

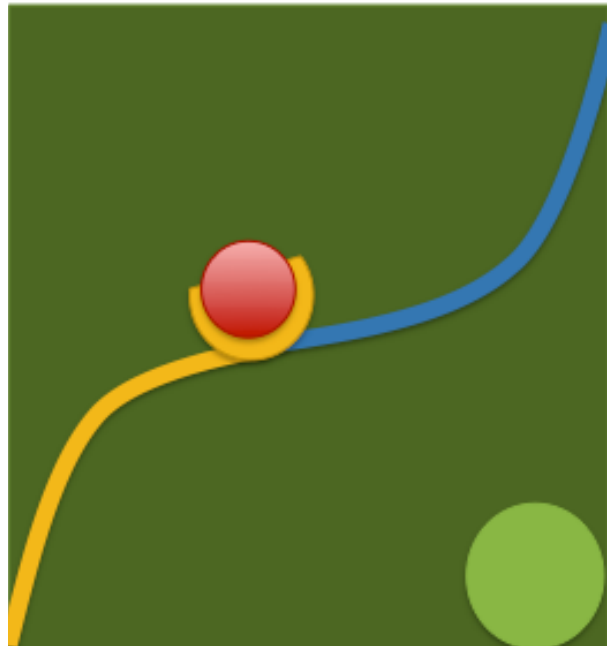
Protection keeps the landscape the same: current is good

Restoration changes the landscape: current is not good

Current Source



Restore Biggest Source

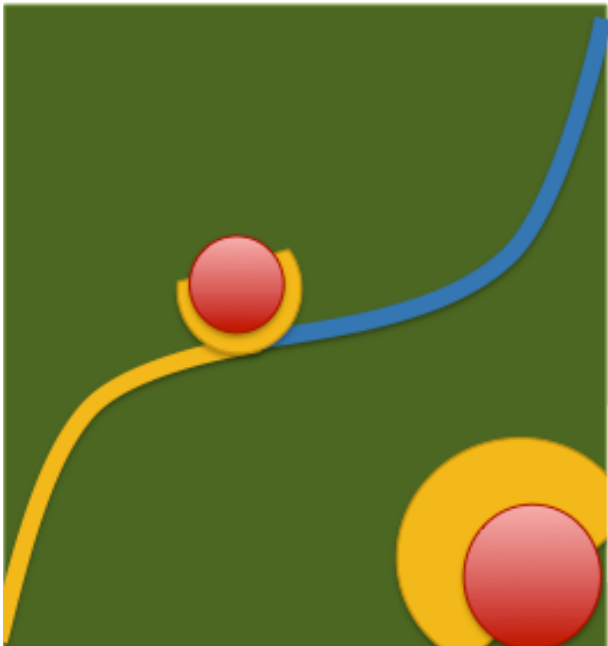


The Role of Diagnostic Screening

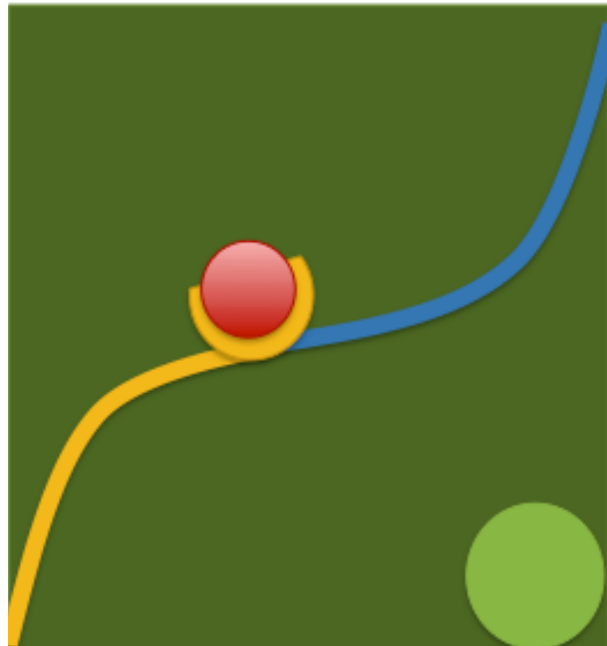
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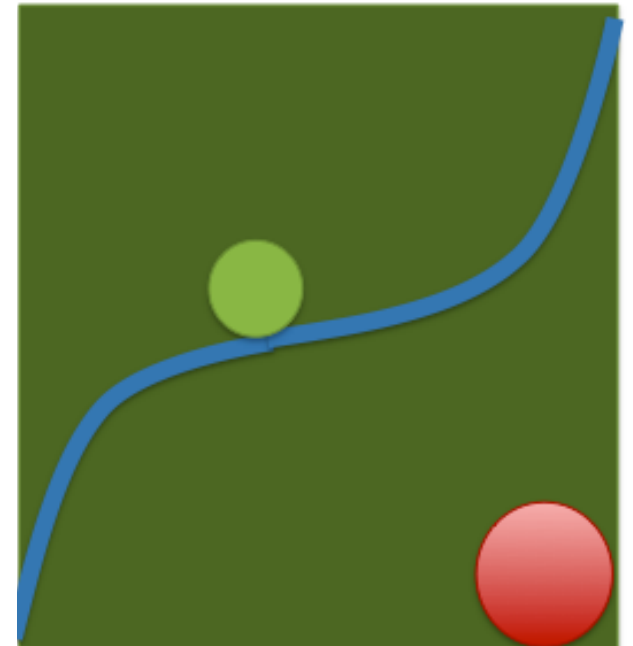
Current Source



Restore Biggest Source

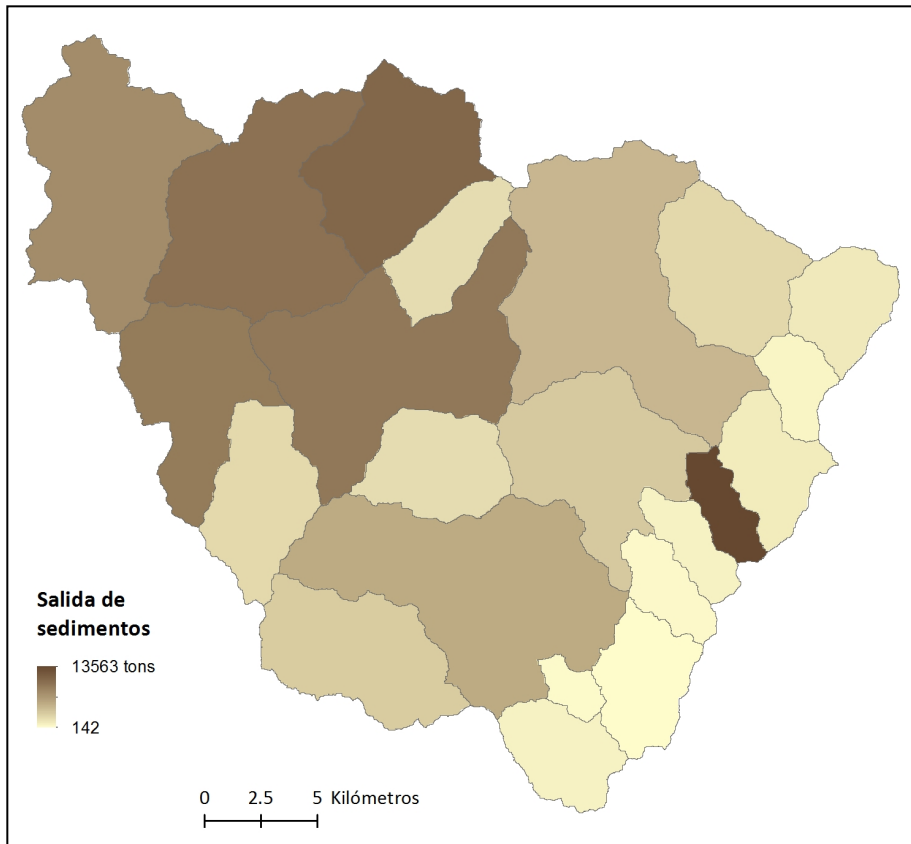


Restore Best Place

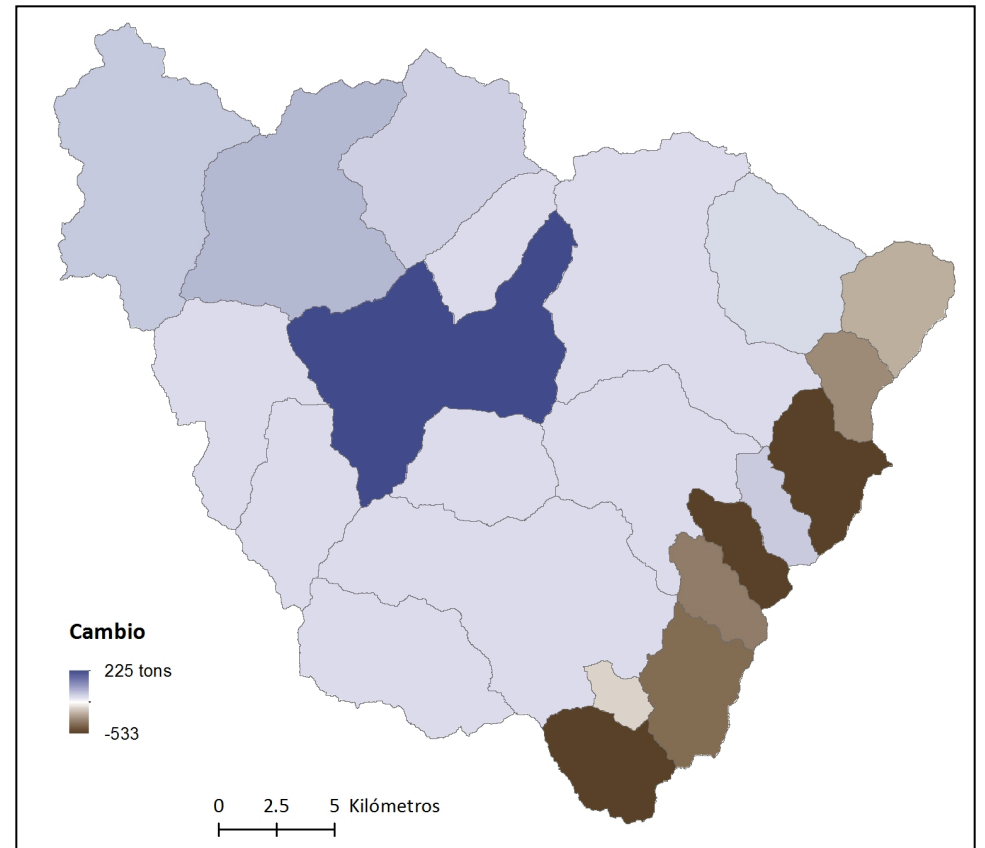


A Real Example: Tuluá Watershed

Current Source

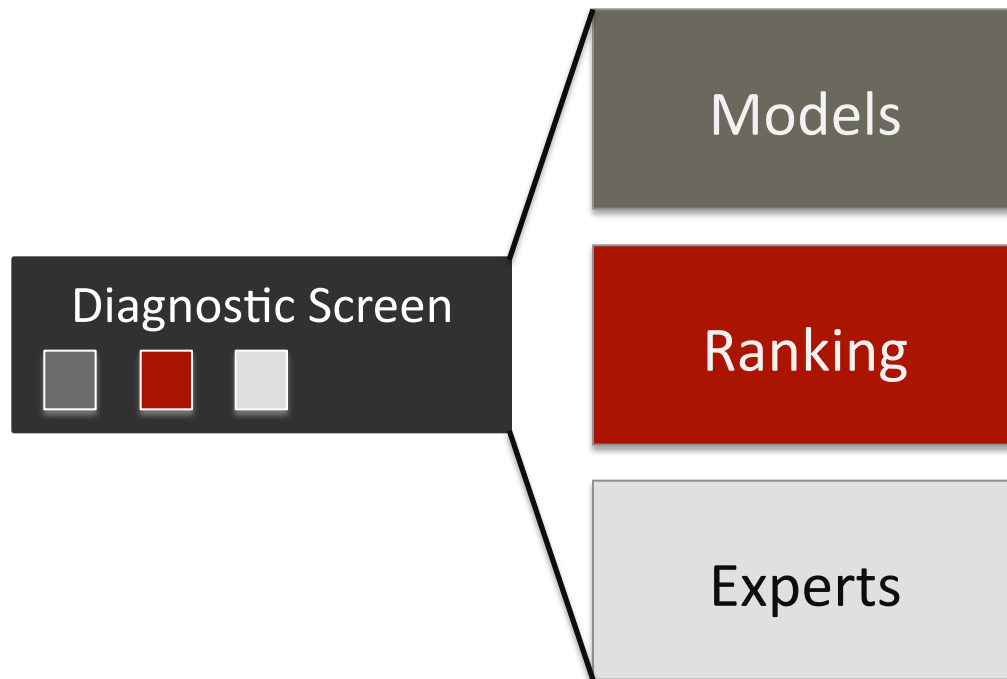


Best Places to Restore

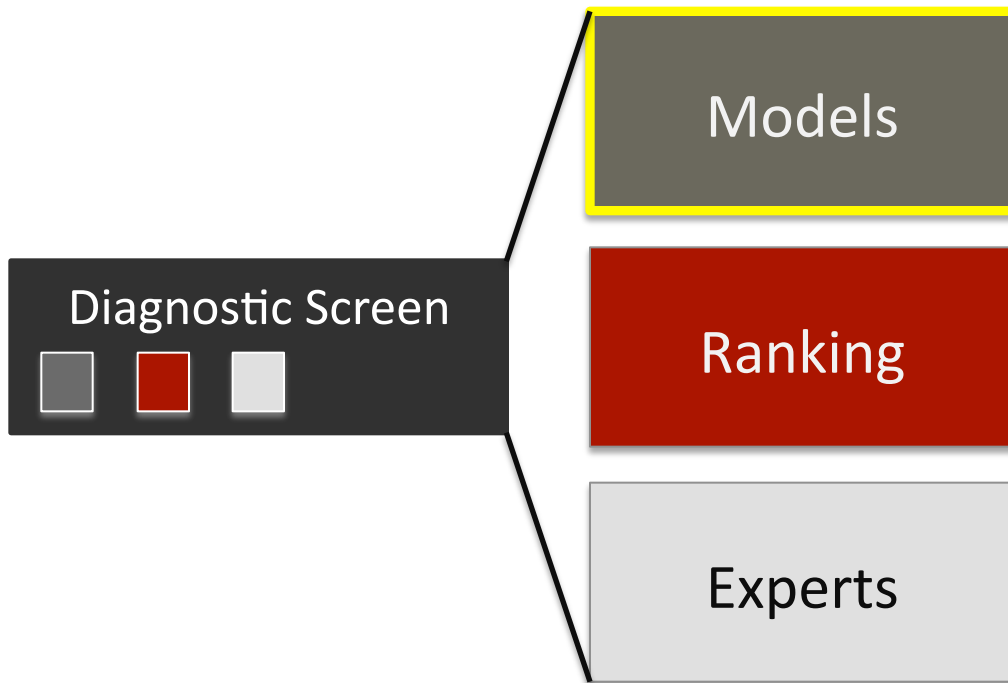


When restoration is involved, we need to think about *change*

Options for Diagnostic Screening



Options for Diagnostic Screening



Models for Finding the Best Places for Change

Predicting Social Change

- Agent-based models
- Others?

Predicting Biodiversity Change

- Meta-population models
- Matrix models
- Others?

Predicting Ecosystem Service Change

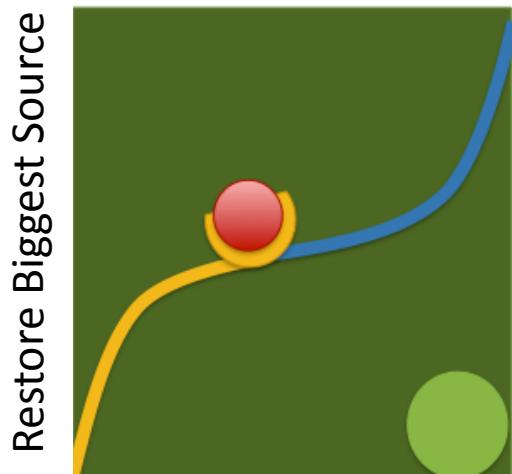
- Biophysical models
- Linked biophysical-economic models
- Others?

Models for Finding the Best Places for Change

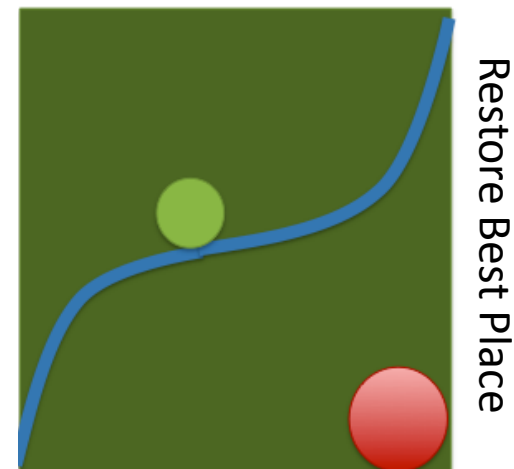
Soil & Water Assessment Tool | **SWAT**



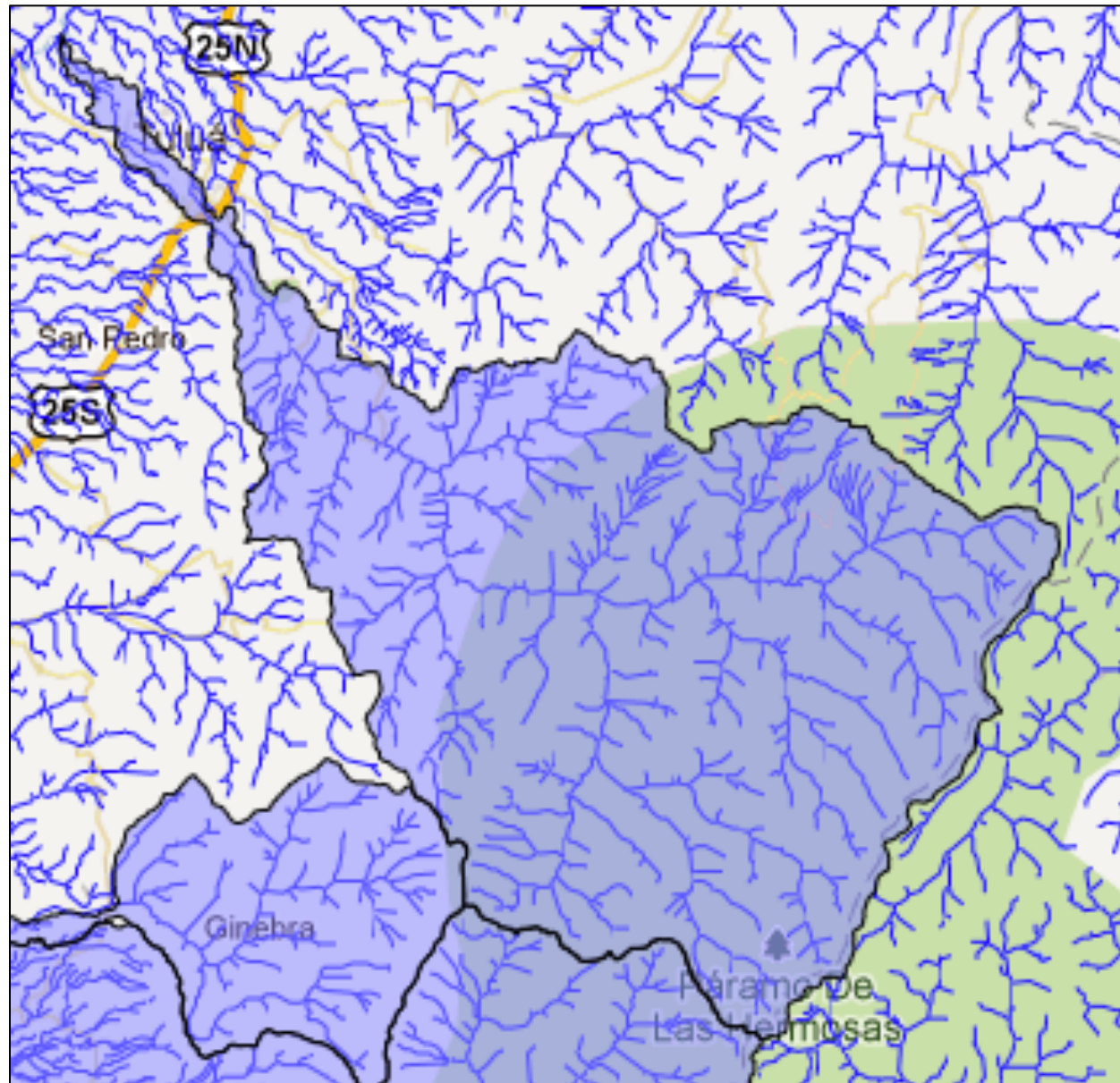
USLE + Transport factor



USLE + Routing and Retention



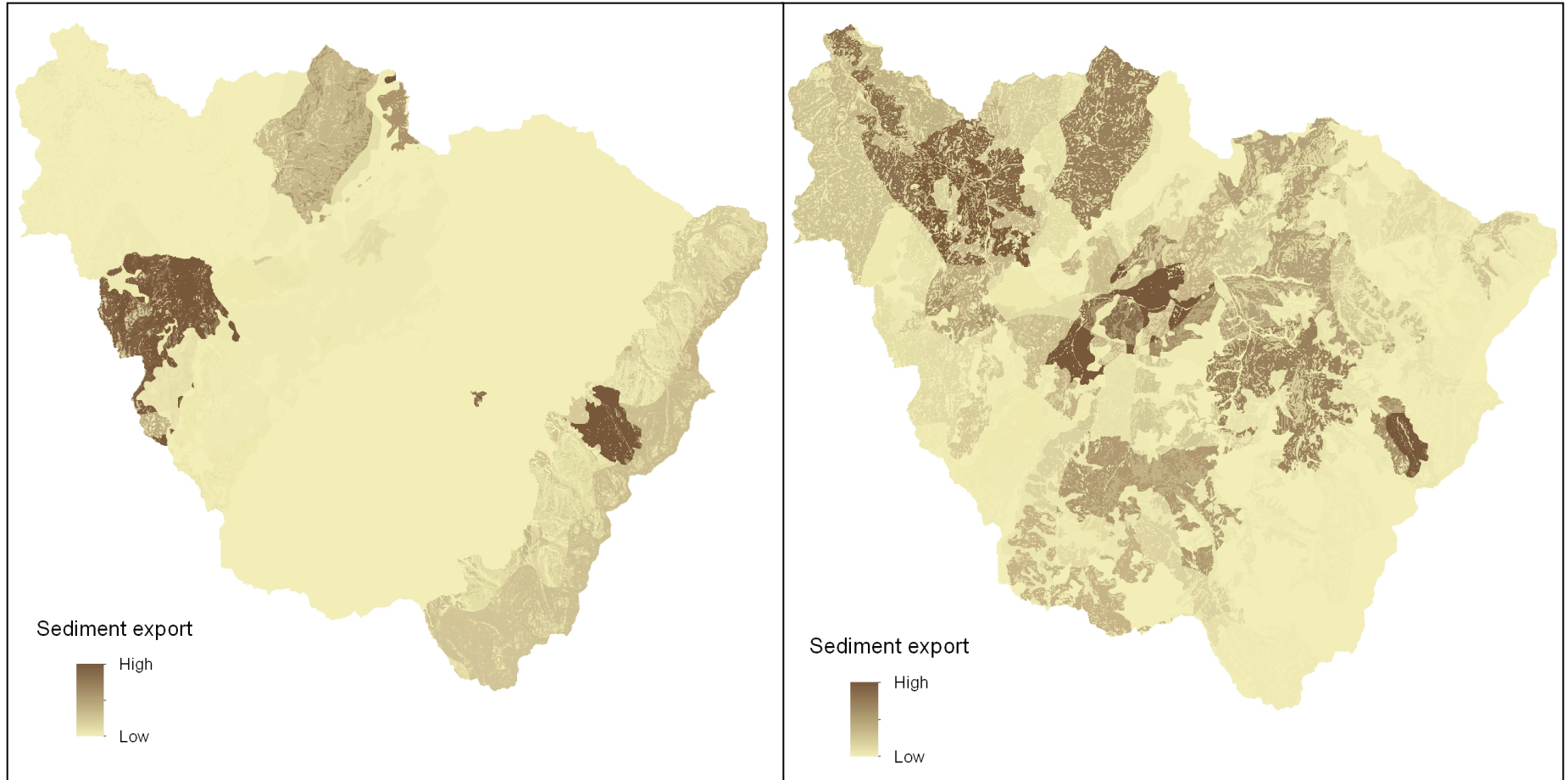
Models for Finding the Best Places for Change



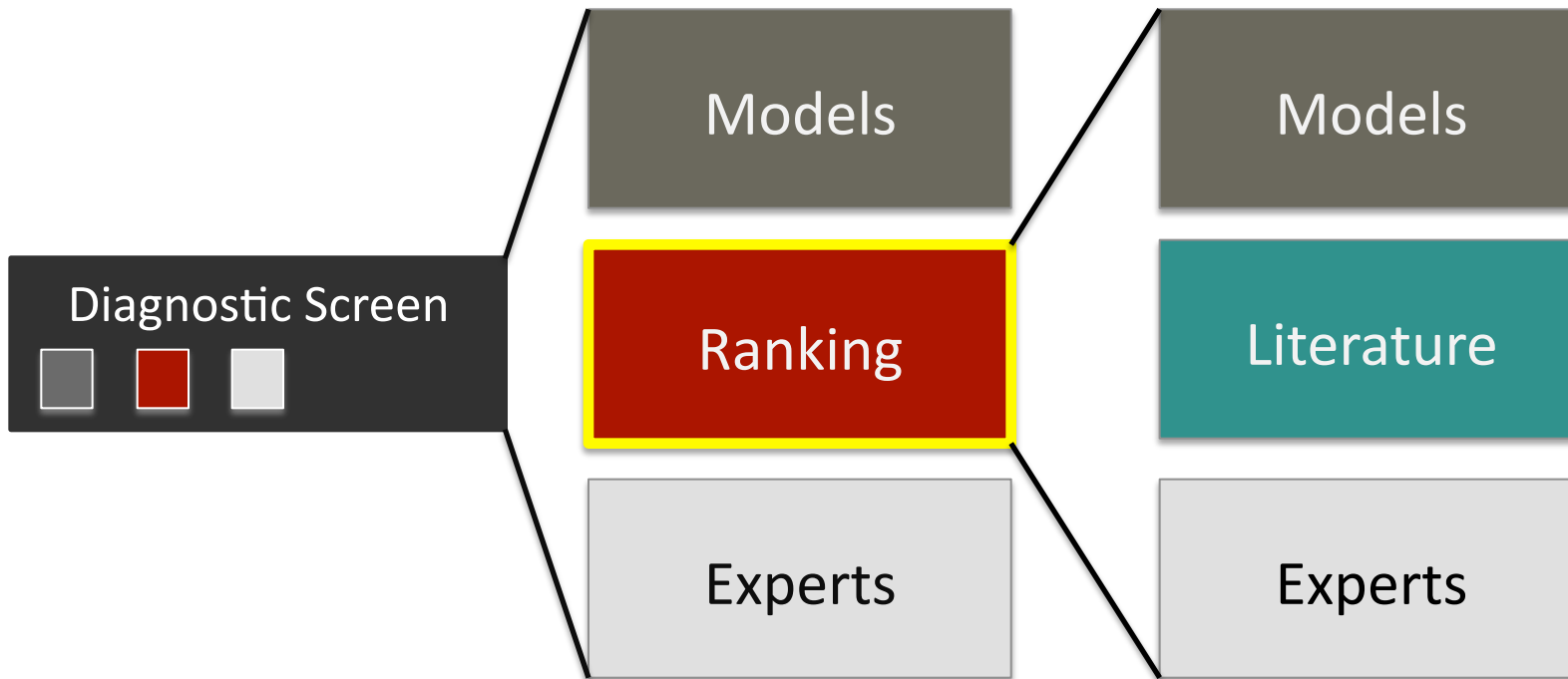
Models for Finding the Best Places for Change

SWAT

InVEST

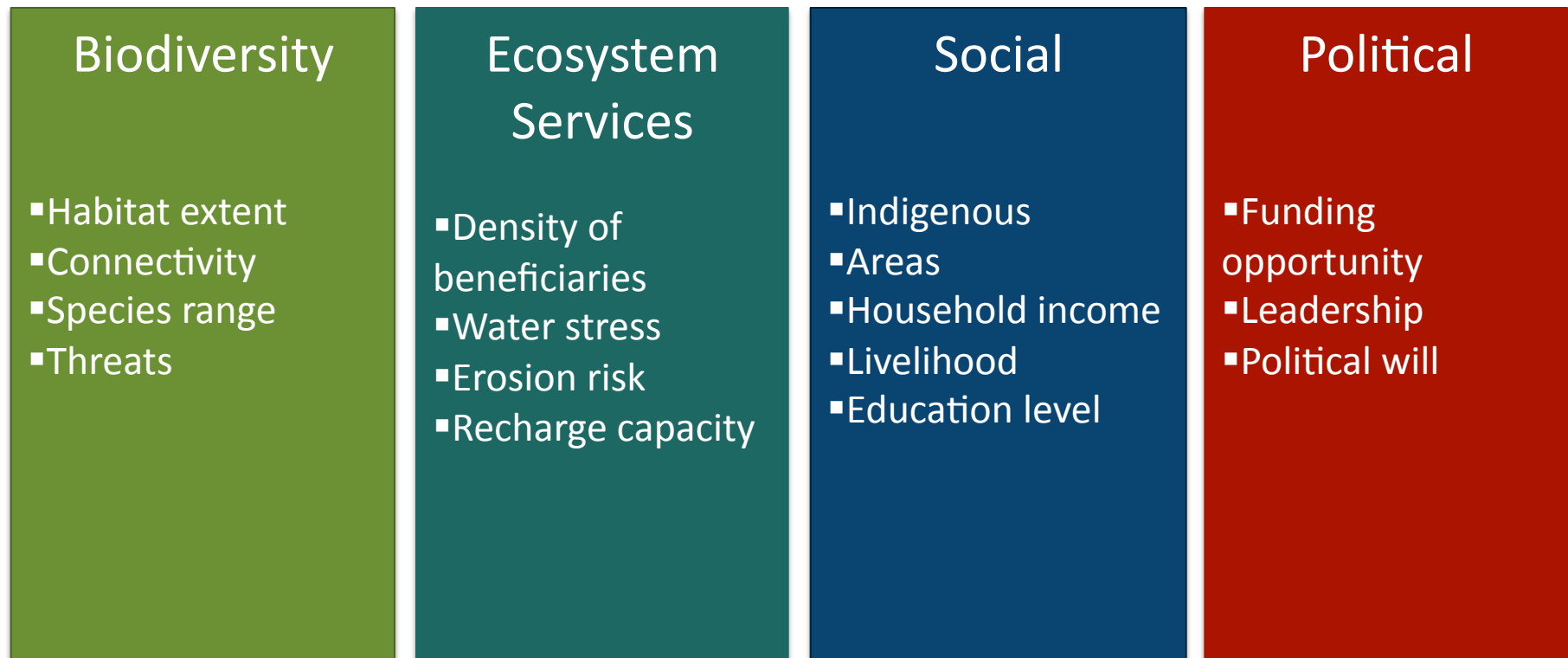


Options for Diagnostic Screening



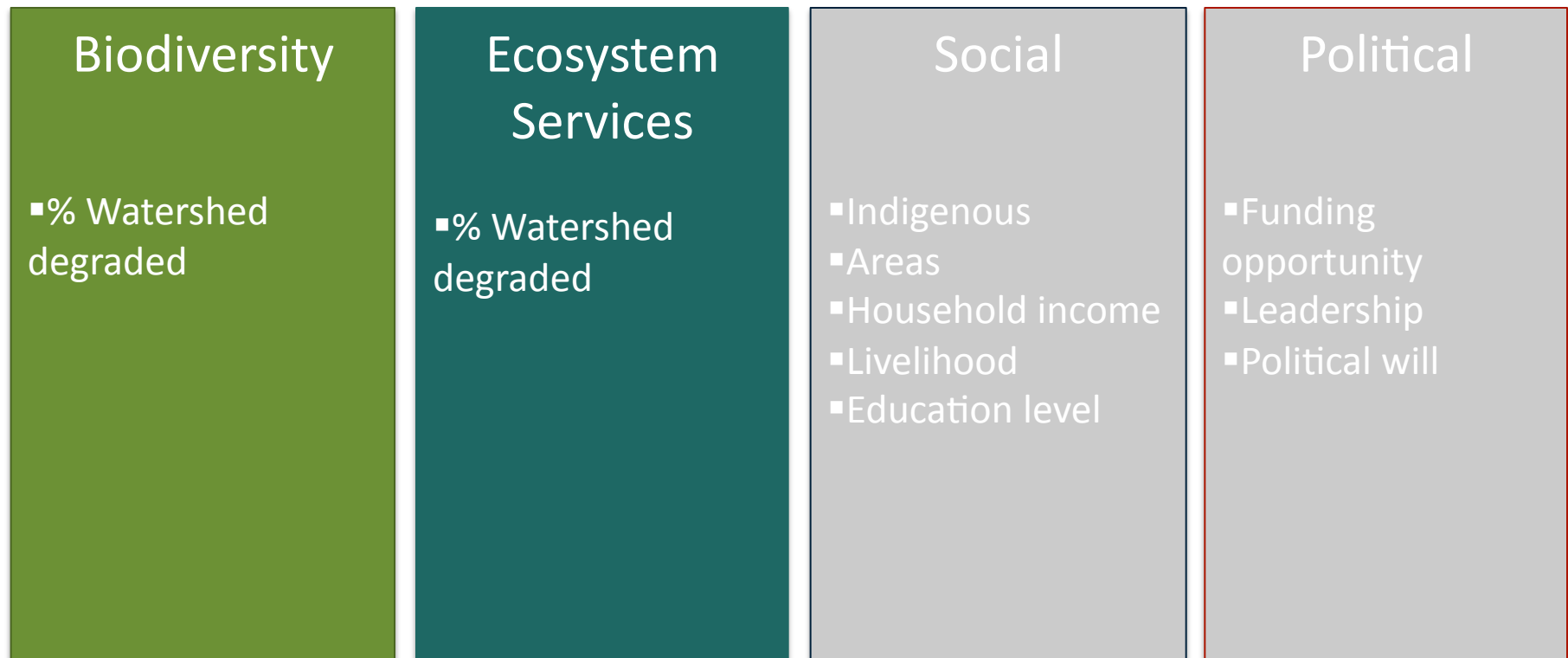
Ranking Approach

Relative scoring of the landscape



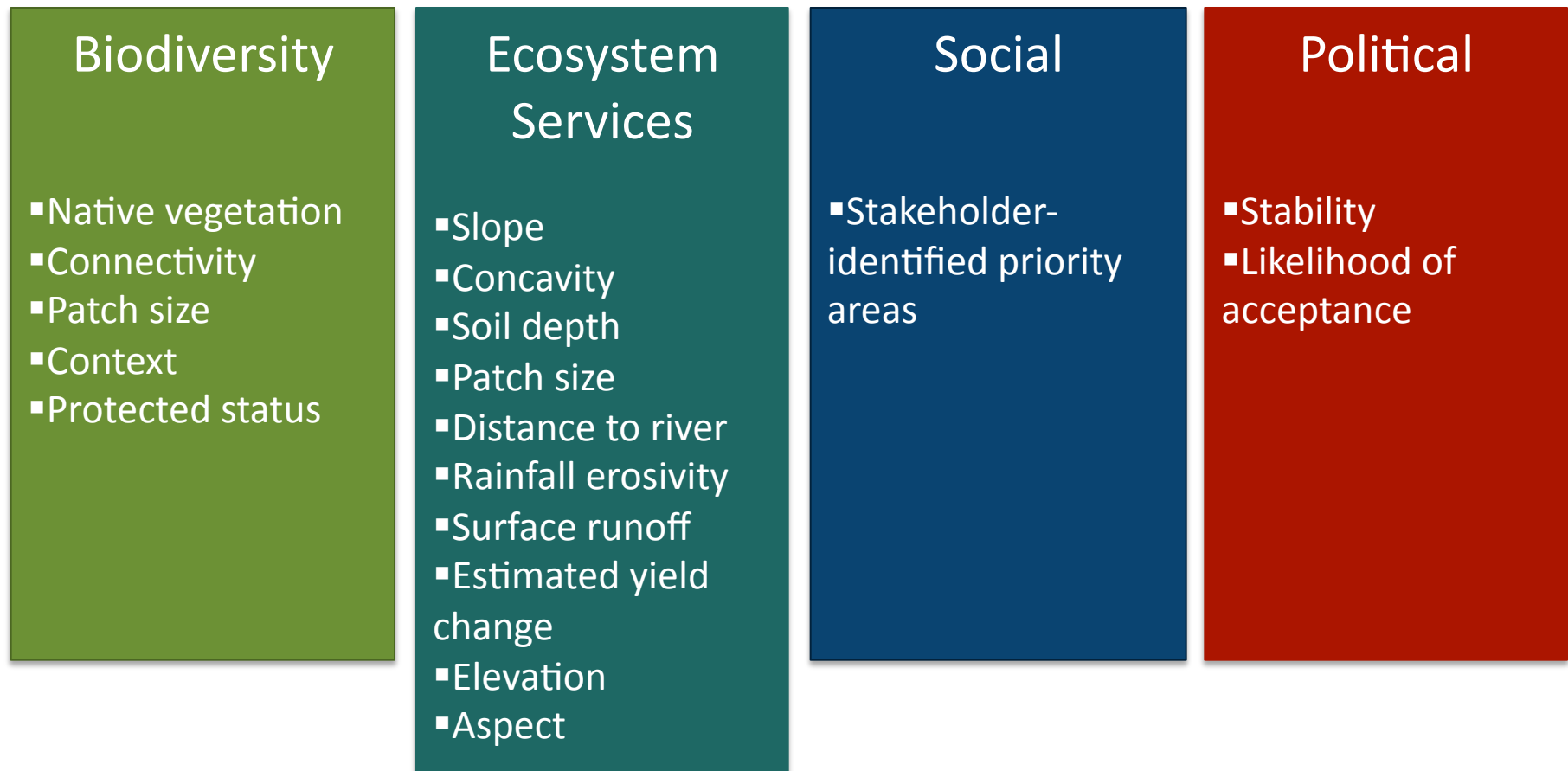
Ranking Approach

Relatively simple: Brazilian cases

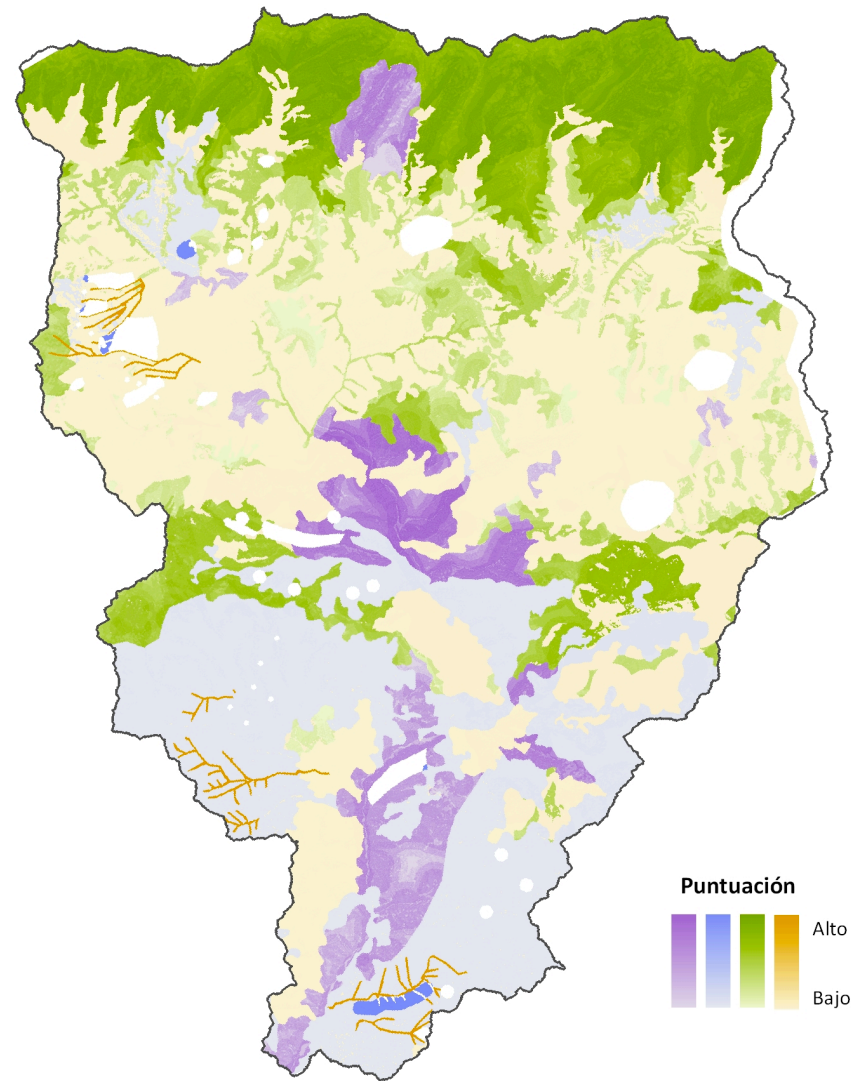
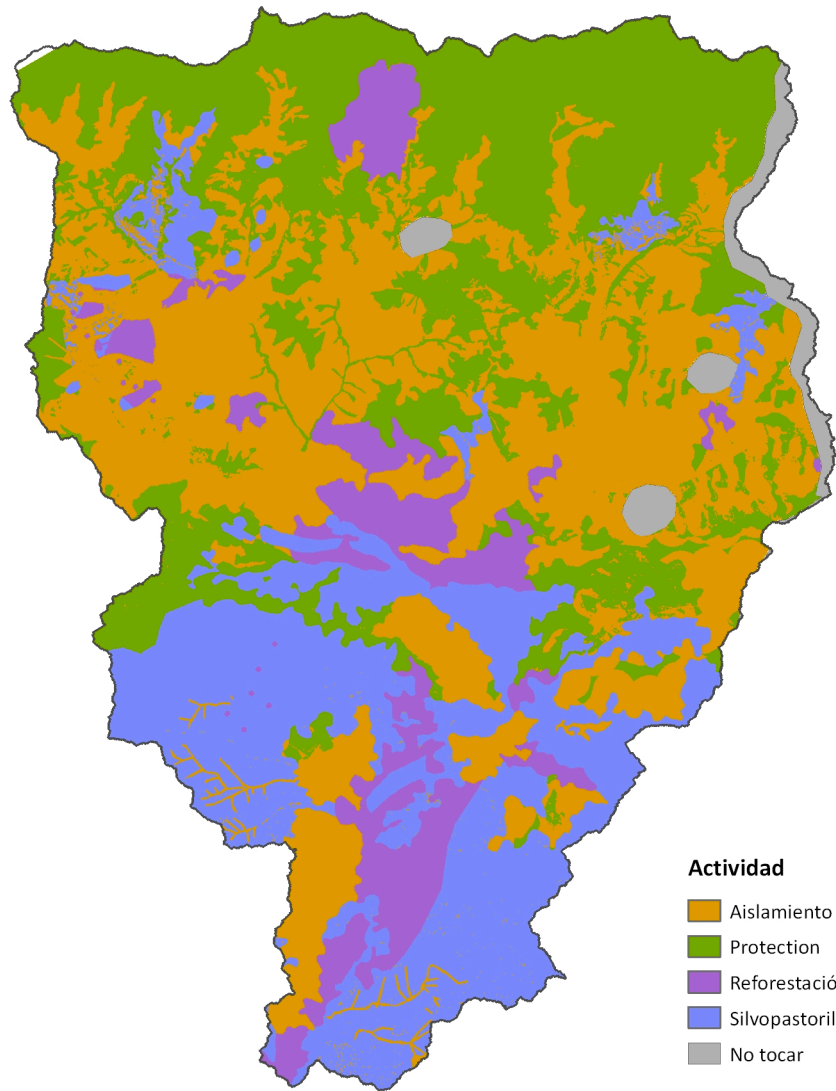


Ranking Approach

Relatively complicated: Cauca Valley



Ranking Approach



Options for Ecosystem Service Diagnostic Screening

	SWAT-type Models	InVEST-type Models	Ranking
Strengths	<ul style="list-style-type: none">▪ Can do 1 scenario of change and find priority areas	<ul style="list-style-type: none">▪ Priority areas are best places to restore	<ul style="list-style-type: none">▪ Can be very simple▪ If focused on change, priority areas are best places to restore
Weaknesses	<ul style="list-style-type: none">▪ Priority areas are biggest sources, not best places to restore	<ul style="list-style-type: none">▪ Need to do millions of runs (<i>unless concrete scenarios are available</i>)	<ul style="list-style-type: none">▪ Relative scoring, no absolute estimates of benefits

Discuss Guidance for Diagnostic Screening

Should the question of where to work be action-specific?

Current

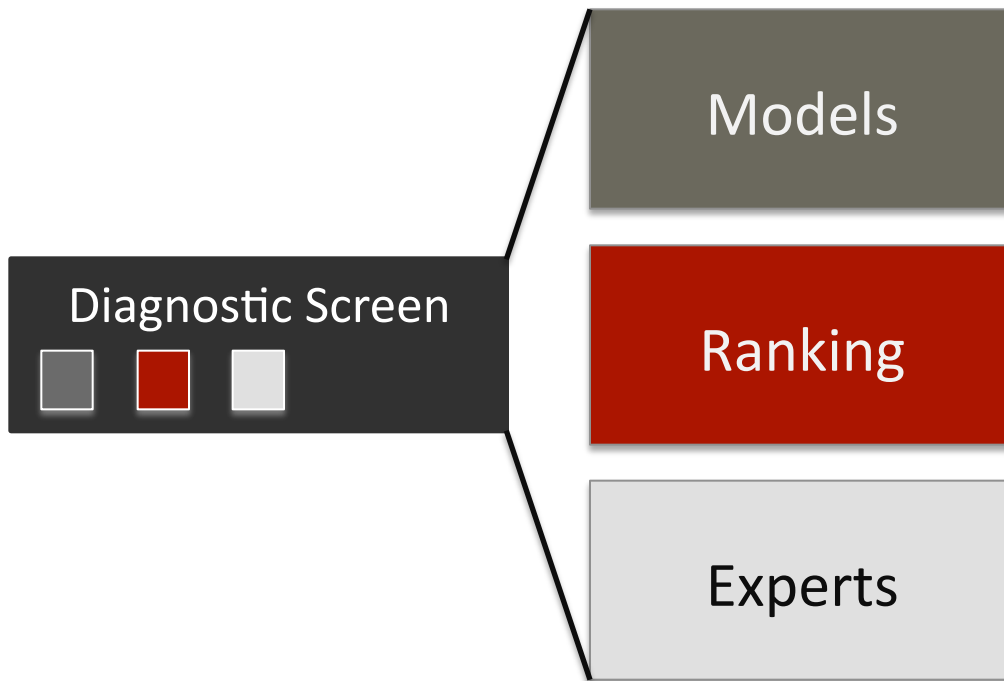
Where are good places to start new water funds?
Where are good places to invest within a fund?

Recommended?

Where would the best places be to *protect*?
Where would the best places be to *restore*?
.....
Where would the best places be to *educate*?
Where would the best places be to *fence*?

⋮

Discuss Options for Diagnostic Screening



Are there options missing?

Discuss Options for Diagnostic Screening

Do we want to recommend certain options?

	SWAT-type Models	InVEST-type Models	Ranking	Expert Opinion
Strengths	<ul style="list-style-type: none">Can do 1 scenario of change and find priority areas	<ul style="list-style-type: none">Priority areas are best places to restore	<ul style="list-style-type: none">Can be very simple or complexIf focused on change, priority areas are best places to restore	<ul style="list-style-type: none">Can be very simple
Weaknesses	<ul style="list-style-type: none">Priority areas are misleading for restoration	<ul style="list-style-type: none">Need to do millions of runs (<i>unless concrete scenarios are available</i>)	<ul style="list-style-type: none">Relative scoring, no absolute estimates of benefits	<ul style="list-style-type: none">Hard to replicate or make consistent