

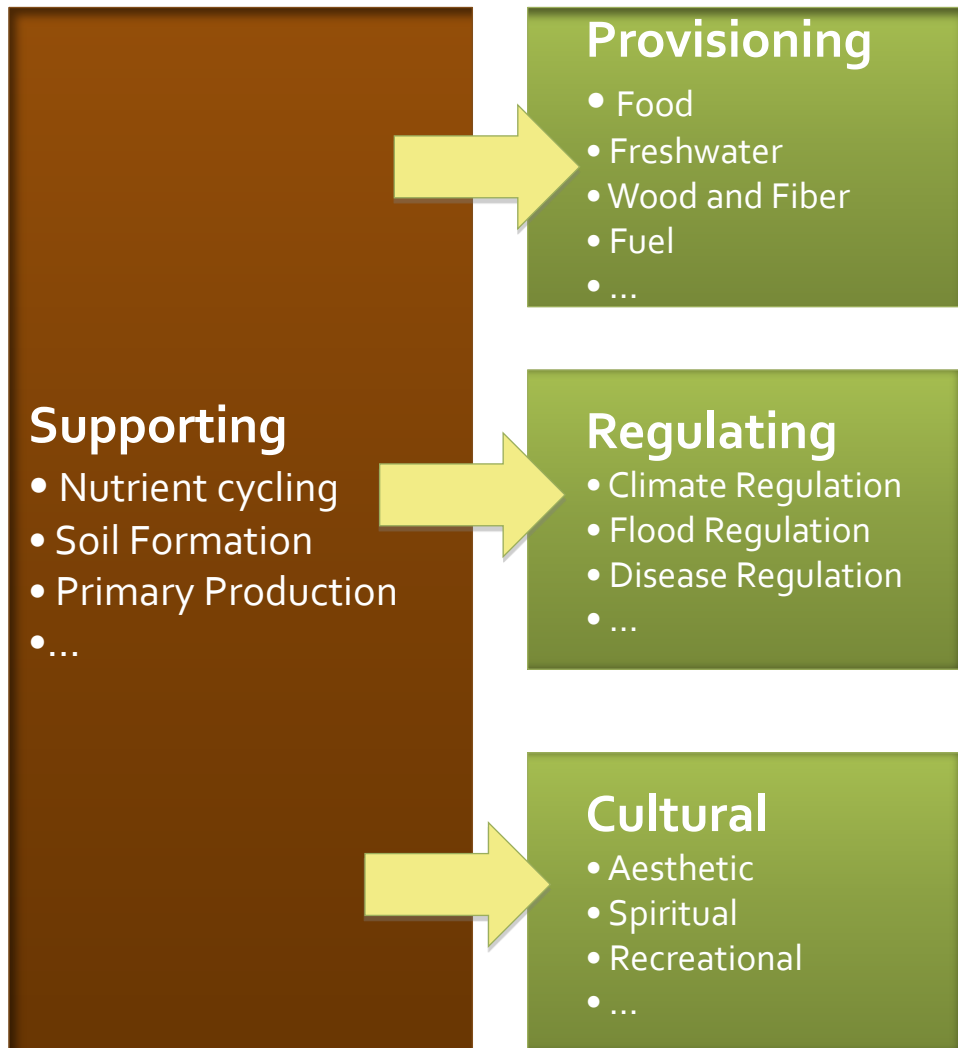
Creating Conservation Strategies as if Ecosystem Services Mattered

Ecosystem Service “HotSpots”

Ann P. Kinzig & Charles Perrings

Focus: Ecosystem Services

The benefits people obtain from ecosystems



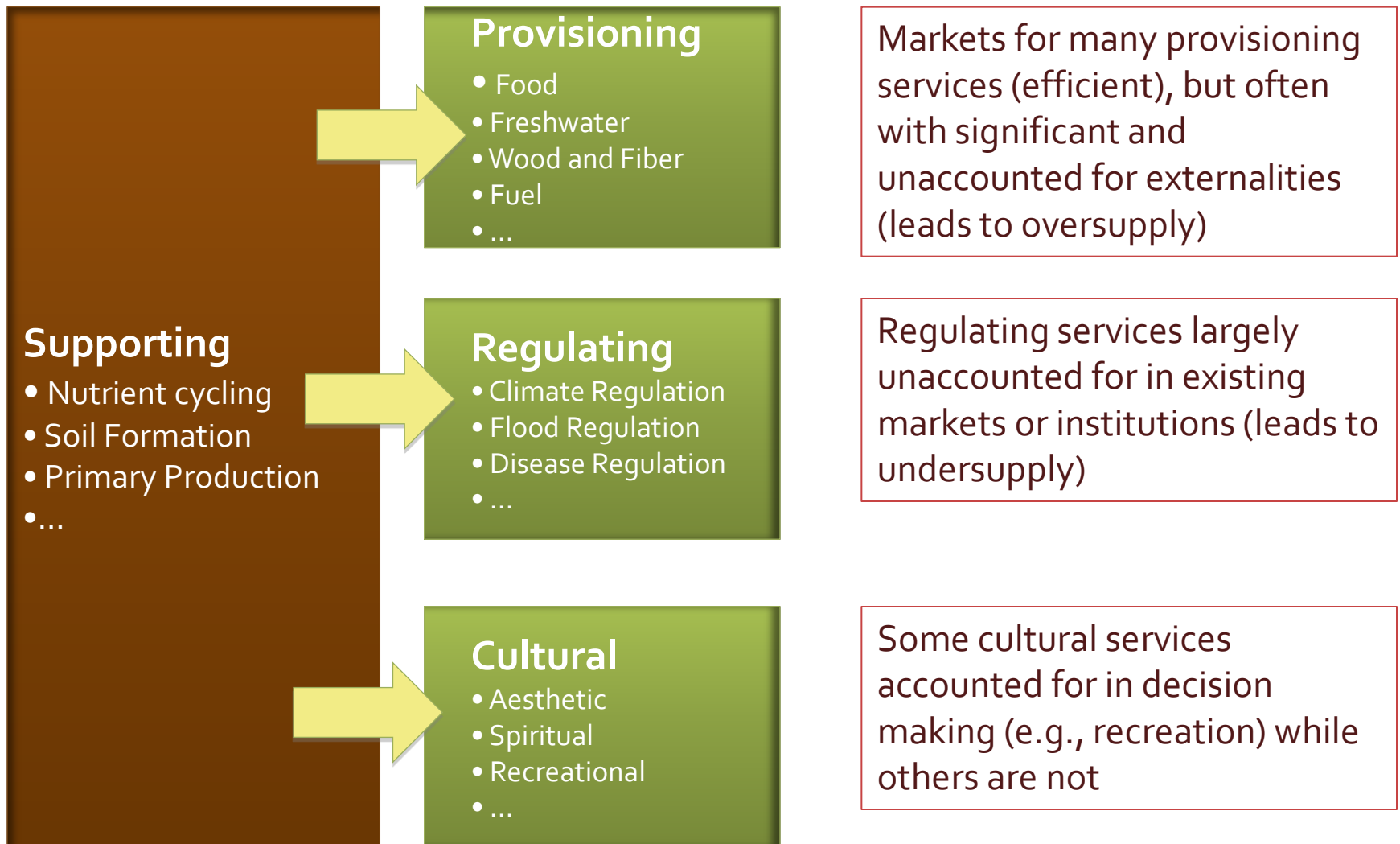
Source: Millennium Ecosystem Assessment

The Problem(s)

- Traditional conservation strategies privilege species and habitats over other types of services.
- Many land use decisions ignore ecosystem services because there are no “signals” directing owners or managers to do otherwise.

Focus: Ecosystem Services

The benefits people obtain from ecosystems



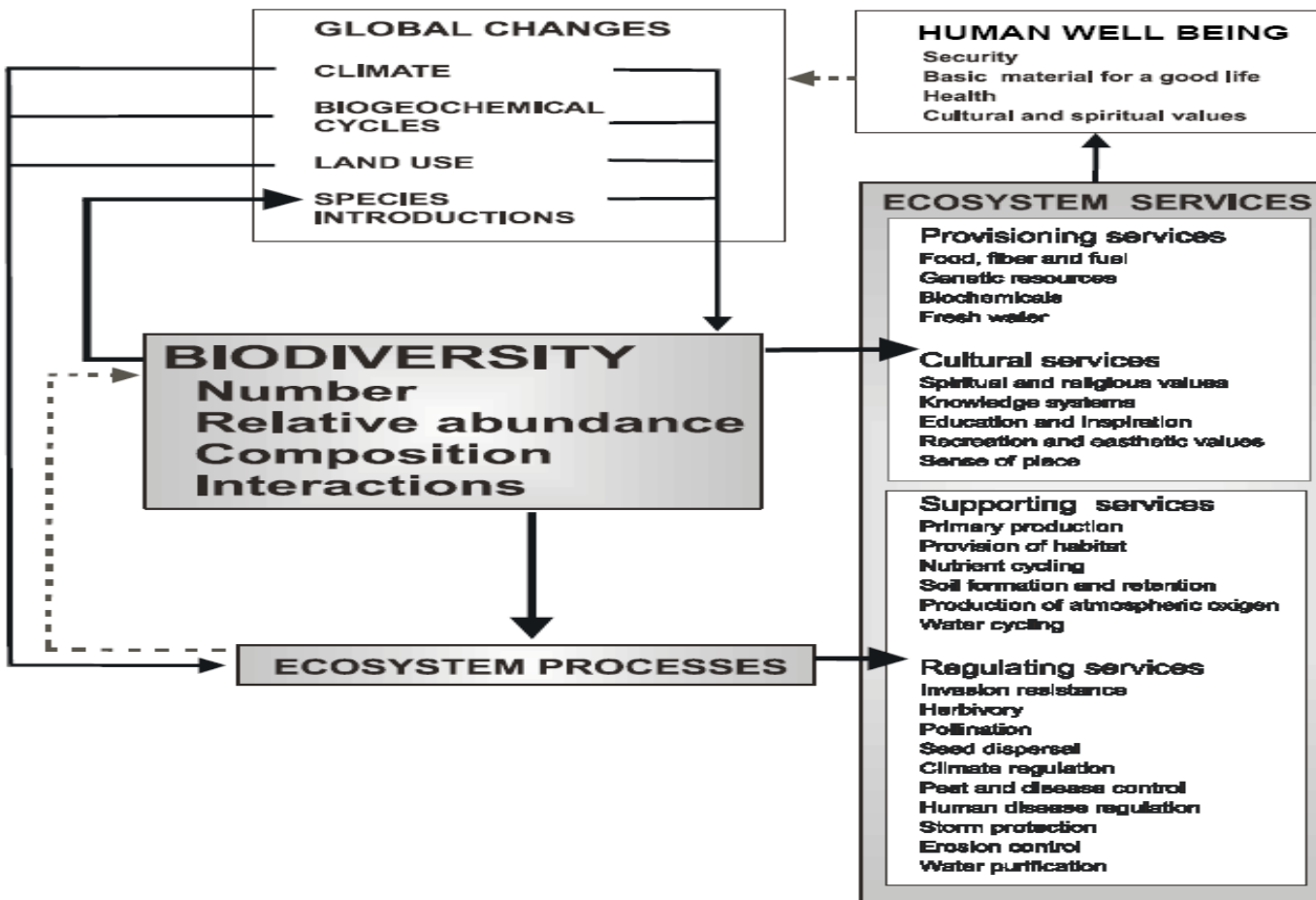
Some Solutions (not mutually exclusive)

- Create mechanisms so that prices (values) are placed on currently unpriced or underpriced services
 - Internalize externalities
 - Create markets (payments for ecosystem services)
 - Impose regulations

Some Challenges

- Ecosystem services can be difficult to manage optimally because there are potential **trade-offs** among ecosystem services, and there are issues of **scale** (the value of a service depends on the temporal or spatial scale under consideration).

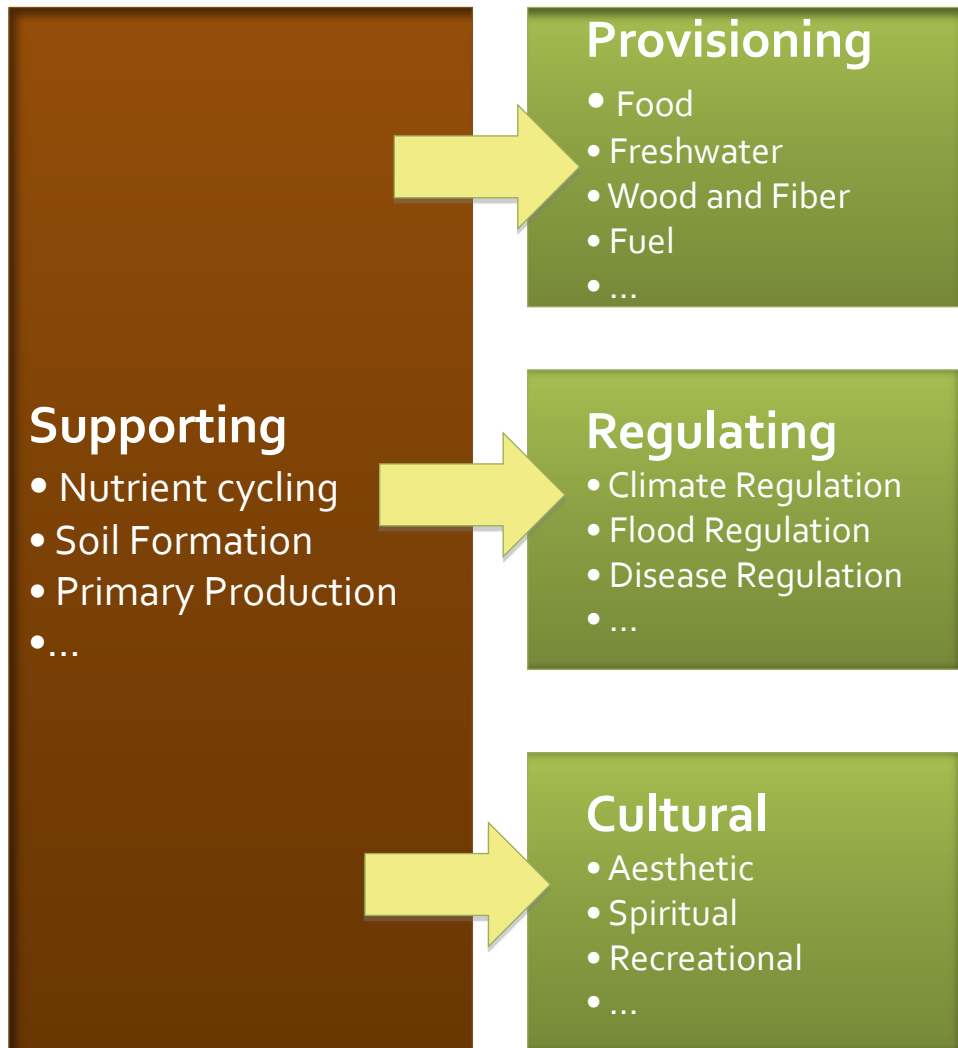
Some Challenges: Trade-Offs



Implication:
Increasing
Biodiversity will
positively influence
ecosystem services.

If this were true,
there would be no
trade-offs among
ecosystem services

Some Challenges: Trade-offs



To Grossly Oversimplify...

Provisioning services are often enhanced through simplification of natural systems (reductions in biodiversity).

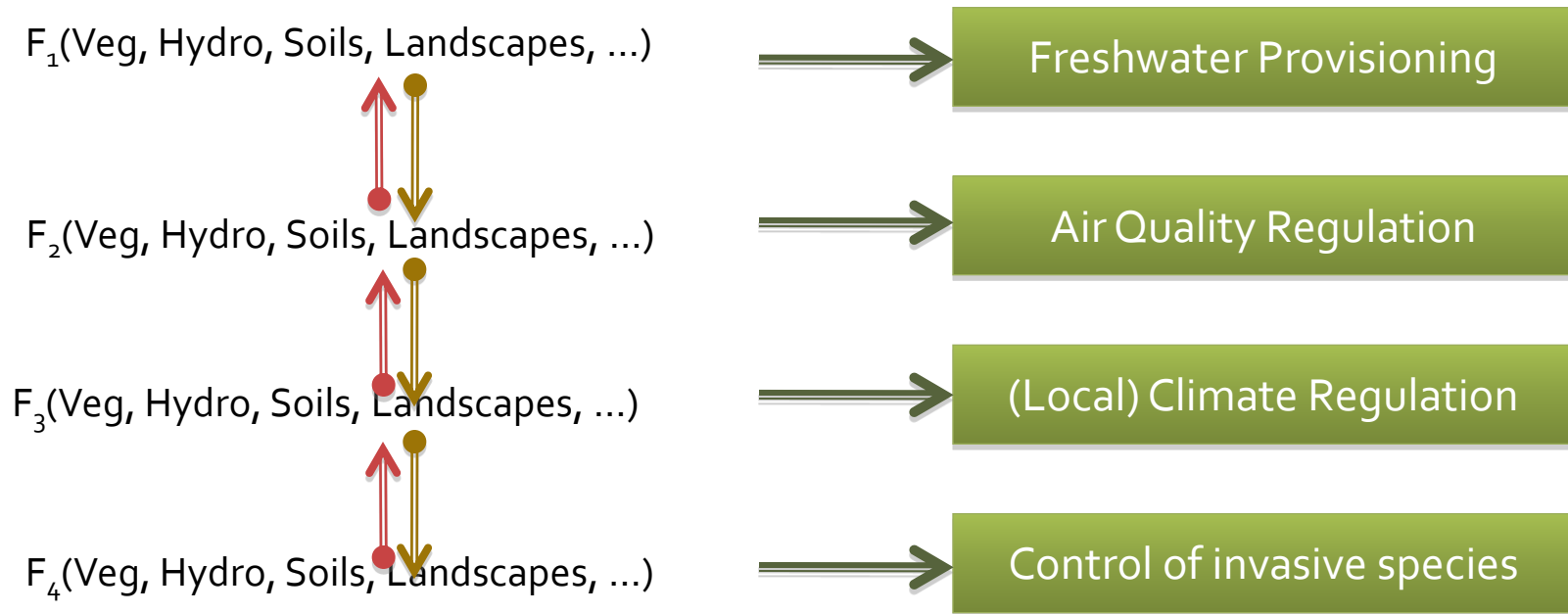
Supporting services and **regulating services** are often positively correlated with biodiversity.

Cultural services have no “regular” relationship with biodiversity.

The Challenge of Trade-Offs

- Consider the case of the Phoenix metropolitan area
 - Some critical ecosystem services include freshwater provisioning, air quality regulation, local climate regulation (urban heat island), control of invasive species

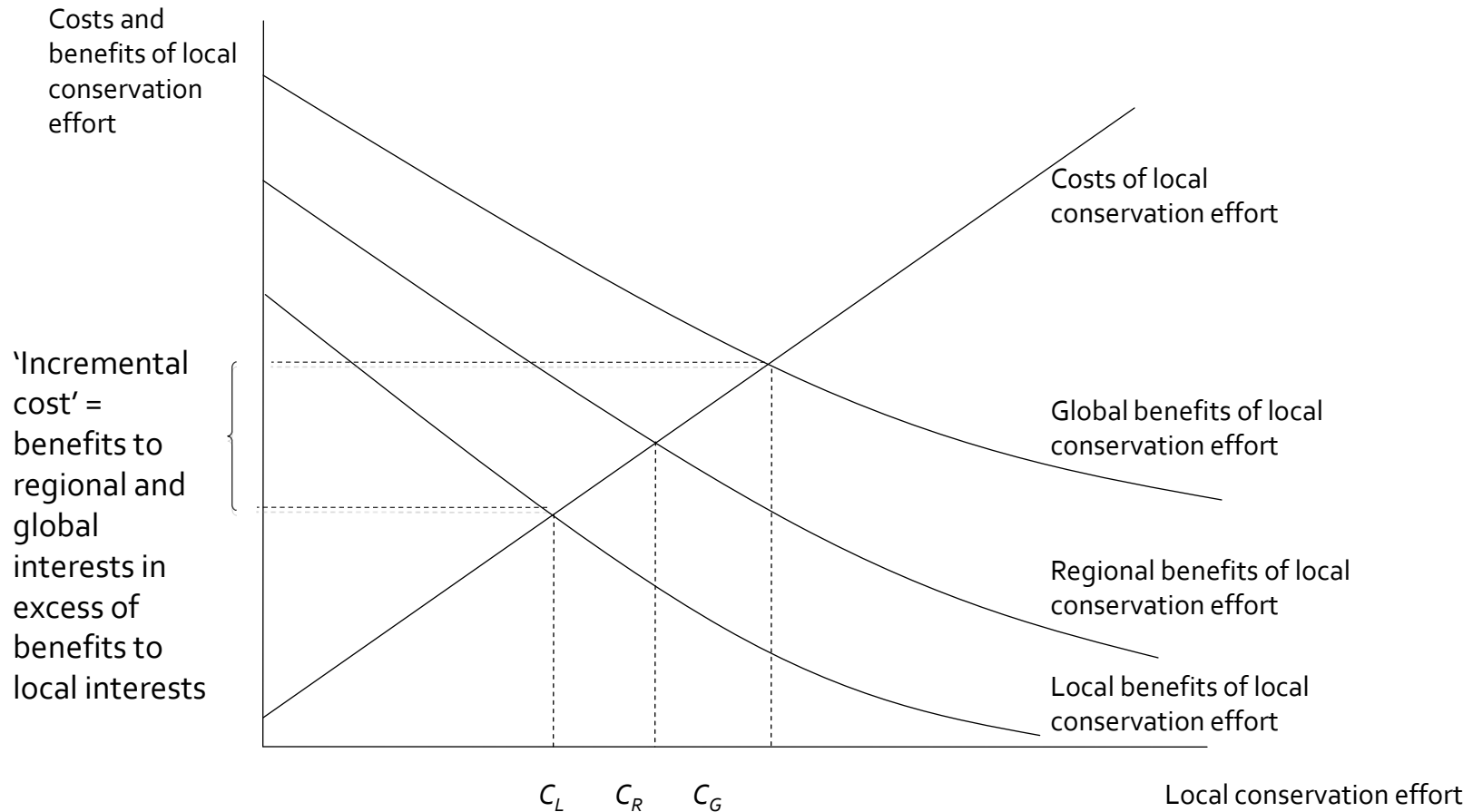
The Challenge of Trade-Offs



Complementarities and trade-offs

This hasn't yet been effectively done for relatively complete sets of ecosystem services in different ecosystem types

The Challenge of Scale



The Challenge of Scale

- Payments for Ecosystem Services are being proposed as a way of bridging this gap (between local and global interests) but...
 - Single service markets (e.g., freshwater, carbon) can distort the supply of other services (under supplying those that trade off; over supplying those that are complements)
 - Those most in need of the service often don't have sufficient market force
 - E.g., poor downstream users

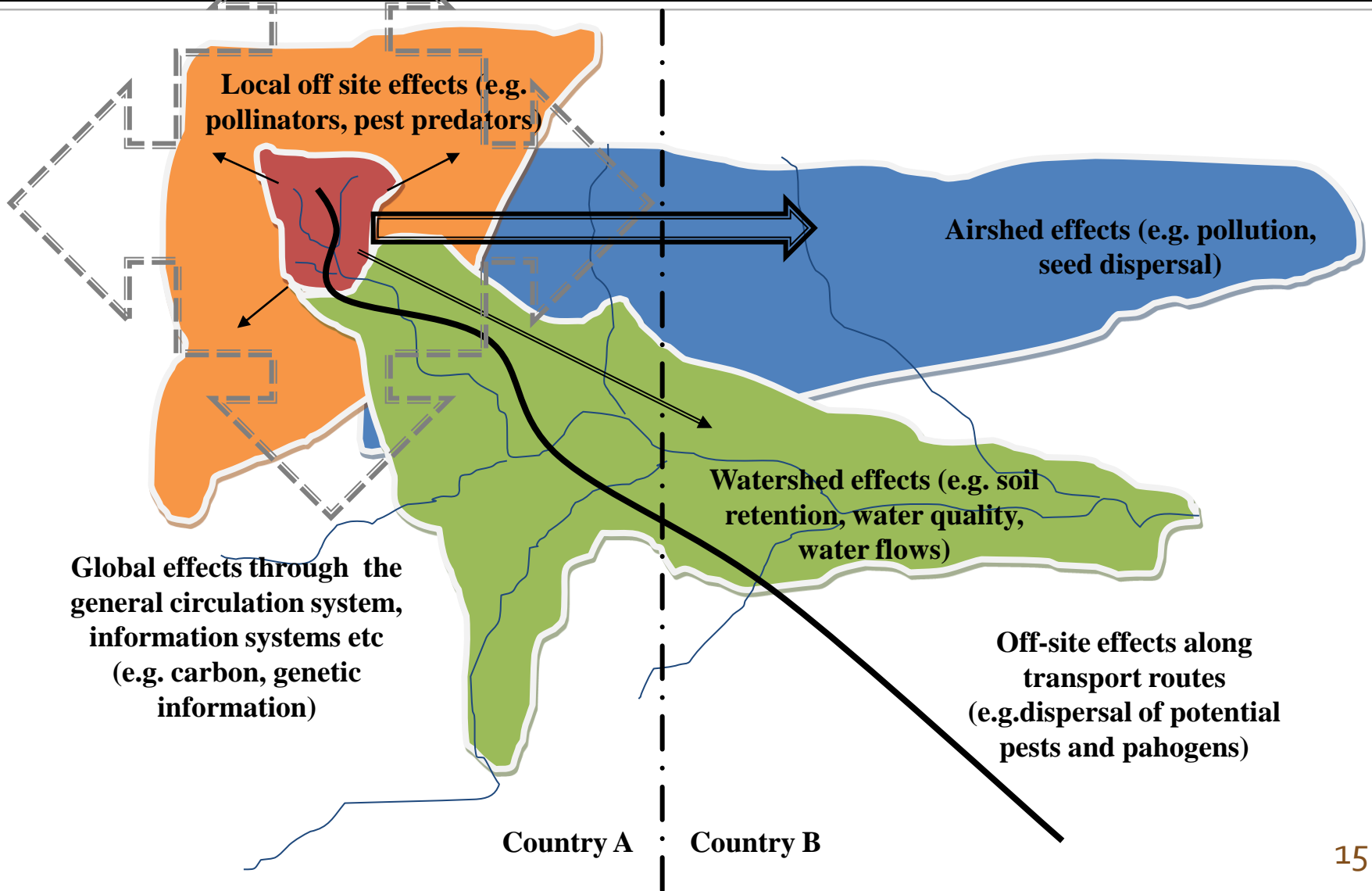
The Challenge of Scale

- Note that in the absence of a PES (or other mechanism) decision makers will only make decisions that benefit their own constituents, and even then only if the signals (prices, political attention) are right.
 - Individual land owners will manage up to the level of services they can co-opt.
 - State or national leaders will consider the well-being only of their constituents.

Our Project: The Research Question

- If the full array of (spatially and temporally distributed) ecosystem services delivered by specific landscapes, and the full set of (spatially and temporally distributed) beneficiaries of those services are taken into account, how should this affect landscape management over the expected range of conditions?

Our Project



Research partners

Project design calls for three key sets of partners:

- International network of scientists working on different dimensions of biodiversity-ecosystem services-human well-being connection
- Local scientists (economics, ecology, hydrology etc) corresponding to each reference site
- Science-based conservation NGOs operating in the areas of the reference sites

Project phases

Phase 1:

- The project will be piloted in four countries: The US, Costa Rica, Panama, Chile – establishing research protocols, data requirements etc
 - Selection of reference sites
 - Mapping of on-site and off-site ecosystem service flows
 - Aggregation of different ecosystem services layers through value metrics.
 - Evaluation of site-specific instruments to promote optimal mix of services

Phase 2:

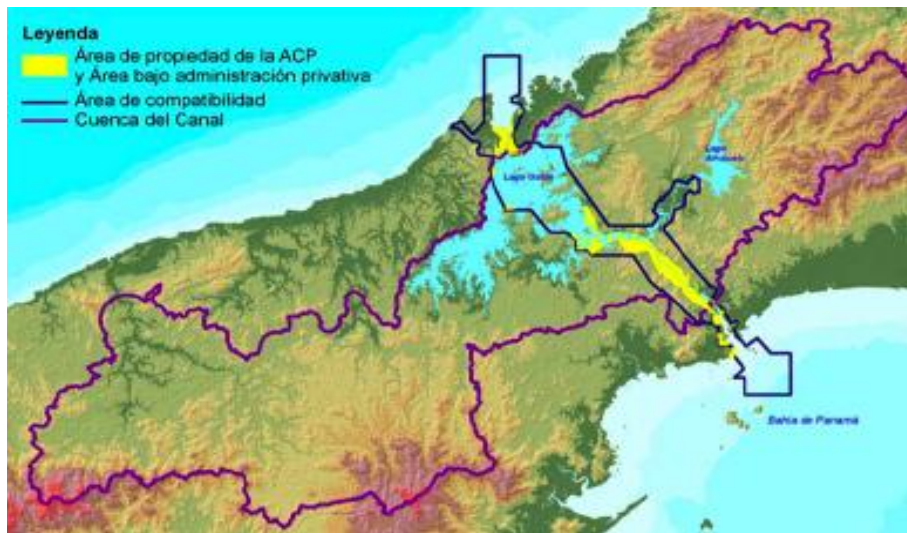
- In a second phase the intention is to apply it to a number of other countries including ASCS partners, China, India, South Africa.

Phase 3:

- The study will be extended to a much larger number of countries represented in the DIVERSITAS network.

Reference sites: Panama

- The reference site in Panama is the Panama Canal Watershed



Panama partners

Smithsonian Tropical Research Institute

Panama Canal Authority

National Environmental Authority of Panama

USGS

Panama Canal Watershed

- “Local” ecosystem services
 - Freshwater provisioning
 - Agricultural production (including subsistence)
 - Disease regulation
- Global ecosystem services
 - Freshwater provisioning (operation of locks)
 - Sedimentation (locks)
 - Dispersal of species
 - Carbon sequestration
 - Protection of endemic or endangered species

What benefits do we expect the project to offer to resource users?

Information

- The project is designed to yield information on the value of ecosystem services under alternative conservation/sustainable use strategies, exploiting insights from ecology, hydrology, climatology and the social sciences, and to test the effectiveness of implementation options – including systems of Payments for Ecosystem Services.

Decision-tools

- It will include a 'front end' involving software that will enable decision-makers to explore the consequences of different instruments for the management of landscapes, and hence for the flow of ecosystem services associated with those landscapes.

Participants

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