The extent at which ecosystem services align with biodiversity planning tools

A case of uMngeni catchment

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INTRODUCTION

- **Conservation planning** is a rapidly evolving field whose goal is to <u>minimise the loss of biodiversity</u> through the selection of <u>priority areas for conservation action.</u>

- **Ecosystem services** are the conditions and processes through which natural ecosystems and the species that make them up <u>sustain and fulfil human life</u>

AIMS

- We assess the role that different conservation planning outputs play in safeguarding ecosystem services

- *The study assessed whether conserving biodiversity pattern at different scales would also maintain ecosystem services*
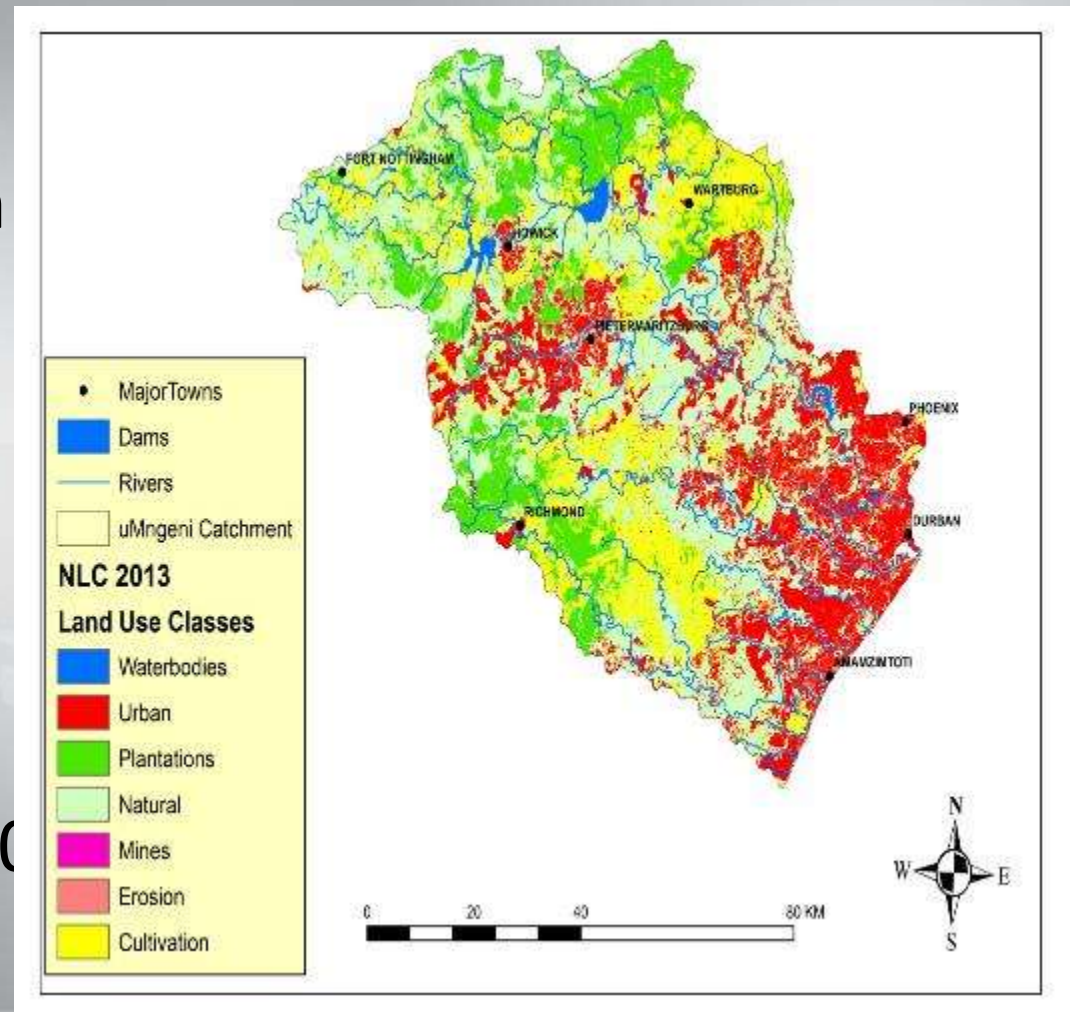
OBJECTIVES

- To what extent do ecosystem services align with <u>NFEPA, CBAs, SDFs &Threatened Ecosystems</u>?

- Are biodiversity conservation areas with the aim of preserving biodiversity important to maintain ecosystem services?

STUDY AREA

Description

- It has two major urban centres within KZN province

- It has a mixture of land use (rural, urban, plantations, etc.)

- uMngeni catchment has total area 441800 ha

MajorTowns

Dams

Rivers

uMngeni Catchment

NLC 2013

Land Use Classes

Waterbodies

Urban

Plantations

Natural

Mines

Erosion

Cultivation

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METHODOLOGY

- We used three approaches to achieve our objectives:

1) Mapping important areas for ecosystem services delivery

2) Spatial alignment of ecosystem services with biodiversity planning tools

3) Time series analysis of the loss of important areas for ecosystem services and protected areas.

Important Areas for ES delivery

- There are different approaches and concepts to map ecosystem services, this study linked land cover with ecosystem services by assigning value to each land cover type based on their capacity to deliver that particular service (Burkhard *et al*.2011, O'Farrell *et al*.2012).

- These values range from
    - 0 = no relevant capacity,
    - 1 = low relevant capacity,
    - 2 = relevant capacity,
    - 3 = medium relevant capacity,
    - 4 = high relevant capacity and
    - 5 = very high relevant capacity

Spatial alignment of ES with biodiversity tools

- Important areas for ecosystem services delivery were compared with important areas for biodiversity as identified by biodiversity planning tools.

- The spatial alignment was done using ArcGIS software by **overlaying priority areas** identified by biodiversity planning tools with areas which have been **mapped as important for ecosystem services delivery**

Time series analysis (ES vs Protected Areas)

- We analysed the role played by protected areas in conserving areas important for ecosystem services

- From 1970 to 2020, we assessed protected areas and calculated for each time step, the proportion of areas important for ecosystem services included in protected areas

RESULTS
**Important Areas for ES delivery in uMngeni catchment**

2010
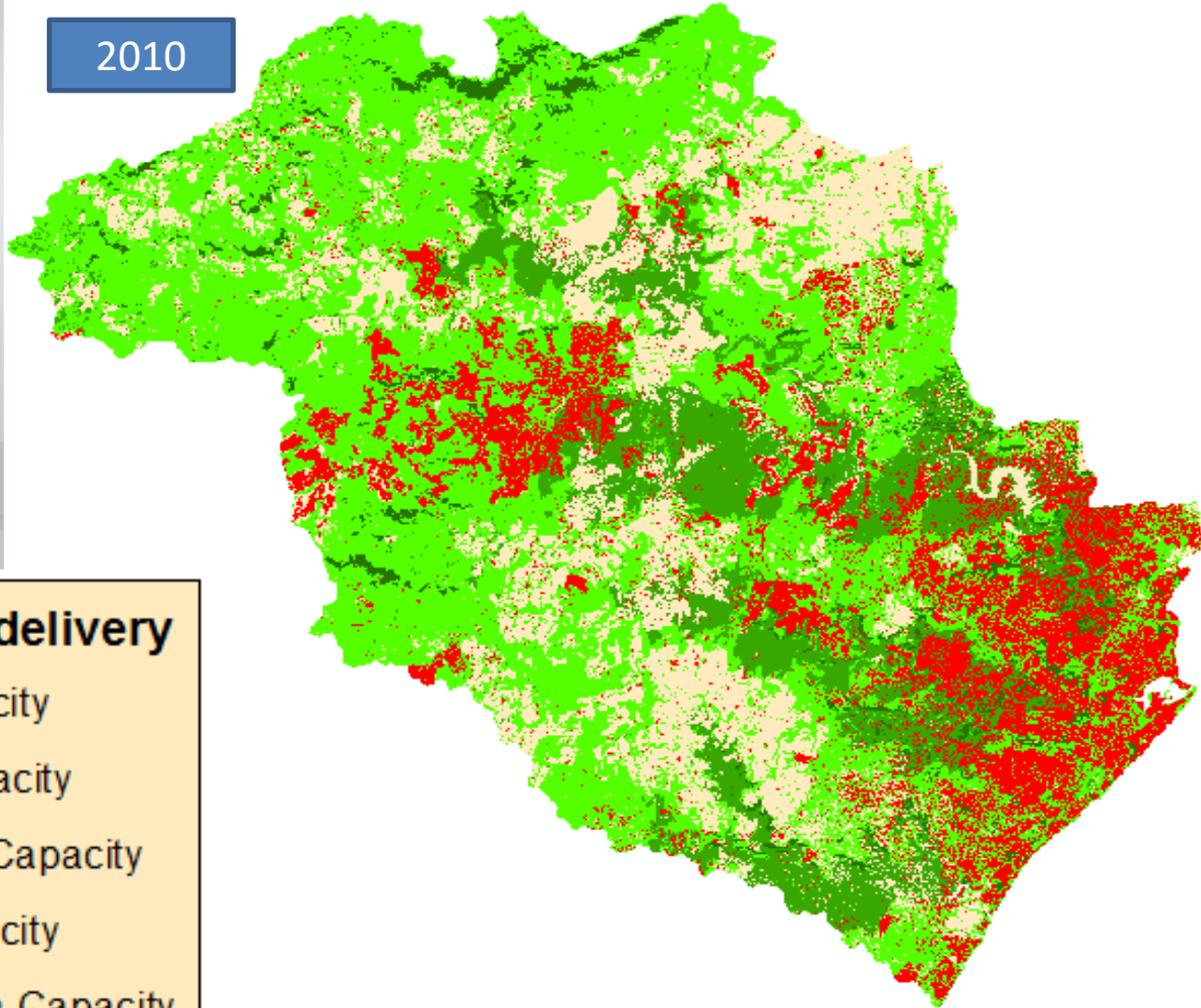
Capacity ES delivery

- No Capacity
- Low Capacity
- Medium Capacity
- High Capcity
- Very High Capacity

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Spatial alignment

Spatial scale	Biodiversity Planning Tools	Total area of Important Ecosystem services areas under different planning tools
National	National Freshwater Ecosystem Priority Areas	64925 ha
	Threatened Ecosystems	201180 ha
	National Protected Areas Expansion Strategy	26449ha
	National Protected Areas	9346ha
Provincial	Critical Biodiversity Areas	96757ha
Municipalities	Spatial Development Frameworks	73576ha
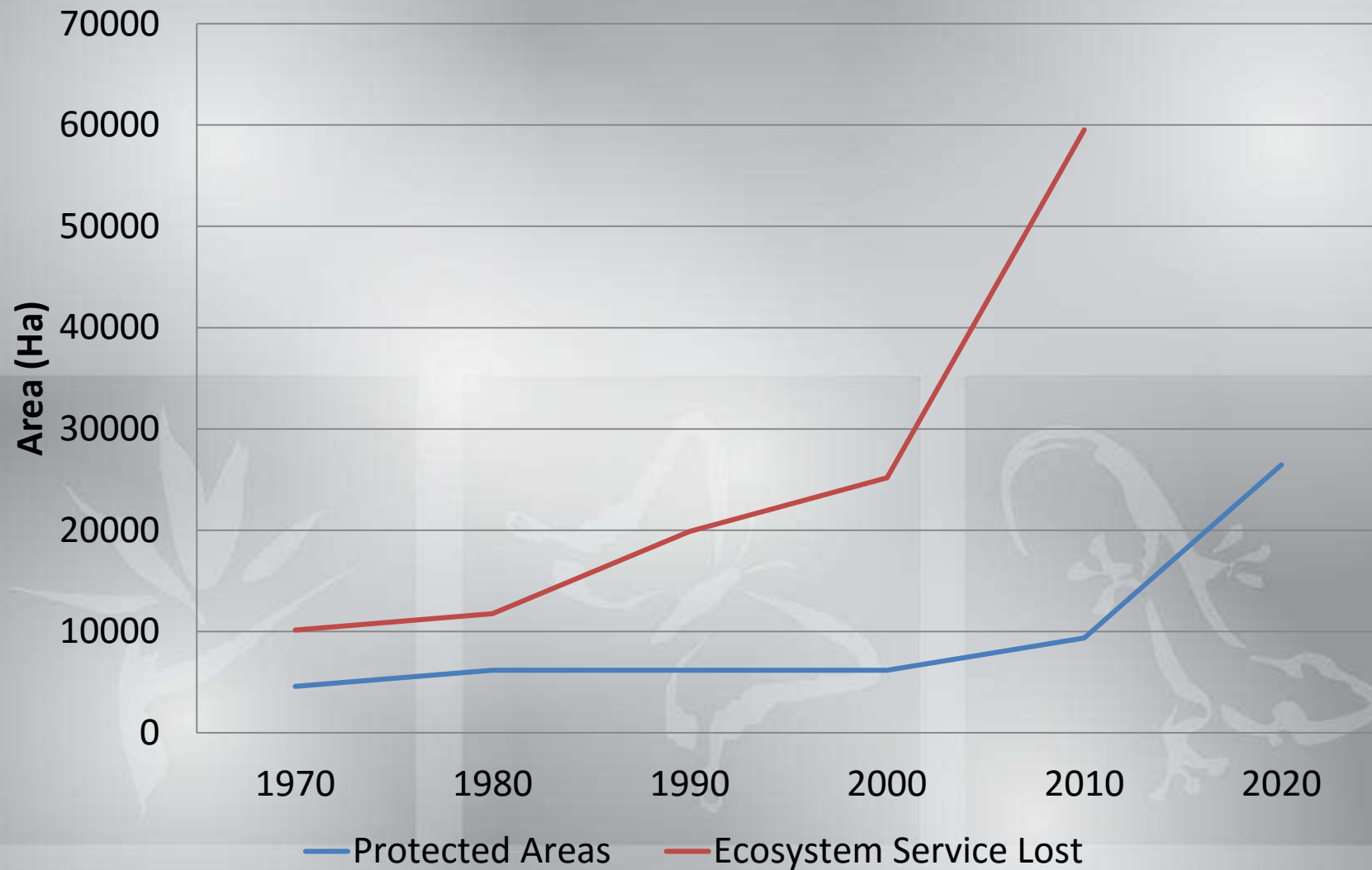
CONCLUSSION

- Areas important for ecosystem service delivery can co-occur with areas important for biodiversity (positive correlation)

- An opportunity for integrated planning (ecosystem service inclusion within conservation plans)

- This is an opportunity of using ecosystem services in supporting biodiversity conservation

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THANK YOU
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