



# **Managing the human-wildlife interface to sustain the flow of agro-ecosystem services and prevent illegal wildlife trafficking in the Kgalagadi and Ghanzi Drylands(KGDEP)**

**UNDP-GEF PIMS 5590 / GEF ID 9154**

**GWP Corridor and Connectivity Workshop**

**29 June 2022**

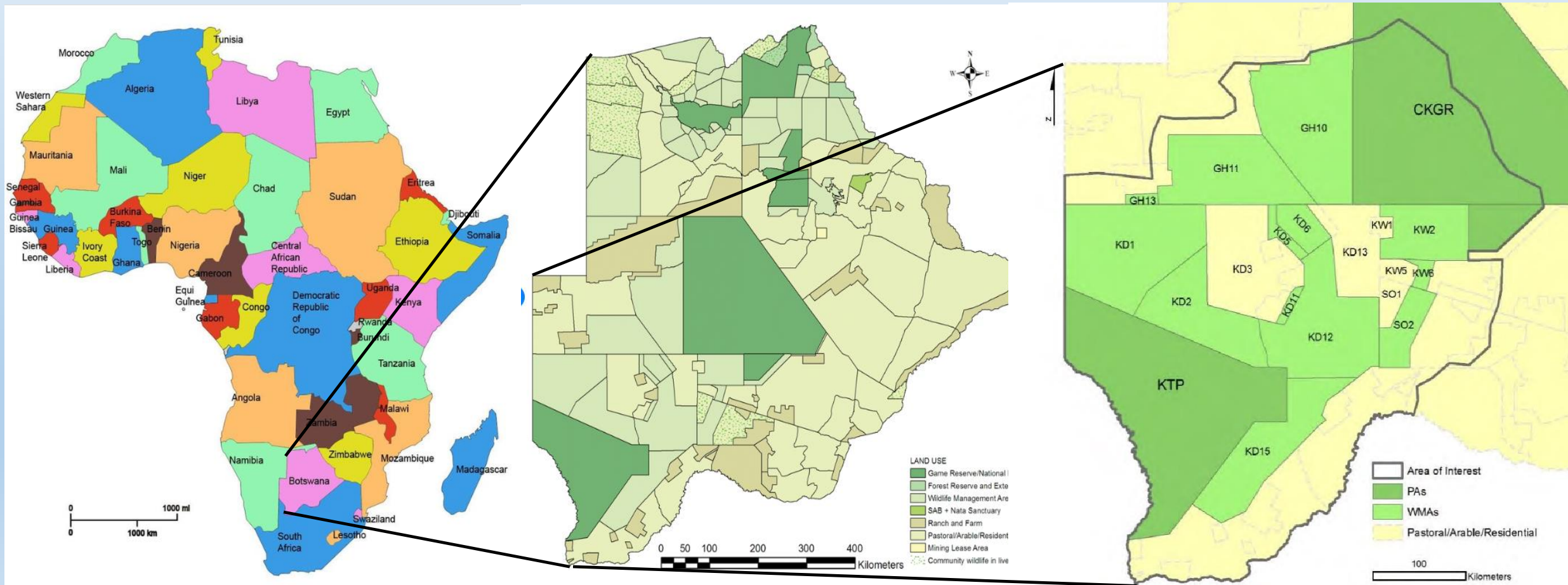
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# KGDEP- AOI

- KGDEP aims to establish land connectivity, and coexistence between the two Protected Areas, through harmonization/alignment of land uses thus reducing competition between land-uses and increasing integrity of the Kalahari ecosystem. KTP and CKGR.





## KGDEP- Landscape connectivity overview

- The Kalahari landscape is home to large herds of ungulates and iconic predators, the landscape was dominated by low-density wildlife with hunter-gatherer livelihoods, until borehole farming enabled cattle ranching proliferation a few decades ago.
- Natural resources management in the Kalahari landscape is characterized by competition and conflict between conservation goals, and economic development and livelihoods.
- Wildlife Management Areas (WMAs) in this landscape are meant to support wildlife-based economic activities and secure migratory corridors linking the Kgalagadi Transfrontier Park and the Central Kalahari Game Reserve continue to be lost to livestock and human encroachment.



## KGDEP- Landscape connectivity overview

- Because of these competing land uses, there is prevalence of HWC, land use conflict, possible adverse impacts of climate change, etc.
- Official gazettement of WMA's and other land used has not been established. Some of the challenges include
  - lack of development plans, ( zoning into pastoral and arable areas).
  - perforation of boreholes and uncontrolled expansion to areas that are integral to the Kalahari ecosystem.
- However there are opportunities for community livelihoods development and beneficiation- CBNRM



## KGDEP- Landscape connectivity overview

- There were choices for engagement of consultancies to develop the Integrated Land Use Management plans( ILUMP), Government took a decision to get involved in the development of the ILUMP.
- The government technical officers drive the process of crafting the ILUMP with an expert providing technical expertise and guidance.
- Development of the ILUMP through a participatory process to promote Ownership:  
***development Participants include communities,- tribal administration authorities, government and landlord, CSOs, and Academics***

**Nonetheless there was need for a high-level connectivity landscape connectivity analysis of the WMAs in between the two National parks**

- This connectivity analysis forms an integral part of the development of the land use management plans,



# **Kalahari Wildlife Landscape Connectivity Analysis**

## **Phase 2 (Final) Report**

**For**

**UNITED NATIONS DEVELOPMENT PROGRAMME**

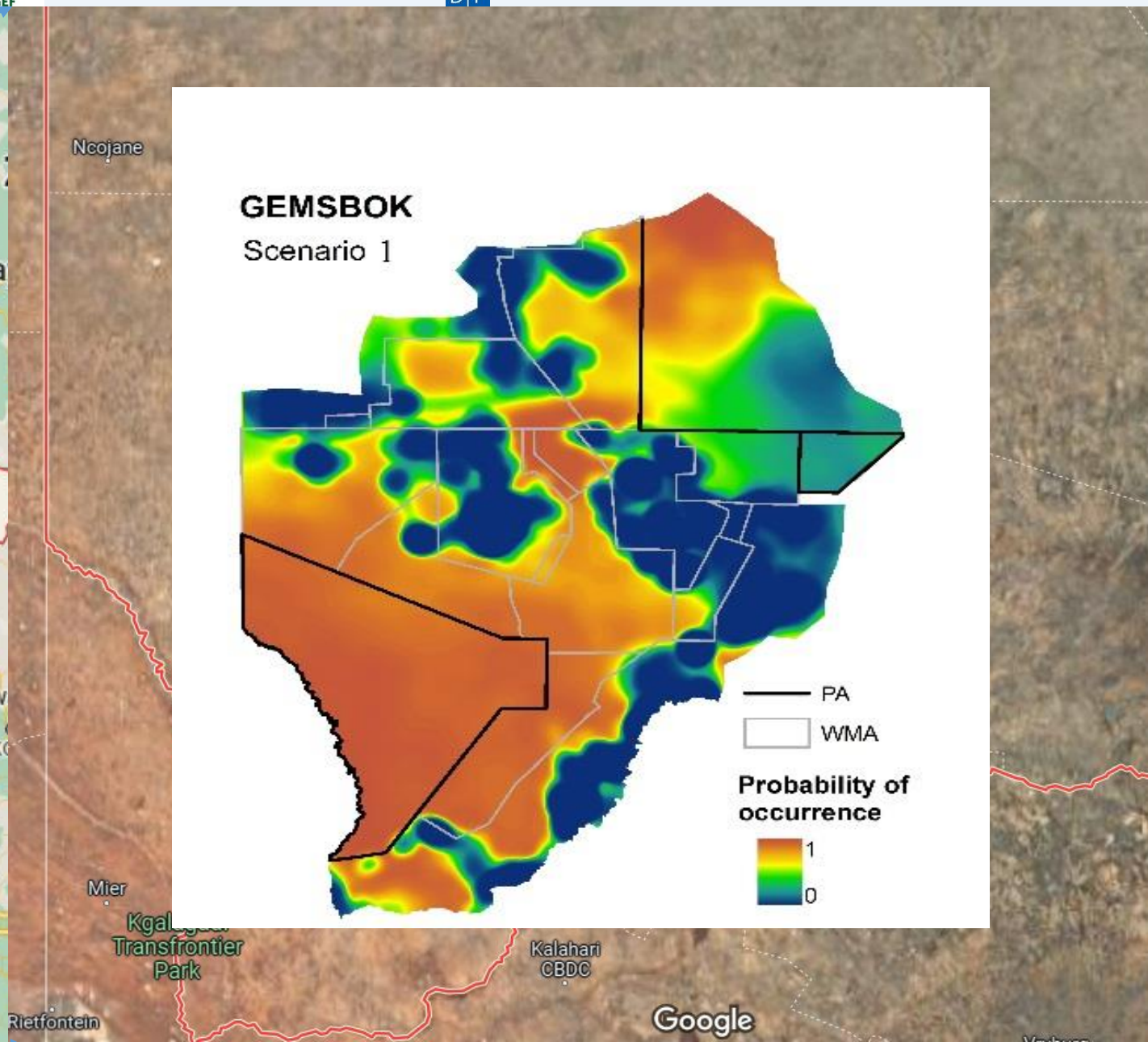
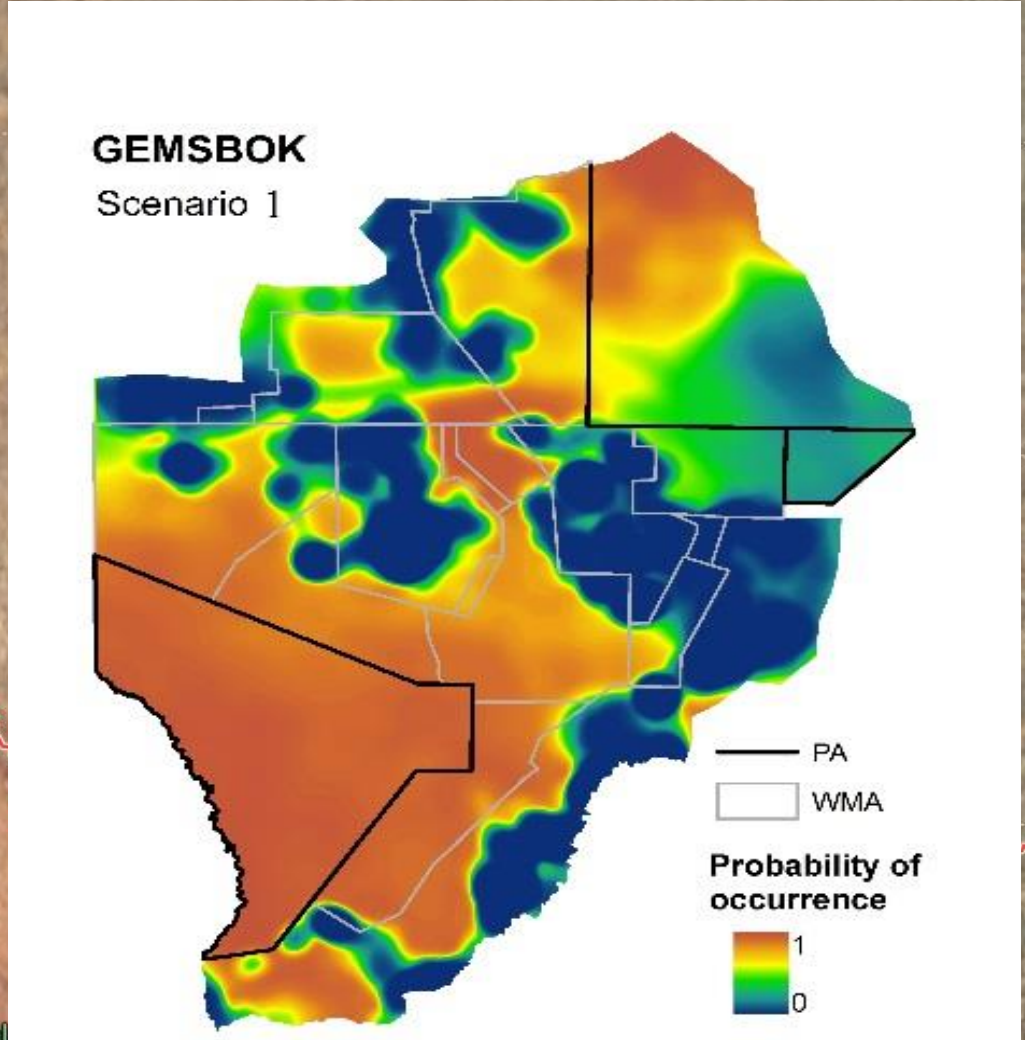
**Kgalagadi-Ghanzi Drylands Ecosystem Project**

**Derek Keeping** PhD

**Zaneta Kaszta** PhD

**Samuel A. Cushman** PhD

**May 2022**





# Phase 2 Components

1. Projecting landscape change across 14 scenarios. New boreholes, new kraals, changes to fencing.
2. Calculating change in habitat quality for focal species across scenarios.
  - a. Where is habitat lost or gained and how much is lost or gained.
3. Calculating change in connectivity for focal species across scenarios.
  - b. Where is connectivity lost or gained and how much is lost or gained.





# Modeling Occurrence of Kraals Around Boreholes

Call:  
glm(formula = kraal ~ borenfgd + boren2k, family = binomial(link = logit),  
data = data)

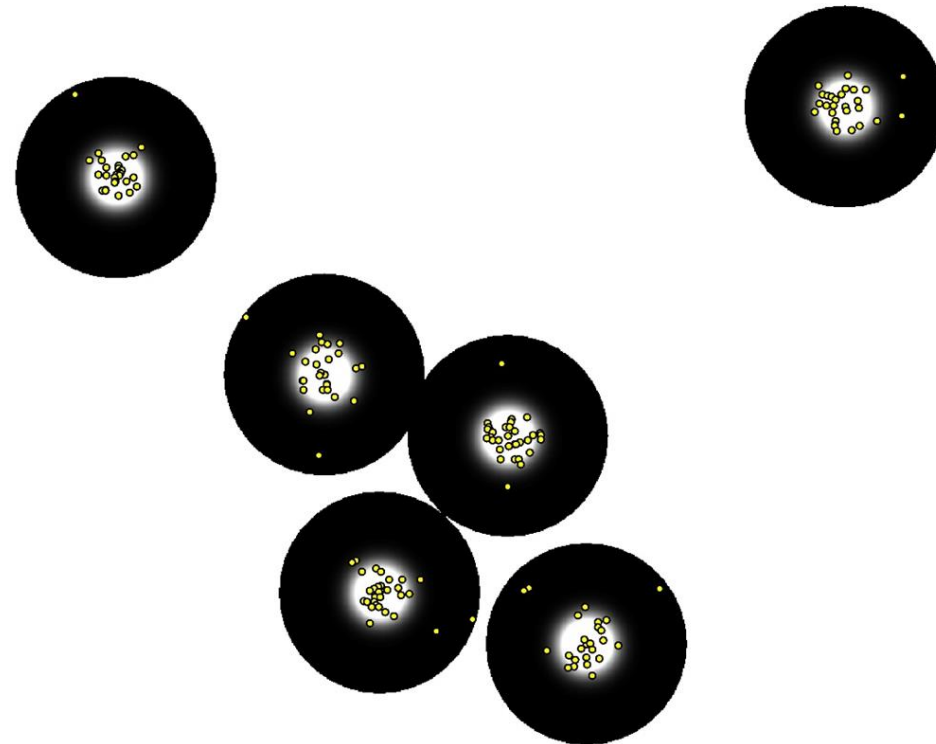
Deviance Residuals:

Min	1Q	Median	3Q	Max
-4.1836	-0.1361	-0.1164	-0.0987	3.3425

Coefficients:

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	-6.314e+00	3.033e-01	-20.813	< 2e-16
borenfgd	3.613e-04	8.514e-05	4.243	2.2e-05 †
boren2k	3.223e+07	1.318e+06	24.459	< 2e-16
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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1





# Parameterizing Road and Fence Resistance

Species	Wildlife & Border fences	Wildlife-friendly fence	All other fences
Gemsbok	1000	375	500
Eland	450	100	400
Lion	350	0	250

Species	Tar road	Calcrete road	Sand road
Gemsbok	50	25	0
Eland	50	25	0
Lion	0	0	0



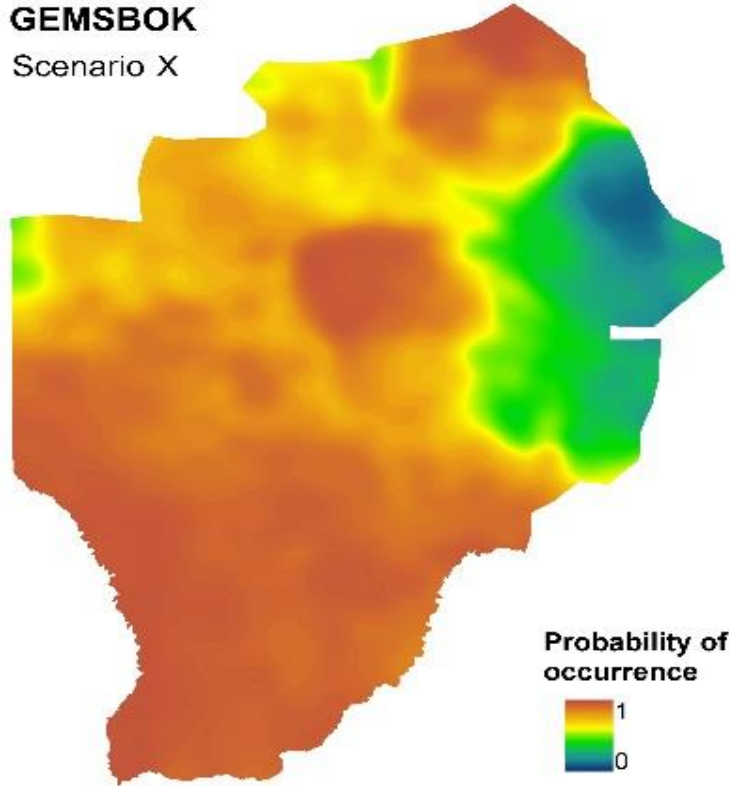
# Scenarios Modelled

	Scenarios																
	Baseline			Future													
Species	X	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Gemsbok			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Eland			✓	✓									✓	✓	✓	✓	
Lion			✓	✓									✓	✓	✓	✓	

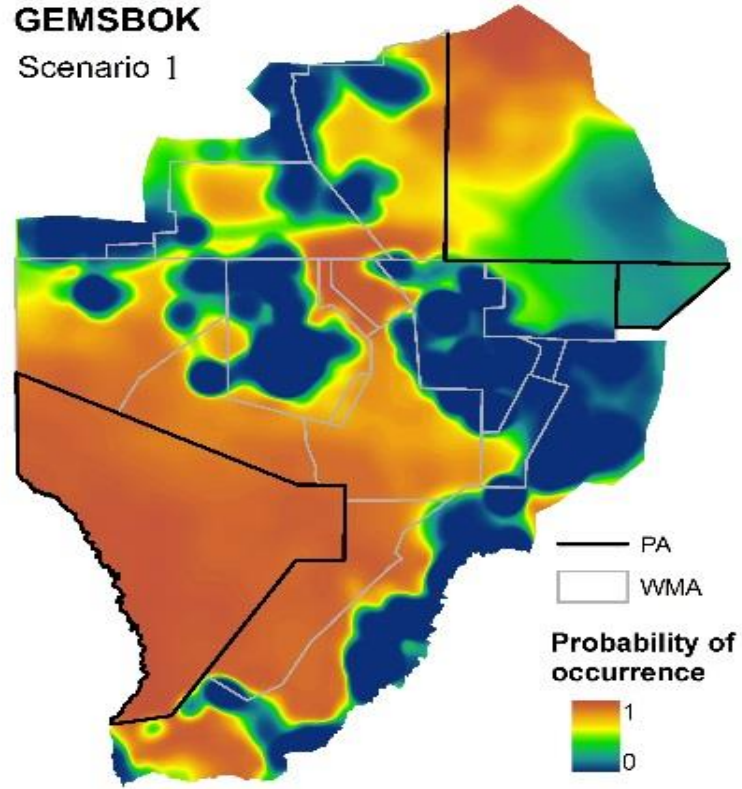


# Change in Habitat Suitability from Historical to Current -- Gemsbok

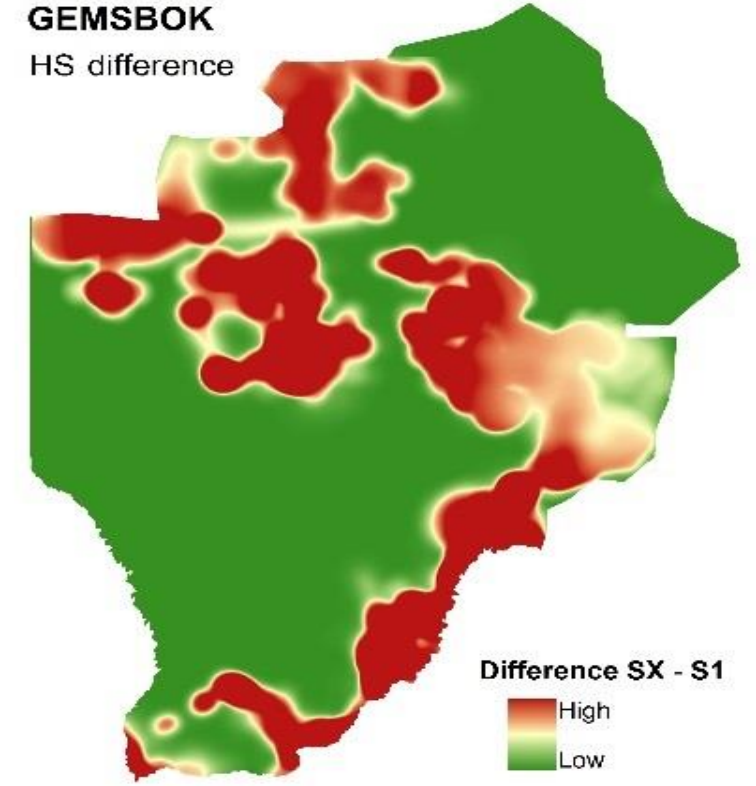
**GEMSBOK**  
Scenario X



**GEMSBOK**  
Scenario 1

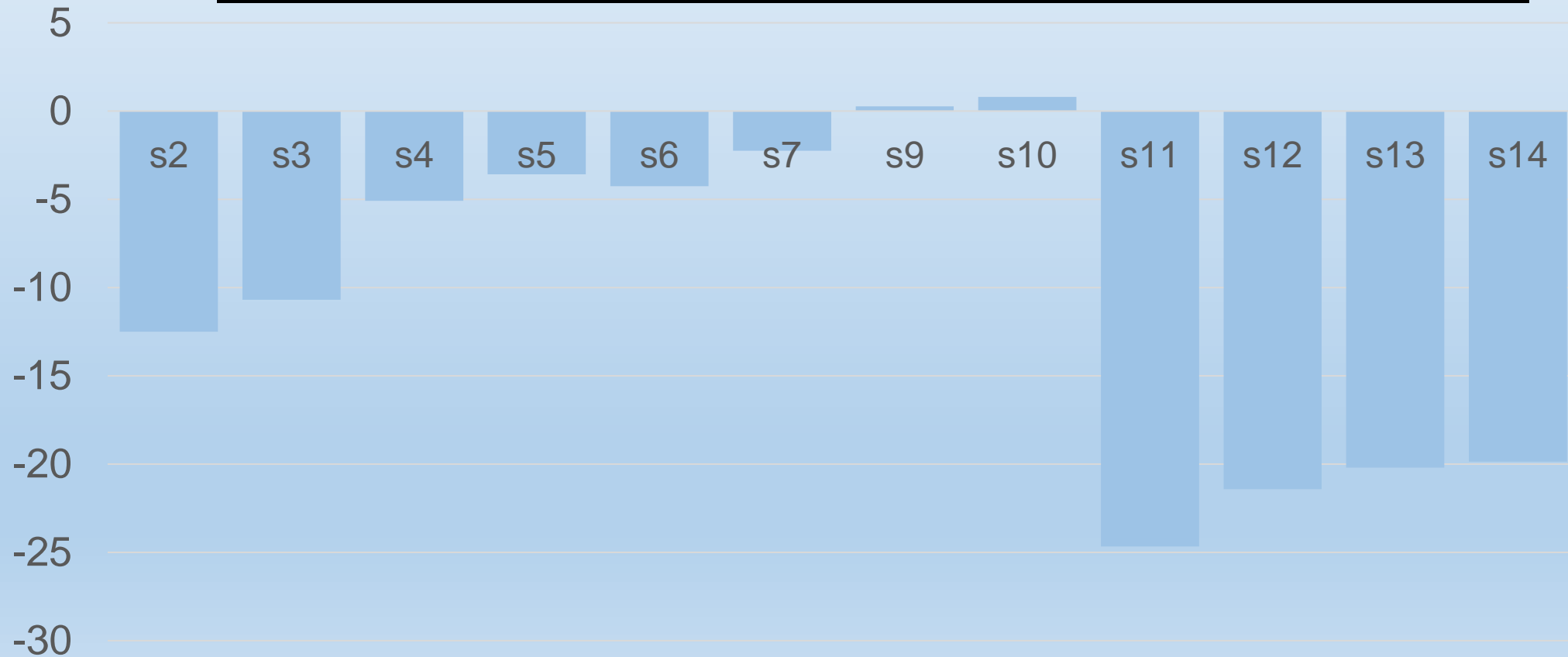


**GEMSBOK**  
HS difference



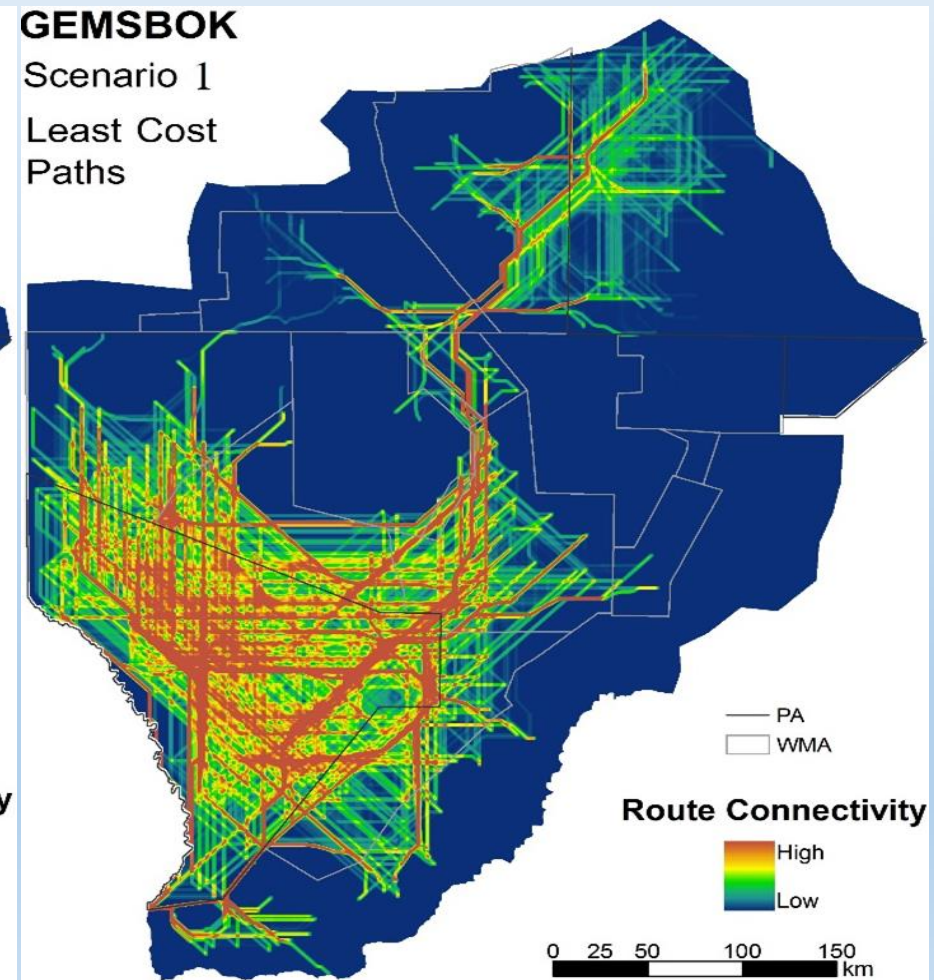
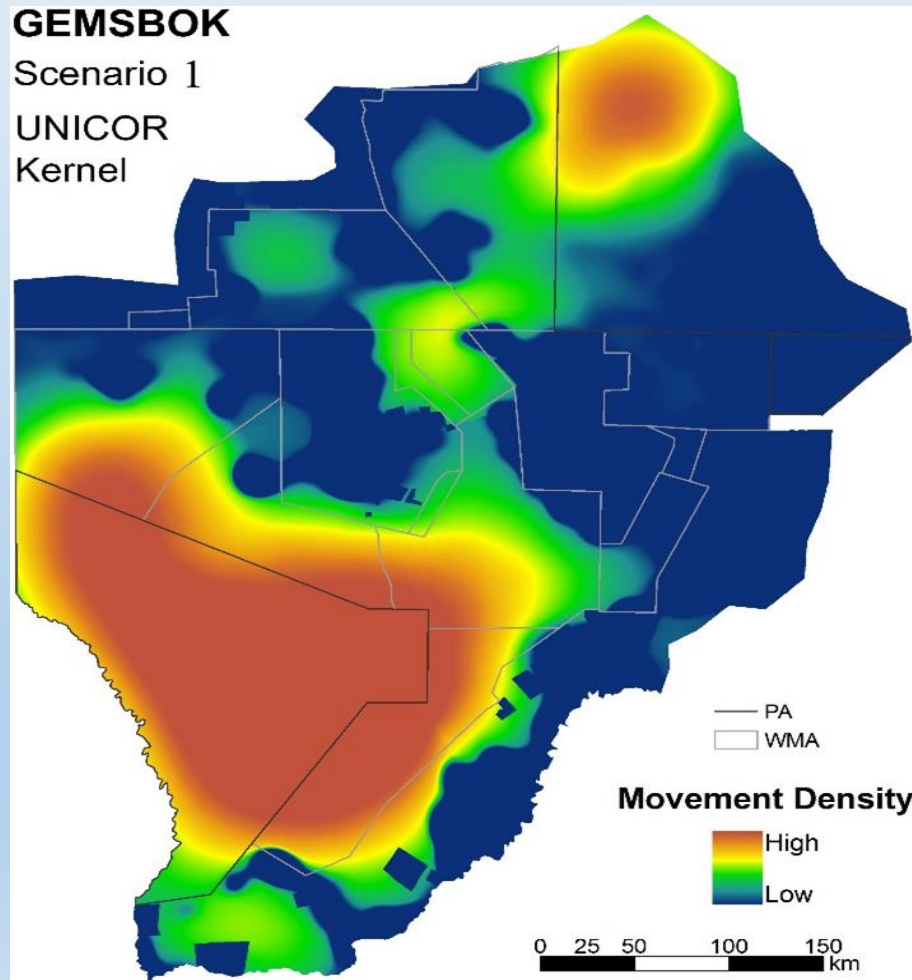


# Percent Changes Gemsbok Habitat Suitability Across Scenarios



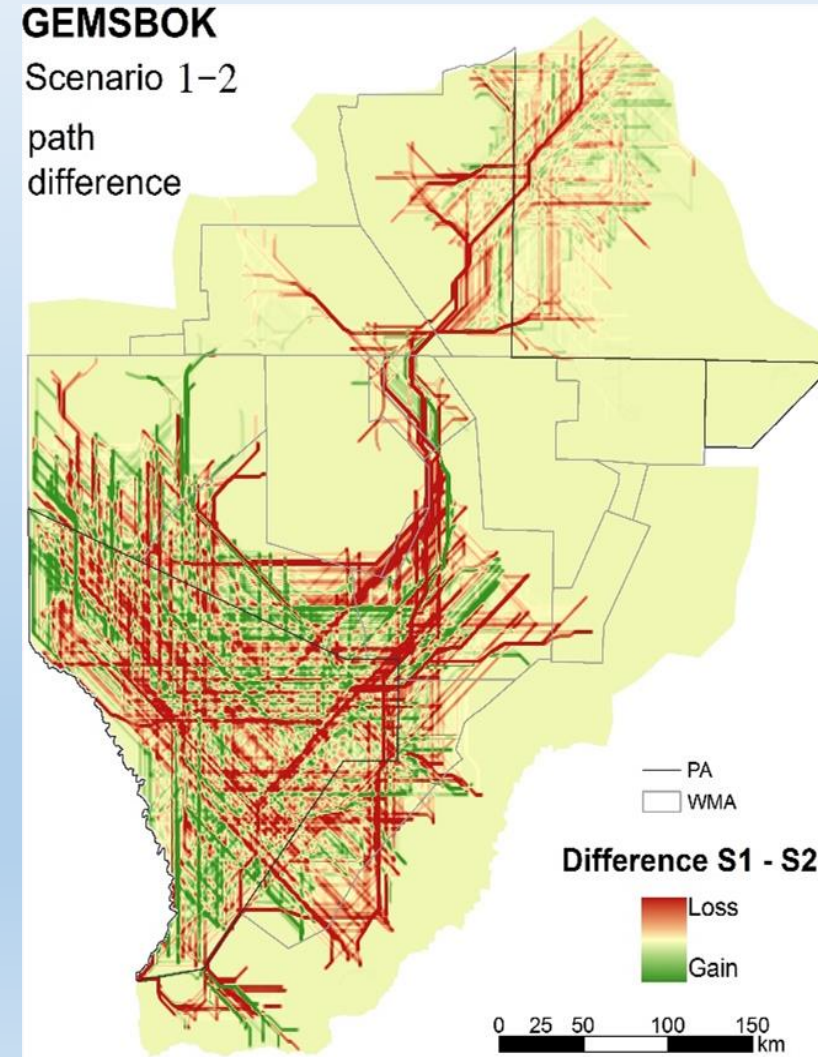
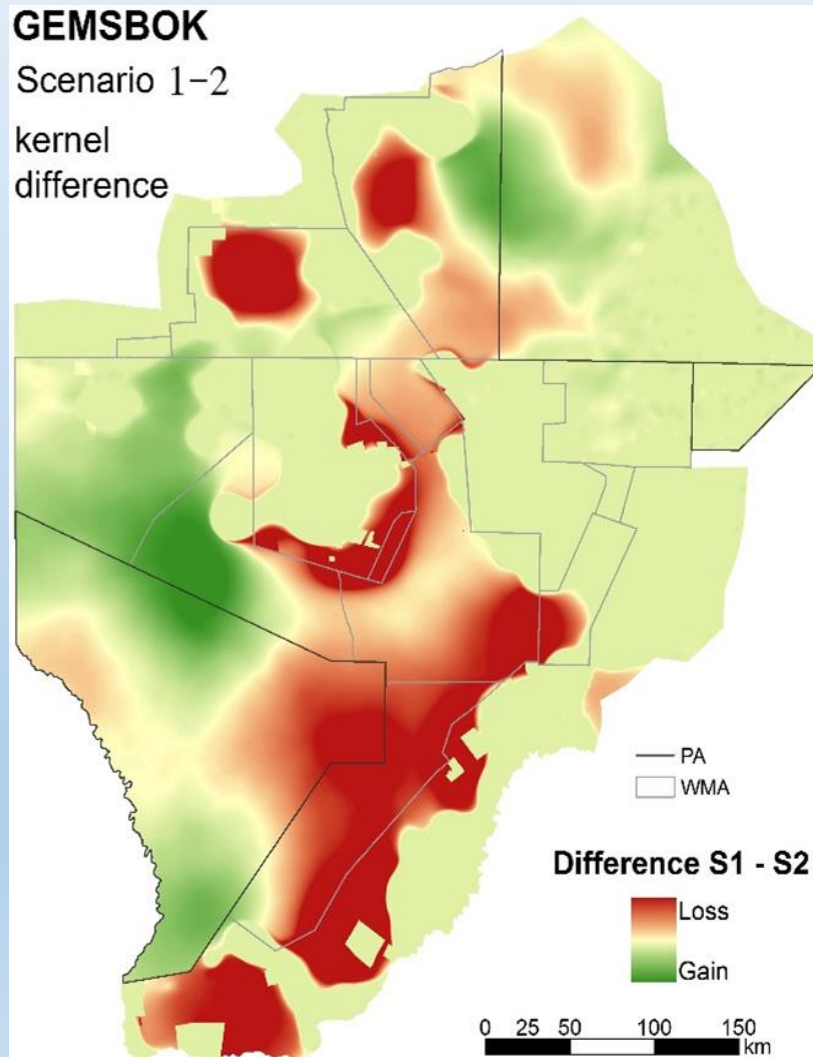


# Gemsbok Kernel and Path Connectivity Scenario 1



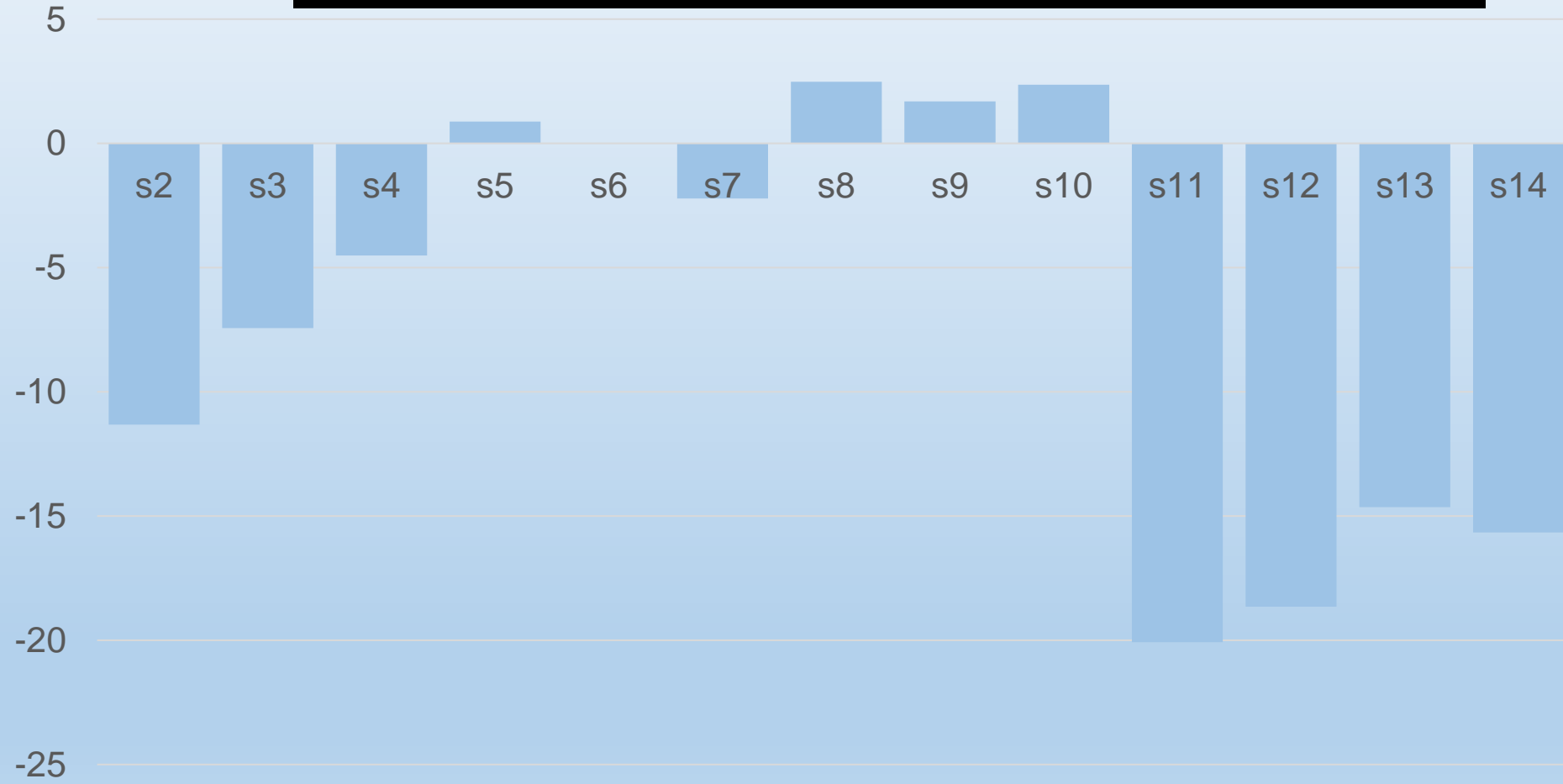


# Change in Gemsbok Connectivity Scenario 1 to 2





## Percent Changes Gemsbok Kernel Connectivity Across Scenarios







# Assessing Local Effects of Scenarios

