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HABITATS AND ANIMALS OF KRUGER NATIONAL PARK

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Stellenbosch University

Kruger National Park

South Africa's Premier National Park

Entrusted with the protection of:

50 fish;

505 bird;

35 amphibian;

119 reptiles;

1990 plants;

148 mammals and;

thousands of invertebrate species (Mabunda *et al.* 2003)

WHAT MAKES A HABITAT A HOME?

The Earth has many different environments, varying in:

temperature,

moisture,

light,

elevation,

geology,

soil,

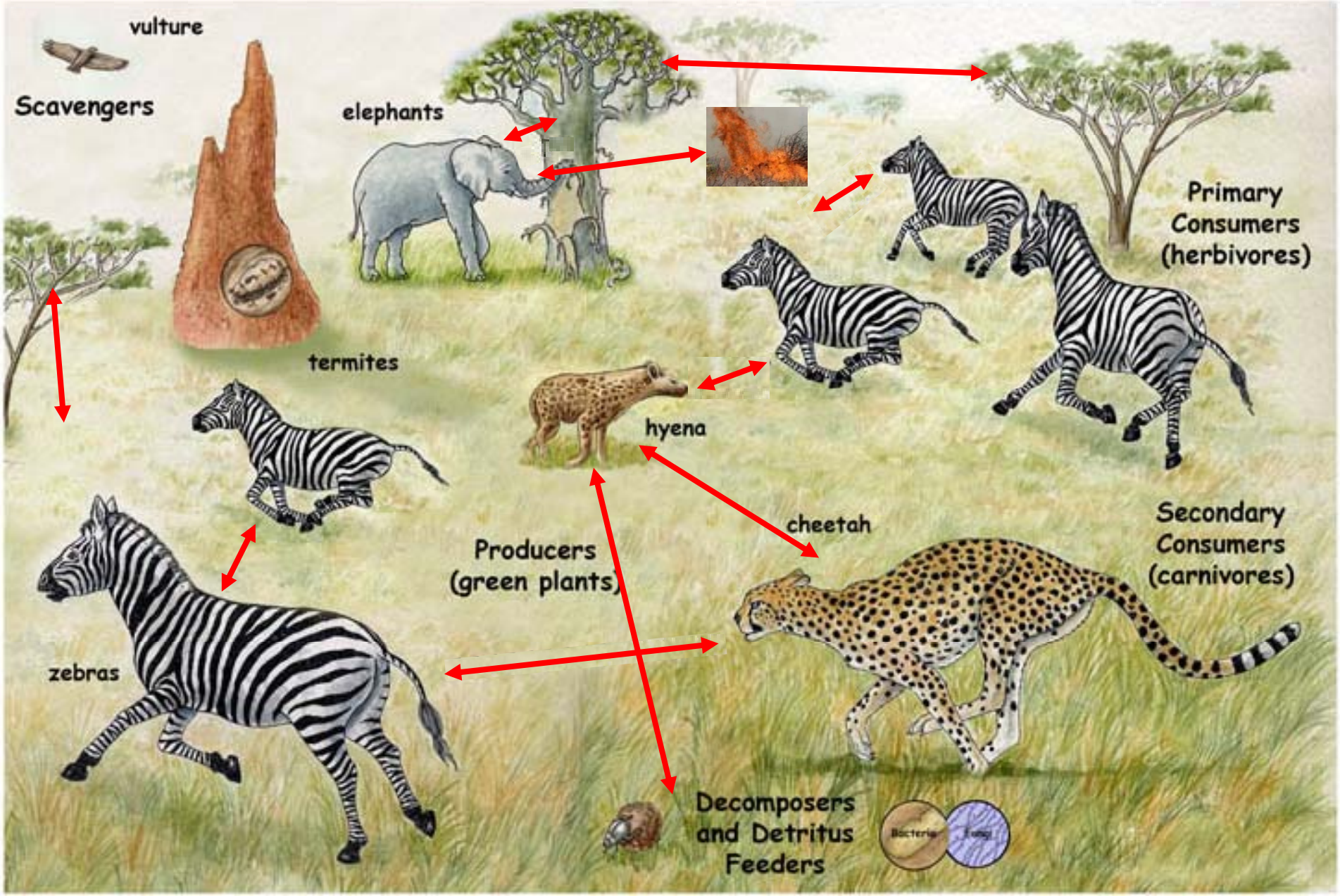
and many other factors……

DIMENSIONS OF HABITAT

1. Heterogeneity & patchiness of landscape (horizontal layer)
2. Structure of habitat (vertical layer)
3. Temporal scales of change :
   - small scale fast turn-over
   - large scale slow turnover

SIMPLISTIC VIEW

SAME SCENARIO- COMPLEX, MULTIPLE INTERACTIONS



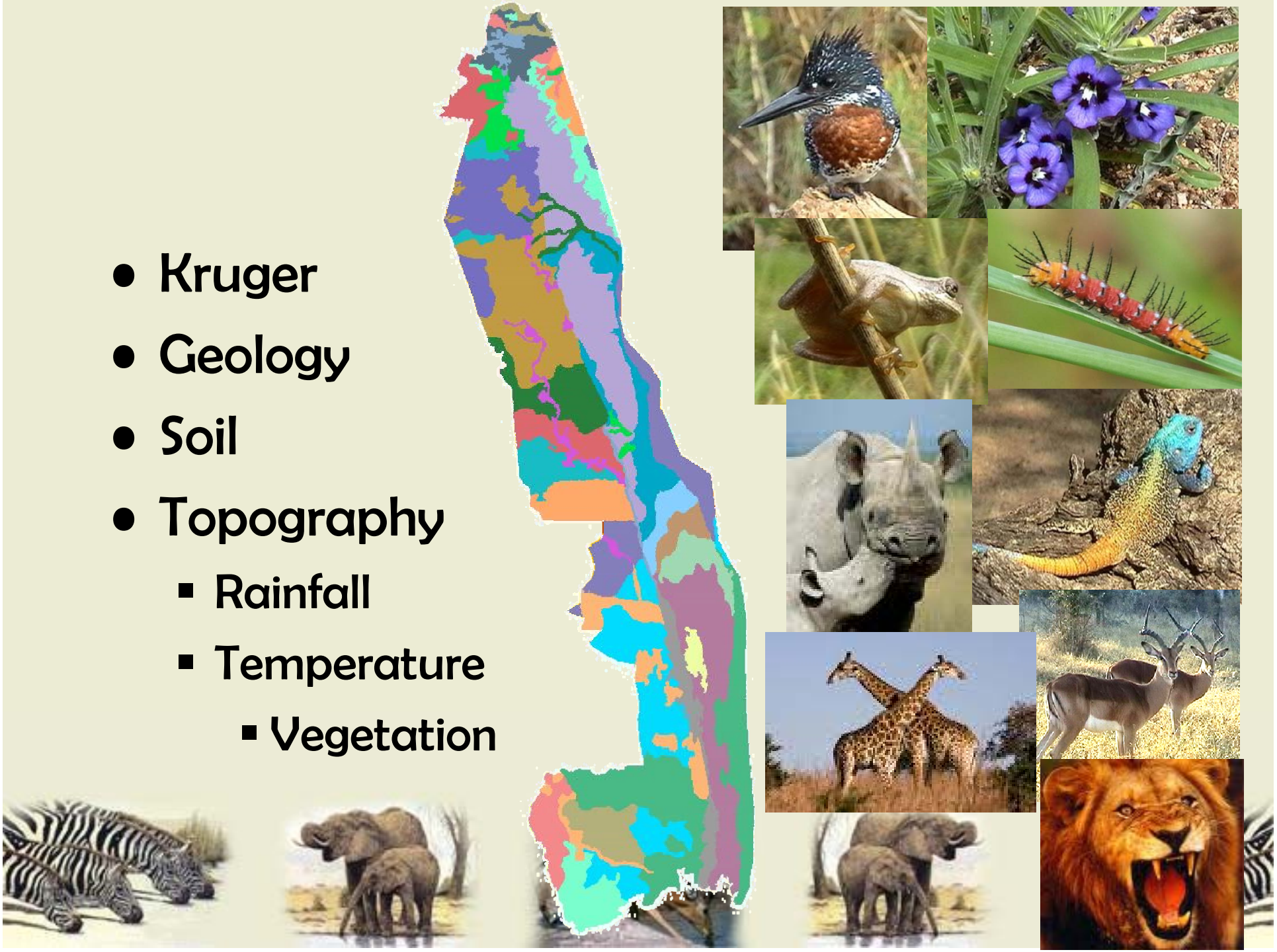
ABIOTIC TEMPLATE

- Abiotic stew > mixed together in different ways across the planet = the template for life on earth.
- Each species requires own mix of these ingredients to survive
- > cannot survive in isolation.
- Each habitat has distinct life forms living in it, forming complex communities of inter-dependent organisms.

HABITATS OF KRUGER

- Savanna biome (Low & Rebelo 1996)
- 20 board-scale vegetation types (Mucina & Rutherford 2006)
- 35 landscapes (Gertenbach 1983) or
- 56 landtypes (Venter 1990)
- Each with their own distinct set of life forms!

- Kruger
- Geology
- Soil
- Topography
  - Rainfall
  - Temperature
    - Vegetation



INTERESTINGLY:

Basic underlying geology (Basalt / Granite division) can be seen from space:

From MODIS satellite looks like fence line

Underlying rock types determine the nature of the soil:

- Younger surface of dark brown loams (nutrient rich) derived from the basalts. Form Knob Thorn / Marula Savannah and Tree Mopane Savannah (*Acacia* spp. / *Sclerocarya* sp. & *Colophospermum* sp.)

- Older exposed surfaces have more sandy soils (leached nutrient poor) derived from granite. Yield woodlands dominated by the *Combretum* species of leadwood and the bushwillows.

➢ impacts the species of game that inhabit each of the Kruger National Park's ecozones, from the browsers and grazers that prefer each habitat to the carnivores that prey on them.

SPECIES NICHE

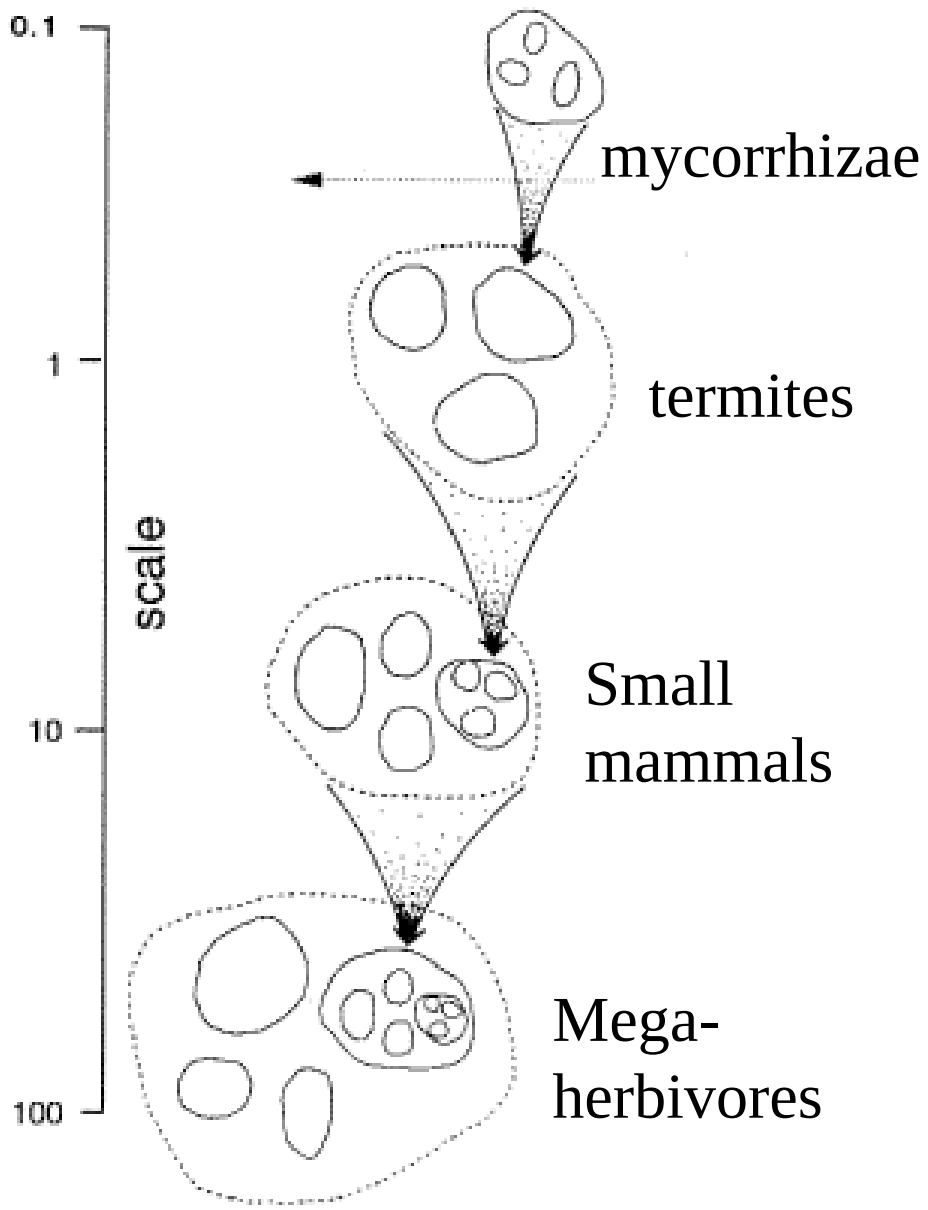
How species perceive the environment;

at their scale;

relative to their needs

> Determines behaviour

Nested hierarchical patches



Patch Structure

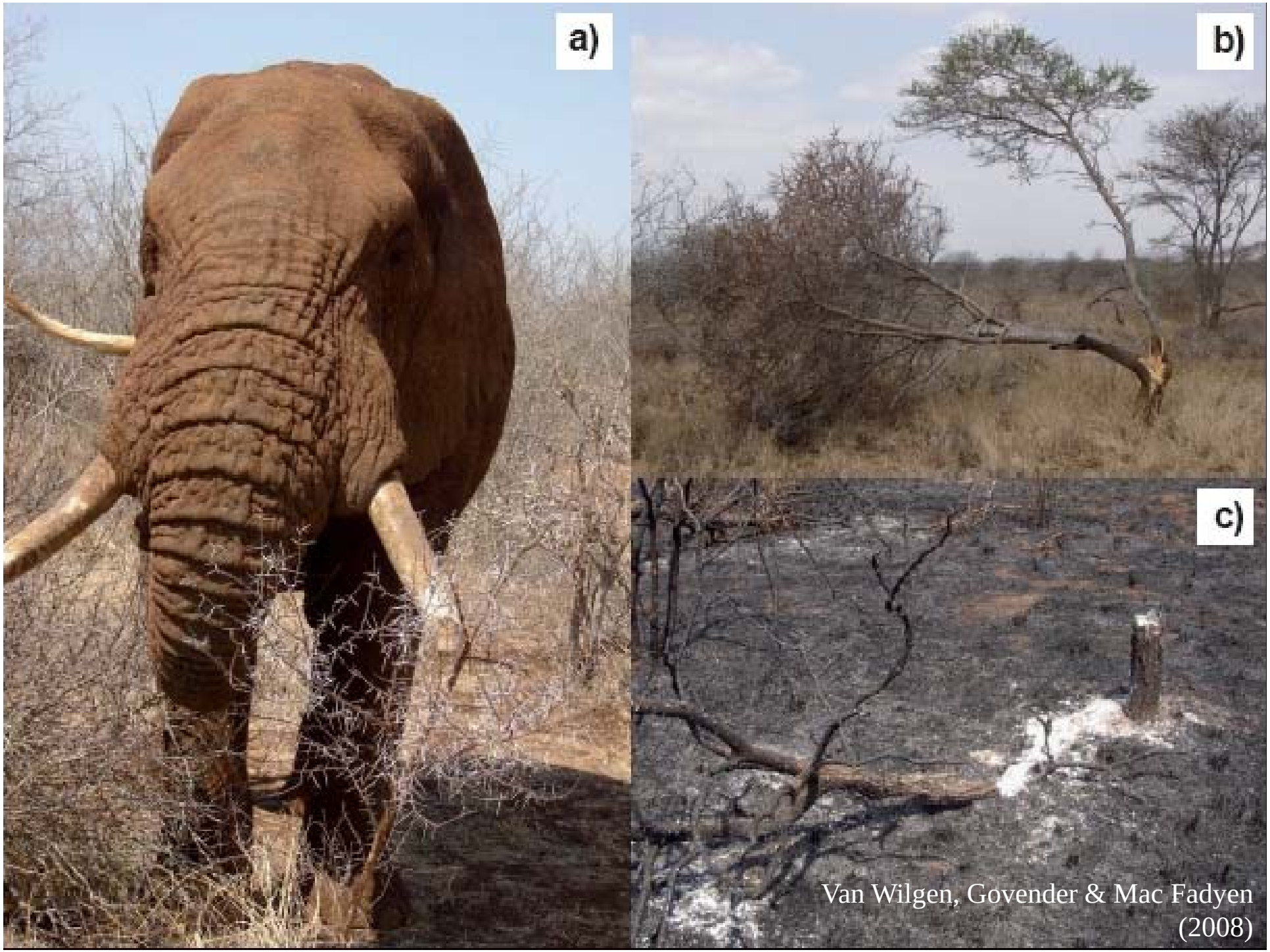
Kotliar & Wiens (1990)

DIFFERENCE OF SCALE

Elephant

VS.

Elephant Shrew



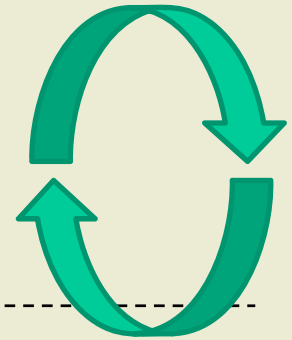
Van Wilgen, Govender & Mac Fadyen (2008)

Ecosystem engineers

Termites

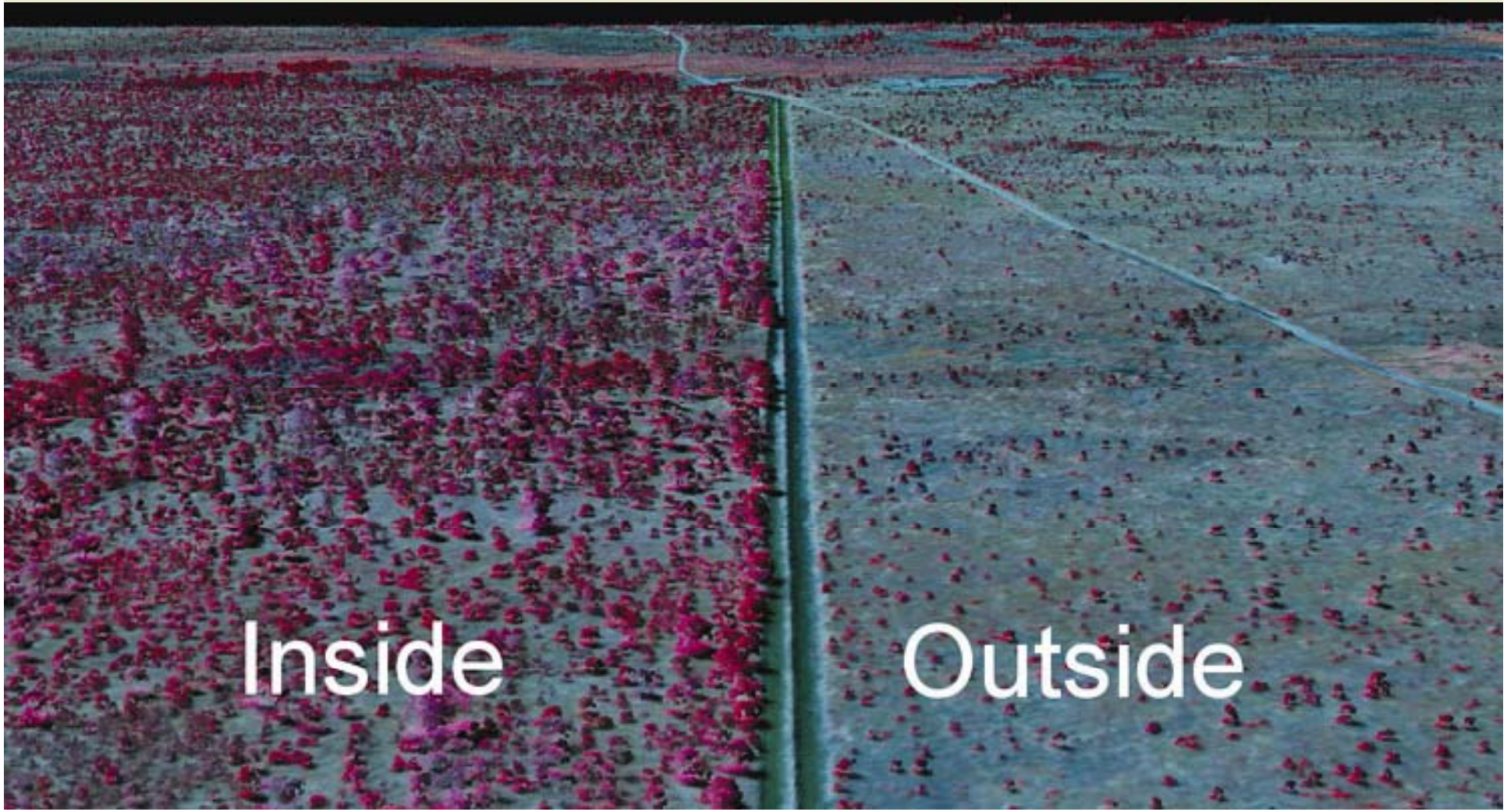
- Contribute to grassland productivity
- enhance plant and animal activity at the local level
- while their even distribution over a larger area maximizes ecosystem-wide productivity

FEEDBACK LOOPS



Animals creating their own habitat

role of fire, elephants, grazers on changing habitat



LANDSCAPES OF KRUGER

Classified into 35 landscapes of similar:

geomorphology,

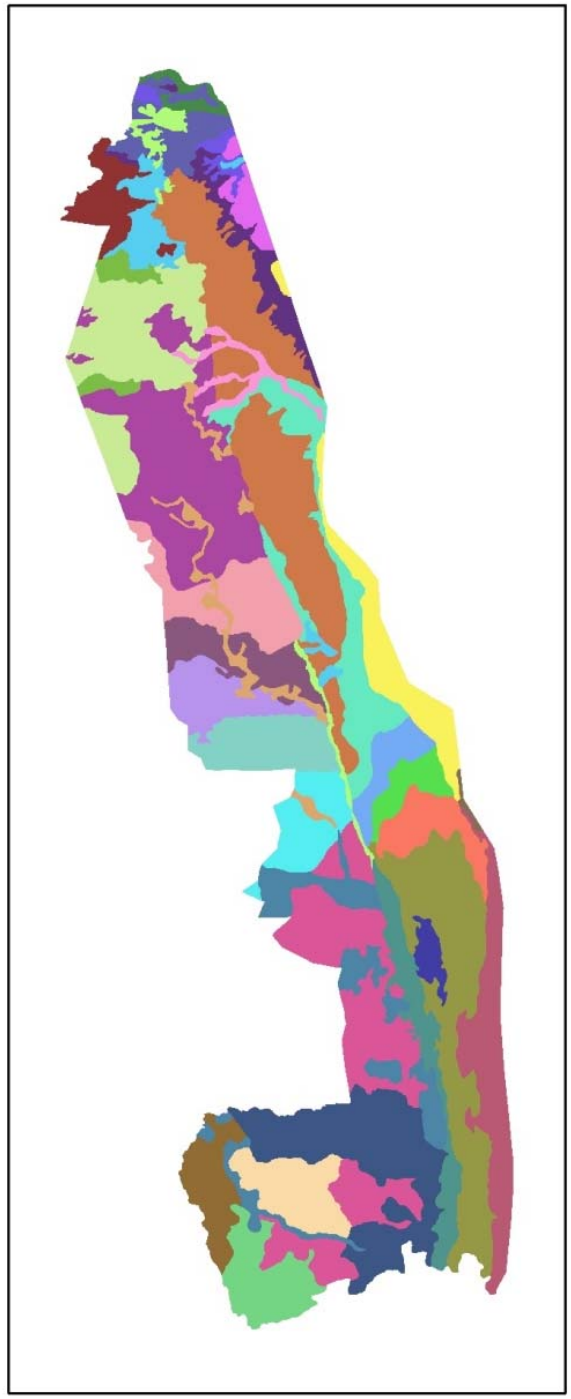
climate,

soil,

vegetation patterns and,

associated fauna (Gertenbach 1983)

Represent the basic functional units on which management decisions are based



LANDTYPES OF KRUGER

Landscapes classification later refined into 56 landtypes on the basis of similar:

geomorphology,

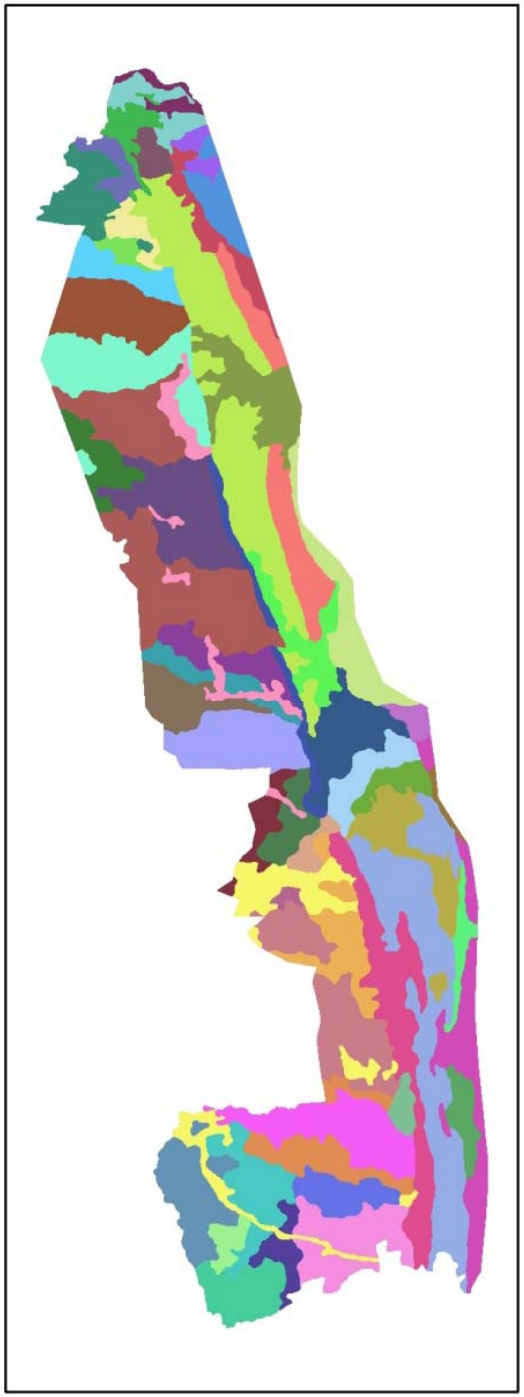
climate,

geology,

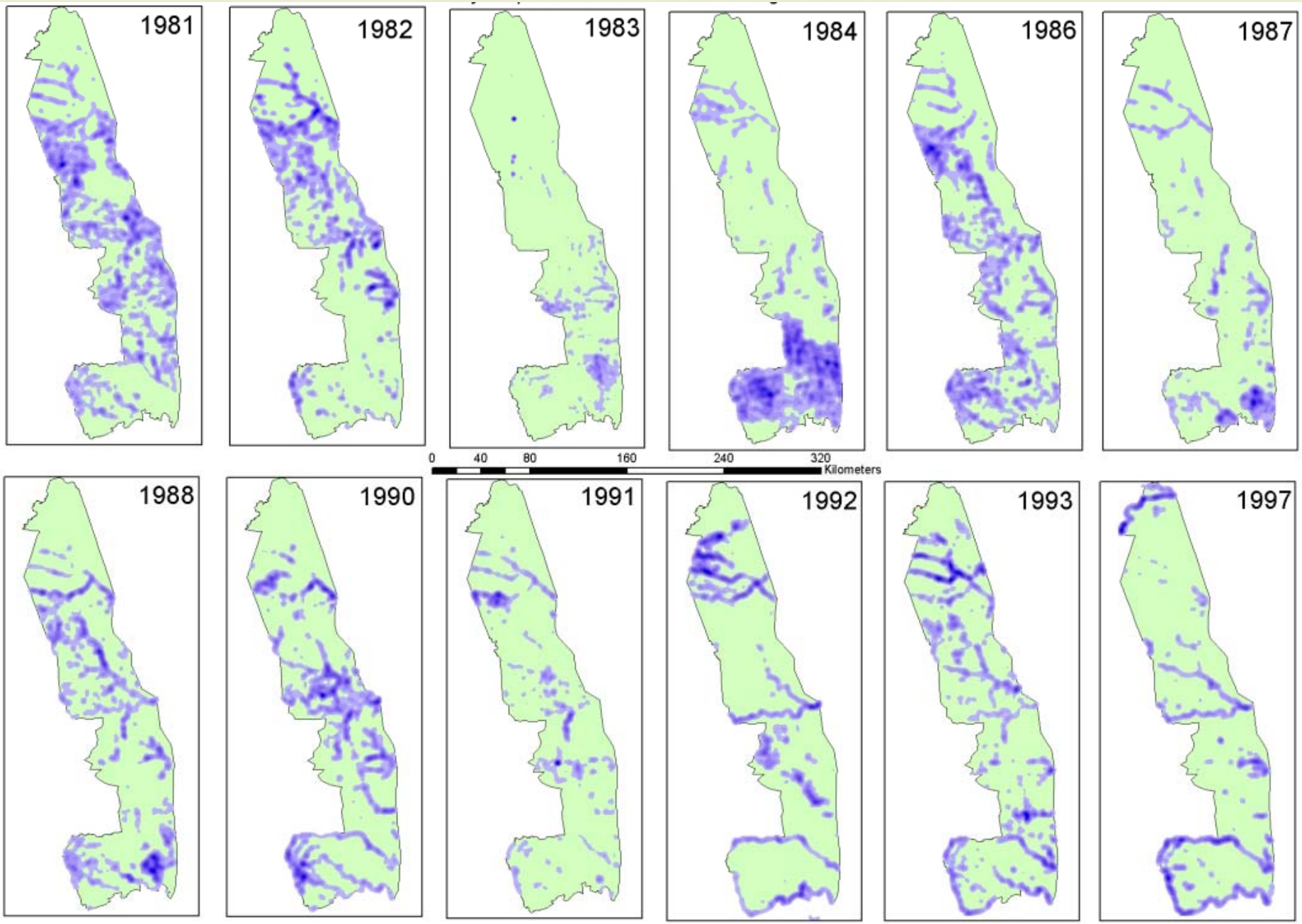
soil and,

vegetation patterns

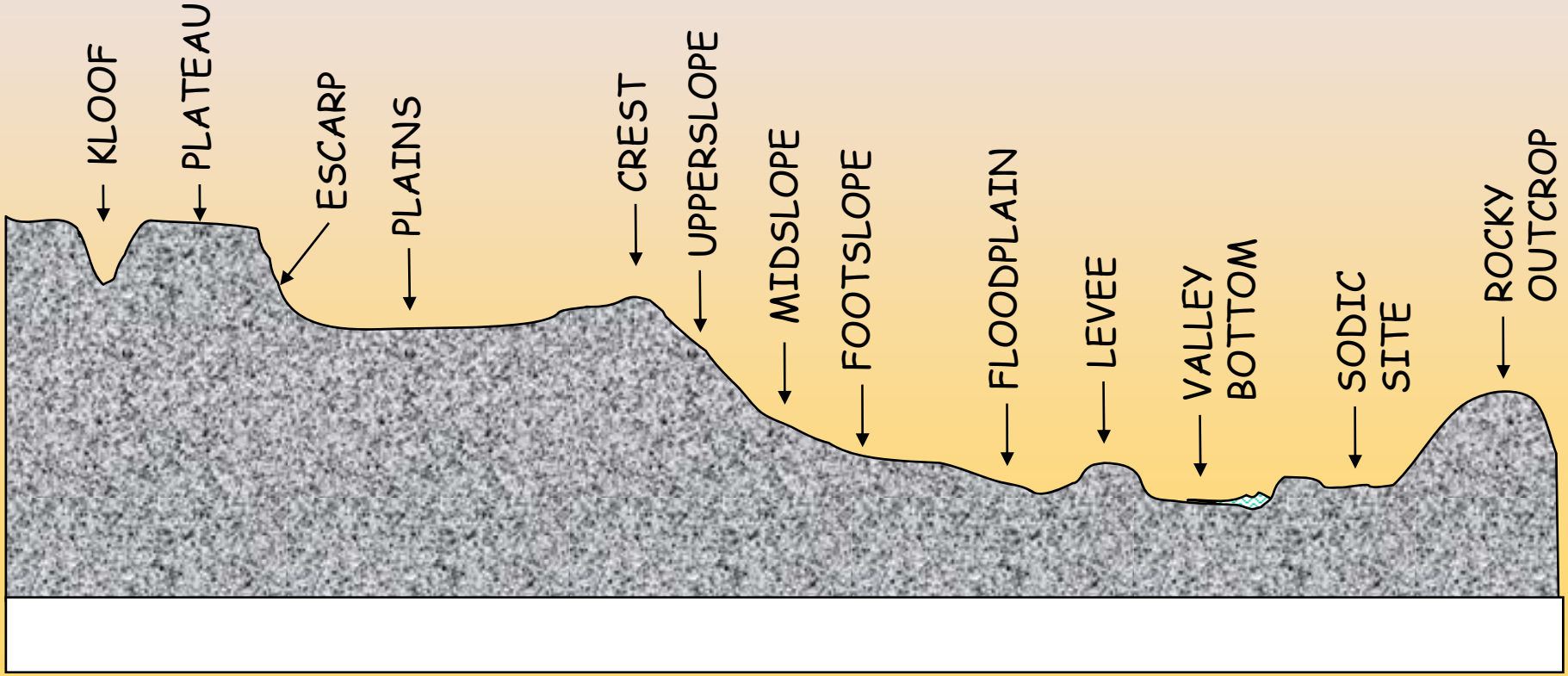
Used for management and research planning in different ways (Venter 1990)

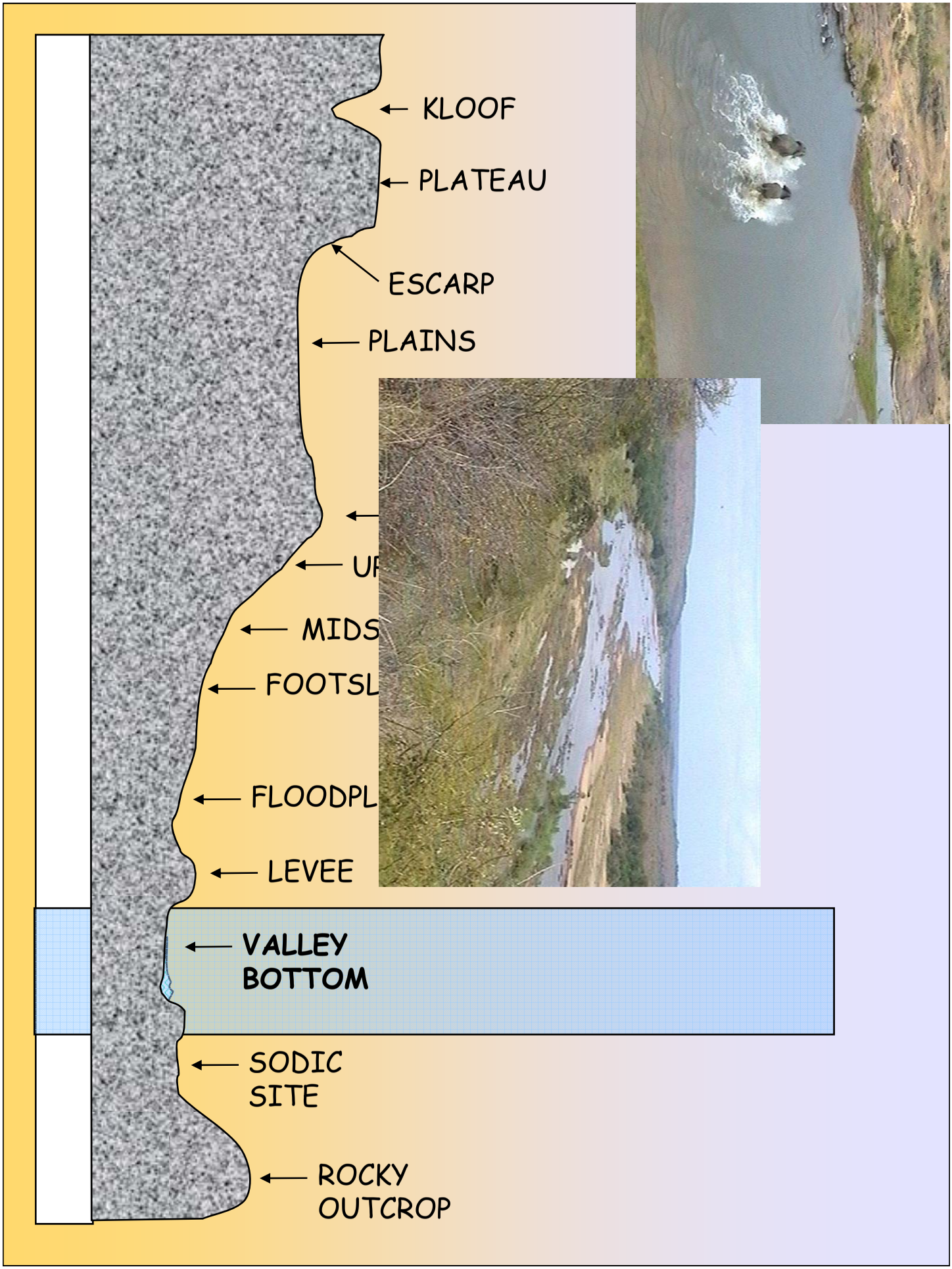


Natural water distribution

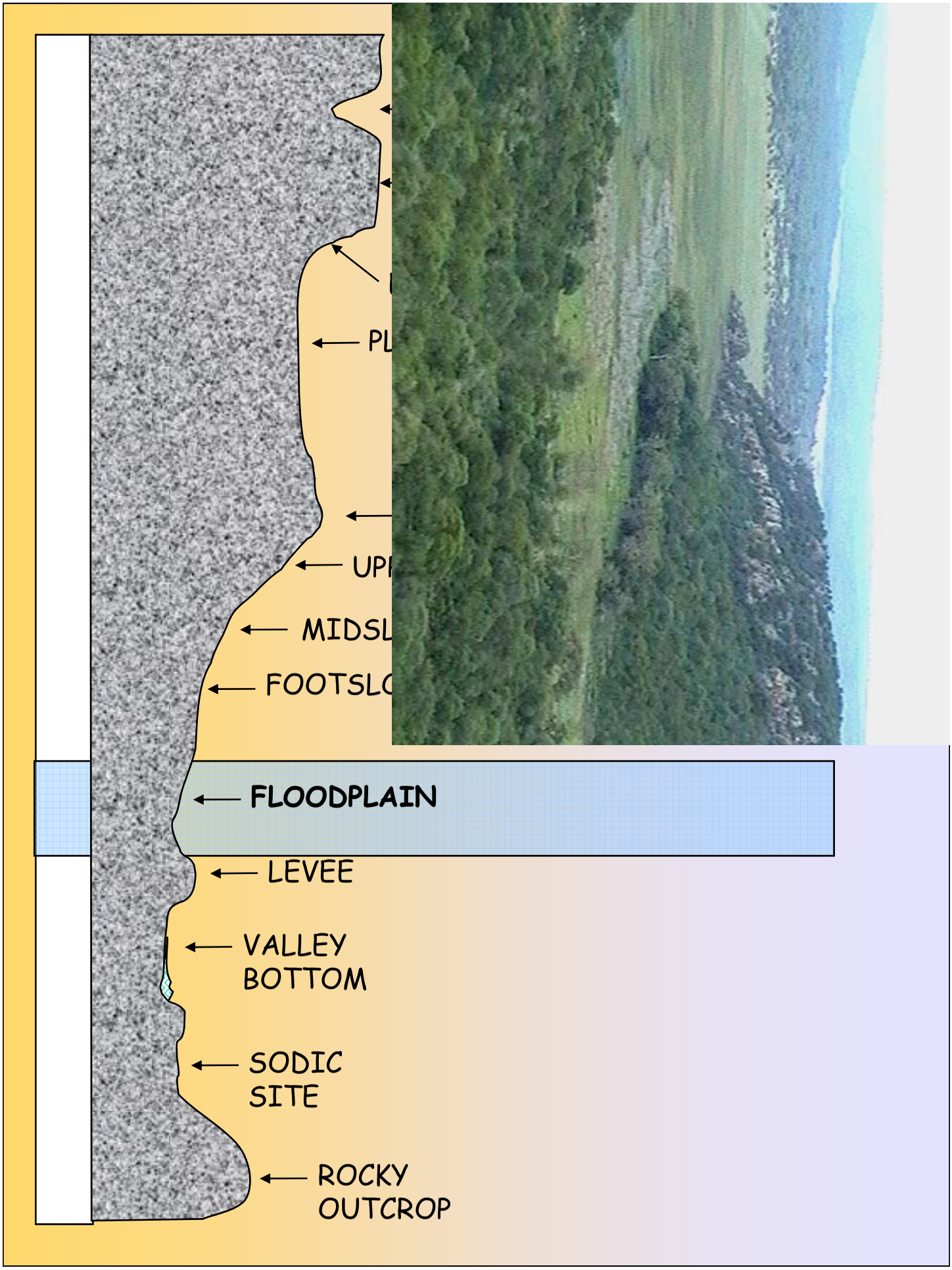


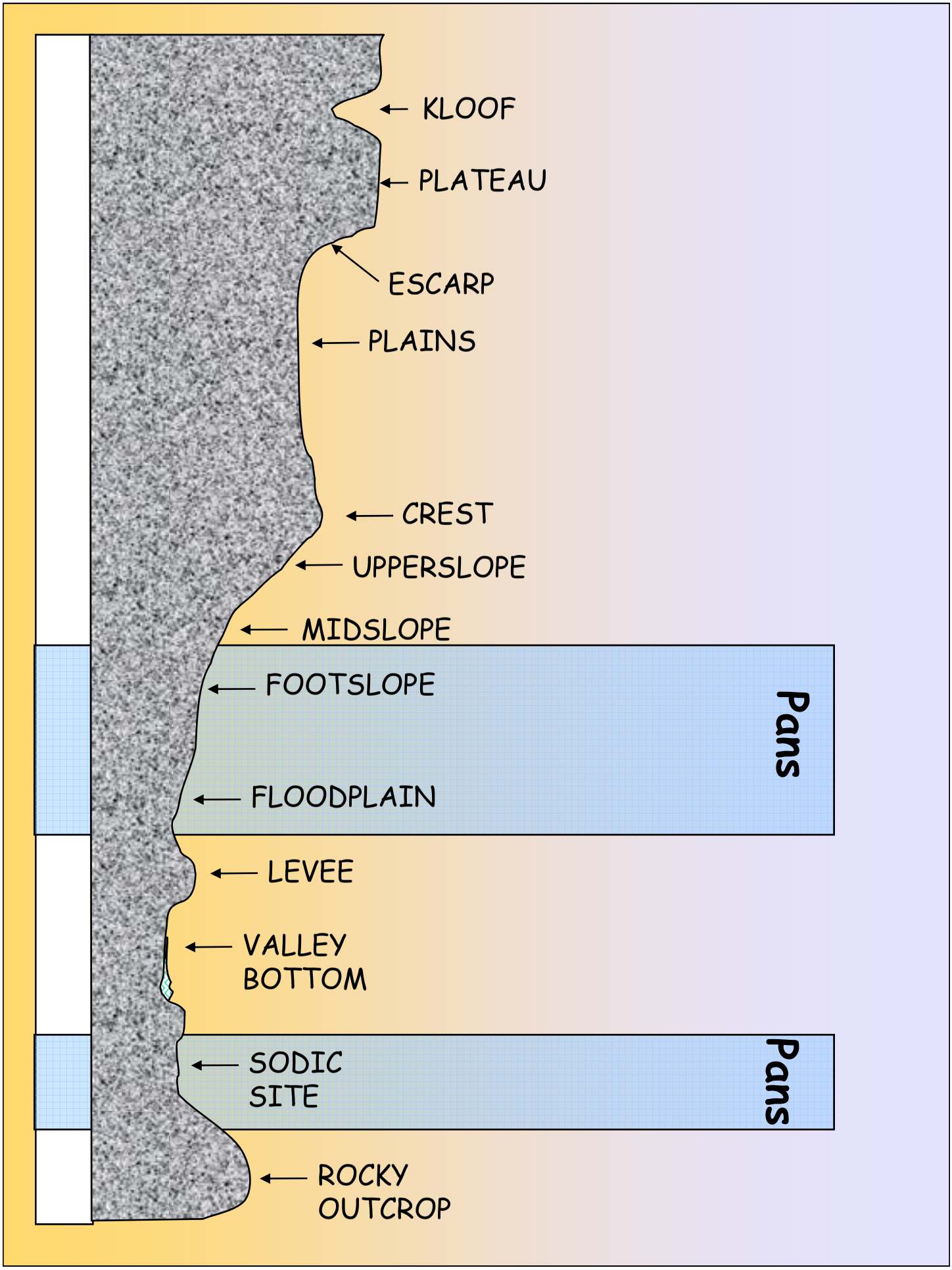
Terrain units

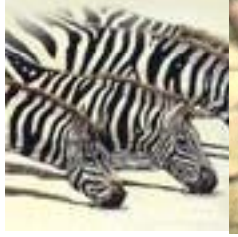


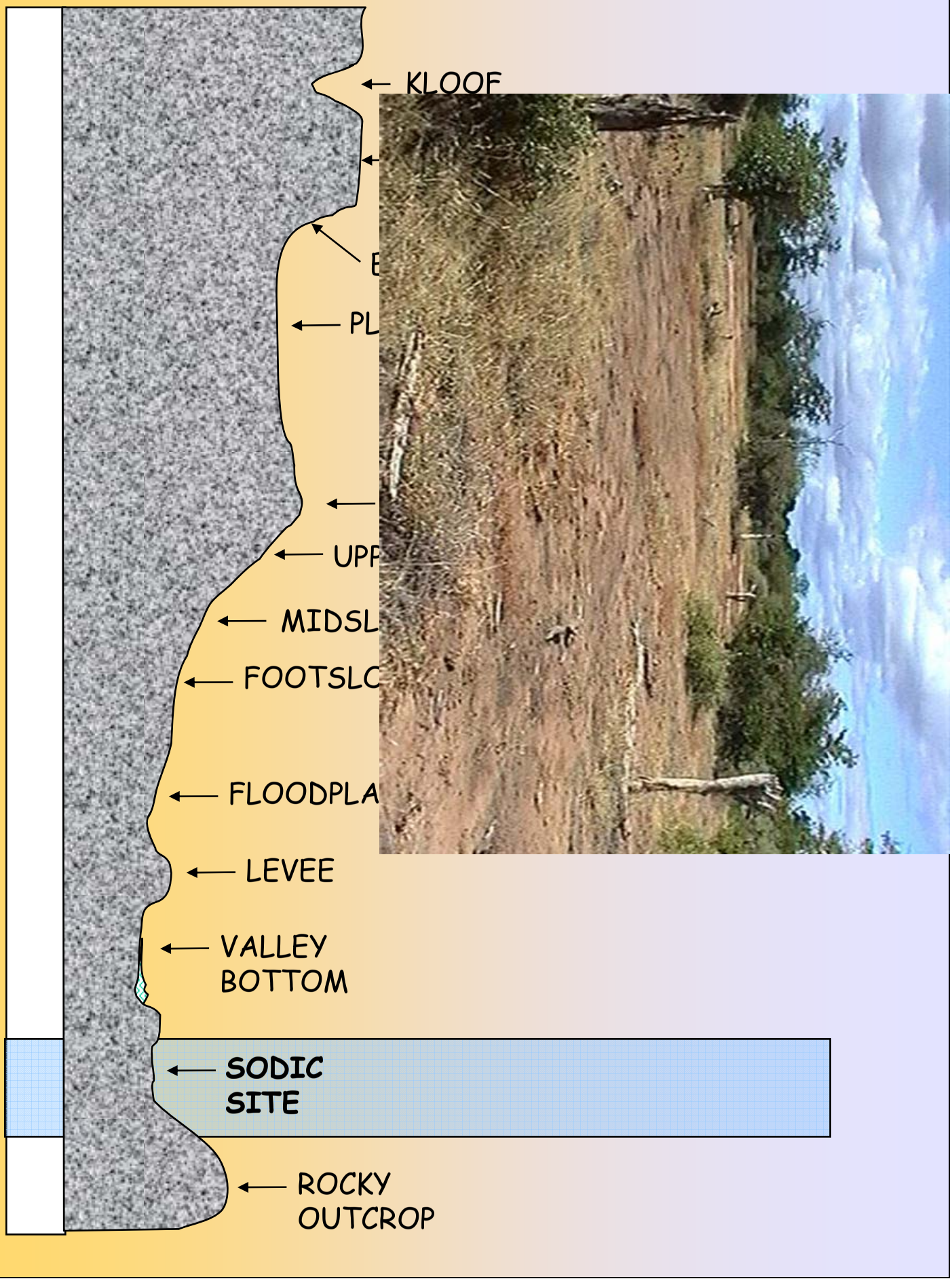

KLOOF
PLATEAU
ESCARP
PLAINS
UP
MIDS
FOOTSL
FLOODPL
LEVEE
VALLEY BOTTOM
SODIC SITE
ROCKY OUTCROP

Riparian zone


PL
UP
MIDSL
FOOTSLO
FLOODPLAIN
LEVEE
VALLEY
BOTTOM
SODIC
SITE
ROCKY
OUTCROP


KLOOF
PLATEAU
ESCARP
PLAINS
CREST
UPPERSLOPE
MIDSLOPE
FOOTSLOPE
FLOODPLAIN
Pans
LEVEE
VALLEY BOTTOM
SODIC SITE
Pans
ROCKY OUTCROP

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LEVEE
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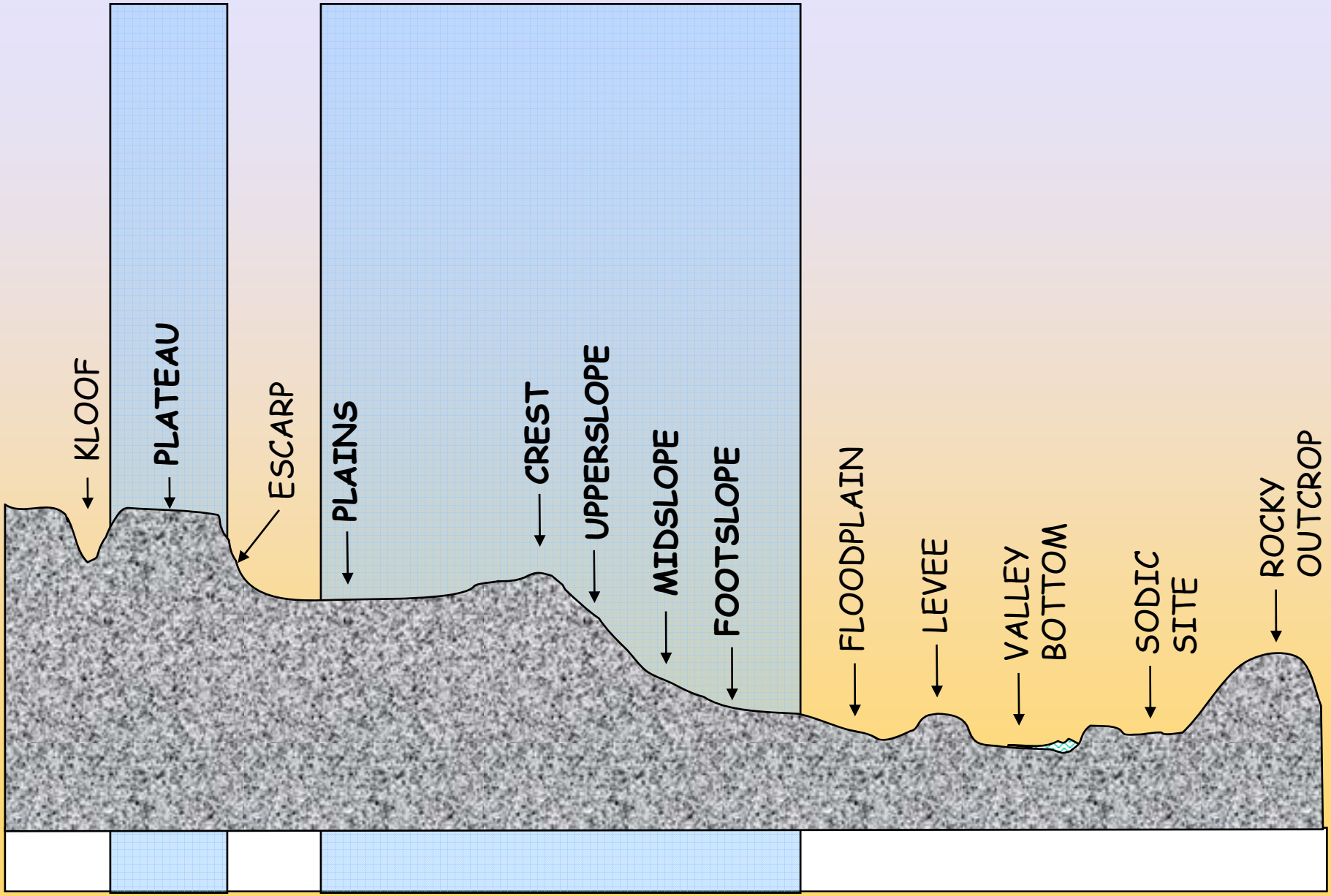
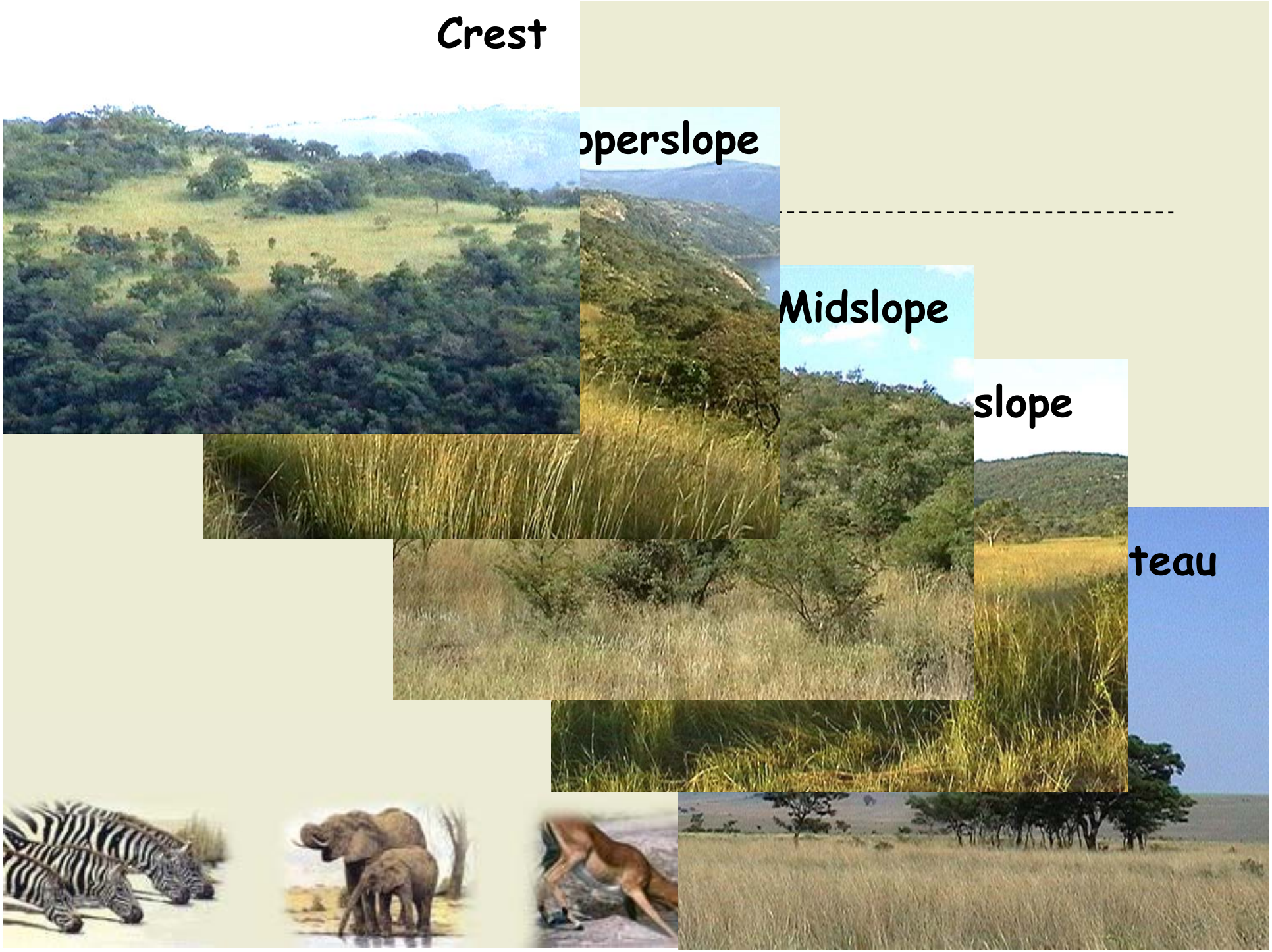
BOTTOM
SODIC
SITE
ROCKY
OUTCROP

Terrain units




Crest
perslope
Midslope
slope
teau

ECOZONES

Generalized from Landscapes for tourism

35 Landscapes → 16 unique Ecozones.

Altitudinal range is from 200m to 830m above sea level.

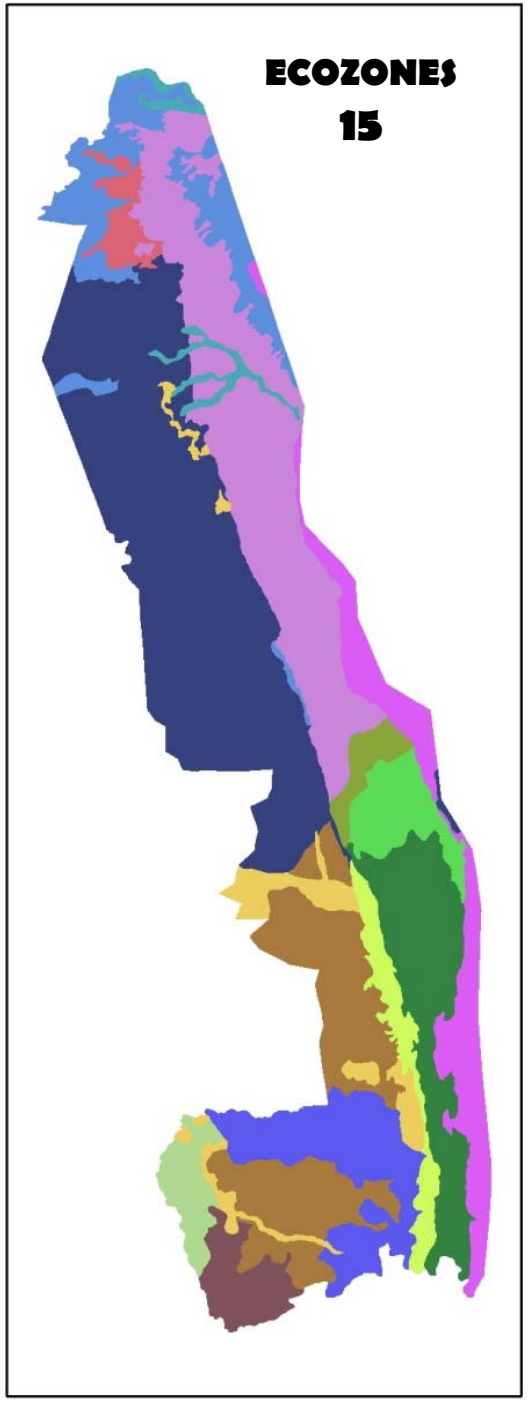
Rainfall increases with proximity to the Great Escarpment

- averages from 300 mm/yr in the east to 900mm/yr in the south & west.

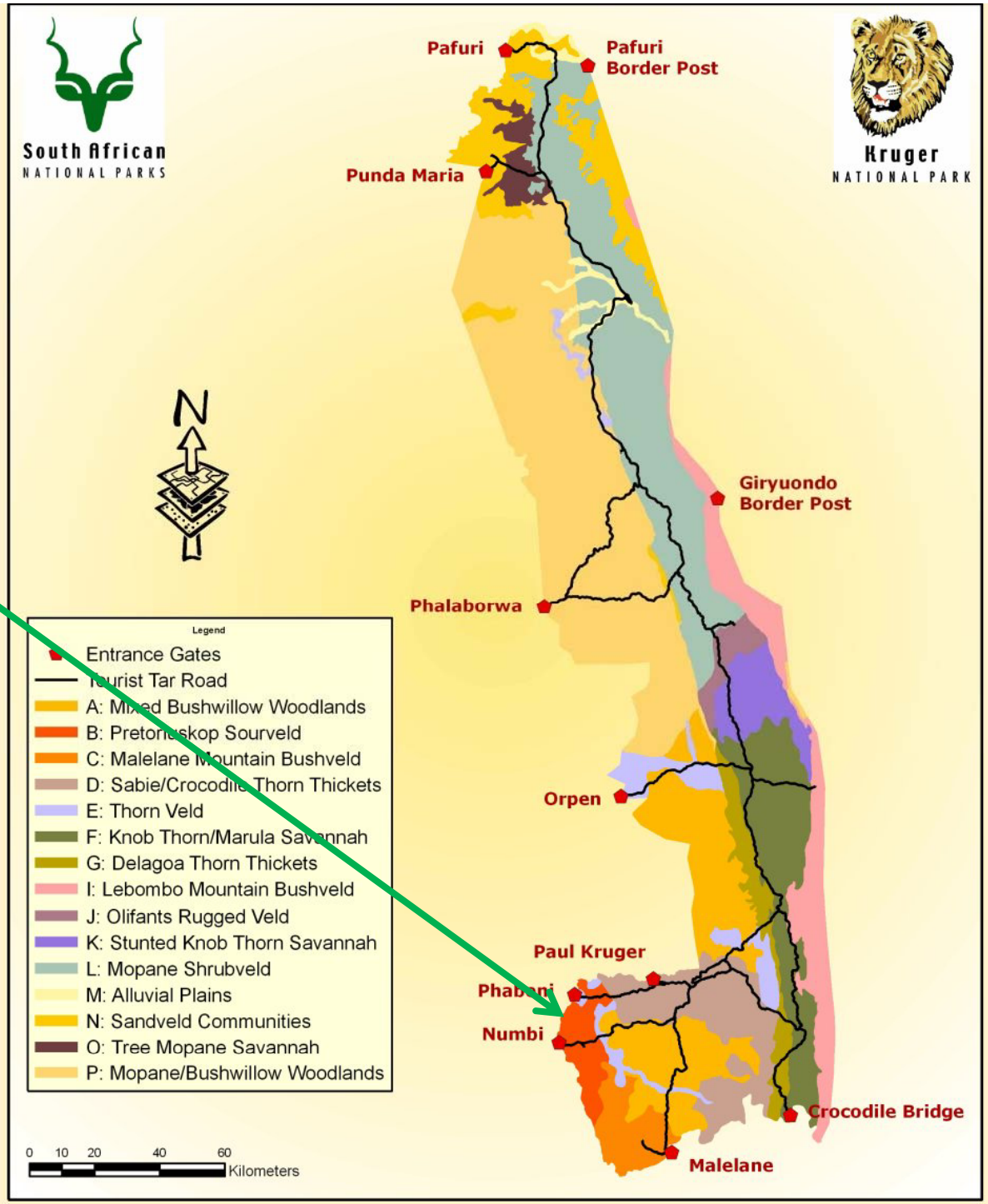
↑ Climatic variations ↑ range of habitats ↑ species diversity.

Park area has very high levels of biodiversity and endemic (uniquely local) species as a consequence.

A - Mixed Bushwillow Woodlands
B - Pretoriuskop Sourveld
C - Malelane Mountain Bushveld
D - Sabie Crocodile Thorn Thickets
E - Thorn Veld
F - Knob Thorn / Marula Savannah
G - Delagoa Thorn Thickets
H - Riverine Communities
I - Lebombo Mountain Bushveld
J - Olifants Rugged Veld
K - Stunted Knob Thorn Savannah
L - Mopane Scrubveld
M - Alluvial Plains
N - Sandveld
O - Tree Mopane Savannah
P - Mopane / Bushwillow Woodlands



Pretoriuskop Sourveld



Pretoriuskop Sourveld

Gently sloping hills & valleys;

Dense trees, shrubs and tall grass;

Historically the area did not have many trees before European settlement & agriculture;

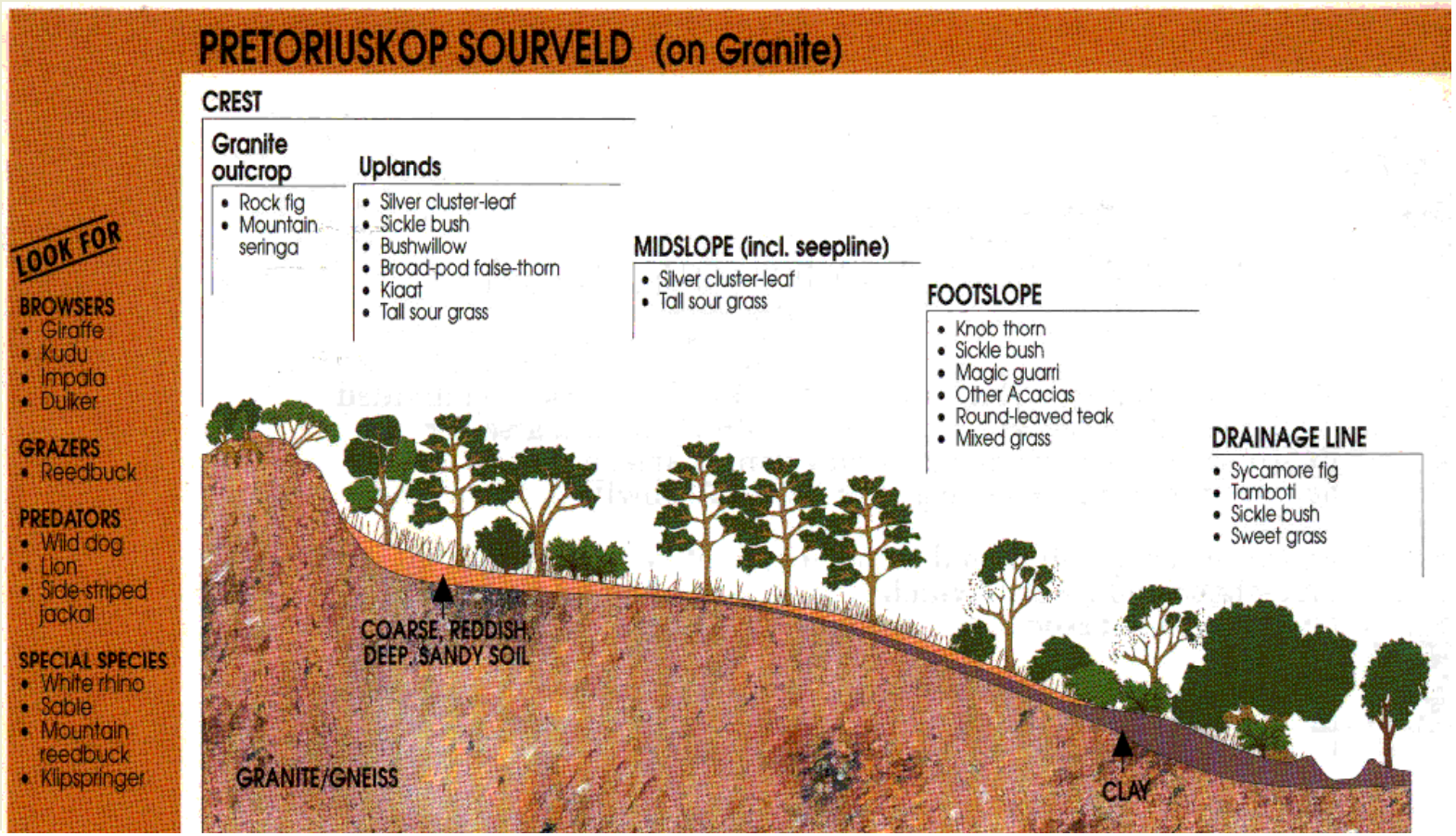
Scattered with granite hills

Associated animals:

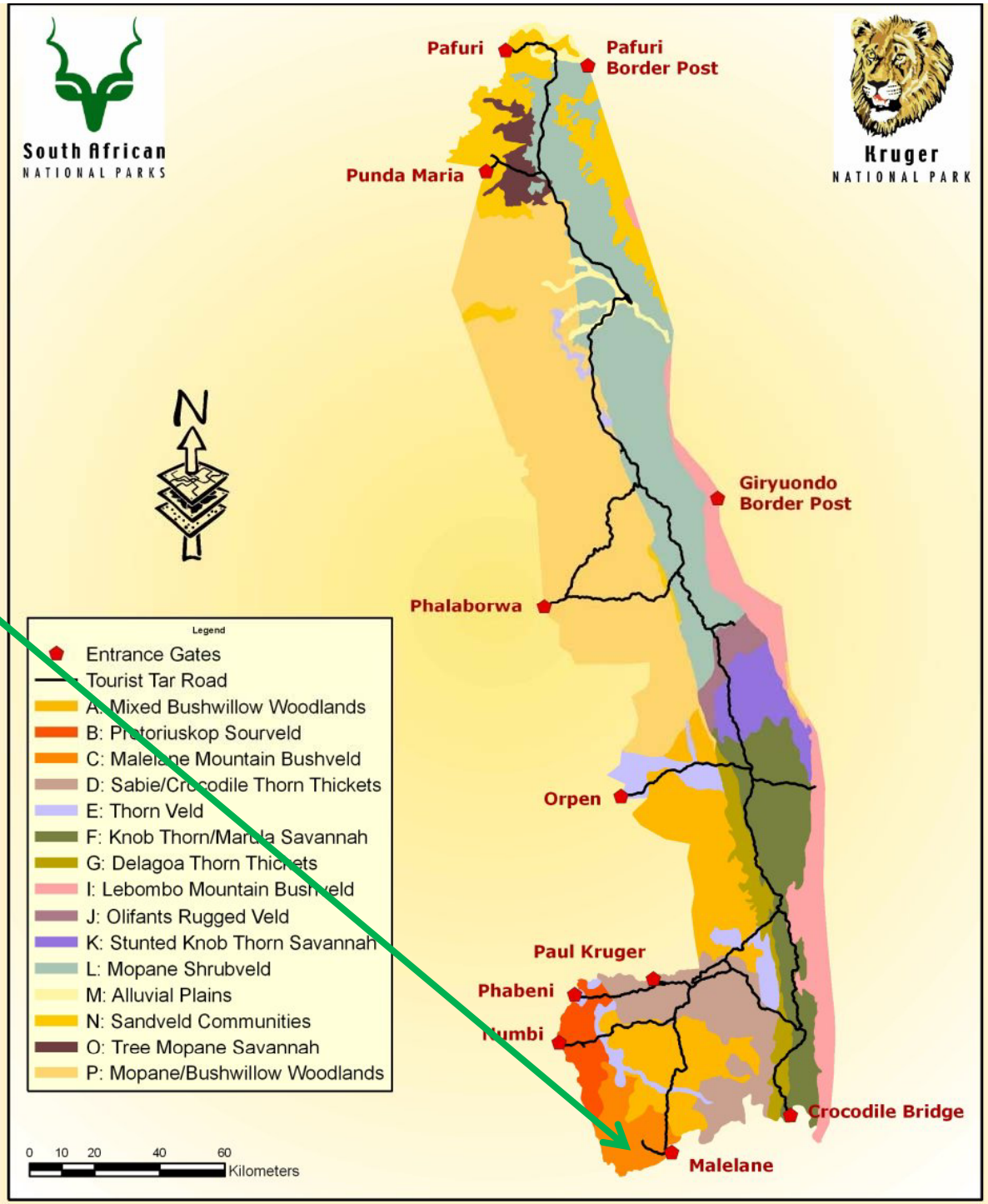
Giraffe,
Kudu,
Impala,
Duiker,

Wild dog,
Lion,
Jackal

Rhino
Sable



Malelane Mountain Bushveld



Malelane Mountain Bushveld

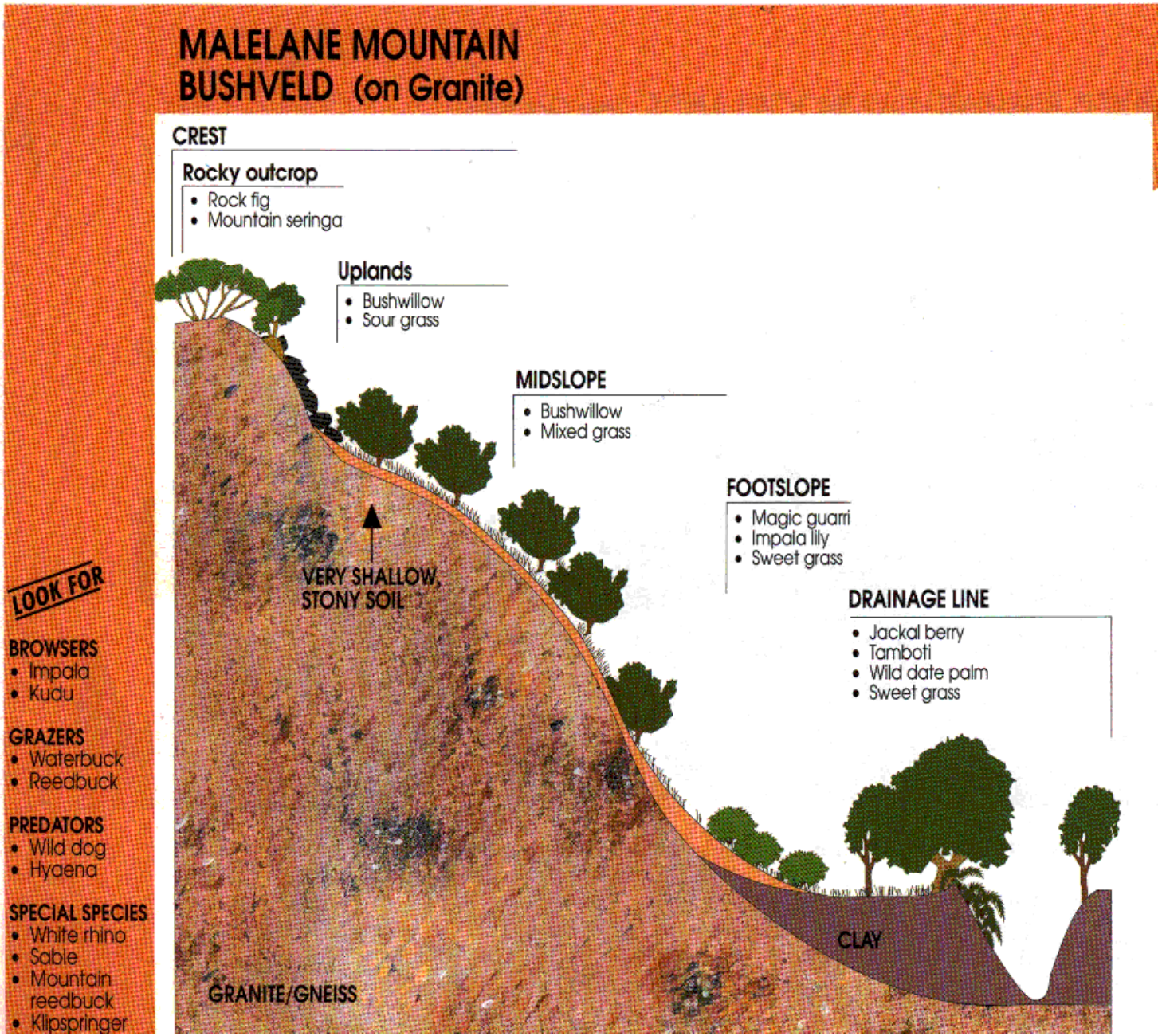
Malelane Mountain Bushveld found on underlying Granite bedrock

Associated animals:

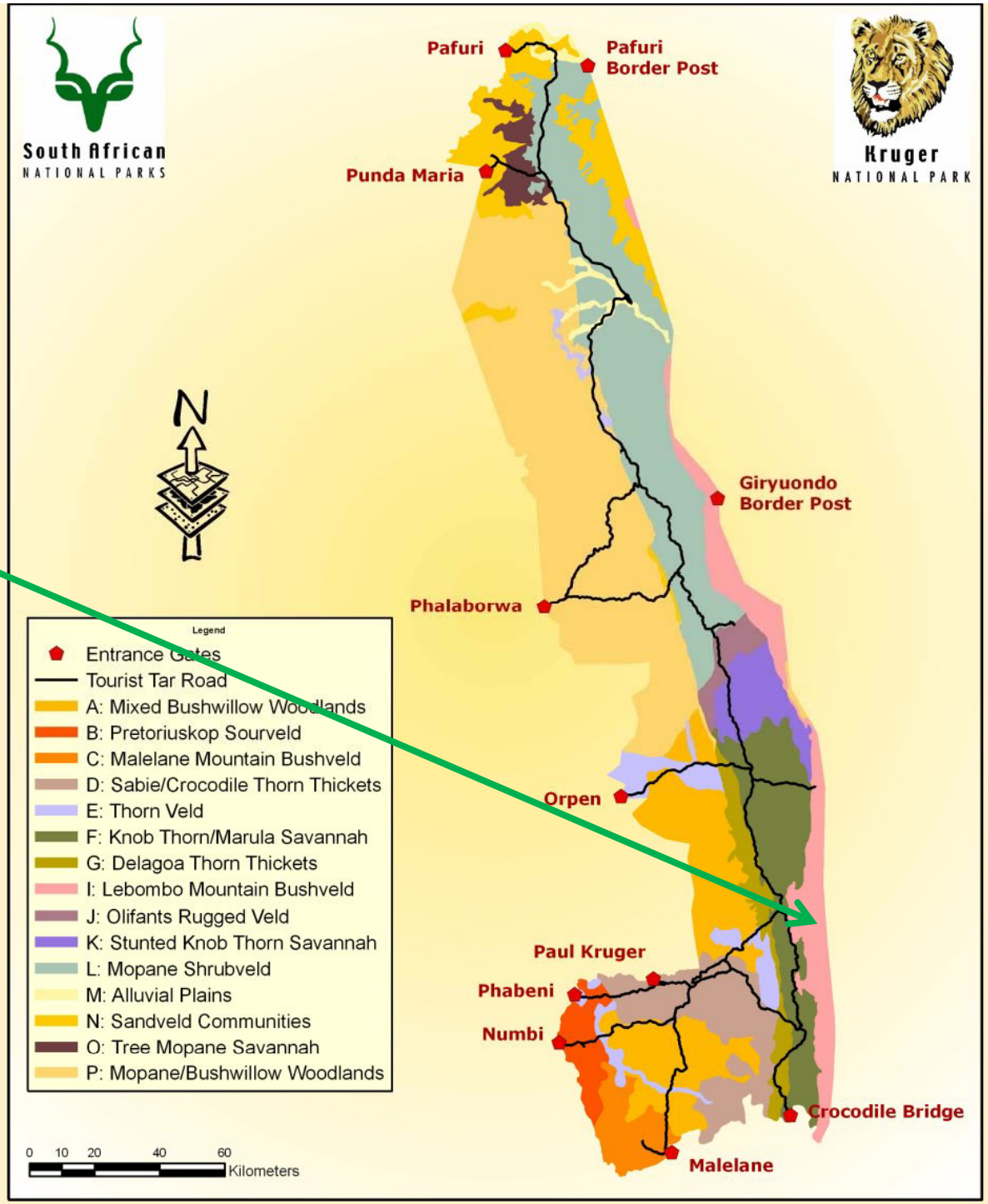
Kudu,
Impala,

Wild dog,
Hyaena

Rhino
Sable
Reedbuck



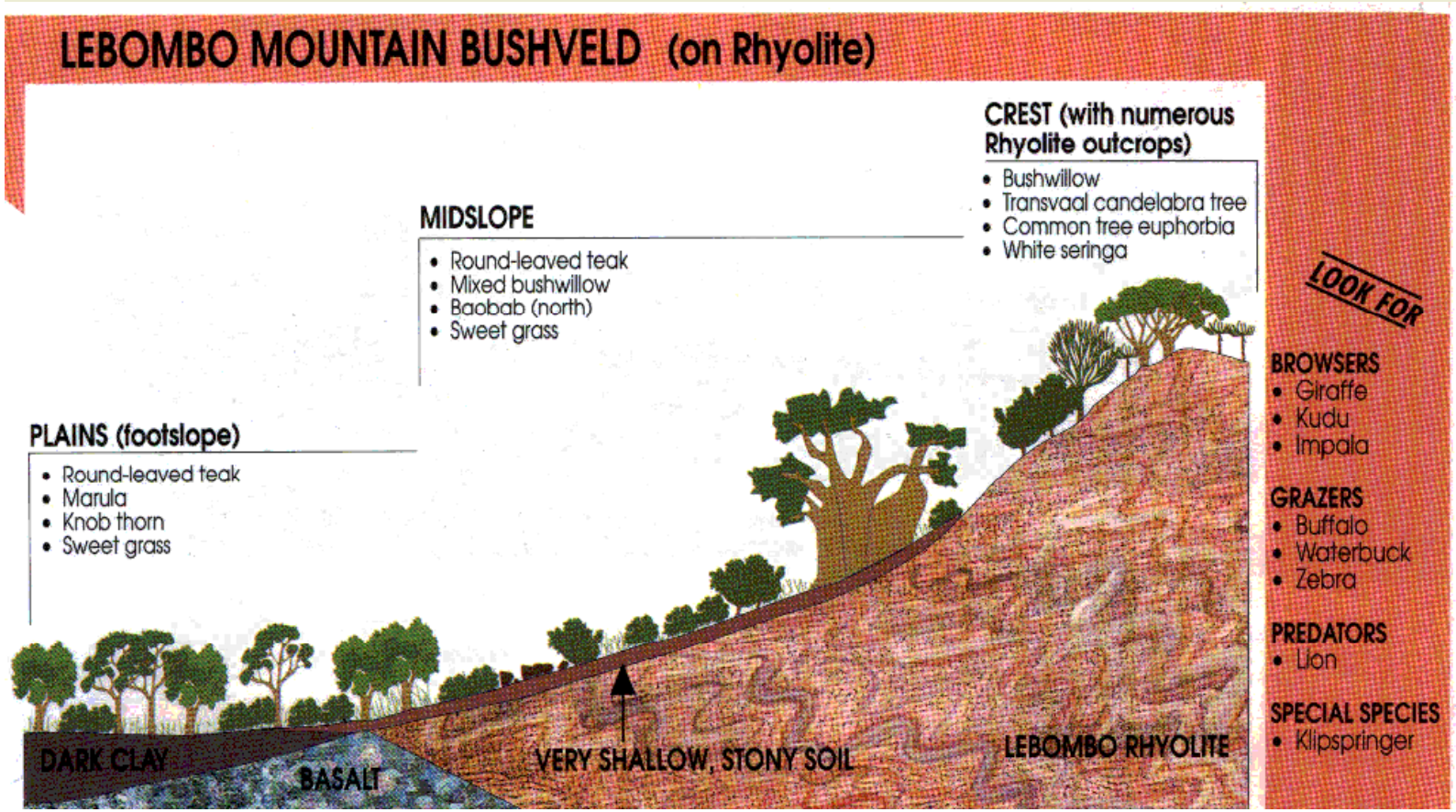
Lebombo Mountain Bushveld



Lebombo Mountain Bushveld

Rugged Lebombo mountains range over the whole length of the Kruger National Park.

Many rocky outcrops & deep ravines are a result of the underlying Rhyolite bedrock which is resistant to weathering

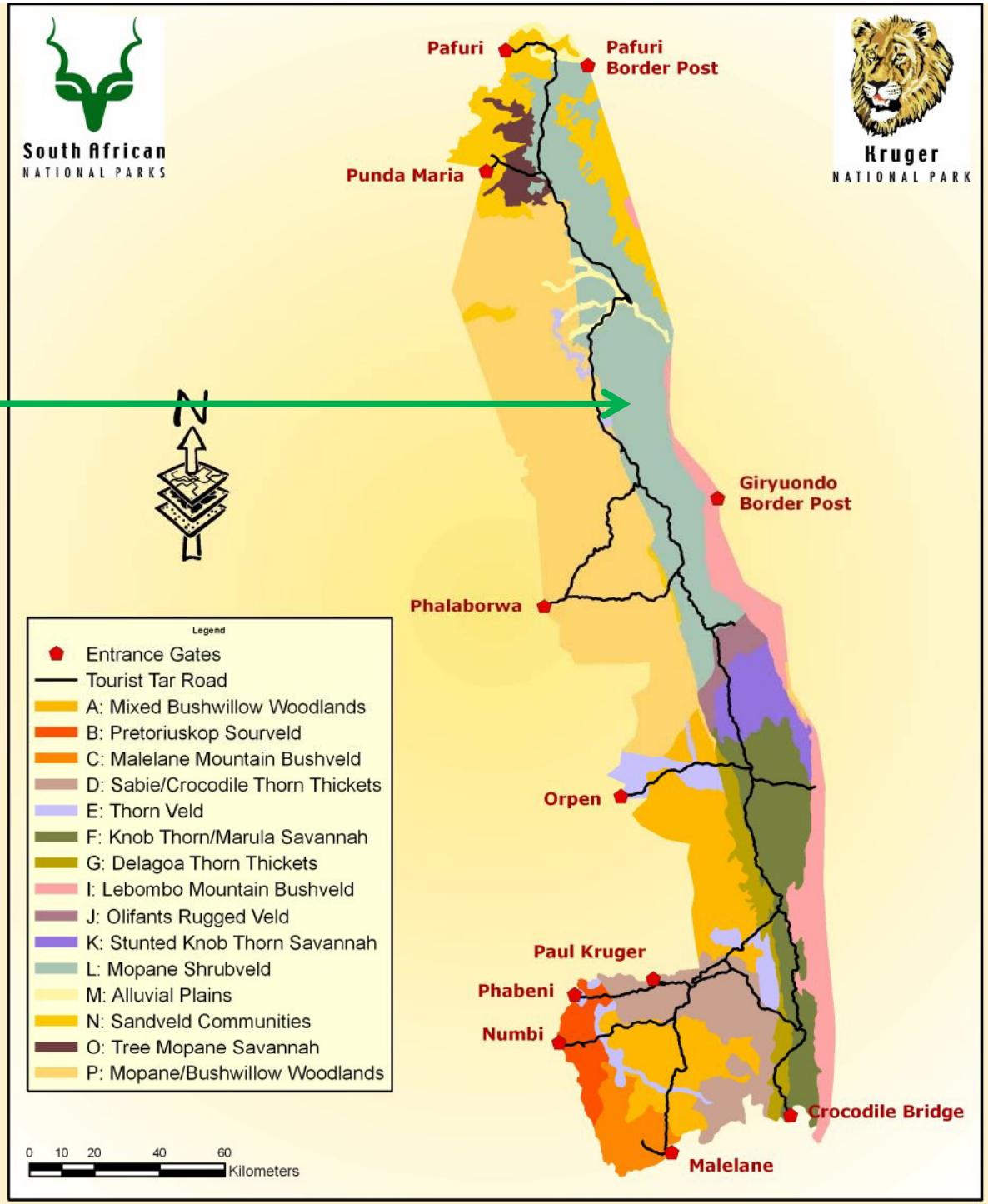


Species:
Giraffe,
Kudu,
Impala

Buffalo,
Waterbuck,
Zebra,

Lion

Mopane Scrubveld

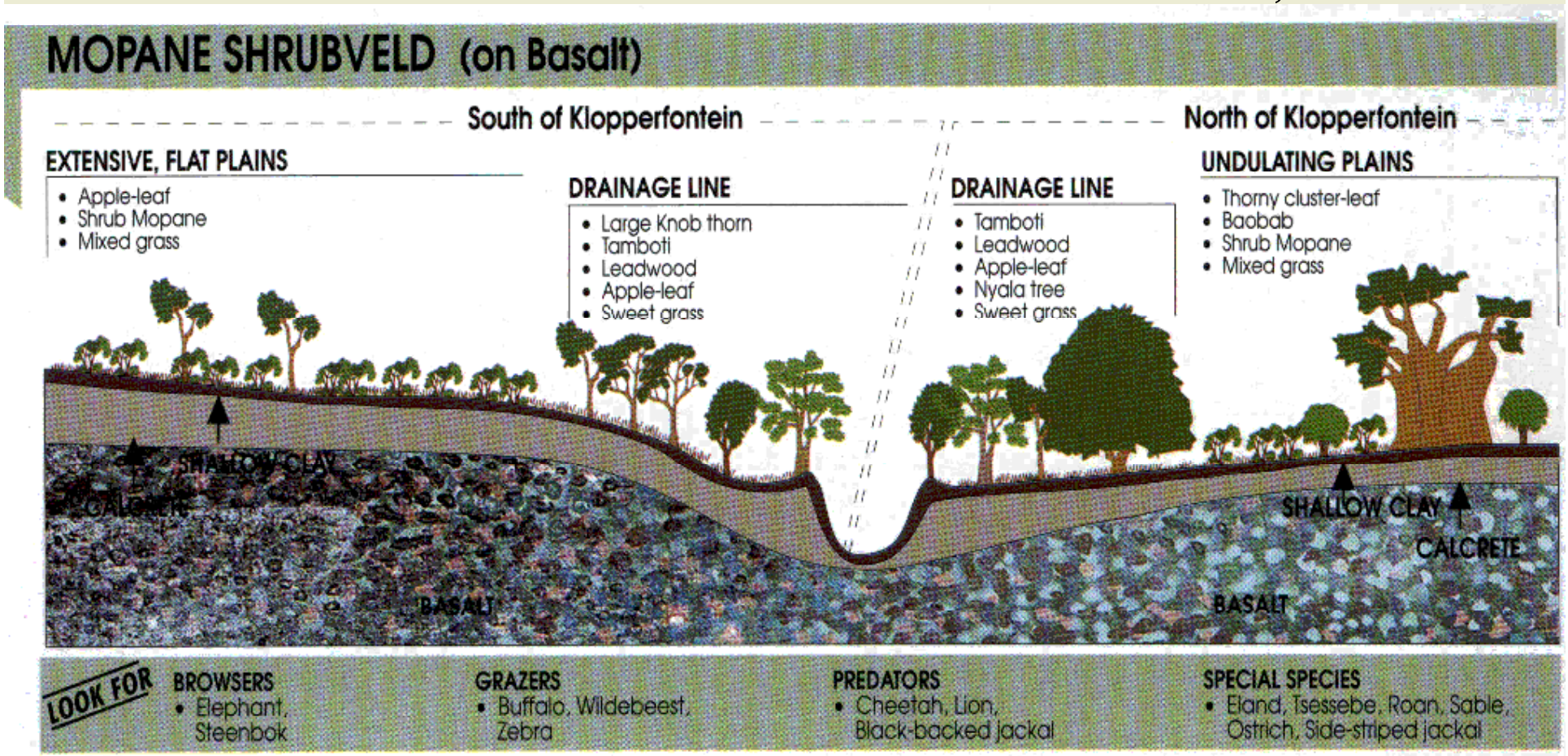


Mopane Scrubveld

Very flat with very few drainage lines;

Typically has areas of dense mopane shrub and sparse grass cover

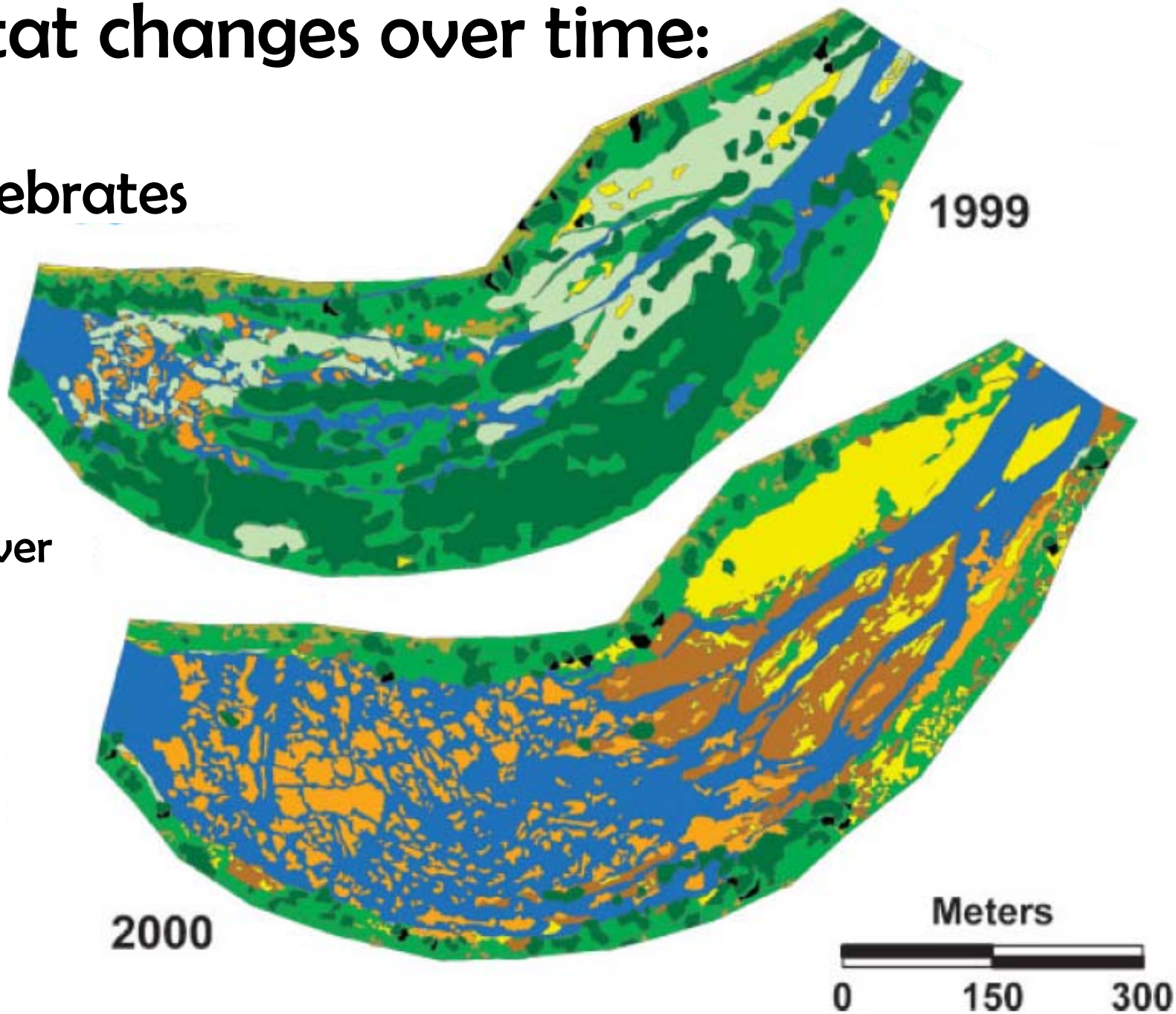
Elephant Steenbok	Buffalo, Zebra, Wildebeest	Cheetah, Lion, Jackal	Eland, Roan, Sable, Ostrich



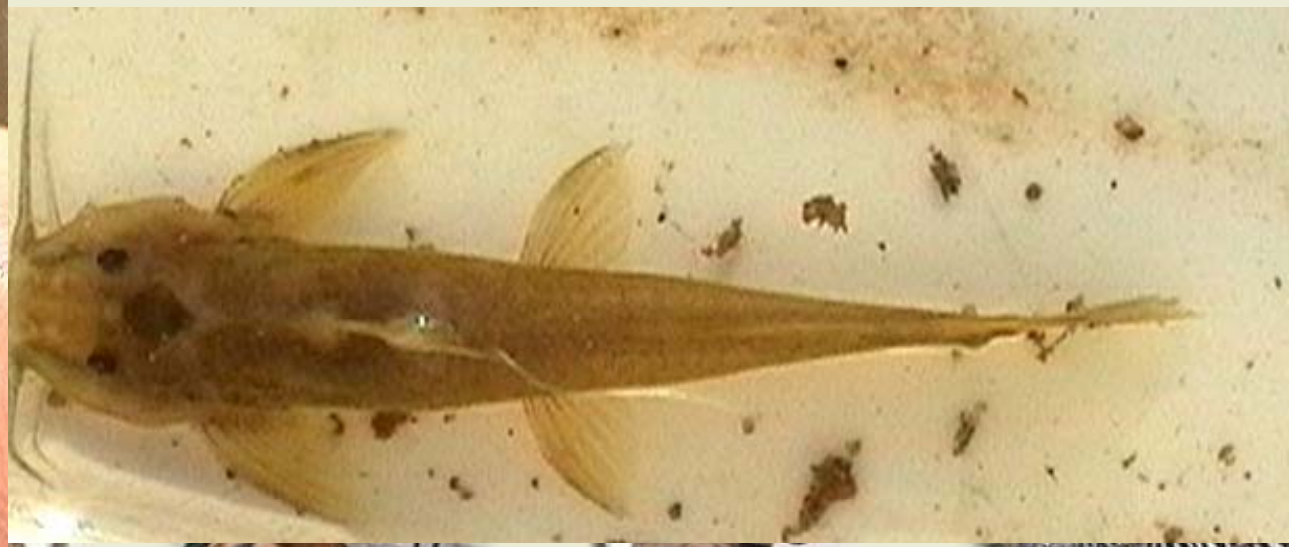
Habitat changes over time:

- Fish
- Invertebrates
- Birds

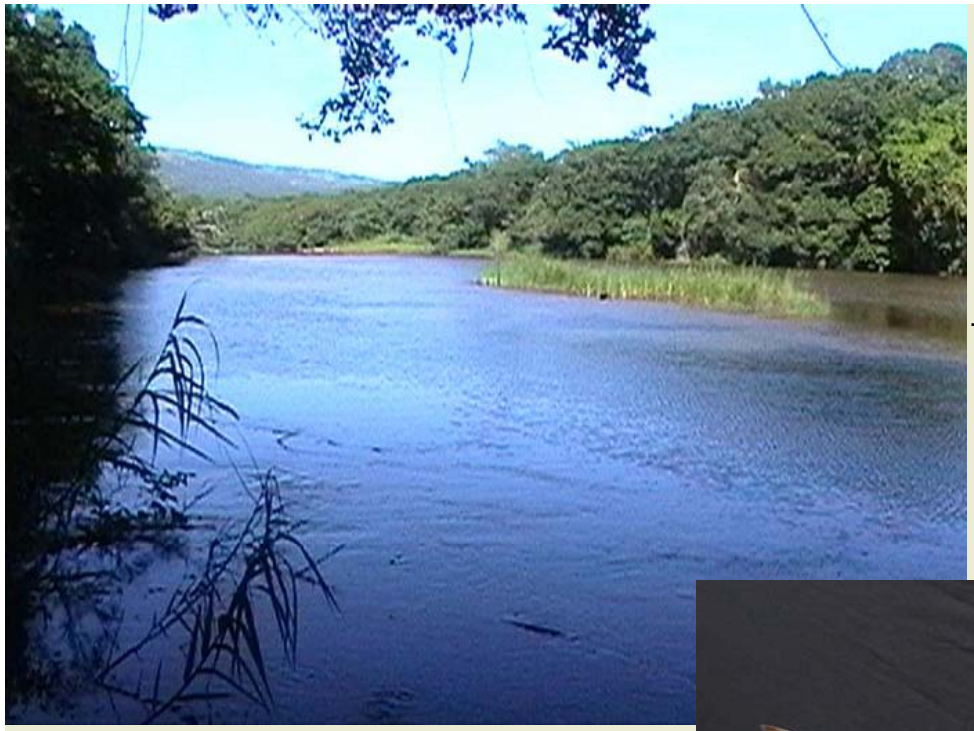
Sabie River



Rapids



Overhanging vegetation



River Runs

THREATS TO HABITATS IN PROTECTED AREAS

- Resource use (illegal most often)
- Invasive Alien Species
- Global Environmental –
  - climate
  - Carbon, nitrogen
  - changed – linked to
- Fragmentation around PAs and no corridors

Summary – habitat creation & species requirements

- Abiotic template – geology, soils, etc
- Climate
- Vegetation patterns – patches and structure
- Multiple feedback mechanisms – elephants, fire, termites, grazers, etc
- Fluctuates across landscape depending on the outcome of all interactions

TO END OFF

"A society is defined not only by what it creates, but by what it refuses to destroy"

John Sawhill

former president/CEO of The Nature Conservancy

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Acknowledgements

- Dr Andrew Deacon – Photographs
- Charles University- Mobility Grant

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