# Monitoring and evaluation as key: meaningful hierarchical nesting of targets and thresholds at different scales.

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SANParks

- Targets used in SCP and Thresholds used in SAM appear to be a similar currency
- We encountered an opportunity to use them in conjunction
- This principle appears to hold promise

# Dilemna we face

- SCP-Targets
  - Regional, National and Global scales
- SAM-Thresholds and Operational guidelines
  - Operate at landscape, parkwide and sometimes national scale
- CDF- Conservation Development Framework used to guide development/activities
  - Zonation, parkwide

- Question: How can we sensibly nest these outputs and outcomes not only within their domain but across domains e.g targets and thesholds

# Concepts

- Targets: In SCP targets are set to ensure the conservation of biodiversity features like rivers and vegetation types.

- National Scale : 442 vegetation types were identified and the % that of each that needs to be conserved.

- Each vegetation type classified into biodiversity status  CE, E, LT, V

- Now renaming Targets to Thresholds but will keep these terms

# Thresholds:

- Thresholds: Limits of unacceptable change chosen for certain ecosystem variables.

- Thresholds can be nested at different scales

- Landscape threshold of up to 100% decline park wide threshold of 20% decline

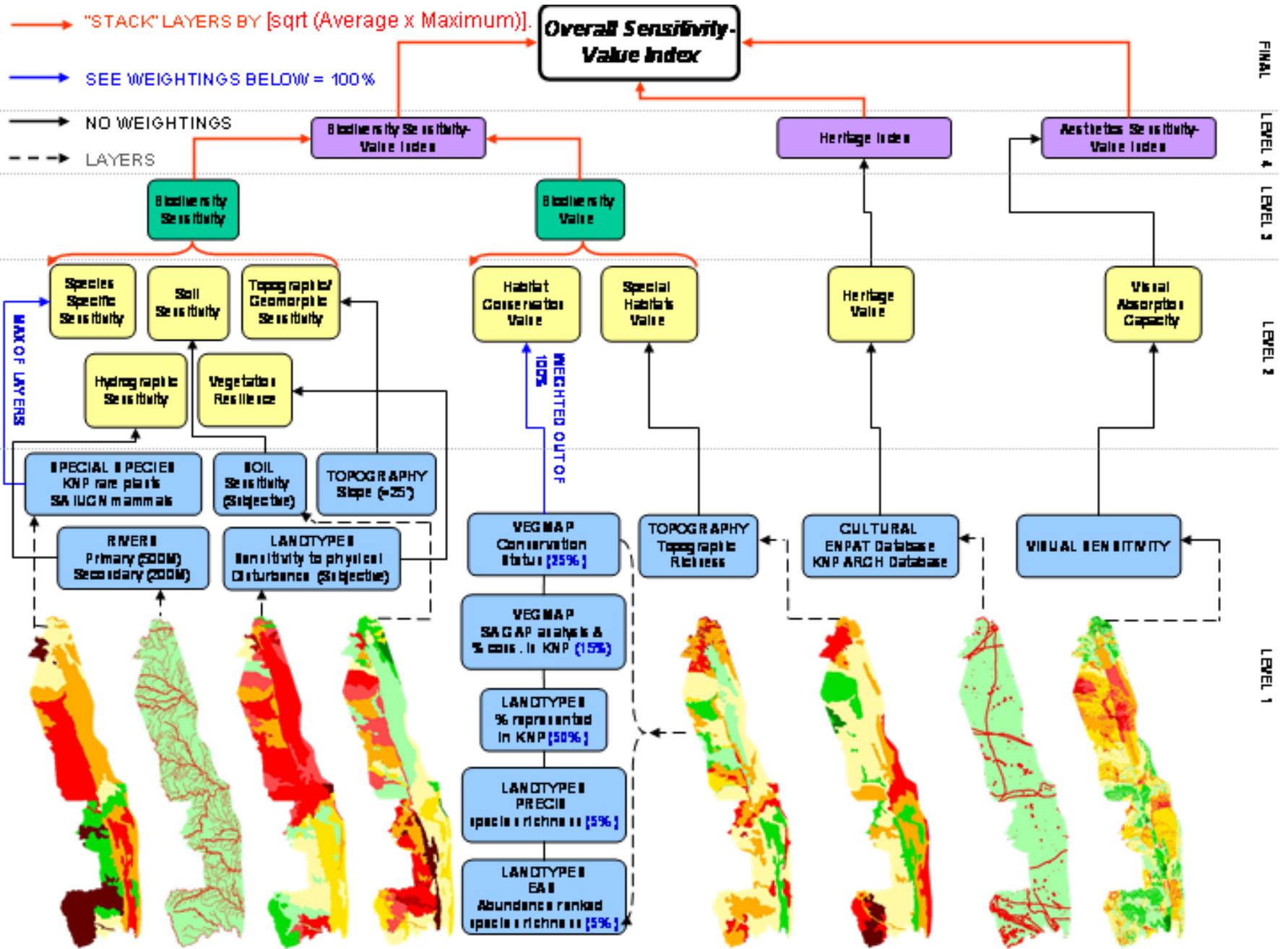# Operational guidelines

- Past were classified as thresholds
  - Percentage area that should be burnt per year per ranger section
  - Percentage total area burnt parkwide

  - These are closer to Targets than to TPC's
  - However, they have monitoring and feedback loops to determine if they are met or not

# Discrete difference between Target and TPC

- TPC's are constantly monitored to determine the integrity/level of the ecosystem variable/TPC.

- Feedback loops operate constantly

- Targets are checked to determine whether the percentage area is realized but not what the integrity of that area is. Spatial heterogeneity of these are also not determined.

- Feedbacks appear to be poor/absent

# Conservation Development Framework (CDF)

- CDF strategic planning tool that uses both the SANBI vegetation map with the critical ecosystem values, plus other layers, to determine a biodiversity sensitivity value

**Legend:**
- "STACK" LAYERS BY [sqrt (Average x Maximum)].
- SEE WEIGHTINGS BELOW = 100%
- NO WEIGHTINGS
- LAYERS

**FINAL:** Overall Sensitivity-Value Index

**LEVEL 4:**
- Biodiversity Sensitivity-Value Index
- Heritage Index
- Aesthetics Sensitivity-Value Index

**LEVEL 3:**
- Biodiversity Sensitivity
- Biodiversity Value

**LEVEL 2:**
- MAX OF LAYERS
- Species Specific Sensitivity
- Soil Sensitivity
- Topographic/Geomorphic Sensitivity
- Hydrographic Sensitivity
- Vegetation Resilience
- Habitat Conservation Value
- Special Habitats Value
- Heritage Value
- Visual Absorption Capacity
- WEIGHTED OUT OF 100%

**LEVEL 1:**
- SPECIAL SPECIES KNP rare plants SA IUCN mammals
- SOIL Sensitivity (Subjective)
- TOPOGRAPHY Slope (>25)
- RIVERS Primary (500M) Secondary (200M)
- LANDTYPES Sensitivity to physical Disturbance (Subjective)
- VEGMAP Conservation Status [25%]
- VEGMAP SA GAP analysis & % cons. in KNP [15%]
- LANDTYPES % represented in KNP [50%]
- LANDTYPES PRECIS species richness [5%]
- LANDTYPES EAI Abundance ranked species richness [5%]
- TOPOGRAPHY Topographic Richness
- CULTURAL ENPAT Database KNP ARCH Database
- VISUAL SENSITIVITY

# BIODIVERSITY SENSITIVITY-VALUE 2006

**South African**
NATIONAL PARKS

*Pafuri*

*Pafuri Border Post*

*Punda Maria* ⊠

*Giriyondo Border Post* ⊠

*Phalaborwa* ⊠

*Orpen* ⊠

*Paul Kruger* ⊠

*Phabeni* ⊠

*Numbi* ⊠

*Crocodile Bridge* ⊠

*Malelane* ⊠

⊠   Entrance Gates

▨   Makuleke Contractual Park

## Biodiversity Sensitivity-Value

- Low
- Low-Medium
- Medium
- Medium-High
- High
- No Data

30    0    30    60   Kilometers
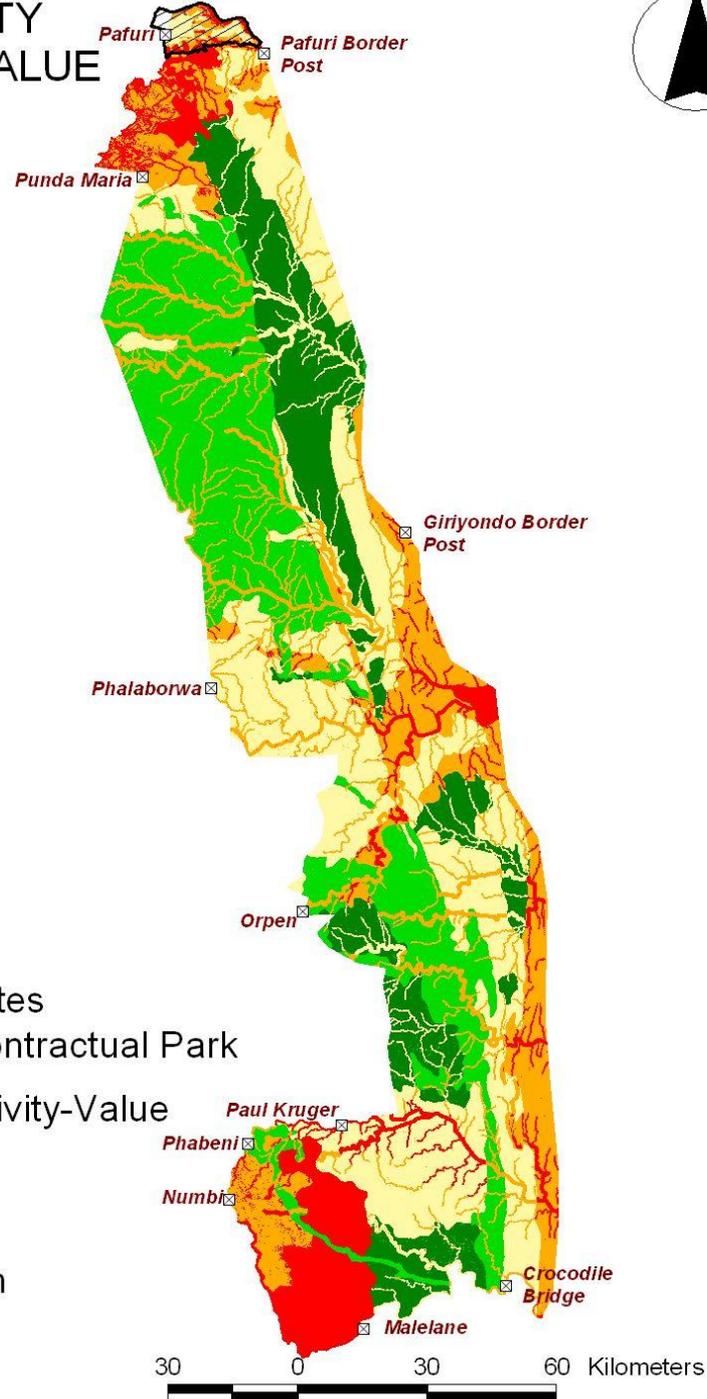
# Marriage between Targets and TPC's Elephant Impact Zones

- VEGMAP of SANBI was adapted to develop a target of percentage of each vegtype conserved within KNP

- Problem conservation status between 80 and 500%. Does not take into account internal threats of different parks

- Own Kruger conservation target was developed developed

**VEGMAP Conservation Status (SANBI)**
Vegetation type conservation status rating
IUCN Red List Categories and Criteria = extinction risk
KNP = 20 vegetation types (3 CE/CR + 5 VU + 12 LT/LC)
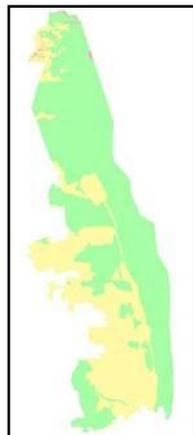
**Kruger Conservation Target**
*(adapted from SANBI VEGMAP)*
*GAP analysis: "Remaining" veg. type area / KNP & APNR represented area = % conserved within KNP.*
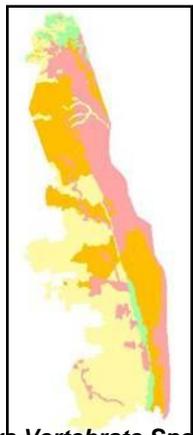
**MATRIX 1:**
**Vegetation Status & Target**

KEY
- Low
- Medium
- High

VEGMAP Conservation Status

| Kruger Conservation Target | LT | VU | EN | CE |
|---|---|---|---|---|
| LOW | low | medium | n/a | high |
| MEDIUM | low | n/a | n/a | n/a |
| HIGH | medium | n/a | n/a | high |
| VERY HIGH | high | | | n/a |

n/a – represents those combinations which do not exist in reality.
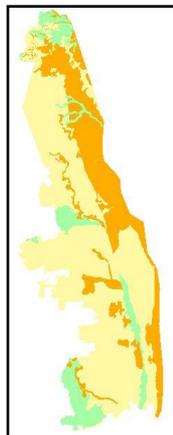
**Landscape Sensitivity to Elephant Impact**
*(Eckhardt & Zambatis, 2006):*
Subjective veg. sensitivity/ vulnerability to elephant impact
35 Landscapes (Gertenbach, 1983) scored 1-3 by
Veg. structure; rainfall gradient & species composition.
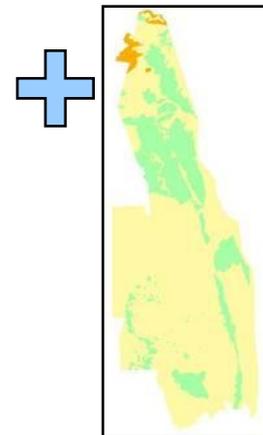
**MATRIX 2:**
**Status-Target & Sensitivity to Elephant Impact**

KEY
- Low
- Medium
- High

Landscape Sensitivity to Elephant Impact

| VEG. STATUS & TARGET | LOW | MEDIUM | HIGH |
|---|---|---|---|
| LOW | low | low | high |
| MEDIUM | low | medium | high |
| HIGH | medium | medium | high |
| | medium | medium | high |
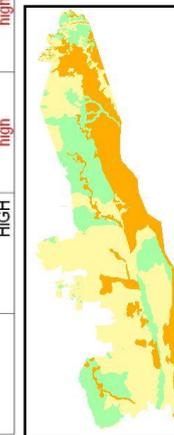
**Rare Plant Species**
(Zambatis & Zambatis, 2006)
90 IUCN red-listed & 93 KNP-rare plants (PRECIS, 2005).
Spatially summarized occurrence by Landscape.
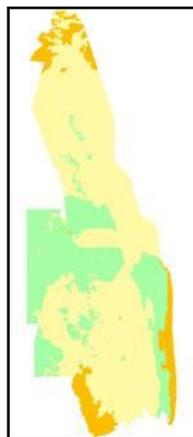
**Rare Vertebrate Species**
*(Deacon, 2006)*
Rare vertebrate species diversity per Landsystem (Venter, 1990)
Spatial distribution of threatened small vertebrates (reptiles, frogs, birds & mammals).
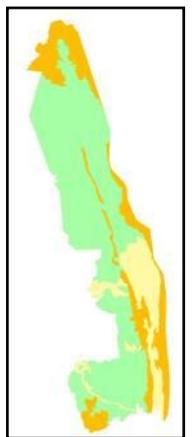
**OVERLAY 1:**
**MAX. Rare plant density & rare vertebrate diversity**
Juxtaposed features unioned = four zones of high rarity (plant and vertebrate species).
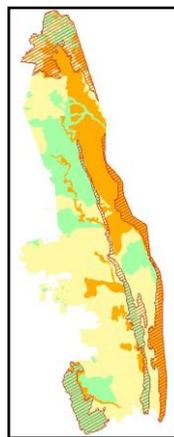
**OVERLAY 2:**
**Distribution & Density Patterns of Elephants**
3 "natural-breaks" classification of mean annual kernel density = riparian areas subjected to consistently high winter elephant densities (1985 – 2004)
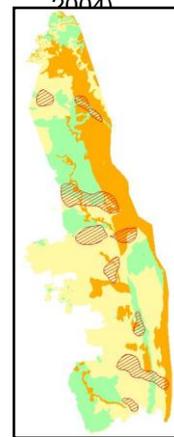
**OVERLAY 3:**
**Human-Elephant conflict/benefit boundaries**
Buffer areas, designed to alleviate human-elephant conflict and provide future economic opportunities for neigbouring communities.
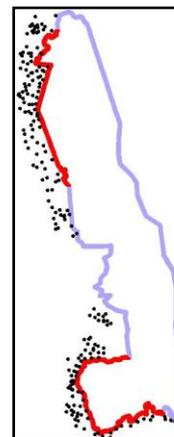
# Impact zones
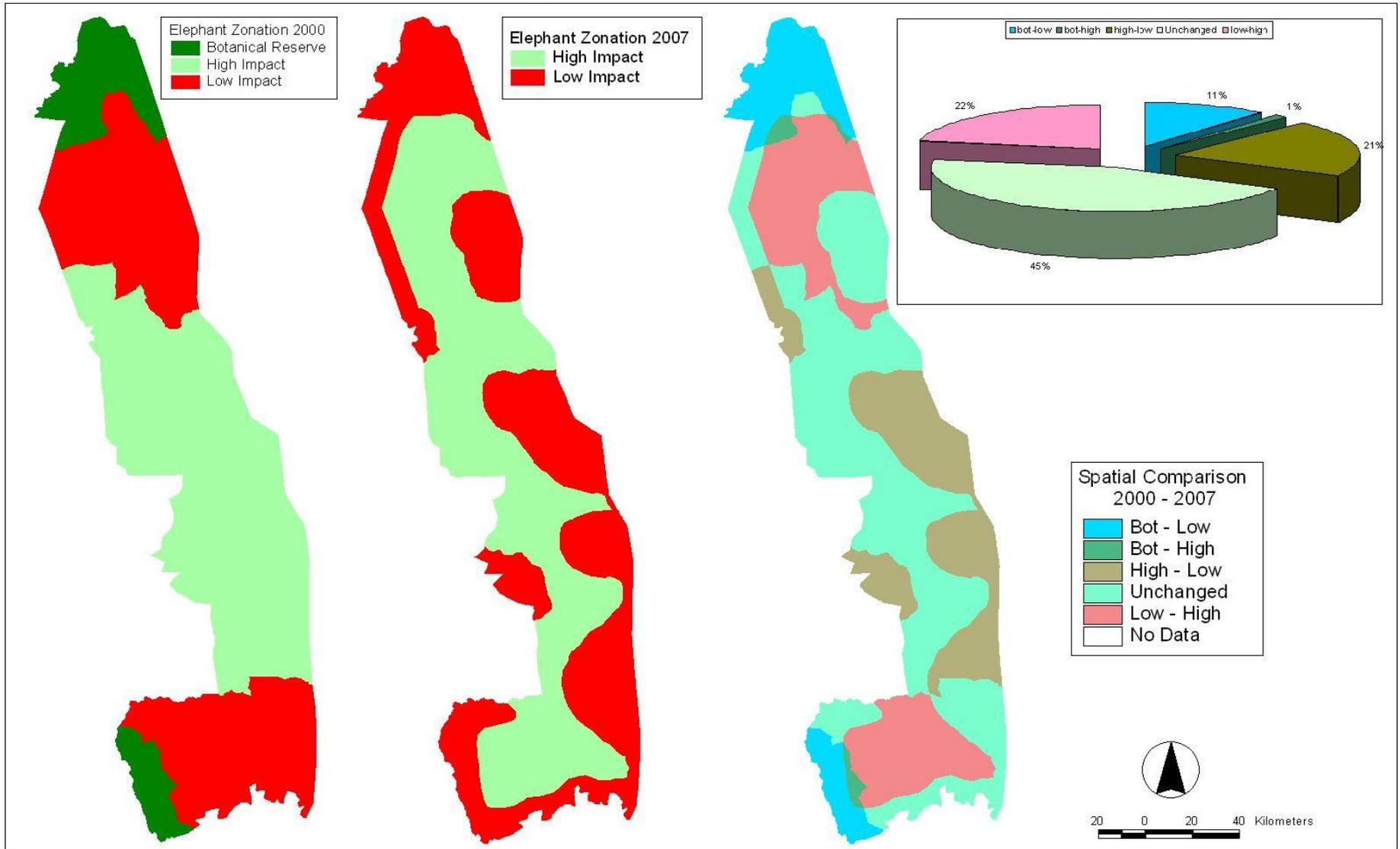
# TPC's in high and low impact zones

- Within each of these impact zones TPC's will be set allowing less or more change depending on the whether the variable is in a high or low impact zone.

- Monitoring and feedback loops will be developed to ascertain the status of the TPC and whether we are achieving what we set out to do

# Concluding remarks

- SANBI targets can be meaningfully used in internal spatial zonation in parks but the target may need to be adapted

- TPC's then nest below these targets to conserve the integrity of these areas

- Suggestion: could we start the SDF at a park level, developing targets per park according to the threats in each park, and then scaling these targets up to the regional/national level?