WATER QUALITY

1. Surface Water Quality

WATER QUALITY STATUS QUO: APPROACH

- Define the study area
- Extensive literature review, incl. land-use data
- Use following available data:
  - Reserve data + other literature
  - outputs (PES maps and Fact Sheets) of the national PES/EI/ES project for WMA5
  - the 2012 Green Drop Report for Mpumalanga Province
  - the water quality scores of the Water Resource Use Importance (WRUI) task

- Identify driving forces in terms of water quality per area
- Develop a general picture of water quality for the study area
- Identify water quality hotspots per secondary catchment (X1-X4), i.e. water quality scores of 3 - 5 according to the scoring system shown below and used in the PES/EI/ES study:
  - Rating = 0: no impact (i.e. an A category)
  - Rating = 1: small impact (i.e. an A/B to B category)
  - Rating = 2: moderate impact (i.e. a B to B/C category)
  - Rating = 3: large impact (i.e. a C to C/D category)
  - Rating = 4: serious impact (i.e. a D to D/E category)
  - Rating = 5: critical impact (i.e. E-F category)

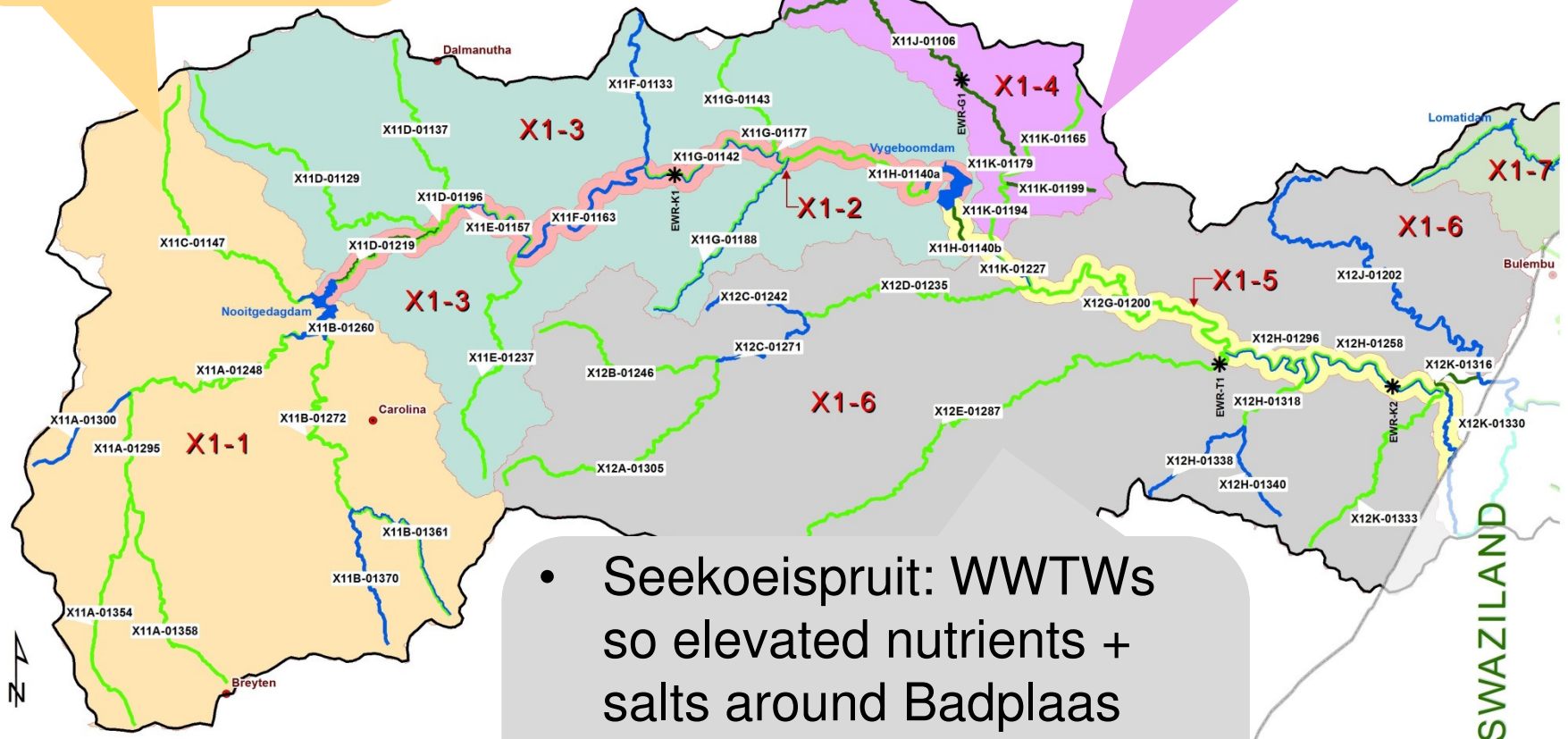
WATER QUALITY ISSUES IN THE INKOMATI WMA

- Non-point source pollution from agriculture (pesticides, fertilizers).
- Non-point source pollution from residential areas (urban and rural townships) e.g. stormwater run-off, washing in rivers.
- Point source pollution from urban infrastructure (e.g. non-compliant wastewater treatment works, saw mills and paper and pulp mills in the X3 Sabie catchment, sugar mills and processing facilities in the X2 Crocodile catchment).
- Microbiological counts and elevated nutrient concentrations.
- Erosion and sedimentation from vegetation removal + overgrazing. Mention forestry

- Dams are scattered throughout the catchments, which impact on the movement of sediment, and temperature and oxygen levels.
- Mining and manufacturing water quality issues

Boesmanspruit: open-cast coal mines

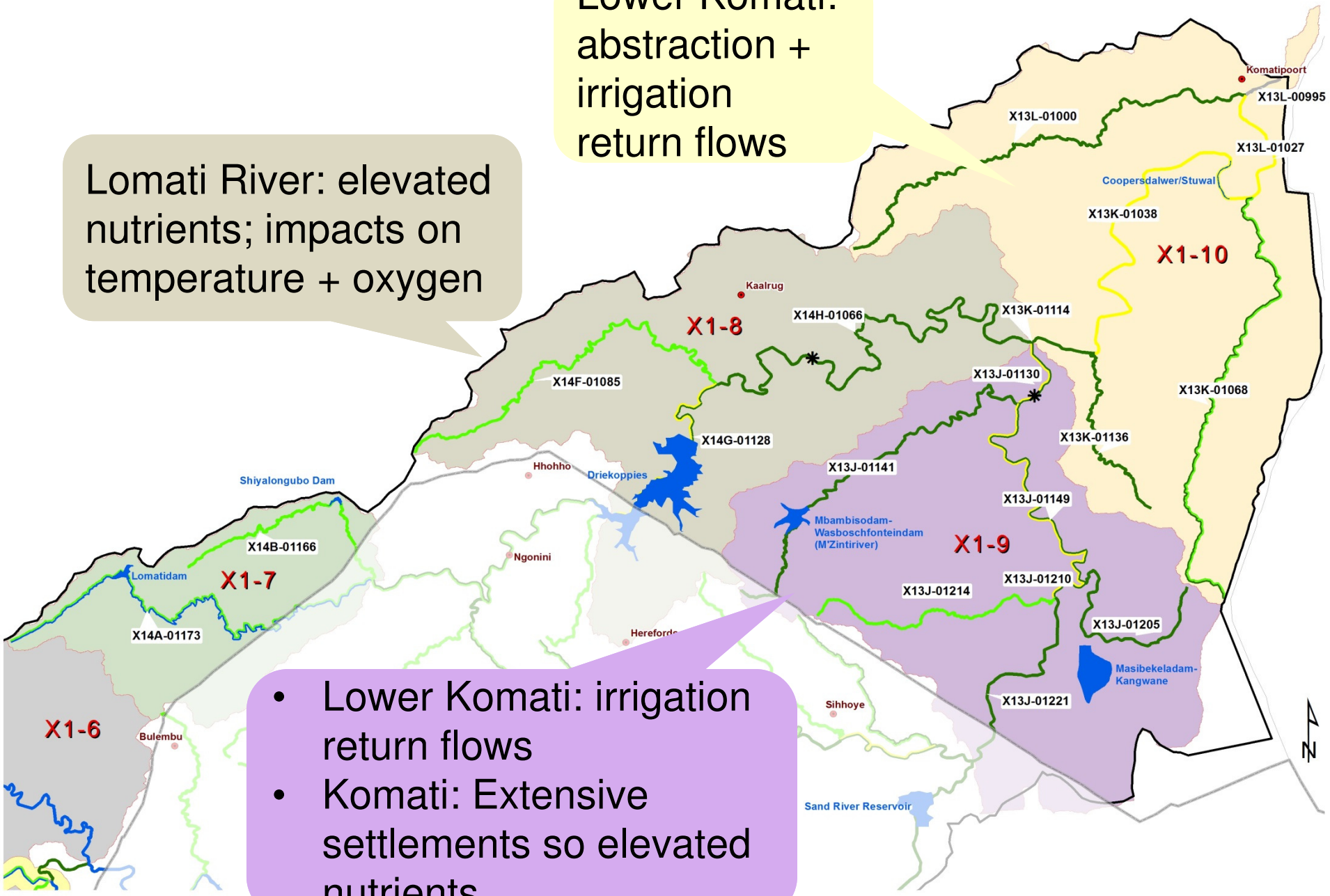
Gladdespruit: AMD from old gold mines, sulphates + raw sewage, trout dams



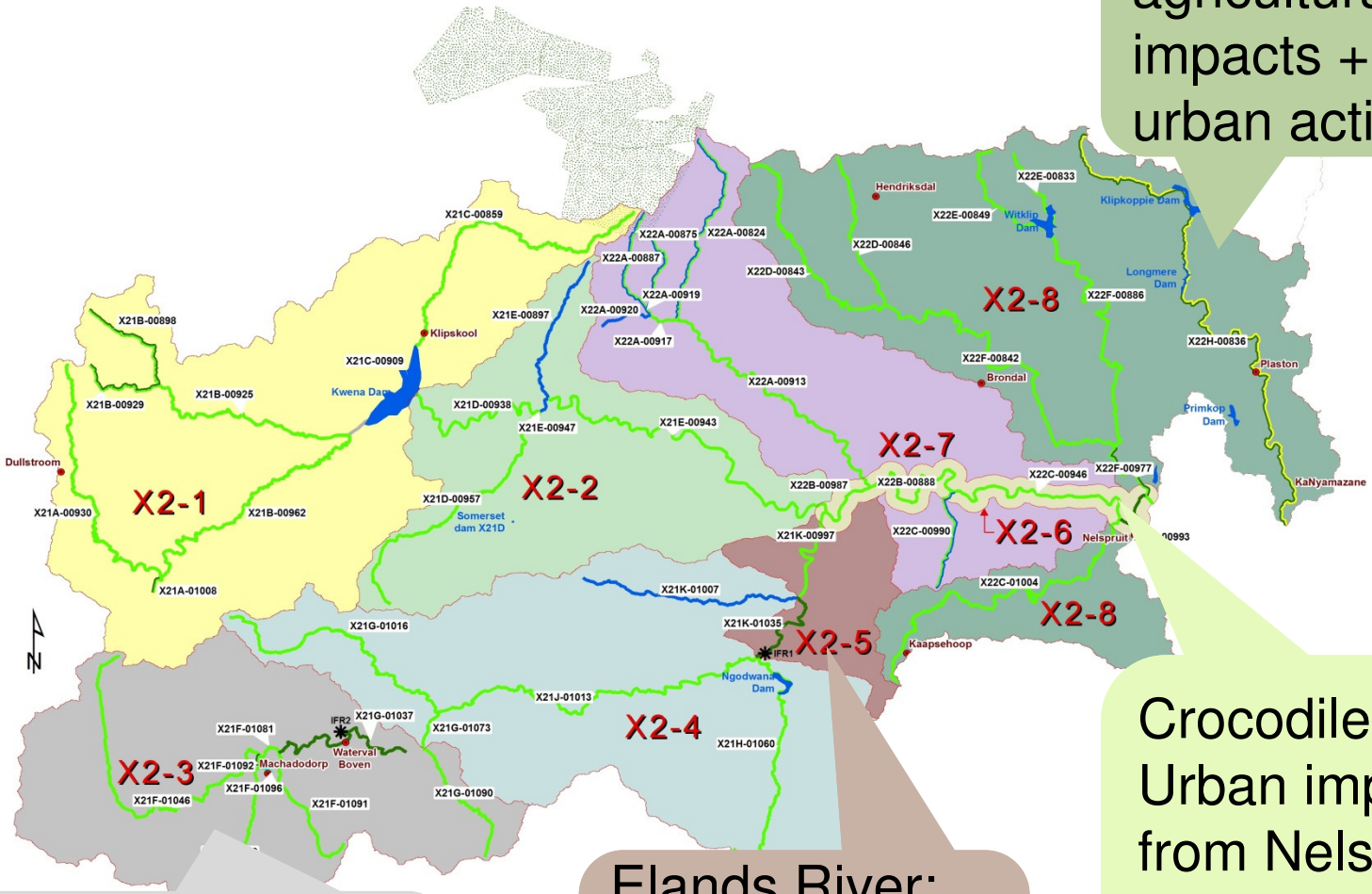
- Seekoeispruit: WWTWs so elevated nutrients + salts around Badplaas
- Teespruit lower reaches: sewage and elevated nutrients

Lower Komati: abstraction + irrigation return flows

Lomati River: elevated nutrients; impacts on temperature + oxygen



- Lower Komati: irrigation return flows
- Komati: Extensive settlements so elevated nutrients



Wit River: agricultural impacts + urban activities

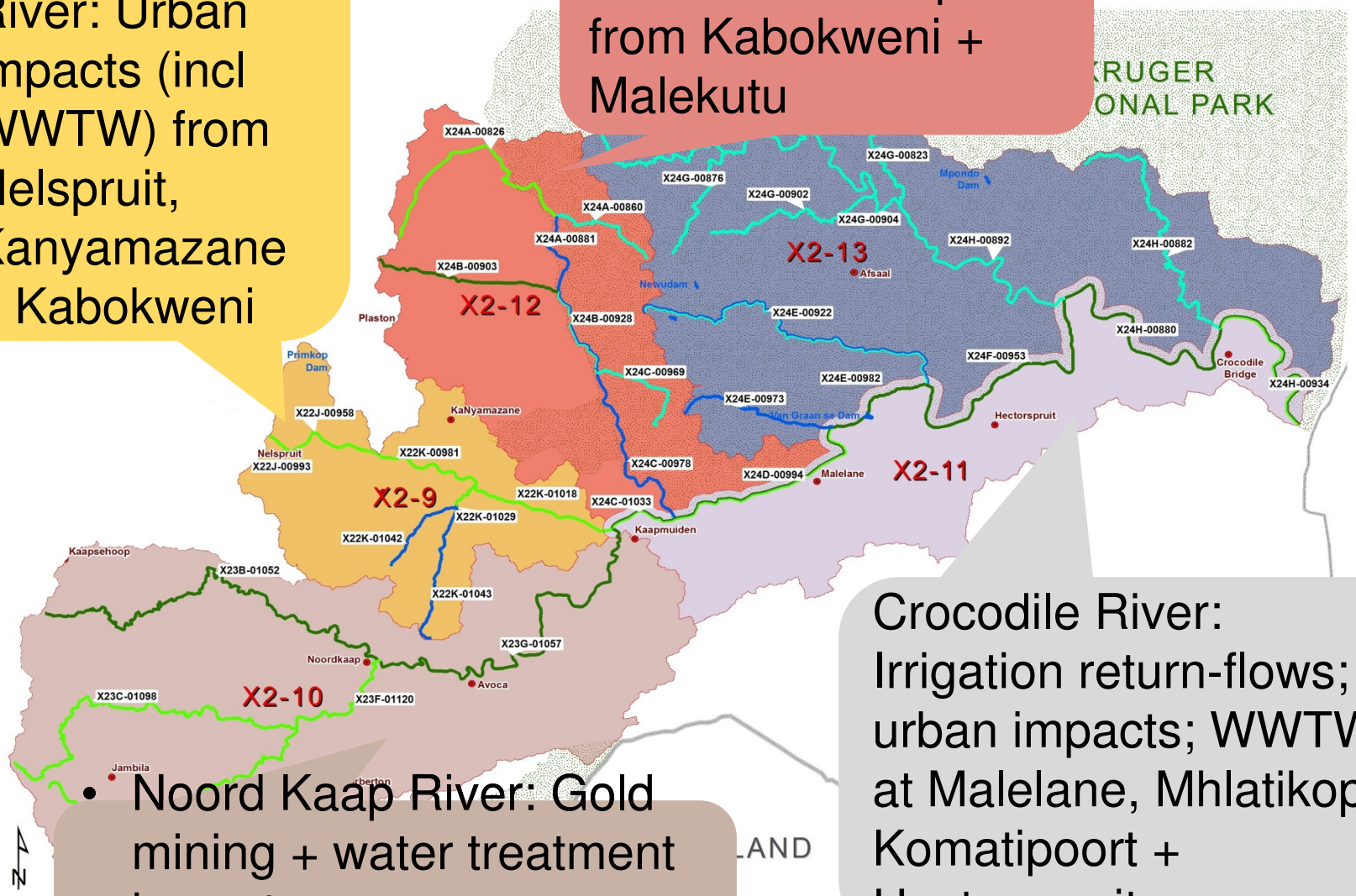
Crocodile River: Urban impacts from Nelspruit + diffuse Mn sources

Elands River: impacts from SAPPI Ngodwana

Elands River around Machadodorp: WWTW + ferro-chrome processing

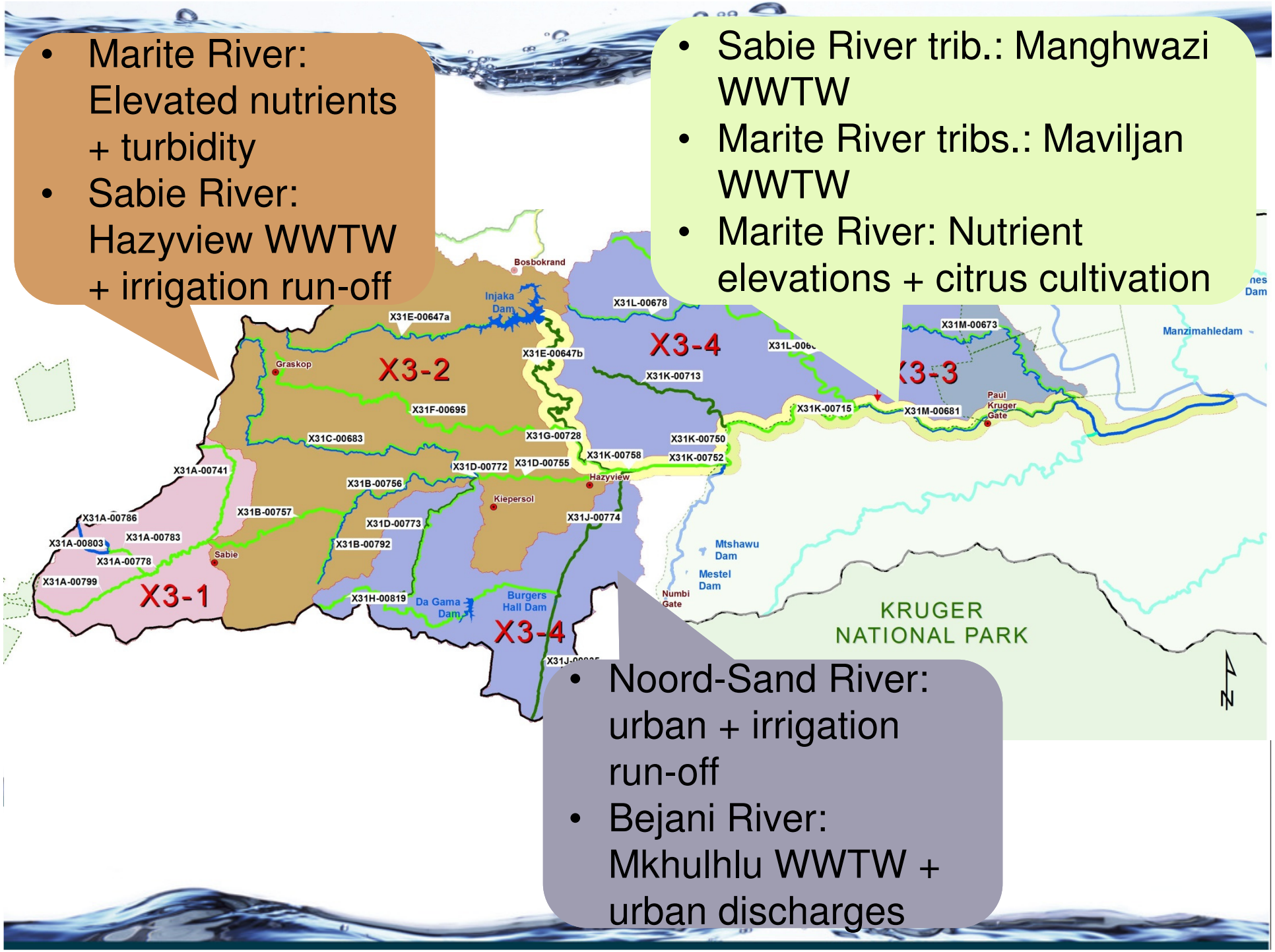
Crocodile River: Urban impacts (incl WWTW) from Nelspruit, Kanyamazane + Kabokweni

Gutshwa River: urban + rural impacts from Kabokweni + Malekutu

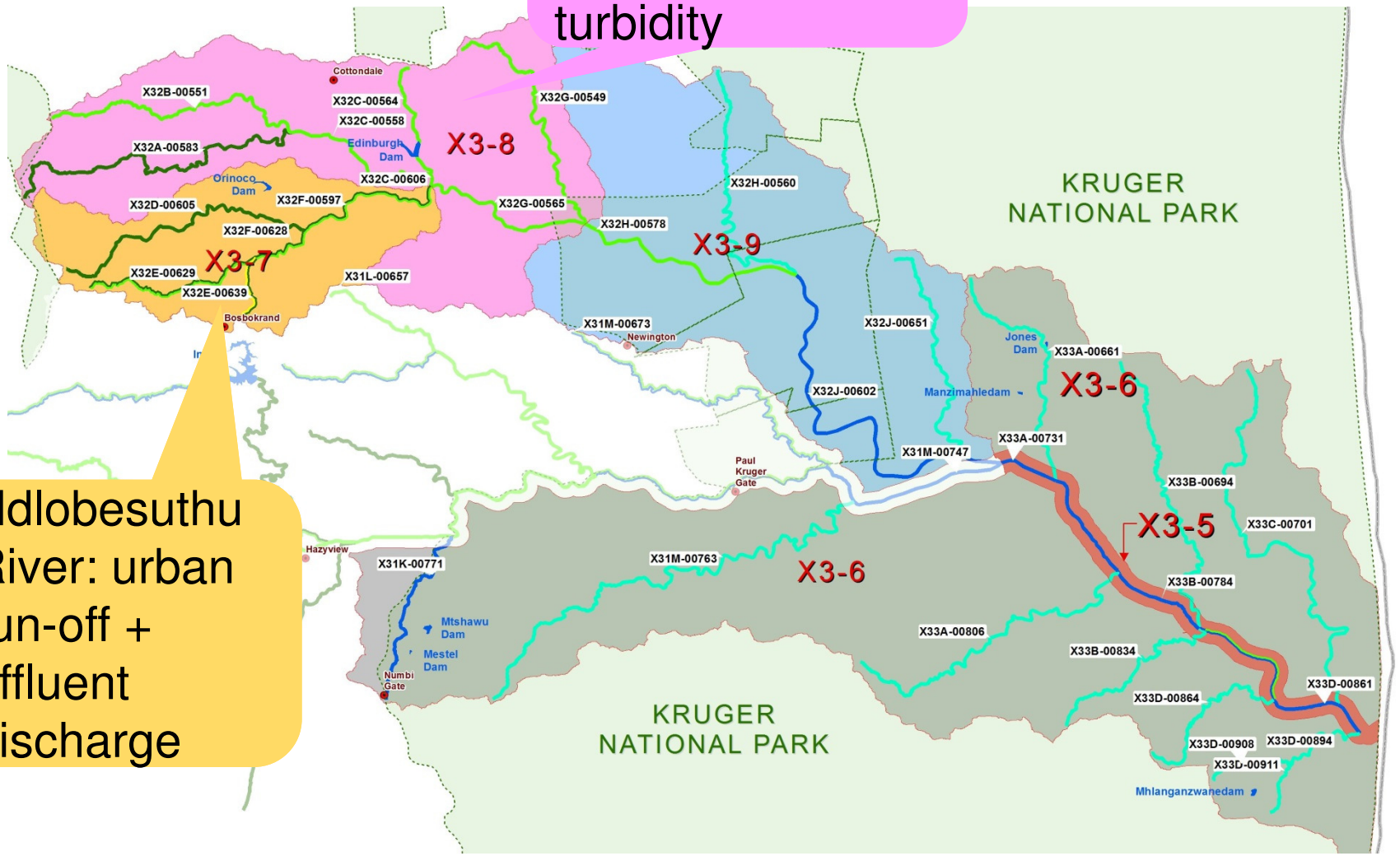


Crocodile River: Irrigation return-flows; urban impacts; WWTW at Malelane, Mhlatikop, Komatipoort + Hectorspruit

- Noord Kaap River: Gold mining + water treatment impacts
- Kaap river: Gold mining + forestry


• Marite River: Elevated nutrients + turbidity
• Sabie River: Hazyview WWTW + irrigation run-off
• Sabie River trib.: Manghwazi WWTW
• Marite River tribs.: Maviljan WWTW
• Marite River: Nutrient elevations + citrus cultivation
• Noord-Sand River: urban + irrigation run-off
• Bejani River: Mkhulhlu WWTW + urban discharges
Bosbokrand
Injaka Dam
X31E-00647a
X31E-00647b
X31L-00678
X3-4
X3-2
Graskop
X31K-00713
X31F-00695
X31C-00683
X31G-00728
X31K-00715
X31M-00673
X3-3
Manzimahledam
Paul Kruger Gate
X31M-00681
X31K-00750
X31K-00752
X31K-00758
X31D-00772
X31D-00755
X31A-00741
X31B-00756
Hazyview
Kiepersol
X31B-00757
X31J-00774
X31A-00786
X31A-00783
X31A-00803
X31D-00773
X31B-00792
Sabie
X31A-00778
X31A-00799
X3-1
X31H-00819
Da Gama Dam
Burgers Hall Dam
X3-4
Mtshawu Dam
Mestel Dam
Numbi Gate
KRUGER NATIONAL PARK
N

Tlulandziteka River: elevated nutrients, toxins + turbidity



Ndlobesuthu River: urban run-off + effluent discharge

WATER QUALITY

1. Groundwater Quality

- The semi-urban areas surrounding Nsikazi South is reportedly experiencing deteriorating groundwater quality due to the large number of pit latrines in the area.
- In some areas in the Sand River catchment the ground water is high in Flourides.
- The groundwater quality surrounding Ngodwana is almost certainly poor due to the disposal of the paper mill effluent through irrigation.

Summary and Conclusions

- The water qualit Hot Spots in the Inkomati WMA are:
  - Upper Komati due to AMD spill from coal mines
  - Lower Elands River due to industrial effluent
  - Middle Crocodile due to urban development
- Groundwater quality in the Lower Elands, Nsikazi South and Sand River catchments I poor.