Inkomati NWRCS, Reserve & RQO

ECOLOGICAL STATUS QUO: RIVERS

ECOLOGICAL IMPORTANCE
ECOLOGICAL RECOMMENDATIONS

water affairs
Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

What is Ecological Classification?

- EcoClassification consists of three processes:
- - Present Ecological State (PES)
- - Ecological Importance
- - Recommended Ecological Category (REC)
- The focus in this presentation is on the status quo, i.e. the PES.
- Information on ecological importance can also be provided to aid visioning.
- The PES describes river reaches according to ecological status or health compared to natural conditions.

What is Ecological Classification?

- Ecological status described in terms of Ecological Categories:

  A – near natural,

  B – largely natural

  C – moderately modified

  D – largely modified

  E – seriously modified

  F - critically modified.

What is Ecological Classification?

Steps in EcoClassification:

- Estimate the natural condition (the “A”).
- Evaluate human impacts & describe how ecology changed. (Present Ecological State).
- Identify whether changes are flow, non-flow or quality.
- Determine the Ecological Importance and Sensitivity.
- Derive a Recommended Ecological Category (maintain or improve the PES)

PES/EIS PROJECT: RESULTS & INFORMATION

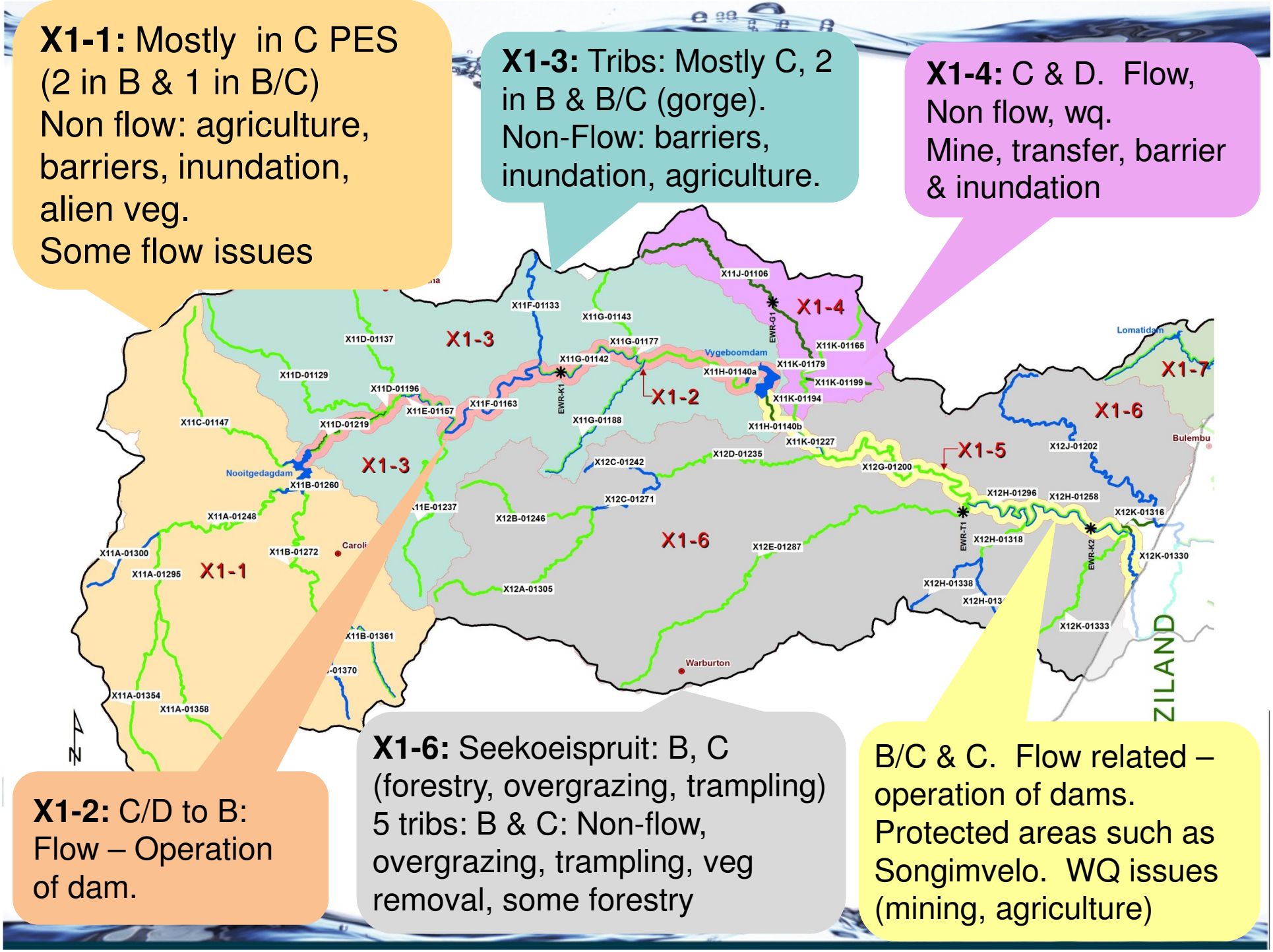
- Undertaken for 288 Sub-Quaternary (SQ) reaches.
- Desktop PES evaluation & info available.
- Desktop EI-ES results available.
- Key non-flow, flow, water quality impacts identified, i.e. key parameters.
- PES/EIS information also extended with additional information in a master Excel Spreadsheet
- All National Freshwater Ecosystem Priority Areas evaluated and compared with PES/EIS results – incorporated where relevant.

	EVALUATION	
SQ Number	X21B-03708	Numbers for NFEPA and used by DWA for PESEIS
River	Elands	
Instream Habitat continuity modification	2	Consider barriers
Riparian zone continuity modification	2	Consider areas of riparian veg that has been removed.
Instream habitat modification activities	2	Lack of flow, sedimentation, phys chem problems, bulldozing etc
Riparian zone modification activities	3	Alien vegetation, agriculture, veg removal.
Flow modification	1	Dams, abstraction, etc
Phys-chem modification	1	Return flows, sewage, urban etc
Phys chem hot spots	-	Additional review to identify hotspot, 3 – 5 rating
Key impact	Non-flow : agric & alien veg	
PRESENT ECOLOGICAL STATE (PES)	C	Median converted to A – F scale

X1-1: Mostly in C PES (2 in B & 1 in B/C)
Non flow: agriculture, barriers, inundation, alien veg.
Some flow issues

X1-3: Tribs: Mostly C, 2 in B & B/C (gorge).
Non-Flow: barriers, inundation, agriculture.

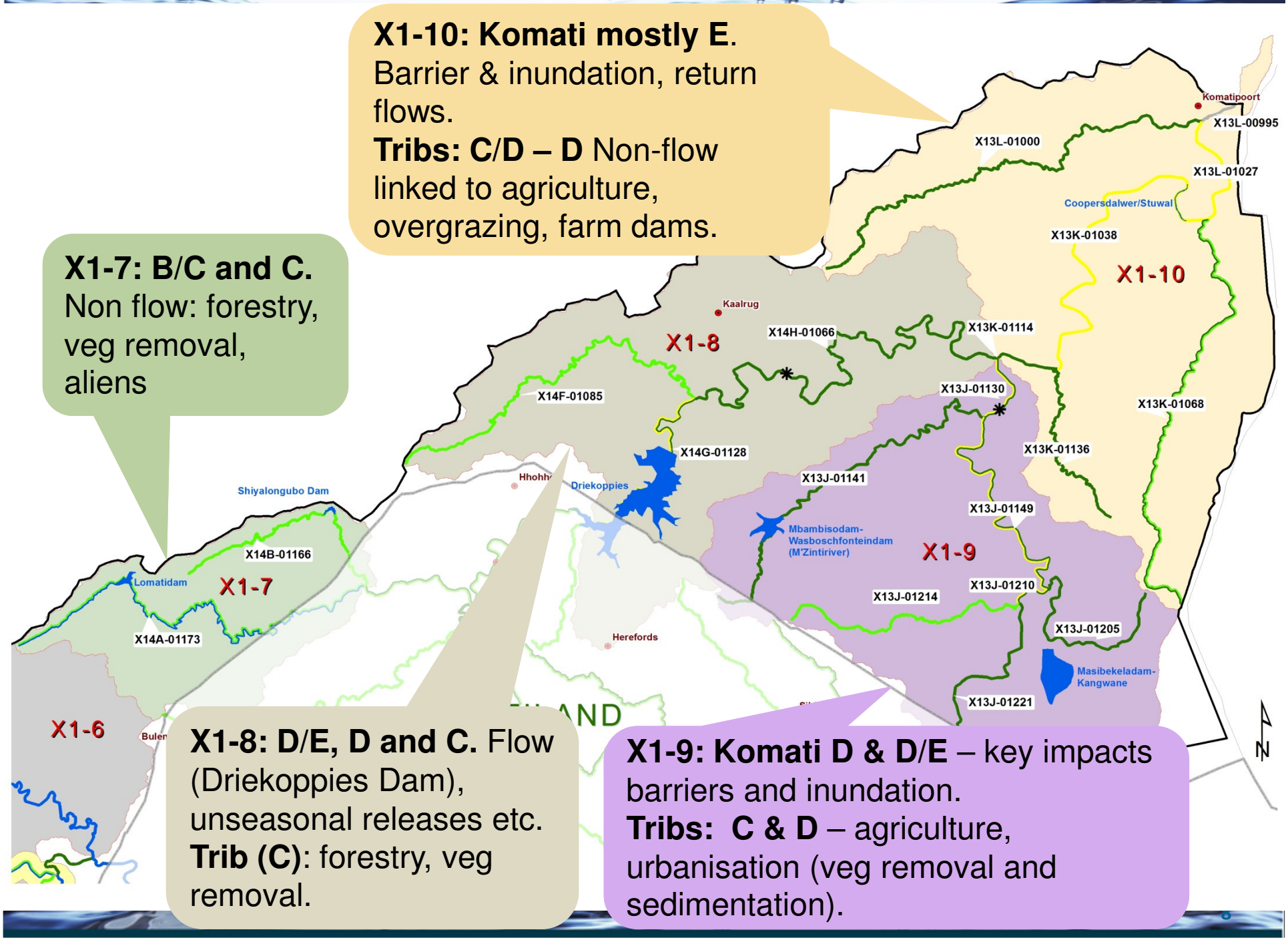
X1-4: C & D. Flow, Non flow, wq.
Mine, transfer, barrier & inundation



X1-2: C/D to B: Flow – Operation of dam.

X1-6: Seekoeispruit: B, C (forestry, overgrazing, trampling)
5 tribs: B & C: Non-flow, overgrazing, trampling, veg removal, some forestry

B/C & C. Flow related – operation of dams.
Protected areas such as Songimvelo. WQ issues (mining, agriculture)

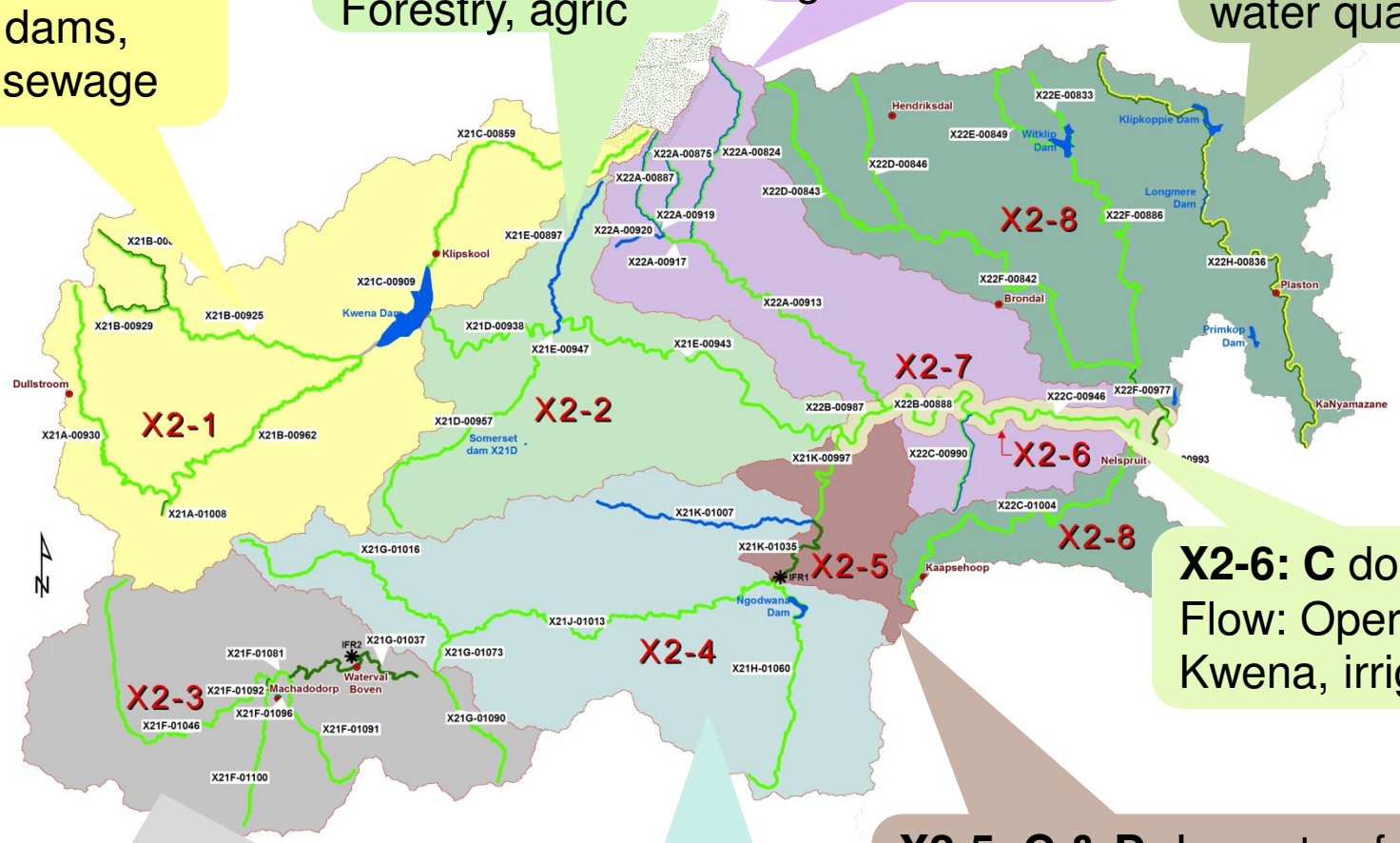

X1-10: Komati mostly E. Barrier & inundation, return flows.
Tribs: C/D – D Non-flow linked to agriculture, overgrazing, farm dams.
X1-7: B/C and C. Non flow: forestry, veg removal, aliens
X1-8: D/E, D and C. Flow (Driekoppies Dam), unseasonal releases etc. Trib (C): forestry, veg removal.
X1-9: Komati D & D/E – key impacts barriers and inundation. Tribs: C & D – agriculture, urbanisation (veg removal and sedimentation).
Komatipoort
X13L-00995
X13L-01000
X13L-01027
Coopersdalwer/Stuwal
X13K-01038
X1-10
Kaalrug
X1-8
X14H-01066
X13K-01114
X14F-01085
X13J-01130
X13K-01068
X14G-01128
X13K-01136
Shiyalongubo Dam
Driekoppies
X13J-01141
X13J-01149
Mbambisodam-Wasboschfonteindam (M'Zintiriver)
X1-9
X14B-01166
Lomatidam
X1-7
X13J-01210
X13J-01214
X14A-01173
X13J-01205
Herefords
Masibekeladam-Kangwane
X13J-01221
X1-6
N

X2-1: C – C/D.
Non flow: Trout farming, dams, grazing, sewage

X2-2: C – B.
Flow: Crocodile.
Non Flow: Tribs: Forestry, agric

X2-7: B-C Non flow: Forestry, some agriculature

X2-8: Non-Flow
Nels: Mostly C. (forestry).
Wit, D/E: dams, water quality



X2-6: C dominated.
Flow: Operation of Kwena, irrigation

X2-5: C & D: Impacts of Ngodwana, irrigation return flows, farm dams.

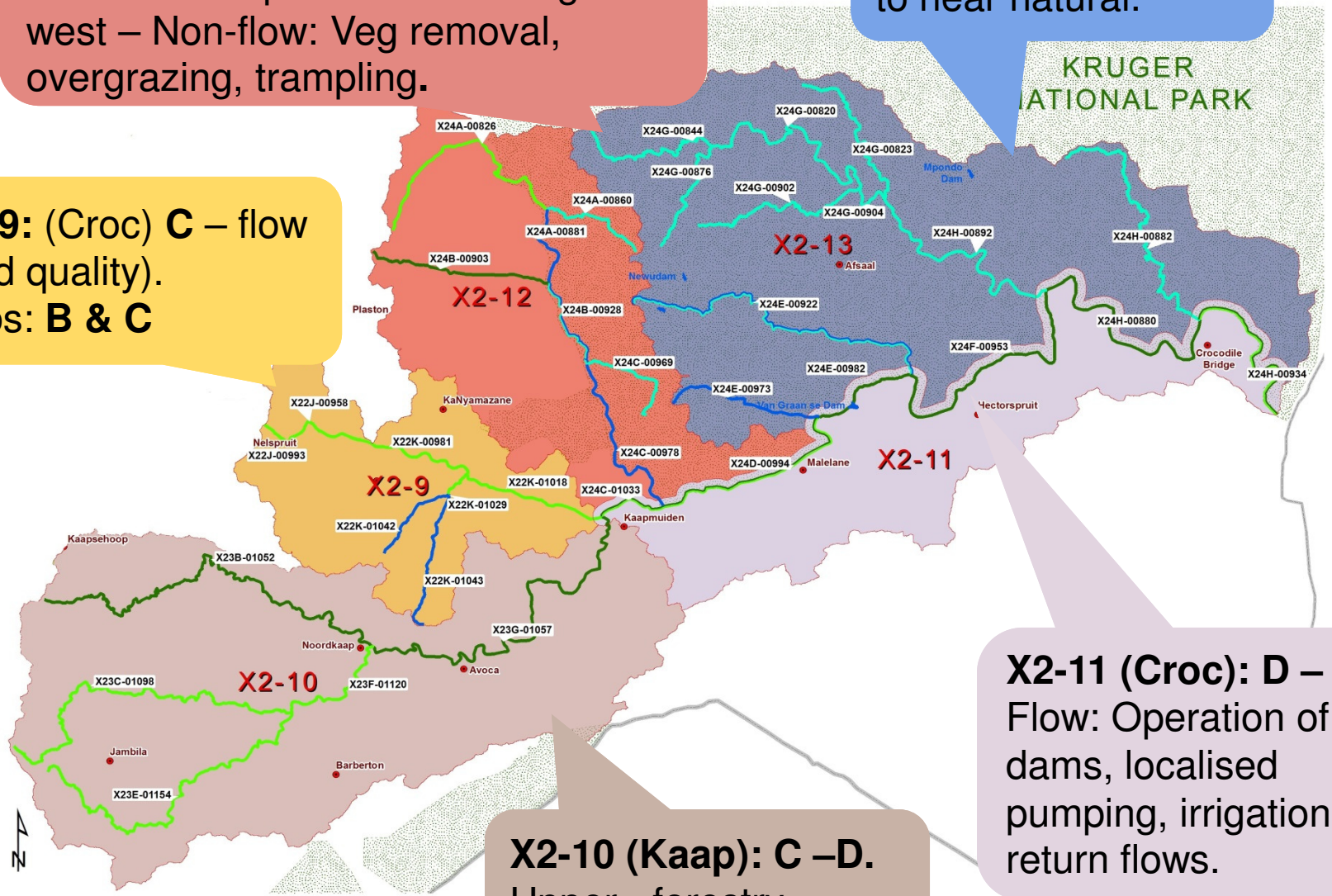
X2-3: C – C/D. Non flow: Trout farming, dams, grazing, sewage

X2-4: C – B (Lupelele). Non flow: Forestry, dams, irrigation

X2-12: C – C/D.
Main river – border KNP. Two tribs in KNP. Main impact rivers flowing from west – Non-flow: Veg removal, overgrazing, trampling.

X2-13: A – A/B.
KNP tribs – natural to near natural.

X2-9: (Croc) **C** – flow (and quality).
Tribs: **B & C**

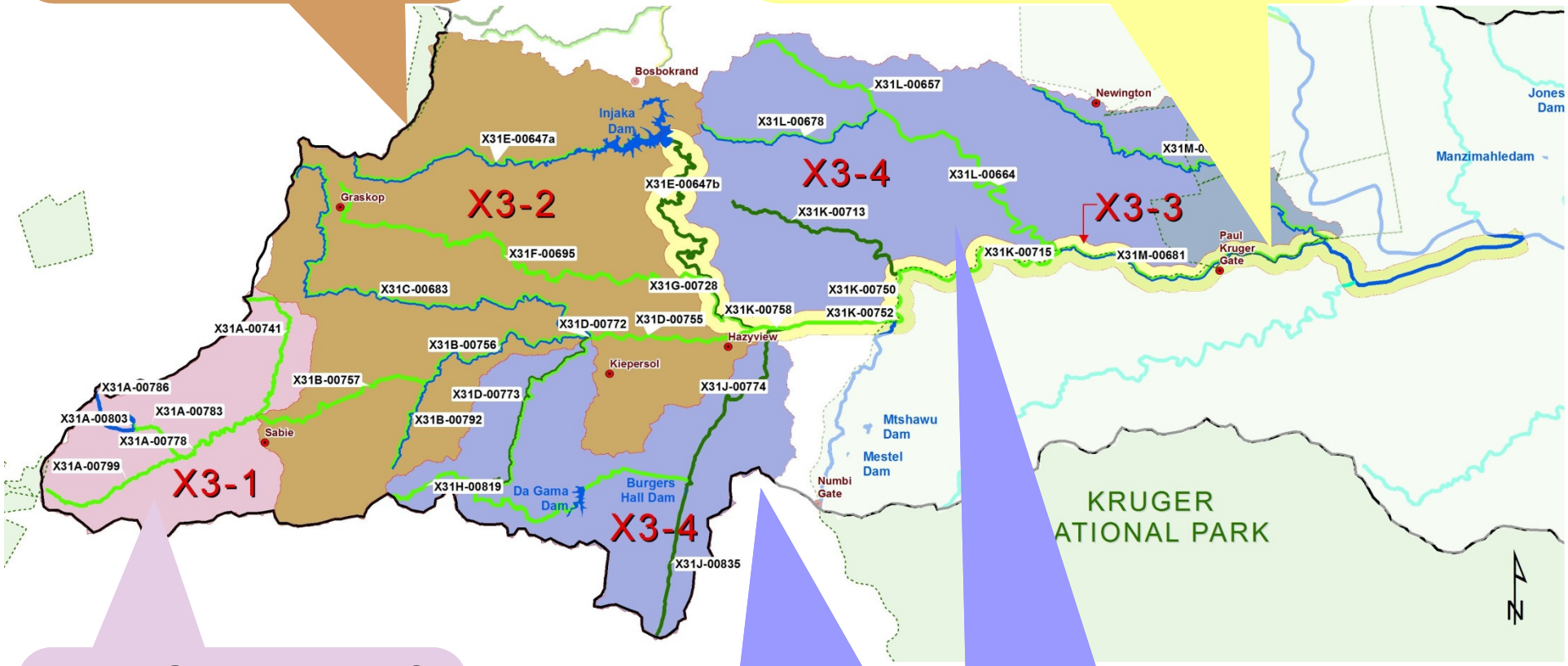


X2-11 (Croc): D – C/D.
Flow: Operation of dams, localised pumping, irrigation return flows.

X2-10 (Kaap): C –D.
Upper - forestry
Lower - irrigation

X3-2: B/C - C. Non flow: Forestry, agric fields, WQ (urban runoff & sawmills).

X3-3: (Marite & Sabie) C – C/D. Unseasonal releases, irrigation, rural settlements, Hazyview runoff.

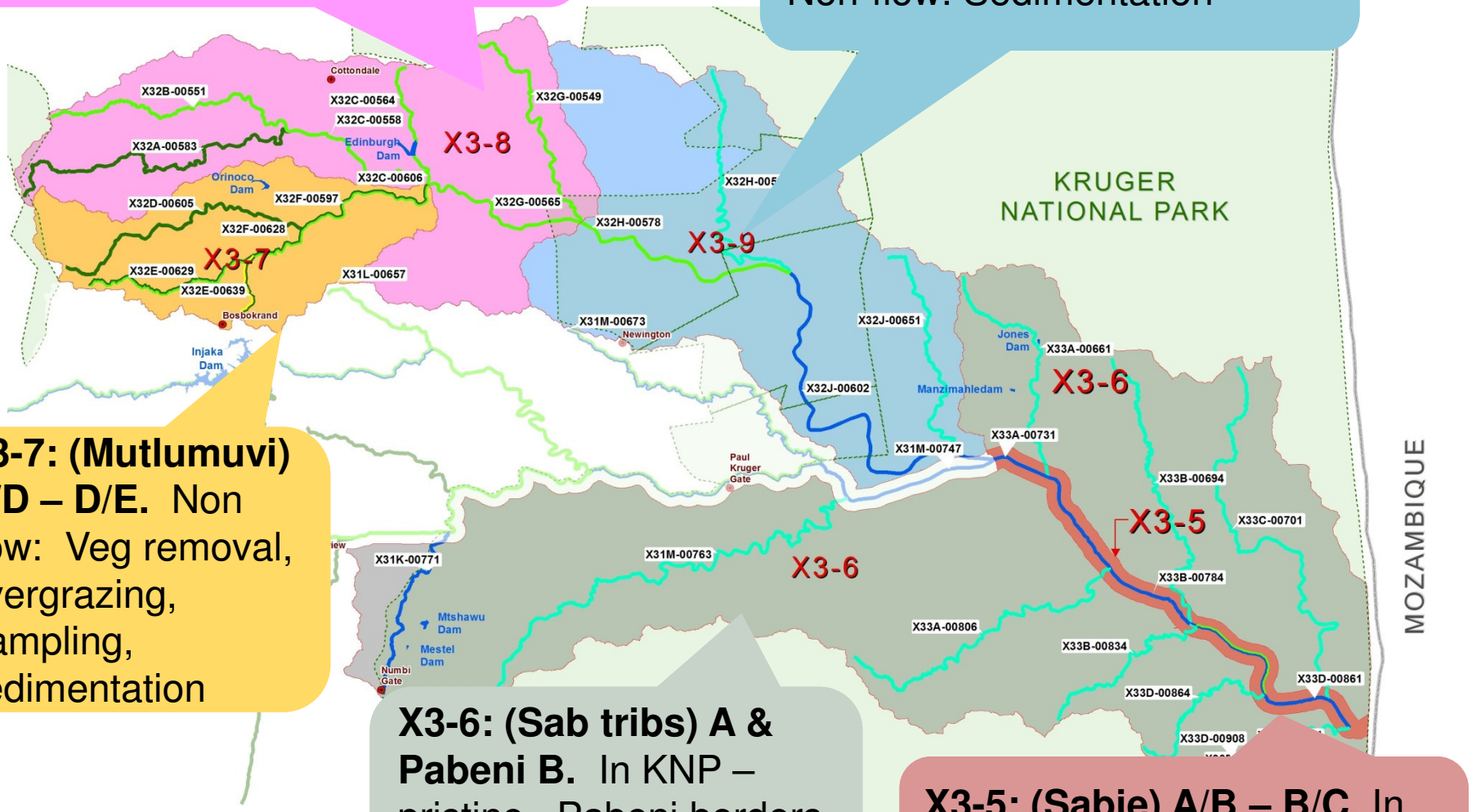


X3-1: (Sabie) B – B/C. Non flow: Forestry, WQ (Sabie runoff & sawmills)

X3-4: B/C - B Non flow: Agric, urban settlements, increased nutrients.

X3-8: C & D. Non flow: Veg removal, overgrazing, trampling, sedimentation

X3-9: (Sand & tribs) C, B, A.
Flow: Dams, canals
Non-flow: Sedimentation



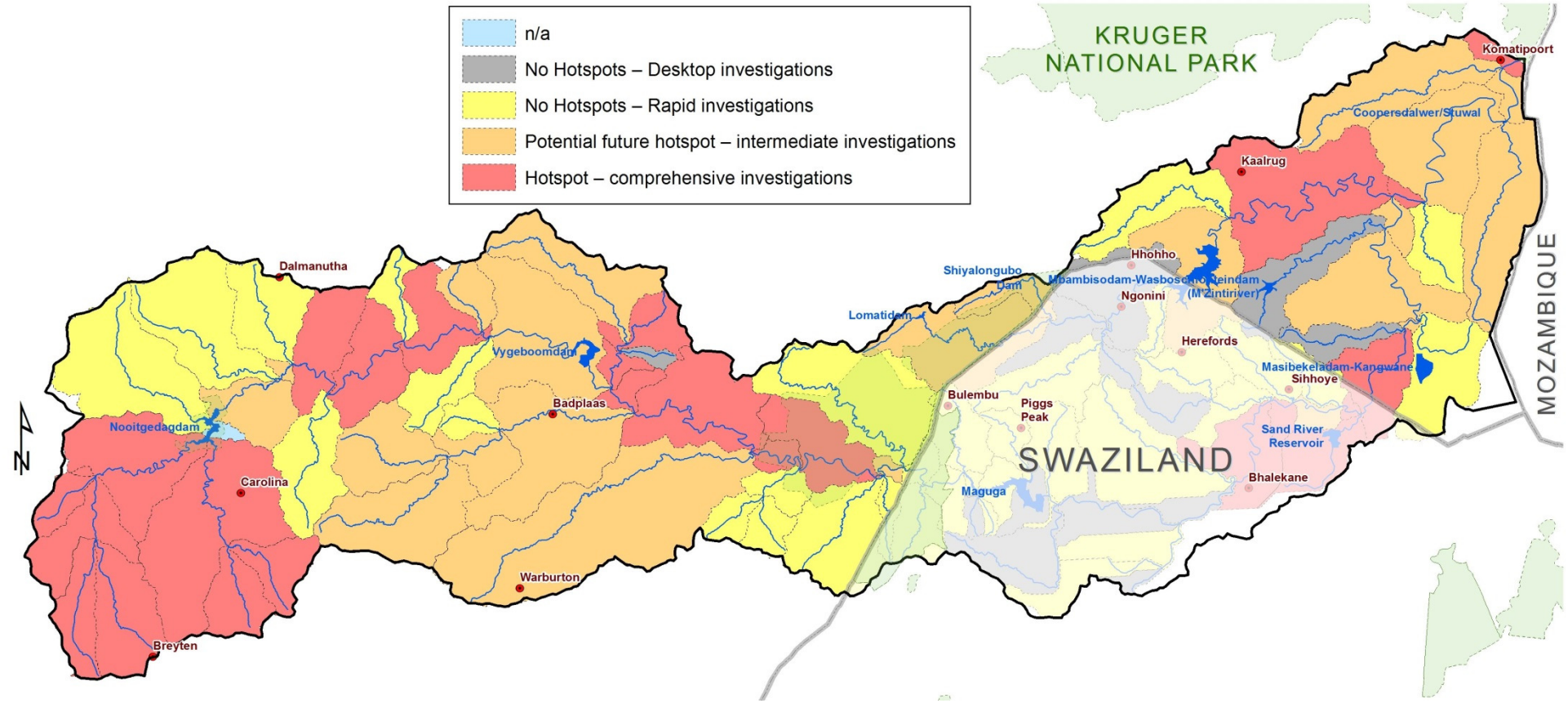
X3-7: (Mutlumuvi) C/D – D/E. Non flow: Veg removal, overgrazing, trampling, sedimentation

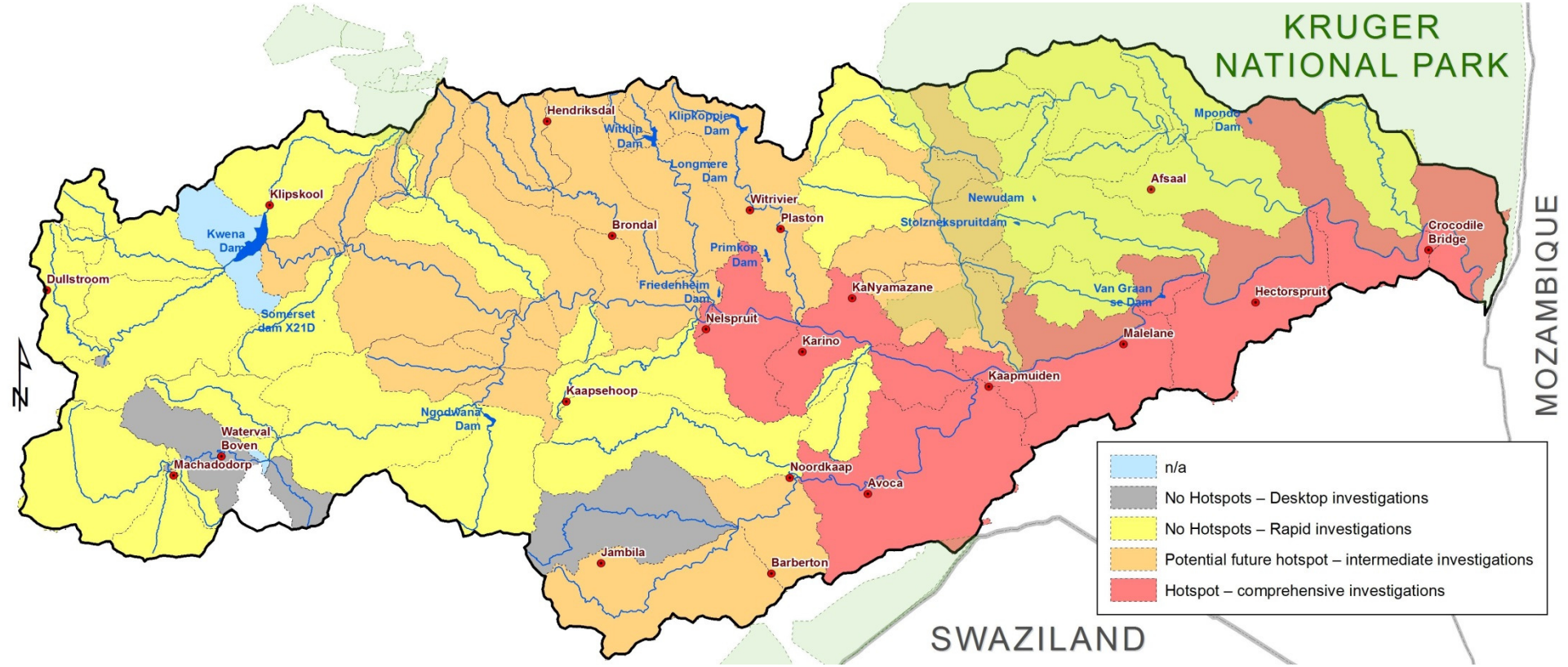
X3-6: (Sab tribs) A & Pabeni B. In KNP – pristine. Pabeni borders KNP – some non-flow impacts.

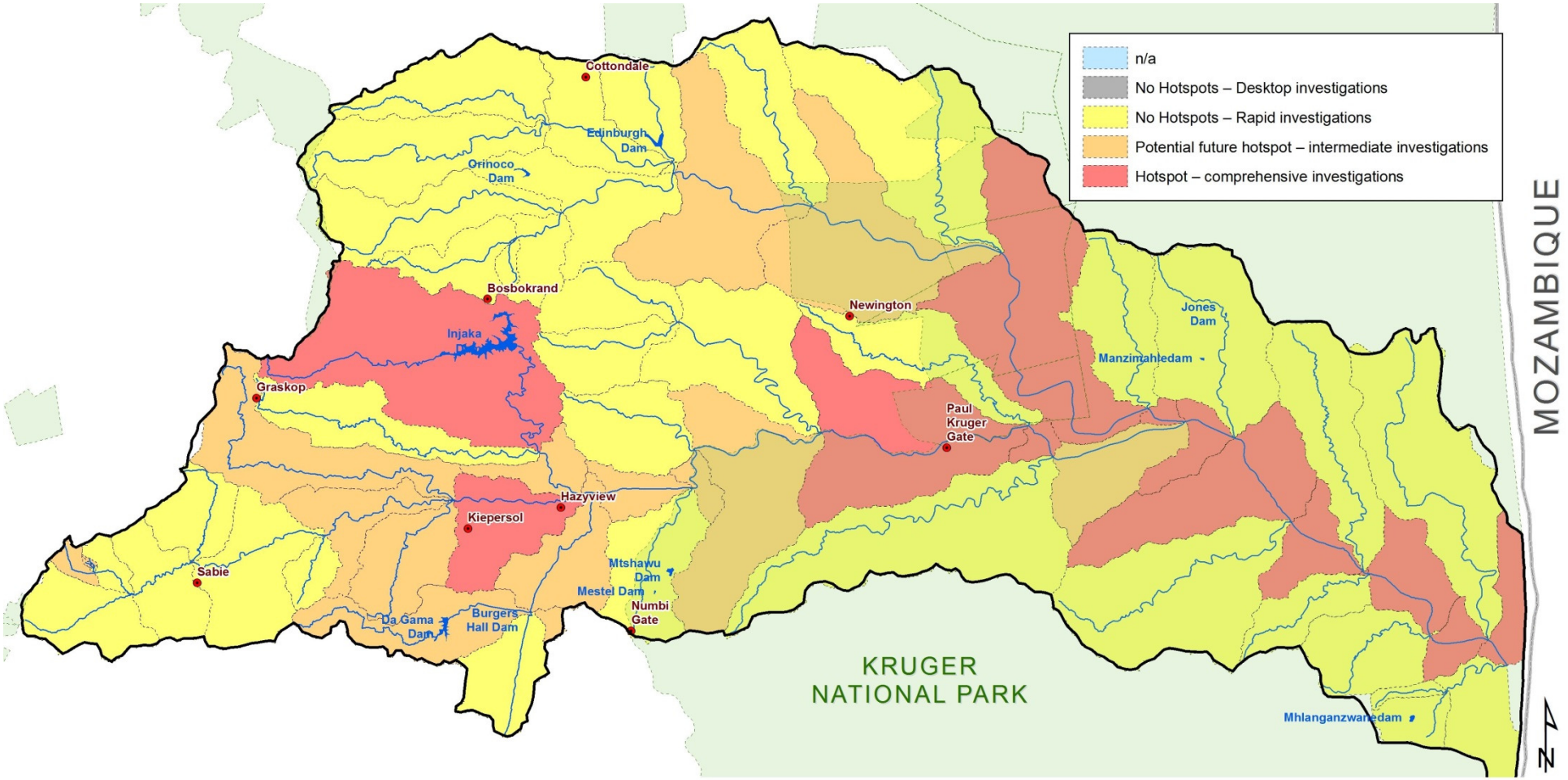
X3-5: (Sabie) A/B – B/C. In KNP – only upstream impacts (flow) and localised impacts

HOT SPOTS

- The purpose of a HOT SPOTS analysis is to indicate areas where more detailed assessments than a Desktop or Rapid analysis is required.
- Hotspots consider areas of ecological, socio-cultural and water resource use importance.
  - **Red areas: detailed work required.**
  - **Orange areas: Less detailed work – rapid or desktop.**
  - **Yellow areas: Desktop**


n/a
No Hotspots – Desktop investigations
No Hotspots – Rapid investigations
Potential future hotspot – intermediate investigations
Hotspot – comprehensive investigations
KRUGER NATIONAL PARK
Komatipoort
Coopersdalwer/Sluwal
Kaalrug
Hhohho
Shiyalongubo Dam
Mbambisodam-Wasbos
Reindam (M'zintiriver)
Ngonini
Lomatidam
Herefords
Masibekeladam-Kangwane
Sihhoye
Bulembu
Piggs Peak
Sand River Reservoir
SWAZILAND
Bhalekane
Maguga
MOZAMBIQUE
Dalmanutha
Vygeboomdam
Badplaas
Nooitgedagdam
Carolina
Warburton
Breyten
N


KRUGER
NATIONAL PARK
MOZAMBIQUE
SWAZILAND
Hendriksdal
Witklip Dam
Klipkoppie Dam
Longmere Dam
Witrivier
Plaston
Brondal
Primkop Dam
Friedenheim Dam
Nelspruit
KaNyamazane
Karino
Kaapsehoop
Ngodwana Dam
Waterval Boven
Machadodorp
Noordkaap
Avoca
Jambila
Barberton
Klipskool
Kwena Dam
Dullstroom
Somerset dam X21D
Mpondo Dam
Afsaal
Newudam
Stolzneks pruitdam
Crocodile Bridge
Van Graaan se Dam
Hectorspruit
Malelane
Kaapmuiden
N
n/a
No Hotspots – Desktop investigations
No Hotspots – Rapid investigations
Potential future hotspot – intermediate investigations
Hotspot – comprehensive investigations


n/a
No Hotspots – Desktop investigations
No Hotspots – Rapid investigations
Potential future hotspot – intermediate investigations
Hotspot – comprehensive investigations
Cottondale
Edinburgh Dam
Orinoco Dam
Bosbokrand
Injaka Dam
Graskop
Hazyview
Kiepersol
Sabie
Da Gama Dam
Burgers Hall Dam
Mtshawu Dam
Mestel Dam
Numbi Gate
Newington
Paul Kruger Gate
Jones Dam
Manzimahledam
Mhlanganzwaledam
KRUGER NATIONAL PARK
MOZAMBIQUE

Summary and Conclusions

- Preliminary analysis indicate the following:
  - Desktop biophysical nodes: 237
  - Key biophysical nodes:21 (7 Sabie-Sand, 8 Crocodile, 6 Komati)
- Nodes which have a Recommended Ecological Category which is higher than the Present Ecological State and is not already in a B Class:
  - IMPROVEMENT REQUIRED (IF FEASIBLE)
- Limited important wetlands

Conclusion of ecological analysis

Secondary	Tot no of nodes	REC = PES	Improvement through non-flow measures	Improvement through flow measures
X1	63	49	8	6
X2	81	55	11	15
X3	69	50	11	8
X4	24	24	0	0
TOTAL	237	178	30	**29**