

Freshwater fishes of the G30 and F60 Water Management Areas

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Outline

- Fish Taxa of the study area and conservation significance
- Habitat requirements
- Water quality at sampling sites
- Fish recorded at sampling sites – Chakona et al. 2019, this study
- Significance of findings

4 Native taxa – 2 endemics, both Endangered



Verlorenvlei redfin *Pseudobarbus verlorenei*
(endemic, Endangered)



Cape Galaxias lineage *Galaxias* sp.
“zebratus verlorenvlei”
(endemic, Endangered)

Native fish taxa



Cape kurper lineage *Sandelia* sp. 'capensis west coast'

No conservation status at present, in Verlorenvlei, Langvlei, Berg and Diep River systems

- Also additional Cape Galaxias lineage found in the Papkuils and Langvlei River systems

Original distribution (1980s, records from FBIS)

- *Jakkals R.* No fish records
- *Langvlei R.* Cape kurper, Cape Galaxias, Verlorenvlei redfin in lower reaches of river
- *Verlorenvlei R.* all above species present and widespread in system
- *Papkuils R.* Cape kurper in upper and lower reaches, Cape Galaxias in upper reaches

Non-native fish species



Banded tilapia
Tilapia sparrmani



Carp *Cyprinus carpio*



Mozambique tilapia
Oreochromis mossambicus



Largemouth bass *Micropterus salmoides*

Habitat requirements

“The summer persistence of these fishes in the Verlorenvlei River system suggests that they may possess physiological and life history traits that allow them to tolerate the extreme environmental conditions often associated with wide hydrological variation in intermittent Mediterranean rivers and streams” (Chakona et al. 2019)

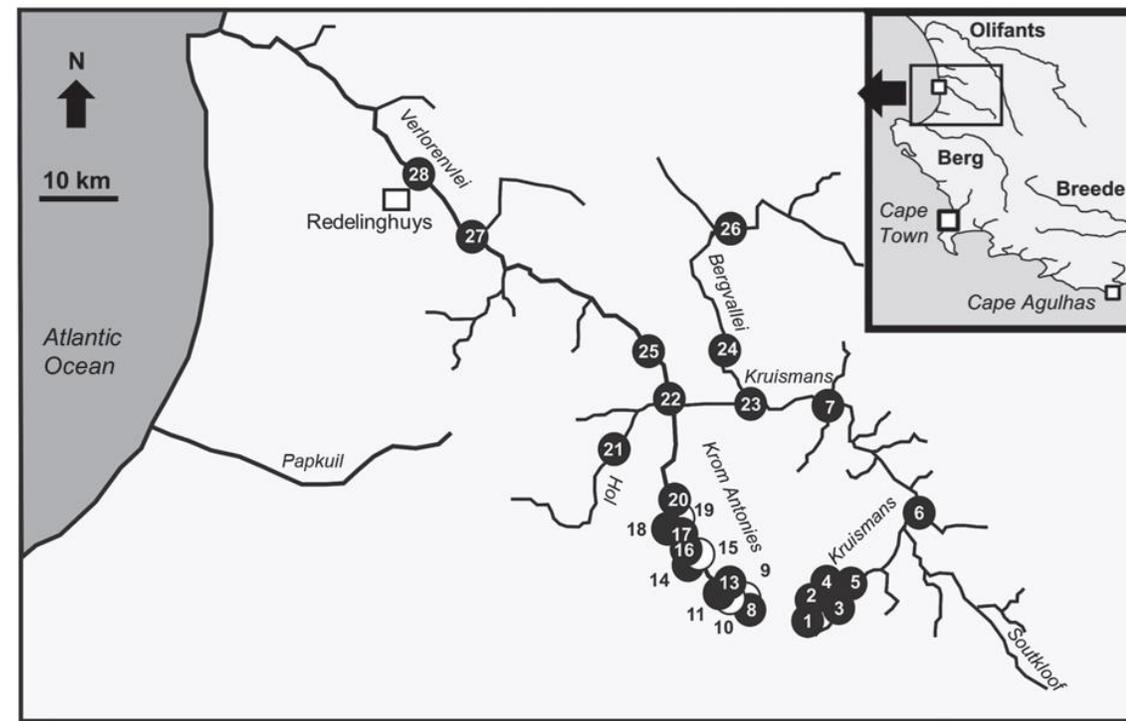
BUT:

“Recent surveys indicate that native fishes are likely to have been extirpated from the Langvlei River, an intermittent system adjacent to the Verlorenvlei River system, potentially due to extreme dry conditions and excessive water abstraction “ (Chakona et al. 2014).

Water quality in the study area

Site	pH		DO (mg/l)		TDS (mg/l)		SPC (uS/cm)		EC (uS/cm)		SAL (ppt)		TEMP (°C)	
	dry	wet	dry	wet	dry	wet	dry	wet	dry	wet	dry	wet	dry	wet
Upper Kruismans	7.4		3.5		864.5		1336		1102		0.67		16.1	
Upper KA	-	6.9	-	11.7	-	47.6	-	93.6	-	57.3	-	0.03	-	13.1
Lower KA	7.42		7.9		1235		1900		1512		0.97		14.3	
Verl. Hol confluence	7.4		11.6		1638		2518		2305		1.4		20.7	
Verl. below Redelinghuys	7.0	6.9	5.4	8.19	1092	1527	1680	2350	1424	1849	0.85	1.22	17.1	13.6
Verlorenvlei just below Wittedrift		6.5		9.9		1462		2282		1883		1.18		15.5

Chakona, Jordaan and Kadye - 2019



- Upper Kruismans / Wabooms tributary a stronghold for all 3 native fish species, but very small area (1-2km of river)
- Lower Kruismans and Lower Krom Antonies have Verlorenvlei redbfin and Cape kurper
- Upper Krom Antonies a stronghold for Verlorenvlei redbfin and Cape kurper, sizeable river area (4-5km of river)
- Verlorenvlei River below Redelinghuys bridge a stronghold for all 3 species

- Likely competition between redbfin, Cape kurper and invasive banded tilapia (similar preference for habitat)

Sampling methods

- Focused on sites with good fish habitat near EWR sites and sites where fish have previously been caught
- Used seine net during day and / or fyke nets set overnight to catch fish
- Assisted by Bentley Engelbrecht of DWS and Junaid Peters, an intern with BlueScience
- Captured fish identified to species and categorised into either adult, sub adult or juvenile based on size
- Water quality, habitat and fish catches recorded as per DWS fish sampling sheet
- CapeNature Fish index used to categorise sites for Fish Health. FRAI seen as not that suitable for non perennial river systems with low fish diversities.

Fish catches during the reserve study

Site	Verlorenvlei redfin (A/SA/J)		Cape kurper (A/SA/J)		Cape Galaxias		Banded tilapia (A/SA/J)		Largemouth bass SA	
	dry	wet	dry	wet	dry	wet	dry	wet	dry	wet
Upper Kruismans	1 A 15 SA	0	5/13/16	0	0	0	0	0	0	0
Upper KA (Mhoek)		12 A		14 A				1		
Lower KA	6 A >150 J		9/23/9				9 A 6 SA		4	
Hol (sandveld lodge)	4 SA 8 J						>50 J&SA			
Verlorenvlei at Hol confluence		2 A 4 SA		3 A 2 SA			2 A 2 SA			
Verlorenvlei at game farm		5/11/52		3 A						
Verlorenvlei below Redelinghuys	31 A 1 SA	2 A 3 SA	1 A	4 A 2 SA		1*	44 A 18 SA	1 A		
Verlorenvlei just below Wittedrift		2 J				3				

Wet and dry season fish survey (other systems)

River	Site	Habitat	Sampling season		Fish species	comments
			dry	wet		
Jakkals	EWR	Large pool (SS, SD)	yes	no	No	Inhospitable to fishlife due to water quality (e.g. hyper saline)
Langvlei	No site surveyed due to lack of water for fish		no	no		Surface water absent in dry season
Papkuils	Low water bridge Just below road to Redelinghuys	Small pool (SS, SD)	no	yes	No	Cape Galaxias likely still occur in part of wetland

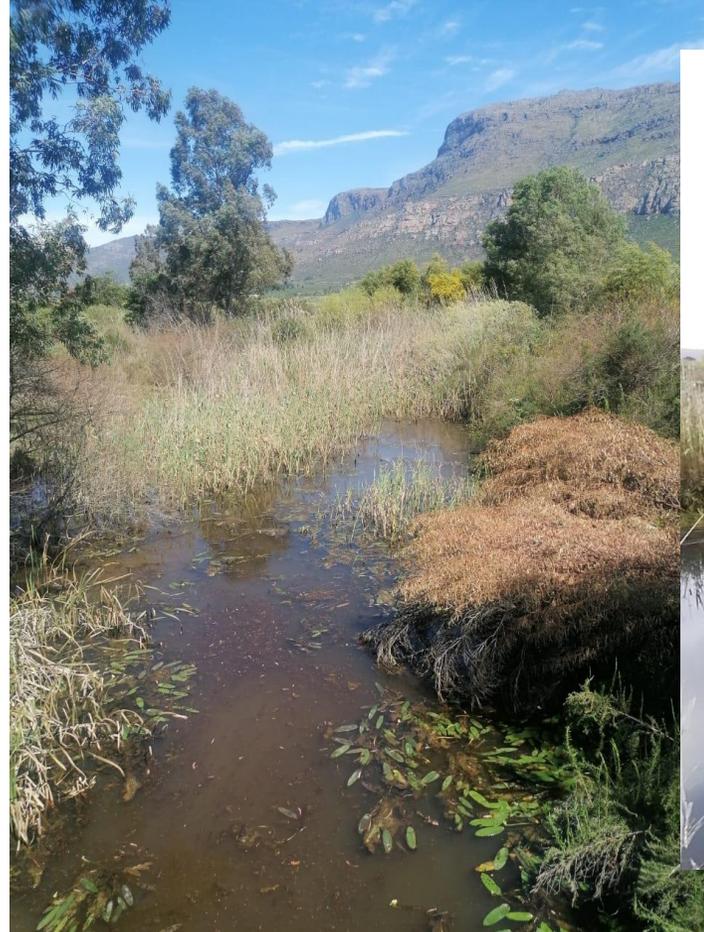
Changes in distribution

- *Langvlei* Likely now fishless, due to lack of surface water in dry season. Farmers report that area that had fish, below EWR site has not had permanent pools for last decade in dry season
- *Verlorenvlei* Verlorenvlei redbfin and Cape kurper still widespread and in good numbers with recruitment in pools that provide good habitat in dry season. Adequate depth (<50cm) and cover (reeds, lilies, rocks) seem to be especially important. Cape galaxias numbers and distribution a concern and they may be more sensitive to water quality and flow reduction.
- *Papkuils* Lack of surface water with adequate fish habitat in dry season a major problem. Likely loss of Cape kurper from system. Cape Galaxias still likely present in upper reaches at large wetland.

Preferred habitat



Upper Krom Antonie R.



Upper Kruismans R.



Verlorenvlei R. near Wittedrift

References

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