DESKTOP REVIEW

DEVELOPMENT AND REGULATION OF THE VANDERKLOOF KRAAL FISHERY

Prepared for The Northern Cape Department of Agriculture, Land Reform and Rural Development

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Table of Contents

1. INTRODUCTION 3
2. NATIONAL LEGISLATION 4
2.1 National Environmental Management: Biodiversity Act (Act 10 of 2004: NEM:BA) 4
2.2 NEM: BA: Threatened or Protected Species (TOPS) Regulations (2007) 4
2.3 Proposed new TOPS Regulations and Species Lists (2015) 5
2.4 National Water Act (Act 36 of 1998; NWA) 5
2.4.1 Regulations in terms of Section 116 of the NWA 5
2.5 NEMA: Environmental Impact Assessment Regulations (2014) 6
Listing Notice 1 (2010) 6
Listed activity 11 (xi) 6
Listed activity 18 (i) 7
Listing Notice 2 (2010) 7
Listing Notice 3 (2010) 7
Listed activity 16 (iv) 8
Listed activity 24 (d) 8
3. PROVINCIAL LEGISLATION 8
Northern Cape Nature Conservation Act (Act 9 of 2009; NC:NCA) 8
Schedules 1 & 2 8
Sections 32 & 33 8
Section 37 9
Section 38 9
Section 44 9
4. SUSTAINABILITY 10
5. MONITORING 10
6. SPECIES SELECTION 11
7. TARGETED SPECIES BIOLOGY 11
7.1 Labeobarbus kimberleyensis (Largemouth yellowfish) 11
7.2 Labeobarbus aeneus (Smallmouth yellowfish) 12
7.3 Cyprinus carpio (Common carp) 12
7.4 Labeo capensis (Orange river mudfish) 12
7.5 Clarias gariepinus (Sharptooth catfish) 12
7.6 Labeo umbratus (Moggel) 13
8. COMMUNITIES INVOLVED 13
Petrusville 13
Keurtjieskloof 13
9. CONCLUDING STATEMENTS 14

10. REFERENCES 14

1. INTRODUCTION

The Kraal fishery has been operating below the Vanderkloof Dam wall for past 15 years and provides much needed sustenance and to a lesser extent economic relief to members of the rural communities of Koffiefontien, Hopeville, Luckhoff, Phillipstown, Petrusville and Keurtjieskloof. Existing provincial environmental and fisheries legislation (Northern Cape and Free State) has neither provisions nor regulations that allow for this type of fishing practice, and the activity is considered illegal by the provincial environmental authorities. There is also currently no National legislation that pertains to freshwater fisheries *per se* but there is applicable National environmental legislation that can be considered where the capture of listed species by any means (regarded as a restricted activity) is concerned. The provisions of this legislation provide for the application for and issuing of a permit to conduct certain activities linked to listed species. Of all the species caught in the Kraal fishery, only one, the Largemouth yellowfish (*Labeobarbus kimberleyensis*) is listed as Vulnerable[1] in accordance with the provisions of NEM:BA. The Northern Cape Department of Agriculture Land Reform & Rural Development (DALRRD) has tasked Rhodes University with facilitating the legalization and subsequent development of the fishery. An advisory committee, comprising representatives from all stakeholder groups, will be established to oversee the process.

The aim of the proposed Kraal fishery programme is to formalise the fishery, i.e. legalize and regulate it. This review not only provides a summary of all the applicable legislation (Provincial and National), but also provides recommendations on how to achieve the primary aim while also addressing the issues of sustainability and biological assessment, monitoring & compliance and the options available to small-scale fishers in terms of catch utilisation. Additional advice and recommendations on the requirements for biological assessment, sustainability, monitoring and indicators have been provided by Professor Olaf Weyl of SAIAB and are attached as a separate document (SAIAB input for Desktop Review.pdf).

[1] Vulnerable is one of three listings under the heading of “Threatened”, the other two being endangered and critically endangered. The largemouth yellowfish is therefore sometimes generally referred to as threatened.

2. NATIONAL LEGISLATION

2.1 National Environmental Management: Biodiversity Act (Act 10 of 2004: NEM:BA)

The Kraal fishery is considered a restricted activity with regards listed threatened or protected species in that it will involve one or more of the following: catching, killing, possessing, exercising physical control, selling, trading, buying or receiving. The only listed species involved is the largemouth yellowfish. Even if all captured largemouth are returned alive, the activity of catching it in the first place is still a restricted activity. A permit, as considered in Section 57(1), to carry out any of the restricted activities may be applied for in terms of Chapter7.

The Kraal fishery is also a restricted activity if an alien or listed invasive species is involved in that it will include one or more of the following: possessing, exercising physical control, selling, trading, buying or receiving. A permit, as considered in Section 65 (which includes a risk assessment), to carry out any of the restricted activities may be applied for in terms of Chapter 7. However, until the Alien and Invasive (AI) Regulations are promulgated this provision may not apply. The species involved in the Kraal fishery that are affected by this is most likely the common carp.

2.2 NEM: BA: Threatened or Protected Species (TOPS) Regulations (2007)

As far as I am aware, Section 3 dealing with issuing authorities in terms of permits for conducting restricted activities involving listed species has been repealed, as such any considerations regarding issuing authorities must be dealt with under the NEM: BA provisions. The permit application procedure and requirements, however, must be done in accordance with Chapter 2 (Part 2). Only a regular permit may be applied for, as standing permits may not be applied for or issued to individuals or small-scale commercial operations in accordance with Section 5(2).

2.3 Proposed new TOPS Regulations and Species Lists (2015)

When these Regulations come into effect they will provide for the application and issuing procedures for permits for conducting restricted activities related to listed species. When the Species Lists come into effect they will provide for prohibited (no permit may be issued) and exempted (no permit required) restricted activities. There is no provision that allows for a permit to catch, kill and sell a listed species as part of any fishery. Exemption from requiring a permit is only provided for the catching and immediate release of a listed species.

2.4 National Water Act (Act 36 of 1998; NWA)

Section 113 of the NWA deals with access to government waterworks (includes dams) and any surrounding state owned land and provides the Minister with powers to control or prohibit access and to levy charges for access or use of such waterworks or land. This provision, however, specifically deals with recreational activities (which could reasonably be interpreted to include angling) and no mention is made of commercial or subsistence-based activities.

In terms of Section 116(1), the Minister may make Regulations that provide for the management of, control over and use of waterworks and surrounding state owned land. Section

116(2) states that when making such Regulations, the Minister must take into account the safety and protection of the waterworks and land as well as the safety and security of people using the waterworks and land for recreational purposes. Despite the singular reference to recreational use, this Section does not appear to exclude other users.

2.4.1 Regulations in terms of Section 116 of the NWA

Regulations relating to access and use of government Waterworks and surrounding state-owned land for recreational purposes in terms of the NWA were published for comment on 30 October

2015 (Notice No. R1046 in Government Gazette No. 39348). In terms of the definitions in Regulation 1, “Recreational Use” does not include commercial fishing activities, but

does include cultural practises and activities that contribute to the general health and well-being of individuals and society.

In terms of Regulation 2, the regulations pertain to water storage reservoirs (unless specified otherwise). Although Kraal 1 is located in the river, its proximity to the dam wall may include it in the water reservoir area. If this is so then the Minister (in terms of Regulation 4) may reserve (as part of an RMP) an area for the use of specified groups or persons or for a specific activity; this could be interpreted to include members of the Kraal fishery and the fishery itself.

2.5 NEMA: Environmental Impact Assessment Regulations (2014)

The EIA Regulations and listed activities drafted in terms of NEMA are constantly being updated or amended. This review is based on the latest versions to my knowledge, but may need to be reconsidered if Provincial authorities are aware of any more recent amendments.

Listing Notice 1 (2010)

This Notice provides a list of activities that would require environmental authorisation (Basic Assessment) prior to commencement of that activity and identifies competent authorities in terms of sections 24(2) and 24D of the National Environmental Management Act (NEMA). The competent authority may be either the Provincial environmental authority, the Minister or an organ of state with delegated powers depending on circumstances.

Listed activity 11 (xi)

The construction of infrastructure or structures covering 50 m^2 or more where such construction occurs within a watercourse or within 32 metres of a watercourse. The Kraals themselves must be considered as structures and their combined surface area will exceed 50 m^2. This listing will do away with the doubt about whether the Kraals are considered as infrastructure as detailed in Listing Notice 3 below.

Listed activity 18 (i)

The depositing of any material more than 5 m^3 into a watercourse but excluding where such depositing is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority. The Kraals are currently considered illegal structures. If the material required to build them exceeds 5 m^3 then authorization will be required. If the authorization calls for a maintenance management plan, which is subsequently approved, then all future works (rebuilding, repair etc.) will be covered.

Listing Notice 2 (2010)

This Notice identifies activities that would require an environmental authorisation (Scoping and EIR) prior to the commencement of that activity and identifies competent authorities in terms of sections 24(2) and 24D of the NEMA. The competent authority may be either the Provincial environmental authority, the Minister or an organ of state with delegated powers depending on circumstances.

There are no listed activities applicable to the proposed Kraal fishery.

Listing Notice 3 (2010)

This Notice provides a list of activities and identifies competent authorities under sections

24(2), 24(5) and 24D of the NEMA, where environmental authorisation is required (Basic Assessment) prior to commencement of that activity in specific identified geographical areas only. The competent authority may be either the Provincial environmental authority, the Minister or an organ of state with delegated powers depending on circumstances.

Listed activity 16 (iv)

The construction of infrastructure covering 10 square meters or more within a watercourse or within 32 meters of a watercourse. In the Northern Cape this applies if the activity is located within five kilometres from a Protected Area identified in terms of the NEM: PAA. The majority of the existing Kraals measure in excess of 10 m^2.

Listed activity 24 (d)

The expansion of infrastructure where it will be expanded by 10 m^2 or more within a watercourse or within 32 meters of a watercourse. In the Northern Cape this applies if the activity is located within five kilometres from a Protected Area identified in terms of the NEM: PAA. This will only apply if the intention is to increase the size of existing Kraals by 10 m^2 or more.

3. PROVINCIAL LEGISLATION

Northern Cape Nature Conservation Act (Act 9 of 2009; NC:NCA)

All reference to permits under this Act refers to permits applied for and issued under the provisions of Chapter 10 of the Act. It must be noted that after considering a permit application, the Director may either refuse the application, grant the permit (or exemption from a permit) unconditionally, or issue the permit subject to conditions.

Schedules 1 & 2

Schedules 1 and 2 of the Act list the specially protected and protected species for the Province. In terms of the species that are relevant to the Kraal fishery, the largemouth yellowfish, smallmouth yellowfish and moggel are all specially protected and the Orange River mudfish is protected.

Sections 32 & 33

These Sections deal with restricted activities related to the above mentioned species. A permit is required to angle and keep, catch, possess or trade in both specially protected

and protected species. The terms “angle” refers to the use of hook & line while the term “catch” is defined as any means or method used to take and/or kill a specimen. It could therefore conceivably include Kraals as a method of capture. While a permit could cover the smallmouth yellow, moggel and mudfish, a separate permit would be required for the largemouth as it is listed under national legislation (NEM: BA and TOPS Regulations).

Section 37

A permit is required to keep more than the prescribed daily bag limit or specimens smaller than prescribed minimum size limit for any species. No specific reference is made to either angling or catching, so we must assume this provision generally relates to fishing irrespective of method used.

Section 38

Unless a person is in possession of a permit, it is prohibited to catch a fish:

i. By means of any device used to guide fish to an opening in such a way that is difficult for the fish to escape;

ii. By means of any prohibited hunting method relating to wild animals as provided in Section 9.

The first provision may be interpreted to include Kraal-style traps. Section 9 states that unless a person has a permit the following are prohibited hunting methods or instruments; during the night, by means of a trap and by luring by means of bait or scent. The term “trap” is defined as any trap or any other device, means or method whatsoever that can be used or adapted for the capture of wild animals (this includes fish). All of these prohibited methods would be applicable to the Kraal fishery and as such a permit application would be required.

Section 44

No person may, without a permit, sell or buy a specially protected animal or fish or sell or buy any fish caught in contravention of this Act. A permit under this Act will therefore

be required for the sale of smallmouth yellows and moggel. By definition it also follows that anyone buying any of these species will also require a permit. Due to its national listing, a separate permit under NEM: BA will be required for the sale of largemouth yellowfish.

4. SUSTAINABILITY

The key to the success of any long-term fishery is the sustainability of the resource in relation to the levels of catch and effort. The indicators that can be used over a period of time include relative species composition, size of fish and abundance. The initial number of participants and Kraals will need to be decided upon and then careful consideration given to the indicators mentioned above during the monitoring of the fishery. If any of the indicators show signs that current levels of catch and effort are not sustainable the options are to either reduce catch (number of fish) or effort (number of fishers or Kraals). Of course the converse may also apply. Despite other factors that may play a role in declining catches (e.g. water quality, poor recruitment periods, habitat destruction within a species' distributional range), it would be better to adopt the precautionary approach and manage the fishery accordingly until such time as recovery can be determined.

A recent look at the fisheries of the Zambezi River system (Tweddle *et al.* 2015) showed that an approach of balanced harvesting with moderate levels of effort had little relevance for communities with no alternative livelihoods. The demand for more access and more fish will always be present. The communities that are intended to benefit from the Kraal fishery are by all accounts poor, with high levels of unemployment and have very little in the way of either financial or food security. Once a fishery has been initiated and the benefits to the participants are realized, there will be the demand for greater access and increased catches.

5. MONITORING

The monitoring of the experimental phase will be a full-time operation with data on all catches being recorded. This should include, species composition & relative contribution of each species, size, number, weight, (except for largemouth yellowfish) and area (Kraal

location) caught. A two-year period should allow for the collection of sufficient data, with year-one data providing the baseline against which year-two data can be compared. If the decision is taken to continue the fishery in the long-term there needs to be a commitment from the environmental authorities that they will continue to monitor catches to both track the sustainability of the fishery and to ensure compliance with all permit conditions. Threshold limits will be determined, which if attained, will trigger adaptive management measures to try and address any further decline in the fishery and maybe even promote recovery.

6. SPECIES SELECTION

Species commonly caught in the Vanderkloof Dam include common carp (Cyprinus carpio), sharptooth catfish (Clarias gariepinus), mudfish (Labeo capensis), smallmouth yellowfish (Labeobarbus aeneus) and the Near Threatened largemouth yellowfish (Labeobarbus kimberleyensis). Since the kraals are setup downstream from the Hydro Electric Plant, in order to take advantage of the release of water, these species commonly caught in the dam will be flushed downstream and trapped in the kraals. Due to their slow growth rate, low fecundity and late maturity (Mulder, 1971; 1973; De Villiers, 2007; Ellender, 2008; Ellender *et al*., 2012), the numbers of largemouth yellowfish need to be monitored and a sustainable limit set. This limit will be based on the existing catches of this species, made by the kraal fishermen.

7. TARGETED SPECIES BIOLOGY

7.1 Labeobarbus kimberleyensis (Largemouth yellowfish)

L. kimberleyensis is the largest cyprinid fish in South Africa, whose biology is described as having slow growth rate, having a longer life span (approximately 15 years), reaching sexual maturity at a later stage and having a low fecundity (Mulder, 1971; 1973; Tómasson, 1983; Skelton, 1993). This species preferred habits are rivers, which have gravel or sand bottoms and clear flowing water (Mulder, 1973). Their diets start to orientate predominately towards piscivorous from juvenile stages, with adults feeding mainly on fish (Mulder, 1973). The maximum recorded length for this species is 825mm FL and weighing 22.2kg. Males reach sexual maturity at 350 mm, which is roughly after six years, and females at 460 mm, roughly eight years (Mulder, 1973; Skelton, 1993).

7.2 Labeobarbus aeneus (Smallmouth yellowfish)

L. aeneus is an important angling species in Vanderkloof Dam, targeted predominately by fly-fishing anglers. This species prefers habitats with sandy or rocky bottoms and clear flowing water. Their diet is considered to be omnivorous and as they mature and grow, become more herbivorous. *L. aeneus* reaches a maximum length of roughly 500 mm and a maximum weight of about 7.4 kg (Skelton, 2001). Males reach sexual maturity at four years, 300 mm and females at five years, 390 mm (Benade 1993).

7.3 Cyprinus carpio (Common carp)

C. carpio is an invasive alien species and is widespread throughout southern Africa (Skelton, 1993). The maximum length of this species is 1037 mm FL and a weight of 36 kg (Bruton *et al.,* 1982; Winker *et al.,* 2011). The diet of the common carp is omnivorous and consists of aquatic plants and organisms. Males reach sexual maturity in roughly four years and females after approximately five years (Winker *et al*., 2011).

7.4 Labeo capensis (Orange river mudfish)

L. capensis occurs only within the Orange-Vaal system, with a habitat preference for large rivers and impoundments. Mudfish reach a maximum length of 500 mm FL and a maximum weight of 3.8 kg (Skelton, 1993). This species is a bottom feeder, with their diet consisting of plant detritus and algae attached to rocks (Baird 1971; Bruton *et al*., 1982). Males reach sexual maturity at four years, 350 mm and females at five years, 400 mm (Mulder 1971; 1973; Tomasson *et al*., 1985).

7.5 Clarias gariepinus (Sharptooth catfish)

C. gariepinus occurs in freshwater habitats across Africa, with a preference for lakes and dams (Skelton 2001). Their diet is described as being both omnivorous and scavenger but with a preference for feeding on fish (Skelton 1993). This species reaches a maximum length of 1.4 m and a maximum weight of 59 kg. Sexual maturity is usually reached after about two years, with males at 440 mm and females at 460 mm (Mulder 1971; 1973).

7.6 Labeo umbratus (Moggel)

L. umbratus is native to the Orange-Vaal, Gouritz, Gamtoos, Sundays, Great Fish and Bushmans systems. Its diet consists of zooplankton, detritus and benthic algae and is predominately a bottom feeder (Bruton *et al*., 1982; Skelton 1993). Males reach sexual maturity after three years, 220 mm and females after four years, 350 mm (Goldner 1967; Mulder 1971; 1973). This species attains a maximum length of 500 mm and a maximum weight of 2.8 kg (Bruton 1982; Skelton 1993).

8. COMMUNITIES INVOLVED

Petrusville

The town of Petrusville was founded before the creation of the Vanderkloof Dam. Prior to the completion, the majority of the employed locals worked as farm workers and builders. During the construction of the dam, locals from Petrusville were employed to build roads, houses and the channels of the irrigation systems. Up until the late 1990's, there was no high school in Petrusville and students had to travel to De Aar and attend the high school there. Unfortunately many students do not complete high school to a matric level, opting rather to find work to support families. As per the census of 2011, there are 5211 people living in Petrusville. The majority of the locals are again employed as farm workers and builders but the unemployment level in the town is still relatively high. This increases the necessity of the locals to catch fish for both food and income. The largest percentage of fishermen which utilize the Vanderkloof Dam, come from Petrusville.

Keurtjieskloof

Keurtjieskloof was founded are 1970 and was only inhabited once the houses were completed, during the construction of the dam. Prior to the completion of the dam, the locals were typically employed as farm workers and builders (but fewer in number than Petrusville). Once the dam was completed, locals were employed by Eskom, Department of Nature Conservation and Department of Water and Sanitation. Some of the women work for Hospice. As per the census of 2011, there estimated to be 699 locals staying in Keutjieskloof.

9. CONCLUDING STATEMENTS

Current estimates are that 23 fishers rely on the Kraal fishery at Vanderkloof as their main source of food and income (Rural Fisheries Programme 2015). The Kraal Fishery, once legalised, may provide the local communities with a sustainable source of food, as well as income (Bene *et al*., 2016).

A sustainable fishery that benefits as many people as possible in the long-term, is the end goal of this project. From the evidence presented above, there is no reason for the provincial environmental authorities (once relevant permits have been obtained) not to support the project and explore ways of facilitating a rapid outcome in terms of fulfilling the legislative requirements. Through establishing the correct monitoring methods and adhering to the relevant restrictions as proposed above, the traditional method of kraal fishing can be managed and remain a sustainable option for local communities in the future.

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