

CHAPTER SIX

Trout and Biodiversity



There is something else to these endeavours, something more profound and difficult to describe than just catching fish, something that has to do not only with being alive, but with the impulse to persist despite difficulty.

CRAIG NOVA¹

The question of the continued existence of trout in South Africa, especially in view of their impact on indigenous species, has sufficient intensity and visibility that the January 2011 issue of the magazine *Country Life* ran a piece by Tom Sutcliffe titled 'Vintage Trout and Sensibility', with the caption, 'Trout were originally introduced to South Africa in 1890, the wisdom of which is questioned by some. Should they be allowed to stay?'

The question 'Should they be allowed to stay?' certainly has the kind of eerie xenophobic socio-political associations pointed

to by Gould in my opening chapter – ‘How easy the fallacious transition between a biological argument and a political campaign’. Sutcliffe’s answer is that ‘our trout have been here for well over a hundred years now and whatever damage they did has long since been done’.² As a keen trout fisher, he also acknowledges that ‘there is an acceptance now that trout are valuable, are wonderful to hunt with a flyrod, and are here to stay’. While on one level I agree with Sutcliffe, I am looking for an answer that is more complex and nuanced than, to misquote Neil Young, that of the ‘species in and the damage done’.³

Whatever argument we may make for the historical and cultural place of trout in South Africa, we cannot sidestep the argument of ecological damage or harm, especially in the present. Several defenders of trout argue that the fish have over many years coexisted relatively benignly with indigenous species. Bob Crass says in this regard:

While trout prey on a great many of the indigenous aquatic animals and are, in their turn, preyed upon, there is a remarkably harmonious relationship between the original inhabitants and the newcomers. Trout have fitted into their new environment and form an integral part of the community, wherever physical conditions are suitable.⁴

In my conversations with Ed Herbst and Gerhard Compion, narrated in Chapter 10, both made a similar argument.

While the threat to indigenous species and ecosystems posed by trout is relatively minor in comparison with those posed by smallmouth bass, carp, prickly pears or wattles, or on a more substantial level by habitat degradation, as Crass himself adds,

translocating species always involves risk.⁵ Let me be clear: any species has an effect on other species, and on the ecosystem in which it is present. As fish that are both insectivorous and piscivorous, trout cause damage, and there is scientific evidence that they have been responsible for the decline in smaller fish species such as galaxias, redfins and the Cape kurper in some waters. Any argument that does not acknowledge that fact is, for me, a non-starter.

But what sort of accommodation is possible – one that values biodiversity – without resorting to arguments for reinstating ecosystems that we can only imagine, and which do not allow our own presence as a species? I quoted Mulcock and Trigger approvingly in the previous section, but I do think that their argument only goes as far as taking apart concepts of naturalness and nativeness. They do not really tackle the vexed issue of whether and how indigenous and endemic species, and more broadly the concept of biodiversity that is key to the functioning of complex ecosystems, should be protected. I would stress, though, that biodiversity in this context should be understood not in terms of simple origin or autochthony, which I have shown to be deeply problematic, but in terms of biological interdependence and accommodation.



It is almost dark as I throw the wet waders, float tube and damp creel – one good fish destined for the cold smoker – into the back of the bakkie. There is the faintest hint of orange behind the softening line of the escarpment as the winter night sets in. My fingers fumble clumsily with the lock on the gate – the cold metal feels

unyielding. But I have found my music: the sound of a diesel engine in the dark on a dirt road.



Sydney Hey's famous book *The Rapture of the River* is a narrative map of rivers in southern Africa suitable for the introduction of trout (and to a lesser extent bass). Reading that narrative from the perspective of 2013, with the benefit of hindsight and also considerable developments in ecological and political thinking, it may seem massively quixotic and colonially hubristic, claiming as it does huge sections of the riverine system of the country for 'alien' species.

The maps produced by Ernst Swartz and others for the conservation and distribution of fish species in terms of the National Environmental Management: Biodiversity Act (NEM:BA) in 2009 are more 'realistic' in biological terms. They allow a legitimate space in the South African landscape for trout, carp, bass and other introduced species, while providing strict control of indigenous species, such as the sharp-toothed catfish, which are extremely invasive outside of their natural habitat. As mentioned earlier, although the bulk of the media coverage has been on the 'invasive' status of trout, Ernst Swartz points out that in many cases the presence of barbel, bass and carp has 'pushed the remaining populations of threatened endemic fish into trout territory'.⁶ Even Jim Cambray, on a rare sabbatical from trout-bashing, has written about the devastating impact on local fish populations of sharp-toothed catfish, which have travelled into another catchment area through the Orange River tunnel system.⁷

Interestingly, the position of accommodation had been put forward as early as 1986 by Bob Crass in his major book *Trout in South Africa*:

For the trout fisherman it is discouraging if those responsible for departmental policy regard any exotic organism as out of place in an area set aside for nature conservation. Certain plants and animals are, indeed, a danger to the natural flora and fauna, but trout are as much part of South Africa as the oak trees of Stellenbosch – not to be planted in wilderness areas where they do not already occur, but to be valued where they are established.⁸

A key development in this mapping process – and one potentially facilitated by NEM:BA, of which more later – has been to sever the connection between the term ‘alien’ and associations of ‘exoticism’, ‘otherness’ or ‘undesirability’. The criteria for ‘belonging’ become less those of origin and increasingly those, positively, of economic and social value and a history of presence, and, negatively, those of invasiveness, threat or harm. This was actually a position proposed by Douglas Hey many years earlier in 1977 in a book entitled *Water Source of Life*, in which he warned of the misconception of equating ‘alien’ with ‘undesirable’.⁹

So indigenous fish, established outside of their natural distribution ranges, such as sharp-toothed catfish, Orange River mudfish, moggel, Orange River yellowfish, Clanwilliam yellowfish, KwaZulu-Natal yellowfish, Lowveld largescale yellowfish, Mozambique tilapia and redbreasted tilapia are classified under NEM:BA in the same table as the ‘exotics’, rainbow trout, brown trout, smallmouth bass, largemouth bass, spotted bass, Nile tilapia, carp and grass carp, simply as ‘Listed Invasive Species’,

which must be 'regulated by area'.¹⁰ This categorising constitutes a fairly clear answer from the Minister of Environmental Affairs and Tourism to the question posed by the title of this book: Are trout South African?

What seems to be an elegant accommodation in terms of NEM:BA was in fact a hard-won compromise. There was extensive consultation by Ernst Swartz of the South African Institute for Aquatic Biodiversity after some initial public relations disasters that led to an outcry that zoning for different species and removing trout from certain areas was the 'thin end of the wedge' in the campaign to remove all trout from South Africa. FOSAF, especially in the persons of Ilan Lax and Bill Bainbridge, played a leading role in negotiating a sensible solution.

But recent developments suggest that the good work, and goodwill, may be about to be undone. The Ministry of Water and Environmental Affairs appears to have retreated from the notion of proclaiming demarcated areas for particular species, in favour of an approach that is apparently likely to be blunter in assumption and implementation. I say 'apparently' because no draft version of this legislation, which is the policy by which NEM:BA is applied to freshwater fish, has been made available. FOSAF has expressed its grave concerns in this regard to the Minister, and also questioned the legality of gazetting legislation without consultation or publication, but without response so far.

Trout are not the only fish potentially at risk here, and concerns have also been expressed by carp and bass fishers. I referred earlier to the negative environmental effects of carp. The small-mouth bass, which breeds successfully in rivers and so is more invasive than its large-mouthed relative, which can only breed in stillwaters, is described by fisheries researchers as having 'severe

ecological impacts'. To illustrate the potential effects of smallmouth bass, a study conducted by Darragh Woodford on sections of river above and below a waterfall that was a natural barrier for smallmouth bass on the Witte River, a tributary of the Breede near Worcester, revealed the following. Above the waterfall: 0 smallmouth bass, 353 Cape kurper, 1 667 Burchell's redfin; below the waterfall: 13 smallmouth bass, 2 Cape kurper and 4 Burchell's redfin.¹¹ As early as 1949, fish scientists were concerned about the impact of largemouth and smallmouth bass on indigenous fish species in the Olifants River system. In a letter to *Piscator*, Thomas H. Brooks stated: 'For the past two seasons I have looked in vain for the shoals of yellowfish and other indigenous fingerlings – in previous seasons the shallows in both the Olifants and Jan Dissels rivers were black with these fingerlings. If as I think the bass are destroying the "yellows", then I regret my part in introducing the bass.'¹²

CapeNature's response to the question of 'alien' species and the conservation of indigenous fish has caused some furore, especially over its plans to remove trout from certain streams and re-establish populations of redfins, galaxias and Cape kurper. The word 'rotenone' – a piscicide that is part of CapeNature's strategy – is about as welcome in a gathering of trout fishers as George W. Bush was/is in an Iranian mosque.

I must admit that my own initial reaction on hearing of this strategy was negative. I have since moderated my approach, though I still have some unease. 'Poisoning streams' seemed on the face of it a bizarre conservation strategy. A string of letters to *The Complete Flyfisherman* reiterated this position, with many letter-writers insisting, incorrectly it seems, that the introduction of rotenone into a stream effectively rendered it sterile and

unable to sustain any fish life in the future. While I think any fisherperson would find the prospect of actively poisoning a fish population very difficult, CapeNature's approach is not an unconsidered response, and draws on research conducted in Australia, New Zealand and the United States.

The scientific literature I have read on the subject seems to concur that the administration of piscicides like rotenone can be an effective strategy to restore indigenous fish populations in specific conditions – more of which below – and rotenone has been extensively and effectively deployed in the United States and elsewhere in protecting trout since the 1930s.¹³ Rotenone is used in over 30 countries in the world.¹⁴ It was also used as an insecticide by organic farmers as a means of controlling external parasites on cattle and dogs, and as a method of capturing fish by indigenous peoples (it is derived from a plant).¹⁵ Bob Crass records that rotenone was actually used on the Mooi River in 1963 and 1968 to reduce the number of fish and so increase growth rate.¹⁶

Physical methods of fish removal – electroshocking, nets, seines, traps – are generally effective only in reducing fish populations, not eradicating them. Elimination of a species from waters in which they breed is only successful if not even one male and female fish is left. In an article co-authored with several other proponents of rotenone, Brian Finlayson acknowledges the negative impacts of such piscicides, which may include 'direct environmental impacts on aesthetics (i.e., sight of dead fish), air quality (i.e., smell of solvents), biological resources (i.e., invertebrates, amphibians and fish), hydrology and water quality (i.e., violation of water quality standards and introduction of piscicide diluents and surfactants), hazards and hazardous materials (i.e., potential spill of piscicides), and recreation (i.e., loss of angling

opportunity)¹⁷ But the authors argue that the benefits offset these, that the extent of the impact depends on the specifics of site, water temperature, piscicide dose and other variables, and that the effects are of short duration.

CapeNature initially announced plans to use rotenone in four Cape streams – the Krom, Rondegat and Suurvlei in the Cederberg region, and the Kromme in the Eastern Cape – to remove predatory fish (mainly bass), which are threatening endangered indigenous fish species. The Department argues that this intervention is imperative as a recent IUCN Red List assessment indicates that the fynbos rivers have the highest concentrations of threatened endemic fishes in southern Africa.¹⁸

Most of the controversy has been over the Cederberg's Krom River, which contains rainbow trout. CapeNature argues that this river is marginal for trout, meaning that the trout population it sustains is not substantial, the fish tend to be small, and it does not have the kind of angling significance of the Holsloot, Smalblaar or Elandspad. In effect, CapeNature claims trout (and bass) anglers are being asked to give up these marginal waters, in return for the guaranteed conservation of significant trout streams, many of which run through conservation areas under the Department's control.

As I have said, the notion of introducing poison to a river in the name of conservation is, of course, controversial, even if, in the case of rotenone, the poison is a 'natural' product derived from the Derris root, of South American origin. Some initial and more recent responses did border on the hysterical, perhaps including my own. An article in *Die Burger*¹⁹ on the use of rotenone at Die Oog and Paardevlei, which I discuss below, was sensationally entitled '*Oorlog verklaar teen vreemdelingvisse*' ('War declared

against stranger/alien/foreign fish' – the human-political echoes are alarming) with an accompanying photograph of a fish kill that would break any angler's heart, although the article itself took a more balanced approach.



This is a fish I will never catch. Creep up to the bridge, bent over double. The water is crystal clear and thin, not much deeper than a few inches. On the bridge you are about 2 metres above water level, and easy to spot. Creep up to the metal rail, and resist the temptation to lean forward. Very, very slowly look just beyond the toes of your boots into the water just behind and to the left of that amber-coloured rock. Do you see it? Look at the way the sunlight picks up the yellow in the fins.



The approach of CapeNature and the Natal Parks Board (now Ezemvelo Wildlife) in KwaZulu-Natal in relation to the continued existence of trout and the protection of indigenous species appears to be in line with that taken in New Zealand, though it should be noted that Ezemvelo has not supported CapeNature's rotenone strategies. In an article on brown trout in New Zealand, Colin Townsend of the University of Otago argues that it is 'highly questionable whether the eradication of trout from New Zealand is desirable in view of the angling pleasure gained by a large proportion of the population and the economic benefits from the trout fishery that accrue to the nation'. In any case, he

points out, 'we lack the technology to this end'. And only 'a very small scale, local eradication and subsequent exclusion of trout from a small tributary might be achievable, perhaps to permit the establishment of a reserve for native species'.²⁰ He does, however, point out that recolonisation by indigenous species is possible, and Mark Lintermans of the University of Canberra documents the successful repopulation of a section of a river in Australia by *Galaxias olidus* after rainbow trout were eradicated by rotenone.²¹

The Natal Parks Board's approach in KwaZulu-Natal over many years seemed to be a sensible one. The Board acknowledges that trout have undoubtedly impacted on indigenous fish species, and has also halted propagation of trout in their own hatcheries (this responsibility is now in the hands of privately owned ventures). They nevertheless argue that we have no data on what the biological make-up of the rivers looked like before the introduction of trout, which may indeed have been a misguided impulse, so the 'restoration to their original state' argument of Cambray is problematic. We can make comparative analyses of rivers without trout, but these are suggestive, rather than conclusive.

They point out that we have a viable trout fishery, which provides recreational and economic opportunities for many people. The trout riverine ecosystems are stable and healthy in comparison with many others. Trout need extremely good water quality and healthy insect populations to survive, and flyfishers and fly-fishing clubs have a vested interest in ensuring the maintenance of the ecosystems that provide their sport and which they value. As trout do not breed in stillwaters, their presence there is non-invasive nor threatening.

The Natal Parks Board argues that the ecosystems have been changed by human history – from the introduction of crop and

livestock species, as well as ornamental plants, to trees, shrubs, grasses and 'wildlife' species – and the solution is to manage those ecosystems in the best way possible. FOSAF is, in turn, in agreement with this position:

It should be appreciated that both brown and rainbow trout have been present in South African waters for over a century. They have adapted to the ecological conditions present, occur in self-perpetuating populations, and consequently have become a permanent feature of the high-altitude stretches of certain rivers, whether or not one approves of their presence.²²

That affirmation of trout, however, is tempered by FOSAF's endorsement of the statement in 1988 by De Moor and Bruton: 'We must not, however, lose sight of the fact that they are alien fishes, and that it is our unique and primary responsibility to safeguard the future of our indigenous fishes.'²³

Wolf Avni echoes this position, and it is worth quoting him at some length:

That trout, in common with virtually every introduced alien species – including practically all animals and plants that humans regard as economically significant – have the capacity to inflict enormous environmental damage is undeniable. That the introduction of trout more than a century ago into the streams and rivers in many of our sensitive catchments was irresponsible is beyond debate.

Their introduction must have changed stream ecology in ways that we can barely measure, in ways that we will never know, for no pre-introductory audits were done in these aquatic systems.

No one of sound reason could possibly support their continued spread into new waters in intact catchments, or indeed their protection at the expense of vulnerable indigenous biota within parts of their established ranges.

Yet in the scale of things, the introduction of trout into these environments has done demonstrably less cumulative damage to these systems than any other exploitative activity you could name, including farming and mining.²⁴

FOSAF's official response to the initial proposals on the classification of trout as an invasive species in terms of NEM:BA was similarly measured. The federation acknowledged that South Africa is a signatory to the International Convention on Biodiversity, and so 'is obliged to put in place plans and measures to control alien and invasive species'. It noted that '[t]rout are on the list of the hundred most invasive species globally because of the damage which introductions have caused in many places around the world', and agreed that 'the [Department of Environmental Affairs and Tourism] had little alternative but to list trout as an invasive species'.²⁵ Accordingly, 'FOSAF has accepted as a principle that no new stocking of rivers should take place without proper risk assessments',²⁶ though the federation does argue that further clarification is required on how trout fisheries, and especially hatcheries that do fall within designated trout areas, will be protected. As indicated, though, that position of accommodation may be reviewed, depending on the policy according to which NEM:BA is applied to freshwater species.

CapeNature's response is to recognise 'the importance of some introduced angling species for angling purposes', and to stress

that the rehabilitation sites have been chosen because of the 'conservation importance of the site for indigenous fish species, and the physical characteristics of the section of river, where recolonisation by invasive alien fish once effective eradication has been achieved, will be highly unlikely'.²⁷

On the face of it, CapeNature's plans seem fairly reasonable. The waters publicly identified for fish eradication are not particularly prime trout or bass waters. Weirs are to be built to allow dedicated sections to be set aside for the preservation of endemic species. Rotenone is only used as a last resort, and its impact on sections below those targeted is prevented by the introduction of potassium permanganate, which neutralises rotenone without adversely affecting fish or insect life.

The well-known trout fisher and flyfishing author Ed Herbst was in 2009 convinced by this approach: 'In my subjective opinion, it would be churlish and environmentally unethical to oppose this project ... there is infinitely more trout water available than will ever be impacted on by this project – more water than most of us could fish in several average lifetimes.'²⁸

His opinion was echoed by Sheena Carnie in her editorial in *Flyfishing* magazine:

Removing smallmouth bass, carp and trout from the Krom, Rondegat and Suurvlei rivers will make a big difference to the endangered minnows, fiery redfins and sawfins which might otherwise be dinner to these predators. Yes, we will lose a few kilometres of trout water, but there are plenty of other spectacular trout streams which will not be affected ...²⁹

As is apparent in his comments in my meeting with him,

narrated later in this book, Ed Herbst is rather more sceptical of the CapeNature approach now. He doubts the financial viability of weir building, has questions about some of the motives of the individuals involved in the rotenone project, and feels that more serious environmental threats to fish species are being ignored. His concern is fuelled by the fact that, although CapeNature has officially identified four sites for the use of rotenone, the minutes of the meeting of the Western Cape Wetlands Forum of 7 September 2011 mention an extremely alarming ‘41 rivers identified for alien fish eradication’. I have to admit my own concern.

Peter Thorpe raises more strenuous objections, in an article evocatively titled ‘Story of an African River’, with its echoes of the famous novel by Olive Schreiner, and provocatively subtitled ‘At Risk and Betrayed’, which is more Deon Meyer or Mike Nicol. He begins by recounting his own unsuccessful attempts to get permission to stock brown trout into a section of the Salt River near Plettenberg Bay, so as to establish a trout syndicate.³⁰ He argues that the project was scuppered by Dean Impson and Jim Cambray, who – Thorpe claims – rejected his proposal on the grounds of the diversity of insect life in and around the river, which would have been adversely affected by the introduction of trout. He says that he was then forced to sell the land when his trout development was declined.

Thorpe points out that while he had made significant progress in restoring the indigenous vegetation on his property, the subsequent owner dynamited large sections of the property to build polo fields, and has allowed the river to silt up. Thorpe accuses Impson of hypocrisy, and describes his behaviour as ‘morally and environmentally reprehensible’³¹ in relation to plans to remove alien fish from the Krom. ‘I ask you to judge for yourself,

as a matter of public and environmental concern and interest,' he says, 'whether the proposal to contaminate the Krom with rotenone is an astonishing manifestation of double standards, hypocrisy and untenable environmental practice'.³² Thorpe's position is supported by Leonard Flemming, who accuses CapeNature of 'targeting trout' rather than dealing with the larger issues of environmental degradation.³³



Just about all the trout I catch are returned unharmed to the water. On the odd occasion that I keep one, this is generally how it ends up. The recipe is as recorded by my wife, Tracey.

Duncan's amazing smoked trout pâté

Smoke one humungous, extra-special trout, caught by Duncs under extreme conditions, and then skin and bone it.

Put the trout and the following into a blender and purée until smooth.

250 g (or more) smoked trout

125 g creamed cheese

125 g softened (not melted) butter

2 tbsp fresh lemon juice

2 tsp creamed horseradish

2 tbsp chopped chives

a dash of tabasco.

Blend until smooth. Enjoy.



I had read accounts of CapeNature's rotenone treatment of two stillwaters targeted for alien species eradication, Paardevlei and Die Oog.³⁴ In both, the presence of large numbers of carp had apparently caused substantial deterioration of water quality. In view of the fact that Paardevlei was to be developed as a residential site, CapeNature was looking to allow restocking with fish that would both promote water quality and provide recreational angling, including the non-indigenous largemouth bass and Mozambique tilapia, the latter of which occurs naturally in the northeastern regions of South Africa.³⁵ It sounded fine, until I did some further reading. I cannot comment on Die Oog, as I do not know it, but Paardevlei is a body of water near to my home, which generally assumes the curious opaque green colour of many Western Cape wetlands, and has dried up almost completely during the summer at least once since I moved to Somerset West at the end of 2008. Back issues of the journal *Piscator* indicate that the water level was historically boosted by water channelled from the Lourens River (the channel still exists), and that large volumes of copper sulphate had to be introduced into the water to achieve any sort of clarity. With these interventions it could sustain a population of bass, and even at one stage trout, though the copper sulphate did at times result in fish kills. When carp were introduced, Paardevlei declined as a fishery, and seems to have returned to its previous state. It seems a rather curious site for a 'rehabilitation' project.

As rotenone is probably the most controversial aspect of the 'alien fish debate' in South Africa, when I was invited by Dean Impson to be present when rotenone was administered to a 4.5-kilometre stretch of the Rondegat River in the Cederberg on 29 February 2012, I had to go along to see for myself.

The Rondegat is a very pretty little river running through a mountainous landscape of craggy, astonishing beauty, into the Clanwilliam dam. The section chosen for treatment had a waterfall at the top end, and a weir at the bottom. Above the waterfall, indigenous fish are prolific. Below it, the river is populated almost exclusively by smallmouth bass. To my flyfisher's eye, the Rondegat looks like a very marginal water for bass, as the pools and runs are small and shallow. In many places you can step from one bank to the other with the greatest of ease. The bass tend to be very small, and might be fun on a one- or two-weight rod, but I could not see much angling value, and could think of dozens of places better suited to pursuing bass.

Driving to the site past orchards of citrus trees and past farm entrances decorated with bougainvillea, I pondered again the whole question of indigeneity that spurred projects like this. The idea of removing a few bass from a stream in this hybridised landscape did seem at best quixotic. Having taken a wrong turning, which led me almost to the town of Clanwilliam itself, I arrived when the treatment was already underway.

Several drip stations had been set up along the length of the selected stretch, with monitors along the river removing dead fish. As the river banks are quite bushy, and there are braids and backwaters, two sprayers also walked the stretch administering rotenone into areas bypassed by the current.

Two things struck me straightaway. There was no smell, and no water discoloration beyond 10 centimetres or so from the drip nozzles. In fact the river looked like the kind from which one would stop to drink while hiking. The dead fish were being collected by teams of students with nets, and placed in cooler boxes. I did not see that many, and all the fish I saw were bass, the

biggest being about 20 centimetres in length, though I have read a subsequent report that some indigenous fish were also killed.³⁶ Many bass had been removed some weeks before by an angling party arranged by CapeNature.

I stayed around, chatting to some of those involved, including Dean Impson and the United States rotenone expert, Brian Finlayson, who had flown in to oversee the operation. Both were happy with the outcome. I drove downstream to the weir that marked the end of the treatment zone. At this point potassium permanganate was being administered to neutralise the rotenone. A pilot fish, a bass caught earlier before the treatment, had been placed in a bucket with holes in it in the river below the weir section to check on the efficacy of the rotenone neutralisation. It seemed to be in good health at the time I left, but was, I gathered from conversation amongst the researchers, potentially destined for sadder fate on a braai grid later that evening. The fish kill was virtually complete by this stage. A biologist from Stellenbosch University who was monitoring the project reported that the same fate had befallen the tadpoles, dragonfly nymphs and crabs he had found.

As I drove back upstream, I spotted a malachite kingfisher on a small tree by the river. I could not help but think that it had a confusing and hungry time ahead of it: the river looked as it had a few hours ago, normal, but there was nothing in it left alive.

I was left with rather mixed feelings. The administration of rotenone in this case had been far less dramatic than I had expected, and I did not feel a sense of enormous loss at bass being removed from a section of river that seemed to be not particularly suited to them anyway. And I could see that this stretch of river had the potential for the reintroduction of indigenous fish, since bass from the Clanwilliam dam could not scale the weir

at the bottom. On balance, then, if the bass have been successfully removed and indigenous fish are successfully re-established, I have no real argument. But walking along a river that appears pristine, but is utterly, utterly devoid of life, and not being sure what will re-establish itself and in what timeframe, is eerie and unnerving. And I could not help noticing not only the orange orchards planted next to the river, but the fact that they were, with their accompanying pesticides and fertilisers, worryingly close to the water.

The success or otherwise of the project has since been debated in a series of articles in *Flyfishing* magazine by Darryl Lampert and Dean Impson.³⁷ The real test will be the state of this section of the Rondegat two to three years from now, and the nature of the fish, insect, bird and animal life it sustains.