FERAL

REWILDING the LAND, the SEA, and HUMAN LIFE

GEORGE MONBIOT

GEORGE MONBIOT studied zoology at Oxford, but his real education began when he travelled to Brazil in his twenties and joined the resistance movement defending the land of indigenous peasants. Since then he has spent his career as a journalist and environmentalist, working with others to defend the natural world he loves. His celebrated *Guardian* columns are syndicated all over the world. Monbiot is the author of the books *Captive State*, *The Age of Consent*, *Bring on the Apocalypse*, and *Heat*, as well as the investigative travel books *Poisoned Arrows*, *Amazon Watershed*, and *No Man's Land*. Among the many prizes he has won is the UN Global 500 award for outstanding environmental achievement, presented to him by Nelson Mandela.

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Contents

Preface

Arrange these threats in ascending order of deadliness: wolves, vending machines, cows, domestic dogs and toothpicks. I will save you the trouble: they have been ordered already.

The number of deaths known to have been caused by wolves in North America during the twenty-first century is one[1,2]: if averaged out, that would be 0.08 per year. The average number of people killed in the US by vending machines is 2.2 (people sometimes rock them to try to extract their drinks, with predictable results).[3] Cows kill some twenty people in the US,[4] dogs thirty-one.[5] Over the past century, swallowing toothpicks caused the deaths of around 170 Americans a year.[6] Though there are sixty thousand wolves in North America, the risk of being killed by one is almost nonexistent.

If you find that hard to believe, you are not alone, and not to blame. For centuries we have terrified ourselves with tales of the lethal threat wolves present to humankind, and the unending war being fought with equal vigor on both sides. In reality, wolves are

1. Candice Berner, in Alaska on 8 March 2010. http://www.adfg.alaska.gov/static/home/news/pdfs/wolfattackfatality.pdf.

2. The cause of a second death, that of Kenton Joel Carnegie in Saskatchewan, Canada, in 2005, is disputed. The evidence appears to suggest that it is more likely that he was killed by a bear.

3. http://urbanlegends.about.com/b/2005/06/29/are-vending-machines-deadlier-than-sharks-repost.htm.

4. http:/tierneylab.blogs.nytimes.com/2009/07/31/dangerous-cows/?_php=true&_type=blogs&_r=0.

5. http://historylist.wordpress.com/2008/05/29/human-deaths-in-the-us-caused-by-animals/.

6. http://www.videojug.com/interview/unlikely-ways-to-die#how-many-people-have-died-from-toothpicks.

exceedingly afraid of people and in almost all circumstances avoid us. If we take the time to win their trust—as the biologists who have been adopted by wild wolf packs can testify—they can become affectionate companions. But the fairytales are more powerful than the facts.

Could it be that we are so afraid of wolves not because they represent an alien threat, but because we recognize in them some of our own traits? They have a similar social intelligence: the ability to interpret and respond to someone else's behavior and mood. They look at you as if they can read your mind. To some extent they can, which is why we domesticated them. This, perhaps, is why they unnerve us, and why so many stories have been written and filmed in which wolves become humans or disguise themselves as such, or humans become wolves.

But perhaps there is something else at work too, a subliminal yearning for the kind of danger that no longer infects our lives. Discovery Channel's very popular series *Yukon Men* is as accurate a description of the world as the tales of Jacob and Wilhelm Grimm. It claims that 'there have been twenty fatal wolf attacks in the last ten years.'[7] This would be wrong under any circumstances, but the strong implication is that all these attacks have taken place in and around the town of Tanana. This town, the series tells us, 'is under siege by hungry predators . . . there's always somebody that's not going to make it home.'

Amid scenes of revolting cruelty inflicted by hunters clumsily killing (or trying to kill) the animals they have caught in their traps, the series insists that the men have no choice: otherwise these animals would stalk and gut them. Even wolverines, it says, 'are capable of tearing human beings apart.' When the biologist Adam Welz investigated this claim, he was unable to find a documented case of a wolverine attacking anyone, anywhere on earth.[8] Had the series maintained that the town was being stalked by killer vending machines, the claim would have been no less plausible.

Programs of this kind now throng the television schedules. Discovery

7. Adam Welz, 17 May 2013, 'Bloodthirsty "factual" TV shows demonize wildlife', http://www.theguardian.com/environment/nature-up/2013/may/17/bloodthirtsty-wildlife-documentaries-reality-ethics.
8. Adam Welz, as above.

has also broadcast a chilling documentary which claims that *Carcharodon megalodon*, a giant shark which has been extinct for over a million years, is still alive and roaming the oceans. In support of this thesis, it shows the horribly mutilated carcass of a whale, washed up on a beach.[9] A contributor tells us "you can clearly see a bite radius in the whale. . . . The whale looks to be almost bit in half, it's absolutely insane. Local marine biologists analysed the whale and determined—as crazy as it sounds—that the tail was bitten off in one bite." That the picture looks like a clunky computer-generated image appears to be no deterrent to the thesis; or to the fabulous viewing figures.[10]

The success of these shows reinforces the notion that we wish to believe we are surrounded by ancient terrors. Like the thousands of annual sightings of imaginary big cats, the ratings suggest we are missing something—something rich and grand and thrilling which resonates with our evolutionary history. Our imagination responds vividly to threats of the kind that we evolved to avoid. In the absence of sabretooths, lions and rampaging elephants, wolves will have to do.

So when I see the myths propounded by *Yukon Men* or by the organizers of the Salmon Predator Derby, which encouraged people to travel to Salmon, Idaho, and compete for a prize of $1,000 for killing the largest wolf,[11] I wonder whether some people hate wolves for the same reason that others love them. Because they have come to embody the fear and thrill that is often missing from our lives, people will fight to re-establish them as fiercely as others will fight to exterminate them.

Nowhere are these conflicts played out with greater intensity than in North America. European lovers of nature gaze longingly at the Wilderness Act, that has so far protected 110 million acres of land from significant human impacts. They also recoil from the ways in which some people still engage with protected lands: at the recent case, for example, in which a hunter in the Lolo National Forest in Montana repeatedly shot someone's pet malamute (and almost shot the owner) with a semi-

9. http://www.discovery.com/tv-shows/shark-week/videos/whale-attacked-by-megalodon.htm.

10. Breeanna Hare, 9 August 2013, 'Discovery Channel defends dramatized shark special *Megalodon*', CNN, http://edition.cnn.com/2013/08/07/showbiz/tv/discovery-shark-week-megalodon/.

11. http://www.idahoforwildlife.com/2-content/39-salmon-predator-derby.

automatic assault rifle.[12] He was found to have broken no law, on the grounds that he believed the dog was a wolf, even though it was wearing an illuminated collar and its owner was screaming at him to stop.

As ranchers and hunters lobby—with some success—to remove the wolf's protections under the Endangered Species Act, other people are seeking to extend its range across the entire continent, by means of the world's most ambitious rewilding program. The four mega-linkages proposed by Dave Foreman and the Rewilding Institute would connect conservation areas from Baja, California, to southern Alaska, from central America to the Yukon, from the Everglades to the Canadian Maritimes and from Alaska to Labrador.[13] Their program seeks to reverse the fragmentation of habitats that has been driving local populations of many animals to extinction. It would create permeable landscapes, through which these animals could move once more. It hopes to restore the populations of large predators (such as wolves, bears, cougars, lynx, wolverines and jaguars) which would then begin to drive the dynamic ecological processes which permit so many other species to survive.

The plan is wildly ambitious, but it might not be as implausible as some people assume. As Foreman points out, even in Florida, where the human population has been rising rapidly and the politics are often difficult, the government, working with private landowners, has spent billions of dollars and added millions of acres to its conservation network, to reconnect fragmented ecosystems.[14] In the United States, perhaps more rapidly than anywhere else, farming is retreating from marginal and unproductive land; forests are returning and conservation easements and land trusts are proliferating.[15] The impossible dream is beginning to look credible, and to embolden similar movements throughout the US and in other parts of the world. I hope that this book will inspire you to support them.

12. John S. Adams, 10 December 2013, 'Pet malamute shot, killed by wolf hunter', *USA Today*, http://www.usatoday.com/story/news/nation/2013/12/10/pet-malamute-killed-by-wolf-hunter/3950523/.

13. Dave Foreman, 2004, *Rewilding North America: A Vision for Conservation in the 21st Century*, Island Press, Washington DC.

14. Ibid.

15. Adam Federman, 2013, 'Return of the Wild: Will humans make way for the greatest conservation experiment in centuries?', http://www.earthisland.org/journal/index.php/eij/article/return_of_the_wild/.

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More than any other book I have written, *Feral* is a collaborative effort. While the words (except those quoted) are mine, and I have spent three years researching, writing and revising it, the ideas, structure and progress of this book have been developed with the help of many people, some of whom have given the project a great deal of their time and energy. I could not have written it without them.

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The mistakes this book doubtless contains are all my own work.

I have changed the names of some of the places in mid-Wales in order to protect the wildlife I discuss from commercial exploitation.

If you find yourself in the area and ask Welsh speakers how to find the places I have mentioned, you are likely to be met with some very odd looks.

In the descriptive passages I have tended to use imperial measurements. When discussing scientific findings I have reverted to the metric system.

Introduction

It is an extraordinary thing for a foreigner to witness: one of the world's most sophisticated and beautiful nations being ransacked by barbarians. It is more extraordinary still to consider that these barbarians are not members of a foreign army, but of that nation's own elected government. The world has watched in astonishment as your liberal, cultured, decent country has been transformed into a thuggish petro-state. The oil curse which has blighted so many weaker nations has now struck in a place which seemed to epitomise solidity and sense.

This is not to say that there were no warnings in Canada's recent past. The nation has furnished the world with two of its most powerful environmental parables: one wholly bad, the other mostly good.

The story of the collapse of the North Atlantic cod fishery reads like a biography of the two horsemen of ecological destruction: greed and denial. The basis on which the stocks were managed was the opposite of the Precautionary Principle: the Providential Principle. This means that if there's even a one percent chance that our policy will not cause catastrophe, we'll take it. Foreigners and seals were blamed for the depletion of the fish, while the obvious contribution of the Canadian fleet and the Canadian government was overlooked. The fisheries science was rigged and, when it still produced the wrong answers, disregarded or denounced.[1] The government continued to sponsor bigger boats and new fish plants even as the stocks were crashing. A moratorium was imposed only after the fishery became commercially extinct: government and industry, after due consideration and debate, agreed that the non-existent fish should no longer be caught.

Even today, the best means of ensuring that stocks can recover and breed freely—declaring a large part (perhaps the majority) of the Grand Banks a permanent marine reserve in which no fishing takes place—has not happened. All over the world the evidence shows that such no-take zones greatly enhance the overall catch, even though less of the sea is available for fishing. But the Canadian government continues stoutly to defend the nation from the dark forces of science and reason.

The other great parable which still resonates with the rest of the world—the battle over Clayoquot Sound—began the same way: private companies were given the key to a magnificent ecosystem and told they could treat it as they wished. The forests would have followed the fishery to oblivion had it not been for a coalition of remarkable activists from the First Nations and beyond, who were prepared to lose their freedom—and possibly their lives—to prevent a great wound from being inflicted on the natural world. In 1994 they won, for a few years at least. Their courage in the face of police brutality and judicial repression inspired peaceful direct action movements all over the world.

So here are the two Canadas: one insatiable, blindly destructive, unmoved by beauty; the other brave, unselfish and far-sighted. There is no doubt about which of the two is now dominant. For Canada today is providing the world with a third parable: the remarkable, perhaps unprecedented story of a complex, diverse economy slipping down the development ladder towards dependence on a single primary resource, which happens to be the dirtiest commodity known to man.

The tar sands poisoned the politics first of Alberta then of the entire nation. Their story recapitulates that of the Grand Banks. To accommodate rapacious greed, science has been both co-opted and ignored, the Providential Principle has been widely deployed, laws have been redrafted and public life corrupted. The government's assault on behalf of the tar sands corporations on the common interests of all Canadians has licensed and empowered destructive tendencies throughout the nation.

Already the planned pipelines whose purpose is to transport the tar to new markets are carrying the toxic sludge of misinformation across

Canada. For example, the company hoping to build the Northern Gateway pipeline deleted from the animations it presented to the public one thousand square kilometres of islands, which lie across its tanker route down the Douglas Channel.[2] This had the effect of making the project look less threatening to the sensitive coastal ecosystems of British Columbia, and collisions less likely. It also strikes me as symbolic: if the natural world stands in the way, we will erase it.

Just as government and industry blamed and persecuted seals for the decline of cod in the North Atlantic, so have they blamed and persecuted other predators for the decline of woodland caribou. The Alberta Caribou Committee, which represents such defenders of the natural world as Petro-Canada, Shell, BP, ConocoPhillips, Koch Industries, TransCanada pipelines, Alberta-Pacific Forest Industries and the pulp company Daishowa Marubeni, came together to puzzle over the downfall of the species.[3] As there could not possibly be a link to the fragmentation of its habitat by seismic lines, pipelines, roads, oil platforms, timber cutting and the transformation of pristine forest into wasteland, the cause was at first mysterious.

But, after taking expert advice from one another, the committee members managed to solve the mystery. The problem was, of course, wolves. Although they have lived with caribou for thousands of years, and though caribou seldom feature in their diet,[4] wolves have suddenly become an urgent threat to the survival of the species, just as seals suddenly became cod's nemesis in the 1980s. The committee explained the nature of the problem to the government, which has responded by intensifying its poisoning and shooting of wolves, in order, of course, to protect the natural world.

But the resurrection of Grand Banks politics has also aroused the spirit of Clayoquot Sound. I see the emergence of the Idle No More movement as one of the most inspiring recent developments anywhere on earth. It demonstrates that the other Canada, though brutally trampled, has not died. The direct actions by the First Nations peoples who lead this movement, in defense of both the living planet and their own patrimony, remind the rest of the world that the Canadian government does not represent the will of all its people.

Even so, as the sheikhs of Saudi Alberta come to dominate federal politics, and as other provincial governments, harried by lobbyists

working for destructive interests, feel licensed by the example of Edmonton and Ottawa to accede to their demands, the nature of Canada—in two senses—is changing with terrible speed. You can see this change manifested in the sharp decline of mountain caribou in British Columbia, caused primarily by logging;[5] in the salmon farms destroying the magnificent sockeye runs up the Fraser River; in the near-extinction of the greater sage-grouse; in the refusal to list severely threatened iconic species—such as polar bears, grizzlies, western wolverines, beluga whales and porbeagle sharks—under the Species at Risk Act;[6,7] in the failure to protect the boreal forests; in the auctioning of offshore oil rights in the Arctic, accompanied by the deregulation of oil spill response plans.[8]

The new Environmental Assessment Act and the gutting of the old Navigable Waters Protection Act suggest that this festival of destruction has only just begun. For those who appreciate natural beauty and understand ecosystem processes, it must feel like living in a country under enemy occupation. It must also be intensely embarrassing. Canada is becoming a pariah state, whose name now invokes images formerly associated with countries like Nigeria and Congo. Canadian friends joke that they stitch US flags onto their rucksacks when they go abroad.

So it feels odd, publishing a book about rewilding in a nation undergoing a rapid dewilding. But I hope that there are several respects in which it can be found relevant in Canada. The first is that it seeks to explain fascinating new findings in the science of ecology, which show that you cannot safely disaggregate an ecosystem. The loss of one species often has severe consequences for species and systems to which it appears at first to be unconnected. Killing predators, such as wolves and seals, can have paradoxical impacts, severely damaging the prey species and ecosystems that the culling claims to protect.

The next is that *Feral* provides a warning of what Canada's destination may be. With astonishing speed, in many places your complex and fascinating ecosystems are being reduced to near-deserts of the kind with which we are familiar in Europe. In the United Kingdom we have all but forgotten what we once had, and see our bare hills and empty niches as natural. Some of us find ourselves afflicted by an ill-

defined longing, which I have come to understand as ecological boredom.

But perhaps most importantly, as I kept discovering over twenty-eight years of activism and campaigning journalism, sustaining the morale of people engaged in any political struggle requires a positive vision. It is not enough to know what you are fighting against: you must also know what you are fighting for. An ounce of hope is a more powerful stimulant than a ton of despair. The positive environmentalism I develop in Feral is intended to create a vision of a better place, which we can keep in mind even as we seek to prevent our governments from engineering a worse one.

My proposals are not in any sense a final answer, and they are likely to be developed in different ways in different places, but I will be happy if this book helps to stimulate new thinking about our place on the living planet and the ways in which we might engage with it. Nowhere, I believe, is in greater need of that than Canada.

I

Raucous Summer

I will arise and go now, for always night and day
I hear lake water lapping with low sounds by the shore;
While I stand on the roadway, or on the pavements grey,
I hear it in the deep heart's core

William Butler Yeats
The Lake Isle of Innisfree

Every time I lifted off a turf, the same thing appeared: a white comma, curled in the roots of the grass. I picked one up. It had a small ginger head and tiny legs. Its skin was stretched so tight that it seemed about to burst at the segments. In the tail I could see the indigo streak of its digestive tract. I guessed that it was the larva of a cockchafer, a bronze-backed beetle that swarms in early summer. I watched it twitching for a moment, then I put it in my mouth.

As soon as it broke on my tongue, two sensations hit me like bullets. The first was the taste. It was sweet, creamy, faintly smoky, like alpine butter. The second was the memory. I knew immediately why I had guessed it was good to eat. I stood in my garden, sleet drilling into the back of my neck, remembering.

It had taken me a moment, when I woke, to realize where I was. Above my head a blue tarpaulin rippled and snapped in the breeze. I could hear the pumps working, so I must have overslept. I swung my legs over the edge of the hammock and sat blinking in the bright light, gazing across the devastated land. The men were already up to their waists in water, spraying the gravel banks with high-pressure hoses. There had been some shootings in the night, but I could not see any bodies.

The images of the past few weeks crowded my mind. I remembered Zé, the serial killer who owned the airstrip at Macarão, taking his gunmen into the bar to liven things up, and the man who had been carried out with a hole the size of an apple in his chest. I thought of João, a *mestizo* from the north-east of Brazil, who had spent ten years crossing the Amazon on foot, walking as far as the mines in Peru and Bolivia, before cutting through the forests for another 2,000 miles to come here. 'I have killed only three men in my life,' he told me, 'and all the deaths were necessary. But I would kill that many again if I stayed here for a month.'

I recalled the man who had shown me the strange swelling on his calf. When I looked closely I saw that the flesh was writhing with long yellow maggots. I remembered the Professor, with his neat black beard, gold-rimmed spectacles and intense, ascetic manner, the cynical genius who managed the biggest claim for its scarcely literate owner. Before he came here he had, he said, been Director of the University of Rondônia.

But above all I thought of the man the other miners called Papillon. Blond, muscular, with an Asterix moustache, he towered over the small dark people who had been driven here by poverty and land-theft. He was one of the few, barring the bosses, the traders, the pimps and the owners of the airstrips, who had come to this hell through choice. Before he joined the goldrush the Frenchman had worked as an agricultural technician in the south of Brazil. Now, having found nothing, he was trapped in the forests of Roraima hundreds of miles from the nearest town, as destitute as the others. Here was a man who had leapt over the edge, who had abandoned comfort and certainty for a life of violent insecurity. His chances of coming out alive, solvent and healthy were slight. But I was not convinced that he had made the wrong choice.

I cleaned my teeth, picked up my notebook, then stepped out over the mud and gravel. The temperature was rising and in the surrounding forest the racket of yelps and whistles and trills was dying away. It was now three weeks since Barbara, the Canadian woman with whom I was working, had found a way through the police cordon at Boa Vista airport, and had shoved us, unrecorded, onto a flight to the mines. It felt like months. We had watched the miners tearing out the

veins of the forest: the river valleys whose sediments were paved with gold. We had seen evidence of the one-sided war some of them were waging against the local Yanomami people, and the physical and cultural collapse of the communities they had invaded. We had heard the gunfire that came from the woods every night, as bandits waylaid the miners, thieves were executed, or men who had struck lucky fought over the gold they had found. In the six months since the main rush began here, 1,700 of the 40,000 miners had been shot dead. Fifteen per cent of the Yanomami had died of disease.

Now, because of the international scandal the invasion had caused, the new Brazilian government was clearing the mines, and moving the miners into enclaves in other parts of the Yanomami's land. From there, they knew, they could re-invade their old claims as soon as the rest of the world lost interest. The federal police had cut the supply lines: no planes had landed on the dirt airstrips for several days. The miners were using the last of their diesel and preparing to move. The police were supposed to have arrived the previous day, to confiscate weapons in advance of the expulsions, and the men had spent the morning moving in and out of the forest, burying their guns in plastic sheeting. I had stayed to watch, but the police had not come. Barbara had – Jesus, where the hell was Barbara?

She had set off yesterday to find a Yanomami village in the mountains and said she would be back that night. But no one had seen her. I cast around, through the shanties and bars the miners had erected, among the groups of men in the bottom of the pits, without success. I found my friend Paulo, a mechanic who had defended the indigenous people in arguments with the other miners, and we struck up the valley to look for her. The river ran orange and dead, choked by the forest clay disturbed by the mines. Around it, the valley was a wasteland of pits, spoil heaps and toppled trees. The miners who worked a stake called Junior Blefé told us that Barbara had passed through the previous day but had not returned. A man with a drinker's face and a black eye knew how to find the village and agreed to guide us. We set off, running, into the mountains.

Soon after we entered the darkness of the forest we began to find the prints of Barbara's plimsolls, a day old, overlain by the naked tracks of the Yanomami. I kept my eyes on the ground, but every so

often Paulo would stop and shout. 'Look at that water, look at those trees: so beautiful, isn't that beautiful?' I would stand and gaze for a moment, and see trees weighed down above clear water by moss and epiphytes, damselflies pausing in spots of light.

We ran on, following Barbara's footprints, slipping on the clay path. By midday we started to climb steeply; my breath came as if drawn through a sheet. Soon I saw light ahead of us: we were reaching the top of a mountain. From its crest we saw women on the far side of the valley, dressed only in loincloths, moving through banana groves, carrying baskets of fruit. Hills stepped away into silence, forested, undisturbed. We remained hidden among the trees for a few minutes, then we walked down to the lap of the valley and up into the gardens, calling out in Portuguese that we were friends. They stood still and watched us come close. I put out my hands and they shook them with shy grins.

'White woman,' I said. 'Have you seen the white woman?' I mimed Barbara's height and long hair.

They laughed and pointed up the slope behind them, into the forest. We began to run again, over the mountain and down into the next valley. We stumbled, exhausted, along the valley floor, tripping on roots, blundering into trees. We turned a corner of the path and stopped.

In the glade beside a stream a crowd of people sat or knelt, the honey of their skins cooled by the stained-glass light of the forest. The women wore feathers in their ears, the painted spots and stripes of wildcats; and jaguar's whiskers: stems of dried grass piercing their noses and cheeks. In the middle of the circle, radiant as a flower in the green dark of the forest, was Barbara.

She turned and smiled. 'Glad you could make it.'

The young Yanomami people led us along the path until we came to their *malocas*: round communal houses thatched almost to the ground with palm leaves. I took off my shirt and shoes – everyone else was nearly naked – and sat down. Children clustered around me, grinning and giggling, hiding their faces when I looked at them. They tugged at the hairs in my armpits: the Yanomami do not possess them. Someone gave me a plug of green leaves, and when I pushed it under my lip and sucked I forgot that I was hungry.

A young man came through the crowd and gestured that I was to help them build an extension to the communal *maloca*: they wanted me to climb to the top of the roof and tie on a tarpaulin they had been given by the miners. I stayed on the roof for a couple of hours, mending holes under his direction. When I came down I asked Barbara why he was so bossy.

'He's the chief,' she said.

'But he's only eighteen.'

She looked around. 'All the older men are dying or dead.'

In the living space of the *maloca*, the hammocks were filled with the sick. As I sat beside a feverish boy, two old women broke through the screen of banana leaves, shuffling on their haunches, roaring and sweeping sticks across the ground, their eyes screwed shut. I was hit on the ankles before I could get out of the way. The women stamped around the hammock, screaming, beating the air with their sticks.

The roaring continued for most of the day. I was later told that female faith healers were almost unknown among the Yanomami: only the absence of men could account for it. The old women led me to the hammock of a teenaged girl and showed me what I must do. I stamped and shouted, sweeping my arms through the air, scooping something from the surface of her body and pushing it away from the *maloca*. Urged on by the two women, I danced and yelled faster and louder, stamping and leaping over the hammock, until I almost fainted and fell into the arms of the healers.

When I had recovered and washed in the stream, the women brought me food laid out on a banana leaf: baked plantains, toadstools and beetle grubs, foetally curled, still writhing. My hand hovered over the leaf. 'Go on,' they gestured. I picked up a grub and opened my mouth.

I leant on my spade, staring at the ground. On that raw December day soon after I had arrived in Wales, I was struck by the smallness of this life. Somehow – I am not quite sure how it happened – I had found myself living a life in which loading the dishwasher presented an interesting challenge.

The invasion of Roraima, which I had witnessed almost twenty years before, represents everything I hate. The miners, many of whom

had been expelled from their own lands in the north-east of Brazil by businessmen and corrupt officials, were driven to the mines by poverty and desperation. But those who had organized it, who had the capital to build the airstrips and buy the machinery, were driven to kill and destroy by greed. Had the government of Brazil not changed, had the miners not, after several more months of procrastination, been expelled from the Yanomami's land, the tribe would have gone the same way as most of those in the Americas: to extinction. The old government knew this. Genocide was not its intention: simply an unavoidable, and unregretted, consequence of its policy.

And yet, even while I stayed in the goldmines and experienced the horrors of the invasion, I was drawn to what I hated. The mines exploded the metaphors by which we live. In the rich nations we trade in ciphers for gold, and seek them through specializations so extreme that we are in danger of losing many of our faculties. In the mines gold was gold, and the men got their hands dirty in all respects. Conflicts were resolved not through legal instruments or on the sofas of television studios, but by shoot-outs in the forest. It was rawer, wilder, more engaging than the life I had led; and the life I would lead thereafter.

J. G. Ballard reminded us that 'the suburbs dream of violence. Asleep in their drowsy villas, sheltered by benevolent shopping malls, they wait patiently for the nightmares that will wake them into a more passionate world.'[1] We still possess the fear, the courage, the aggression which evolved to see us through our quests and crises, and we still feel the need to exercise them. But our sublimated lives oblige us to invent challenges to replace the horrors of which we have been deprived. We find ourselves hedged by the consequences of our nature, living meekly for fear of provoking or damaging others. 'Thus conscience does make cowards of us all.'[2]

Much of the social history of the past two centuries consists of the discovery, often grudging, that other people, whatever their language, colour, religion or culture, have similar needs and desires to ours. As mass communication has enabled those whose rights we formerly disregarded to speak for themselves, to explain the impacts on their lives of the decisions we make, we become increasingly constrained by a necessary regard for others. Just as potently, we now know that little

we do is without environmental consequence. The amplification of our lives by technology grants us a power over the natural world which we can no longer afford to use. In everything we do we must now be mindful of the lives of others, cautious, constrained, meticulous. We may no longer live as if there were no tomorrow.

There are powerful and growing movements in many nations of people who refuse to accept these constraints. They rebel against taxes, health and safety laws, the regulation of business, restrictions on smoking, speeding and guns, above all against environmental limits. Like the people who promoted the invasion of the Yanomami's lands, they kick against the prohibitive decencies we owe to others. They insist that they may swing their fists regardless of whose nose is in the way, almost as if it were a human right.

I have no desire to join these people. I accept the need for limitations, for a life of restraint and sublimation. But I realized, on that grey day in Wales, that I could not continue to live as I had done. I could not continue just sitting and writing, looking after my daughter and my house, running merely to stay fit, pursuing only what could not be seen, watching the seasons cycling past without ever quite belonging to them. I had offered too little to that life, the life of the spirit,

> Which is not to be found in our obituaries
> Or in memories draped by the beneficent spider
> Or under seals broken by the lean solicitor
> In our empty rooms[3]

I was, I believed, ecologically bored.

I do not romanticize evolutionary time. I have already lived beyond the lifespan of most hunter-gatherers. Without farming, sanitation, vaccination, antibiotics, surgery and optometry I would be dead by now. The outcome of mortal combat between me, myopically stumbling around with a stone-tipped spear, and an enraged giant aurochs is not hard to predict.

The study of past ecosystems shows us that whenever people broke into new lands, however rudimentary their technology and small their numbers, they soon destroyed much of the wildlife – especially the larger animals – that lived there. There was no state of grace, no

golden age in which people lived in harmony with nature. Neither do I wish to return to the hallows and gallows of the civilizations we have left behind.

Nor was it authenticity I sought: I do not find that a useful or intelligible concept. Even if it exists, it is by definition impossible to reach through striving. I wanted only to satisfy my craving for a richer, rawer life than I had recently lived. Yet somehow I had to reconcile this urge with the life I could not abandon: bringing up my child, paying my mortgage, respecting the rights and needs of other people, restraining myself from damaging the natural world. It was only when I stumbled across an unfamiliar word that I began to understand what I was looking for.

So young a word, yet so many meanings! By the time 'rewilding' entered the dictionary, in 2011,[4] it was already hotly contested. When it was first formulated, it meant releasing captive animals into the wild. Soon the definition expanded to describe the reintroduction of animal and plant species to habitats from which they had been excised. Some people began using it to mean the rehabilitation not just of particular species, but of entire ecosystems: a restoration of wilderness. Anarcho-primitivists then applied the word to human life, proposing a wilding of people and their cultures. The two definitions of interest to me, however, differ slightly from all of these.

The rewilding of natural ecosystems that fascinates me is not an attempt to restore them to any prior state, but to permit ecological processes to resume. In countries such as my own, the conservation movement, while well intentioned, has sought to freeze living systems in time. It attempts to prevent animals and plants from either leaving or – if they do not live there already – entering. It seeks to manage nature as if tending a garden. Many of the ecosystems, such as heath and moorland, blanket bog and rough grass, that it tries to preserve are dominated by the low, scrubby vegetation which remains after forests have been repeatedly cleared and burnt. This vegetation is cherished by wildlife groups, which prevent it from reverting to woodland through intensive grazing by sheep, cattle and horses. It is as if conservationists in the Amazon had decided to protect the cattle ranches, rather than the rainforest.

Rewilding recognizes that nature consists not just of a collection of

species but also of their ever-shifting relationships with each other and with the physical environment. It understands that to keep an ecosystem in a state of arrested development, to preserve it as if it were a jar of pickles, is to protect something which bears little relationship to the natural world. This perspective has been influenced by some of the most arresting scientific developments of recent times.

Over the past few decades, ecologists have discovered the existence of widespread trophic cascades. These are processes caused by animals at the top of the food chain, which tumble all the way to the bottom. Predators and large herbivores can transform the places in which they live. In some cases they have changed not only the ecosystem but also the nature of the soil, the behaviour of rivers, the chemistry of the oceans and even the composition of the atmosphere. These findings suggest that the natural world is composed of even more fascinating and complex systems than we had imagined. They alter our understanding of how ecosystems function and present a radical challenge to some models of conservation. They make a powerful case for the reintroduction of large predators and other missing species.

While researching this book I have, with the help of the visionary forester Adam Thorogood, stumbled across an incendiary idea that seems to have been discussed nowhere but in a throwaway line in one scientific paper.[5] I hope it might prompt a reassessment of how our ecosystems function, and of the extent to which they are perceived as natural. There is, we believe, powerful circumstantial evidence suggesting that many of our familiar European trees and shrubs have evolved to resist attacks by elephants. The straight-tusked elephant, related to the species that still lives in Asia today, persisted in Europe until around 40,000 years ago,[6] a mere tick of evolution's clock. It was, most likely, hunted to extinction. If the evidence is as compelling as it seems, it suggests that this species dominated the temperate regions of Europe. Our ecosystems appear to be elephant-adapted.

Even so, I have no desire to try to re-create the landscapes or ecosystems that existed in the past, to reconstruct – as if that were possible – primordial wilderness. Rewilding, to me, is about resisting the urge to control nature and allowing it to find its own way. It involves reintroducing absent plants and animals (and in a few cases

culling exotic species which cannot be contained by native wildlife), pulling down the fences, blocking the drainage ditches, but otherwise stepping back. At sea, it means excluding commercial fishing and other forms of exploitation. The ecosystems that result are best described not as wilderness, but as self-willed: governed not by human management but by their own processes.*Rewilding has no end points, no view about what a 'right' ecosystem or a 'right' assemblage of species looks like. It does not strive to produce a heath, a meadow, a rainforest, a kelp garden or a coral reef. It lets nature decide.

The ecosystems that will emerge, in our changed climates, on our depleted soils, will not be the same as those which prevailed in the past. The way they evolve cannot be predicted, which is one of the reasons why this project enthralls. While conservation often looks to the past, rewilding of this kind looks to the future.

The rewilding of both land and sea could produce ecosystems, even in such depleted regions as Britain and northern Europe, as profuse and captivating as those that people now travel halfway around the world to see. One of my hopes is that it makes magnificent wildlife accessible to everyone.

I mentioned that there are two definitions of rewilding that interest me. The second is the rewilding of human life. While some primitivists see a conflict between the civilized and the wild, the rewilding I envisage has nothing to do with shedding civilization. We can, I believe, enjoy the benefits of advanced technology while also enjoying, if we choose, a life richer in adventure and surprise. Rewilding is not about abandoning civilization but about enhancing it. It is to 'love not man the less, but Nature more'.[8]

The consequences of abandoning a sophisticated economy, supported by high crop yields, would be catastrophic. Before farming began in Britain, for example, these islands appear to have supported a maximum of 5,000 people.[9] Had they been evenly dispersed, each person would have occupied 54 square kilometres, an area slightly larger than the city of Southampton (which now houses 240,000 souls).[10] This, it seems, was as many people as hunting and

* This term was coined by Jay Hansford Vest.[7] It has been championed by Dr Mark Fisher, whose work has been influential in shaping this book.

gathering could sustain. (Even so, Mesolithic men and women severely reduced the numbers of large animals.) The fantasy entertained by some of the primitivists I have met, of returning to a hunter-gatherer economy, would first require the elimination of almost all human beings.

For the same reason I do not think that extensive rewilding should take place on productive land. It is better deployed in the places – especially in the uplands – in which production is so low that farming continues only as a result of the taxpayer's generosity. As essential services all over Europe (and in several other parts of the world) are cut through want of funds, farm subsidies in their current form surely cannot last much longer. Without them, it is hard to see how farming in these places can be sustained: for good or ill, it will gradually withdraw from the hills.

Some people see rewilding as a human retreat from nature; I see it as a re-involvement. I would like to see the reintroduction into the wild not only of wolves, lynx, wolverines, beavers, boar, moose, bison and – perhaps one day in the distant future – elephants and other species, but also of human beings. In other words, I see rewilding as an enhanced opportunity for people to engage with and delight in the natural world.

Feral also examines the lives we may no longer lead and the constraints – many of them necessary – that prevent us from exercising some of our neglected faculties. It explains how I have sought, within these constraints, to rewild my own life, to escape from ecological boredom. I am surely not alone in possessing an unmet need for a wilder life, and I suggest that this need might have caused a remarkable collective delusion, from which many thousands of people now suffer, that seems to be an almost perfect encapsulation of the desire for a fiercer, less predictable ecosystem.

If you are content with the scope of your life, if it is already as colourful and surprising as you might wish, if feeding the ducks is as close as you ever want to come to nature, this book is probably not for you. But if, like me, you sometimes feel that you are scratching at the walls of this life, hoping to find a way into a wider space beyond, then you may discover something here that resonates. I seek to challenge

our perceptions of our place in the world, of its ecosystems and of the means by which we might connect with them.

In doing so, I hope to encourage a positive environmentalism. The treatment of the earth's living systems in the twentieth and early twenty-first centuries has been characterized by destruction and degradation. Environmentalists, in seeking to arrest this carnage, have been clear about what people should not do. We have argued that certain freedoms – to damage, to pollute, to waste – should be limited. While there are good reasons for these injunctions, we have offered little in return. We have urged only that people consume less, travel less, live not blithely but mindfully, don't tread on the grass. Without offering new freedoms for which to exchange the old ones, we are often seen as ascetics, killjoys and prigs. We know what we are against; now we must explain what we are for.

Using parts of Wales, Scotland, Slovenia, Poland, East Africa, North America and Brazil as its case studies of good and bad practice, *Feral* proposes an environmentalism which, without damaging the lives of others or the fabric of the biosphere, offers to expand rather than constrain the scope of people's lives. It offers new freedoms in exchange for those we have sought to restrict. It foresees large areas of self-willed land and sea, repopulated by the beasts now missing from these places, in which we may freely roam.

Perhaps most importantly, it offers hope. While rewilding should not become a substitute for protecting threatened places and species, the story it tells is that ecological change need not always proceed in the same direction. Environmentalism in the twentieth century foresaw a silent spring, in which the further degradation of the biosphere seemed inevitable. Rewilding offers the hope of a raucous summer, in which, in some parts of the world at least, destructive processes are thrown into reverse.

Nevertheless, like all visions, rewilding must be constantly questioned and challenged. It should happen only with the consent and enthusiasm of those who work on the land. It must never be used as an instrument of expropriation or dispossession. One of the chapters in this book describes some of the forced rewildings that have taken place around the world, and the human tragedies they have caused. Rewilding, paradoxically, should take place for the benefit of people,

to enhance the world in which we live, and not for the sake of an abstraction we call Nature.

Researching this book has been a great adventure: this is the most bewitching topic I have ever explored. It has taken me to wild places, brought me into contact with wild life and wild people. It has exposed me to some of the most riveting findings – in the fields of biology, archaeology, history and geography – I have yet encountered. It has wrought deep changes in my own life. At times investigating these issues has felt like stepping through the back of the wardrobe. This story begins slowly, with my efforts to engage more fully with the ecosystems on my doorstep, to discover in them something of the untamed spirit I would like to resurrect. If you would care to push past the coats, you can join me there.

2
The Wild Hunt

I must go down to the seas again, for the call of the running tide
Is a wild call and a clear call that may not be denied

John Masefield
Sea Fever

On the riverbank, beside the old railway bridge, I loaded my boat. I tied on a spool I had made from hazel poles, wound with orange twine and a team of tinsel lures. I lashed a bottle of water and a wooden club to the cleats on either side of my seat, and attached the paddle to the boat with a leash: anything not tied down was likely to be lost. In the pockets of my lifejacket were spare lures, swivels and weights, a chocolate bar, a knife and – in case I was stung – a cigarette lighter.

I stepped into the brown water. It filled my diving boots, soaking into my socks. It would keep my feet warm all day. I pushed the boat into deeper water then swung myself into it and set off downstream. Two sandpipers dipped and swooped along the bank. A family of swans bow-waved up the river, struggling against the current. Soon I reached the fast sparkling water in the shallows beyond the first meander. It rose in plumes over the rocks and raced between them, breaking into manes of spray. I sped through the rapids, bouncing off the water cushions on the boulders, feeling alive and free. Then the river reached the beach and spilled in a shallow fan across it. I found a channel just deep enough to carry me, and slid down into the first wave, which swamped the kayak then let me pass. The other breakers alternately sluiced over the prow or lifted the boat to smack it down

with a great shudder onto the water. I paddled hard, submerging, rising, collapsing into the troughs, pushing through the breaking waves into the rolling waters beyond.

I turned once, memorized the marks on the shore, then set out to sea. There was a moderate, irregular swell with a few white horses. The waves had the knapped faces of flints; their chipped crests spangled with sunlight. Ahead of me a fulmar glided down to the surface, half-wheeled then soared away.

I let the line out, lodged the spool beside my foot and passed the twine across my leg, just below the knee. As I paddled, I could feel the weight tripping across the rocks of the reef. Occasionally the line would drag, and I pulled it in to find clumps of crusty pink seaweed attached to the hooks, or leathery ropes of ribbon weed, sometimes twelve feet long. Half a mile from the land I crossed a band of lilac jellyfish. They could almost have been oilspots, a faint, two-dimensional bleaching of the water, but occasionally the wind would lift them, and they roiled, fat and rubbery, through the surface. They poured under the boat in their thousands. Some carried orange nematocysts on their tentacles. Seedy, segmented, the jellyfish looked like burst figs.

On the far side of the reef a crabber made his lonely rounds, hauling up his pots, rebaiting them, threading them back down the line as his boat chugged slowly between the buoys. I could smell the bait and diesel across half a mile of sea. He headed back to shore and I was alone.

Towards the edge of the reef the swell rose. The line felt its way through the sea like an extension of my senses, an antenna attached to my skin, twitching and trembling. From time to time the spool jumped up and the twine snapped taut across my knee, but when I stopped and pulled I felt only the weight dropping back as the wave that had lifted the line passed by. I was now a mile or more from the shore, but I had not yet found what I was looking for. Every time I encountered it, it seemed to be a little further from land than before.

A mile beyond the reef a gannet skimmed past me. It rose a few yards into the air, folded its wings and fell like a dart into the water, raising a plume of spray. It sat in the surface swallowing what it had caught, flew on then dived again. I gave chase, but still the line throbbed limply through the water. The sky had clouded over, the

wind had stiffened, and now the rain began to spatter. The sea felt like a half-set jelly.

I paddled west for three hours, straight out to sea. The land became an olive smear, the seaside town to the south a faint pale line. The waves were rising and the rain pelted into my face like birdshot. I had travelled six or seven miles from the shore, further than I had been before. Yet still I had not found the place.

On the horizon, I saw a flock of dark birds. Convinced that they had found the fish, I raised my pace to ramming speed. They disappeared, then appeared again, whirling a few feet above the waves. As I came closer I saw that they were shearwaters, about fifty of them, rising, turning, then landing on the sea again. A knot of birds peeled off from the flock and circled me. Their black velvet wings almost brushed the waves. They were so close that I could see the glints in their eyes. They were not feeding – just looking. The faint sense of loneliness that had crept up on me as I headed away from land dispersed.

The birds settled on the water again and I stopped a short distance away. There was no sound except the sloshing of the waves and the wind, whistling high and very faint, through the shock cords on the boat. The birds were silent.

Every time I go to sea I seek this place, a place in which I feel a kind of peace I have never found on land. Others discover it on mountains, in deserts or by the methodical clearing of their minds through meditation. But my place was here; a here that was always different but always felt the same; a here that seemed to move further from the shore with every journey. The salt was encrusted on the back of my hands, my fingers were scored and shrivelled. The wind ravelled through my mind, the water rocked me. Nothing existed except the sea, the birds, the breeze. My mind blew empty.

I put down my paddle and watched the birds. They trod water, preserving the distance between us. Squalls of rain drummed against my forehead. The waves, higher now, lifted the bows and swung the kayak round: I had to pick up the paddle and occasionally turn the boat to face the wind. The drops raised little spines on the face of the waves. Here was my shrine, the place of safety in which the water cradled me, in which I freed myself from knowing.

After a while I began to move south, parallel to the distant shore. I travelled for about a mile, then stopped and allowed the wind to carry me. I might have drifted all the way to land, but I began to feel cold, so I started to paddle again. I was now so tired that, even with the wind behind me, the sea felt lumpy and stiff.

About three miles from the coast I passed two brown guillemots, dipping their beaks in the water, occasionally standing up to flutter their wings. As I paddled past them, they held their heads in the air, watching me from the corners of their eyes, but not leaving the sea. Soon afterwards I felt a sharp, unmistakable tug against my knee. I yanked the line, then pulled it in, hand over hand. I could almost hear the electric twanging on the cord. As the tackle approached the boat it jinked about crazily. I saw a white flash far down in the green, and soon afterwards pulled the fish into the boat. It bounced around on the deck, then drummed on the plastic with rapid shivers. I broke its neck.

The mackerel's back was the same deep emerald as the water, slashed with black stripes, which swirled and broke across the head. The belly was white and taut, narrowing to a slim wrist and the crisply forked tail of a swift. Its eye was a disc of cold jet. My fellow predator, cold-blooded daemon, brother disciple of Orion.

After another mile I felt the lightest tap on the line. I picked it up and pulled, but there was nothing. I pulled again and it was almost wrenched from my hand. Whatever had tugged before had come back when it saw the lures rise. This felt different: heavier and less jagged. The white flash showed me that I had three fish – a full hand. I hauled them in, trying to hold the line clear as they landed on the boat and threw themselves about: a moment's inattention would leave me with a twenty-minute tangle. As soon as I had stowed them I turned the boat and paddled back to where I had hooked them. I circled the water but could not find a shoal.

I ate the chocolate and tramped on. The sun flickered for a moment and the sea turned to fresh-cast lead. Then the clouds closed and the rain came down again.

Half a mile from the coast I hit a small shoal and pulled in half a dozen mackerel. Then I found myself in a strand of jellyfish so dense that in places it scarcely seemed to contain water. They poured under

my boat in a column just a yard wide, heading away from land. The mackerel came up sporadically, in twos and threes. A driftline perhaps, which could explain why the predators had clustered around this strip: the plankton, like the jellyfish, had been corralled by a gentle rip tide, and the bait fish had followed them.

I watched the moon jellies rolling over each other like bubbles in a lava lamp. At one point the procession broke. There were a few yards of clear water, then I was startled by a monstrous ghostly jelly, pale and hideous, leading the next battalion. It took me a moment to see that it was a white plastic bag, parachuted taut in the water, the jellyfish king whose subjects followed him out to sea.

I drifted with them, sawing the line up and down. When I paddled, the jellyfish bumped against the line, causing me to stop and test the signal, to see what manner of life was tapping out its message from the gloom. I searched in vain for a baitball.

As usual in such matters, there were as many opinions about why the mackerel had scarcely appeared this year as there were people to ask. A local fishmonger told me with great authority that a monstrous new ship was operating in the Irish Sea, fishing not with a net but with a vacuum tube that sucked up the mackerel and everything else that came its way, which it turned into fishmeal for use as fertilizer and animal feed. It had been licensed by the Environment Agency to catch 500 tonnes of mackerel a day, and had received a £13 million subsidy from the European Commission. I checked this story and soon discovered that the Environment Agency has no jurisdiction at sea, that vacuum tubes are used not for fishing but for sucking the catch out of the nets, that there is no such fishmeal operation in the Irish Sea and that no boat is licensed to take such a tonnage. Otherwise the explanation was impeccable.

Others blamed the dolphins which, they said, had come into the bay in greater numbers than usual this year (the records suggested otherwise), or the north-west winds that had predominated since the end of May and were alleged to have broken up the shoals. Some people pointed to the black landings by a group of crooked fishermen in Scotland (they took £63 million-worth of over-quota mackerel and herring[1]); others to the failure by the European Union, Norway, Ice-

land and the Faroes to decide how many fish each nation should take, now that the shoals were moving further north in the winter;[2] or to overfishing in the Cantabrian Sea by the Spanish fleet, which had recently netted almost twice the tonnage its quota permits.[3]

I have not been able to establish whether or not the fish which migrate into Cardigan Bay belong to the same populations as those being hammered in other waters. In any case, the mackerel which enter the bay, even in better years, when you can pull 100 or 200 into the boat in an hour or so, are the tattered remnants of what was once a mighty population. Within living memory, local fishermen say, the shoals were three miles long;[4] today you would be lucky to find one which stretches to a hundred yards. The European Union classifies the mackerel stock in the Irish Sea as being 'within safe biological limits',[5] but this says more about our reduced expectations of what a healthy population looks like than the state of the species.

There was another bump on the line and I pulled up a small brown fish. I hesitated before I swung it in. Brown fish, on this coast, are brought in carefully, in case they belong to the species which, for anglers, is the most dangerous animal in British waters.

I first snared one on my virgin voyage into Cardigan Bay. I had been catching mackerel, which dashed around wildly when I hooked them. But this thing stayed down and shook its head. I could feel the vibrations all the way up the line. I brought it to the surface and saw that it was about eighteen inches long, etiolated, mottled brown and white.

As I lifted it out of the water it started thrashing madly. I swung it towards my free hand, but just before I grabbed it, some ancient alarm, long buried in the basal ganglia, sounded. I dropped the fish on the boat and studied it as it rattled around the deck. I thought I knew every species in British waters, but I had never seen anything like this. Fins ran the length of its body, shimmering purple and green. It had a snake's stripes on its flanks, bug eyes on the top of its head and a huge, upturned mouth. Suddenly, from some long-forgotten book or poster, the name swam into my mind.

This was not a member of the lesser species, which hides in the sand at low tide, ruining the holidays of bare-footed children. It was a greater weever, which, I later read, could make grown men weep and rage with pain. Like the smaller species, it has three poisoned spines

on its dorsal fin and one on each gill cover. The pain, if not quickly treated, can last for days. A local woman, fishing on a charter boat, sat on one that someone had landed on the deck and spent six weeks in a wheelchair. A man I met was unable to move his left hand for six months. Few people have been killed by weevers, but if you are stung in a kayak and have no means of treatment, you will not make your own way back to land. The pain and shock ensure that paddling is impossible.

I managed, after nearly falling out of the boat, to shake the creature off the hook. Since then I have always carried a club with me. Whenever I catch a weever, I draw it against the side of the kayak and hit it very hard. It has firm white flesh, which makes an excellent bouillabaisse or curry. In the Mediterranean the charter boats allow anglers to take all the fish they catch except the weevers, which the crews keep for themselves.

On some occasions in the previous season I had caught weevers in greater numbers than mackerel. I had never been stung on the boat, but one day, filleting the fish on the shore while my partner made a fire in the dunes, my hand slipped and I impaled my thumb on a spine. It felt as if I had put my thumb on a workbench, raised a hammer and hit it as hard as I could. I went rigid with pain, then felt a panic-inducing numbness spreading up my arm, across my shoulder and into my chest. But, even as my brain flooded with red light, the wheels began to spin. The cure for weever stings is hot water, applied as quickly as possible. There was no hot water on the beach. But it could not be the water that cured you, as skin is waterproof. It must be the heat. The poison must be heat-sensitive. It did not matter what the source of heat was. Where was heat? I cast around, my eyes flickering, and saw the smoke rising from the dunes.

I ran up the beach, crouching over my arm, jumped over the dunes and thrust my thumb into the flames. My partner stared at me as if I had gone mad. But the effect was remarkable. Within a minute the pain began to subside. I held my thumb so close to the fire that it almost scorched; the pain from the flames was less urgent than the pain from the venom. Soon my screaming nerves fell still. The numbness subsided, and within half an hour I felt as well as I had before I impaled myself.

But the fish I brought into the boat now was not a weever. It had a high square forehead, a delicate beaked mouth, damasked chestnut flanks shot with gold, and crimson fins like Spanish fans, flecked with turquoise. Under the throat were long bony fingers, which it used to probe the sediments for food. Seen from the front, the tub gurnard looked like a goose, its eyes set high on the sides of its beaked head. From the side, it was as pretty as an aquarium fish. I released it and it flicked back into the deep.

Now the waves were breaking on the shingle a few hundred yards from where I sat. Still trailing the line, my arms heavy, legs trembling with effort, I made my way north, towards the row of white breakers on the edge of the reef. I wound the cord back onto the spool, secured the hooks and stowed it. Soon afterwards I crossed the salt barrier. It was a neat white line of foam. On one side the water was green and clear; on the other it was brown and turbid: fresh water pouring from the river and fanning out into the sea. The change was as abrupt as the colouring on a diagram.

I wove through the breaking waves. They beat themselves against the boulders in the rivermouth. They flicked the back of the boat around, threatening to tip me broadside into the rocky surf. I caught the end of a large roller; it swung me round and smashed the prow down onto a rock. I back-paddled, skidded across the face of the next breaker, then found a passage between two waves. My paddle bit the water and I pushed myself into the rivermouth.

The whitewater in the river had been slowed by the rising tide, and I was able, clinging to the inside of the meanders, to make way against it. Small flatfish torpedoed away beneath the hull. After a few hundred yards, the riverbed rose and the force of the water gathered. I hauled at the paddle, but soon came to a standstill. I wedged the paddle between the rocks and slid out of the boat. But, unstrung by tiredness, I lost my footing, fell headfirst into the water and caught my ankle in the paddle's leash. The boat started to drift downstream, pulling me with it. I thrashed until I grabbed the leash. I freed myself just as my face was being dragged under the water, then dived down the river to catch the kayak. I turned it and began to wade back upstream, so tired that I could scarcely breast the river.

In the quiet waters beyond the railway bridge I pulled the stern

onto the shore, and shook the boat to slide the fish in the hold down to the bow hatch. Their backs had turned a deep aquamarine and their bellies had taken on a pink iridescent flash. They glowed in the evening light.

I fetched a board and another knife from the car. I filleted one of the mackerel, exposing the clean, translucent bone, then pinned the tail of the fillet to the board with my penknife and skinned it with the other knife. The flesh tasted of raw steak. I filleted two more fish and ate them. I sat on the riverbank for a while, watching the mullet dimpling the surface and the crows landing momentarily on the rusty bridge then flapping away when they saw me. I gutted the remaining fish. It was not a great haul, but for the first time on the boat that summer I had caught more energy than I had used.