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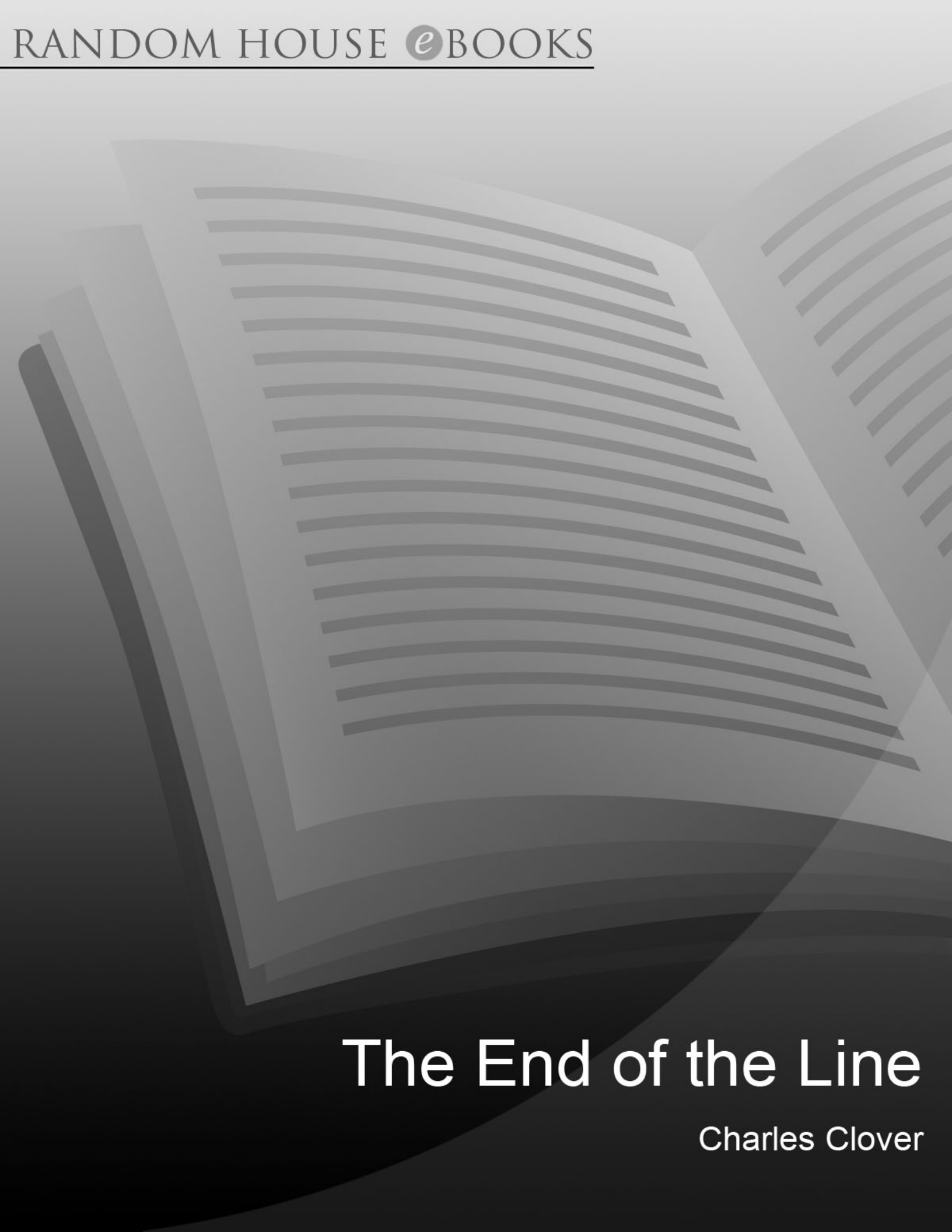

The End of the Line

Charles Clover

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‘Well researched . . . We must act now – before the world runs out of fish.’ HRH The Prince of Wales

‘Devastating . . . a succinct and powerful crash course on the pressing environmental issues surrounding fish that should send consumer awareness soaring.’ *Daily Mail*

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‘Mr Clover’s excellent book. Little escapes him . . . his counsel seems eminently wise.’ *The Economist*

‘A book to make you do more than think.’ *Country Living*

‘You will never look at a fish supper in the same way again.’ *The Economist*

The End of the Line

How Overfishing is Changing the World and What We Eat

Charles Clover

For Harry and Jack

INTRODUCTION – THE PRICE OF FISH

IMAGINE WHAT PEOPLE would say if a band of hunters strung a mile of net between two immense all-terrain vehicles and dragged it at speed across the plains of Africa. This fantastical assemblage, like something from a *Mad Max* movie, would scoop up everything in its way: predators, such as lions and cheetahs, lumbering endangered herbivores, such as rhinos and elephants, herds of impala and wildebeest, family groups of warthog and wild dog. Pregnant females would be swept up and carried along, with only the smallest juveniles able to wriggle through the mesh.

Picture how the net is constructed, with a huge metal roller attached to the leading edge. This rolling beam smashes and flattens obstructions, flushing creatures into the approaching filaments. The effect of dragging a huge iron bar across the savannah is to break off every outcrop, uproot every tree, bush and flowering plant, stirring columns of birds into the air. Left behind is a strangely bedraggled landscape resembling a harrowed field. The industrial hunter-gatherers now stop to examine the tangled mess of writhing or dead creatures behind them. There are no markets for about a third of the animals they have caught because they don’t taste too good, or because they are simply too small or too squashed. This pile of corpses is dumped on the plain to be consumed by carrion.

This efficient but highly unselective way of killing animals is known as trawling. It is practised the world over every day, from the Barents Sea in the Arctic to the shores of Antarctica, and from the tropical waters of the Indian Ocean

and the central Pacific to the temperate waters off Cape Cod. Fishing with nets has been going on for at least 10,000 years – since a time when hunters pursued other humans for food and killed woolly mammoths by driving them off cliffs. Yet because what fishermen do is obscured by distance and the veil of water that covers the Earth, and because fish are cold-blooded rather than cuddly, most people still view what happens at sea differently from what happens on land. We have an outdated image of fishermen as bearded adventurers in the mould of friendly Captain Birds Eye, not as overseers in a slaughterhouse.

Eating fish is fashionable and it is consumed with far less conscience than meat. Even many vegetarians see no irony in eating fish. It has become a kind of dietary talisman for Western consumers. Nutritionists tell us that fish is good for us – the best source of fat-free protein and vitamins – and that the omega-3 fatty acids in oily fish give optimum brain function, reduce the danger of heart attacks and strokes, and delay the onset of arthritis and osteoporosis. Studies even indicate that consuming fish slows down the ageing process and can help us lose weight because a fishy diet switches off our hunger hormone, making us feel satisfied on smaller, more nutritious, amounts of food. Skinny models, whom we are encouraged to admire as the ideal shape for the human form, don’t need to smoke to stay skinny, but can be satisfied on bird-like portions. All they have to do is eat fish.

Unfortunately, our love affair with fish is unsustainable. The evidence for this is before our eyes. We have seen what industrial technology did to the great whales, the hunting of which is now subject to a worldwide, but not total, ban. I believe we are about to cross another watershed in public thinking – namely, what industrial techniques, unchecked market forces and lack of conscience are doing to inhabitants of the sea. On land a watershed was reached in farming when sprays, fertilisers, food additives and battery-

farming techniques used in the raising of crops and animals led to the collapse of farmers' reputations as custodians of the countryside and guardians of the quality of food we eat. The farmers' image is only slowly being rebuilt, amid much suspicion.

Fish were once seen as renewable resources, creatures that would replenish their stocks forever for our benefit. But around the world there is evidence that numerous types of fish, such as the northern cod, North Sea mackerel, the marbled rock cod of Antarctica and, to a great extent, the west Atlantic bluefin tuna, have been fished out, like the great whales before them, and are not recovering. Reassurance from official sources on both sides of the Atlantic that the seas are being 'managed' scientifically is increasingly hard to believe. Enforcement of the rules that are meant to prevail in the oceans has proved wanting almost everywhere. Even in some of the best-governed democracies, experts admit that overfishing is out of control.

The perception-changing moment for the oceans has arrived. It comes from the realisation that in a single human lifetime we have inflicted a crisis on the oceans greater than any yet caused by pollution. That crisis compares with the destruction of mammoths, bison and whales, the rape of rainforests and the pursuit of bush meat. It is caused by overfishing. As a method of mass destruction, fishing with modern technology is the most destructive activity on Earth. There is no exaggeration in saying that overfishing is changing the world. Just as the deep sea has become the last frontier, its inhabitants a subject of fascination to film-makers, so creatures of the shallow seas, such as sharks and sea horses, are on a slide to extinction. Overfishing threatens to deprive developing countries of food in order to provide delicacies for the tables of rich countries, and looks set to deprive tomorrow's generations of healthy food supplies so that companies can maintain profitability today.

As traditional fish stocks crash and others are found as substitutes, overfishing is altering our diet. It is even altering evolution: the North Sea cod has begun to spawn at an earlier age in response to the pressure of fishing. Overfishing has been, and no doubt will be again, a cause of war and international disputes. It is a force in world trade and international relations, and a corrosive agent in state and community politics.

This book argues that, as a result of overfishing, we are nearing the end of the line for fish stocks and whole ecosystems in the world's oceans, and that it is time we arranged things differently. It takes the form of a journey around the world that I made in several stages and forms the record of many conversations about the problems and potential solutions – many of these as controversial as the problems. It reveals the extent of what is happening in the oceans in our name while satisfying our appetite for fish, and shows the true price of fish that isn't written on the menu.

CHAPTER 1

NAILING THE LIE

WEMBURY, NEAR PLYMOUTH, England. Like a film noir, our story begins with a mutilated corpse on a beach. The body belonged to the sixth common dolphin we had found washed up on a mile of beach owned by the National Trust, which has bought up and protected hundreds of miles of coast in England and Wales, though its writ stops at the high-tide mark. There were fresher dolphin corpses round the rocky headland. The large male we were looking at was the most eloquent in death. The broken, twisted beak showed that the dolphin spent its last minutes tearing frantically at something blocking its way to the surface, almost certainly a net.

Strewn along the beach were bodies in varying states of decay, but all showing the same cause of death. Broken beaks and missing lower jaws and flukes pointed to signs of a frantic struggle as the last ten minutes or so of air in the dolphins' lungs ran out. These animals clearly died unpleasant deaths. Some also had random chunks cut out of them that could not be explained by fox damage after being washed ashore. My companion Joan Edwards, the experienced marine conservation officer of the Wildlife Trusts, observed that these wounds and the missing flukes were probably inflicted as someone hacked the bodies out of a net. Some people found dolphin corpses here with stab wounds, inflicted in a fruitless attempt to make them sink.

As to who was responsible for this carnage, the culprits were clearly fishermen who, like the dolphins, follow the shoals of fish that migrate through the English Channel. Which fishermen were responsible and why was less certain. Trawlers passed us all the time, steaming out from Plymouth harbour to the fishing grounds in the Channel. In the darkest detective stories the evidence is inconclusive and we never find enough to point to who exactly was responsible. All we could do here was look for a motive and try and work back.

It was the fifth year that Joan Edwards and her volunteers had walked these beaches and counted mutilated dolphins washed up on England's south west coast. This year, 2003, there were 123 in six weeks, an increase of 25 per cent on the year before. Experts maintain that the corpses probably represented only one tenth of the dolphins actually killed, since the rest either sank or drifted out to sea. It was unlikely the dolphin population could take this kind of attrition. A video film exists – taken by the Government's fisheries research agency – which showed 30 dolphins trapped in a single haul. I spoke to people who had seen this tape, which would cause an outcry if shown on television, but the agency said its whereabouts were unknown. Dolphins of all species – common, striped, bottle-nosed, Atlantic spotted, Risso's, the lot – are protected under European law. Fishermen who net them by accident must throw them back into the sea, even if they are dead. There is even a treaty that states that fishing *must* be stopped if it is shown that it is taking more than one per cent of a cetacean's population every year. But no one knows how many dolphins there are, in the English Channel, or how many there ought to be, so the treaty can never be invoked. The sad washed-up bodies have struck a chord with the television channels and the newspapers of the South West – Joan Edwards hears anger among the morning dog walkers on the beach.

Local fishermen and conservationists seemed quietly to agree that what was killing the dolphins was pair trawling for sea bass. This involves two powerful trawlers pulling a net up to 1 km (⅔rds of a mile long) between them for hours in the hope of intercepting a shoal of bass returning from their spawning grounds in the Channel. It is a hit and miss operation. Bass swim at varying depths within the water column, their movements unpredictable, making it hard to find them with a fish-finder, the sonar device that highlights fish as grey clouds on a screen. The trawlers therefore spend much of their time towing water. Dolphins prey on bass, swimming with their shoals, though fishermen say they usually see dolphins only when the net is hauled. The herding of the bass into a tight space makes the dolphins think it is dinner time. They surge into the packed shoals of bass and, in attempting to rise to the surface for air, are trapped by the netting.

Pair-trawling is doubly unpopular locally because outsiders – French, Scottish, Dutch and Irish – are the main practitioners of it, and usually operate in larger vessels than those that putter out of Plymouth and Looe to fish the English Channel.

The dead dolphins make headlines on the local television news, and cause flurries of press releases from animal welfare groups, but what angers local people just as much is the squandering of a great West Country resource, the bass. Animal welfare groups such as the Royal Society for the Prevention of Cruelty to Animals tend not to mention what industrial fishing methods are doing to the fish, only what they are doing to dolphins – arguably an example of ‘speciesism’, the disrespect for other species about which animal welfare groups often complain. Joan Edwards worries about the bass, though, for the Wildlife Trusts are locally-based. The Trusts know that until the pair trawlers appeared, around the mid-1990s, the bass were actually that rare thing, a conservation success story.

The life cycle of the bass is as miraculous in its way as the Atlantic salmon, which migrates to Greenland to feed, or the eel, which swims all the way to spawn in the Sargasso Sea. Bass spawn in the Channel and the Bay of Biscay in areas only recently discovered by fishermen and scientists. Once the bass eggs hatch, the fry somehow find their way on the current back to estuaries around the coast of Britain, some of them far away from their spawning grounds. Estuaries are the nursery areas where the school bass spend their time until they are 4–7 years old. Until the 1980s, bass were prone to being caught in large numbers by inshore fishermen using fixed nets which were also used to catch sea trout and salmon. Then stocks of all three fish declined. The British Government swiftly banned netting in the estuaries, the crucial nursery areas where bass spend most of their lives. Anglers were encouraged to return individual fish they had caught to the sea. The protection of the bass worked for a time and stocks increased. Anglers, who are important to the west of England's tourist economy, began to notice the improvement. Bass are a near-perfect sporting quarry on rod and line as they run close to the shore in summer, fight hard and grow to over 8 kg (15 lbs) in weight. They were also a welcome, if unexpected, catch for local fishermen trawling for lemon soles or cuttlefish.

It was not long before the resurgent bass began to attract the attention of fishermen with larger boats. Some time in the early 1990s the French trawlers discovered where the bass went to spawn in the Channel. This is when the problems began.

Although bass were never as plentiful as cod and haddock once were, the demand for those caught in Channel waters was reliable and there was money to be made. Bass – *loup de mer* in French – usually attracts a higher price per kilo than any other native British fish – so a relatively small amount of bass will pay for a lot of fuel spent catching it. A large grilled bass that fills your plate will cost you £16 in

Platters restaurant on Plymouth docks. A strip a few inches across as part of a main course will cost £18.50 in *Fifteen* the chic London restaurant run by Jamie Oliver, the most exciting of British TV's superstar chefs. Recipes for bass are widely found in Oliver's cook books and in his hands, bass became a kind of British national dish when he included a recipe called 'Roasted slashed fillet of sea bass – *à la* Tony Blair' in one of his most popular books. He records that it 'went down a treat' when he cooked it for an Anglo-Italian summit between Blair and the Italian prime minister, Massimo D'Alema, in July 1999.

The choice of bass for a meeting of two prime ministers was another confirmation of the ascendant culinary status of fish. The people who choose menus at summits have to be sensitive to the significance of food. In another era, before Britain's farming industry was brought low by scares about industrial farming methods, and in particular by the epidemic of bovine spongiform encephalopathy, or 'Mad cow' disease, that began in the late 1980s and was linked with a human disease CJD, they might well have chosen beef. However, with a Europe-wide ban on British beef still in force, feeding beef – let alone beef on the bone – to one of Italy's top politicians was unthinkable. So the protocol people chose fish, recognising that it had progressed from being cheap food for the masses to being the premium food of a culture whose confidence in intensive livestock farming had been rocked. Bass has firm flesh and a delicate taste. It was British-caught, satisfyingly expensive, reliably low-fat, healthy and chic – the aspirational dish of the day. And wild fish was untainted by associations with industrial methods.

But that's where they were wrong. For Mr Blair's wild bass – I checked with Jamie Oliver, they were wild – could have come from the English Channel pair-trawl fishery. And the pair-trawl fishery appears not only to be responsible for the slaughter of dolphins but for squandering the bass stocks on which the west of England's inshore fishing industry and

tourist trade partly depend. Fishermen report that the bass are less plentiful and the average size is lower. These are classic signs of stock collapse. The anglers complain they are not getting their share. David Rowe of the National Federation of Sea Anglers told me: ‘There is no doubt that the slaughter in the offshore fishery affects bass stocks. We’ve noticed a complete lack of larger fish. That is what keeps anglers going, the expectation of catching larger fish. The International Council for the Exploration of the Sea (ICES), which assesses stock in European waters, has said that catches are still within sustainable limits, but their stock assessments for minor stocks tend to limp a year or two behind reality. ICES has called for the European Union to limit catches to their present level. True to form, the EU has yet to do so.

There is no love lost between local fishermen and the pair-trawlers. Bill Hocking, a Looe-based inshore fisherman, told me: ‘It takes a tremendous amount of fish to keep these pair-trawlers afloat, let alone to make money. It’s slaughter.’ Hocking, an advocate of conservation for far longer than most fishermen, believes in fishing only in ways that leave plenty of fish in the sea.

The plight of the dolphins and the bass in the South West was reported as if it was an isolated problem. But I was to stumble upon something that gave their fate a more sinister aspect and showed that the fate of the bass and the dolphins was linked to a wider disaster.

When I arrived in Plymouth the environmentalists told me that the boats to blame for killing the dolphins and stealing the West Country’s fish were big 200ft boats built to catch shoals of mackerel and herring – known collectively as pelagic fish, i.e. those that swim in the upper water of the open sea. Pelagic vessels fish with purse seine nets which are set around the shoals and closed off with drawstrings like purses. Since stocks of pelagic fish remain in relatively good shape, pelagic vessels, based mostly in the big east

coast Scottish ports or in Shetland, still pay their way. As a result these new highly equipped ships are emblems of wealth and power within the fishing industry and became convenient scapegoats. Rumour had it that it was rich and callous fishermen in these big pelagic boats, rather than journeymen trawlers fishing out of Plymouth, who were primarily responsible for the pair-trawling that was killing the dolphins and stealing the West Country's fish. As bad guys, they fitted the stereotype, but the rumour turned out to be false. The truth was more poignant.

I found Scottish fishermen in Plymouth harbour, but quite different fishermen – cod and prawn men. Their rusting 80ft trawlers, run with a crew of five, had steamed all the way from the east of Scotland in search of a catch. These were still big boats, but smaller and older than the pelagic vessels I had seen pumping out their fish holds full of herring and mackerel at Peterhead docks. Then the penny dropped about why they were so far south – these were vessels that would otherwise have had to tie up for 15 days a month because of emergency restrictions imposed by European fisheries ministers in a half-hearted attempt to protect the cod.

It was impossible not to feel for them. John Watt, 41, skipper of the *Defiance*, and Ian Duthie, only 28 and skipper of the *Uberous*, were bright lads from Fraserburgh. Owing to cuts imposed in the last, but hardly rigorous, attempt to save the cod, they, along with the rest of east Scotland's fishing industry, were struggling to survive. In desperation, they had turned to bass fishing, and this was the second year the catch had been bad. They showed me the receipts from the market indicating how much they were catching. They had landed 113 kilos (250 lb) of bass for five days' steaming, which they had sold for £670 through Plymouth Trawler Agents. It didn't even cover their fuel bill. Since the beginning of the year they'd laid out £25,000 in fuel and oil, and taken only £6,000 for their fish. The men's wages would

have to be fimded by their overdrafts. They claimed to have seen – which I think meant killed – a single dolphin in their nets. Watt explained that his vessel was 30 years old, worth little on paper and costly to insure. If he applied for a Government decommissioning scheme (as many did that year) he would be lucky to come out with anything once he'd paid off his overdraft.

The overfishing of the North Sea cod therefore played a part in the deaths of the dolphins washed up on Wembury beach and the collapse of the West Country's bass stocks. The whole European sea was caught in a spiral of decline. The fate of cod in EU waters is an example of history repeating itself. Surely the collapse of the cod on the Grand Banks, off Newfoundland, once the greatest stock of codfish in the world, would have been warning enough to prevent other countries, besides Canada, from going down the same route? Apparently not. It is a conundrum of political systems why so few are capable of learning from others' mistakes. Since 1992 – the same year the Grand Banks fishery was finally closed – scientists from ICES have called with increasing urgency for a drastic reduction in fishing effort in the North Sea. Then, as the black blobs on the chart that denote cod stocks have dwindled from size of a penny to the size of a full stop in ICES autumn assessments, they called for the complete closure of the North Sea cod fishery – without success. In an increasingly desperate attempt to bring fishing to a halt, the secretary general of ICES stated in December 2002 that the amount of spawning cod left in the North Sea was 38,000 tons – the tonnage of a single car ferry.

The annual ministers' meeting in Brussels that year was unusually fraught. The fishing industry had decided that the ban on fishing for cod that the scientists were calling for was unacceptable, as it would mean the death of the whitefish industry in Scotland. Britain's politicians, and those of many countries in Europe, came under pressure to provide more

fish to catch, even though biology suggested that this would push stocks ever closer to disaster.

Iain Duncan Smith, then leader of the Conservative party, wrote an outrageously inaccurate and ill-informed article in *Fishing News*, throwing doubt on the scientists' view that the cod was on the verge of collapse, though no-one had noticed him take much interest in marine biology until then. Tony Blair, the prime minister, made a much-publicised telephone call to the head of the European Commission asking for British fishermen to be allowed to catch more fish. Apparently this wasn't an issue for demonstrating his environmental credentials. A month later, to mollify those who accused him of playing for fishermen's votes just as irresponsibly as Mr Duncan Smith, Mr Blair asked his Strategy Unit to carry out a review of options for making the UK fishing industry sustainable 'in the medium to long term'.

In the short term, however, Mr Blair had managed to raise the number of days fishermen were allowed at sea from seven to fifteen, while British Government ministers solemnly asserted that the reduction in fishing effort was consistent with scientific advice. This was a lie. In fact, while cuts in fishing effort were made, they were long overdue and poorly enforced. The spiral of decline attrition goes on, the opportunities for recovery are not grasped, and with every turn of the downward spiral there is less chance that nature will bounce back.

The blackened dolphin corpses on Wembury beach are merely a visible sign of a greater and more dispiriting problem, the failure to conserve fish stocks, and therefore nature, in European seas. Although governments still like to give the impression that industrialised fishing is scientifically managed and under control, such claims are looking increasingly threadbare. In most oceans of the world, they do not stand up to sustained examination. Without radically more imaginative conservation measures, life in the seas

around Europe and elsewhere will more and more resemble a desert.

Many sensible suggestions for running things better have been proposed, nationally and internationally. What several groups are asking around Plymouth is whether fishing for bass on an industrial scale for negligible returns is really the best use of such a valuable fish. Sea anglers point out, as salmon fishermen did before them, that the value of a rod-caught fish is much greater to the local economy than that of a commercially caught one. Rod-and-line fishermen stay in hotels, hire cars, eat in restaurants and catch relatively few fish. Estimates suggest that 2 million people go sea angling in Britain at least once a year. They spend £1 billion on equipment, travel, food and accommodation – about the same amount of economic activity cause by the commercial catching industry. Surely favouring the anglers and restraining the wasteful industrial boats would be a more sensible idea for the West Country economy?

Five years after it was first asked, the EU, with glacial pace, has finally required gill-net fishermen to fit acoustic devices, ‘pingers’, to warn harbour porpoises that they are approaching nets. These measures are to be introduced at a leisurely pace – from 2007 in the eastern Channel – and the smallest boats will be exempt. It is also to monitor the bycatch of dolphins through a compulsory observer scheme. The British Government is now trialling the use of escape doors for dolphins on pair trawls. But there is scepticism whether escape doors will work since the same idea was tried for sea lions in New Zealand and Tasmania, with mixed success. The sea lions lost flippers and died.

You might ask what is the point of making nets dolphin-friendly if the bass stocks are as close to collapse as local people believe? A closure of the pair-trawl bass fishery would suit local fishermen and anglers. It would save the bass. It would save the dolphins.

Yet the European Commission remained unpersuaded of the need to curtail the activities of the pair-trawlers. The British Government did everything possible, ordering a ban on pair-trawling within its 12-mile limit in autumn 2004. But pair-trawling will continue in the mid-Channel and on the French side, where most fishing is done. In the strange world of EU politics, the political clout is wielded by the most commercial – which means the most industrial, not necessarily the most economically productive fishermen. So what is called the 'displacement' of fishing effort goes on from cod to bass and from bass to lobster, crabs and every other fish or shellfish that desperate fishermen think they can sell. Absurdities accumulate. The reason that the pair-trawlermen will go on fishing at a loss is simply because they will need to demonstrate a track record of catches in order to claim their share if the EU were to impose a quota in the future.

This is no way to run a common sea. The European Union's inability to manage fish stocks for recovery, its indifference to marine wildlife, its craven electoral fear of fishermen and its inability to agree a solution, such as paying fishermen not to fish so that stocks may recover are all interlinked. They are the result of a political accommodation – an exchange of fishing rights for free trade in Europe – with which no one wants to tamper. No one wants to say no to the fishermen, but no Treasury minister wants to pay them not to fish either, so the system teeters on and the politicians hope secretly the white fish boats will go bust before the cod crashes once and for all.

* * *

Lowestoft, England. January. Six hundred years of enterprise directed at pulling fish from the North Sea in all weathers ends like this. The unrepaired doorways and shabby 1930s office buildings on the seafront tell a story of economic

collapse. So, too, does the fish dock of what was once one of England's greatest fishing ports, famous the world over. The grey-brown swell and the driving rain cast a mood of gloom, which is worsened by the gaping crack in the wall and the flapping, broken panel of the company secretary's desk in the offices of Colne Shipping, the last company to run a fleet of beam-trawlers fishing for sole and plaice on the town's traditional fishing grounds off Dogger Bank. Once every schoolchild knew that the Dogger Bank was the North Sea's most productive fishing ground, and that Lowestoft was East Anglia's most productive fishing port. Hugh Sims, company secretary of Colne Shipping, explained how in August 2002 the company made one of its hardest decisions in a 58-year history and tied up its fleet of 40-metre (130 ft) trawlers for the last time because the price of fuel had gone up and the number of fish had gone down.

Inshore boats still go out for a night and land a box or two of cod, rays and dogfish, plying a trade not dissimilar from when Lowestoft was founded as a fishing village in the 14th century. There is a run of sprats, someone has discovered, which the Danish sand eel trawlers with their fine mesh nets haven't vacuumed up yet. But the deep-water fleet has gone. Lowestoft lacks a future, except as a retailing and commercial centre for the Norfolk Broads tourist trade, for there's not much to see in Lowestoft. The terrible sadness that seeps out of the place is reminiscent of a mining town where the coal ran out.

When in 1965 Hugh Sims answered an advertisement for a chartered accountant placed by the Boston Deep Sea Fishing Company, Lowestoft was a thriving port with 120 fishing vessels in the dock. There were five fishing companies, each of which employed its own staff – skipper, crew and onshore workers including fitters, mechanics and ice-men. Only your own staff would get up at a minute's notice at 3am so you could catch the tide. The whole town, from the prostitutes in the dockside bars to the proprietors

of prosperous shipping companies, celebrated enterprise and extravagance. Successful skippers wore the port's traditional shore-leave suits in garish colours ranging from red to lime green, when they went out on the town. When one successful skipper bought a Mercedes, the managing director of Colne Fishing, as it was then, said: 'Good. Now the others will want one.'

From its heyday in the 1950s well into the 1980s, Lowestoft was the principle supplier of plaice and sole to Billingsgate, London's fish market. Dover sole was a misnomer. The fish boned at your table in the Savoy Grill was more likely to come from the Dogger Bank via a train from Lowestoft. Competition led the five Lowestoft companies to consolidate and cut staff. They moved to fewer, larger trawlers that could stay two weeks at sea. New techniques of netting were tried. Then in 1984 Colne Fishing moved to the Dutch style of beam-trawling, using powerful 2000-horsepower trawlers dragging nets weighted with heavy beams and 'tickler' chains along the bottom to force the sole, plaice and monkfish up into the net. Beam-trawling was a highly efficient way of killing fish. The only disadvantage seen at the time was that it was heavy on fuel.

Slowly through the 1980s and 1990s, the profits declined. The best skippers saw there was little profit left in the southern North Sea, so they moved away, to the south coast of England or the west of Ireland, where their pay packets were larger because they caught more fish. In the end, Colne had to accept that its vessels were too large and too expensive to run for the amount of fish that were left to be caught.

One might think that the collapse of the last fleet catching flatfish on England's east coast would have caused questions to be asked in Parliament, heads to be shaken and Britain's fisheries minister to be held to account. But after an initial rash of media coverage, the story faded. It was too

late and the market had moved on. Buyers had switched to other parts of the British coast to find plaice, sole and monkfish. Consumers, if they noticed anything at all, found there were still plaice and sole in the shops.

There are still fish and chips on the menu at Captain Nemo's, the restaurant on Lowestoft's Claremont pier, which offers cod, haddock, skate, plaice, kippers and tuna bake. Yet the inshore boats bring in only cod, skate and dogfish in small quantities, the rest comes from further and further away. Michael Cole, the Lowestoft fish merchant who supplies Captain Nemo's says he now spends a quarter of his morning sourcing fish on the phone, whereas once he would have bought his stock off the docks at dawn and spent the rest of the day selling it.

Mr Cole says he regrets the loss of Lowestoft's deep-sea fleet every day, for the 20 inshore boats cannot catch turbot, brill, witches (deep water sole) or lemon soles. But he still finds his trade exciting because the world is getting smaller. Mr Cole now calls France, Peterhead, Grimsby, the Channel ports and Milford Haven every day. He has swordfish steaks, red mullet and snapper flown in to Heathrow daily. He can now offer fish from the Seychelles, Sri Lanka, Oman, New Zealand and Australia. A local entrepreneur has begun bringing in cod and haddock from Iceland and the Faroes in containers landed at the docks. The downside, he says, is that all the fish he sells is second-hand and, some of it is not as fresh as he would like, as you depend on the attentiveness of the supplier. Lowestoft, like its rivals Hull and Grimsby, now trades in fish rather than catching it. Mr Cole concedes that, as a consumer, you now have even less of an idea whether the fish stocks your dinner comes from are in good shape, even assuming that would form part of your purchasing decision.

The old world of Lowestoft trawlers and captains courageous exists side by side with the new one of global sourcing in the local branch of the newsagent chain W.H.

Smith, where you can buy illustrated histories by a local author, Malcolm R. White, on the old fishing companies of the town. Close by are the racks of glossy magazines containing fish recipes for women conscious of their weight and their health, and opposite is a shelfload of cookery books, prominently featuring Nigella Lawson, whose latest summer cookery book makes mouth-watering use of both swordfish and raw tuna, a taste in fish which has come to Britain from the United States and Japan. Past and present in Lowestoft reflect the reality of fishing: mine out the seam and move on. If Europe depended on its own seas for food, draconian solutions to save the fish stocks and return them to historical levels might have been imposed by now. But we live in a global market so Europe simply exports its demand for fish, with all the destructive power this has had in its own waters, to other oceans of the world. In its defence, it may be said, it is hardly alone in so doing.

CHAPTER 2

FEEDING FRENZY

TSUKIJI MARKET, TOKYO, 4.45am. Top of the food chain. They say that if it swims in the sea, it will end up here in Tsukiji, the biggest fish market in the world. Many central markets have moved out to wholesale parks on the city fringes, but Tokyo's fish market remains lodged in the city's heart. This seems appropriate in a country that eats seafood for breakfast, lunch and dinner, and out of intricate vending machines between mealtimes. Tsukiji is more than a market; it is a national shrine to what one of its wholesalers describes defiantly on its website as the 'inexhaustible sea'. It is a place where a national obsession is indulged and that foreigners visit to be amazed. Part of Tsukiji's fascination is that it is old-fashioned and therefore reveals a lot about Japanese custom. Tourists keen enough to get up in the dark for their fix of Japanese food culture face multiple threats to life and limb. Motorised three-wheeled trolleys, powered by dustbin-like engines with steering wheels, are driven at a frantic pace between auction and stalls. Tractors fitted with giant scoops deposit rock-hard frozen tuna in the back of trucks at head height. Normally polite Japanese give no quarter. The best advice is to get out of the way.

The market is set out like this. Two large areas in this single-storey sale-room of the sea are laid out with tuna. A larger wet-fish area sells virtually everything else from salmon to horse mackerel. Peeping out of the few iced

polystyrene boxes that are open for show – in a market obsessed with quality everything is kept at minimum temperature – are yellowtail, squid of all sizes, anchovies, snapper, barracuda, butterfish and eye-catching scarlet alfonsinos.

On the huge number of small stalls over the covered road from the main auction rooms you will find anything you might want to consume and many things you might wish to avoid. Finger-long eels from China squirm in buckets. Live amberjack and Pacific cod from farms around Japan wait in tanks to be slaughtered. The notorious fugu, or puffer fish, swims listlessly, waiting to kill some unfortunate diners with the poisons in its skin or liver if it is not properly prepared. Unfeasibly large, phallic barnacles and fresh mussels await specialist buyers. A whole stall of pink, cooked octopus is neatly set out, suckers skywards, tentacles tucked underneath, looking like sea urchins without their spines. Here sits a speciality I have yet to see on any menu: a tray of garfish, their long beaks tucked within the coils of their bodies. The buyers here delight in variety and seasonality. Just in, and attracting good prices, is Pacific saury, a thin, silvery fish shaped a bit like a miniature barracuda.

Here in the most crowded part of the market, where there is a danger of being hit by a shopping cyclist, marine delicacies air-freighted from different oceans, involving incalculable emissions of carbon, are packed into every inch of space. Stalls specialise: one has pink prawns from Mexico, black tiger prawns from Vietnam and Malaysia, another scallops, lobsters and crabs from the north Atlantic, another farmed salmon and fresh salmon eggs from Chile and Norway. The stalls also have a role in the most lucrative business of the market – providing raw fish to a city of 15 million people obsessed with the taste of sashimi, the standard version of Japanese raw fish, and the added design and extravagance of sushi, raw fish in its exquisitely presented haute cuisine form. Top-quality raw fish is

everywhere in Tokyo: it just arrives on the side when you order a beer. The stalls here are where the giants – the tuna and swordfish – will be dismembered and jointed into more affordable chunks after the early morning frenzy of the auction is over.

From around 4am the wholesalers arrive to inspect the tuna laid out on palettes by the auctioneers' staff. Nearly a thousand fresh tuna, northern bluefin, southern bluefin and bigeye, will be sold in the next two hours. About the same number, blast-frozen at sea at –50ºC, lie frosted white and gill-less on a floor in an adjoining hall. A mist rises around the buyers' white rubber boots as the tuna warm. The most valuable fresh bluefins are slashed along the lateral line so that the deep red colour, the sign of peak freshness, is visible. Each fish is labelled with its weight and surmounted by a tiny sample of the most succulent flesh laid out on a piece of paper for the buyers to taste. This courtesy is largely disdained by the wholesalers, who rely on experience, a torch and a tuna hook to examine each carcass for signs of *yake* or 'meat burning' – the first sign of decay – which lowers the price.

It's a big auction today because it is the Friday before a public holiday, explains my guide Hide (pronounced 'hee-day'), a student in his mid-twenties. He is wearing a fleece emblazoned with the badge of the Australian tuna company he is to work for in the new year. The auctioneer rings a bell at 5.30am precisely. The wholesalers, with cap badges denoting their licence to bid, surge into the stands and the auctioneer starts the sale. Meanwhile, another four auctions by other firms are being held on other areas of the floor. Each auctioneer has his own patter, his own particular tone and vocabulary. To a non-Japanese speaker the auctioneer we are watching seems to be uttering a particularly frenzied torrent of howls and yelps. Each price is made in less than ten seconds, the buyers holding up fingers to indicate what

they are prepared to pay, in an unspoken contract based on trust.

The bluefin represents the peak of evolution in fish – an extraordinary creature that can swim at more than 80 kilometers an hour (50 mph), accelerate faster than a Porsche, and cross the Atlantic in its annual migrations. The secret of its ability to turn on such dazzling bursts of energy is that it is *warm blooded.* Here, however, what matters is taste and the bluefin is commonly agreed – unfortunately for it – to be the fish equivalent of Aberdeen Angus raised on Argentine pampas.

The largest fresh bluefin, and therefore the first to be auctioned, is a giant of 232 kg (510 lb) caught by fishermen with mixed motives off Cape Cod. The New England fishery is allegedly conducted for sport, but money is clearly another motive. As Carl Safina has ably demonstrated in his book *Song for the Blue Ocean*, greed and political influence have kept a fishery going that by rights should have closed or been drastically reduced years ago. Every year since the 1960s the USA's eastern seaboard fishery has taken more bluefins from the threatened west Atlantic population than scientists say is right. The headless carcass on sale in Tokyo was air-freighted from Boston, packed respectfully in plastic and refrigerated within a huge cardboard sarcophagus filled with ice. Tuna fishermen in the United States claim, probably rightly, that the western Atlantic bluefin tuna fishery is under the strictest controls ever. What almost everyone now acknowledges is that the most urgent problem is with the bigger, largely separate population of bluefin tuna that forages in the east Atlantic and migrates into the Mediterranean.

First, a surprise. The Boston fish makes only 4,000 yen per kilo (£9 per pound), or £4,620 for the whole fish. This might seem a lot of money for a fish, but exceptionally large, fresh bluefins can make £50,000 apiece. Hide's expectations were higher. A new trend is exerting downward pressure on the

market today. Top-quality bluefin tuna usually fetch over 5,000 yen (£25) per kilo at Tsukiji. Today, even with strong demand, we see the price of sparkling fresh bluefin slump at under 4,000 yen (£20) a kilo. There is a brief surge to 4,600 yen (£23) for one particularly fresh specimen of southern bluefin, caught off Australia and fattened in a ‘farm’ before being shot through the head. Hide says tuna fattening – he calls it ‘farming’ – is what has caused the slide in the market. Ironically enough, a fish regarded as over-exploited in every ocean where it swims is in oversupply. Too many fish are in the market, too few in the ocean.

Tuna farming is the only kind of farming I know in which you reap but you don’t sow. Tuna fattening, as it should really be called, started in Australia, where it was found that small, overfished southern bluefins could be purse-seined in shoals and released into cages at sea. The fish are fattened on low-value wild-caught fish until the level of oil in their flesh has improved – fattened fish have better oil levels than wild fish – and the price is right. No actual breeding takes place, though Japanese research has shown it to be theoretically possible. Breeding is just uneconomic compared with catching wild fish, as there is no charge or penalty to reflect the fact that the wild fish are over-exploited. Farming could be a good idea if it genuinely meant breeding, but first one would have to ensure the wild fish, the brood stock, was properly looked after. Australia claims to have its southern bluefin fishery under control, but this cannot be said of Europe.

In under a decade, tuna fattening has swept the Mediterranean, where the bluefin tuna has been prized since the ancient Greeks gloried in its slaughter and it was used to feed Roman legions in preparation for battle. The eastern Atlantic population of bluefins is larger than the one remaining in the west. It migrates in a great ellipse out into the Atlantic and ranges into the furthest corners of the Mediterranean. At one time, most forms of tuna-catching