

Prud'hommes de la Pêche: Community fisheries along the Mediterranean Coast



Interview with Christian Decugis, Prud'homme

Species: Mixed (flatfish, sea bream, scorpion fish, wolf fish, hake, eel and shellfish)

Fishing gear: Longlines, nets and traps

Country: France

Ocean: Mediterranean

Fishery tonnage: 100t (2010)

Main markets: Local markets



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"The Prud'homme institution was officially recognized in 1859 – so we have a long history. We are professional fishermen elected as representatives with responsibility to sustain fisheries within our territorial seas. There are 33 Prud'homme committees along the Mediterranean coast, representing 1,650 fishermen.

Following the industrialization of fishing in the Mediterranean in the 1980s we almost lost out but succeeded in reorienting ourselves towards providing high quality local seafood. We fish in small boats from 6 to 12m using longlines, nets and traps to catch: flatfish, sea bream, scorpion fish, wolf fish, hake, eel and shellfish. We leave the species of less value – such as sardines and anchovies – to the industrial sector.

One of the major challenges we face is ensuring that national and European regulations are relevant to our small-scale fleets. We have to defend our interests from a European-wide reduction in the artisanal fleet, which may be relevant to other Mediterranean countries, but is not here where the government has already capped the number of licenses and we have our Prud'homme institution to oversee fisheries management.

In 2006 following the EU technical regulations for the Mediterranean we reviewed and adjusted our local regulations. In St Raphael we took a number of steps to make our regulations more stringent. For example, the EU regulation allows 6km of net, whereas we only allow 5km. We have also banned trawling and while the EU allows lobster fishing throughout the year we limit this to four months. In the case of an infraction, we may first give a

warning but can follow this up with a fine and even suspend fishing licenses.

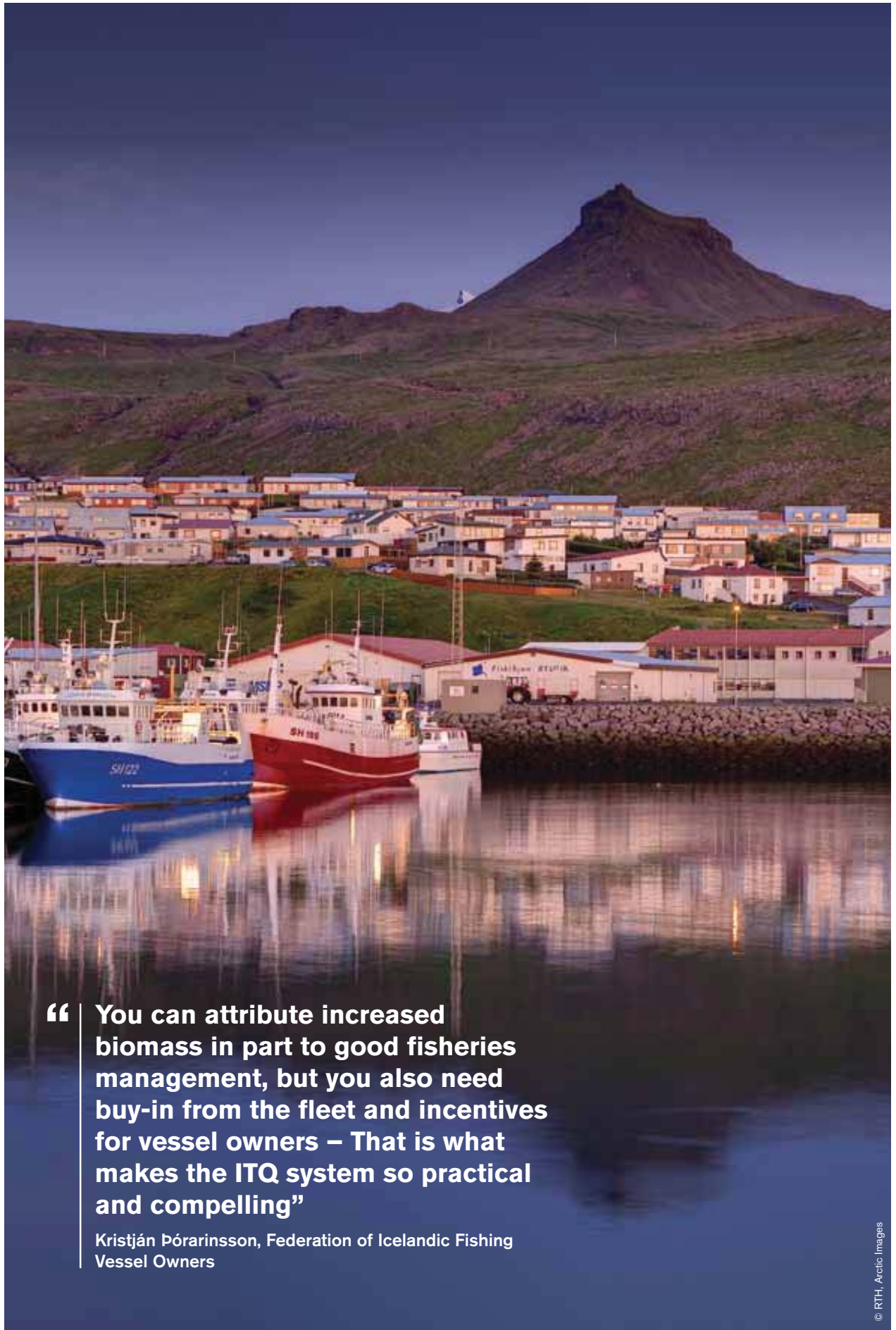
A significant development was the creation of a reserve in 2004. This covers 450ha – the largest marine reserve in France. The reserve is incredibly rich in fish and biodiversity, but is also an area that is difficult to access. There were some fishermen from Cannes who were unhappy with the reserve, but as it is within our territory we had the right to close it, and our fishermen unanimously voted for the closure.

We have seen benefits of the reserve, and scientific studies have shown that fish are twice as large within the reserve, and are left in peace to spawn contributing to the rest of our fishing grounds. We have also noticed some reserve spillover effects, but this is difficult to prove. What is more certain is that the reserve has enabled us to show to the authorities that as fishermen we take our custodian responsibilities seriously.

There are wider benefits of the Prud'homme structure. It provides representation at the national and EU level, and a voice in local developments or wider policy changes. Fishermen also benefit economically. As we have been gifted a number of buildings over our long history, we can rent them out to realise revenue. This is put back into our profession by providing equipment and ice free of charge to our members.

For the future, we want to ensure that our institution is recognised by the European Union so that we have a voice in EU policy. We need to avoid a one-size-fits-all approach, and continue to set our regulations specific to our local area."

Before intervention – 1990				Transition	After intervention – Current (2010)			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
–	–	Stable	30 boats	<ul style="list-style-type: none"> St Raphael Prud Homme revenue from renting building assets: €3,000/month (US\$3,800) In addition receive subsidies from government and EU for improvements to infrastructure e.g. cold rooms, ports etc 	Total catch: 100t/year Increased value of catch by 20% over the past 20 years.	Stable	Stable	Stable 30 boats



“ You can attribute increased biomass in part to good fisheries management, but you also need buy-in from the fleet and incentives for vessel owners – That is what makes the ITQ system so practical and compelling”

Kristján Þórarinnsson, Federation of Icelandic Fishing Vessel Owners

Icelandic Groundfish Fishery

Interview with Kristján Pórarinnsson, the Federation of Icelandic Fishing Vessel Owners



Species: Cod, haddock, saithe, redfish, flatfish
Fishing gear: Bottom trawl, longline, gill net, Danish seine, handline
Country: Iceland
Ocean: North-east Atlantic
Fishery tonnage: 169,000 tonnes (cod only, 2010)
Markets: Worldwide



"I'm an ecologist working for the fishing industry. Part of my job is to aid communications between scientists and fishing vessel owners. The owners need to understand what the scientists are saying, and there is a corresponding need for scientists to understand what vessels are doing at sea, and why.

Historically we had foreign fleets on our fishing grounds – French, German, British – as well as Icelandic vessels, and there was overfishing of cod after the Second World War. During the 1950s, the catch for a number of years exceeded 500,000 tonnes, compared to less than 200,000 tonnes now, leading to high mortality rates. Female cod over 10 years old are the most fertile, but they weren't being given the time to grow.

In 1975, an exclusive economic zone (EEZ) was declared, and in 1976 the foreign fleet was expelled. That gap was quickly filled by Icelandic vessels and overfishing of cod continued. We knew we had to restrict the catch, allow the fish to grow older and build the stock higher, but also have a profitable industry.

Among the proposed measures were individual transferable quotas (ITQs), adopted in stages from 1984 to 1991. You get scientific advice by species, based on management goals. Then a total allowable catch is set. Each boat has a percentage share of that, but you can trade quotas with other vessels and sell to the market. Discarding is illegal and this is an important part of the solution.

Vessel owners know from the start of the year how much they can fish, so they can plan operations, sales and marketing. What's more, the long-term objectives of fisheries management, based on scientific advice, are aligned with those of vessel owners. The owner who sacrifices part of his catch today has a known share in the benefits that will generate in the future. As the stock grows, so does his quota of fish. That is effective management.

Since ITQs were introduced, we've seen clear economic benefits. The fleet operated at a loss before; now it is in profit, despite lower catches. Under this system, you start merging quotas, scrapping vessels, operating one boat that can catch the quota of many. Under others, you often have too many boats with smaller and smaller quotas each, all operating at a loss and requiring subsidy.

Underpinning the TAC for cod is the harvest control rule, which Iceland was among the first to adopt. Four years ago, we reduced our annual target from 25 to 20% of stock and we are seeing improvements in spawning stock biomass. The smallest was 125,000 tonnes in 1993; it now exceeds 300,000 tonnes, with an increased proportion of larger, older fish. You can attribute that in part to good fisheries management, but you also need buy-in from the fleet and incentives for vessel owners – and you have to align those incentives with objectives. That is what makes the ITQ system so practical and compelling."

EUROPE

Before intervention/s– Introduction of ITQs in stages from 1984 to 1991				Transition	After intervention/s – Current			
Economic indicator/s (e.g. Total value of catch, or fish prices/kg)	Social indicators e.g. (Average wage – of crew; no. of vessels)	Environmental indicators e.g. (Status of stock)	Fleet indicator: number of vessels or licenses	Cost of interventions (Estimate of the financial costs)	Economic indicator/s (e.g. Total value of catch, or fish prices/kg)	Social indicators e.g. (Average wage – of crew; no. of vessels)	Environmental indicators e.g. (Status of stock)	Fleet indicator: number of vessels or licenses
<ul style="list-style-type: none"> Catches: 1990 – 335,390t of cod Total mixed fishery: 650-700,000t 	–	Spawning stock biomass (smallest in 1993): 120,000t	–	–	<ul style="list-style-type: none"> Fleet previously operating at a loss – now in profit even though catching less Catches 2010 – 169,153t cod; Total mixed fishery: – around 400,000t Quota and planned operation eliminated race to fish; focus is on quality rather than volume; better quality commands higher price per kilo. 	Fewer employed directly in fishing and fish processing; better jobs in sector, better working conditions and better pay.	Spawning stock biomass: 300,000t	No. boats reduced

Isle of Man Scallop Fishery



Interview with Frankie Horne, Scallop Fisherman

Species: Queen Scallops (*Aequipecten opercularis*)

Fishing gear: Otter Trawl

Country: Isle of Man

Ocean: Irish Sea

Fishery tonnage: 2000 tonnes (2007)

Main markets: EU: Italy, Spain and France



© Peter Duncan



"I have been fishing for over 30 years, and my son is also a fisherman here in the Isle of Man. We mainly fish for scallops, but at times will also target Dublin Bay Prawns.

The jewel in the crown of the Isle of Man fisheries is the Queenies. In most parts of the world these are dredged from the sea bed, but here we use an otter trawl which is much kinder to the sea bed and produces a more marketable product.

The scallop fishery hasn't always been such a positive story as it is today. The 1980s saw the introduction of the first closed fishing area which was introduced to preserve the scallops and to allow the scientists at the Marine Biological Station to undertake research. The fishers were not too pleased with this move and fought against the decision as they thought their livelihoods were being taken away. Some fishers continued to poach scallops from this area. It took many years for the realisation that this closed area was for our benefit and now 99.9% of the fishers not only respect the closed areas but also support them being there.

"The benefits to the fishing community have been good – the curfews have helped restore stocks and mean that we now have a working day and are back on the island in the evening, which gives us a far better lifestyle"

The 1990s saw a big drop in the stock levels around the Isle of Man with effort having to increase massively to maintain a catch of 10–12 sacks per trip, the amount needed for the fishers to make

a living. As a result of the increased fishing effort, a curfew was introduced in the three mile inshore area that is under the Isle's direct control, limiting fishing to the daytime between six and six. The benefits to the fishing community have been good – the curfews have helped restore stocks and mean that we now have a working day and are back on the island in the evening, which gives us a far better lifestyle.

These management measures took a few years to show results, but then the recovery began and the Isle of Man Scallops have never looked so healthy. We have never seen as many Queenies in the sea as there are nowadays. The health of our fishery was demonstrated when we achieved MSC certification in 2011. This has helped to keep the door open to our main European markets. There hasn't been a significant increase in the price, but it certainly stops doors closing on us.

The Isle of Man is fortunate in the dialogue that it has with politicians and decision makers. Being a small island and a close-knit community has meant that fishers have good access to decision makers and so can raise concerns and issues in a very direct manner. We also have better relations with the scientists, and the Scallop Fisheries Science Workshop held in 2011 has helped establish an understanding that we are working towards a common good.

There are now several marine protected areas around the Isle of Man and these are viewed positively by the fishers: marine life is so obviously thriving in and around these areas. Of course, it's easy for us to be positive about the restricted areas while times are good but the true test will come if there is ever a downturn in the quantity and quality of scallops available."

Before intervention/s – 1980's – Introduction of first closed fishing area; 1990's – Introduction of curfew				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
7800 tons (1972)		Over exploited		<ul style="list-style-type: none"> Implementing closed areas Implementing curfew 	<ul style="list-style-type: none"> 2000 tonnes (2007) Decrease in the annual catch 		Healthy stock levels	25 vessels

Norwegian Discard Ban

Interview with Torfinn Pettersen, Norwegian Fisherman



Species: Cod (<i>Gadus morhua</i>)
Fishing method/gear: Demersal trawl, gillnet and long line
Country: Norway
Ocean: Barents Sea
Fishery tonnage: 283,310 tonnes (2010)
Markets: EU, China, Brazil



"I have been fishing for 30 years, first on trawlers, but now I have my own boat: a 12 metre gillnet and long line vessel that I use to catch cod and haddock in the Barents Sea.

The discard ban was introduced for cod and haddock in 1988. Before the ban some 30% of fish caught were thrown back into the sea. It was terrible. We were bought up not to throw away.

The ban was mainly directed at trawlers to stop these discards, while other measures were introduced to protect juvenile fish. Now when boats come to an area with an abundance of small fish the Directorate closes the area and the boats have to move to another area to fish. We also fill in log books on a haul by haul basis so that the type and size of fish can be monitored. Everyone knows this makes sense; we don't want to catch ten fish but discard nine under-size ones for the sake of keeping the one marketable sized fish.

One of the incentives for us to report honestly and to keep all the catch on board is a compensation scheme. This works by the government paying us for the part of our catch that does not meet management regulations, such as undersized fish or over-quota fish. The payment does not cover more than the cost of fishing, so we do not make a profit from it. But it is good that everything is taken to shore and used in some way and this system has made a big difference to the groundfish stocks. 'High-grading'¹² doesn't happen anymore, mainly because we are more aware of the damage it causes and due to the monitoring systems in place.

Of course this process has not been easy. At the time when the cod stocks collapsed in the late 1980s and the ban was introduced everyone felt the burden of the changes. Many of those who had not contributed to the collapse lost their fishing rights and many thousands of small vessels had to stop fishing.

"We fill in log books on a haul by haul basis so that the type and size of fish can be monitored. Everyone knows this makes sense; we don't want to catch ten fish but discard nine under-size ones for the sake of keeping the one marketable sized fish"

Generally the management of our fisheries is now good. We realise that the regulations have been introduced to preserve the fish stocks for our benefit as well as for future generations. The observers and inspectors make sure that everyone is following the rules. Sometimes restrictions have been brought in that have not worked. Fortunately the Directorate listens to us, and when we say that there is an issue they will negotiate with us to make sure that we can fish, while at the same time making sure that the fish stocks are not damaged.

The cod have now, finally come back. Ten years ago I had to go far away and it took me a long time to reach my quota, even if it was small. Now my quota for cod is twice as big and I fish it faster. There are a lot more fish in the sea. The discard ban is one of the reasons for this."

EUROPE

Before intervention/s - 1988				Transition	After intervention/s – current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
US\$287M (1988)	US\$37,000	Over-exploited	Norway 17,391 vessels (1990)	Monitoring by the coastguard (approx. 2,200 boat inspections per year) at an annual cost of c.US\$132M	US\$540M (2009) and is expected to increase with the TAC increase set by ICES in 2010.	US\$58,850	<ul style="list-style-type: none"> Dramatically improved since 1990. Based on simulations, ICES concludes that the plan, if fully implemented, is expected to lead to further significant rebuilding. 	6,309 vessels (2010)

¹² The practice of keeping bigger fish that they caught while discarding smaller, but still legal sized fish

Lira Coastal Community Fishery

Interview with Juan M Blanco Gomez, Project Coordinator, Lonxanet Foundation for Sustainable Fisheries



Species: Octopus, spiny spider crab, barnacle, velvet swimming crab, sea urchin

Fishing gear: Handline, traps and gillnets

Country: Spain

Ocean: Atlantic

Annual tonnage: 90,000t

Main markets: Regional, local and national



© Lonxanet Foundation

"I come from a fishing family and have worked with artisanal fishers in coastal communities since 1995, training them and developing a code of conduct for responsible fisheries. One key project has been in Lira, a fishing village in Galicia, where the fishermen faced an uncertain future in the late 1990s. Erratic prices and lack of a guaranteed market drove many out of business, and young people didn't want to go into fishing any more. The community was silently disappearing.

In 2000, the fishermen pre-empted a crisis by setting up their own marketing company. Their aim was to obtain a decent, stable price that was fair for both fisher and consumer, rather than a higher price based on a wildly fluctuating market. The next step was to raise awareness of the fishers' lives and culture through fishing tourism projects, such as guided tours of the port.

Then in 2003 they began a process of creating marine protected areas to further guarantee the fishery's future. With the Foundation's help, the fishermen submitted a document to the authorities in charge of regional fisheries management, setting out the benefits of co-management. The idea was that fishers should have a stake in managing all the resources in their area. That proposal is now formalised under a statute in which responsibilities are split 50-50 between fishers and public administrators.

Most MPAs are set up by states or environmental organisations without the involvement of those who live there and have helped maintain the ecosystem. At *I Miñarzos*, as our fishery reserve is called, there is an active management plan designed and implemented by the community that serves as custodian.

In the protected area, fishing is restricted under license. Artisanal methods are already highly selective, so by-catch and dis-

cards have been virtually non-existent and impacts from ghost fishing (where lost gear continues to trap marine life) is negligible. The benefit of co-management is that, when fishers are involved in the process or are themselves the managers, the data they provide is real rather than abstract. The best barometer of biodiversity is daily observation.

"Fishers have been able to differentiate their products from others, on the basis of coming from a sustainable, well-managed fishery and this has opened up niche markets"

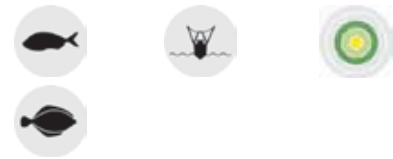
The economic situation is much better now than it was four years ago. Before, it was hard for two fishers to survive on sales of barnacles, for instance. Now, 20 families are able to live all year on sales of this species alone. What's more, the value of licenses to fish in the protected area has increased by 500%, boosting income further. Fishers have been able to differentiate their products from others, on the basis of coming from a sustainable, well-managed fishery and this has opened up niche markets.

The result is a successful methodology for self-financing or co-financing the entire community structure – a model that can be replicated throughout Spain and on other continents. This is bound to influence fisheries policy-makers. The biggest benefit is that fishers have regained recognition for a profession that was socially marginalised. There are more boats, more crew per boat, and more young people wanting to fish. That was one of our main objectives."

Before intervention/s – 2003				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
Fluctuating prices	Barnacle fishery supported 2 fishers	–	–	–	<ul style="list-style-type: none"> Value of licenses to fish in the reserve increased by 500% Prices stabilised 	<ul style="list-style-type: none"> Today: Barnacle fishery supports 20 families Increase in boats, crew & more young people wanting to fish 	Reduced by-catch, discards & ghost fishing	Increase

Brixham Beam Trawl Fishery

Interview with Alex Philips, Vessel Owner and Shaun Gibbs, Skipper of Barentssee trawler



Species: Mixed species. Plaice, lemon sole, whiting, cod and haddock

Fishing gear: Beam trawls

Country: UK

Ocean: Channel, North Sea, Atlantic

Fishery tonnage: 12,800t

Markets: France, Spain, Italy (China)



“We fish for 31 different species, targeting at different times of the year: Dover sole, plaice, lemon sole, monk fish, whiting, cod and haddock. There used to be 45 beam trawlers 15 years ago but after decommissioning this has been reduced to 20. It has been a good thing; the boats that are left are good at what they do with a mind to the future.

Over the past five years, we have seen the need for change. You look at fishing ports around the country, the likes of Lowestoft, Grimsby and Hull. They were once huge and now they are gone. We want Brixham to continue in the future.

One of the most significant changes we've made is improving the selectivity of our gear. We started working on different net designs, but the 50% CEFAS project helped to get other fishermen on board and give us recognition. The project allowed fishermen to design their own nets, share ideas with scientists and move it forward. Now 90% of the fleet are using modified nets, and as the name suggests we've reduced our discards by over 50% across the fleet.

The new nets create less drag in the water, save us 20% on fuel and reduce contact with the sea bottom. We only catch fish of marketable size and let the smaller fish escape allowing them to grow and breed again. We used to get 8-10 months out of a normal trawl and are now seeing them last up to 14-16 months. So, for a relatively small cost changing gear technology and a bit of thinking; you catch less, make a bit more and save on fuel.

Normally the crew would be on deck for over an hour per trawl but that is down to half an hour now as they don't have to sort through heaps of small fish. Their wages have improved as well. Just taking the fuel savings alone, the crew are probably taking home an extra £200 per week.

We are also getting more saleable sizes out of the nets and therefore maximising the value of the catch. Sole prices have increased from £6/kg to £18/kg and Dover Sole from £13/kg to £25/kg over the past two years. Some of the other less marketable fish, such as Gurnards, have gone up 300% from 20-30p/kg to 60-80p/kg.

A proportion of these price increases is due to improved selectivity (around 5%), for instance the new trawls allow unwanted benthic species and rocks to pass through the larger mesh size nets, which in turn creates less abrasion in the trawl and improves the quality and hence value of the fish. However, there have also

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been other factors, for instance smaller catches focusing on higher quality, a weaker pound helping exports, and the regenerated market at Brixham have all helped. We have also been working with the supermarkets to improve marketing of under-utilised species.

We're still working to further reduce drag and impact on the sea bed. We're also participating in a camera catch share scheme, where we get more quota for having a camera on board and landing all our catch. The reports they are getting back are really good. Out of 100 hauls in seven days, some of the traditional trawlers are landing 40-80kg of smaller fish. Our unmarketable catch is literally measured in numbers of fish.”

EUROPE

Before intervention/s – 15 years ago				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
–	–	–	45 trawlers (15 years ago)	£2000–3000 (US\$3000–4000) for new nets	<ul style="list-style-type: none"> Increased value of catch: 5% due to quality improvements 20% saving on fuel 	Increased wages by up to £200/week (US\$300)	Reduced discards by over 50%	20 trawlers

Cornish Sardine Fishery



Interview with Stefan Glinski, Cornish Fisherman

Species: Sardine (*Sardina pilchardus*)

Fishing gear: Ring nets (and drift nets)

Country: UK

Ocean: Celtic Sea, Atlantic Ocean

Fishery tonnage: 1,000 – 3,000t/year

Markets: UK, Europe



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"I used to handline for mackerel but noticed shoals of sardines that no one was doing anything with. I saw the opportunity but there was a marketing problem. We could catch sardines, but there wouldn't be any buyers. That was ten years ago, and now we've built up the fishery and the market, making sure that we are using highly selective gear and minimising any contact with the environment.

Obviously sardine fishing did have a history in Cornwall with a large pilchard fishery in the 1800s (pilchards and sardines are the same thing, just different labels). The pilchards were preserved in salt and packed into wooden barrels. However, the fishery began to die out in the 1900s. Some people put it down to declining stocks driven by environmental factors, but I think there were probably economic reasons. There was a small revival in the fishery between 1950 and 1970, but they found it difficult to get year-round supply.

I could see that the traditional technique of gill-netting sardines was labour intensive and produced a poor quality of fish; whereas ring netting could provide much better quality and the volumes needed to get a market going. I studied the technique and applied what I knew from my own experience. We thought through all the processes so that when we first trialled the net we got it 99% right; but have been tweaking it ever since.

We're a very selective fishery and the way we use the net we typically only catch sardines. We're not towing the net through the water for miles and miles or having contact with the sea bed. Over the past 10 years I have perfected the use of sonar so it is possible

to tell by the signature what fish are shoaling and their size. You can avoid going after other species and small sardines. The beauty of it is you can also easily let out the net in the water to release fish unharmed.

"I studied the technique and applied what I knew from my own experience. We thought through all the processes so that when we first trialled the net we got it 99% right; but have been tweaking it ever since"

Prices have risen from the early days, but as volume goes up prices come down. We were catching 500-700t ten years ago and 3,000t this year. We always try to produce the best quality to maintain price and we were awarded MSC certification in 2010. While this hasn't made a difference to international markets, it has helped for the UK retail market. They have to buy MSC certified fish because their customers demand it. The problem for us as a small fishery is keeping up with the cost. There are only six sardine ring-netters but annual audit costs are around £4,500 and it will be over £30,000 for recertification in three years time.

The Cornish Sardine is classed as a non-pressure stock, so it is not considered a priority for management. There are some controls in place but the number of vessels should be limited. I think the time for controls should be when fisheries are thriving, well before they start to decline."

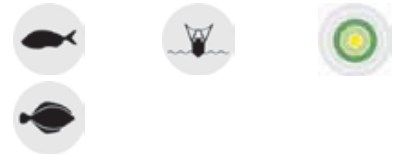
EUROPE

Before intervention/s – 10 years ago (1991)				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
Total catch: 500t	–	Non-pressure stock	<ul style="list-style-type: none"> 1 ring netter 12 drift netters 	<ul style="list-style-type: none"> Cost of ring-netting gear/boat? MSC certification: £30,000 (US\$46,000) for certification; £4,500 (US\$6,900) annual audit costs 	<ul style="list-style-type: none"> Catch 2010: 1,400t Catch: 2011, 3,000t 	<ul style="list-style-type: none"> Increased slightly Drift netters getting lower prices for sardines as poorer quality 	Non-pressure stock	<ul style="list-style-type: none"> 6 ring netters 12 drift netters (Drift netters phasing out of sardines & catch other species)



“ We’re a very selective fishery and the way we use the net we typically only catch sardines. We’re not towing the net through the water for miles and miles or having contact with the sea bed”

Scottish Groundfish Fishery



Interview with Mike Park, CEO, Scottish White Fish Producers Association (SWFPA)

Species: Mixed: e.g. Cod, haddock, megrim, hake
Fishing gear: Bottom trawling
Country: UK (Scotland)
Ocean: North Sea, North-east Atlantic
Annual tonnage: 60,000 to 70,000 tonnes
Markets: Cod & Haddock: UK; Others: Europe



EUROPE

"I started fishing at the age of 10, skippered my first boat at 21 and built my own business at 30. Now I'm working for the largest fishermen's association in Europe, with 230 vessels and a collective turnover of £256m (US\$389m).

At our peak in the 1970s, we had too many vessels and too many subsidies (from the European Commission); we never decreased the fleet in line with diminishing stocks. Something had to give. When I was a young skipper, we were landing 120,000 tonnes of cod a year; now it's 15,000 tonnes. We crashed the stocks, and now we are rebuilding them. Our target is to remove only 15 to 17% of the cod each year, compared to 70 or 80% in the 1990s.

The first step towards sustainable fishing in Scotland was decommissioning, in 2001 and 2003. We spent £75m (US\$117m) and took out 140 vessels. Then came the EU's Cod Recovery Plan, which reduces effort by taking away days at sea. Within it are derogations saying that, if you do good things, you can draw down extra effort from the Commission. The big innovation in Scotland has been the Conservation Credits Scheme, which rewards vessels with days at sea in return for reductions in cod mortality, so they can still make money from other species. It's a way of incentivising the industry, not punishing it.

In 2007 we put in place five seasonal closures for cod to protect spawning aggregations. We now have 11 or 12 real-time closures in any month – sometimes more and 170 this year, covering 40,000 square miles. Every time a vessel enters one, it loses five days at sea. This has reduced the capture of all cod significantly, although the seasonal closures specifically focus on spawning cod.

There are also buy-backs for using bigger mesh cod ends. The basic size is 120mm but our vessels use 130 or 135mm and get additional days for that. If they use the Orkney trawl, which has a 2ft mesh in the bottom to let the cod escape (because cod, unlike other species, dive when they are caught), they get 20 or 25 days. We've also introduced CCTV cameras on 26 vessels. If anyone is seen discarding cod, they're removed from the catch quota scheme, which allows a higher quota but requires everything to be landed.

"The big innovation in Scotland has been the Conservation Credits Scheme, which rewards vessels with days at sea in return for reductions in cod mortality, so they can still make money from other species. It's a way of incentivising the industry, not punishing it"

There has been significant recovery in the cod stock, though it's not where it should be. In the North Sea, spawning biomass has continued to increase gradually and stock has doubled in six years. That is due to our investment in best practice more than anyone else's. What's hard to get across to fishermen is that they still can't land what they landed before. That's why we've set up courses in fisheries science, which ten of our skippers recently attended. What's more, a fully documented fishery with CCTV cameras can supply a huge amount of data to the system. Our hope is that, with a system like ours, there won't be a need for effort reduction, sparing us further decommissioning."

Before intervention/s – 1970s				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
Catch: 120,000t	–	Removed 70-80% of cod stock each year	–	£75m (US\$117m) to remove 140 vessels	Catch 15,000t (Total catch declined; individual boats increased)	–	<ul style="list-style-type: none"> Stock has doubled in the past 6 years Aim to remove 15–17% of cod stock each year 	Reduced by 140 vessels

Scottish Pelagic Fishery



Interview with Ian Gatt, Director/Secretary, Scottish Pelagic Sustainability Group¹³

Species: North Sea herring, Atlanto-Scandian herring, Western mackerel (all MSC-certified) and West of Scotland herring (in assessment)	Markets: Mainly Europe, also Russia and some domestic (for North Sea and Atlanto-Scandian herring); West Africa (west of Scotland herring); Japan, Europe and South-east Asia (Western mackerel)
Fishing gear: Mid-water trawl	
Country: UK (Scotland)	
Ocean: North Sea, North-east Atlantic	
Annual tonnage: 200,000 tonnes	



"For generations, my family on my mother's side has been involved in fishing. When I left school, the industry was the biggest employer in coastal communities and it was natural for me to go to sea. In 1932, there were more than 1,000 boats; now there are 28. We had a huge problem with herring in the 1970s which led to the fishery's closure. Whether it was recruitment failure or overfishing or both, that was a big driver for change in the pelagic industry.

We were very fortunate that mackerel changed its migration pattern and ended up in western waters. In 30 or 40 years, it has gone from nothing to being the stock we rely on. That gave us breathing space for reform, and the most important element in that has been long-term management plans.

In the past, ICES (the International Council for the Exploration of the Sea) and fisheries managers would tell the industry what was going on. Now, the process is largely stakeholder-led. Through bodies like the Regional Advisory Councils, stakeholders draw up a long-term plan with scientists, then put it to the European Union. The EU then puts it to ICES to see if it is precautionary and sustainable. This co-operative approach has been the biggest single change in the pelagic fishery in the past 10 or 12 years.

The other has been adhering to agreements. Before, the advice of ICES would be disregarded on political grounds. Now, Iceland, the Faroes, Norway, Russia and the EU agree that the priority in setting TACs should be science.

It's a culture that has spread to the fishing grounds. People are thinking more responsibly about their quota and their market, prior to putting their nets in the water. That has aided stock recovery. If

we look at North Sea herring, we've seen a complete turnaround in three years, from a biomass of 890,000 tonnes in 2009 to 1.7m tonnes. It's good news for us, and reassurance for the Marine Stewardship Council which certified North Sea herring in 2008. They can see that the plan is good and our product deserves to carry the MSC logo.

"Through bodies like the Regional Advisory Councils, stakeholders draw up a long-term plan with scientists, then put it to the European Union. The EU then puts it to ICES to see if it is precautionary and sustainable. This co-operative approach has been the biggest single change in the pelagic fishery in the past 10 or 12 years"

We're in a situation where we have three fisheries certified and one in assessment, so we can scientifically measure the difference the MSC label makes. Last year, there was a price premium of £100 a tonne for North Sea herring, which is certified, compared to West of Scotland herring, which is not. In terms of markets, our MSC-certified herring – North Sea and Atlanto-Scandian – is sold mainly to Europe and a little bit to Russia, whereas West of Scotland herring has found a market only in western Africa. You simply cannot sell it into Europe. It's probably going to cost us £75,000 a year to keep all our certifications going, but there are benefits. That's why we decided to put West of Scotland herring up for assessment as quickly as possible."

EUROPE

Before intervention/s				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
–	–	North sea herring biomass (2009): 890,000t	–	£75,000/year (US\$115,400) to keep certification going	Price premium for MSC certified herring: £100/t		North sea herring biomass (current): 1.7m t	28 vessels (reduced from 1,000 in 1932)

¹³ The Scottish Pelagic Sustainability Group (SPSG) is one of five member groups within the Scottish Pelagic Sustainability Group (SPSG) that applied for MSC certification.

“ Our sole, our wealth, our lives: this is the vision of our management plan”

Ousman Bojang, Chair of GAMFIDA



AFRICA

Gambian Red and Black Sole Fishery



Interview with Ousman Bojang, Sole Fishermen and Chair of the Gambian Artisanal Fisheries Development Association (GAMFIDA)

Species: Red and Black Sole (*Cynoglossus senegalensis* and *Synaptura cadenati*)

Fishing method: Bottom gill nets

Country: Gambia

Fishery tonnage: Approx 200t

Markets: Europe (Netherlands, Spain)



"I started fishing when I was 19, and it was then that I built up my local knowledge on fisheries in The Gambia. After a period working for the government, I then returned as a commercial fisherman in 1978, and now fish for sole alongside 500 other fishermen spread along the coastline.

We undertook an MSC pre-assessment in 2006 and are hoping to go for full assessment next year. Sole is an ideal candidate as it is exported and not consumed in The Gambia. Our chief buyer, Atlantic Seafood, is not sure if we will get a better price but they do think it will open up new markets, as some European retailers only buy MSC product. At the Gambian Artisanal Fisheries Development Association (GAMFIDA) we feel that to be qualified as sustainable by the MSC would be a major achievement.

For the past two years, we have been working on a USAID funded project (Ba Nafaa) – supported by the University of Rhode Island, WWF, Atlantic Seafood and the Gambian Government – to meet the requirements set out in the pre-assessment. One of our main achievements has been the closure of the sole fishery from May until October within a protected area 1nm from the shore. This means we will allow the sole to breed; the young ones will be there, and when they grow we start to catch them.

Each landing site now has its own sole management committee and has written its own by-laws. This brings the management down to the community level. For example, while the government

allows for nets that are 40mm,¹⁴ we have increased the net size to 42-46mm. We are not catching small fish and the by-catch is reduced dramatically.

"We are also collaborating with research and have been out to sea with the scientists to share our local knowledge and map out the sole's migration routes, their reproduction areas and spawning grounds"

Stock levels are very much improved and I am proud of that. We have benefited from better catches after the closed season, but for now these are just my observations. For the future, we are training fishermen to use log-books so that we can collect monthly data and compare this with previous years' data held by Atlantic Seafood. We are also collaborating with research and have been out to sea with the scientists to share our local knowledge and map out the sole's migration routes, their reproduction areas and spawning grounds.

'Our sole, our wealth, our lives' is the vision of our management plan which will be signed by the Honorary Minister in 2012. The next steps for us will be a stock assessment using the new data we have collected and then MSC certification. It is no good exploiting the resource without good information. I want to have sustainable fisheries for years to come."

AFRICA

Before intervention/s – Current				Transition	After intervention/s – Too early to determine impacts			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
<ul style="list-style-type: none"> 2007: 1,293t 2008: 866t 	<ul style="list-style-type: none"> Crew: US\$2,364/year Boat Owner: US\$12,582/year 	Stock assessment not yet completed	475 Sole Fishers In addition approximately 34-249 people employed by processing plants (mainly women)	–	–	–	–	–

Sources for table include: Fatajo, FS; Tobey, J & Drammeh, O (2010) Sole Fishery Value Chain Assessment, Coastal Resources Center, University of Rhode Island, pp.33

¹⁴ Only refers to artisanal catch

Malagasy Octopus Fishery



Interviews with stakeholders of the fishery

Species: Reef octopus (*Octopus cyanea*)

Fishing method: Spear-fishing

Country: Madagascar

Ocean: Indian Ocean

Fishery tonnage: 600t/year

Markets: Southern Europe: France, Spain, Italy, Greece & Portugal



© Blue Ventures



Fishing is a way of life along the remote south-west coastline of Madagascar known for some of the largest coral reef systems in the Western Indian Ocean. Over 90% of adults in the region are fishers or known locally as 'gleaners' which involves going out at low tide to collect primarily octopus but also snails and sea cucumbers from the reef flats. "The octopus is a hugely important fishery to the local communities," says Sophie Benbow, of Blue Ventures and Project Coordinator of the Regional Octopus Project, "and is now one of the largest export commodities from the south-west."

Prior to 2002, the villages exploiting octopus for commercial export were limited to those close to the regional capital of Toliara. However, in 2002 the main octopus collectors expanded their range to the whole of the southwest coast, leading to rapid exploitation of octopus and anecdotal reports of decreases in catch. Blue Ventures,¹⁵ together with local communities decided to trial temporary closed areas to see if these could stem the decline.¹⁶

The first temporary closures for octopus were established in 2004, and have gradually grown in number. "We started with a temporary closure in the remote community of Andavadoaka," says Sophie, "but through local demand have now expanded to 50 other communities extending along 400km of the coastline." One of the initial problems was the success of the closures attracting fishers from outside the communities. Yet since the first pilot, the area covered by the temporary closures has increased, spreading the

benefits and reducing the incentives for free riders. Felicite from Andavadoaka (who has been fishing for 35 years) sums up the benefits to villagers, "We have experienced an increase in octopus catch and an increase in the individual size of octopus".

"The temporary closures of octopus fishing grounds have been immensely successful," says Sophie. "We have found that all of the closures are profitable at the village level and analysis of seven years of landings data has shown that individual fishers are also benefitting, with each fisher catching 5.9 kg of octopus per day on average after the closures, compared to 2.3 kg before."

The latest development has been an MSC pre-assessment to determine whether the south-west Madagascar octopus fishery could be certified, and thereby gain international recognition for the significant strides in sustainability. "It would be the cherry on the top," says Sophie. "This way the fishery can illustrate how local communities are able to manage their own octopus fishery in a sustainable way." Sophie also explains how new buyers have been attracted; "Several international import companies did not know that Madagascar produced octopus before this work began."

The next steps for the fishery are to develop a fisheries improvement plan and set up a regional management committee. As Roger Samba, President of Velondriake,¹⁷ explains, "the villages are now working together for one goal, which is managing our resources to sustain our livelihoods."

Before intervention/s – 2004				Transition	After intervention/s – 2011			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
CPUE in 2004 2.4kg/fisher/day	Wages Less than US\$2/day	Reported declining catch (but no data to prove this)	–	Administrative costs of a single round of closures is approximately: US\$500	CPUE in 2010 3.5kg/fisher/day	Wages: US\$2/day	<ul style="list-style-type: none"> Current level of exploitation is not negatively affecting octopus stocks. Recent stock assessment modelling for the Velondriake region between 2008-2010 indicates fishing effort, given current management model, is sustainable 	Increased (population increase and migration from inland tribes)

¹⁵ Blue Ventures is a British marine conservation NGO: <http://blueventures.org/>

¹⁶ Collaboration also with the Madagascar Institute of Marine Sciences (Institut Halieutique des Sciences Marines – IHSM) and the Wildlife Conservation Society

¹⁷ The largest locally managed marine area in south-west Madagascar and the site of the pilot octopus closures (www.velondriake.org)

Malagasy Shrimp Fishery



Interview with Mathias Ismail, Group Managing Director, OSO (R&O, Seafood Gastronomy)

Species: Shrimp (*Penaeus monodon*)

Fishing method/gear: Trawl

Country: Madagascar

Ocean: Indian Ocean

Fishery tonnage: 8,000 tonnes

Main markets: EU, Asia, Africa and USA



"Industrial fishing started in Madagascar in the early 1970s, but fishing effort was minimal. Few investors were interested in basing their businesses in the country, due to the political situation during the 1980s and early 1990s, and we were not popular with distant water fishing nations. The resultant lack of fishing effort meant that, at a time when many of the world's oceans were being over-fished, the Malagasy wild prawn resources were preserved.

Change came in the 1990s with a new vision from the private sector to further develop and invest in our shrimp fishing business. However, we knew that we needed reassurance from our government that they shared our view of being committed to supporting responsible fishing and preserving the sustainability of the resource.

We got this reassurance, and the result is a shrimp fishing sector that is co-managed by private sector operators through the shrimp farmers' and fishermen's group of Madagascar (GAPCM) and the central government. This established a system of institutions and incentives to ensure sustainable management of shrimp resources. Among the institutions are: the Malagasy Fisheries and Aquaculture Agency, which is responsible for overall co-management of the sector; the Fisheries Monitoring Centre, for control and licensing; and the Economic Observatory of Shrimp Fisheries, a joint public-private organisation responsible for producing analysis on the sector and regulating closed seasons.

In 2000, when fishing effort was frozen in both the industrial and artisanal sectors, a range of management measures were in-

roduced to improve sustainability of the stocks. These included the use of satellite tracking and government observers on vessels for improved monitoring as well as the introduction of dolphin safe nets and turtle excluding devices to reduce incidental catches.

Further regulations aimed at controlling fishing effort and improving efficiency of fishing equipment were introduced in 2009, in response to a pre-assessment for possible certification of the fishery. These included reducing fishing effort from 66 to 32 vessels. We also increased net mesh sizes and reduced the width of the trawls in an effort to reduce the use of fuel and thus the cost to achieve the same level of catch.

We have also developed shrimp aquaculture in Madagascar as we could see that the demand for Malagasy shrimp outstripped the levels that could be sustainably met by our wild catch. The production of EU-certified organic shrimp, of the same species type and quality as are caught wild, has enabled us to meet the demands of the market without increasing pressure on the wild stocks.

Despite the current difficulties, stemming from the poor international economic climate and political instability in Madagascar, the reputation of the Madagascar shrimp has protected us from declining sales. In the last 30 years the sector has become the country's leading source of foreign exchange and a major source of tax revenue and jobs. As a company we also bring the financial benefits of packaging and processing to the community, as all our product is processed in Madagascar before being dispatched directly to our customers."

Before intervention/s - 2000				Transition	After intervention/s – current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
9,000 tonnes (2003) (Wild & Farmed Prawns)	Less income but more fishers involved	Under exploited	66 vessels (2000)	Management of fishery by government and fishing sector	8,000 tonnes (estimate for 2011) (Wild & Farmed Prawns)	<ul style="list-style-type: none"> Better income for less fishers but wider sector, with aquaculture and processing Overall better income to country and community 	Healthy stock levels	32 vessels (2011)

Mozambican Fisheries Surveillance



Interview with Manuel Castiano, Mozambique's Director of fisheries surveillance

Species: All species in Mozambique (e.g. Tuna & demersal species)

Fishing gear: All methods

Country: Mozambique

Ocean: Indian

Fishery tonnage: +100,000 tonnes (domestic and all landings)



"It was a proud day for us all, when the *Antillas Reefer* sailed into Maputo harbour painted red and white and bearing the name "Fiscalização Da Pesca" - Fisheries Patrol Vessel. Although the vessel, originally an illegal long-line vessel, had been arrested in 2008, the journey to this day began in 1990 when our new fisheries law came into force, followed by the formation of a dedicated Ministry for fisheries.

As a country, fish are important to us. We record catches of over 100,000 tonnes each year, but we know these are underestimates, as much of the catch in the small scale and subsistence sectors is not reported. The main catch, from our national industrial and semi-industrial fleet, includes shrimp, demersal fish and small pelagic fish. These fisheries are managed by licences, closed areas, and gear restrictions. The system is not perfect, but it is starting to work well. We also have an important foreign fishery that brings in much needed hard currency from access payments for about 150 vessels that come annually to fish yellow-fin, big-eye and albacore tuna.

Before the 1990s our most important commercially exploited stocks – shrimp and demersal fish – were highly or fully exploited and only the pelagic and tuna resources were lightly exploited. So we knew action was necessary. We have made changes in the last two decades, in order to strengthen our management system to one where access is controlled and monitored and action is taken when laws are broken.

In my main areas of work - monitoring, control and surveillance - we still have a long way to go, but the story of the *Antillas Reefer* demonstrates that we are succeeding. When the vessel company applied for a tuna licence we received intelligence from the legal fleet that the vessel was already fishing in our waters. So we requested the Namibian operators to order the vessel to port in Maputo for a pre-licence inspection. Following the inspection it became evident that the master, a Spanish national, had been fishing illegally in Mozambique waters for some 50 days, targeting kitemfin shark, which is also an illegal activity. Over the next days, and through working closely with our partner agencies of foreign affairs, the judiciary, defence and immigration and also the vessel operators and international partners, we were able to evacuate 37 crew members, over 80 tonnes of shark product, 65 tonnes of bait, and illegal fishing gear including long lines of over two kilometres in length.

It took two years from the arrest to the successful confiscation of the vessel, its cargo and the imposition of a fine of four million US dollars on the master and ships' owners. So, although we still have a way to go, we demonstrated that our policies, institutions and processes are in place and that they can work to ensure that our fisheries can be managed sustainably. Now we have the benefit of the *Antillas Reefer* operating as a patrol vessel providing support to legal operators and acting as a deterrent to those who don't follow the regulations."



© Ministério das Pescas

Mozambican Shallow Water Shrimp Fishery



Interview with João Marcos Mangave, Mozambique Fisheries Association

Species: Indian White prawn (<i>Penaeus indicus</i>) and Speckled shrimp (<i>Metapenaeus monoceros</i>)
Fishing gear: Trawl
Country: Mozambique
Ocean: Indian Ocean
Fishery tonnage: 5,500t (2010)
Markets: Europe, Japan, South Africa



“Our association represents 60% of total fishing capacity in Mozambique, although through my role in the Confederation of Business Associations I represent the entire fishing industry.

Our most important fishing ground for shallow-water shrimp is the Sofala bank. This is an area in southern Mozambique 40km from the coast, covering an area of 50,000km², and supporting 12 industrial freezer trawlers and 5 semi-industrial vessels. Prior to independence the shrimp resources were almost open access, but as the fleet developed the government realised how important the fishery was as a source of foreign currency and started to put management measures in place.

“We see the importance of protecting the environment and allowing recovery of shrimp biomass”

We now have a system of total allowable catches (9,000t/year in the 1980s and around 6,500t today), marine protected areas closed to trawling and a closed season. The closed season was initially brought in for less than a month but has been gradually increased to five months. This year it started on 5th October and we will go back to the fishery at the end of February. The scientists believe this is important to protect the biomass, and as businesses it had become less economic to fish during this period as daily catch rates decline over the summer months. There has also been a mind-shift in the industry over the past four years. We see the importance of protecting the environment and allowing recovery of shrimp biomass. Part of

this shift has been the industry's employment of fisheries biologists on their staff as well as increasing demand from our European market for shrimp that is caught in a responsible and sustainable way.

Stocks are not as healthy as we would like them to be and part of this is due to reduced river run-off which limits the amount of nutrients flowing into the sea. The building of dams for electricity generation hasn't helped, but we have also noticed that the onset of the rainy season is much later than previously. We find that when we return to the fishing grounds after the closed season that the shrimp are not as large as before.

The government is taking further action by reducing the capacity of the fleet by up to 40% between 2011 and 2013. After this period there will be an evaluation and if there has been a recovery of the stock and the government increases the TAC the operators that had previously had their capacity reduced will have priority over increased quotas.

The most positive change we see coming is a move towards rights-based fisheries management. This has been written into the new Fisheries law which is going through Parliament. Currently the industry has annual licenses that expire every year, and companies have no security that the government will allow them to go back to the fishing grounds the following year. A rights-based system would significantly increase our willingness to invest and participate in initiatives to protect the fishing ground. We would know that even though we may not be able to fish this year, we would be able to fish in future years and reap the benefits.”

AFRICA

Before intervention/s				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
<ul style="list-style-type: none"> CPUE: 25.8kg/hour (1999) Catches: 8,111t (1999) Have fluctuated from 9,300t in 1981 to lows of 5,668t in 1990. Back to 9,000t in 2002. 	–	Stock biomass: 2,310t (1999)	–	–	<ul style="list-style-type: none"> Catches: 5,500t (2010) Low catches also due to a smaller number of vessels involved. 	–	–	12 Industrial 5 semi-industrial

Namibian Fisheries

Interview with Donovan Hawes, Hake fisherman



Species: Hake (*Merluccius paradoxus* and *M. capensis*)

Fishing gear: Bottom trawl method

Country: Namibia

Ocean: Atlantic

Fishery tonnage: 134,976 tonnes (2009)

Main markets: EU, mostly Spain



“Prior to independence, in 1990, Namibia’s fisheries were largely foreign-operated and most were vastly overexploited with more than 300 mid-water and bottom trawl vessels operating off the coast. Following independence, the government quickly turned this situation around by declaring a 200 nautical mile exclusive economic zone and dramatically enforcing it through the arrest of thirteen illegal trawlers. This sent out a strong message that unlicensed foreign vessels would not be tolerated and resulted in a 90% drop in the number of vessels fishing in the area.

In 1992 a new policy and legal framework was introduced. These stated a clear and transparent process for allocating fishing rights based on criteria that ensured Namibians had a fair chance to enter the industry, and facilitated the empowerment of groups that had previously been disadvantaged due to the apartheid regime. This policy provided an economic incentive, to encourage Namibian participation in fisheries in terms of both ownership and employment, in the form of tax reductions on quotas fees.

I became a fisherman back in 1988, when I was 17, in order to support my family when my father passed away. I started in the monkfish fishery and later joined the small pelagic fishery. Back then, it was difficult for us ‘non-white’ people to get any promotion or opportunity in the fishery, but I benefitted from the new laws and now I am a skipper in the hake fishery, Namibia’s most valuable fishery which contributes almost 10% to Namibia’s Gross Domestic Product.

The new policies that followed Namibia’s independence gave me the opportunity to have a successful career in the industry.

Policy change, together with the high levels of management within Namibia’s fisheries, has resulted in sustainable benefits for the Namibian people. Apart from the fact that most Namibians now have an opportunity to apply for fishing quotas and can also attend maritime schools, our government implements strict rules to protect our fish stocks. The amount of fish that can be caught has been reduced considerably, and this means that our

“We are better equipped to ensure good education for our children and we have a sense of pride and respect. It is important for us to protect and take care of our resources for the generations to come”

resources are not overexploited. Our government also has a firm control over harvesting and processing: it limits access to the different fisheries; provides Total Allowable Catches by fishery as well as demands all fishing vessels to be flagged in Namibia, the only exception being those that are involved in the horse mackerel fishery.

I can truly say that the Namibian Government has gone to great lengths to include the Namibian people, by allowing us the opportunity to take further studies and become captains, chief engineers and crew members. This has improved our overall living standards; we are better equipped to ensure good education for our children and we have a sense of pride and respect. It is important for us to protect and take care of our resources for the generations to come.”

AFRICA

Before intervention/s – 1980’s				Transition	After intervention/s – 2011			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
<ul style="list-style-type: none"> Hake landings: 382,000 tonnes (Estimated from foreign landings) 	–	Over exploited	Open access	The cost of MCS in the “newly” defined EEZ and the management system.	<ul style="list-style-type: none"> Hake landings 134,976 tonnes (2009) Decreased aiming at sustainable levels in an access controlled fishery 	<ul style="list-style-type: none"> Average wages: about US\$15,000 per year depending on position on vessel Increase in on-shore processing 	Sustainable	38 companies hold rights of exploitation for hake

Seychelles Hook and Line Fishery

Interview with Beatty Hoarau, Seychelles Fishing Boat Owners Association



Species: Emperor red snapper (*Lutjanus sebae*), Green jobfish (*Aprion virescens*), Humphead snapper (*Lutjanus sanguineus*), Yellowfin tuna (*Thunnus albacores*), Sword fish (*Xiphias gladius*), Bigeye tuna (*Thunnus obesus*), line fish label covers: - captain blanc, job jaune, etelis, grouper

Ocean: Indian Ocean

Fishery tonnage: 9 tonnes (2011)

Main markets: EU, local high-end consumers

Fishing gear: Hook and Line

Country: Seychelles



"When the Seychelles Fishing Boat Owners Association was formed in 2003, discussions began on how we could add value to our fish and fish products. We wanted our fishery to be sustainable to ensure that future generations would benefit from the same quality and abundance of fish that we enjoy today.

In 2008, with the assistance of The Seychelles Fishing Authority, and in collaboration with the French Sea Bass Association (Association de Ligneurs de La Pointe de Bretagne) we began work on what was to become a flagship programme of fisher self-monitoring known as the 'Seychelles Hook and Line programme'. Through the creation of our own certification and labelling process we are able to guarantee that our fish meet the criteria demanded by ever-more aware consumers that fish are selectively caught and in a manner that respects the environment.

Certification is overseen by the Seychelles Bureau of Standards who assess all fishing units to ensure they satisfy requirements relating to the vessel, crew and fishing methods as well as to hygiene and sanitary regulations regarding the handling, processing and storage of the fish. Inspections are carried out on a random and ongoing basis to ensure that standards are met by all vessels.

The hook and line fishing technique is a traditional fishing method in the Seychelles and is internationally recognized to be one of the most selective means of harvesting wild fish. For this reason our fishery has a very low level of by-catch, discarding of fish does not occur, and there is no damage inflicted on marine habitats. Our circle hooks ensure that we catch mostly larger fish which have already reproduced.

Our approach, from inception, was one of ownership by the fishermen. They are the ones that are involved and their buy-in to the programme was considered to be of utmost importance. The fishermen and fishing boat owners on the two main islands, Mahe and Praslin, were consulted at all stages.

We also worked closely with the Fish Veterinary Division to develop a set of standards which the fishermen could adhere to in order to improve their on-board handling practices. When vessels and boat owners meet the minimum criteria for food safety and hygiene standards, a certificate is issued by the Fish Inspection Unit.

This has been very good for our fishery as it has raised the quality of fish being brought to the market, and as a result has increased the revenue that fishermen get. This has resulted in other fishers voluntarily joining the programme after seeing the benefits.

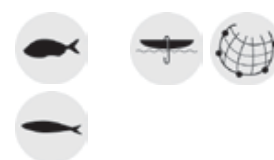
The branded fish are more expensive, and are targeted towards export markets and the high-end hotels and restaurants within the Seychelles. In the long run we would like to see all exported fish from the Seychelles being branded in this way. However, we are careful to also maintain our local markets as the Seychelles has one of the highest per capita consumption rates of seafood worldwide, and all Seychellois families depend on fish as a principal source of protein.

In addition to improving the branding of Seychelles fish, we have also improved the image of artisanal fishing in the Seychelles as a noble profession, one which provides food security for our nation, thus encouraging young people to join the industry."

Before intervention – 2003				Transition	After intervention – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
Varies from US\$3–6 per Kg	US\$770 per month	–	No hook and line members	US\$150,000	Up to US\$7.5 per kg	US\$900–US\$1,000 per month	–	15 licensed as Seychelles Hook and Line

Sierra Leone Community Fisheries

Interview with Thomas Siddiqui, Bonthe Master Fisherman



Species: All species in the Inshore Exclusion Zone

Fishing method/gear: Canoes with nets

Country: Sierra Leone

Ocean: Atlantic

Fishery tonnage: Artisanal catch: 112,653 t (2010)

Main markets: Local: Bonthe, Yargoi and Bo



“As fishermen in the Sherbro River Estuary, our livelihoods come from the fish we are able to catch using our dugout canoes. We target species such as grouper and catfish. Until recently our catches have been declining in the Estuary and we were afraid to take our boats into the open sea, as trawlers from other countries were fishing illegally and unsustainably in the Inshore Exclusion Zone (IEZ) of Sierra Leone. They were ruining our fishing gear, taking away fish from fishing grounds reserved for us and preventing fish from entering the Estuary. We lacked the resources to effectively control and monitor fishing activities in our waters and the decline in the fish catches was resulting in a direct loss to local fishermen.

In order to combat this problem, we collaborated with the Ministry of Fisheries and Marine Resources, the NGO Environmental Justice Foundation (EJF), and local authorities to develop a community surveillance programme. Two years ago a new EJF-funded surveillance vessel was launched to patrol the IEZ along Sierra Leone’s coastline. We alert the vessel to any irregular activity and they record that activity and collect evidence that is used towards the arrest and hopefully prosecution of illegal fishers. They have now purchased a bigger, faster boat.

In March 2011 information from us and the patrol boat led to the seizure of \$6 million worth of fish in Las Palmas, Spain; I'm told this is the largest seizure of suspected illegally caught fish since new EU regulations came into effect two years ago. It is still early days, but we have already seen a real drop in foreign illegal trawlers since the patrol boat started to operate. Community reports

show a significant decline: between April and June 2011 there were only 4 reports of illegal trawler activity, compared to 32 during the same period in 2010.

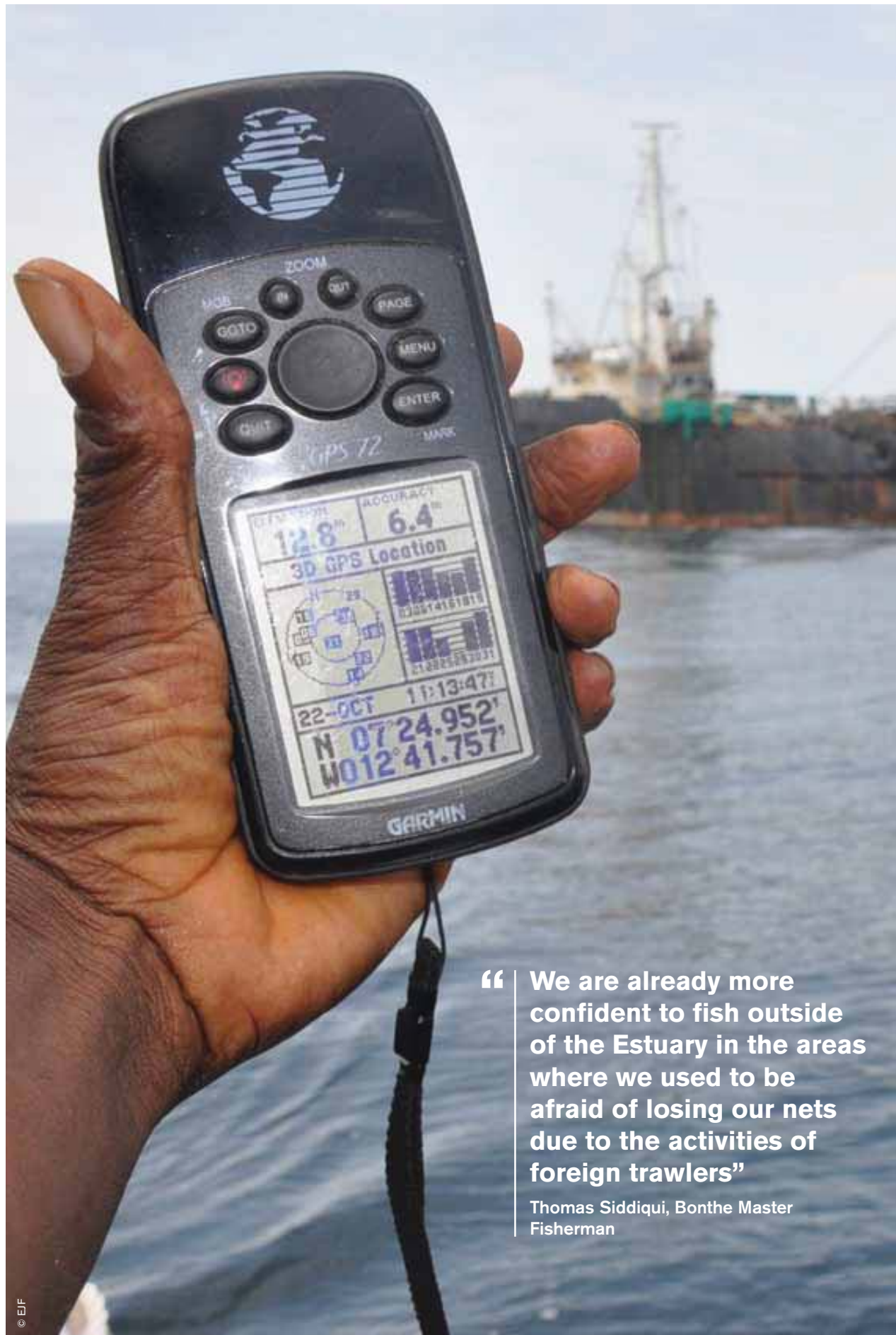
Not only are our interests and livelihoods being protected but the initiative has also recently generated government revenue in excess of US\$150,000 as a result of a fine issued after the observation of illegal activity in the Sierra Leonean IEZ.

Although we lack detailed catch data, we are already noticing an improvement in catches in the Estuary. A catch reporting scheme has recently started which will provide us with better data in future years. We are already more confident to fish outside of the Estuary in the areas where we used to be afraid of losing our nets due to the activities of foreign trawlers.”



AFRICA

Before intervention/s – pre 2008				Transition	After intervention/s – current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
<ul style="list-style-type: none"> Artisanal catch: 65,758t (2003) Fish smoked and dried for consumption and some local trade 	Costs to fishers due to damaged gear	Assumed threatened	Around 8,000 vessels in small scale sector	<ul style="list-style-type: none"> US\$180,000 This covers the initial buying of the boat and other equipment Running costs: US\$15,000 year 	Artisanal catch: 112,653t (2010)	<ul style="list-style-type: none"> Better fishing conditions, less danger and less fear Improved safety of fishers and gear 	Reduced pressure on stocks	Open access so assumed to be still around 8,000 vessels



“ We are already more confident to fish outside of the Estuary in the areas where we used to be afraid of losing our nets due to the activities of foreign trawlers”

Thomas Siddiqui, Bonthe Master Fisherman

South African Hake Fishery



Interview with Roy Bross, Secretary of the South African Deep Sea Trawling Industry Association (SADSTIA)

Species: Hake (*Merluccius paradoxus* and *Merluccius capensis*)

Fishing gear: Bottom trawl

Country: South Africa

Ocean: Atlantic

Fishery tonnage: 128,500t

Markets: EU, USA and Australia



“Commercial bottom trawling, largely for hake, has been important in South Africa for over one hundred years and today it accounts for half of South Africa’s fisheries catches. Historically, the fishery was heavily fished by a large foreign fleet that had severely depleted the fishery stocks. In the late 1970s South Africa set about expelling the foreign fleets and putting in place a regulatory and conservation system for the main fishery resources, including hake. In the beginning this system focused on controlling access and setting precautionary catch limits, tasks that the government and the industry cooperated on. Slowly, and with great relief we started to see an improvement in the hake stocks and a move to more prosperous times.

In more recent years our association – South African Deep Sea Trawling Industry Association (SADSTIA) – has played a key role in building on this early cooperation between industry and government to support the move to gain Marine Stewardship Council (MSC) accreditation for the deep-sea trawl fishery. We achieved this goal in 2004 making us the first African fishery to gain MSC certification as well as being the first bottom trawl fishery to be certified.

It took several years and hard work from both the industry and government sides to gain this certification, but today’s more prosperous and stable situation for the industry has made it worthwhile. In the last five years, MSC certification has provided many benefits: we have moved away from our traditional lower-value markets for unprocessed whole fish, towards new markets where we deliver processed, packaged and branded high-value goods. These are

sold largely in the markets of Europe – where we were relatively inactive in the past. Our MSC labelled goods do not attract a price premium in these new markets, but they do get us access.

There have also been other benefits emerging from the certification process, such as the improved relations and co-operation with the conservation NGOs; improved co-management especially in association with the resource management authorities; and a better attitude in the trawling community where there is now a readiness to fish sustainably for its own sake.

Since the initial certification in 2004 we have continued to improve on the sustainability of our fishery. There have been improvements in by-catch management as well as better understanding of our fish stocks. Tori lines are now part of permit conditions and this measure is estimated to have reduced seabird mortalities by about 90% since 2006.

Assessment for MSC certification meant that we had to research and identify habitats susceptible to impacts from bottom trawling. We have charted our modern trawling grounds and introduced a monitoring system to ensure that trawlers never go outside the demarcated area. Non-fishing zones were created in the vulnerable areas and the fishery has initiated an independent assessment of their potential as offshore Marine Protected Areas.

Personally, the most gratifying benefit is the way in which certification motivates participants. Certification raises awareness of all fishing stakeholders about the need to adopt best practices with a view to the long term future of the hake resource and benefits for us all.”

Before intervention/s – before 2004				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
166,000 tonnes (2002)	Data not available	Previously assessed as a single species	106 vessels (2004)	US\$70,000 for MSC certification process	<ul style="list-style-type: none"> Catch: 128,500 tonnes Decrease in hake harvested, aimed at maintaining sustainable levels in fishery 	Data not available	<ul style="list-style-type: none"> M.capensis stock is above sustainable levels, and catches below maximum sustainable levels. M.paradoxus stock is below precautionary levels, and a rebuilding plan is in place. 	<ul style="list-style-type: none"> 46 vessels A decrease in the number of vessels, to maintain sustainable levels

South African Rock Lobster Fishery



Interview with Richard Ball, Chair of the South Coast Rock Lobster Association

Species: South Coast Rock Lobster (*Palinurus gilchristi*)

Fishing gear: Longline trap fishery

Country: South Africa

Ocean: Atlantic, Southern Indian Ocean

Fishery tonnage: 330 tonnes (2011)

Main markets: US



"I have been involved in the South Coast Rock Lobster fishery for over 35 years and today I am the Chair of the South Coast Rock Lobster Association. This is a deep-water longline trap fishery that began around 1974 when the lobsters were first detected in the search trawls of fishing vessels, and then they were targeted using the standard lobster traps that are common for the west coast of South Africa.

In the early 1970s the open access fishery had a large number of vessels exploiting the resource, and this led to high and unsustainable levels of effort in the lobster fishery. This inevitably led to the lobsters being overexploited, and fishers were at one point harvesting 1,200 tonnes of lobster tails annually and this culminated in a sharp downturn in the lobster population in the late 1970s. It was this downturn that excluded a number of fishers from the fishery, as it became less economically viable for some of them to carry on catching the rock lobster.

"The most impactful management intervention has been the introduction of a quota system, which eliminated a number of participants from the fishery in the early 1980s and reduced the pressure on the lobster population"

In late 1976, a licensing system was introduced in the fishery, which further reduced the number of vessels, and in general the lobster fishery became a reasonably sustainable and stable fishery for the next two decades. However in the late 1990s there was

once again a decline in the fish stocks, and it was discovered that some members of the fishery were in fact poaching. A stop was put to this through pursuing prosecutions including fines and imprisonment with the assistance of third countries. After the poachers' exclusion the fishery once again became stable, with very little change in fishing effort or in the number of participants.

The most impactful management intervention has been the introduction of a quota system, which eliminated a number of participants from the fishery in the early 1980s and reduced the pressure on the lobster population. After the introduction of the quota system the number of vessels in the fishery went down from about 40 fishing vessels to 8 registered vessels, a level that has now been maintained for 15 years. Had quotas not been introduced, the business would undoubtedly have been flattened within ten years.

The South Coast Rock Lobster Fishery is one of the few global crustacean fisheries that have not experienced an increase or decline in output greater than 10% over the last ten years. This is due to a good Operational Management Plan, which includes a computerized and objective total allowable catch calculation system. This fishery provides a constant supply of high quality lobster resulting in a good market price. The limited number of operational groups in the industry coupled with the long term (fifteen year) rights to the fishery has ensured that fishers have a sense of ownership over the resource, and do not fall prey to the 'tragedy of the commons'. It is a fishery responsibly operated by the state and stakeholders."

Before intervention/s – the 1980s				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
1200 tonnes	Initial economic return	Exploited	40 vessels	Fewer people are now employed in the fishery otherwise management costs	330 tonnes (tail mass) @ US\$50 per kg	Increase in economic return	Stable	8 registered vessels

Zanzibar's Village Fishermen Committees



Interview with Mohammed Sulieman Mohammed,
Chairman of the Fumba Village Fishermen Committee

Species: Mixed small pelagics

Fishing gear: Small scale and artisanal.
Primarily canoes

Country: Zanzibar, United Republic of Tanzania

Ocean: Indian Ocean

Fishery tonnage: Data deficient

Main markets: Local sale and consumption



"Fishing is important to the people of Zanzibar with many in our communities reliant on fish for food as well as for their livelihoods. For many years the fishers around Zanzibar used destructive and unsustainable fishing methods, such as drag nets and dynamite blasting, and these had a really bad effect on the fish and the seas around Zanzibar. The government found it difficult to stop these damaging practices or to enforce conservation policies in this area because of under-staffing and poor financial resources.

In the 1990s the fishers around Zanzibar began to suffer from extremely low catches. Fishers were spending much more time at sea, but their catches were small, almost nil on some days. By 1994 the situation had become so bad that the villagers were motivated to ask government authorities for greater control and responsibility for the marine resources. The government, with support from WWF, assisted communities in setting up Village Fishermen Committees.

I was fully involved in the setting up of the Fumba Village Fishermen Committee. Fumba is one of the villages along the Menai Bay Conservation Area. My major role was to mobilize fishers to work together and to give them training on the importance of management of marine resources. I was also involved in mobilizing fishers in my village to turn up to election meetings; it was important that everyone had a say and chose who represented them.

Before the Village Fishermen Committees were formed we used to think that the marine resources belonged to the government. No one took any care and they were not worried if they saw somebody using destructive fishing methods. After the formation of the Village Fishermen Committees and after attending a series

"As a result of effective surveillance made jointly by government and Village Fishermen Committees, the marine resources have thrived, coral reefs are now in good condition and rare marine mammals like dolphin and whales are now common"

of classes on environmental education every fisher believed that the marine resources were his and had to be used sustainably. Over the last ten years we have seen a regeneration of our marine resources so fishers catch more fish and sell them at good prices. These increased fish catches have led to the increased well being of fishers.

As a result of effective surveillance made jointly by government and Village Fishermen Committees, the marine resources have thrived, coral reefs are now in good condition and rare marine mammals like dolphin and whales are now common. This has resulted in booming tourist activities within the area which helps our local economy."

Before intervention/s – 1994				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
–	Very reliant on fisheries	Exploited	18,619 small canoes and vessels	Estimated project cost for establishing committees in Zanzibar US\$150,000	<ul style="list-style-type: none"> Stable but increase in revenue from tourism Mixed systems of livelihood generation 	<ul style="list-style-type: none"> Improved for fishery and indirectly for tourism Fishery communities have improved social conditions 	Unable to say – but indications are stable	34,570 vessels

Patagonian and Antarctic Toothfish Fisheries



Interview with Martin Exel, Chair of the Coalition of Legal Toothfish Operators (COLTO)

<p>Species: Antarctic toothfish (<i>Dissostichus mawsoni</i>) and Patagonian toothfish (<i>Dissostichus eleginoides</i>)</p> <p>Fishing gear: Trawl and longline</p> <p>Countries: Australia, New Zealand, Chile, Argentina, Uruguay, Peru, Falklands, Spain, France, Japan, CCAMLR waters</p> <p>Ocean: Antarctic and sub-Antarctic –</p>	<p>specifically South Georgia, Ross Sea (both MSC-certified), Heard Island, Macquarie Island and Kerguelen/Crozet (all under assessment), Prince Edward and Marion Islands, and the EEZs of Chile, Argentina, Uruguay and Peru (all outside CCAMLR waters).</p> <p>Fishery tonnage: 20,000 tonnes</p> <p>Markets: Europe, the United States and Japan; China a growing market.</p>	
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"I work for Austral Fisheries, which harvests Patagonian and Antarctic toothfish. We fish all around the Antarctic, but the Heard Island stock is particularly important for us and within Australia's exclusive economic zone.

One of my main tasks has been protecting those species from illegal, unreported and unregulated (IUU) fishing. In the late 1990s, it was at a level no single government could keep pace with. That's when we started COLTO¹⁸ (the Coalition of Legal Toothfish Operators) to provide information about what we were seeing and to help governments control IUU fishing. Illegal fishing was like a military operation then, and its impact on the legal industry was huge.

This threat to the long-term sustainability of the fishery was one issue, bird by-catch another. IUU fleets were killing tens of thousands of seabirds a year as they used no mitigation measures. That issue helped us collaborate with NGOs, as one common goal we shared was the reduction of bird by-catch.

We addressed the first problem by sharing information between members in all relevant countries, within and outside the jurisdiction of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). We helped CCAMLR devise a catch documentation scheme using VMS, observers, verified product containers and verified unloading, to ensure the legal catch was traceable.

On the by-catch side, gear manufacturers, scientists and the legal industry developed integrated weighted lines, which reduce the availability of bait to seabirds. Other measures included using

bird scarers (tori lines) to prevent birds diving on baited hooks, and not throwing offal overboard. Through collaboration and sharing a common goal with the NGOs, we reduced seabird by-catch by 99%. Last year, only 36 birds were caught in gear across the entire CCAMLR zone of the southern ocean. Because birds are no longer stealing bait from hooks, catch rates per set have gone up, reducing costs.

"With less illegal toothfish on the market, prices have improved. Catch values are as high today as they have ever been"

Such significant reductions in by-catch could only be achieved by getting rid of the illegal operators. Since 1996, we have reduced IUU fishing by 97%, with illegal catches down from 32,000 tonnes a year to about 1,000 tonnes. That's a huge achievement.

Toothfish stocks are recovering too. In the early years, the TAC for Heard Island was 3,800 tonnes, but dropped to 2,500 tonnes because of IUU catches, and to ensure sustainability of the stock. However, as we have addressed the IUU issue TACs are again increasing and went up by 200 tonnes this year.

With less illegal toothfish on the market, prices have improved. Catch values are as high today as they have ever been. At the peak of illegal fishing, you could expect as little as A\$ 3 per kilogram, whereas toothfish sold to the United States now fetches up to A\$ 23 per kilogram. It's a win-win."

Before intervention/s – (1996/7)				Transition	After intervention/s – Current			
Economic indicators	Social indicators	Environmental indicators	Fleet indicator	Cost of interventions	Economic indicators	Social indicators	Environmental indicators	Fleet indicator
US \$3/kg	–	Catches: 60,000t	–	<ul style="list-style-type: none"> Industry: US \$10-50m Governments: US \$100-500m 	Price US \$21-24/kg	Increased	<ul style="list-style-type: none"> Allowable catches: 20,000t Reduced IUU of Patagonian toothfish: 97% Reduced by-catch seabirds: 99% 	Small reductions

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