

WILD OCEAN

directors notes



A large group of whales breaching the ocean surface, creating a massive splash of white water against a clear blue sky. The whales' dark, sleek bodies are visible above the water.

WILD OCEAN

Our first IMAX® movie, *Pulse*, was a natural extension of our stage work with Stomp, being a celebration of the Rhythms of the World shot entirely in 70mm IMAX format film. During and after production, we attended several Giant Screen Cinema Association conferences and concluded that for our second large format movie we should work in 3D and find a compelling subject that not only lent itself to the format, but would deliver the kind of film that appealed to large format movie theatres and audiences. Since we were both keen divers (Luke also being chairman of the Brighton Scuba Society), we already knew there was one dive that was considered to be one of the most exciting underwater experiences in the world. Despite its remote location and the physical difficulties of the wild open sea; despite the absence of harbours and far from perfect visibility, South Africa's Sardine Run was something of a legend for scuba divers.

We knew that each June and July (winter in South Africa), billions of sardines extended their range northwards from the Cape, towards KwaZulu Natal and Mozambique: that they were





pursued by up to 20,000 Common Dolphins, 5 or 6000 Bottlenose, thousands of sharks of varying species, Bryde's Whales, Cape Fur Seals, African Penguins and Gannets. There were so many sardines that many of them would be swept up on the beaches and captured by fishermen and local people in scenes that border on a frenzy.

Meanwhile, out at sea, the predators would force many sardines to form bait-balls that were then subject to attack from below by dolphins and sharks, and from above by gannets.

Luke, myself and David Marks (our producer), took a trip to South Africa in 2005 and saw such scenes that we were convinced this was a movie waiting to be made, with endless opportunities for spectacular 3D photography.

In the following 12 months we put together an incredible team, and an amazing array of 3D equipment. Reed Smoot was our land based Director of Photography, with an impeccable 70mm track record, he would be principally shooting with the IMAX Solido 3D camera system. This consists of two 70mm cameras running in parallel. A cumbersome, expensive way to shoot 3D, but capable of the highest motion picture image quality possible.



For aerials, he would shoot in 2D, using an IMAX MSM 2D camera. Joining Reed would be our location stereographer, Peter Anderson, who would also lead a 2nd unit with the 35mm Paracam camera system. This consists of two 35mm cameras shooting at right angles through a beam splitter, to allow very precise control over the 3D image.

Shooting on the water from a small Zodiac, was Dave Douglas, operating the IMAX/ Lockheed Spacecam: a 3D 70mm camera devised for use in the Space station (and used for the film Space Station 3D). His job was to pursue whales, dolphins and gannets, out at sea, day in day out.

Peter Anderson with Paracam 3D rig



Reed Smoot is shot while shooting gannets with the IMAX Solido 3D



Dave Douglas shooting with the iWerks 8 perf 2D camera

Transporting the IMAX Solido





DJ Roller and friends with the Pace 3D HD rig plus behind the scenes photography

Underwater was a different matter altogether: whilst 1570 cameras are capable of extremely high quality images (assuming there is light enough for the subject matter), they are bulky and have very short loads (a maximum of 3 minutes per reel). Since our subject matter moved at high speed across the ocean, since the action can be short and frantic, and since water visibility wouldn't lend itself to pristine image quality, we quickly realised the impossibility of shooting these sequences on film. By shooting HD video we would be ready to go when the action was upon us, we would be able to continue shooting for as long as the action was happening and wouldn't lose out because of reloading. Also, the two camera operators could take the camera deep into the action so as to immerse us completely in the 3D environment.

James Cameron had already shown how successful HD could be underwater, and it was natural for us to use the same rig (the Pace-Cameron HD - Sony HD 3D system) used for *Ghosts of the Abyss* and *The Aliens of the Deep*. Also, there had been advances made in post processing of HD material that convinced us this was the way to go. With 3D underwater DP, DJ Roller on the team, our shooting force was complete.

We knew that we wanted to create a 3D IMAX movie that would have as its an underwater bait-ball sequence. We also saw incredible action above water with the gannets and dolphins, and with Humpback Whales in their coincidental migration.



We'd also witnessed amazing scenes on the beaches with netting and beaching shoals. We wanted to include people in this movie, as the events in the ocean had impact upon the people of the South African coastline. A little research also showed us that there was a thriving sardine/pilchard fishery on the East coast that we could weave into our story.



One thing that attracted us to this subject was that we could show the food chain in action, and see mankind as a part of this chain.

When a large predator, such as a dolphin or whale, dies, its body sinks to the bottom of the sea where various scavengers will quickly consume it. Among the scavengers are microscopic organisms: zooplankton. They are part of the clean up operation on the sea bed. This zooplankton can be swept to the surface in massive, cold up-wellings. One area with such up-wellings is the West Coast of South Africa. These up-wellings attract juvenile sardines who thrive on the plankton, before returning to the main bio-mass of sardines off the southern cape as they approach adulthood.

Sardines (also known as Pilchards) are central to the oceanic ecosystem: they swim with their mouths open, filtering the micro organisms from the water, effectively turning the oceans tiniest creatures into the protein and oil that the next layer of predators crave. Sardines are eaten by almost everything in the sea that is bigger than their 7 to 12 inches. Game fish like tuna, shad and garrick eat them, as do the predators at the very top of the food chain: sharks, whales, dolphins, birds and man... of course, when some of these apex predators that have thrived on sardines die, their bodies sink, decay, and are consumed by zooplankton. The circle is complete.



2005 turned out to be a bumper year, possibly the last of the bumper years, with action reaching the beaches of KwaZulu Natal on a daily basis. When we returned, we were to learn how global warming was changing the face of the ocean.

The sardines will simply not enter water that is above 19°C/66°F. Global warming is raising ocean temperatures, and a rise of just 1 or 2 degrees can completely alter the life within it. Shooting in 2006 and 2007,

the temperatures along the KwaZulu Natal coast were consistently over 20°C/

68°F. There was little or no action on the beaches, where we waited day after day with our IMAX equipment. There was still plenty of action underwater, and out at sea, however, so we had to shift the focus of our film slightly. Also, the Wild Coast is one of the most stunning coastlines in the world as our aerial photography was to demonstrate. There are only a handful of waterfalls that fall directly into the ocean in the world: there are three of them on the Wild Coast. We actually only feature two of them in the film, a third, equally spectacular waterfall is on the cutting room floor.





Although we had no shortage of subject matter to film, we were made acutely aware of the changes global warming were wreaking upon the ocean: also, we heard some comments among local fishermen that the fishing fleets in the south were taking too many pilchards, and that was another reason the Sardine Run was not reaching the beaches. Certainly our experience of the fishing boats was to show that both the government and the fishermen were taking their quotas seriously. Learning from other nations mistakes, the sardine/pilchard fishery in South Africa has been sustained much much longer than elsewhere. The industry only really got started in the 1960s in South Africa (whereas in Europe and the USA the fisheries were all but gone by the 1940s). It seemed as though the boom was to be short lived when the sardines all but disappeared in the late Sixties: bans and strict controls were put into place, and the stock rebounded. So now, the South African government has much more control over what is taken in the purse seine nets.

In 2007 we heard rumours of a resurgence of the sardine shoals on the West Coast... whether this is because of the absence of the fleets on that coastline, or because temperature changes are altering the behaviour patterns of the southern bio-mass is difficult to tell.

It was the second year of underwater shooting that gave us our best sequences and assured the climax of the film, which is a compilation of several bait-balls shot off Port Elizabeth and Port St Johns. With DJ Roller and Vance Weiss in the the thick of the action, surrounded by sharks which were at least inquisitive, at most, frenzied, an incredible 3D experience had been captured.



Putting the film together, editing and composing the soundtrack simultaneously, we also continued to conduct research for our narration. The more we read about sardines, pilchards and herring around the world, the more we realised how much the ocean had changed in the last 100 years.

Many years ago, Luke and I had spent some time diving around Sardinia, the island that gave the fish its name. We didn't see a single sardine, and actually saw little life there at all. Pristine, clear water, and somewhat barren underwater landscapes. In the first draft of our script we intended to shoot in Sardinia, to show the empty ocean. We knew that there had once been a thriving sardine industry in the UK, in Cornwall, but didn't realise the extent of it till we read the book SEA CHANGE by Richard Girling:

"In 1834, it is claimed, thirty million pilchards were landed in a single hour (in Cornwall)... in the early 1900s, for whatever reason, the shoals simply stopped coming..."



During the African sardine run, spotters watch the ocean from the cliff tops, ready to spread the word by cellphone should they see the black shoals swarming beneath the waves. Back in the eighteen hundreds, people stood on cliff-tops in the UK's west country. They were known as Huers: when they saw the shoals darkening the sea, they would let out a Hue and Cry, to spread the word that the British sardine run had begun.

The rise and fall of the sardine industry in Monterrey Bay, California has been well documented: the decline of Cannery Row is part of American history. The sudden collapse of

the sardine populations off Peru was more recent: some of this collapse being attributed to El Nino and changes in the Pacific environment.

We discovered that whilst some talked of overfishing, others claimed evidence of climatic variations which took place over several decades, seeing populations rise and fall, sardines replaced by anchovy populations and vice versa.

It wasn't until we came across the work of Callum Roberts, and particularly his book "The Unnatural History of the Sea" published late 2007, however, that the extent of mans influence upon the Ocean became all too clear.

Migrations and feeding frenzies far larger than the ones we witnessed in the making of this film, used to be annual events in the seas of Europe and the Oceans of the Americas. When the rivers of the northern hemisphere ran clear and clean, the estuaries were nurseries for much of the open sea's fisheries.



Through the transformation of our rivers by agriculture and industry, with a combination of silt and chemical pollution, we have destroyed these nurseries. Through ever more heavily industrialised fishing we have taken almost all the sea has to give: and our trawlers have scratched and pummelled the sea bed the world over, destroying deep cold water coral and vegetation... habitat for many juvenile species.

In the mass killing of the predators at the top of the food chain (the whales and sharks) we also are unwittingly breaking the entire chain: without their natural process of death and decay, the plankton that depends upon them will no longer thrive. Thus they can no longer be converted into food for the larger predators by the pelagic fish... the entire food chain collapses as a result.

This has other implications: plankton and algae are an important part of the worlds oxygen/ CO2 cycle... by disrupting their development we contribute in yet another way to global warming and climate change.

Marine Reserves have consistently shown themselves to be a way to restore the fecundity of the Ocean. It has been noted how fish stocks rebound during wartime as fishing is suspended, often far beyond expectations. The marine reserves that are "no take zones" replicate this process, but are also proven to have a "spillage" effect, whereby the fish stocks

surrounding the reserves improve, and local fishermen benefit as a direct result. This was predicted by Marcel Herubel as long ago as 1912.

Callum Roberts concludes:

"The creation of national and international networks of marine protected areas, together with some simple reforms in the way we fish, could reverse this run of misfortune. It will take concerted public pressure and political will to change attitudes that have become entrenched over hundreds of years. But if today's generations do not grasp this opportunity, tomorrow's may not get the chance because many of the species now in decline will have gone extinct."

Far far less than one percent of the Ocean is protected. This has to change if life is to continue as we know it. With a global network of marine reserves, and the restoration of our rivers and estuaries, there would be hope for our Oceans.

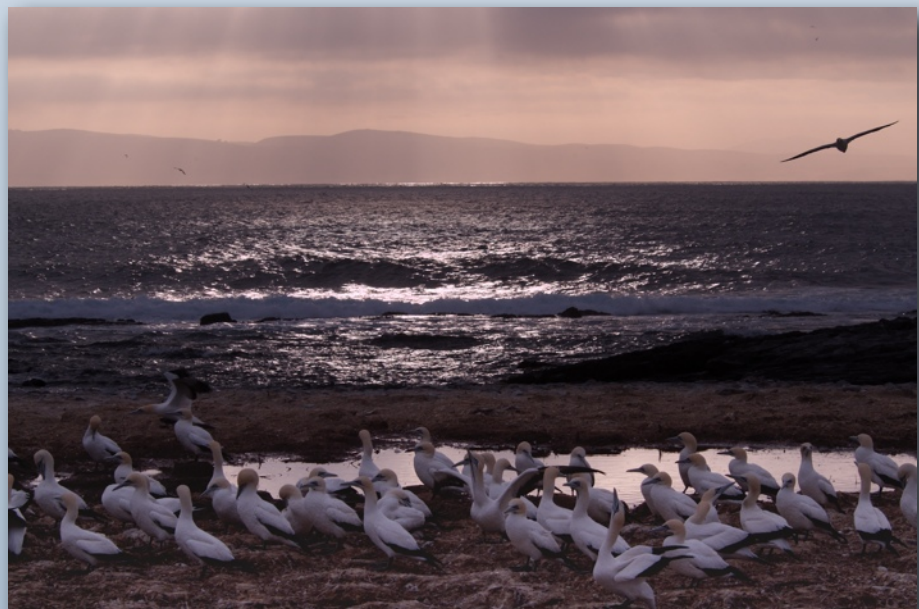
Coming back to South Africa, we started to see positive signs:

"Our oceans and marine resources are global treasures, and we will act, in partnership with our coastal communities, to ensure that they thrive, expand and teem with life."

South African Ministry of Environmental Affairs

The Wild Coast was recently included in South Africa's network of Marine reserves. With the country pledging to protect 20% of its coastline, including estuaries. A proposed highway along the Wild Coast was stalled by the Ministry of Environmental Affairs as a potential threat to the ecology of the region. With strict controls over the sardine industry, it really looks as if South Africa, despite its many socio-economic problems, is prepared to show the rest of the world how to manage its marine resources.

This was why it became so important for us to have a South African narrator: this last element of our film being recorded in Johannesburg in December 2007 with Tony award winning actor and playwright, **John Kani**.



Food for Thought

Over 10,000 plant and animal species - almost 15% of the coastal species known worldwide - are found in South African waters, with about 12% of these occurring nowhere else... It is estimated that 80% of the world's tanker traffic passes South Africa's coast.

South African Government Information

You must remember in the old days you could walk knee deep in sardine lying on the beach, and that hasn't happened for years. The ocean comes alive when the sardine run happens. It's amazing. You guys unfortunately haven't seen the best of it.

Roger Allchin, Bates International

(advised and helped throughout the shoot)

An adult dusky shark was found with 621 sardines in its stomach.

South Coast Factfile

It is harder to kill off fish than mammals. But after 1,000 years of hunting the Atlantic Cod, we know that it can be done.

Mark Kurlansky, COD

We are eating today what our grandparents used as bait

Daniel Pauly, University of British Columbia co author In a Perfect Ocean

Nearly 1,000 whales, dolphins, and porpoises drown every day when they become entangled in fishing gear

WWF, the global conservation organisation

89% of hammerhead sharks and 80% of thresher and white sharks have disappeared from the North East Atlantic Ocean in the last 18 years, largely due to bycatch.

WWF, the global conservation organisation

Where detailed data are available we see that the average size of these top predators is only one fifth to one half of what is used to be. In many cases, the fish caught today are under such intense fishing pressure, they never even have the chance to reproduce

Dr. Ransom Myers, Dalhousie University

As of 1995 some 37,000 industrial-sized fishing ships, plus about a million smaller boats, were between them taking twice as many fish from the sea as they had just twenty five years earlier.

Bill Bryson, A Short History of Nearly Everything

Sharks have survived 5 major extinctions, but with 10s of millions of sharks killed each year for the shark fin trade the question we should be asking is "will sharks survive us?"

UK Sharks Trust

Farming as we do it is hunting, and in the sea we act like barbarians...
The sea is the universal sewer.

Jacques Yves Cousteau



A group of Bottlenose off the Wild Coast



A shoal of sardines on a KwaZulu Natal beach

Let us have plenty of reserves... where life is assured to the reproductive adults as well as to the young, whence the surplusage would radiate in all directions...

Marcel Herubel 1912

Fishes, invertebrates and seaweeds typically have grown 28% bigger and have become 166% more abundant inside marine reserves

PISCO the science of Marine reserves

Recommended Reading:

The Unnatural History of the Sea

Callum Roberts

Cod

Mark Kurlansky

Wild Seas, Secret Shores of Africa

Thomas P Peschak

Mkambati and the Wild Coast

Div de Villiers and Dr Ian Player



Original Text and Photography by Luke
Cresswell and Steve McNicholas
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