

Reefunding fishermen – Marine Conservation in Lyme Bay.

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One of the greatest threats to marine sessile species in Lyme Bay is fishing activity. Line snagging on species like the pink sea fan can lead to fouling, trawling can smother filter feeders with a layer of sediment and whole communities can physically be removed by dredging. Unlike clearly visible land-based activities, the water column masks the effects of fishing on benthic communities, and it has been difficult to truly appreciate the damage that has been done.

In the early 1990s local recreational divers expressed concern to the Devon Wildlife Trust (DWT) that damage was being caused to reef communities apparently from scallop dredging. DWT got involved and conducted several surveys, firstly to establish if scallop dredging was responsible and secondly to identify the most vulnerable reef habitats. A “before-after” dredging survey using a team of divers and a video camera provided strong evidence that scallop dredging was the primary culprit. Of the 8 main reefs between Exmouth and West Bay, 3 of them were particularly vulnerable to dredging, Saw Tooth Ledges, Lanes Ground and Beer Home Ground. A fourth reef, the “Exeters” off Exmouth, had been dredged to such an extent that the soft mudstone ledges had been reduced to more of a plateau. It was DWT’s greatest concern that the underlying reef habitat on other reefs would be similarly eroded and would become unsuitable for colonisation.

Fishing activity on and around the reefs

Pots have been set on the reefs for centuries. Many of the boats from small villages such as Beer have a limited range and are dependent on the reefs for edible crab and lobster. They also set nets to benefit from the high quantities of finfish that congregate around the reefs and take angling trips during the summer. While some inshore trawling does occur, the majority of mobile activity around the reefs is scallop dredging. Scallop dredging is a relatively new activity, having been practised heavily for the last 30 years or so, primarily because scallops are such a lucrative species. In recent years the market has been flooded from vessels fishing offshore with 20 + dredges aside. This has lowered the price and increased the pressure on the stock as fishermen have had to fish harder to maintain catches. With the introduction of spring-loaded dredges, fishermen have ventured on to harder ground (the reefs) and habitat damage and gear conflict with local potters have become major problems.

Enforcement at sea is a constant problem and local potters have lost much gear from rogue boats not prepared to abide by the gentlemen’s agreements that have been established. One major issue is uncertainty in the fishing industry. Days-at-Sea legislation has been brought into the North Sea limiting the amount of days that fishermen can fish and South West fishermen have been concerned that the same will be brought in here. They are consequently reluctant to enter into agreements with organisations like DWT because they do not want to shoot themselves in the foot by further limiting fishing effort spatially. Furthermore, the absence of property rights in the fishery means that even if fishermen do enter into an agreement to see an area closed to fishing, it may not be them that benefits from the increase in the stocks. They are concerned that nomadic vessels will arrive, make the most of the booming stocks and then move elsewhere.

Monitoring of closed areas

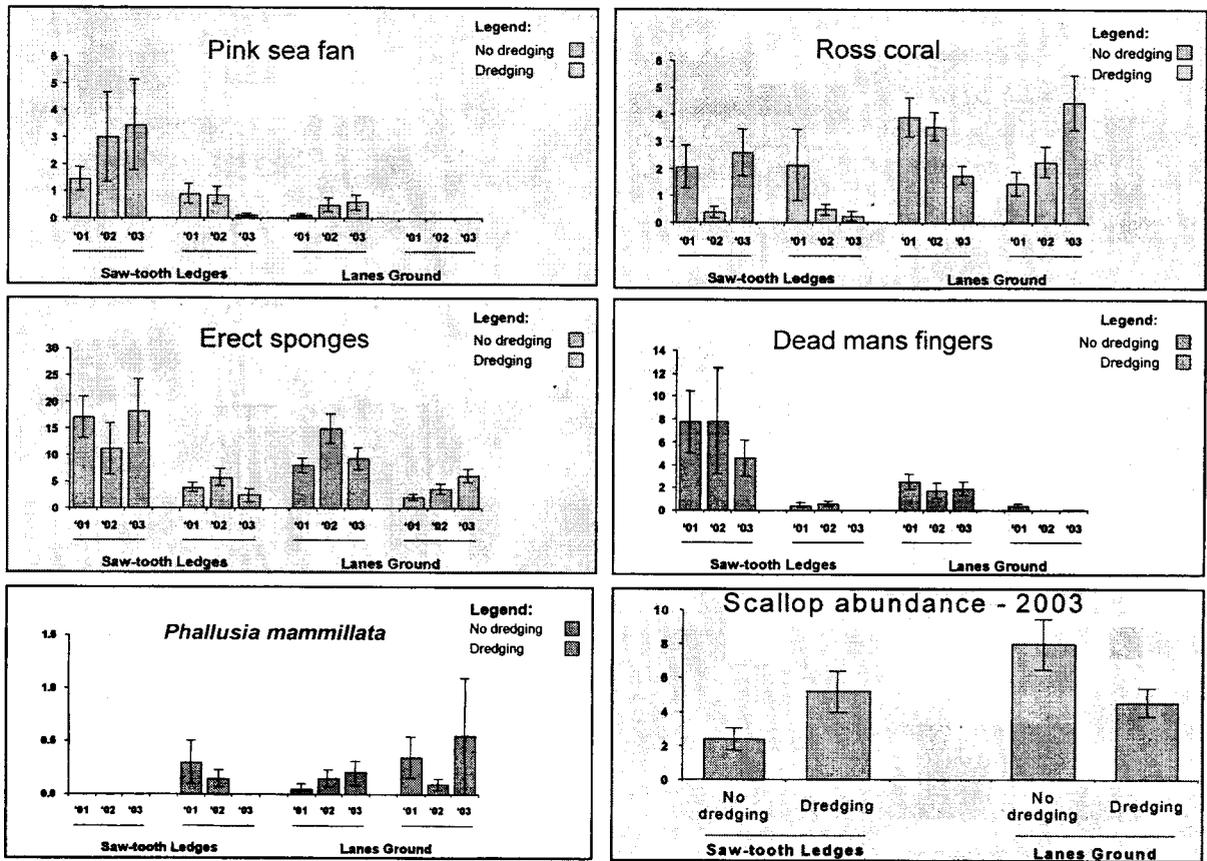


Figure 1: Annual monitoring data for the 5 indicator species and king scallops for closed and control areas in Lyme Bay. For each of the indicator species the abundance is in number of individuals per 2 m x 2 m quadrat. For scallops it is the abundance of scallops in a 10 m x 2 m transect.

Despite all of these difficulties, in 2001 DWT had tremendous success by securing two areas that were voluntarily closed to dredging in Dorset, Saw Tooth Ledges and Lanes Ground. DWT started monitoring these and each summer send down a team of divers who, using a quadrat, measuring the abundance of 5 indicator species. In 2003, for the first time they also measured the size and abundance of scallops to assess if the closed areas were having direct benefits for the fishery.

To date, results have been encouraging with a significant difference in the abundance of pink sea fan, erect sponges and dead mans fingers between the closed and open areas (Figure 1). Pink sea fans seem to have shown a recovery each year although caution is needed with these data because the pink sea fan is such a slow growing species and recovery will not be immediate. The scallop abundance at Lanes Ground was higher in the closed areas than in the dredged areas but the difference, although encouraging was not significant. In Saw Tooth Ledges there were actually less scallops in the closed area than in the open area. This may have been caused by a high concentration of commercial diving for scallops or simply that the substrate sampled was bare rock and unsuitable habitat for scallops. It is important to stress that these results do not fully indicate that the differences are due to the recovery of the reefs as the original areas were selected on the basis that they were the best sites and most worth protecting. This probably also coincides with the areas that were the most difficult to dredge. When comparing open with closed sites there is also the

assumption that those that are open to dredging will actually be dredged and this may not actually be the case. The patchiness of fishing effort and the variation in prices may mean that fishermen decide to trawl rather than dredge.

Finally, substrate plays an important part in determining what grows there. Much of Lyme Bay around the reefs is a mixed substrate of boulders, cobbles and gravel but there are also patches of mud. In the 2003 survey the differences in substrate between some of the sites in the open and closed areas were obvious to the dive team. Some of the quadrats in the open areas landed on ground that was predominantly silt that would not be expected to support sea fans. This could positively bias the results and is something that has been taken into consideration for the 2004 survey.

Moving on to Beer Home Ground

The areas that were closed in 2001 were the areas of most diversity but least importance for fishermen. There is considerably more at stake economically on Beer Home Ground. Initially when entering into discussion with fishermen about Beer Home Ground the response we received was that there was not an inch of the area that had not been heavily dredged and that there would be nothing worth protecting anyway. So DWT agreed to conduct an extensive survey of the reef prior to doing anything else. We also agreed to investigate ways of enhancing the scallop fishery and guaranteeing a higher market price for fishermen.

Underwater survey

Our aims in surveying the reef were a) to identify physically where the reefs were and b) to identify at a broad biotope level what lived there.

Several people initially suggested that we would be able to achieve this with the acoustic ground discrimination systems QTC-view or Roxann but the size of the corals would be too small to create a strong signal. Dive surveys were prohibitively expensive and so we opted to map the seabed using side scan sonar. The advantage of this was that we already had a broad scale side scan sonar map of the whole of Lyme Bay from the Hydrographic Office that we could validate with the new tracks. We then sent down a video camera at different locations to drift with the tide and record what we saw. Combining the side scan map with nearly 70 tracks of underwater filming, we have been able to get a comprehensive understanding of the reefs that has amazed both us and the fishermen. The extremely positive part of the survey was that there were pockets of soft corals and sponges that seemed to have remained fairly untouched. Although the fishermen persisted in their view that they had fished every inch of ground, they eventually conceded that the evidence of large pink sea fans on the rockiest ground was proof that they must have missed some areas. Interestingly, these pockets coincided with the highest densities of pots. Because of the gentlemen's agreement for dredgers not to fish on the pots, the pots had acted to provide protection for those areas. The combination of map and video has allowed all of the members of the working party to see for the first time what Beer Home Ground looks like. We have been able to prioritise areas that require further protection and discussions are ongoing with fishermen about further voluntary closed areas. Unfortunately the dredging activity is ongoing and even within the last 6 months areas containing large pink sea fans have been heavily dredged and the sea fans are gone.

Scallop enhancement

A large slice of our funding comes from the EU through the Financial Instrument for Fisheries Guidance. This money has been provided to move Lyme Bay towards a sustainable fishing industry and one of the key areas we wanted to investigate was scallop enhancement. Working along with Devon Sea Fisheries Committee we have been making and deploying scallop spat collectors. These are designed to provide an artificial substrate that the planktonic stage of scallops can settle on to. Doing this project has been of tremendous benefit for our relationships with the fishermen. It has provided clear evidence that what we are interested in is a sustainable thriving industry and not just putting them out of business.

In 2003 we had hundreds of queen scallops (*Aequipecten opercularis*) per bag and this year we repeated the trials but changing the timing to try and catch more king scallops (*Pecten maximus*). The aim is to grow on the scallops in Brixham harbour and then relay them on the seabed when they are large enough to avoid predation. The record bag contained more than 1200 queens and 50 kings and fishermen are excited about how this can be used to boost the fishery.

Marketing

The final area that we committed to investigate was the marketing side of the industry. Having secured funding from Seafish, we conducted an investigation into where the catch goes once it has been landed. By tracing it from the fishermen to the fork we hoped to see if adding market value somewhere in the chain was possible. If the consumer is being provided with a premium product that is wildlife friendly will they be prepared to pay more? Early indications from this work and many examples from the farming industry is that they are. The problem for Lyme Bay is that currently the majority of the scallops get exported to the continent. This investigation is ongoing and we are hopeful that by using marketing we can move towards a sustainable fishery.

Trust is crucial

Although our work involves research and education, it is futile without good relationships with local fishermen. In the past there has been tremendous suspicion about environmental groups and from a fishermen's perspective they have mostly done more harm than good. Fisheries management is a complex business and the U.S. Secretary of Commerce once remarked that fisheries took up more time than any other industry. Part of the problem is indeed that because no one owns it, no one looks after it and there is a race to maximise profits first. Over and above everything else trust is vitally important. If the fishermen don't trust you then the project will quickly stagnate. The great news from our point of view is that the trust is there. Fishermen do want to work with us although they certainly retain that wariness about the "Greenies". The video of the seabed has had a tremendous impact in enabling all sides of the working party to see what the seabed really looks like. From this viewpoint we have been able to have positive discussions about the way forward. Fishermen are as aware as anyone that closing areas will naturally "reefund" them as habitat and stocks recover. The added incentives that we are seeking to provide go that extra step to further encourage them to look to the future of the industry.