



## Fishing Practices

Gear modifications, such as those used to minimise unwanted by catch (including protected species) will take on increasing importance as the ecosystem approach is developed and applied to fisheries.

Continued fishing by lost gear, emission of exhaust gas with dangerous substances to the atmosphere, pollution from oily waste litter and fish waste all have negative impacts on the ecosystem. Minimising such impacts will require development and successful introduction of alternative cost effective technologies and fishing practices.

## The Future

There is no doubt that the ecosystem approach will shape future exploitation and management of EU fisheries. This will demand a greater insight into how fishing impacts on all the animals of the ocean, the sea bed and the environment.

The substance of many recent international agreements, the state of many fish stocks and an increasing awareness and concern among the public on the state of the marine ecosystem are now major drivers for change.

The need for scientists, managers and industry to continue to work closely together, is greater than ever.

## The Fisheries Science Services Team

In order to ensure the sustainable harvesting of the fisheries resources, it is essential that management is underpinned by sound marine science that is clear, transparent, timely, impartial and inclusive.

The Marine Institute's Fisheries Science Service Team works closely with the fishing industry to provide this marine science through.

- Research Vessel Surveys (Acoustic, Groundfish, Egg and Larval Fish, Underwater TV)
- Surveys on Commercial Vessels
- Market Sampling of Landings
- Discard Sampling at Sea
- Analysis of Logbook Data
- Studies on the Biology of Fish
- Working with the Regional Advisory Councils (RAC's)
- Articles in the trade press
- Working with our international scientific colleagues
- Regular meetings with Industry Representatives and DCMNR
- Regular Meetings with EU

This information is essential to our understanding of the current state of the fisheries resources and the ecosystem in which they live.

More detailed information, as well as similar leaflets on related issues are available from

Marine Institute, Fisheries Science Services (FSS), Rinville, Oranmore, Co. Galway, Ireland. Phone: + 353(0) 91 387200

### Or your local Port Based Technician in

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A DEEPER UNDERSTANDING...

# ECOSYSTEMS



## FISHERIES SCIENCE SERVICES

Assessing, researching and advising on the sustainable exploitation of living marine resources in a healthy ecosystem



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Increasingly, fisheries management is moving towards an 'Ecosystem Approach' to the management of our oceans - not just the fish stocks!

## What are Ecosystems ?

Ecosystems are composed of living animals, plants and non living structures that exist together and 'interact' with each other. Ecosystems can be very small (the area around a boulder), they can be medium sized (the area around a coral reef) or they can be very large (the Irish Sea or even the eastern Atlantic).

One of the first tasks marine scientists must decide on is to define the boundaries of the ecosystem they want to look at (e.g. is it Dublin Bay ? the Irish Sea ? the north east Atlantic?). Once the ecosystem we are interested in is defined then we can think about how this part of the ocean should be managed. This must be agreed by consensus with all the stakeholders (users of the ecosystem). The idea here is that we are managing an ecosystem with many users not just a fish stock exploited by fishermen!

## Why Ecosystem Management?

In many fisheries, by catches of seabirds and marine mammals are caught on lines or in nets. There are many records of dolphin and albatross by catch in the tuna fisheries of the Pacific and Southern Oceans. Other concerns about the effects of fishing focus on the impacts of towed gears on bottom living animals and their habitat (the spaces they live in).

The impact of those who use dynamite and poisons on coral reefs in the Pacific is an obvious worry as is the effects of fish wastes on populations of scavenging birds and fish.

## Food Webs

Fishing can also effect 'food webs' . A simple food web could be shark eat cod who eat whiting who eat pout who eat shrimp who eat worms. What happens when we remove cod? What happens if all the worms die as a result of an oil spill? By removing predators such as fish that eat other fish, or prey, such as small shoaling fish that are eaten by seabirds and marine mammals we alter the ecosystem and change the ocean.

The impact of human's activities on the oceans are now the focus of great debate among scientists, ocean users and the general public. The debate centres on the concept of the 'ecosystem approach to management of our seas'. The fishing industry are major ocean users and have a major role to play in this debate.

## Ecosystem Management of Fisheries

Fishing activity usually affect the ecosystem in ways such as by catch of non target species, physical damage to habitats, impacts on the food chain (e.g. removal of top predators – sharks) and changes in Biodiversity (removal of larger fish) . Fisheries management must consider the broader impact of fisheries on the ecosystem as a whole. The objective of the ecosystem approach is the sustainable use of the 'ocean' as a whole not just a 'targeted species' (e.g. the herring fishery).

Generally speaking, the purpose of an ecosystem approach to fisheries management is to plan, develop and manage fisheries in a manner that addresses the desires of our society in general, without jeopardising the options for future generations to benefit from the full range of 'goods and services' provided by the marine ecosystem. A bit of a mouthful but think about it. ...



## Improved Communications

The ecosystem approach requires the inclusion of all stakeholders views in the decision making process. This will require improved co-ordination and consultations. This will not be easy. Even small ecosystems can be very complex and can include a broad range of stakeholders who may have 'competing' interests and 'conflicting' views.

The inclusion of the views of the fishing industry will be an integral part of ecosystem management.

## What is Driving the Ecosystem Approach?

Interest in an ecosystem approach to fisheries has been motivated by:

- heightened awareness of the importance of interactions between fish, other animals and the ecosystem in which they exist.
- recognition by the general public of the value of fisheries resources and marine ecosystems within the context of sustainable development.
- poor performance of current management approaches as witnessed by the poor state of many of the worlds fisheries.
- recent advances in science, which highlights the value of ocean ecosystems to planet earth and humankind.

The EU have released a green paper on a European vision for the oceans and seas. This will have a large influence on future management of EU fish stocks and is another step towards the implementation of the ecosystem approach.

[http://ec.europa.eu/maritimeaffairs/green\\_paper\\_en.html](http://ec.europa.eu/maritimeaffairs/green_paper_en.html)