

Highlighting land-based effects on fisheries



There is a Māori saying, *te maunga ki te moāna*, meaning that what comes down our streams and rivers affects our coastline and fisheries.

These impacts are growing, as roading and building increases and as we farm and use rural land more intensively. There are also predictions of more extreme rainfall and storms in future years, which will increase the sediments and nutrients washing out to sea.

Recent findings highlight how important it is to protect marine habitats from land-based effects like sediment and nutrient run off.

“There’s increasing evidence from both New Zealand and overseas that land-based activities can have significant effects on fisheries, as well as on the wider ecosystem,” says MFish science manager, Martin Cryer.

“In the North Island’s west coast snapper fishery we have a situation where the entire fishery – from 90-mile Beach to the Kapiti Coast – depends on snapper nursery grounds in the Kaipara Harbour.”



Finding the snapper-harbour connection

A recent study looked at the chemical signature of ear bones (called otoliths) in adult snapper to work out the nursery area that they came from.

Otoliths are laid down each year, much like tree rings, and are commonly used to age fish. The chemical make-up of otoliths depends to some extent on the chemistry of the surrounding water, and this chemical signature lets scientists identify the places these fish have lived during different stages of their lives.

In 2003, researchers from NIWA collected juvenile snapper from the seven main estuaries on this coast, and chemically analysed their otoliths.

“These chemical ‘signatures’ allowed us to distinguish fish from Whangape, Kaipara, and Manukau Harbours individually, and from Hokianga, Raglan, Aotea, and Kawhia as a combined group,” says NIWA scientist, Mark Morrison.

In 2007, when they had grown large enough to ‘recruit’ to the fishery, NIWA collected snapper from the same age class from the commercial coastal fishery. They sampled five zones covering the entire west coast, from Ninety Mile Beach to Mana Island just north of Wellington, with 20–30 fish from each zone.

“Based on the chemical signatures of their otoliths we worked out that 98 percent of these fish had spent their juvenile years in Kaipara Harbour, with the remaining two percent coming from Manukau Harbour,” Mark says.

“This shows that the Kaipara Harbour is a critical component of the wider west coast North Island fisheries ecosystem. So, any negative impacts on the production of juvenile fish in the Kaipara will cascade through into the much larger coastal ecosystem, ultimately affecting the abundance of fish several hundreds of kilometres away.”

In northern New Zealand harbours, the most important habitats for baby snapper are sub-tidal seagrass beds and horsemussel/sponge communities. These have now largely disappeared from many northern harbours, as a result of land-based effects.

“Today, the Kaipara is pretty pristine compared to the Manukau or some other harbours along that coast,” Martin says. “But the Kaipara is under increasing pressure from land development, farm intensification, roading, and forestry in its surrounding catchments.”

People have been concerned about this situation for some time, says MFish inshore fisheries manager, Sarah Omundsen. She says MFish staff members have been talking with Auckland and Northland regional councils about the importance of protecting these last snapper nurseries from land-based effects.

MFish is working to help regional councils and other land managers and planners understand the effects land-based activities are having on coastal fisheries and biodiversity.

“The Ministry doesn’t control what people do on the land, but we can work with the agencies that do control this,” Sarah says. “It’s important we make sure people know what is at stake, in terms of how land-use practices affect fisheries.

“I’m sure that if people knew what effects their activities were having on their local fisheries and ocean, they would be more careful in some of the things they do in their daily lives.”

Community groups, too, have recognised the issue and are working with councils and others to address the problem.

The Integrated Kaipara Harbour Management Group is one such group. Initiated by Te Uri o Hau, Ngāti Whātua and partners, this group has set themselves the task of helping restore the Kaipara Harbour and its fisheries. MFish is a participant in this group along with councils, other government agencies, industries, and non-government organisations.

“This is something we all have to work together on,” says Sarah. “Because we are all a part of this problem, we must all must be part of its solution.”

To help this work, MFish has asked the National Institute of Water and Atmospheric Research (NIWA) to compile a review of these effects and some of the fisheries and ecosystems affected. The review should be available soon.

To find out more about this issue refer to the MFish website and look under ‘environment’.

