

Gorse a potential water pollutant

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A potential source of nitrogen pollution in New Zealand's lakes and waterways has been identified and measured by a leading water and soil quality scientist.

Dr Guna Magesan, a senior scientist with Crown Research Institute Scion, recently completed a two-year study on nitrogen leaching from mature gorse stands in Rotorua lakes catchments.

The results indicate that in the areas studied, gorse leaches between 40-60 kilogram of nitrogen per hectare per annum through the soil into underground waterways and on into the region's lakes. If compared on a per hectare basis, these figures equate to levels of nitrogen leaching from dairy farming.

In contrast, a stand of radiata pines in the control area produced less than 1 kilogram of nitrogen per hectare annually over the same period.

The study, funded by Environment Bay of Plenty, covered two catchments in the Rotorua lakes region, which were monitored over a 20-month period.

"Nitrates and phosphates are two of the major nutrients that damage water quality," says Dr Magesan.

"Our study concentrated on nitrogen, which is an important growth stimulant and contributes significantly to algal bloom and weed growth in water bodies, particularly lakes.

"This in turn can cause environmental hazards, for example making the water harmful for drinking, unsafe for recreation, and uninhabitable for aquatic life.

"Significant sums have been spent both in New Zealand and globally trying to resolve water eutrophication, which is a particular problem in the Rotorua area. Much of the focus has been on agriculture and other sources, but very little research has been conducted into gorse and other leguminous weeds, such as broom."

Dr Magesan says gorse is already widespread in New Zealand. It is highly invasive and fast growing, and has already taken over 900,000 hectares nationwide. It can live here for more than 40 years, and seeds can remain in the soil for up to 30 years.

"Until 1984 the Government offered subsidies totalling \$17 million annually in an effort to eradicate gorse, but these were discontinued because the problem was thought to be unsolvable.

"My hope is that these results will motivate interested parties such the Ministry of Agriculture and Forestry, the Ministry for the Environment and the Department of Conservation to take another look at how we can reduce the detrimental effect of such weeds.

"Areas for research could include not only eradication methods, but also alternative uses for gorse, such as new materials or bioenergy."

Environment Bay of Plenty (EBOP) spokesperson Rob Donald, said the agency commissioned Dr Magesan's study because of the uncertainty about the impacts of gorse on nutrient levels.

"We were aware that there are areas of gorse in the Rotorua lakes catchments but that existing information offered conflicting views on what effect, if any, the weed has on nutrient levels in groundwater. We wanted to fill this information gap, and approached Dr Magesan because of his

expertise in the subject.

“We were very surprised that the research showed such high levels of nitrogen leaching, and are now evaluating the scale of the issue within the Rotorua lakes catchments.

“It is thought that the area covered by gorse in the lakes catchments is relatively small but without detailed information it is difficult to put the problem into perspective. We are now measuring gorse coverage, after which we will be better positioned to plan appropriate remediation policies if and where necessary.

“The research again points to land use being a major factor in managing lakes’ water quality. The more information that becomes available on both sources of nutrient pollution and best land management practices, the better the region will be equipped to resolve the problem.”

Dr Magesan has now started discussions with some local governments on extending his research to other areas of New Zealand.

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