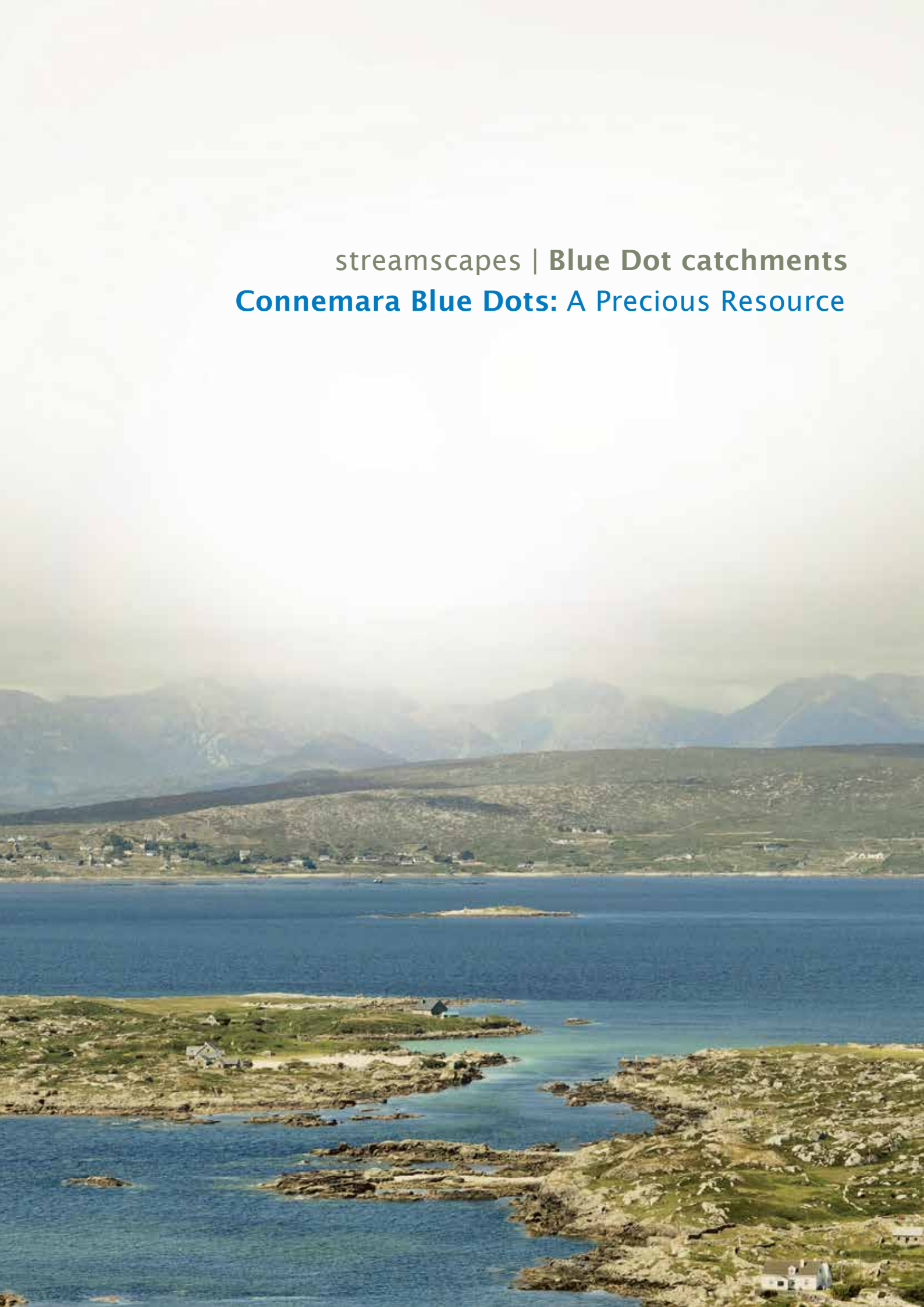


streamscapes | **Blue Dot catchments**
Connemara Blue Dots: A Precious Resource



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SAFETY FIRST!!!

The 'StreamScapes' programme involves a hands-on survey of your local landscape and waterways; safety must always be the underlying concern. If you are undertaking an aquatic survey, remember that all bodies of water are potentially dangerous places. Slippery stones and banks, broken glass and other rubbish, polluted water courses which may host diseases, poisonous plants, barbed wire in riparian zones, fast moving currents, misjudging the depth of water, cold temperatures – all of these are hazards to be kept in mind. If you and your group are planning a visit to a stream, river, canal or lake for purposes of assessment, ensure that you have a good ratio of experienced and water-conscious adults to students, keep clear of danger and insist on discipline and caution.

The Blue Dot Catchments programme's vision: "Collaborating with local communities to protect and improve our pristine waters so that the benefits to biodiversity, our health and well-being, our heritage and the climate can be enjoyed by current and future generations."

This booklet introduces four of the Connemara Blue Dot Catchments, so that we can better understand the wonders of these incredible water bodies in our midst, the issues that we face in protecting them and to motivate us to contribute to safeguarding these riches.

Don't forget to watch the new 'Connemara Blue Dots' short film at:

<https://www.youtube.com/watch?v=Ch2EGXwNX1A>

INTRODUCTION

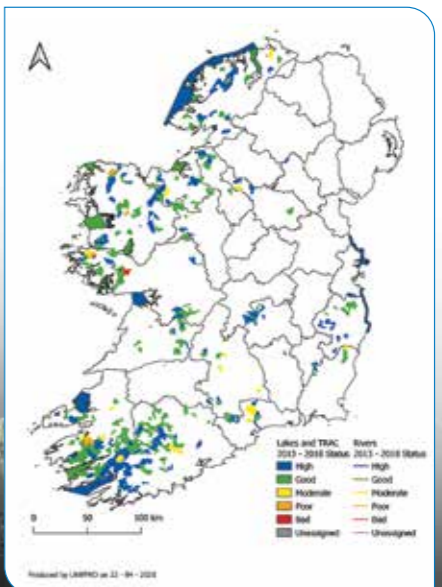
What is a Blue Dot? Why the Blue Dot Catchments programme?

Ireland is a land shaped by rock and water; from the ancient glaciers which carved our mountains and valleys to our modern-day lakes and rivers, water has sculpted this landscape for millennia. Clean water is vital for all life, and it is critically important for some of our rarest plants and animals, which thrive on pristine water flowing through an ecologically healthy landscape. Situated on Ireland's west coast, Connemara has long hosted some of our most pristine and sensitive waters. These waterbodies are a refuge for species which were once commonly found across Europe but are now sadly in decline. Under European Union Directives, all member states, including Ireland, must prevent the ecological deterioration of all surface waters; we, and our communities, have a vital role to play in achieving the aim that water bodies in healthy ecological condition or 'high status' will not decline. The Environmental Protection Agency (EPA) has identified the waters in Ireland that should have a high-status objective and these are more commonly known as Blue Dot waters or Blue Dots. Our Blue Dot waters include rivers, lakes, estuaries and coastal waters. In these pages, you can learn about the wonders of these Connemara Blue Dots and how we can help conserve them.

CONOR RUANE, COMMUNITY WATER OFFICER, LAWPRO



Blue Dot waters are our best quality waters, of which Connemara has many, including rivers, lakes, estuaries, and coastal waters!



The Owenriff Blue Dot Catchment

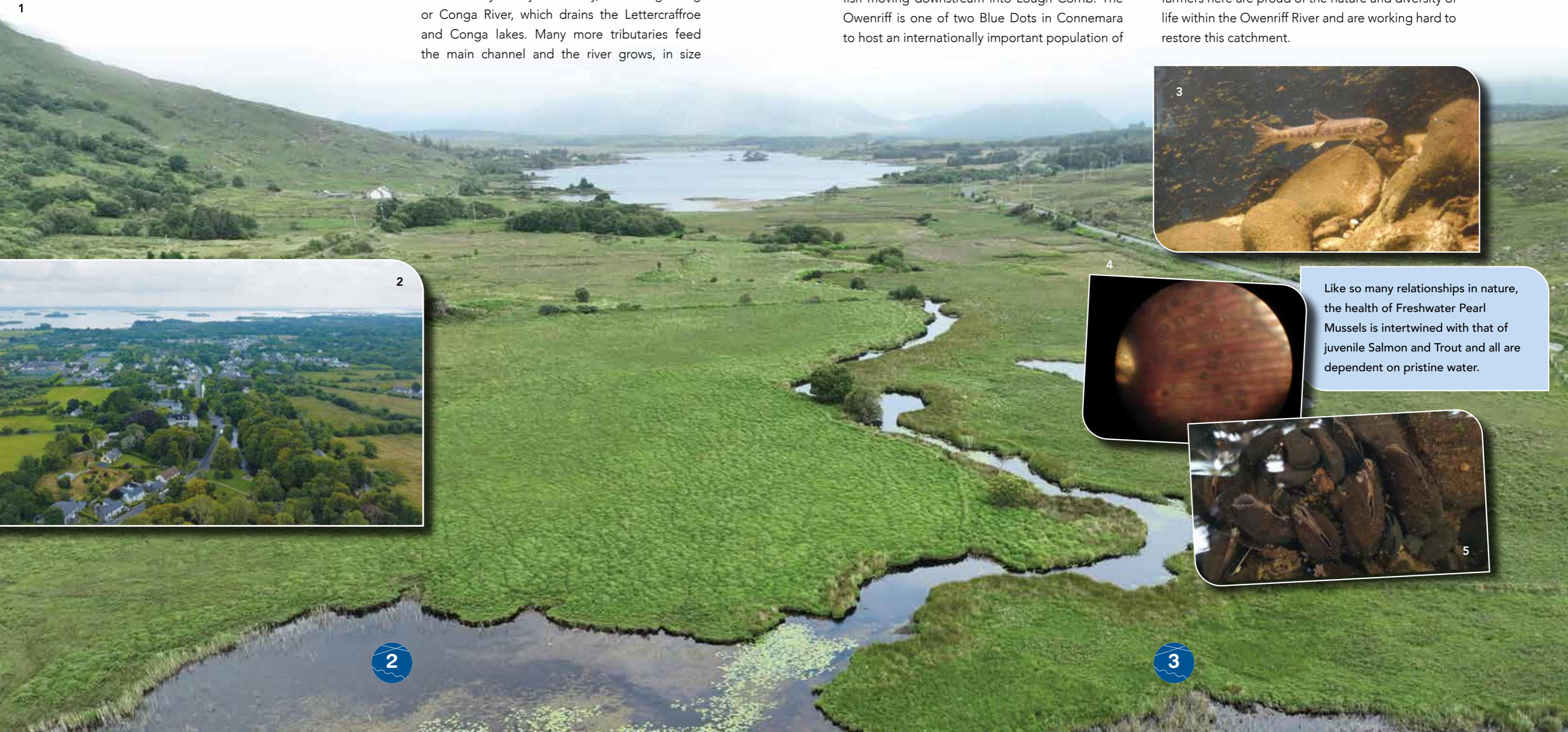
- 1 Looking upstream towards Loch Bó Finne in the Owenriff Catchment
- 2 Oughterard town: where the Owenriff meets Lough Corrib
- 3 Juvenile Salmon
- 4 Microscopic Freshwater Pearl Mussel juveniles – ‘glochidia’ – on a trout gill
- 5 Adult pearl mussels

The Owenriff Blue Dot Catchment is located to the west of Lough Corrib, the river flowing through the town of Oughterard, Co. Galway, before entering the lake. There are actually two Blue Dot waterbodies within this catchment: the Owenriff River and Lough Bofin/Loch Bó Finne further upstream.

The Owenriff River/Abhainn Ruibhe (Sulphur River) is the main river within the catchment. It rises 16km west of Oughterard in Loughaphreaghaun/Loch an Phréacháin. It flows through Lough Bofin, then moves southeast towards Lough Adrehid, under the ‘Quiet Man’ Bridge and through to Lough Agraffard. The Owenriff is then joined from the south by a major tributary, the Glengawbeg or Conga River, which drains the Lettercraffroe and Conga lakes. Many more tributaries feed the main channel and the river grows, in size

and power, before tumbling over the waterfalls upstream of Oughterard. At certain times of year, you see Salmon and Brown Trout jump the waterfalls at Oughterard as they migrate upstream to spawn. The Owenriff River is an important habitat for Salmon and Trout and is also an important fish migratory corridor for young fish moving downstream into Lough Corrib. The Owenriff is one of two Blue Dots in Connemara to host an internationally important population of

Freshwater Pearl Mussels which are some of Ireland's oldest living creatures. This catchment has provided a healthy ecosystem for these animals for centuries but, due to declines in water quality and to introduced non-native species in recent years, Salmon, Trout and the Freshwater Pearl Mussel have suffered and their numbers are declining. Many communities and farmers here are proud of the nature and diversity of life within the Owenriff River and are working hard to restore this catchment.



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Like so many relationships in nature, the health of Freshwater Pearl Mussels is intertwined with that of juvenile Salmon and Trout and all are dependent on pristine water.

The Cashla Blue Dot Catchment

- 1 Overview of the Cashla Blue Dot Catchment
- 2 The Cashla River moves dynamically through a peaty landscape
- 3 Anglers come from all over the world to fish the Cashla River

The Cashla Blue Dot Catchment is located north of the villages of Casla/Costello and Ros an Mhíl/Rossaveel. The Cashla River/Abhainn Chasla is the main river of this catchment and has its origin approximately 15km from Casla and Ros an Mhíl Baile, as a collection of small lakes and streams flowing through peatland and forestry located in the hills of Seanabhán/

Shannawona. The main channel is joined by streams flowing in from two lakes before flowing into Loch an Chlochair/Aclogher Lake, then continues its journey in a southwesterly direction through a number of lakes such as Formoyle Lake/Loch Fhormaoil and Glenicmurrin Lake/Loch Ghleann Mhac Muirinn. Past these lakes, the river flows southward, widens and becomes

tidal before entering Clynagh Bay near Cashla. The Connemara Bog Complex Special Area of Conversation (SAC) and Special Protection Area (SPA) cover most of the Cashla Catchment; a number of rare species are present, including Salmon, Sea Trout, Otter, Slender Naiad along with rare breeding birds such as Golden Plover and Merlin, and breeding Cormorants. The

catchment is also home to rare peatland grass habitats and old Oak woodland. The coastal nature of this catchment is important for returning Salmon and Sea Trout, with the river pools and lakes in the Cashla Catchment forming part of the Costello and Fermoyle Fishery. Anglers come from all over the world to fish these waters and enjoy the beautiful scenery.

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The Dawros Blue Dot Catchment

The Dawros Blue Dot Catchment has an area of approximately 58 km² located to the east and north of Letterfrack, Co. Galway. The headwaters of this catchment are formed by numerous, fast-flowing mountain streams in a northern valley of the Twelve Bens mountain range, to the east of Connemara National Park. These streams flow down through a vast peatland habitat and join to form the Kylemore River. This river flows in a northeasterly direction before turning north and then west where the river flows into Kylemore Lough and then Pollacappul Lough, which is overlooked by Kylemore Abbey. The lakes are also fed by

several dazzling mountain streams. The outflow of Pollacappul Lough forms the main channel of the Dawros River which is then joined by a major tributary called the Polladirk River, downstream of Kylemore Abbey. The Polladirk River courses down from the mountain valleys of Diamond Hill in Connemara National Park, flowing northerly to where it meets the Dawros. Due to the different rock types these rivers flow through, the riverbed of the Kylemore River is dark, dull and grey while the Polladirk River is much brighter and clearer. Toward the end of its journey, the Dawros River meanders through more peatland north of Letterfrack before cascading down rocky falls and into Ballynakill Harbour. The

Dawros Blue Dot Catchment is one of the top eight Freshwater Pearl Mussel catchments in Ireland and supports a major population of this endangered species. The peatlands and wetlands in this catchment provide the necessary conditions for the Freshwater Pearl Mussel to thrive. Farming families have lived and worked alongside these miraculous creatures for centuries and it is vital that we continue to farm in a sustainable manner and help preserve our Freshwater Pearl Mussels. The Dawros River also

supports migratory Salmon, Sea Trout and Eels, while Kylemore and Pollacappul Loughs are home to Arctic Char. A glacial relict species, this population of Arctic Char has become isolated from other char populations. Thousands of years ago, the geographic range of this species was retreated northwards at the end of the last ice age, and it is now one of the rarest and most vulnerable fish species in Ireland and throughout Britain and continental Europe.

- 1 A view of the scenically stunning Dawros Blue Dot Catchment
- 2 Arctic Char juvenile fry
- 3 Adult Arctic Char

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Kilkieran Bay & Loch an Aibhnin Blue Dot

Kilkieran Bay is a marine example of Blue Dot waters. This catchment is located just north of Galway Bay and extends from Keeraun Point, south of Carraroe, westwards to Ardmore Quay and to all the waters northward towards Inver. Kilkieran Bay Blue Dot forms part of the Kilkieran Bay and Islands SAC. The waterbody contains a large area of open marine water, many islands

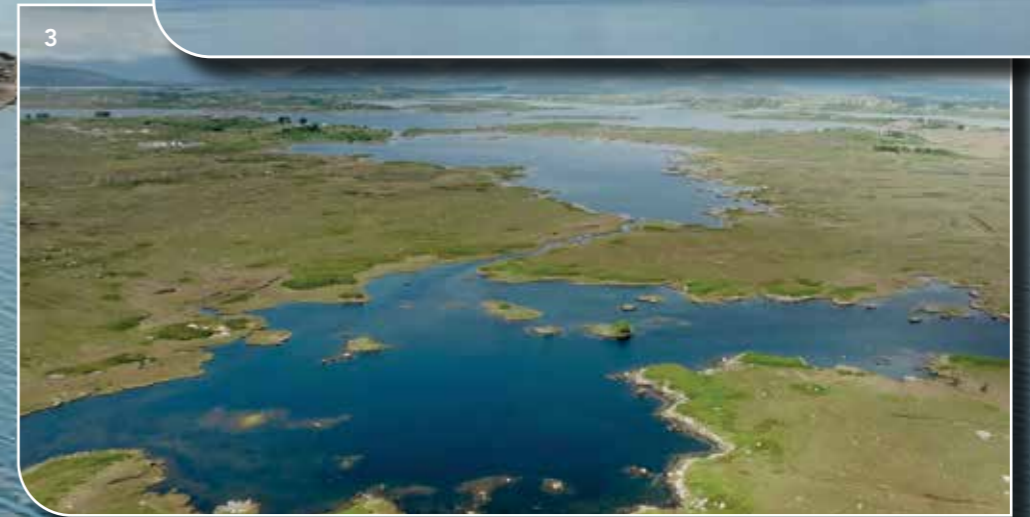
and rocky islets, and the coastline is much indented with a series of bays (and, notably, inter-connected channels and inlets). The marine habitats found within Kilkieran Bay are of very high conservation value. A high number of species that are rare or considered to be worthy of conservation in Ireland occur in the area, such as the extensive and varied beds of free-living red calcareous algae or maerl (known

locally as 'coral'). Though brightly coloured when underwater, dead algae that break off from the maerl beds wash up on local shores and, bleached by the sun, become bright white which gives local beaches such as Trá an Dóilín (Coral Strand) their name. The Kilkieran Bay and Islands SAC is extremely important for the number of coastal lagoons. This is considered to be one of the best

- 1 The enchanting Coral Strand on Kilkieran Bay
- 2 The sea and landscape of the Kilkieran Bay SAC
- 3 Aerial view of Lough Nacrimina/Loch Tanai and Loch an Aibhnin

sites in the country for this habitat which includes saline lake lagoons situated on peat. This habitat type is rare in Europe but characteristic of south Connemara. Finally, Loch an Aibhnin is a large tidal saline lake which hosts Otter, Common Seal and Grey Seal, as well as important colonies of seabirds, particularly breeding terns.

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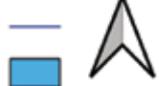
Connemara Blue Dots: A Precious Resource

Legend

Owenriff and Cashla Blue Dot



Rivers



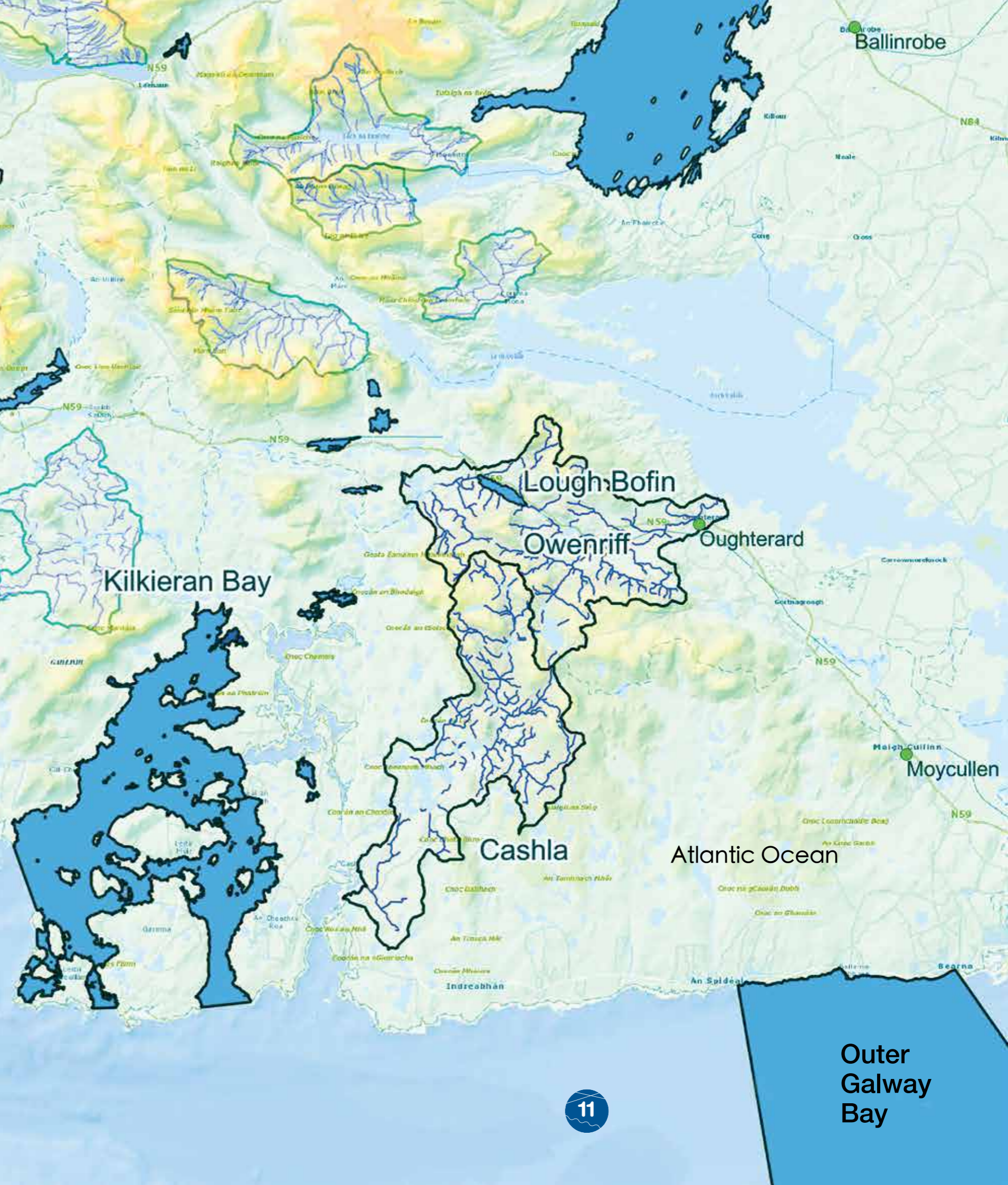
Blue Dot Lakes/Transitional/
Coastal Waterbodies



Other Blue Dot River Waterbodies



0 2.5 5 km



What makes a good river?

We have seen how far our Salmon can travel into the Atlantic Ocean after leaving its river. But let's go back, like the Salmon, and look at the important spawning and nursery habitats in our rivers.

What makes a good, healthy river? Salmon are very fussy about their homes (habitats): they favour sparkling water tumbling over crisp gravels in the dappled light of a diverse riparian zone. For nutrition, they depend on a suite of organisms

that share their requirement for a pristine aquatic environment. Where geography allows, a healthy river will freely meander, snaking through the landscape and creating wetlands in level, low-lying areas. The river's depth will be constantly changing, with a pool-riffle-pool continuity. Pools offer calmer waters where larger fish will rest, while riffles are shallow, fast-flowing areas which recharge the oxygen content of the water and provide spawning and nursery habitat for Salmon.

What about waterfalls? No bother; Salmon will leap up nearly 4m to ascend a waterfall and access habitat above it.

What else do we look for? A healthy river will have stable banks, interspersed with native trees, shrubs and plants which attract birds, bats and insect life and also contribute leaves and woody debris into the stream which act as food sources for insects. An intact and robust riparian zone can help buffer the effects of both urban

and rural land-use impacts, including silts and pollutants, which can limit a river's capacity to support a wide range of biodiversity.

Just remember: a river and its entire catchment, its geology, the landscape and the weather, with all its life forms from microscopic bacteria through plants, invertebrates, birds, fish and mammals (including humans), together create a complex ecosystem that needs clean, clear water at its heart!

A river and its catchment, together with all of its life forms, combine to create a complex ecosystem dependent on clean, clear waters

Native trees, shrubs and plants stabilise banks and provide food and energy to nourish all life

Rain: "Low-anchored cloud [...] fountain-head and source of rivers" – Henry David Thoreau

Balanced bankside vegetation allows 'dappled light' (patches of light interspersed with patches of shadow) to reach the river

Waterfalls? No problem! Salmon can leap up to 4m high!

Good 'buffer zones' protect the river from impacts of adjoining human activities

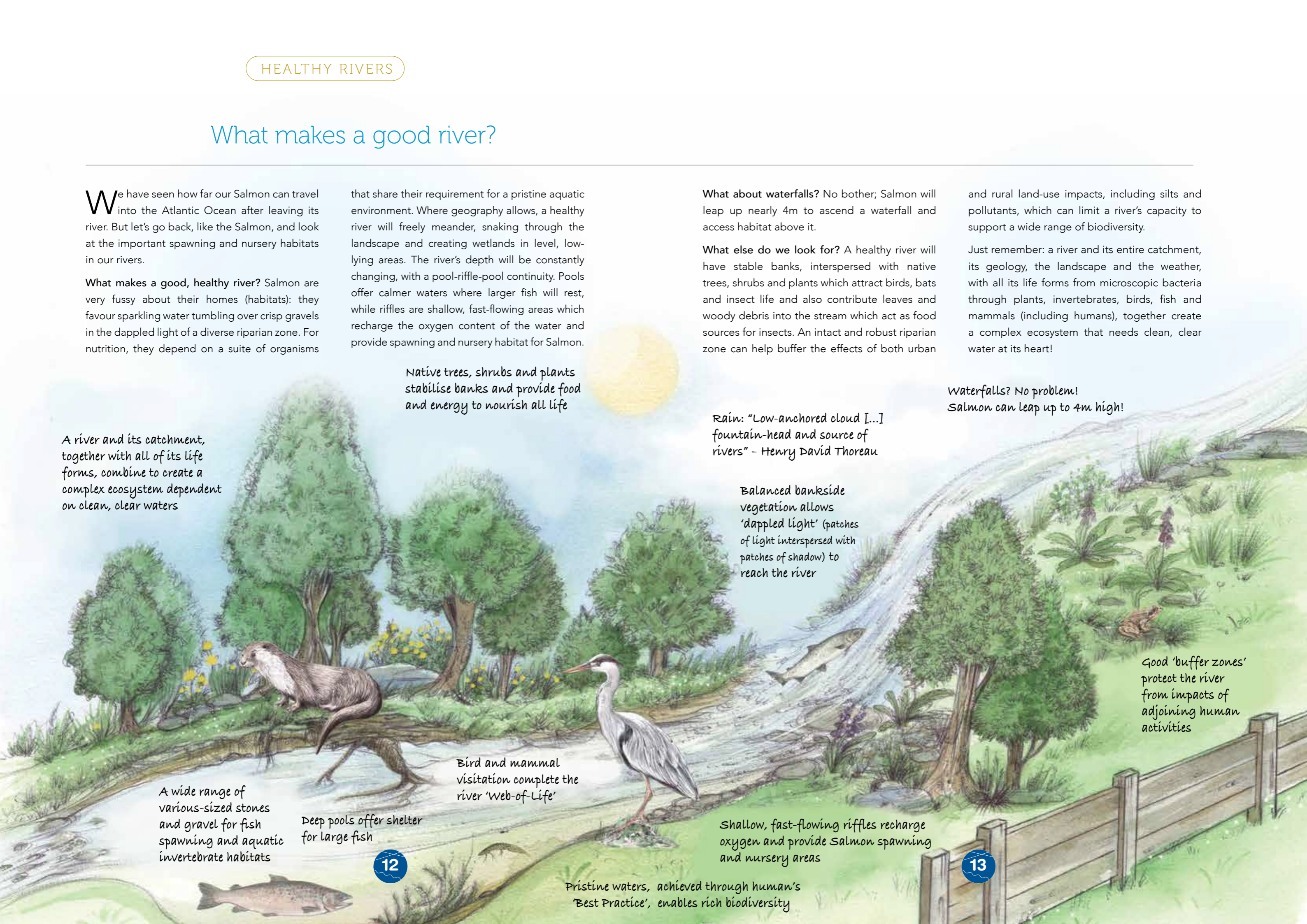
A wide range of various-sized stones and gravel for fish spawning and aquatic invertebrate habitats

Deep pools offer shelter for large fish

Bird and mammal visitation complete the river 'Web-of-Life'

Shallow, fast-flowing riffles recharge oxygen and provide Salmon spawning and nursery areas

Pristine waters, achieved through human's 'Best Practice', enables rich biodiversity



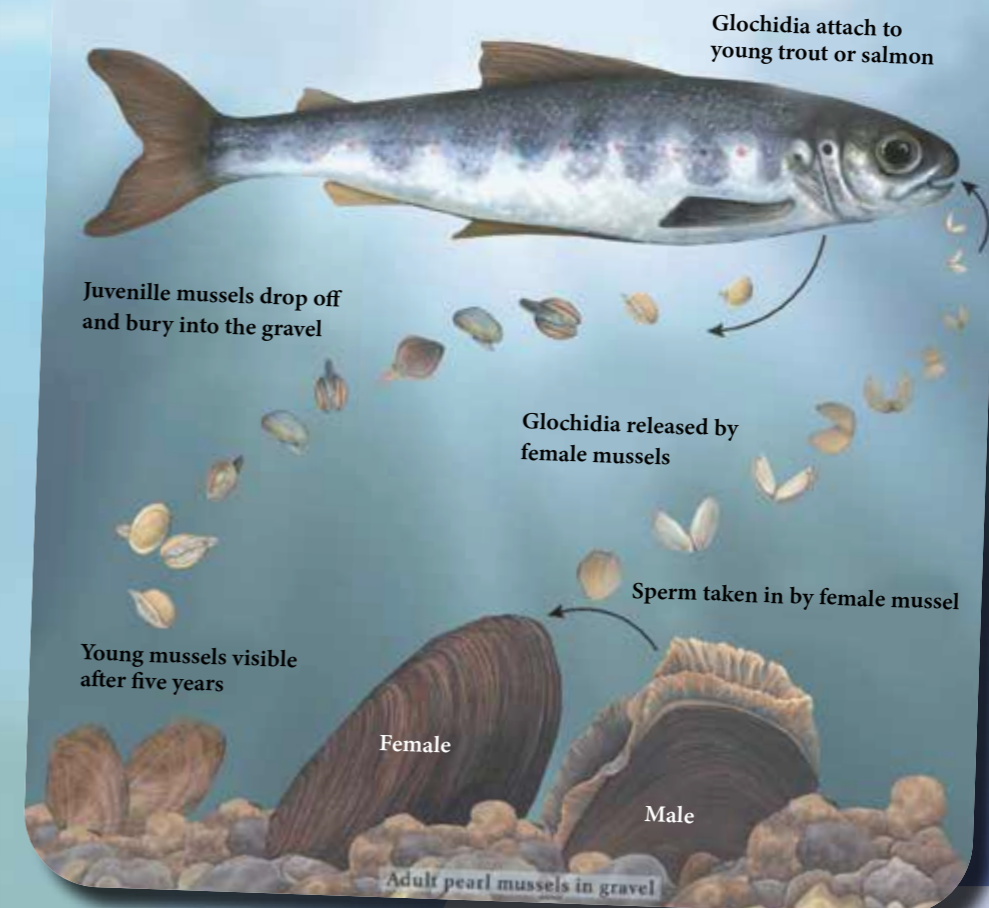
Biodiversity and 'Food Webs' along rivers

No species can exist on its own; Salmon, for instance, are part of a huge complexity of different life forms and processes which all depend on the cool, clean, clear waters of your local river. All of these life forms interact, from leaves (and even whole trees) which fall into rivers, through fungi and microscopic diatoms and bacteria which break these down, aquatic insects which graze all of these (and each other), young Salmon that eat these bugs and who in turn are eaten by other species, including Eels, Herons, Otters, Kingfishers, as well as other Salmon and Trout. Even as adult salmon may die in your river after spawning, their remains are scavenged and scattered, enabling the minerals and organic content that they have gained from their time at sea to be dispersed across the landscape, contributing nutrition to all of these species – your river catchment area really is a self-sustaining greater organism which, if a degree of wilderness is allowed for, can continue to retain this rich biodiversity permanently!



But its not all predators and parasites!

Sometimes, two or more species work together to achieve something beneficial to both or all concerned, and even to benefit the wider biodiversity; this is called 'symbiosis'. For example, Freshwater Pearl Mussels live in salmon rivers; when the mussel spawns, the microscopic juveniles are only viable if they enter into a juvenile Salmon or Trout's gills where, if they are successful, they will remain attached to the gills (without harming the host fish) for many months before dropping off and diving down into the river gravels; this is how Freshwater Pearl Mussels achieve dispersal through a river system. In turn, the mussels (being bivalves) filter and remove nutrients from the water for their own growth, thereby helping to keep the river pristine for the Salmon – another miracle of biodiversity.



Did you know? Wild Atlantic Salmon (*Salmo salar*) often share their catchments/watersheds with their cousins Brown Trout (*Salmo trutta*) and Arctic Char (*Salvelinus alpinus*), two other exciting salmonids.

A Catchment is a Community Related by Water!

Managing our catchments requires us to understand and integrate a huge range of information: how people are using the water, including drinking, for agriculture, industrial or for bathing; the geography and geology of an area, looking at how all the water bodies are connected both above and below ground, how the water flows from where it falls as rain to the sea; how people use the land and water bodies and what livelihoods are supported; and possible sources of pollution, including urban waste-water treatment plants, septic tanks and runoff from farming, forestry, hard surfaces, construction and landfills. In recent years, there has been good progress in tackling serious pollution but small-point and diffuse sources of pollution and physical damage to river corridors remain an issue. This booklet is designed to inform people of the part they play in nature's water cycle and provide us with lots of information on how we can reduce our impact on water resources. Hopefully, it will also encourage better informed individuals and communities to reconnect with their local river or lake and work together to restore habitat and water quality.



TIPS FOR DRAWING YOUR MAP

Where are the streams, rivers, lakes and other wetlands? Where are the towns and industries? Include any details you can think of, including farms, forests, waste-water treatment plants, recreation on the water etc. And add any other features of interest: waterfalls, the presence of Salmon, Trout or other fish, and other scarce species like the Kingfisher, Dipper or Otter.

Be curious and creative and have fun.

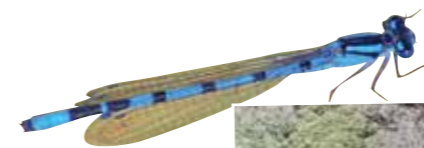
Here in the space below you are invited to draw your own map of your catchment!



Story Time!

This booklet has been all about telling stories about the Connemara Blue Dot Catchments – streams, rivers, lakes, lagoons, estuaries, coastal waters – the wonder of the wide number of habitats which surround us, and hinting at the rich diversity of creatures who share this world with us. Now it is time to write your own story. Or, if you prefer, write a poem or do a drawing or painting in the space provided here.

Need ideas? Write (or paint) about your favourite stretch of river or area of coastline. Or research one of the birds, fish, mammals or insects that you have learned about and write a ‘first-person’ account of what their life is like – the challenges and hardships, their cycle of life, the other creatures they might meet along their journeys. Another idea might be to interview your parents or grandparents about memories they have of their interaction with our waters and the wilds: have they ever boated on the lake, seen a kingfisher, seen an otter? If so, where? Or did they ever pick mayflies or catch, cook and eat one of the famous Connemara Sea Trout? Get them talking!



Blank Space for Writing | Drawing

NEED FURTHER INSPIRATION?

See if you can get a copy of *Scéal and Tales*, produced by the students of Clifden Community School and supported by FORUM Youth Service and Adolescent Support Project, with proceeds from the book going to the Young People of Connemara and their future agricultural initiatives. (<https://www.clifdencommunityschool.com/News/Sceal-and-Tales/56272/Index.html>)

What Can We Do?

We have the power to have quite an effect on the quality of our local waters and wildlife as we work, play or manage our homes. Have a look at the 'best practice' advice on these pages, put it into practice and spread the word. Our actions will benefit all the habitats and species we have been learning about

SEPTIC TANKS

Properly functioning septic tanks (and their 'soakaway' areas) are crucial to the water quality of our BlueDot Catchments and when they do not work effectively, they can threaten your and your neighbours' health. (Don't forget to check your system is working at least once a year, and to have a permitted contractor remove any sludge as required). It is important to remember that the work septic tanks do depends on a really healthy set of resident bacteria in them to break down our wastes properly and reduce their adverse impacts on water quality and wildlife. Be extra mindful of what goes down your drains and into your septic tank, and help it to do its important job. The same applies if you live in a town which has a sewage treatment system.

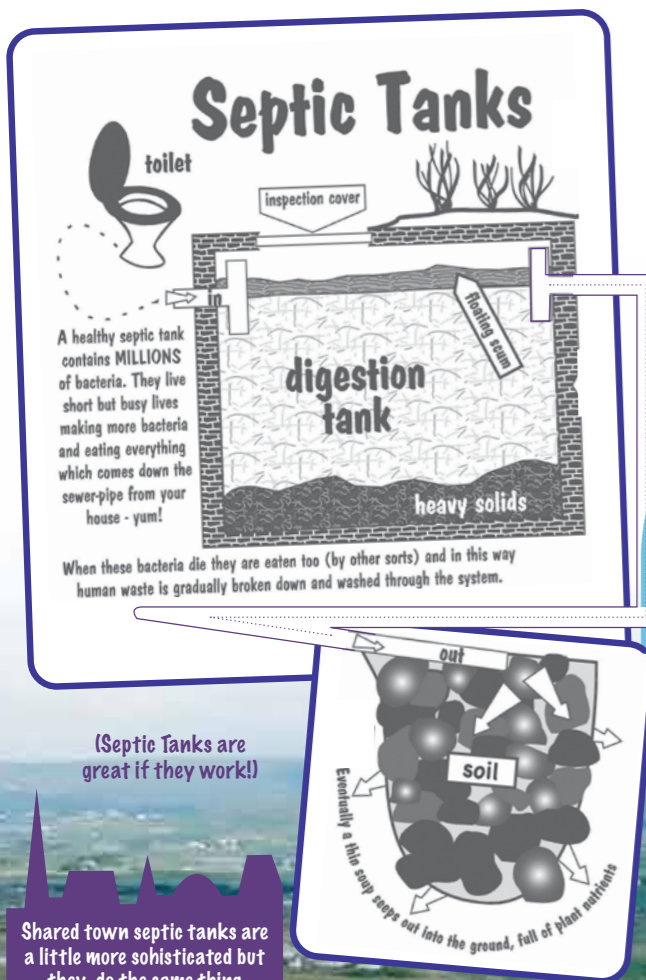
PRIVATE WELLS

Do you get your water from a private well? Ensure that it is not subject to pollution from surface- or ground-waters and get it tested regularly to make sure that it is clean and uncontaminated to protect your family's, your animals' and your crops' health.

The EPA provides helpful leaflets on proper maintenance of septic tanks and wells. Check these out:

<https://www.epa.ie/publications/compliance--enforcement/waste-water/SS-Septic-Web.pdf>

<https://www.epa.ie/media/epa-2020/environment-amp-you/drinking-water/Private-wells-protection-leaflet.pdf>



Best Practice Guidelines

We are dependent on clean water coming to us from upstream, while other people and wildlife downstream depend on the water we discharge being as clean and clear as possible. It can be helpful to think of our sinks, showers, toilets and washing machines as tributaries of our local river. Outside, on our farms and in our gardens, we also have a huge capacity to help or hinder good water and habitat quality. Here are a few tips to lessen our harmful impacts and ensure that we do our bit to protect our local waters and associated wildlife:

- Avoid any cleaning products which contain phosphates or bleach – they spoil the good work of your sewage treatment/septic tank, leading to aquatic pollution; use eco-friendly products or learn how to make your own citrus- and vinegar-based cleaning agents.*
- Any common household product labelled 'Hazard' or 'Poison' or 'Toxic' or 'Irritant' must be treated as Toxic Waste – avoid using them and if you must dispose of them, follow Local Authority Guidelines; never pour them down the sink or into drains. This applies to paint and paint thinners, antifreeze, most drain cleaners, air fresheners, carpet and upholstery cleaners and toilet-water fresheners – they are all potentially hazardous and harmful to water quality, wildlife and humans!
- Keep your garden low-maintenance and low water-dependent; use native plants and trees to establish suitable local habitats and assist insects/pollinators, birds, mammals and fish.
- Avoid pesticides, herbicides and application of synthetic fertilisers – they can be harmful to biodiversity and soil health, and they can do a lot of harm to water quality if they run off into waterbodies.
- Whether digging your garden, preparing a building site or ploughing a field, remember that silts and surplus sediments are some of the biggest enemies of aquatic biodiversity (particularly of sensitive species like Salmon, Trout and Pearl Mussels). Contain such materials and do not allow them to reach watercourses.
- Allow for healthy riparian zones along streams and rivers – such zones help buffer the effects of fertilisers and silts, and enable a flourishing of riverside vegetation.
- Take an interest in nature and expand your awareness: there are lots of groups dedicated to observing and learning about birds, bats, trees and other vegetation, and Angling Clubs, etc. Awareness leads to pride in local biodiversity and learning enables you to become a steward of your landscape and local biodiversity.

* Learn how to make your own eco-friendly household cleaning agents: <https://www.rte.ie/lifestyle/living/2020/0422/1134147-10-cleaning-hacks-with-vinegar-lemons-and-bicarb>

WOULD YOU LIKE TO LEARN MORE? VISIT THESE WEBSITES:

<https://lawaters.ie/citizen-science/>

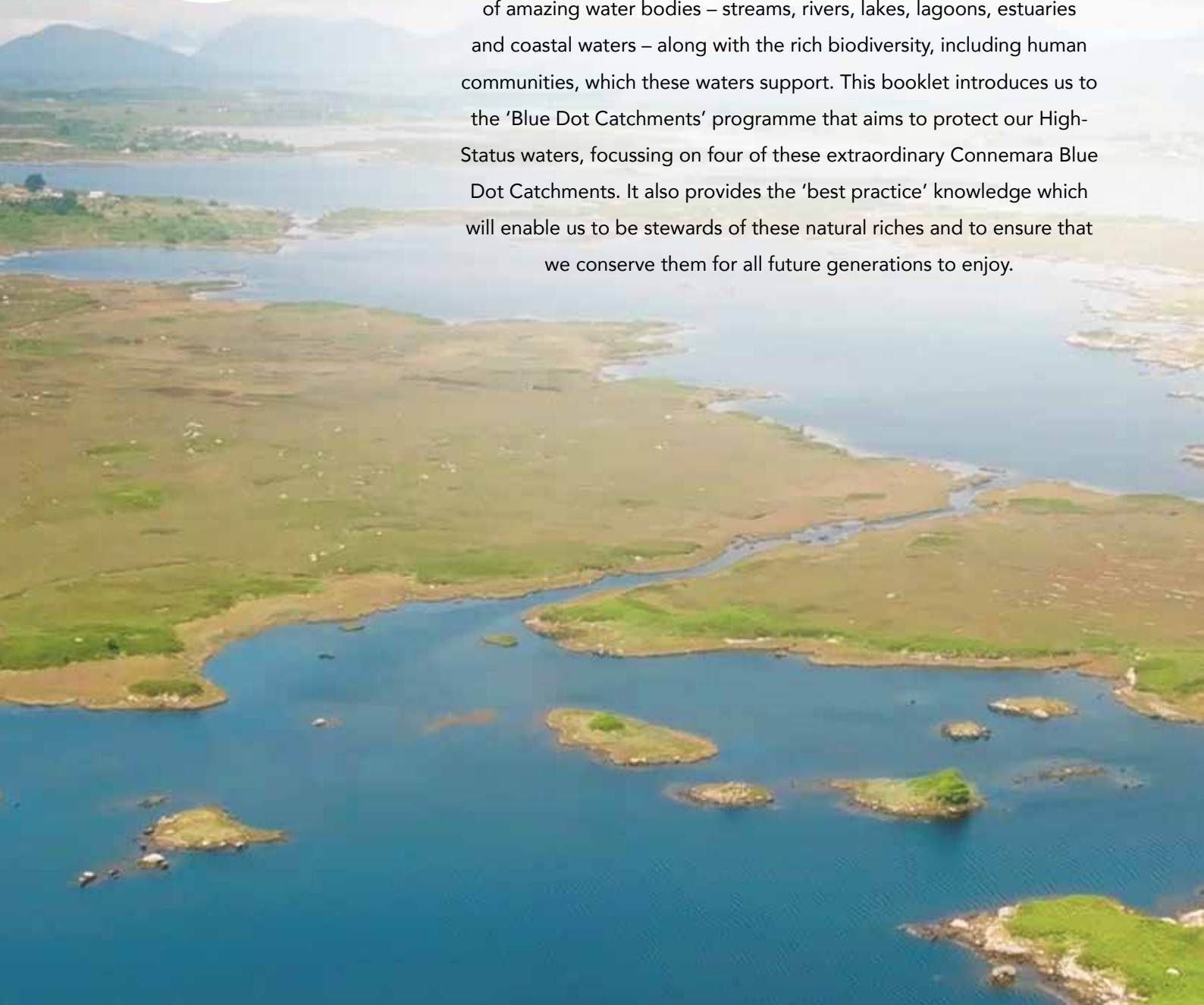
<https://lawaters.ie/blue-dot-programme/>

<https://www.catchments.ie/the-blue-dot-catchments-programme/>



“Mo Chuisle means my pulse, my love, my dearest, my life; that the same life force is in us both; you are as important as my pulse. For me, Mo Chuisle can refer to your nearest river.” PÁRAIC BREATHNACH, CARNA

In Connemara we are fortunate to be surrounded by a wide variety of amazing water bodies – streams, rivers, lakes, lagoons, estuaries and coastal waters – along with the rich biodiversity, including human communities, which these waters support. This booklet introduces us to the ‘Blue Dot Catchments’ programme that aims to protect our High-Status waters, focussing on four of these extraordinary Connemara Blue Dot Catchments. It also provides the ‘best practice’ knowledge which will enable us to be stewards of these natural riches and to ensure that we conserve them for all future generations to enjoy.



An tSeirbhís Páircenna Náisiúnta agus Fiadhúla
National Parks and Wildlife Service



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Local Government and Heritage