

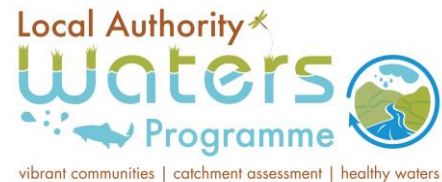
Water – Quality, Importance, Pressures & Action



Ruth Gaj-McKeever – Community Water Officer

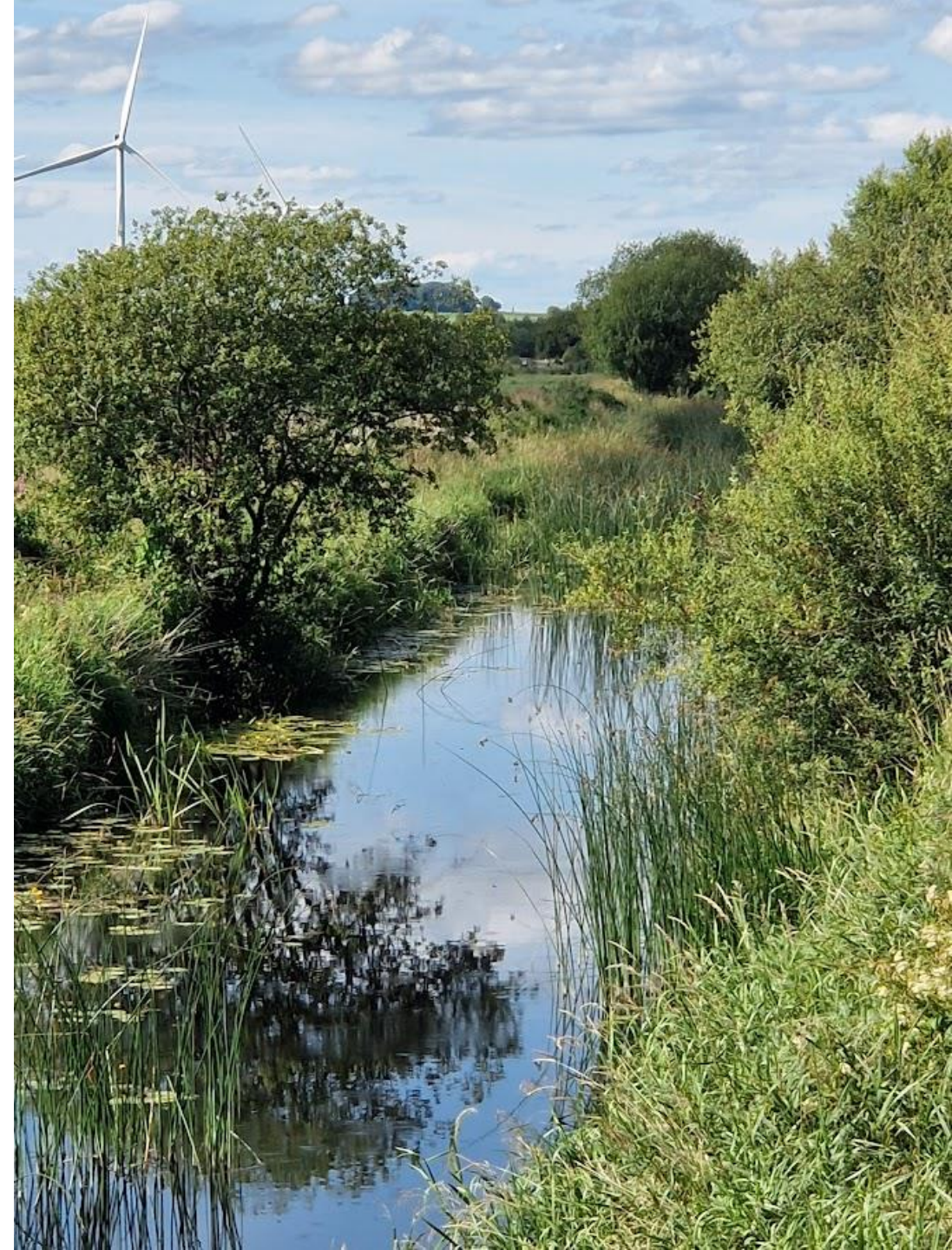


**Adult
Literacy
for Life**



Agenda

- **10.30 -11.30** – Water – Quality, Importance (Benefits), Pressures & Action
- **11.30 – 11.45** – Tea Break
- **11.45 – 12.15** – Community Group Talk
- **12.15 - 12.45** – Water Quality Testing
- **12.45 – 13.00** – Walk to Site
- **13.00 – 13:30** – Lunch
- **13.30 – 14.30** – Water Quality Testing
- **14.30 – 14.45** – **Feedback**

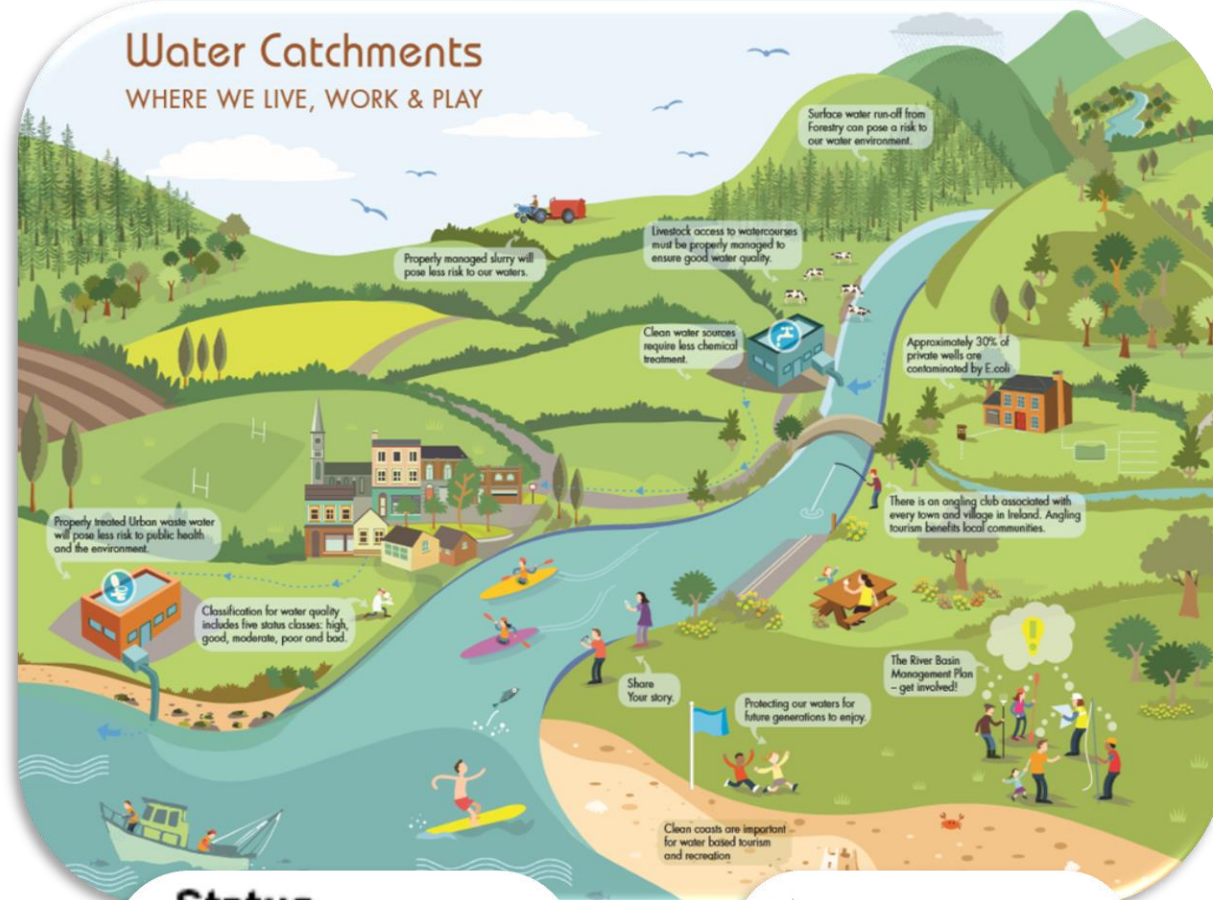


LAWPRO

The Local Authority Waters Programme (LAWPRO)

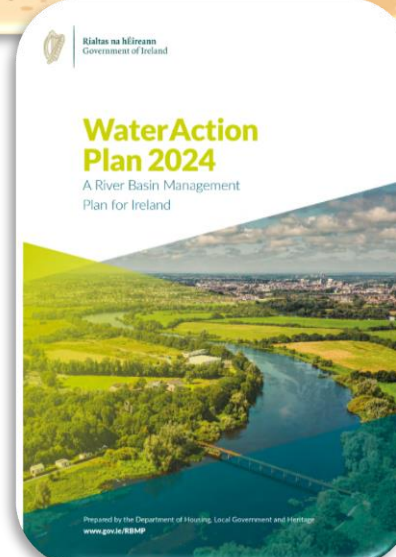
Our job - Protect and restore water quality in our waters

Goal - Good water quality in all waters by 2027



Status River Waterbodies

- High
- Good
- Moderate
- Poor
- Bad

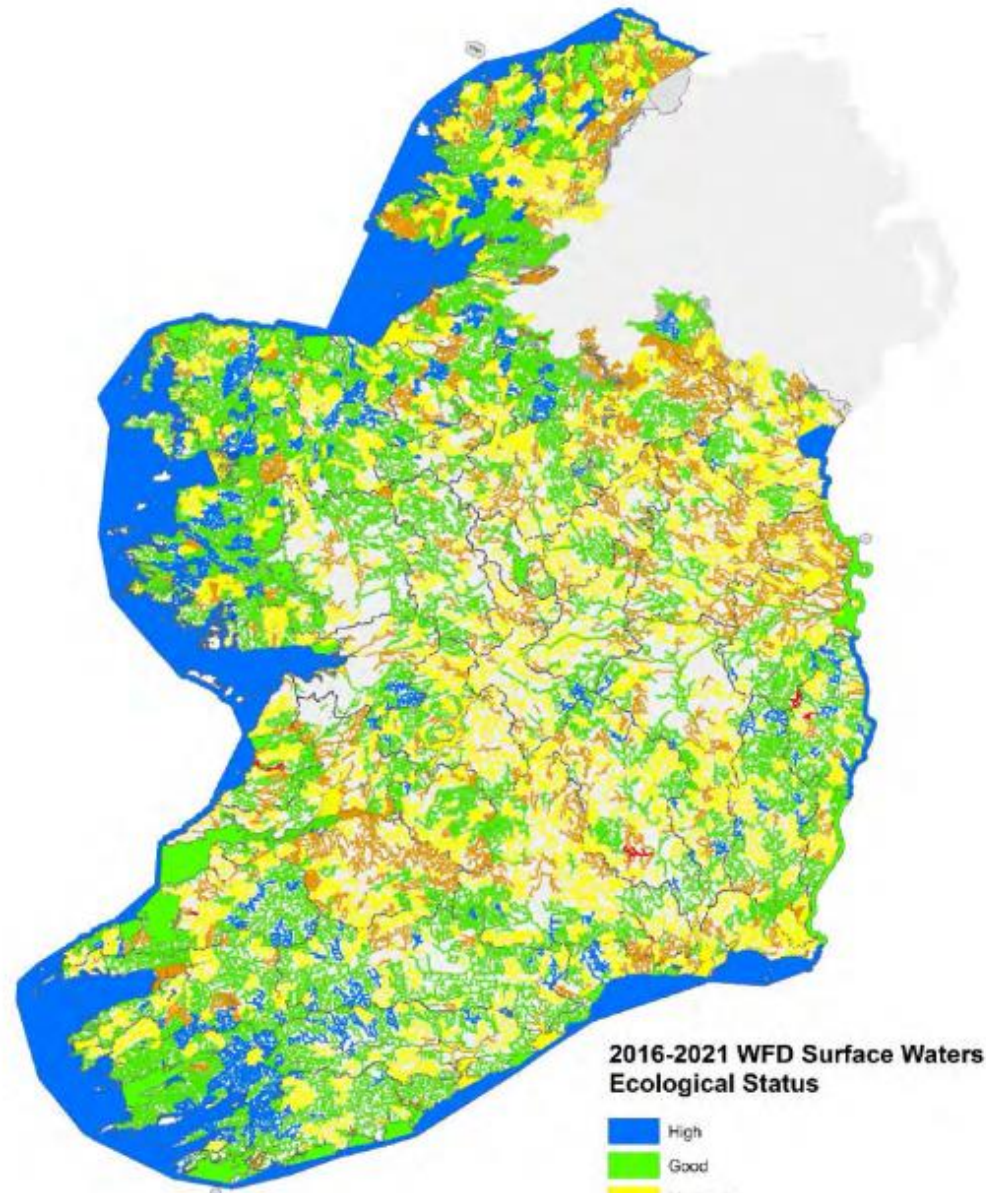


vibrant communities | catchment assessment | healthy waters

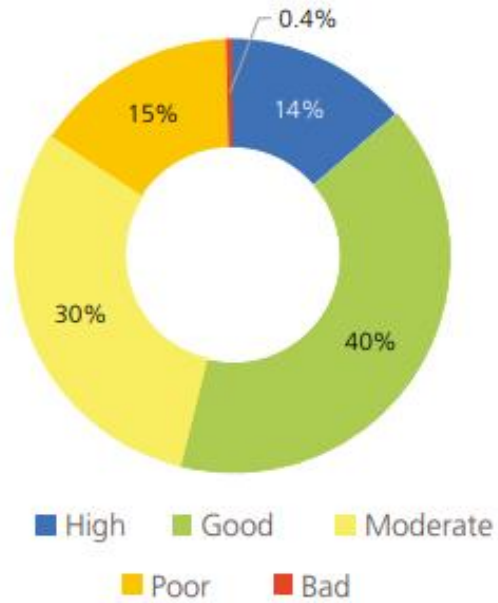
Water Quality

The health of Ireland's streams, rivers, lakes, and estuaries.

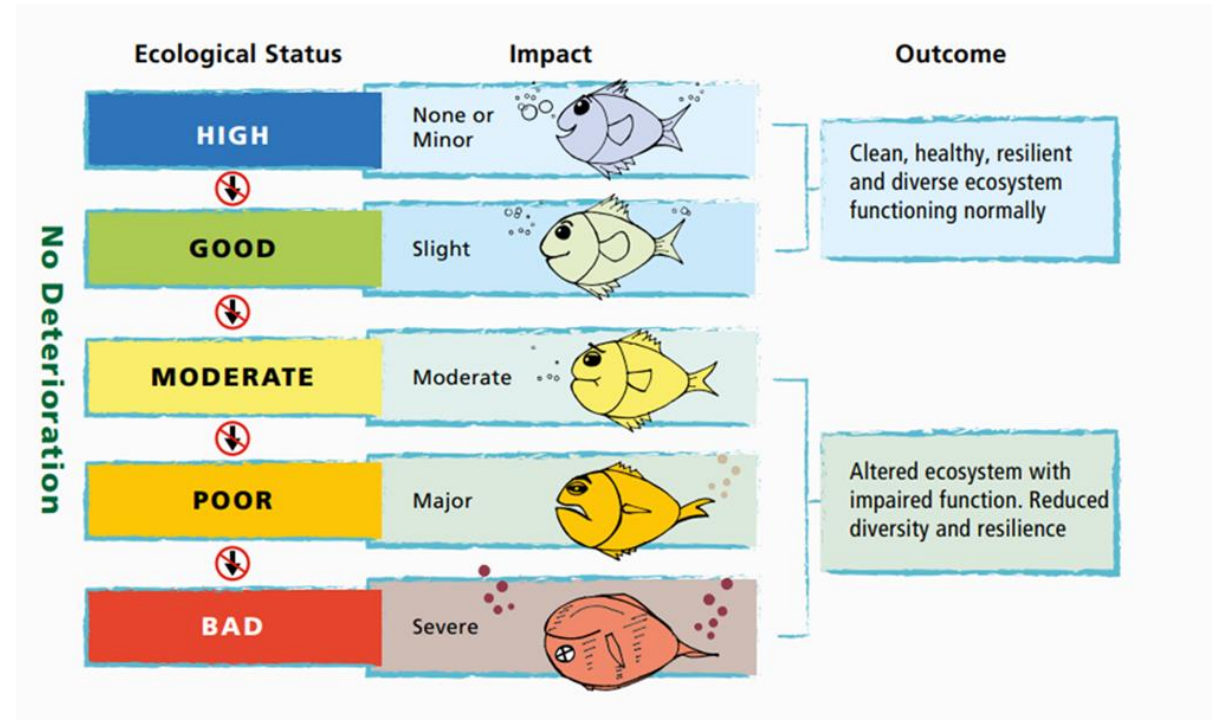
- **54%** of our surface waters are in **Good** or **High** ecological status.
- **46%** are in an **unsatisfactory** ecological status



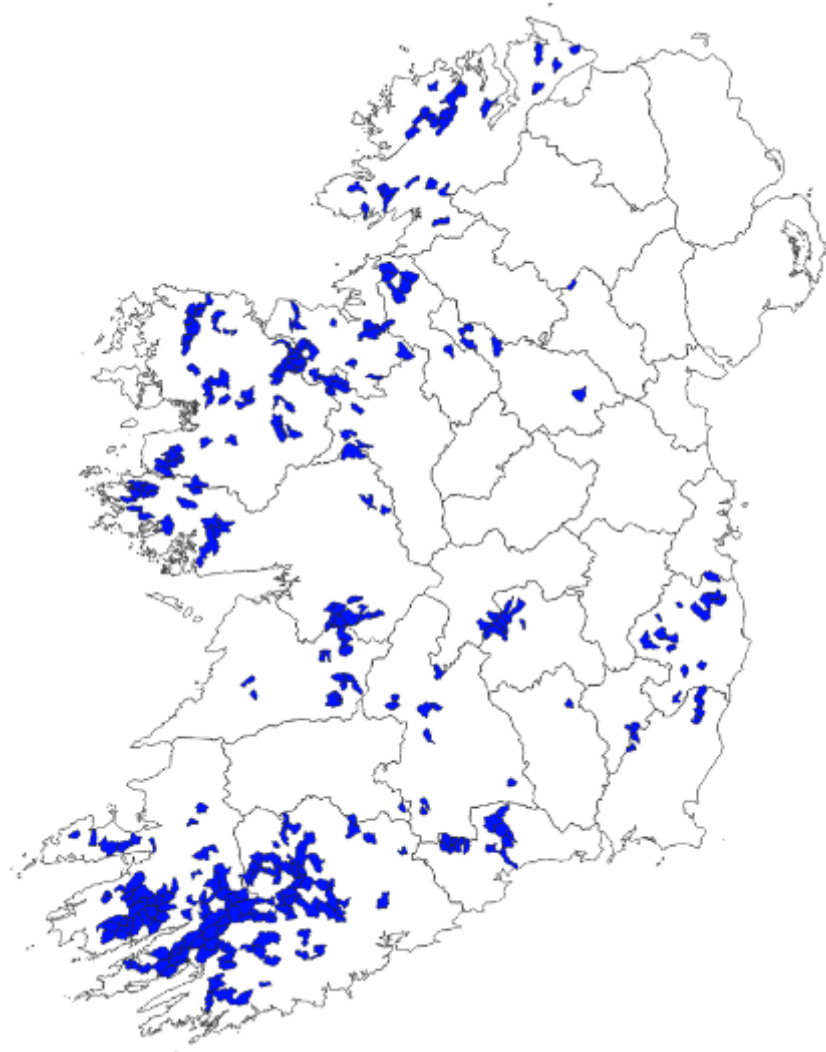
Environmental Protection Agency – Water Quality in Ireland - 2016 - 2021



Proportion of all surface water bodies in each ecological status class 2016-2021

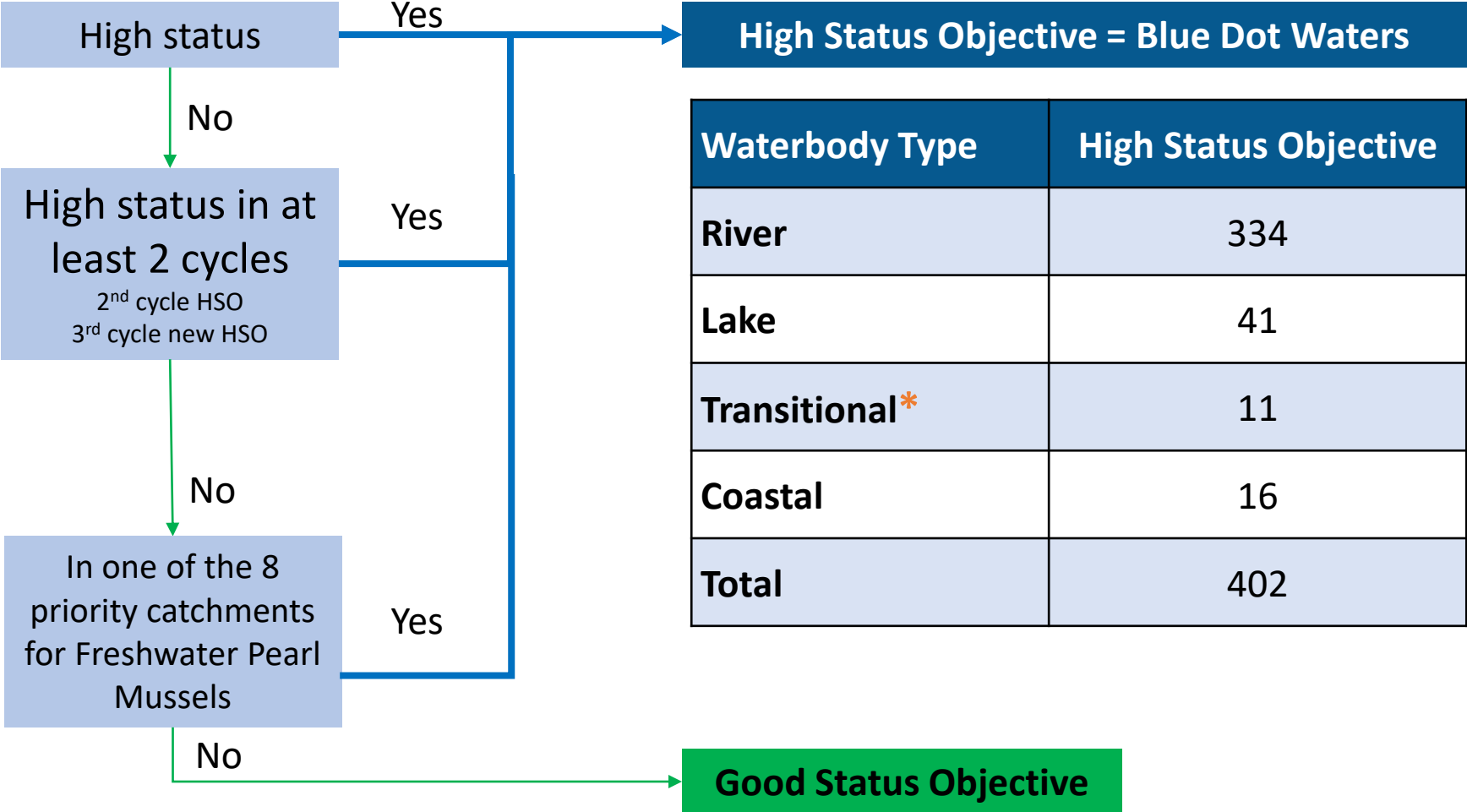


Blue Dot Water – Best of the best



- Blue Dot (High status or pristine water)
 1. Cleanest of natural water in Ireland
 2. Quite rare in Ireland (<18% nationally)
 3. Sections of 3 rivers in Offaly – We'll investigate later
 4. Water quality essential for Salmon and trout – especially for breeding grounds
 5. Also supports rare species such as Freshwater Pearl Mussel
 6. And a range of increasingly threatened insects and other invertebrates
- Blue Dot Catchments Programme
 - Collaborative program led by LAWPRO
 - Brings together relevant stakeholders
 - DHLGH, DAFM, Teagasc, EPA, Forest Service, Coillte, L.A.s, IFI, Irish Water
 - Aims to
 - address pressures preventing Blue Dots from achieving high status

Blue Dot / High Status Objective (Rivers)







“Water is not a commercial product like any other but rather, a heritage which must be protected, defended and treated as such.”

Water Framework Directive

LAWPRO Supports

- **The Teams in LAWPRO**

- 1) Catchment Science
- 2) Water EIP
- 3) Nature Based Solutions
- 4) Communities

Funding!

- **Community Water Officer (CWO)**

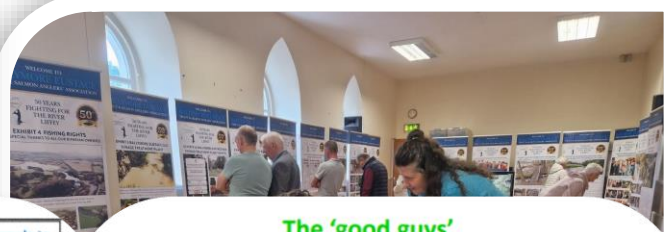
Engage and support communities to carry out water related actions



Community Engagement

- Our work with Communities
 - Funding
 - Events and Outreach
 - Walks and Talks
 - Capacity Building
 - Project Delivery
 - Citizen Science

Griese Youth Theatre perform for a Seanad audience in Leinster House with a strong Climate



Take a clear photograph of your sample to let us check and verify your sample

Take a good, clear photo of all of the six key invertebrates that were found in the 3 samples, placed in a small white-bottom dish (eg jam jar lid) including a label, with information on the date, stream name, location and recorder.

	Sample 1	Sample 2	Sample 3
Stonefly (+1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flattened mayfly (+1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green caddisfly (+1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snail (-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leech (-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waterlouse (-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Sum of scores 1	Sum of scores 2	Sum of scores 3
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Total score for the 3 samples = CSSI Score

CSSI Scores can be a 'traffic light' for water quality

- CSSI score -9 to -5 **Heavily polluted**
- CSSI Score -4 to +4 **Moderately polluted**
- CSSI Score +5 to +9 **Clean**

The 'good guys'

Stonefly
2 thin filamentous tails at end of abdomen

Flattened mayfly
3 thin filamentous tails, wide head with large eyes on top and flattened body

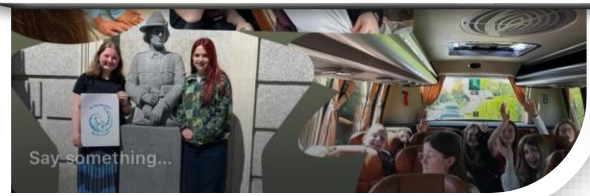
Green caddisfly
Green caterpillar-like larva. Gills along abdomen give it a 'spiky' appearance

The 'bad guys'

Leech
Suckers at both ends & moves by stretching out body

Snail
Hard pointed or coiled shell covering body

Waterlouse
Looks like a woodlouse, crawls slowly along bottom



Community Water Officers

LAWPRO's Community Water Officers (CWOs)

Local Authority
Waters
Programme
vibrant communities | catchment assessment | healthy waters

Border



Andy Hallewell
Senior CWO



Lisa McDaniel
Donegal



Luke Kenny
Sligo
Leitrim



Eoghan Connaughton
Cavan
Louth
Monaghan

West



Luke Drea
Senior CWO



Éanna Hyland
West Galway
Mayo



Janet Laffey
Roscommon
East Galway

South West



Ruairi Ó Conchúir
Senior CWO



Bláthnaid O'Loughlin
Kerry



Colum Walsh
Clare
Limerick



Ellen Murphy
Cork

Midlands and East



Basil Mannion
Senior CWO
Westmeath



Ruth Gaj McKeever
Kildare
Offaly



Luke Kenny
Longford



Éanna Gallagher
Dublin - South Dublin,
Fingal, Dublin City
Meath



Justin Ivory
Wicklow
Dublin - Dún
Laoghaire-Rathdown

South East



Maggie Morrissey
Senior CWO



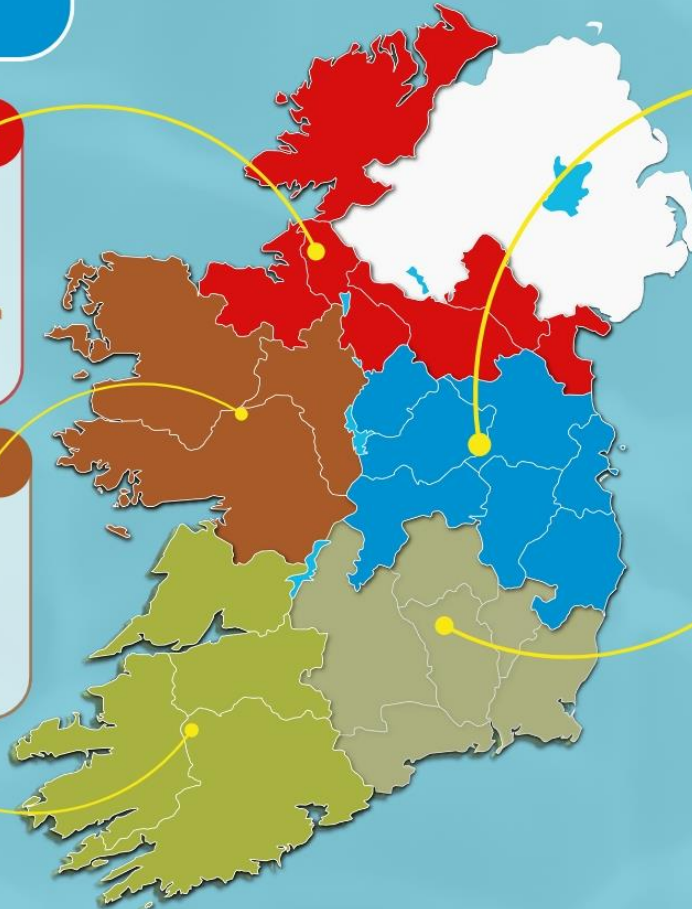
Catherine Seale-Duggan
Tipperary
Waterford



David Rafter
Wexford
Carlow



Ann Phelan
Laois
Kilkenny



crab and blennie under. I knew the mud where the razorclams lay, the sand to find ragworm in and the slightly different texture where the lugworm hide.

I remember August evenings in this cove, watching the mackerel, now deep in the harbour, erupt in feeding frenzies just off the shore.

The mackerel are breaking! The mackerel are breaking!
Diving terns hammered the water surface, emerging with streaks of silver. In the aftermath dead or damaged sprats would be thrown onto the shore by ankle high waves.

This event was always thrilling to me and felt like the climax of the summer.

In time, I grew up and moved away from Currabinny.
Later, as a young adult and student of environmental science I was given new perspectives on these formative experiences. The green slime that would foul my net each summer now made sense and I learned how it and other pressures on our waterbodies threaten to destabilise the intricate webs of life upon which we all depend.

I still return to Currabinny often.

The wheat and sugar beat in the field have yielded to dairy. The wet ditch remains

Why are rivers important to you / water memory?

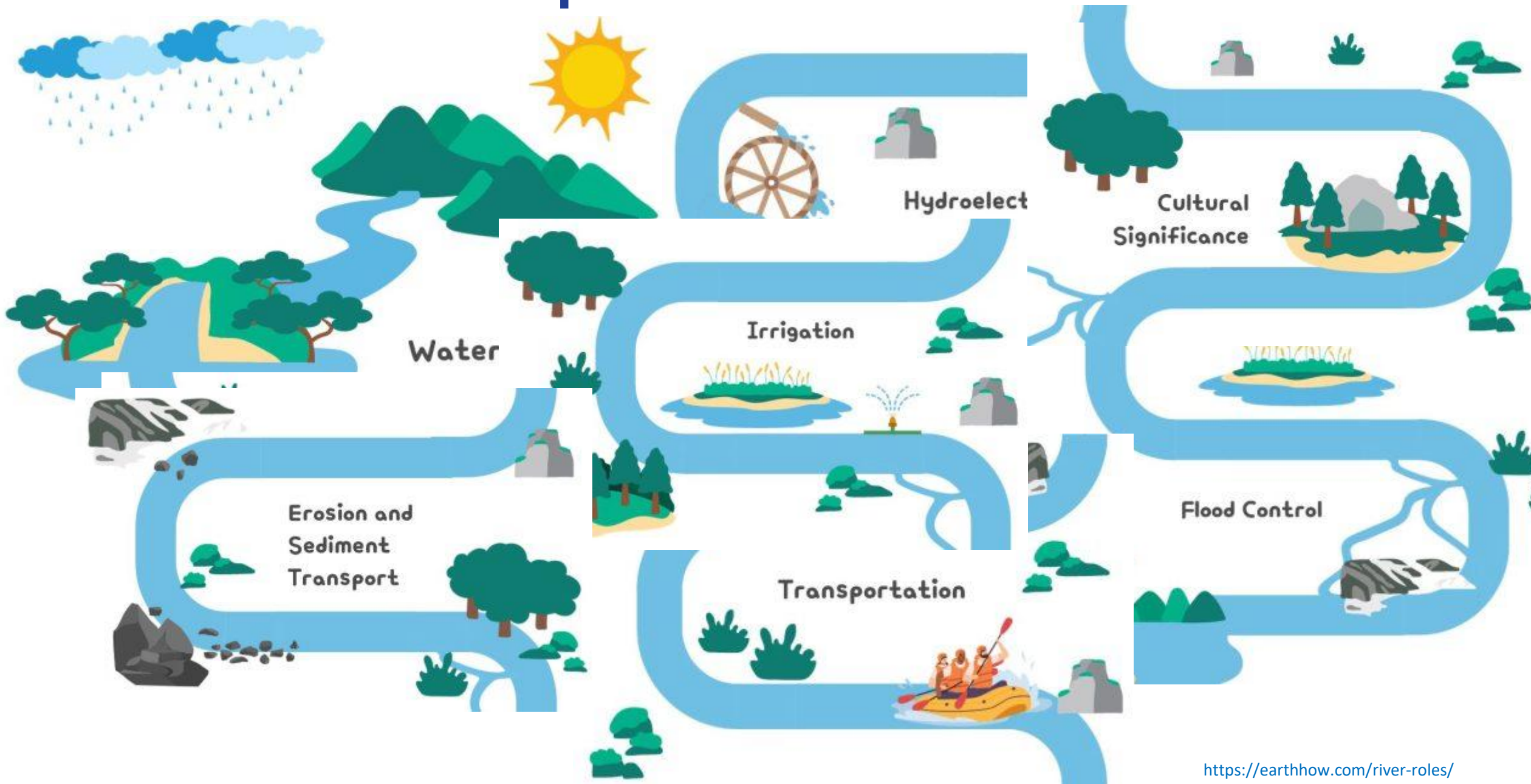
A habitat, sustaining itself against the odds.

The trees we planted that day were alder and are thirty feet tall now. As promised, they have crept west and form a humble corridor between Currabinny Woods and Lough Beg. Tall grass grows in their dappled shade.

Last year I sat at their feet for hours observing sand martins feasting on insects overhead

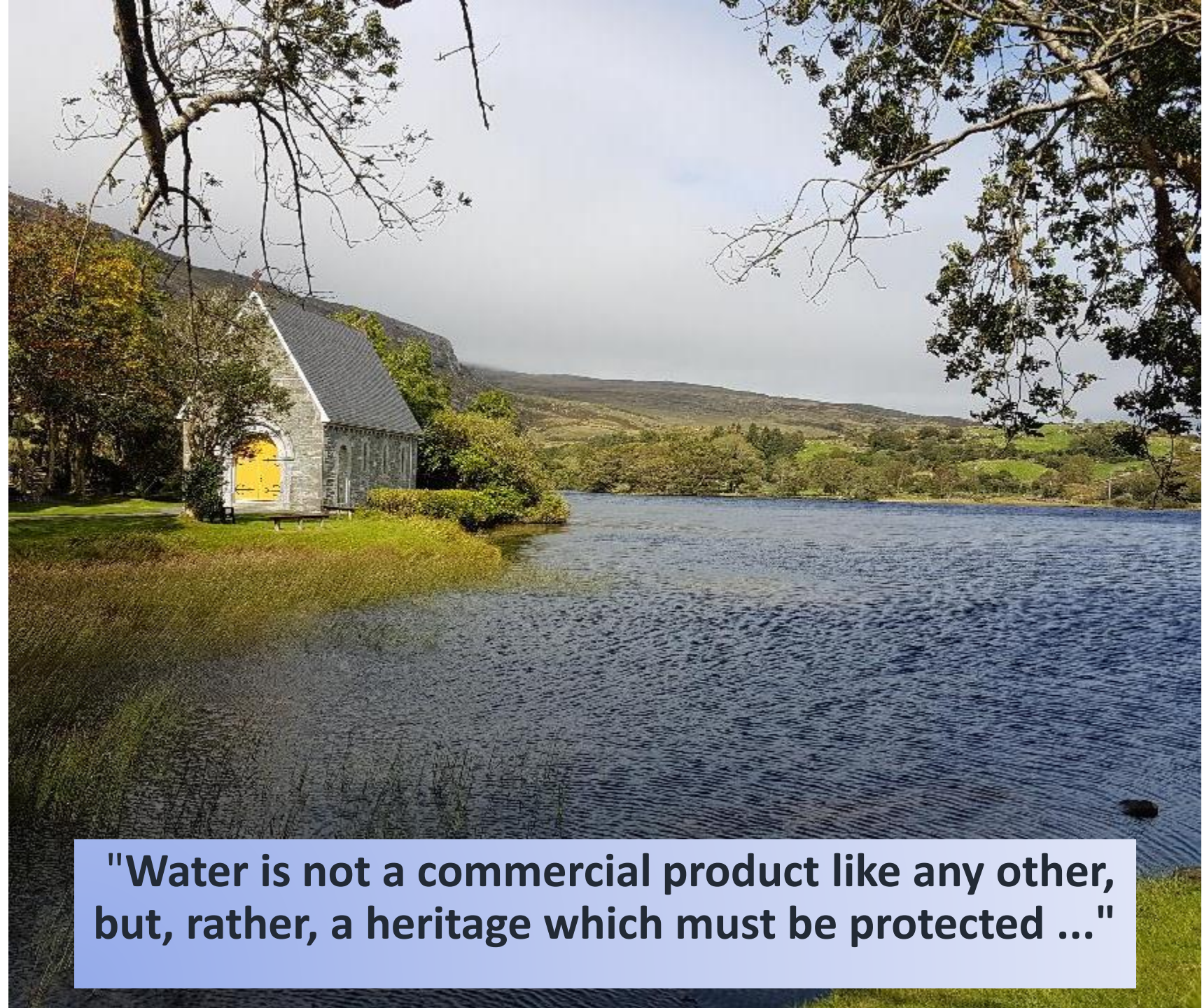


Importance of Rivers



Good water management underpins our economy

- Agriculture (irrigation, land management, flood risk, green image etc.) – €1.5billion
- Tourism (fishing, boating, scenic views etc.) - e.g. trout and salmon angling =>€240m pa
- Industry (clean water cheaper to treat, volumes often critical for high tech)
- Public health (nitrates, pesticides/herbicides, pathogens – e.g., Corrib Cryptosporidium €19m)
- Community (flood risk, group water schemes, insurance etc)
- Biodiversity – Natural capital



"Water is not a commercial product like any other, but, rather, a heritage which must be protected ..."

Importance of Local Rivers



Figile River Walk

Cosán Abhainn Fhiodh Gaibhle

The Figile river is a refuge and a home to many of Ireland's native wild birds, trees, animals & fish

Tearmann agus gnáthóg is ea Abhainn Fhiodh Gaibhle do chuid mhór d'fhiabhheatha dúchasach na hÉireann, éin, crainn, ainmhithe agus éisc.

Birds - Keep an eye out for the kingfisher, heron, mute swan, (éin) dipper, moorhen, coot & grey wagtail.

Trees - Trees along the river include willow, birch, ash, oak, (crainn) alder, rowan, poplar, sycamore & beech

Fish - Fish present in the Figile include brown trout, salmon, (éasc) perch, pike, eel & bream

Animals - Otters, foxes and badgers like the quiet (ainmhithe) parts of the river



Coot
Cearc cheannann



Bream
Bran



Mute Swan
Eala, bhalbh



Pike
Liús



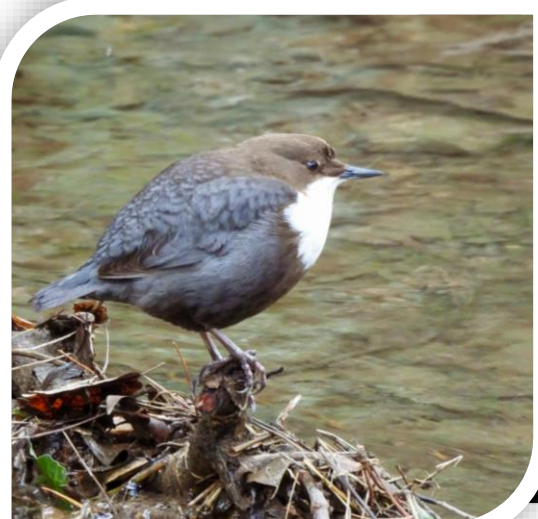
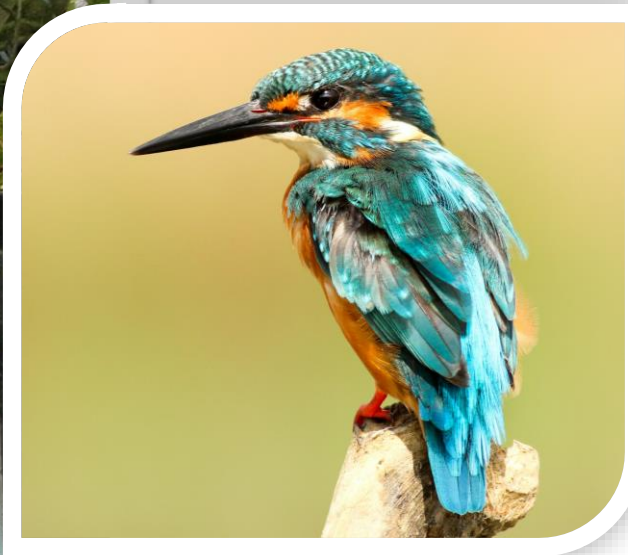
Wagtail
Glasóg



Rudd
Ruán



Otter
Madra uisc



© Paul van Hoof



Understanding how your local waterbody & Some Commonly Used Terms

Upper Course

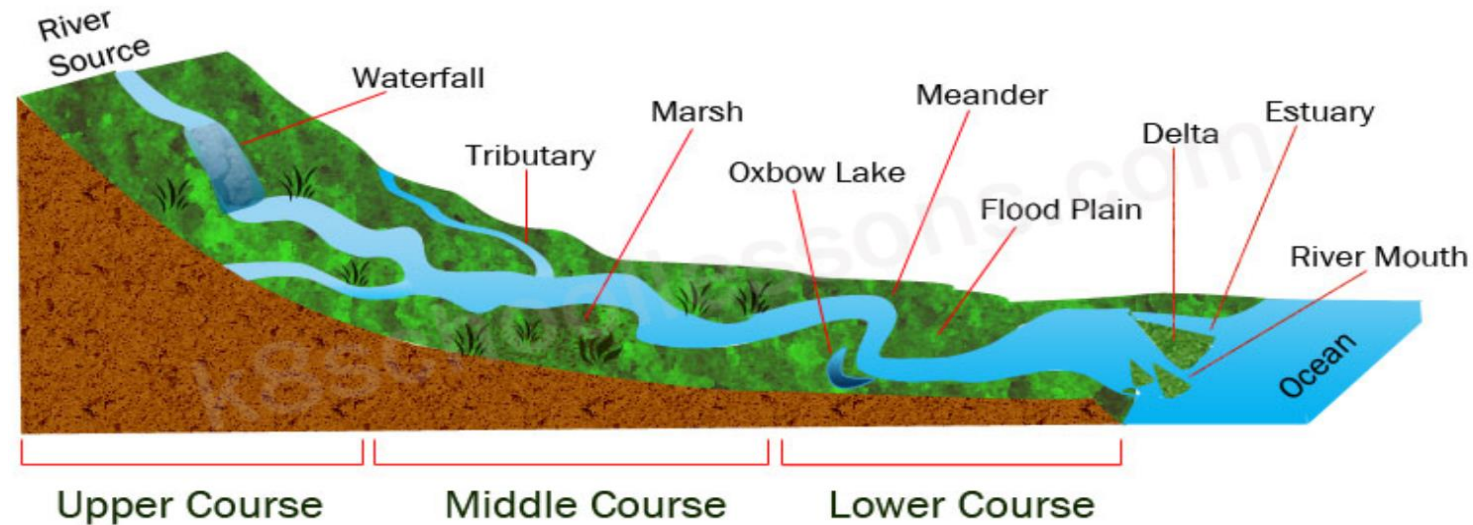
The river is often in steep, mountain areas. This section of a river is cold, clear and fast-flowing. It has a very steep slope.

Middle Course

It is less steep and has a moderate flow of water. The bottom becomes a mixture of silt and gravel. At this stage small meanders or bends and small flood plains can be formed. Oxbow lakes may also be formed.

Lower Course

The river flows gently because of its gentle slope. Lowland parts of a river contain muddy, slightly warmer water. Large meanders, large flood plains, oxbow lakes can be formed at this stage.



<https://k8schoollessons.com/courses-of-a-river/>

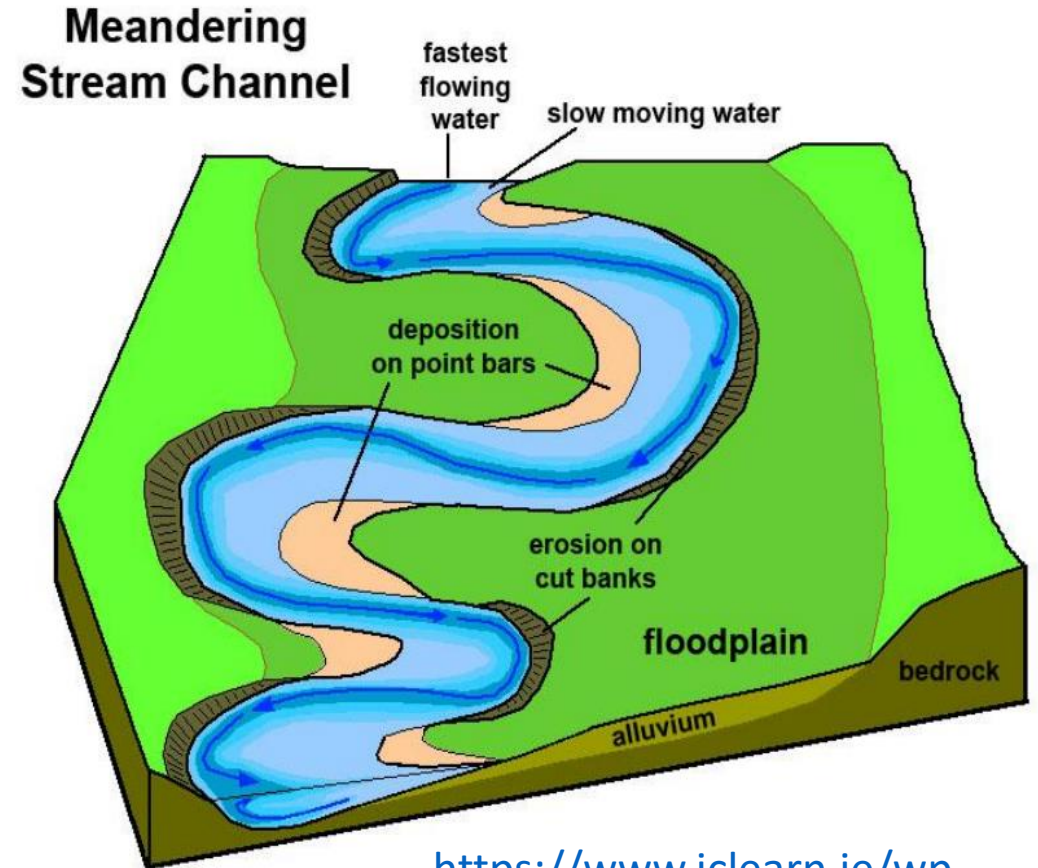
Understanding how your local waterbody

Erosion

The rate of erosion depends on:
Size of river (river erodes faster when it is in flood) and the speed of river.

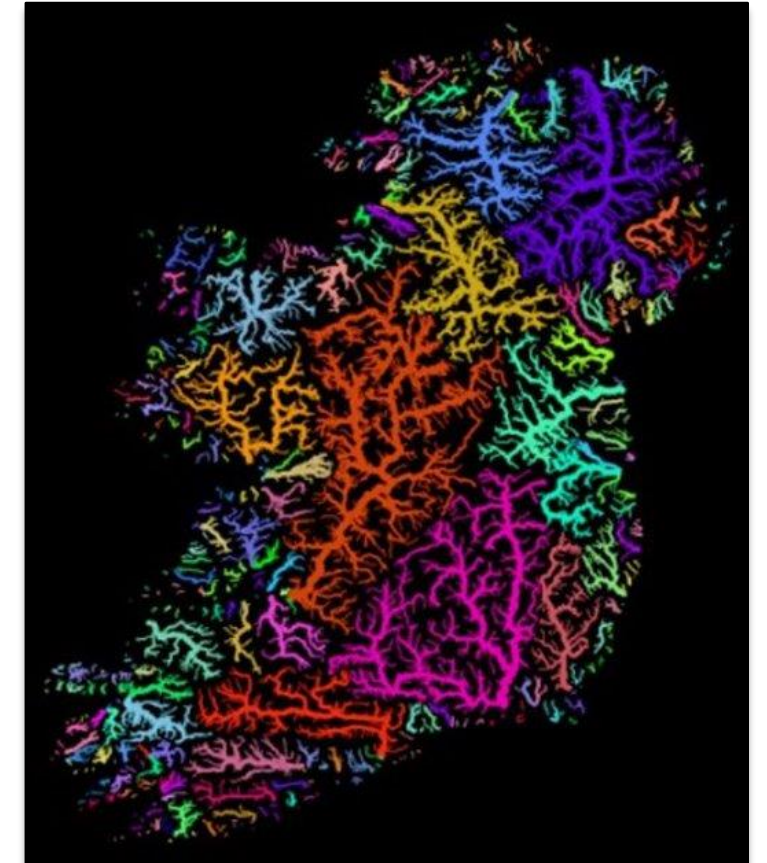
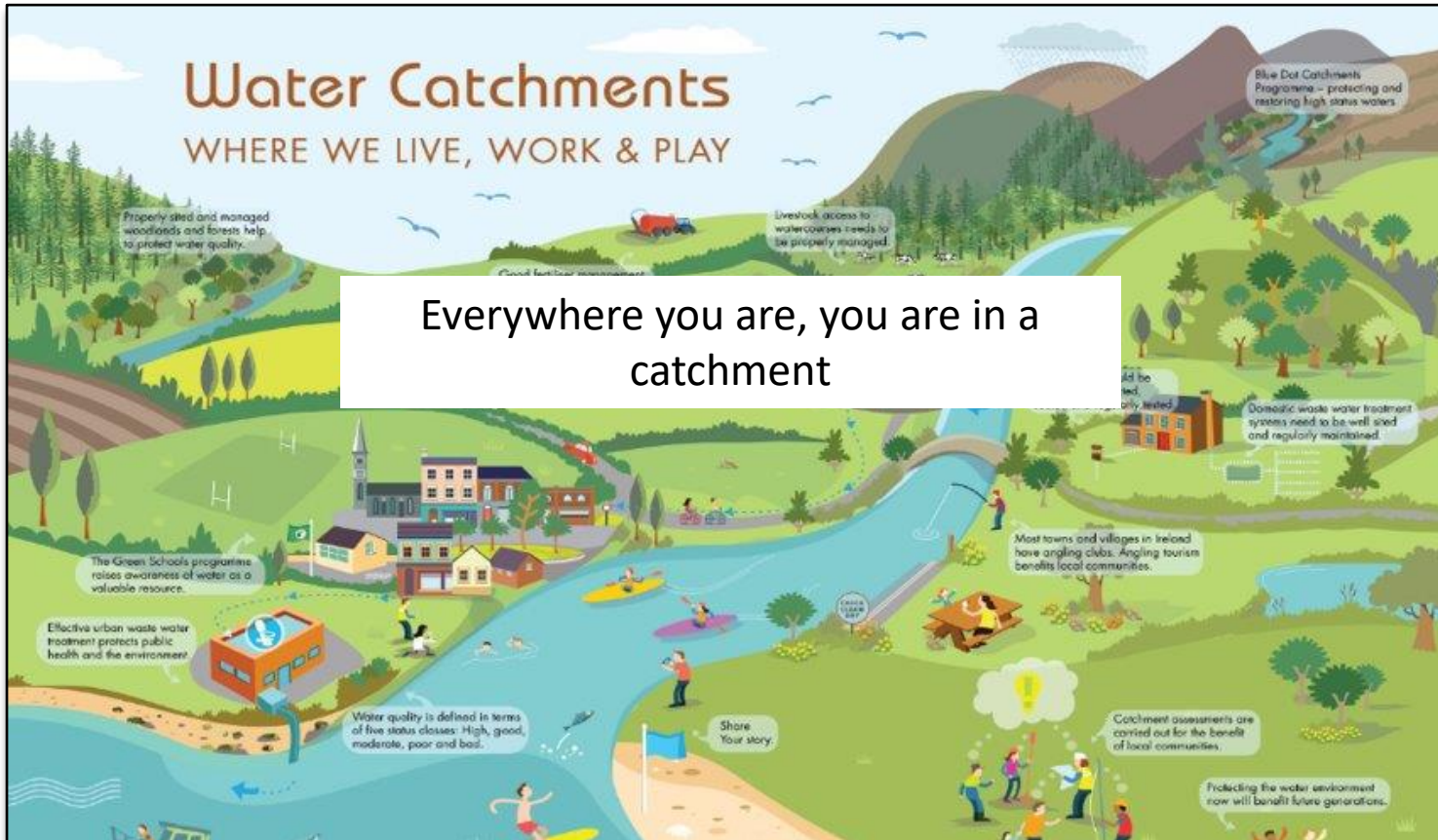
Deposition

When a river loses energy, it will drop or deposit some of the material it is carrying.



<https://www.jclearn.ie/wp-content/uploads/2015/09/Rivers.pdf>

What is a catchment?



An area that contributes water to a river and its tributaries, with all the water ultimately running off to a single outlet

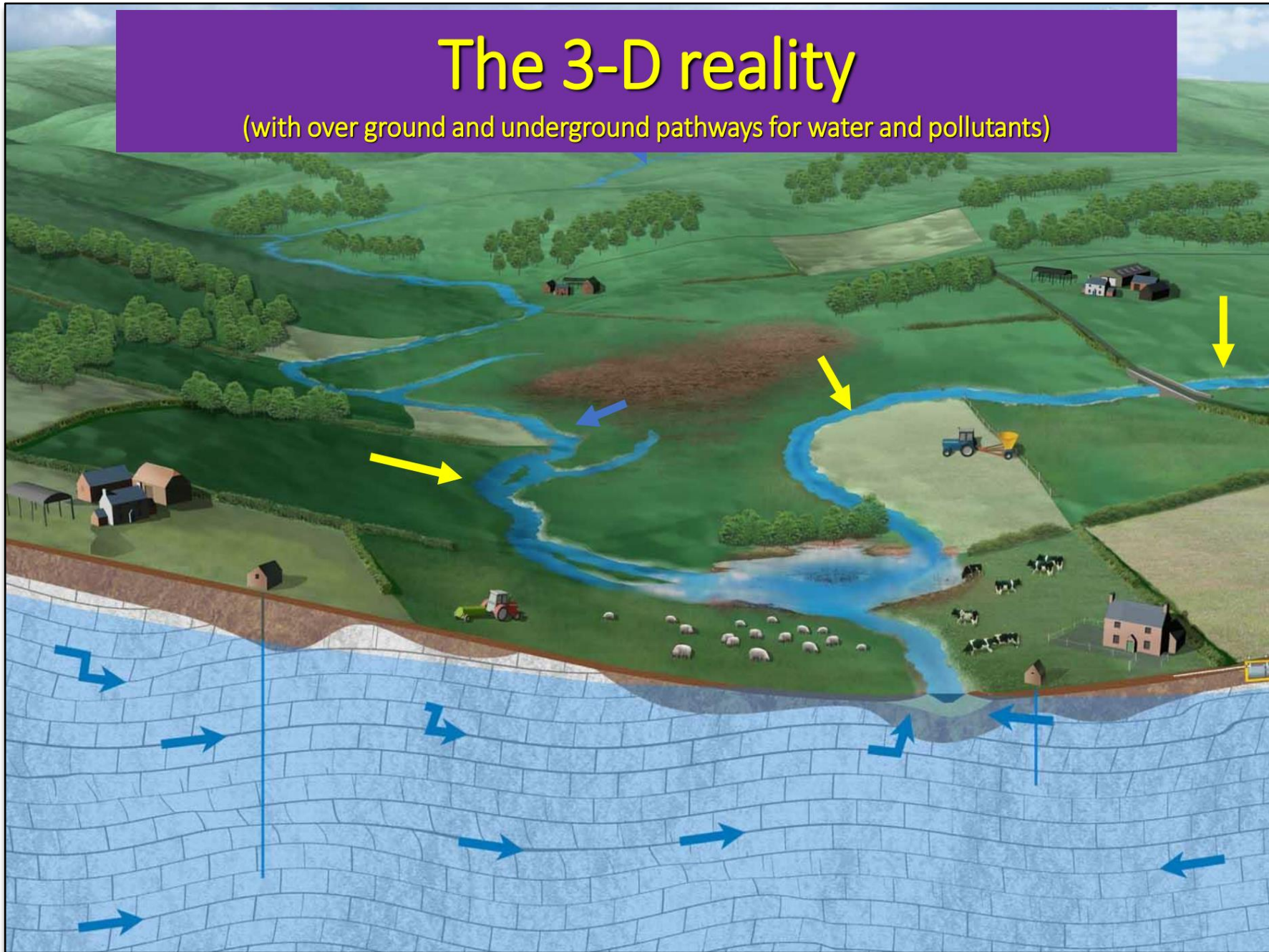
46 catchments in Ireland

The 2-D view of the world!!



The 3-D reality

(with over ground and underground pathways for water and pollutants)



Small Streams



Small Streams represent 77% of the length of the Irish river network

Small Streams

Importance of Small streams

- Spawning for salmon and trout
- Nursery habitat for salmon and trout
- Water for livestock
- Rare aquatic water bugs (aquatic macroinvertebrates)
- Tourism & recreation
- *They make for beautiful places*



Threats to small streams

- Pollution
- Drainage
- Land changes – e.g., windfarms, housing, roads etc
- Climate change – drying out

The Riparian Zone

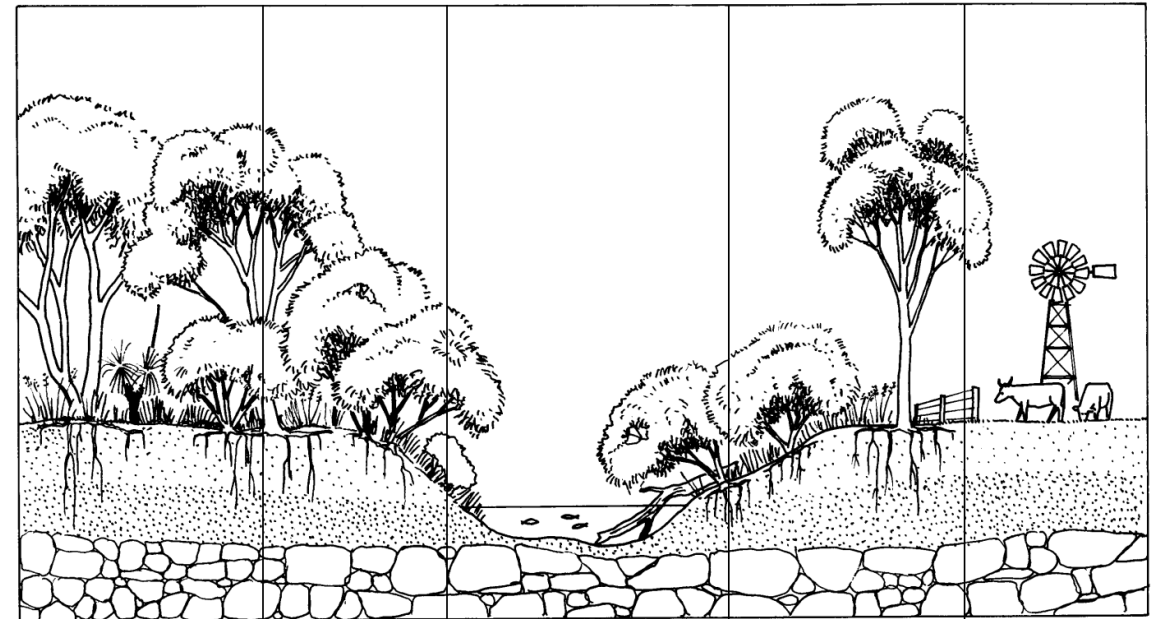
What is the riparian zone?

- Riverbank and its vegetation
- The strip of land between the water and dry land
- Can flood often
- Has vegetation typical of river margins such as Willow, Alder, Meadow sweet, Willow herb, even Water mint!



Why is it important to have a healthy riparian zone?

- Provides habitat for animals including fish
- Provides food and shade for fish
- Channel stability
- High nature value ecosystems
- Flood control
- Wildlife corridors
- Pollution, sediment and nutrient trapping



1. Biofiltration prevents sediments and nutrients from entering the stream. Vegetation and leaf litter increase infiltration and slow overland flows preventing erosion. The zone provides flora and fauna habitat and corridors between remnants.

2. Vegetation provides organic matter to the stream. Trees shade the stream and reduce light and water temperature.

3. LWD* and living vegetation provide shelter, feeding and spawning habitat for birds, fish and invertebrates. Riffles, LWD and aquatic and emergent vegetation help to increase O₂ levels in the water.

4. Root systems reinforce soils, provide protective surface matting, increase soil cohesion and drainage to reduce bank collapse and erosion.

5. Floodplains are commonly used in agriculture and for recreation and need to be carefully managed.

*Large Woody Debris

https://www.water.wa.gov.au/data/assets/pdf_file/0008/3113/11441.pdf

Wildlife Corridors

Wildlife corridors are areas of vegetation that allow animals to travel from one area to the next.

A **corridor** provides shelter, food and protection from predators by imitating the native vegetation.



Riparian Corridors

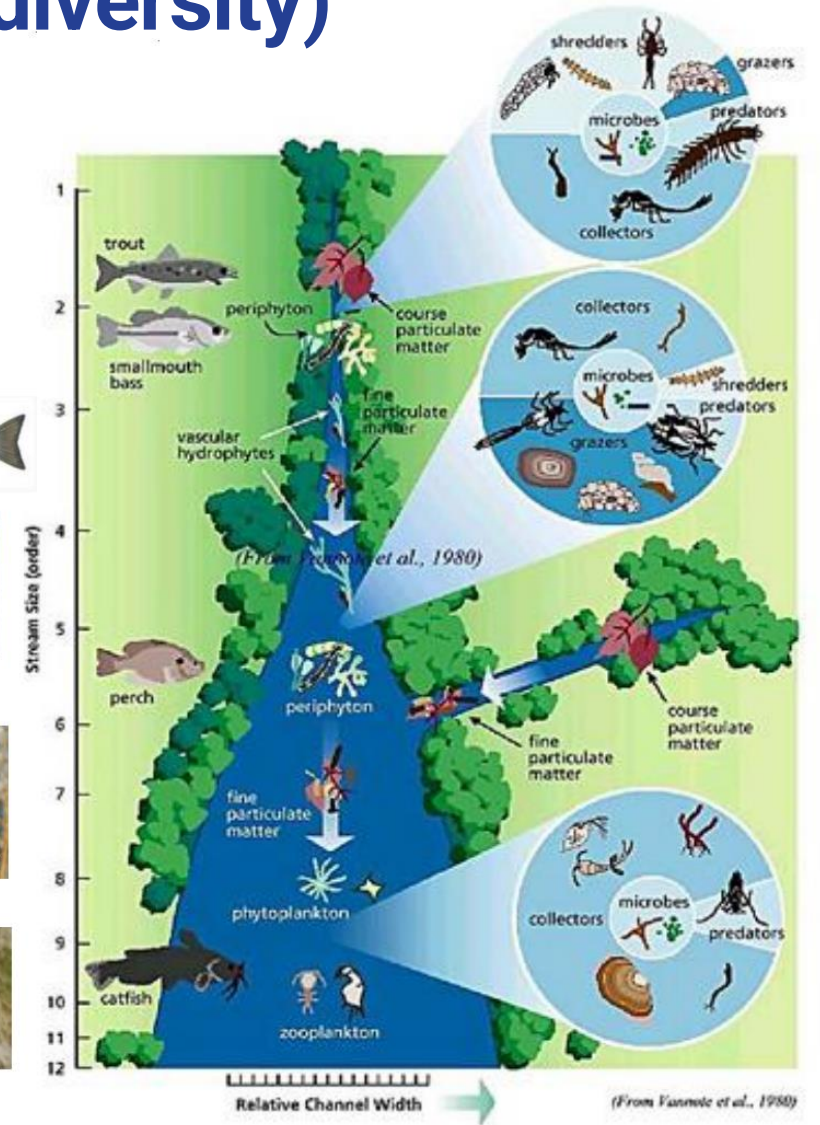
In the healthiest riparian corridors the types and ages of plants vary

This produces a range of food types and habitat conditions for both terrestrial and aquatic wildlife.



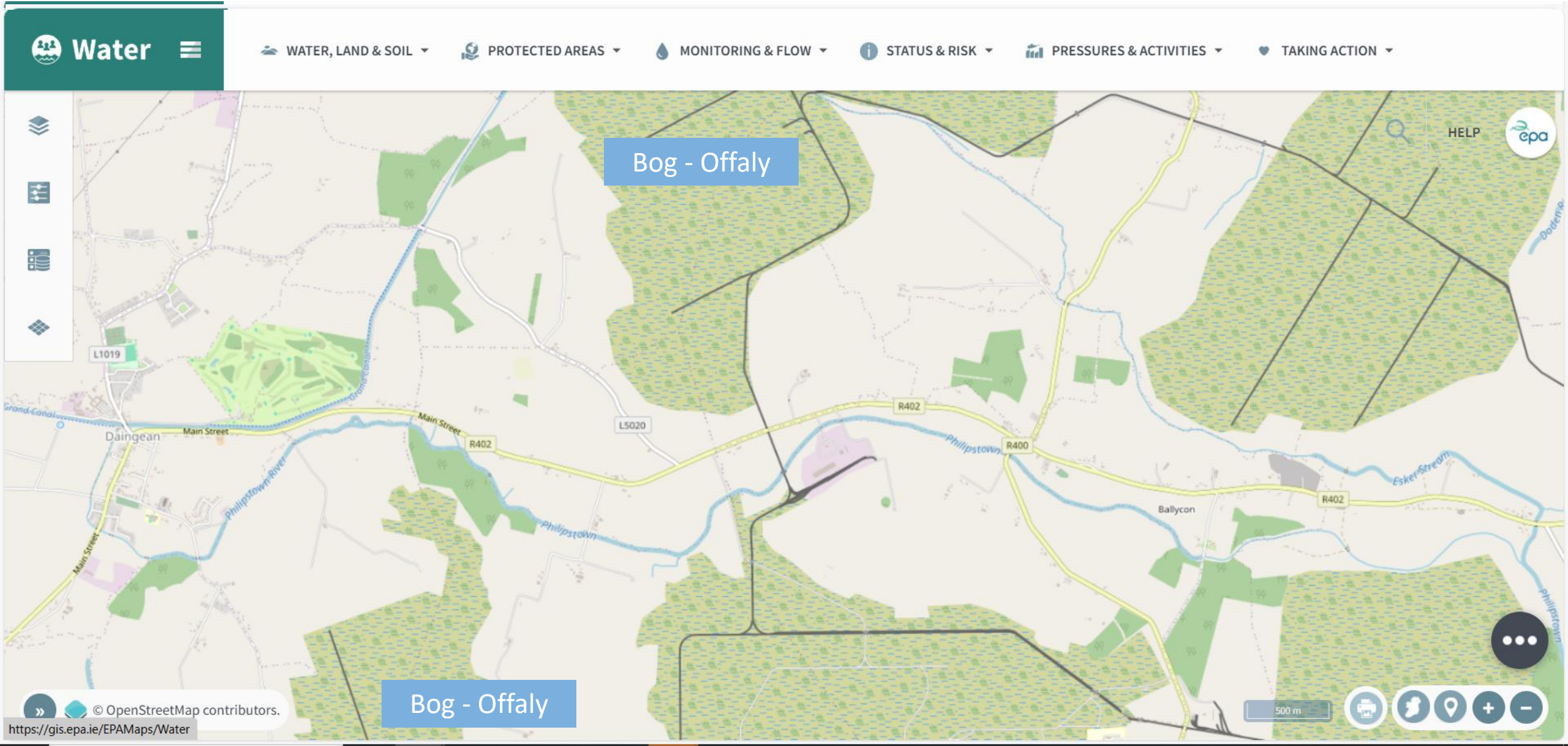
Rivers & Variety of Plants and Animals (Biodiversity)

Freshwater Pearl mussel need slightly different habitat to salmon which in turn needs different habitat to sand martins or kingfishers – but a river should be able to support all these different types but usually at different places – so think about the overall river and its riparian corridor



https://www.researchgate.net/figure/3-Generalized-view-of-the-River-Continuum-Concept-From-Vannote-and-others-1980_fig7_266852073

Tributaries of the Figile – Cushaling, Crabtree (Lugherra), Philipstown (Esker, Wougles)



Local Water Quality – how healthy is your river?

Activity – Check local water quality - Go to EPA Water Maps (Search Engine or address <https://gis.epa.ie/EPAMaps/Water>)

The screenshot displays the EPA Water Maps interface. At the top, a navigation bar includes 'Water' and several menu items: 'WATER, LAND & SOIL', 'PROTECTED AREAS', 'MONITORING & FLOW', 'STATUS & RISK', 'PRESSURES & ACTIVITIES', and 'TAKING ACTION'. A dropdown menu is open over the 'MONITORING & FLOW' tab, showing options for 'Q Values' (Latest River Q Values and River Q Values 1971-2020), 'Flow and Levels', and 'National Water Monitoring Stations'. A search panel on the right shows 'Offaly' and 'Clonbulloge' selected. A legend on the far right defines status categories from High (blue) to Bad (red). The map shows a network of rivers and monitoring points, with Clonsast Bog highlighted in blue. A red cross marks a specific location on the map.

What can cause poor water quality?



What can cause poor water quality?



What are the Local Water Pressures?

What do you think local pressures are?

Activity - Go to EPA Water Maps (Search Engine or address <https://gis.epa.ie/EPAMaps/Water>)

The screenshot displays the EPA Water Maps web application. At the top, a navigation bar includes the 'Water' logo and several menu items: 'WATER, LAND & SOIL', 'PROTECTED AREAS', 'MONITORING & FLOW', 'STATUS & RISK', 'PRESSURES & ACTIVITIES', and 'TAKING ACTION'. On the left, a 'Results' panel shows details for 'River Urban Run Off Pressures IE_SE_14S010210', including its code, name (SLATE_060), pressure category (Urban Run-off), and water body type (River). An 'EXPORT' button is located below this panel. The main map area shows a geographical view of the Clonsast Bog and Rathangan region, with a red crosshair indicating a specific location. A 'Search Tools' panel on the right allows for searching by 'Address/Eircode', 'County/Town', or 'By Coordinates', with 'Offaly' and 'Clonbulloge' selected in the respective dropdown menus. The map interface includes standard navigation controls like zoom in/out, a scale bar (2 km), and a mobile menu icon.

Testing Water Quality – Identifying the Problem

We will look at:

- Ecological (Surrounding background information)
- Hydrological (Water information)
- Chemical (Nutrients)
- Optical Information

- Biology (Citizen Science Stream Index)

Tea Break



Clonbulloge Community Actions



Community Engagement



LAWPRO Funding

1. Community Water Development Fund
2. Catchment Support Fund
3. Small Grants and Events Scheme
4. LAWPRO Water Heritage Day Event Grants Scheme

<p>River restoration – e.g. reinstatement of natural processes, preparation of river restoration plans.</p>	<p>Nature-based solutions – Urban - e.g. rainwater planters, rain gardens, hard surface removal, rainwater management plans etc.</p>	<p>Nature-based solutions – Rural – Wetlands/ponds, leaky dam, Silt trapping or ‘Slow the Flow’ Natural Flood Retention Measures (e.g. the addition of large woody debris to drains), Flood management measures (e.g., Swales, attenuation ponds), catchment woodlands, etc.</p>
<p>Protected Area Projects – Projects in support of protection/restoration of drinking water sources, bathing waters, shellfish waters, or water dependent habitats/species, e.g. salmon, freshwater pearl mussel.</p>	<p>Pathway interception measures (to reduce phosphorus, microbial pathogens) – e.g. Riparian planting – trees, fencing, closing off cattle access point with provision of cattle drinkers, hedge planting, etc.</p>	<p>Surveys – e.g. wetland surveys, water quality assessments (macroinvertebrates, fish, chemistry, etc), fluvial geomorphology assessments etc.</p>
<p>Fish barrier mitigation (Note 1) – e.g. feasibility reports, remediation of fish barrier etc.</p>	<p>Permissions & Consents – e.g. Appropriate Assessment Screening, Planning permission, etc.</p>	<p>Fish habitat enhancement (Note 1).</p>
<p>Reports – e.g. Feasibility Reports for scoping medium to large scale projects.</p>	<p>Landscape management actions – e.g. Invasive Alien Species (IAS) surveys, biosecurity programmes, IAS treatment (Note 2), IAS removal (Note 2) etc; Bog restoration*** – e.g. conserve and improve. the quality of blanket bogs and associated habitats (Note 2).</p>	<p>Education Programme & Training Delivery – e.g. Citizen Science; Outdoor classrooms; development of primary of secondary level educations programmes and local delivery; participatory workshops; development of media, or online/social media products; information/training sessions; or collaborative projects.</p>
<p>Blue Dot Catchments Projects (Note 3) – Projects for the protection and restoration of Ireland’s network of blue dot waters in support of the Blue Dot Catchments Programme.</p>	<p>Biodiversity (Note 4) – Riparian management/tree planting, planting of native species/hedgerows, de-tunneling, green space development, Creation of habitat near river, lake, wetland; projects in support of the National Biodiversity Action Plan.</p>	<p>Water conservation measures – e.g. Rainwater harvesting.</p>
<p>Climate action (Note 4) – Water project with co-benefits for climate; Projects in support of the Climate Action Plan.</p>	<p>Bespoke Projects – innovative projects in support of water quality action delivery will be considered.</p>	<p>1. Consultation with IFI is mandatory. 2. Consultation with NPWS and/or Local Authority Biodiversity Officer mandatory. 3. Consultation with LAWPRO’s Blue Dot Catchments team recommended. 4. Must have a water quality benefit.</p>

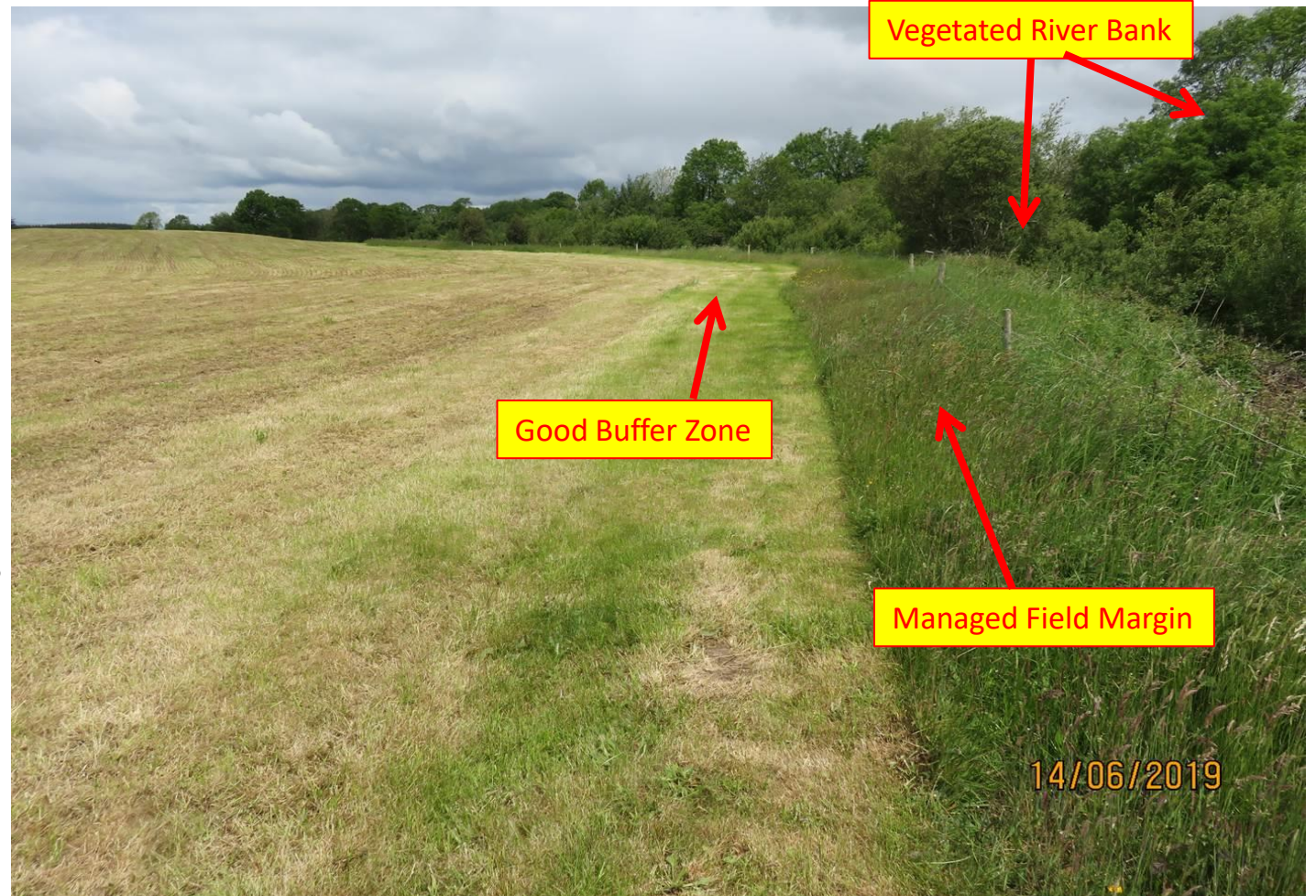
Community Actions



Community Actions

Working with natural processes to restore river riparian areas!

- Buffer Zones
- Fencing of watercourses
- Tree planting etc
- Rewilding areas
- Reconnecting rivers with their floodplains
- Creating / recreating wetlands
- Creating / recreating river meanders



Community Actions

Protection of Watercourse – Field Margins and Fencing



Community Water Development Fund 2025

- €1,047,265.26 awarded across 54 projects in 24 counties
- €28,975 awarded to projects in Offaly
- **Offaly Projects:**
 - **Rahan Community Hall (€15,000)**
Flood Alleviation - Hall car park and road - Creation of Rain Garden and bio retention area
 - **Clara Tidy Towns (€ 13,975)**
Creation of Rainwater Garden in town center at River Street in Clara

2.5 | SuDS Features & Opportunities

River Brosna Sustainable Drainage Systems



Filtration - Nature-based drainage can filter water of pollutants before it is delivered to the river.



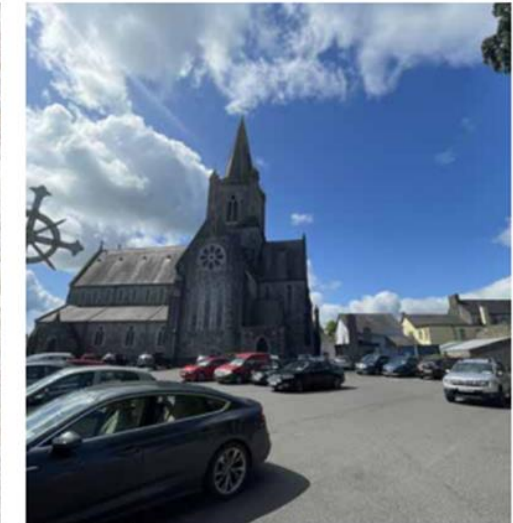
Street Drainage - Attenuation and retention features can be added to roadside drainage systems for greater sustainability in streetscapes.



Permeability - Permeability allows for surface water infiltration.



Roof-scapes - Roof water run-off can be sustainably recycled or fed into a sustainable drainage feature (swales, raingardens, etc.)



Hardstanding TarMac Surfaces - Car parks, roads and service yards using permeable surfacing materials, draining into SuDS features, or



LAWPRO Catchment Support Fund 2025

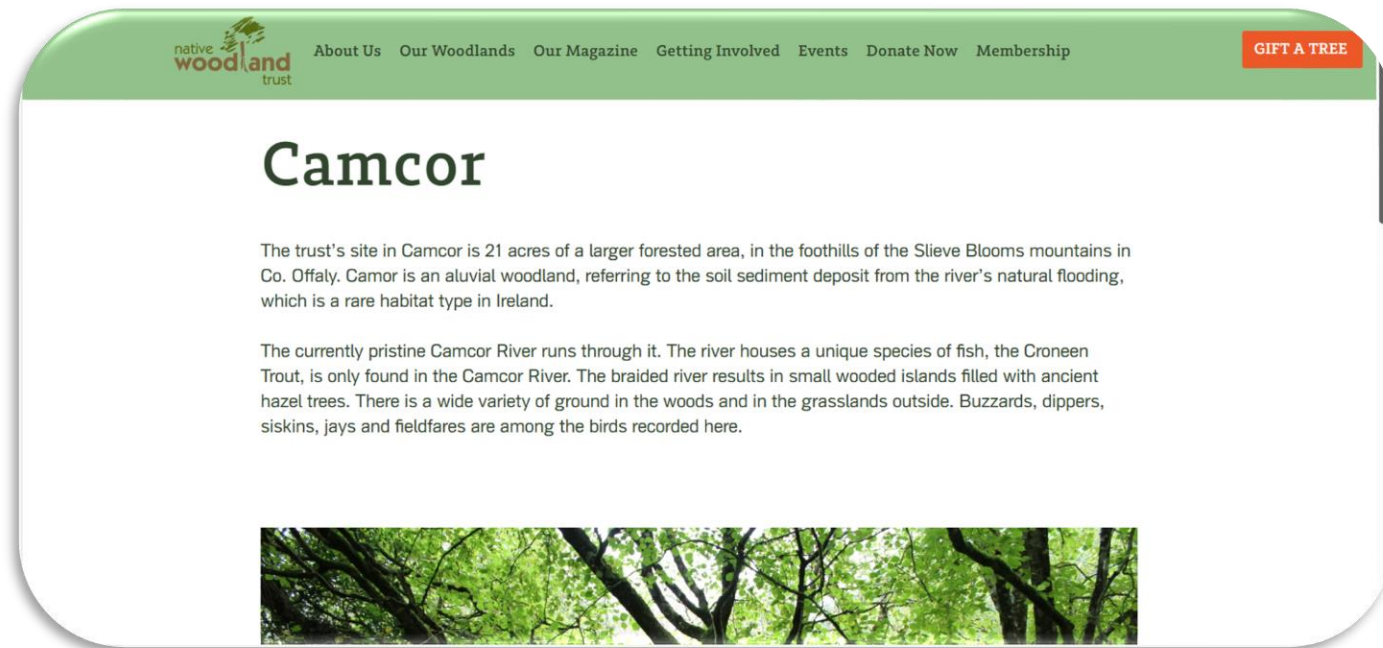
- Overall, €856,260 in funding to 40 community groups in 19 counties
- Clara Heritage Society – Awarded €4,897.50, for the set up of a Brosna Rivers Trust



**The
Rivers
Trust**

LAWPRO Small Grants & Events Scheme

- Native Woodlands Trust - €2890.5
Project Woodlands and Waterways:
Community Conservation
- Centre for Environmental Living and Training (CELT) - €620
Bio-diversity & wildlife pond workshop
- Belmonte District Fishing Club - €200
Fishing Event and Water Awareness



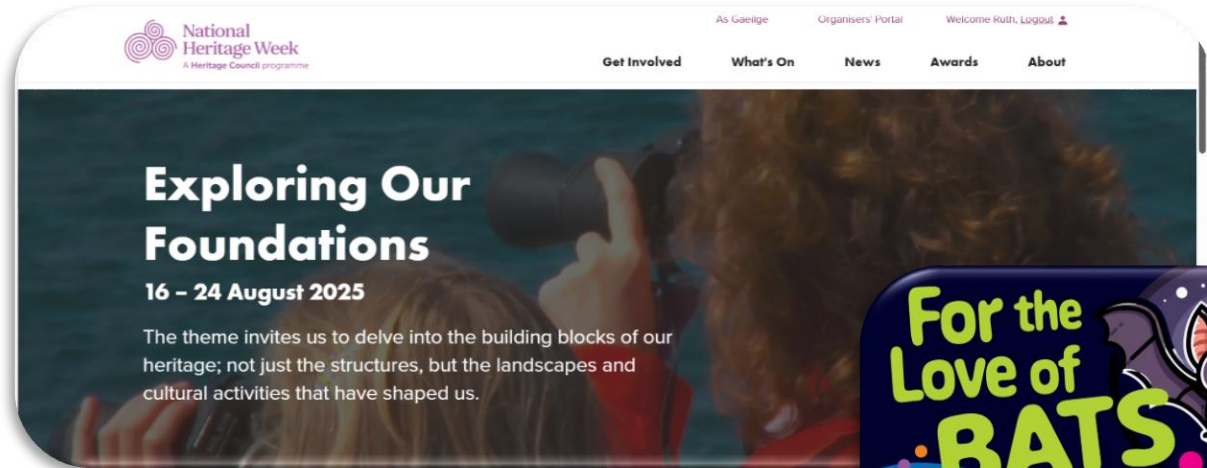
The screenshot shows the website for the Native Woodland Trust. At the top, there is a green navigation bar with the logo 'native woodland trust' on the left and a list of links: 'About Us', 'Our Woodlands', 'Our Magazine', 'Getting Involved', 'Events', 'Donate Now', and 'Membership'. On the far right of the navigation bar is a red button that says 'GIFT A TREE'. Below the navigation bar, the main heading is 'Camcor'. Underneath, there are two paragraphs of text. The first paragraph describes the site as 21 acres of a larger forested area in the foothills of the Slieve Blooms mountains in Co. Offaly, noting it is an alluvial woodland. The second paragraph describes the Camcor River, mentioning the Croneen Trout and various bird species like buzzards, dippers, siskins, jays, and fieldfares. At the bottom of the screenshot is a photograph of a dense forest with green trees.

Create your own wildlife pond



LAWPRO Water Heritage Day Event Grants Scheme

- Ballycumber Tidy Towns - €300 – "For the love of Bats"
- Women's Circle Midlands - €120 – Wildflowers Watercolour workshop
- Clara Heritage Society - €360 – The Brosna River, Past, Present & Future and Clara's Deckenssian Mile, (Along the Brosna River)river.
- Inland Waterways Association of Ireland (IWAI) - €500 - Work Party - 107B Restoration of Heritage Boat as a floating exhibition





Ecological Information

See your recording sheet!

FreshWater Watch Datasheet



Name: Date: Time:

Site name: Number of participants:

The exact location can be selected using an online map when uploading your results. Alternatively, record the site coordinates here: **Latitude** (optional) **Longitude** (optional)

 Please take a photo to go with your data.

Ecological

Freshwater body type

Pond Stream Lake River Wetland Canal Ditch Other:

What is the main land use within ~50m?

Urban residential Rural residential Industrial/commercial Urban green space Mixed agricultural Arable agricultural Livestock Forest Grassland/shrub Other:

What is the main bank vegetation? (select all that apply)

Trees/shrubs Grass/small plants Bare soil Concrete/impermeable surface Other:

Is there any of the following on the water surface? (select all that apply)



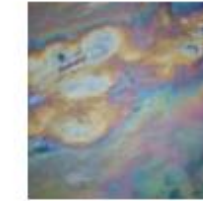
None



Foam



Floating algae



Oily sheen



Slurry

Is the algae... (select all that apply)



No algae



Evenly dispersed



Floating mats



Attached



Blue-green scum

Can you see any litter (including litter caught in vegetation)?

In/on the water Within 1m of river edge 1-5m from river edge No

Which of the following sources of plastic pollution can you see?

Landfill site Bin Fly tipping Recreational

Are there any pollution sources in the immediate surroundings? (select all that apply)

Urban/road runoff Agricultural runoff Outfall/pipe currently discharging
 Outfall/pipe not currently discharging Other:

Can you see any of the following water uses right now? (select all that apply)

Fishing Swimming Boating Irrigation Public water supply Public use of bank
 Animal access Other:

What aquatic life is there evidence of? (select all that apply)

Plants below surface Plants emerging from water Floating plants Fish Frogs/toads
 Aquatic birds Aquatic mammals Dragonflies/damselflies Reptiles None Other:

Has there been any rain during the last 24 hours?

None Light/showers Heavy/prolonged

Mention
Invasive
Species



Hydrological Information

Hydrological

Estimate the water flow: Surging Steady Slow Still

Estimate the water level: High Average Low Dried up

Estimate the waterway width (by measuring the widest bank distance at your current location):

< 1m 1-2 3-5 6-10 11-15 16-25 >25

Speeds explained:

Surging (faster than your walking pace),

Steady (your walking pace),

Slow (slower than your walking pace),

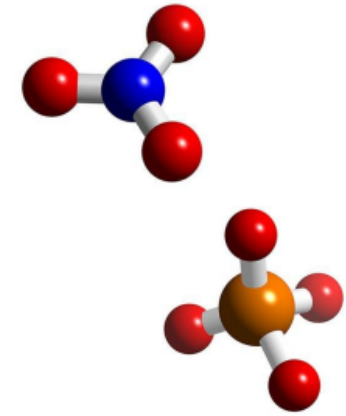
Still

Chemical Testing

Nutrients Test: Nitrate and Phosphate

Nitrate (NO_3^-): a form of inorganic **Nitrogen**
Phosphate (PO_4^{3-}): a form of inorganic **Phosphorus**

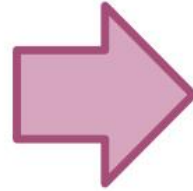
- ◆ **Essential nutrients for plants and algae:** they are absorbed and utilised to grow and perform other biological processes
- ◆ **Human-related sources include:** farming (fertilizers and animal wastes), sewage and other wastewater effluents, industrial discharges
- ◆ If present in **excess** in rivers and lakes, they can cause **eutrophication**
- ◆ Nitrates can have **harmful effects** if ingested with **drinking water**



Testing for Nutrients: Method

1. Create a Sampler

- You can use a plastic container, such as an used water bottle or a bucket, attached to a stick or a rope



2. Collect your Water Sample

- Rinse your sampler using water from the river (to avoid contamination)
- Collect a water sample from the river
 - Water must be collected below the surface (immerse the container)
 - Avoid disturbing the riverbed (it would affect the result)
 - Do not take a sample too near the riverbank

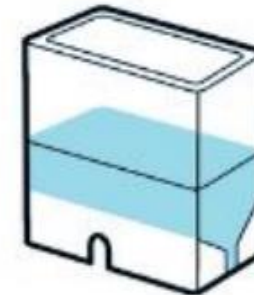
Testing for Nutrients: Method

3. Test your Sample

We will use a **FreshWater Watch Kit**

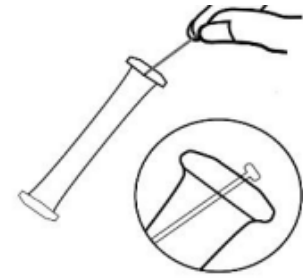
- Nitrate testing tubes
- Phosphate testing tubes
- Sample cup
- Nitrate and phosphate colour charts

1. Rinse the **sample cup** twice and fill the cup with sample water until the water reaches the line in the middle of the cup.
Be careful to fill until the bottom of the sample water surface (the meniscus) touches the line.



Testing for Nutrients: Method

2. Remove the **yellow pin** from the top of the **testing tube**.

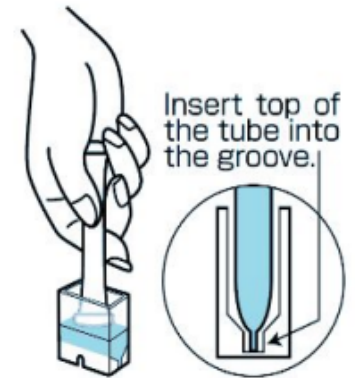


3. Squeeze the sides of the tube to expel about half of the air volume.



4. Whilst squeezing, insert the tube fully into the sample cup.

5. Release the tube and allow the tube to suck up all of the water from the cup into the tube.



Testing for Nutrients: Method

6. Place a finger over the top of the tube to block the pin hole and shake the tube lightly until all the powder is immersed (the powder may not entirely dissolve: this is ok).

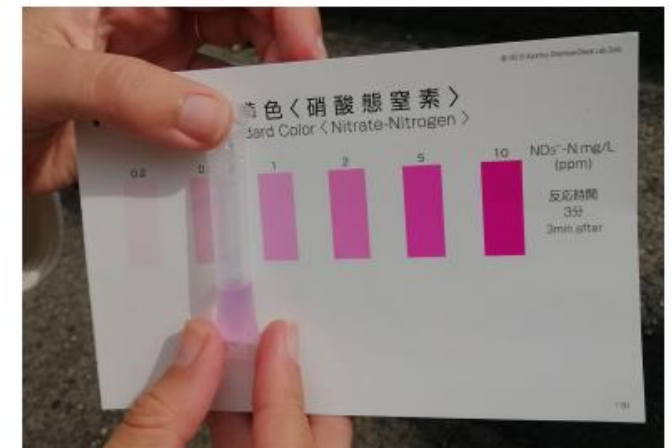
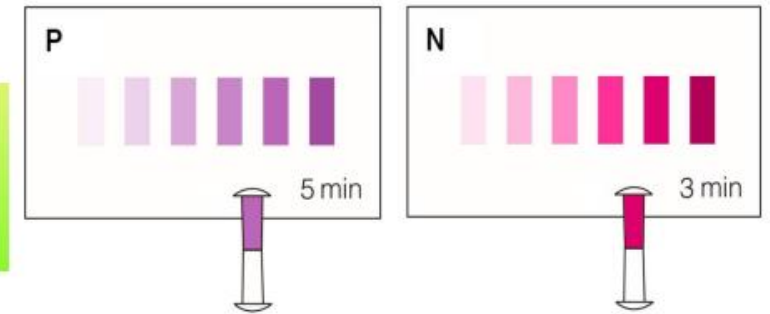


7. Place the tube upright to one side for the required time (**3 minutes for Nitrate, 5 minutes for Phosphate**).



8. Move the tube along the colour chart and decide which two colours your sample best fits between. Record the nutrient range of the sample.

Observations should be made out of direct sunlight.



Optical Information

Water Turbidity

(measured with a Secchi tube)

Very Clear

Highly Turbid

from <14 **NTU** (tube filled to top), to >240 NTU

*Nephelometric
Turbidity Units*



- A measure of the water “cloudiness”
- Influenced by the presence of particles in the water (suspended sediment or micro-organisms)

Method

- Gradually pour the river water into the **Secchi tube**, and observe how the **black and white disc** at the bottom of the tube becomes less and less clear.
- At the water height when the disc is no longer visible, record the number on the **turbidity scale (NTU)** on the side of the tube.
- Record the highest value of NTU at which the Secchi disk disappears, e.g. if the disk disappears between the marks 100 NTU and 75 NTU, record 100 NTU.



Optical Information

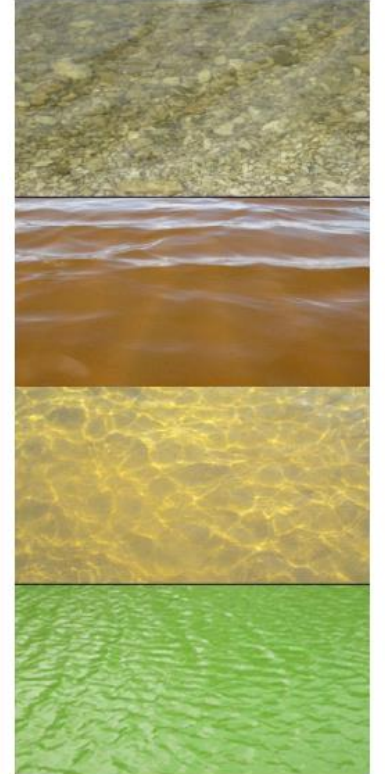
Water Colour

Colourless, Yellow, Brown, Green, Grey, White/Milky

- It can be influenced by both natural processes and human activities
- It is interesting to monitor changes in time, since they can indicate impacts

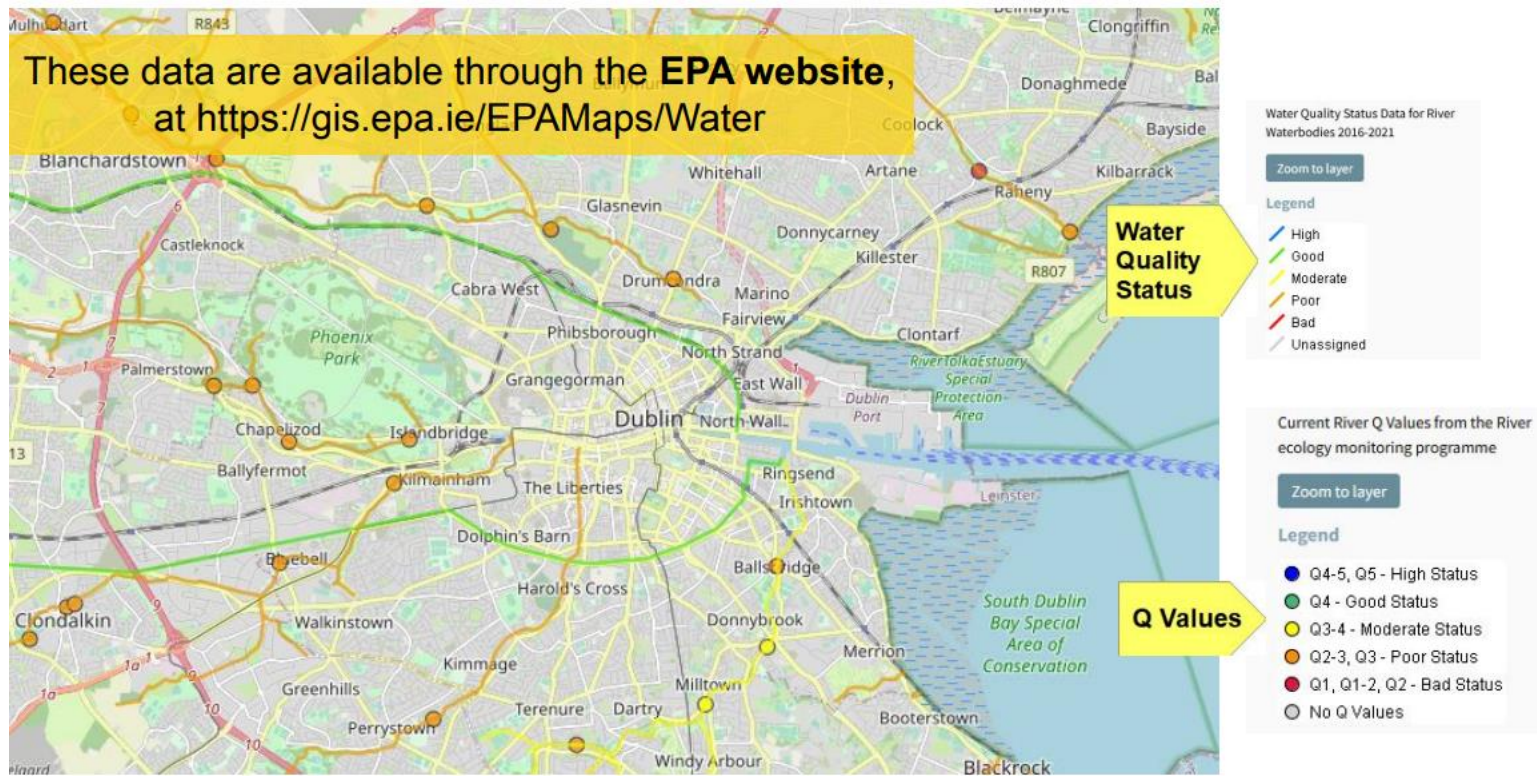
For instance:

- **Brown** → increased soil erosion or sedimentation, or presence of decaying wood matter (tannin, lignin)
- **Yellow** → presence of organic matter from peat or decaying vegetation
- **Green** → increase in algae biomass, possible indicator of eutrophication



Citizen Science Stream Index (CSSI)

- Looking at water quality by examining what lives in a river.
- EPA measures different “Quality Elements”: **Biological**, Physico-Chemical and Hydromorphological
- **The Biological = Q Value**
[Q1 (polluted) to Q5 (unpolluted)]
- The Water Quality Status of the water body is determined by the element with the worst status out of all the elements (“One out, all out” principle)
- **CSSI** looks at **presence/absence of 6 macroinvertebrates**
- Easy to ID, good indicators of polluted/unpolluted streams and common in rivers and streams
- Importantly, looking at what lives in the river gives a long-term picture of health



Citizen Science Stream Index

- What are macroinvertebrates?
- Animals lacking a backbone (basically “non-vertebrates”) and large enough to be seen without the aid of a microscope
- Part of every freshwater ecosystem in the world
- At the base of the aquatic animal food chain
- They differ in their tolerance to polluted environments (especially organic pollution)
- The most utilised biomonitoring organisms for rivers

- **Juvenile stages (larvae and nymphs) of insects** (stoneflies, mayflies, caddisflies, dragonflies and damselflies, alderflies, true flies, ...)
- **Adult insects** (beetles, true bugs)
- **Crustaceans** (freshwater shrimps, waterlouse, crayfish, ...)
- **Molluscs** (snails a.k.a. gastropods, and “clams and mussels” a.k.a. bivalves)
- **Worms** (earthworms, leeches, roundworms, horsehair worms, flatworms...)
- **Water mites and spiders**





Stonefly

filamentous tails
of abdomen



it indicates good water quality

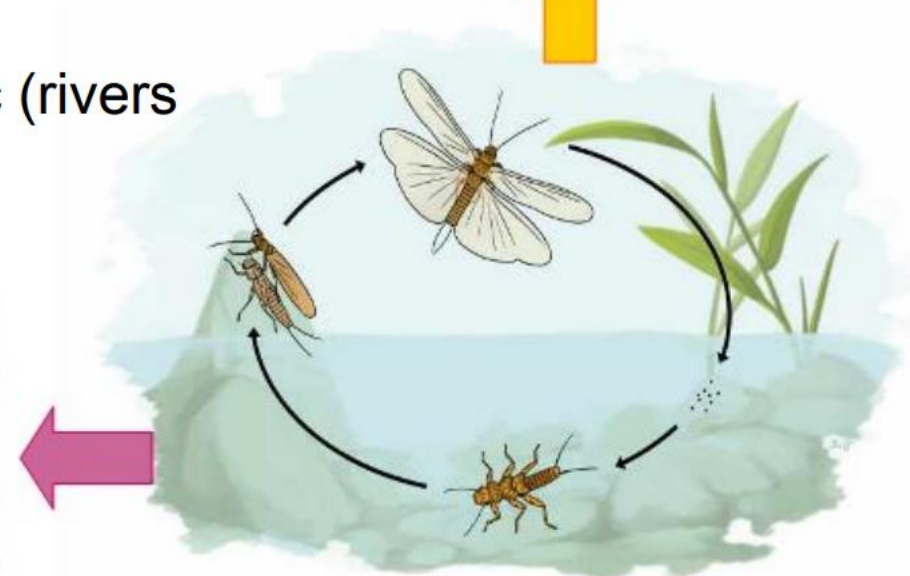
Macroinvertebrate Information

CSSI

“The good guys”

1. Stoneflies (Order Plecoptera)

- All of them are sensitive to habitat degradation and organic pollution
- 19 species in Ireland
- The juveniles (**nymphs**) are aquatic (rivers and lakes), the adults are terrestrial



CSSI

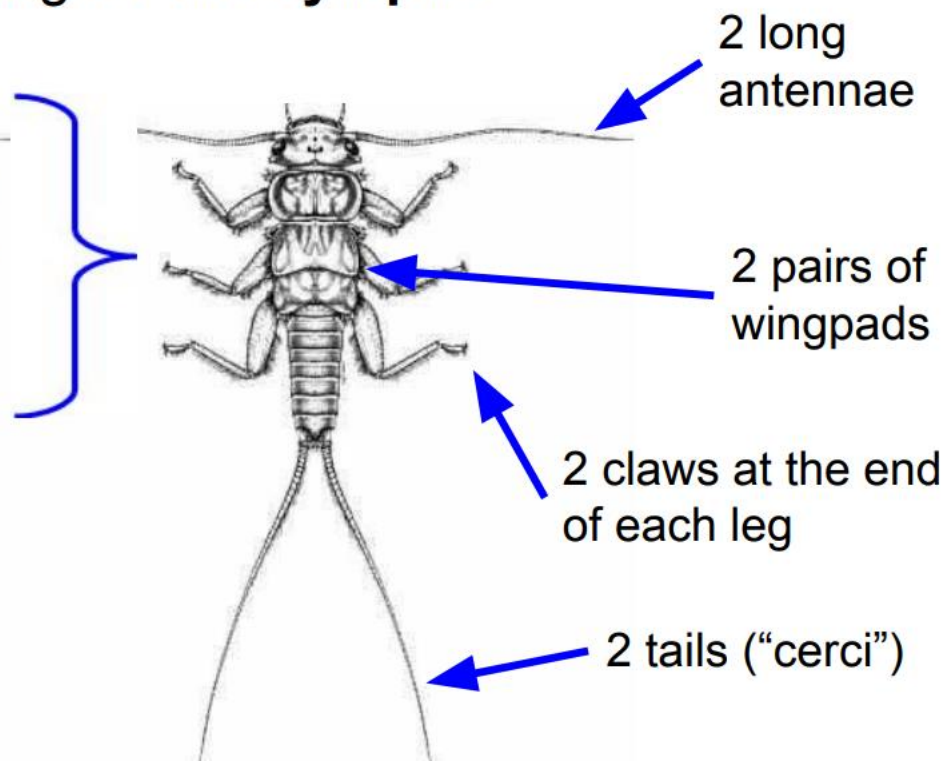
“The good guys”

1. Stoneflies (Order Plecoptera)

→ In our case, we are looking for the **nymphs**



Classic “insect -
body structure”:
→ head, thorax
and abdomen
→ 6 legs



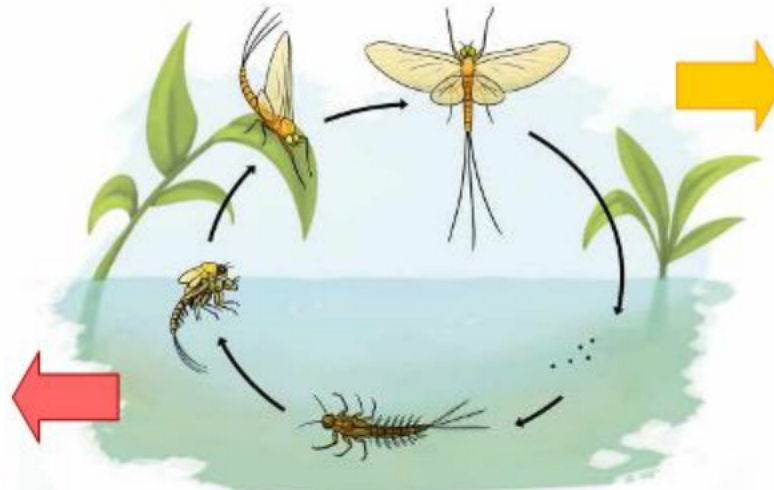
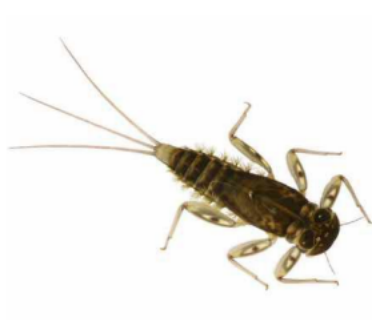
CSSI

“The good guys”

2. Flattened Mayflies

(Order Ephemeroptera, Family Heptageniidae)

- 9 species in Ireland
- The juveniles (**nymphs**) are aquatic (rivers and lakes), the adults are terrestrial
- The adults do not feed



CSSI

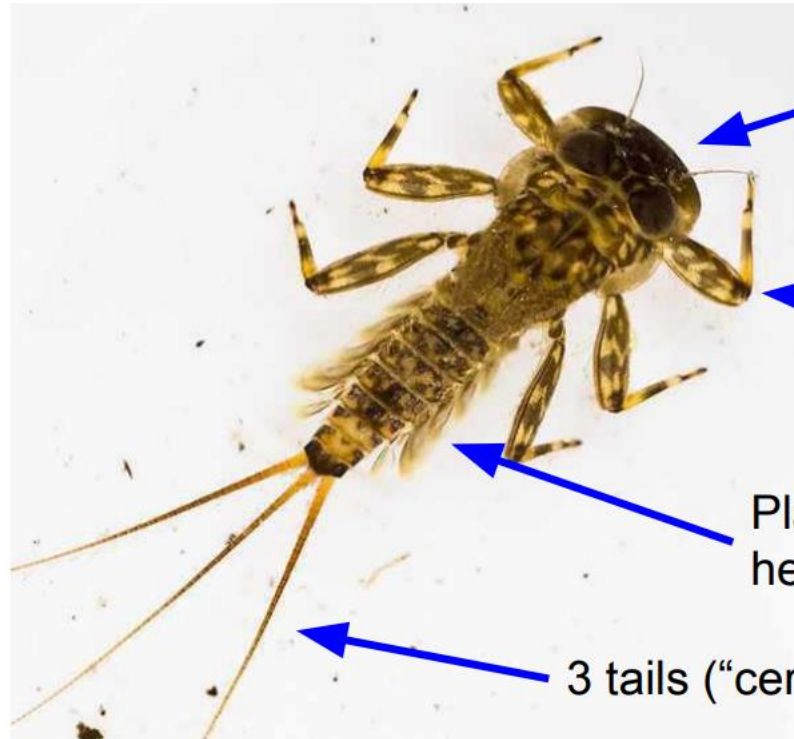
“The good guys”

2. Flattened Mayflies

(Order Ephemeroptera, Family Heptageniidae)

→ In our case, we are looking for the **nymphs**

Classic “insect body structure”:
→ head, thorax and abdomen
→ 6 legs



Broad, flattened head, with large eyes

Powerful, flattened legs

Plate-like gills, held out sideways

3 tails (“cerci”)

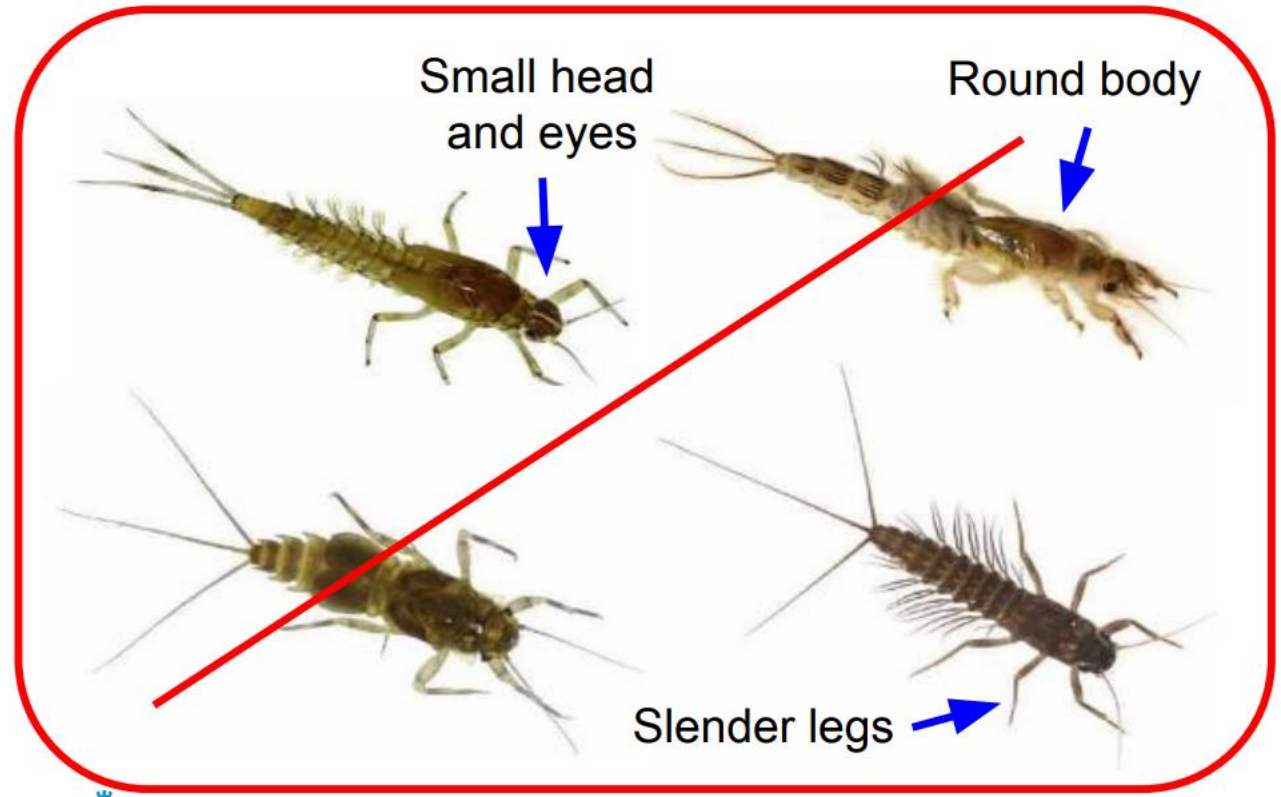
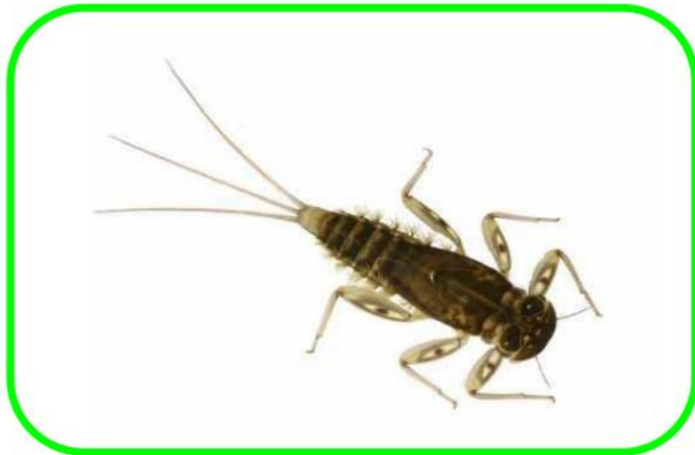
CSSI

“The good guys”

2. Flattened Mayflies

(Order Ephemeroptera, Family Heptageniidae)

- We don't consider **other mayflies (“non-flattened”)**: they can be found in polluted and unpolluted waters

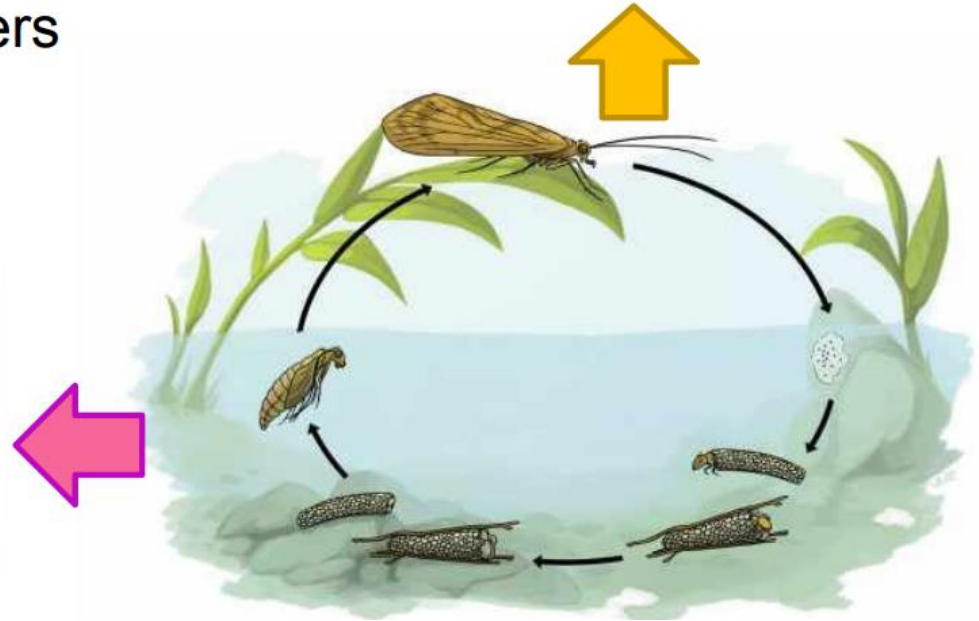


CSSI

“The good guys”

3. Green Caddisflies (Order Trichoptera, Family Rhyacophilidae)

- 2 species in Ireland
- The juveniles (**larvae**) are aquatic (rivers and lakes), the adults are terrestrial



CSSI

“The good guys”

3. Green Caddisflies

(Order Trichoptera, Family Rhyacophilidae)

In our case, we are looking for the **larvae**

Green body,
“caterpillar-like”



Hard head capsule

3-segmented thorax
(with 3 pairs of legs)

Long abdomen,
with tufts of external gills



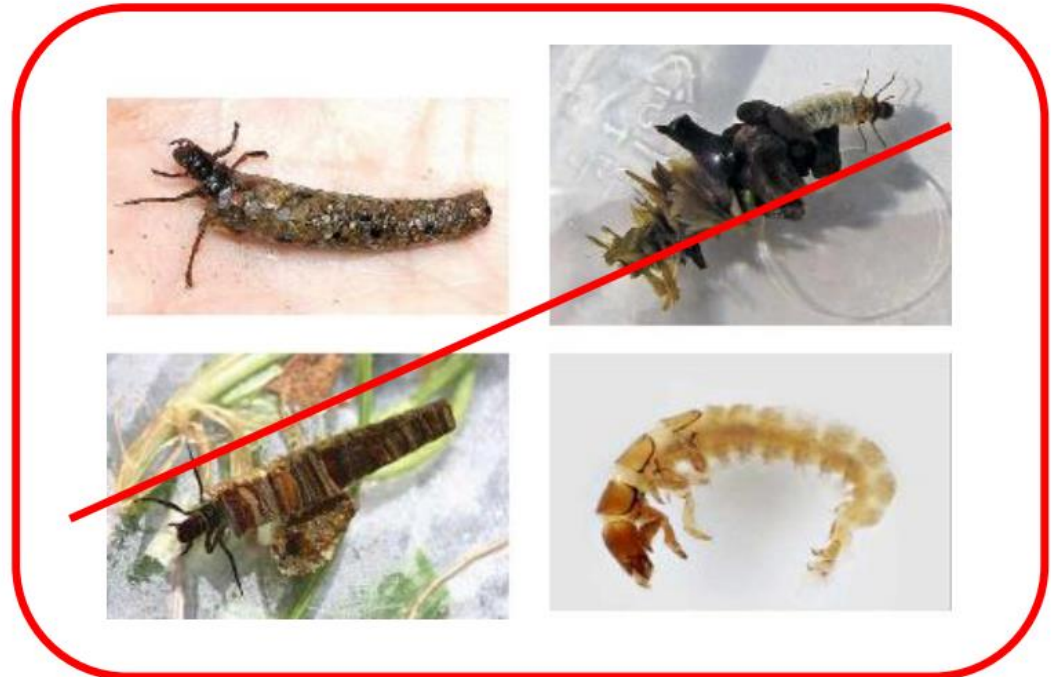
CSSI

“The good guys”

3. Green Caddisflies

(Order Trichoptera, Family Rhyacophilidae)

- Caddisflies larvae can be “**cased**” (living inside a case built by themselves) or “**non-cased**” (such as the Green Caddisflies)
- We don't consider all the **other caddisflies**: they can be found in polluted and unpolluted waters



w

CSSI

“The bad guys”

1. Snails (Class Gastropoda)

- Characterised by a calcareous shell coiled in a spiral patterns
- 36 freshwater species in Ireland
- Very diverse group (shape, size, colour)



CSSI

“The bad guys”

2. Leeches (Sub-class Hirudinea)

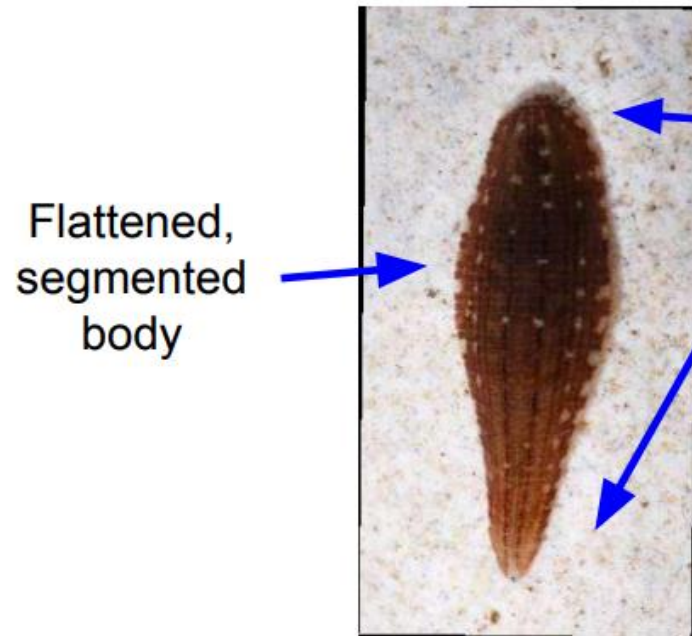
- Segmented worms (annelids), closely related to earthworms
- 37 species in Ireland & UK
- Although leeches are usually known as parasites, most of the Irish species are predators or scavengers



CSSI

“The bad guys”

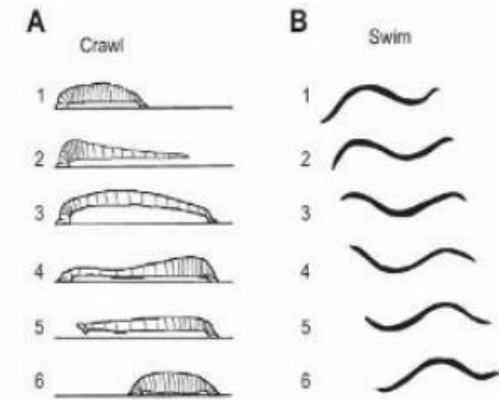
2. Leeches (Sub-class Hirudinea)



Flattened, segmented body

Sucker at both head end and rear end

They move by contracting or crawling movement, or undulatory swimming



CSSI

“The bad guys”

3. Waterlouse (genus *Asellus* spp.)

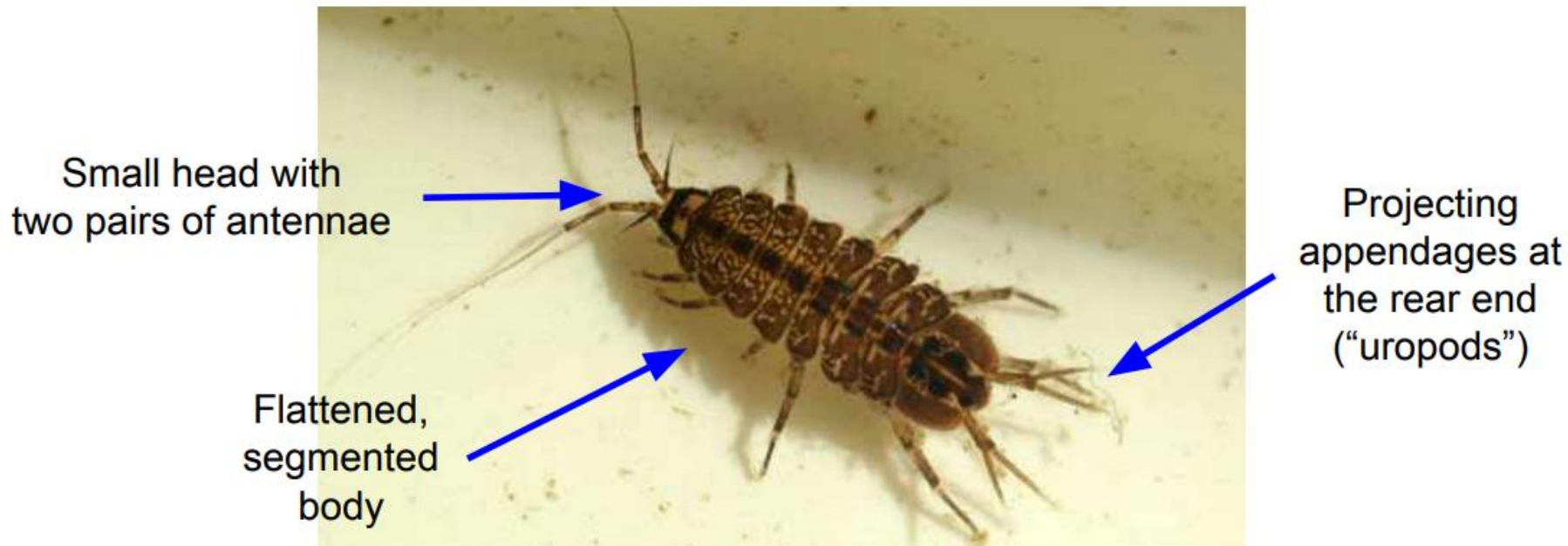
- Small crustaceans, closely related to woodlice (Isopod Order)
- Also known as “water slaters”



CSSI

“The bad guys”

3. Waterlouse (genus *Asellus* spp.)



Not to be confused with **freshwater shrimps**, that have instead a laterally compressed body



Citizen Science Stream Index: Tips

Choosing a site:

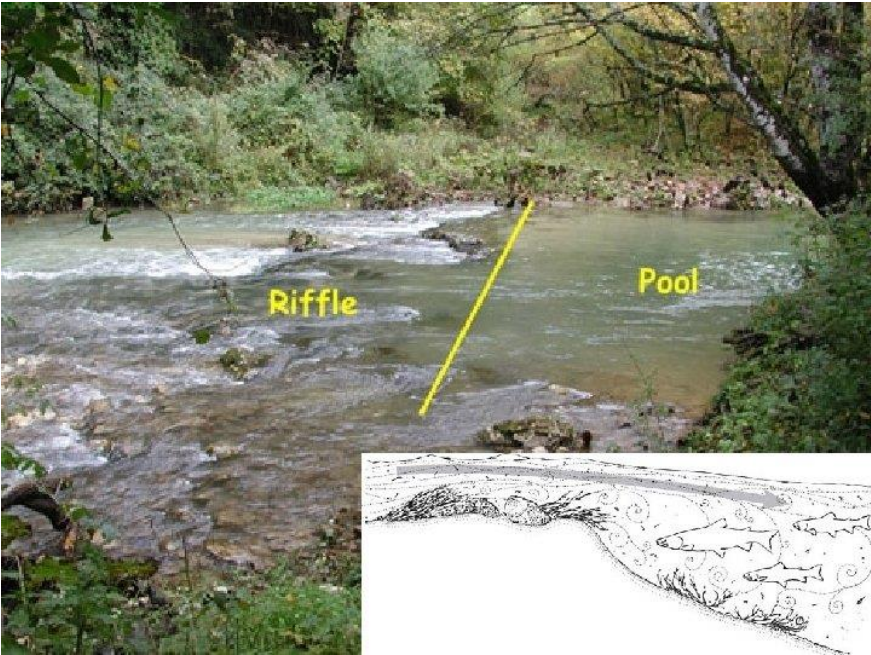
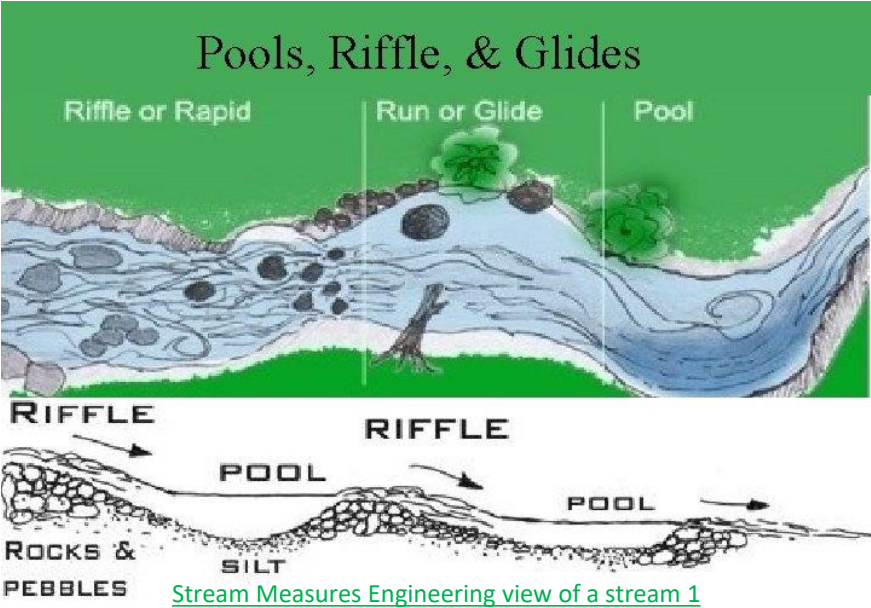
Investigate your river by visiting <https://gis.epa.ie/EPAMaps/Water>

Do a walk of potential site looking for:

- Safe points of entry
- Shallow water
- Low energy
- Mix of habitats (gravel best)
- Potential pollution points (before & after)



[Outfall Safari Guide and Resource Pack - CaBA](#)



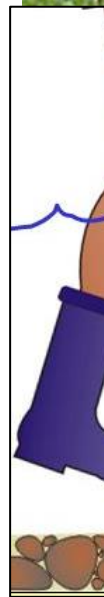
Citizen Science Stream Index

Carrying out a kick test

- Give everyone a job
- Stop invasives: Check/Clean/Dry
- Use net getting in & out
- Hold net away from you
- Walk slowly upstream watching where you step
- Remove stones & leaves to see better
(NB: leave some & wash first)
- Let contents settle
- Count good & bad guys once
- Take clear photos: whole river, tray & sample
Important for - verification & reporting



Allows us to enter individual taxa records – sometimes even to species level. These can be submitted to the National Biodiversity Data Centre – *this can be important for high status areas for example*



Perla bipunctata – a large predatory stonefly (that can live to 3 years)

Recording Results

Ecological, Hydrological, Chemical (Nutrients), Optical - Information

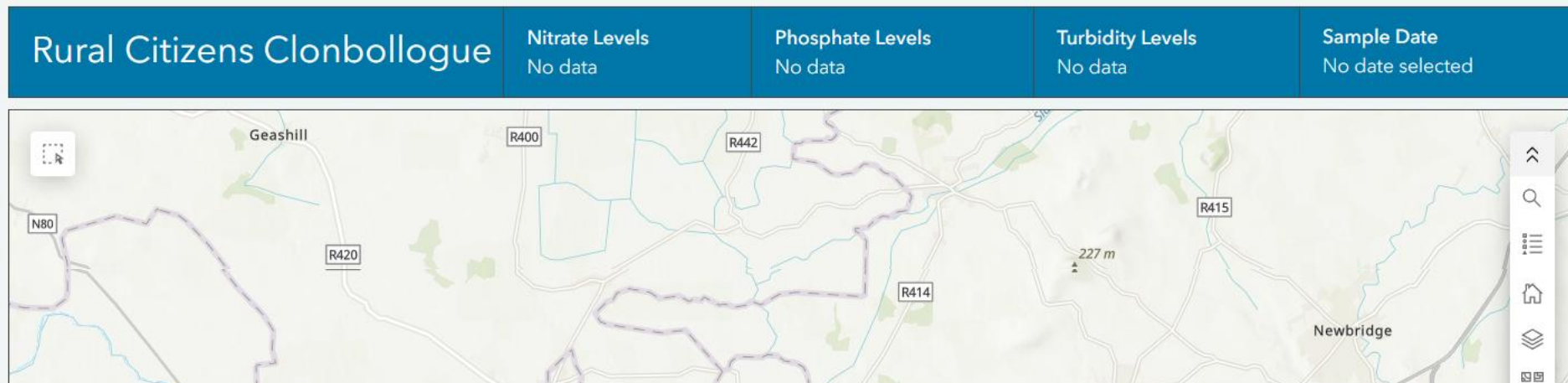


- About ▾
- Get involved ▾
- Our data ▾
- News
- FAQs
- My Groups
- Donate

RESULTS

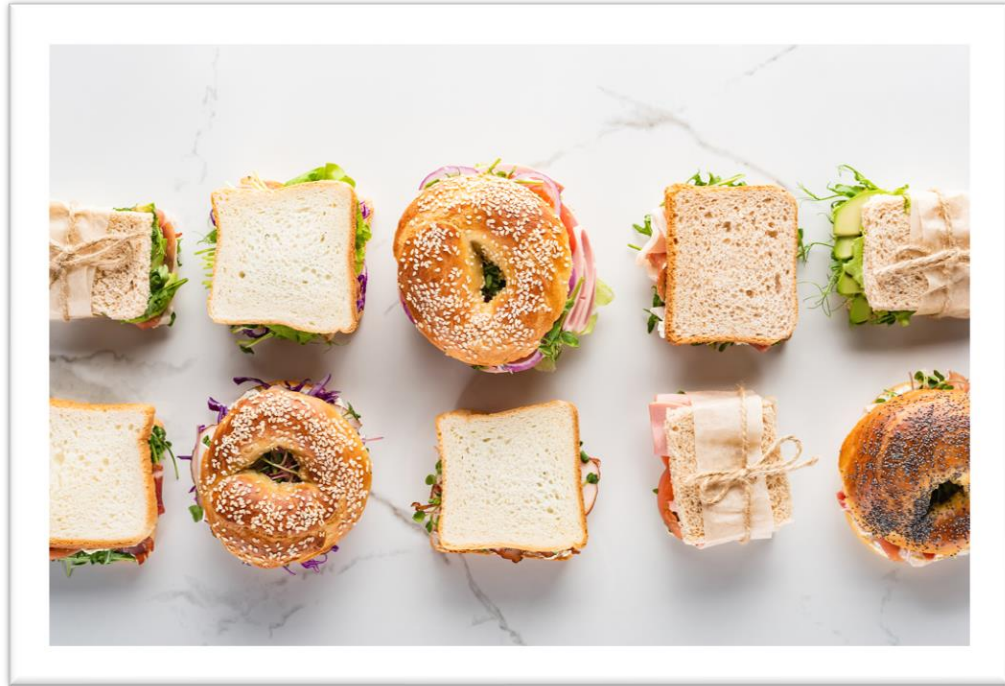
[View, edit and analyse your results](#)

The below map provides an overview of the data collected by this group. You can double-click on the map to zoom in and single-click to select individual records.



What Now?

- Lunch
- Water Sampling!



FreshWater Watch Datasheet



Name: Date: Time:

Site name: Number of participants:

The exact location can be selected using an online map when uploading your results. Alternatively, record the site coordinates here: **Latitude** (optional) **Longitude** (optional)



Please take a photo to go with your data.

Ecological

Freshwater body type

Pond Stream Lake River Wetland Canal Ditch Other:

What is the main land use within ~50m?

Urban residential Rural residential Industrial/commercial Urban green space Mixed agricultural Arable agricultural Livestock Forest Grassland/shrub Other:

What is the main bank vegetation? (select all that apply)

Trees/shrubs Grass/small plants Bare soil Concrete/impermeable surface Other:

Is there any of the following on the water surface? (select all that apply)



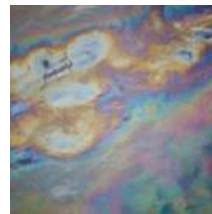
None



Foam



Floating algae

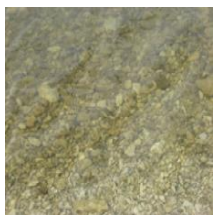


Oily sheen



Slurry

Is the algae... (select all that apply)



No algae



Evenly dispersed



Floating mats



Attached



Blue-green scum

Can you see any litter (including litter caught in vegetation)?

In/on the water Within 1m of river edge 1-5m from river edge No

Which of the following sources of plastic pollution can you see?

- Landfill site Bin Fly tipping Recreational

Are there any pollution sources in the immediate surroundings? (select all that apply)

- Urban/road runoff Agricultural runoff Outfall/pipe currently discharging
 Outfall/pipe not currently discharging Other:

Can you see any of the following water uses right now? (select all that apply)

- Fishing Swimming Boating Irrigation Public water supply Public use of bank
 Animal access Other:

What aquatic life is there evidence of? (select all that apply)

- Plants below surface Plants emerging from water Floating plants Fish Frogs/toads
 Aquatic birds Aquatic mammals Dragonflies/damselflies Reptiles None Other:

Has there been any rain during the last 24 hours?

- None Light/showers Heavy/prolonged

Hydrological

Estimate the water flow: Surging Steady Slow Still

Estimate the water level: High Average Low Dried up

Estimate the waterway width (by measuring the widest bank distance at your current location):

- < 1m 1-2 3-5 6-10 11-15 16-25 >25

Chemical - Nutrients in parts per million (ppm)

Nitrate (mg/L): < 0.2 0.2-0.5 0.5-1 1-2 2-5 5-10 >10

Phosphate (mg/L): < 0.02 0.02-0.05 0.05-0.1 0.1-0.2 0.2-0.5 0.5-1 >1

Optical

Secchi Tube (Turbidity): NTU (result will be between <14 (very clear) and >240 (highly turbid))

Estimate the water colour: Colourless Yellow Brown Green Grey White/milky

Other:

Notes (e.g. please list any aquatic mammals observed)

Recorder name:

Stream name:

Date:







GPS/location:

The **Citizen Science Stream Index (CSSI)** is based on the presence or absence of six key aquatic invertebrates. Three pollution-sensitive invertebrates ('good guys') are commonly found in clean streams and three pollution-tolerant invertebrates ('bad guys') are commonly found in polluted streams.

Citizens use a pond net to take three 30-second kick-samples (the three samples should be a few metres apart) from a shallow (<20cm), gravelly, fast-flowing part of the stream. The invertebrates captured in each sample are examined in a white tray on the bankside. The six key invertebrates are easily spotted amongst the many other species in the tray, by their characteristic shape, colour or movement.

The citizen will score each sample depending on which, if any, of the six key invertebrates occur in the tray. The three **'good guys' have a score of +1** each and the three **'bad guys' have a score of -1 each**. The score for each kick-sample can range from +3 (all three good guys and no bad guys) to -3 (all three bad guys and no good guys). When the scores from all three samples are added together, the CSSI ranges from +9 to -9. Check out this your tube video on how to take a kick-sample. <https://youtu.be/HsDZ0siO6Ds>

Send your results to info@lawaters.ie and don't forget to attach a clear photograph of your sample and of a copy/photograph of this filled in sampling sheet.

	Sample 1	Sample 2	Sample 3
Stonefly (+1) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flattened mayfly (+1) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green caddisfly (+1) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snail (-1) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leech (-1) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waterlouse (-1) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Sum of scores 1	Sum of scores 2	Sum of scores 3
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Take a clear photograph of your sample to let us check and verify your sample

Take a good, clear photo of all of the six key invertebrates that were found in the 3 samples, placed in a small white-bottom dish (eg jam jar lid) including a label, with information on the date, stream name, location and recorder.



River: _____ Site: _____
Sample no. _____ Recorder: _____

CSSI Scores can be a 'traffic light' for water quality

CSSI score -9 to -5

Heavily polluted

CSSI Score -4 to +4

Moderately polluted

CSSI Score +5 to +9

Clean



Total score for the 3 samples = CSSI Score

+ +

Any observations (eg. excessive algae or fine sediment, cattle access nearby, surface foam, presence of trout/salmon etc):

Send your results to info@lawaters.ie and don't forget to attach a clear photograph of your sample and of your filled in sampling sheet.

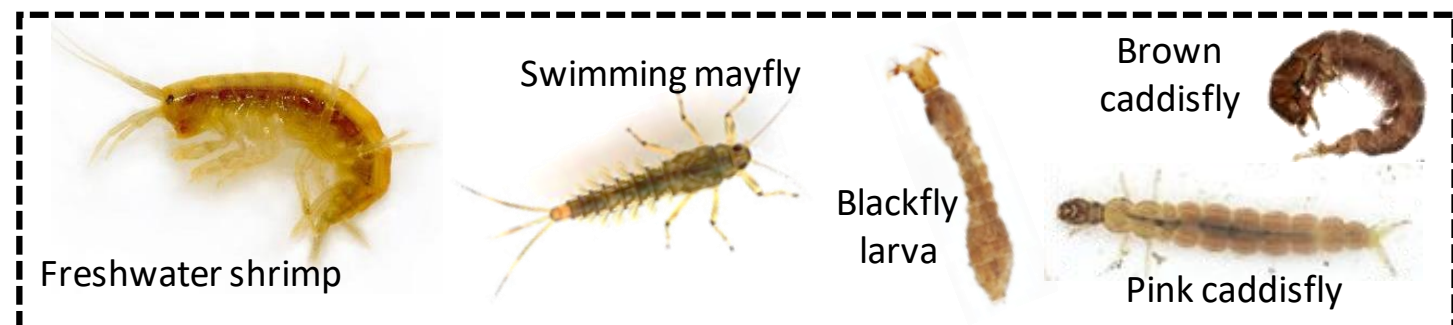
The 'good guys'



The 'bad guys'



These invertebrates are found in most streams and are **NOT** scored for the CSSI



How to register and join the Rural Citizens Clonbollogue group

Online registration only takes a couple of minutes. By creating an ArcGIS account, you will then be able to join your group and access your group page, the app survey and all data visualisation tools.

Create your account [*HERE*](#)

Your username will be publicly visible so please do not use your full email address.



Once you have completed the joining steps, you can sign in and access your group page here:

<https://www.freshwaterwatch.org/pages/rural-citizens-clonbollogue>

Additional guidance for creating an account:

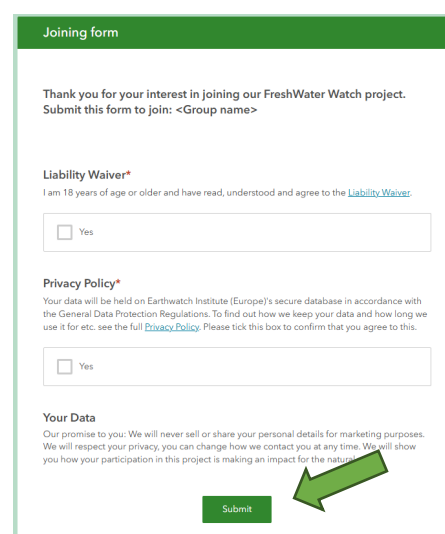
- Click the link above, or scan the QR code
- In the grey pop-up box, select 'No account? [Create a Earthwatch Community account](#)'

Create a Earthwatch Community account.' and another link for 'Not a member of this organization? [Sign in to your account on ArcGIS Online](#)'. A blue arrow points to the 'Create a Earthwatch Community account.' link." data-bbox="83 591 436 843"/>

- Click the activation link in your email
- Follow the prompts to create a username, password and security question/answer

Additional guidance for joining your group:

- You will be automatically redirected to a [Joining form](#) displaying your group name
- Tick the boxes to confirm that you agree to the Liability Waiver and Privacy Policy
- Click the green 'Submit' button



- You will then see your group appearing within the '[My Groups](#)' area when signed in

How to report a water pollution incident in Ireland?

There are many different organisations involved in the protection of water in Ireland each with similar but different roles and responsibilities.

Roles and Responsibilities

The [Local Authority Waters Programme](#) (LAWPRO) is a national shared service working on behalf of all 31 local authorities in Ireland. We coordinate efforts to achieve good or high-water quality in our rivers, lakes, transitional and coastal waters, and groundwater, as required by the European Union Water Framework Directive. Healthy rivers and catchments support a healthy environment, a robust economy, our health, and wellbeing. **LAWPRO, however, does not have a regulatory or enforcement function so complaints should be directed to the relevant implementing body as outlined below.**

The 31 [Local Authorities](#) across the country they are responsible for the implementation of several water related pieces of legislation. They enforce the Water Pollution Acts 1977 and 1990 and regulate small trade effluent or wastewater discharges; carry out inspection of domestic wastewater treatment systems (septic tanks) and farms amongst many other activities including planning authorisations. With the introduction of Uisce Éireann (Irish Water), local authorities are no longer responsible for the provision of public water supplies or public wastewater treatment plans, but they have a supervisory role in relation to private group water schemes.

[Uisce Éireann](#) (UE) is a national service provider for drinking water treatment and supply including management of leakage as well as the management and maintenance of wastewater treatment plants. The Environmental Protection Agency is the regulator responsible for oversight of UE.

The [Environmental Protection Agency](#) (EPA) has many different responsibilities including licensing and enforcement; waste management; water management and environmental monitoring and assessment as well as supervision of the activities of local authorities and Uisce Éireann.

[Inland Fisheries Ireland](#) (IFI) is the statutory body responsible for inland fisheries in Ireland. The principal function is the protection, management, and conservation of the inland fisheries resource. IFI enforce the Fisheries Acts 1959 – 2010 and the Water Pollution Acts 1977 and 1990.

[National Parks and Wildlife Service](#) has a complex range of responsibilities. These range from significant policy and advisory functions to operational responsibilities in the National Parks and Nature Reserves, conservation, compliance, licensing, nature, and biodiversity and as a statutory consultee on planning. If you are aware of a pollution incident or an activity likely to cause pollution or damage within a protected area or concerned about damage or disturbance to habitats or protected species under the Habitats and Wildlife Acts, contact them.

[Waterways Ireland](#) is one of six North/South Implementation Bodies established under the British-Irish Agreement of 1998. It is the cross-border navigational authority responsible for the management, maintenance, development, and promotion of over 1000 km of inland navigable waterways, principally for recreational purposes.

[Office of Public Works](#) The OPW carried out several arterial drainage schemes on catchments under the **Arterial Drainage Act, 1945**, and flood defence schemes under the **Arterial Drainage (Amendment) Act, 1995**. The OPW is required to maintain drainage works in proper repair and

effective condition. It is also responsible for leading and co-ordinating the implementation of localised flood relief schemes to provide flood protection for cities, towns, and villages, either directly or in association with relevant Local Authorities.

Information needed to report a water pollution incident

This a check list of the type of information you should provide when reporting a water pollution incident.

- **Where You Are:** Describe exactly where the incident has happened. If it is close to a known bridge, road, or important landmark, that information would be useful. Even better, if you can provide a specific reference point, because the person on the phone might not know the local area well.
- **Date and Time:** Make a note of when you saw the problem. Write down the exact time you noticed the issue.
- **Explain What You Saw:** Give a clear description of what happened. Can you see any unusual discharges? Is there a bad smell? Are there fish struggling in the water?
- **Identify the Source:** If possible, can you tell where the pollution is coming from? This might not always be obvious, but if you can figure it out, please report it. This detail could be really important in deciding who will investigate the problem.
- **Photos or Videos:** Nowadays, most of us have cameras on our phones. If you can, take pictures or short videos. These can be really helpful. You can capture things like water that's a strange colour or fish and other animals that seem to be in trouble.

In all cases, look for a reference number for the pollution incident report and request that you be kept informed.

Which organisation to contact?

The answer to this question is dependent on several factors,

- Location of the incident.
- Cause or source of the incident.
- Severity or Risk Posed by the incident.

A National Complaints Line has been put in place to help co-ordinate the response to environmental incidents and complaints as sometimes there are several different organisations who have responsibility to react to the complaint or incident. This should be your first point of contact when reporting a water pollution incident. Make sure you get a reference number, which can be used to track follow up actions.

- **A smart phone App 'See It? Say It!' is also available.**

Apple iPhone: [Download from the Apple App Store](#)

Android smartphone: [Download from the Android Play Store](#)

- **EPA National Environmental Complaints Line (NECL)**

Tel: 1800 365 123, open 24-hours, 7-days per week.

These systems are used to capture water pollution incidents and complaints in relation to waste and litter.

If you want to report directly to the responsible organisations, you will need to be able to answer the following questions. Please let each organisation know who else you have reported the incident to and provide any relevant reference numbers, where available.

1. Location of the incident:

- a. If within a protected area, contact NPWS.
- b. If within a canal managed by Waterways Ireland, contact them.
- c. If within a drainage network managed by OPW, contact them.
- d. If not within a known area identified above, **contact relevant LA environment section.**

AND

2. Suspected cause or source of the incident – it is difficult in many cases to be able to identify the suspected cause or source of the incident and more difficult to know who operates the facility but if you do know then this is a guide as to who to contact.

- a. If the incident is suspected to be caused by an Uisce Éireann facility (drinking water or wastewater):
 - i. contact UE and the EPA as the supervisory authority and copy the LA and IFI on the complaint.
- b. If the incident is caused by an industrial or waste facility, identify the type of activity:
 - i. If activity under LA's Authority
 1. Contact Environment Section of LA.
 - ii. If activity type is EPA regulated:
 1. Contact EPA.
- c. If the incident is caused by an agricultural activity, e.g., slurry spreading:
 - i. Contact the LA.
- d. If the incident is caused by in-stream works or works on a riverbank:
 - i. Contact LA and IFI.
- e. If the incident causes or is affected by flooding:
 - i. Contact LA and OPW.

AND

3. Risk Posed by the Incident:

- a. If incident poses a risk to drinking water supplies:
 - i. Contact UE, EPA, and LA.
- b. If incident poses a risk to waterbodies fish/shellfish
 - i. Contact IFI.
- c. If incident poses a risk to habitats or birds:
 - i. Contact NPWS.
- d. If incident poses a risk to bathing waters:
 - i. Contact LA
- e. If incident poses a risk to ecological health to waterbodies:
 - i. Contact LA
- f. If the incident poses a risk to the Marine water environment
 - i. Contact the [Marine Institute](#) (MI), [Sea Fisheries Protection Authority](#) (SFPA), [Food Safety Authority of Ireland](#) (FSAI) and [An Bord Iascaigh Mhara](#) (BIM)

4. Provide Information to Each Organisation:

When reporting to an organisation, inform them about other organisations you've contacted. Provide relevant reference numbers, if available. Licence's/Certificates of Authorisation's (COA) issued by the Agency include conditions requiring notification of incidents to the Agency and other relevant bodies. Licensees/Certificate of Authorisation (COA) holders are reminded of their obligations under these conditions and should ensure compliance as required.

What can I do if I am not happy with how my pollution incident is dealt with?

The EPA provides support and coordination to the county and city councils and also has a statutory role to supervise their environmental activities including their response to water pollution incidents.

[Support and supervision of county and city councils | Environmental Protection Agency \(epa.ie\)](#)

Organisation Contact Details

Local Authorities

Your local authority will investigate your incident complaint, you can use the different forms of contact as listed below:

- **Contact your local council directly. [Find contact details for your local authority.](#)**

Kildare Co Co:

Water Pollution: environ@kildarecoco.ie

➤ PH: [045 980588](tel:045980588)

➤ PH: [045 980587](tel:045980587)

Offaly Co Co:

Pollution: environment@offalycoco.ie

Environment Section, Áras an Chontae: (057) 9357403

Environmental Hotline: 1800 242 673

Out of Hours number: 1890 750 750

To report large scale illegal dumping please contact the Dump the Dumpers line: LoCall 1850 365 121

Uisce Éireann (Irish Water)

Uisce Éireann is the new name for Irish Water. For any questions about public water services, or to report an issue in your area, we can be contacted 24 hours a day 7 days a week on **1800 278 278**.

Email: operations@water.ie Web: www.water.ie/contact Web: www.water.ie/contact

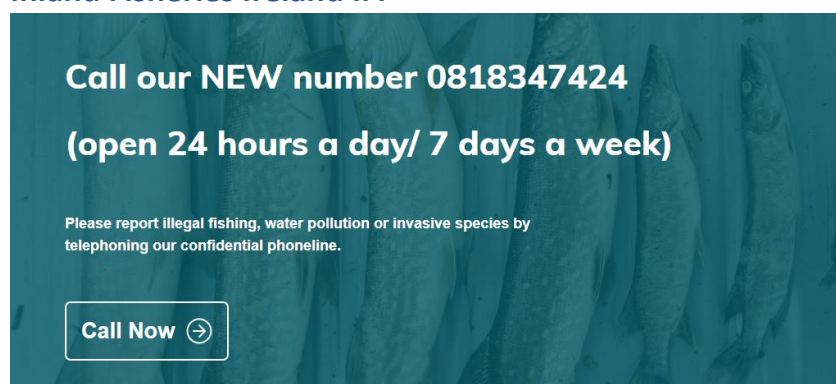
Environmental Protection Agency EPA

The EPA have their own information page on reporting incidents and making a complaint. See links.

[Incidents | Environmental Protection Agency \(epa.ie\)](#)

[Make an environmental complaint | Environmental Protection Agency \(epa.ie\)](#)

Inland Fisheries Ireland IFI



Call our NEW number 0818347424
(open 24 hours a day/ 7 days a week)

Please report illegal fishing, water pollution or invasive species by telephoning our confidential phoneline.

Call Now →

National Parks and Wildlife Service NPWS

It is an offence to destroy vegetation on uncultivated land between the **1st of March** and the **31st of August** each year. If you wish to make a complaint in relation to illegal damage to vegetation, please do so in writing to natureconservation@npws.gov.ie or contact your local Garda station. For concerns in relation to other activities, please [Contact Us | National Parks & Wildlife Service \(npws.ie\)](#) for further advice.

Waterways Ireland

Waterways Ireland has regional contact numbers and a complaints form on their website [Waterways Ireland | Contact Us](#)

Office of Public Works

[Have you checked our FAQ section?](#)

Email: floodinfo@opw.ie Telephone: [\(+353\) 46 942 2000](tel:+3531469422000)

Complainant Confidentiality

Complainants can specify in writing that they wish their details to be kept confidential. It should be noted that protection is given to complainants under the Freedom of Information Acts, as amended. However, each case will be assessed on its own merits and confidentiality cannot be guaranteed. As a general rule, the contact details of complainants should always be treated with discretion.

Rural Citizens Climate Justice Programme

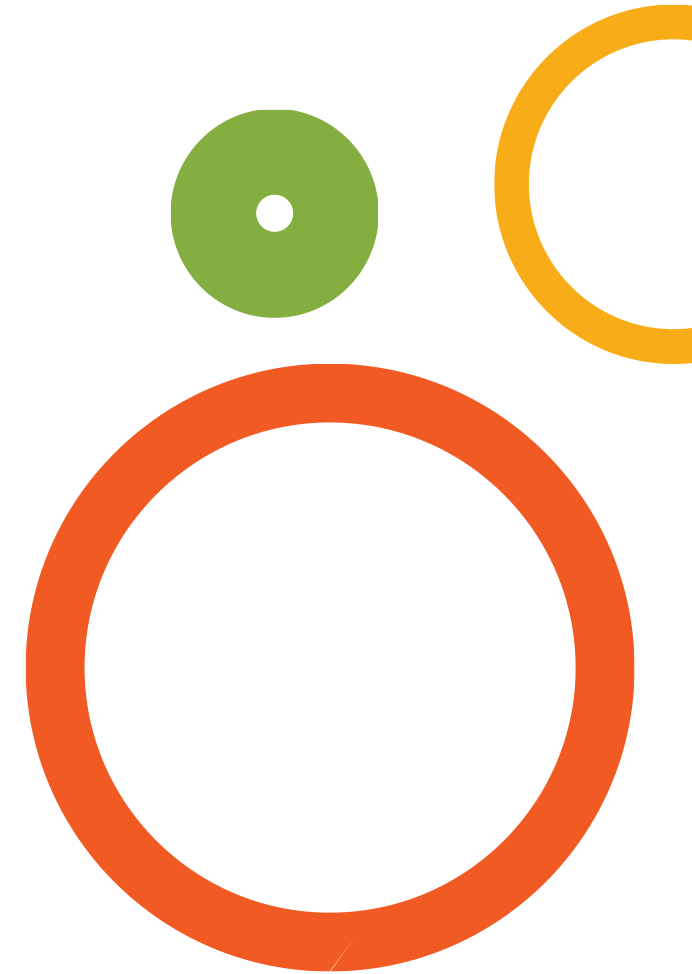
Date: 12 September 2025
Duration: 1 hour/ 1.5 hours

Topics we will cover today

- Climate and Climate Change.
- Consequences of Climate Change
- Causes of Climate Change
- The Three Pillars of Climate Action

Greta Thunberg

‘Climate Change is not only a threat, it is, above all an opportunity to create a healthier, greener, and cleaner planet which will benefit all of us.
We must seize this opportunity.’





**CLIMATE
CHANGE?**

Weather VS Climate

Weather = Is the state of the atmosphere at a particular location over a short period of time. (the weather is what you experience on a day-to-day basis when you step outside your front door)

Climate = The average of the weather patterns in a location over a long period of time usually 30 years or more. (the climate of a country or region is determined by watching the weather patterns over a long period of time)



Climate Change

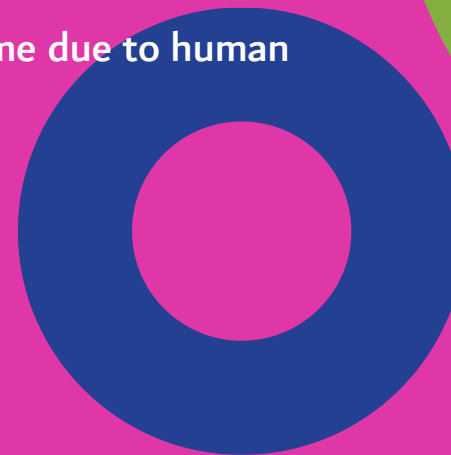
What is climate change?

"Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

[United Nations Framework Convention on Climate Change, Article 1](#)

In other words

Climate change is the shift in temperature and weather patterns over a long period of time due to human behaviour.



Climate Change



1. What serious weather events can climate change bring?
2. Have you noticed any difference in the seasons weather patterns lately?
3. How are these seasons changing?



<https://www.bing.com/videos/riverview/relatedvideo?q=dauid+attenborough+explaining+climate+chnage&mid=25EF9B8282956EFA130125EF9B8282956EFA1301&FORM=VIRE>

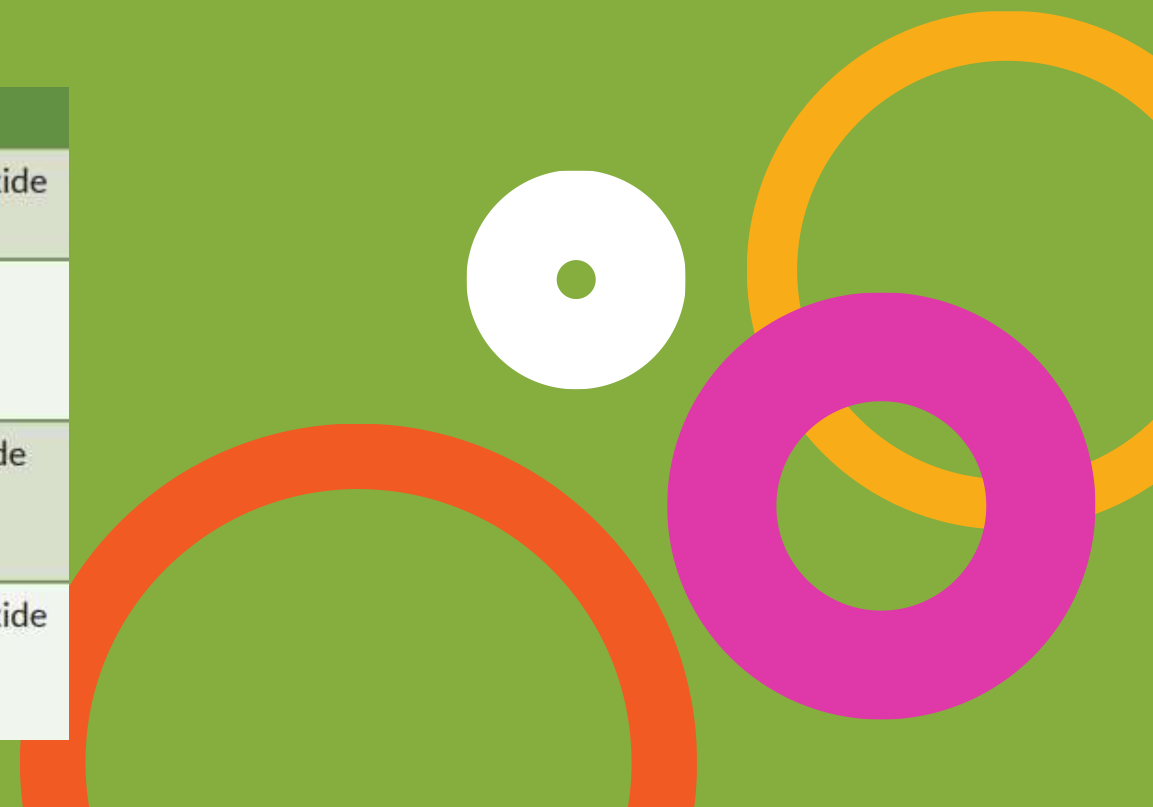


Greenhouse Gases

What is a Greenhouse Gas (GHG)

Greenhouse Gas is a gas that traps heat and contributes to climate change. Some greenhouse gases occur naturally and some occur because of human activity.

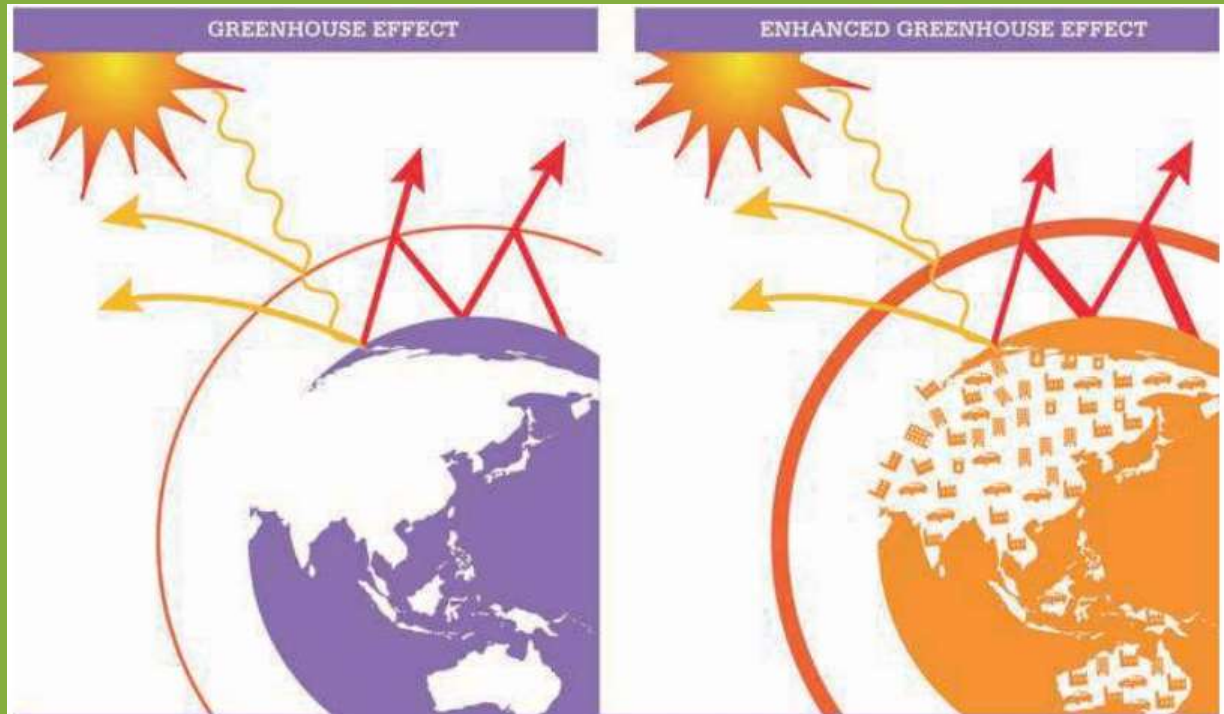
Human Activity		Increases
Burning of gas, oil and coal – also known as fossil fuels	When fossils fuels are burned, they release CO ₂ into the atmosphere.	CO ₂ – carbon dioxide
Increased livestock farming	Cattle and sheep produce large amounts of CH ₄ - methane - when they digest their food.	CH ₄ – methane
Use of fertilizer in intensive farming	Large-scale use of nitrogen-based fertilizer increases the amount of nitrous oxide in the atmosphere.	N ₂ O – nitrous oxide
Deforestation	Trees absorb CO ₂ . Large-scale cutting down of trees means more CO ₂ stays in the atmosphere.	CO ₂ – carbon dioxide



How does Climate Change Happen

The Greenhouse Gas Effect

1. Energy from the sun enters the suns atmosphere and heats up the surface of the earth.
 2. The surface of the earth releases this heat as energy back into the atmosphere.
 3. Green House Gases absorb some of this heat and raise earths temperature.
-
1. Human activities such as burning fossil fuels add green house gases to the atmosphere.
 2. This traps more heat within the earths atmosphere causing global temperatures to rise.



Think about greenhouse gases like a doona; the more feathers in a doona, the more heat is trapped. The more greenhouse gases in our atmosphere, the more heat is trapped, which makes the Earth warmer.

The greenhouse effect is a process where radiative energy from the sun passes through the atmosphere and warms the surface of the Earth. The Earth's surface then releases most of this energy as heat, back into the atmosphere. Greenhouse gases absorb some of the heat and raise temperatures on Earth's surface, making it suitable for life.

Human activities, particularly the burning of fossil fuels, are adding more greenhouse gases to the atmosphere. This is enhancing the greenhouse effect, trapping more heat and causing global temperatures to rise.

Consequences of Climate Change

1. Environmental impacts

2. Ecological Impacts

3. Societal impacts



Environmental Impacts

- Rising Temperatures and Heatwaves.
- Melting Ice Cap and Rising Sea Levels
- Heavy Precipitation and Extreme Weather events.



Met Eireann issues urgent warning for heavy rain in parts of Ireland

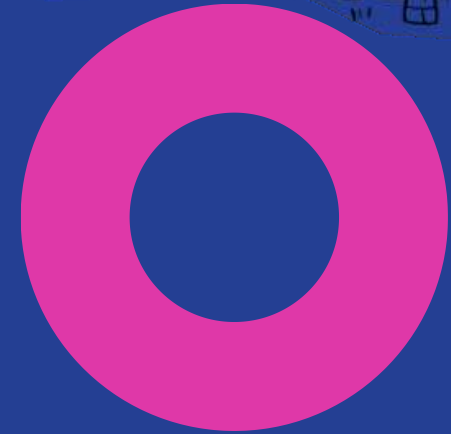
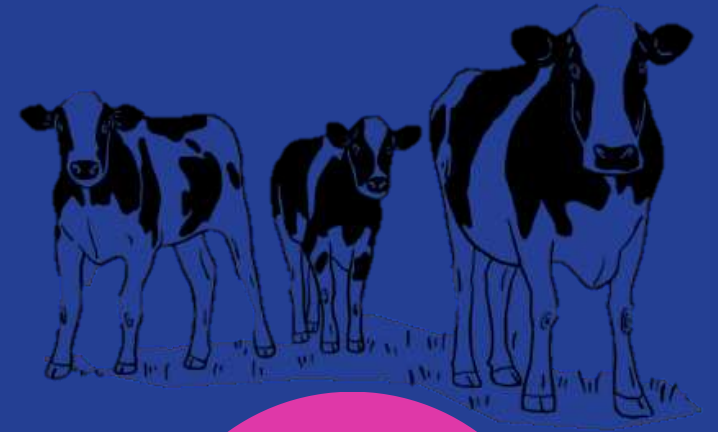
Europe heatwave: Spain summer heat breaks records as temperatures hit 46C while 50,000 flee Turkey wildfires

Record temperature recorded in Portugal as heat lowers water level of Germany's Rhine



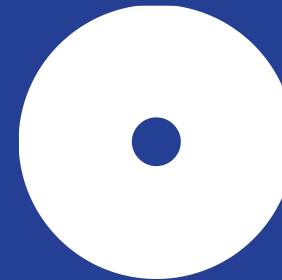
Ecological Impacts

- Damage to ecosystems and biodiversity loss.
- Migration and extinction of species.
- Negative impact on ecosystem services.



Societal Impacts

1. Threats to Food Security and Agriculture.
2. Human Health Challenges.
3. Displacement and human migration due to climate related factors.



**Changing Rain
and Snow
Patterns**

**Changes in Animal
Migration and Life Cycles**

**Less
Snow and Ice**

**Higher Temperatures
and More Heat Waves**

**More Droughts
and Wildfires**

**Thawing
Permafrost**

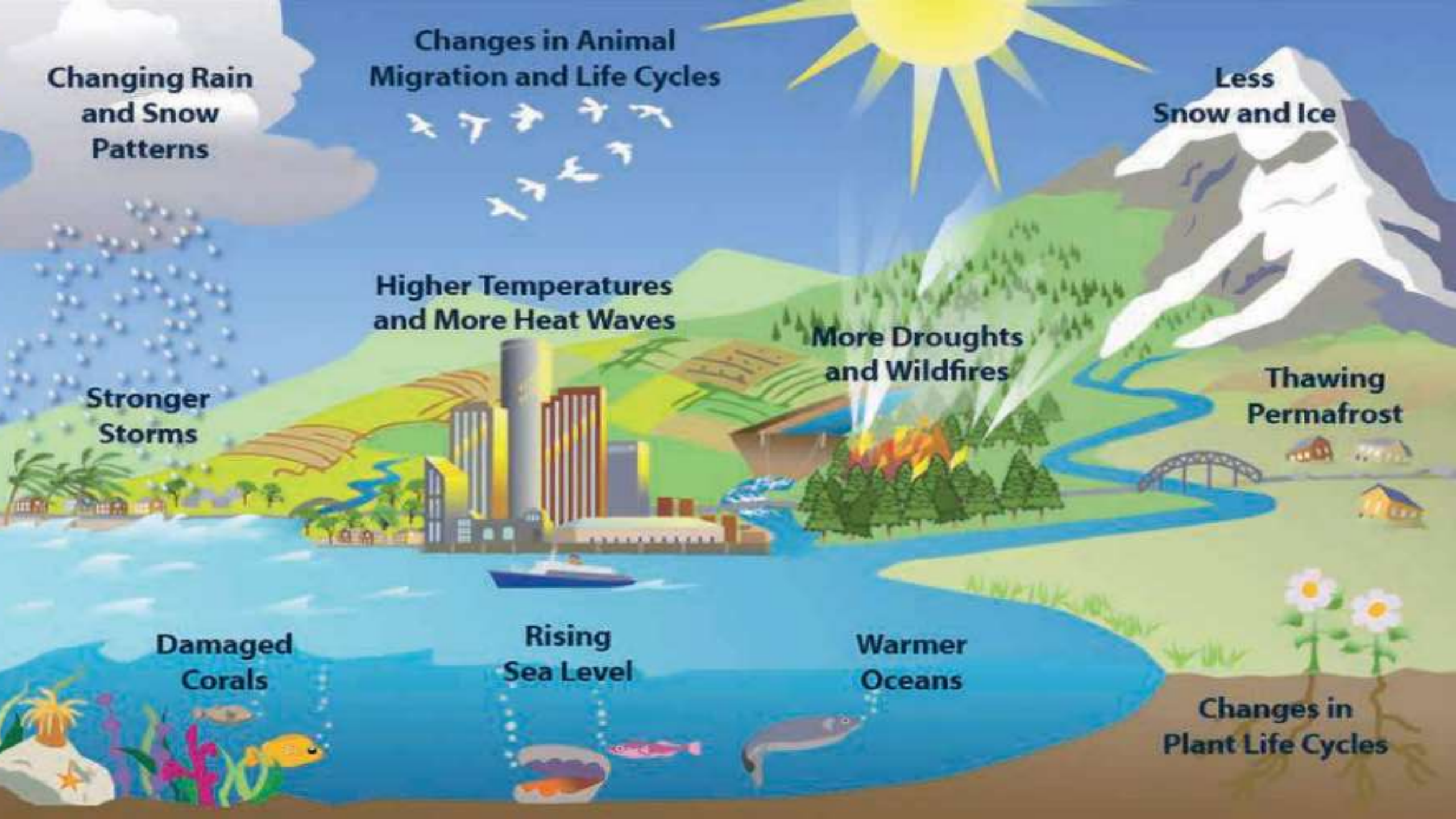
**Stronger
Storms**

**Damaged
Corals**

**Rising
Sea Level**

**Warmer
Oceans**

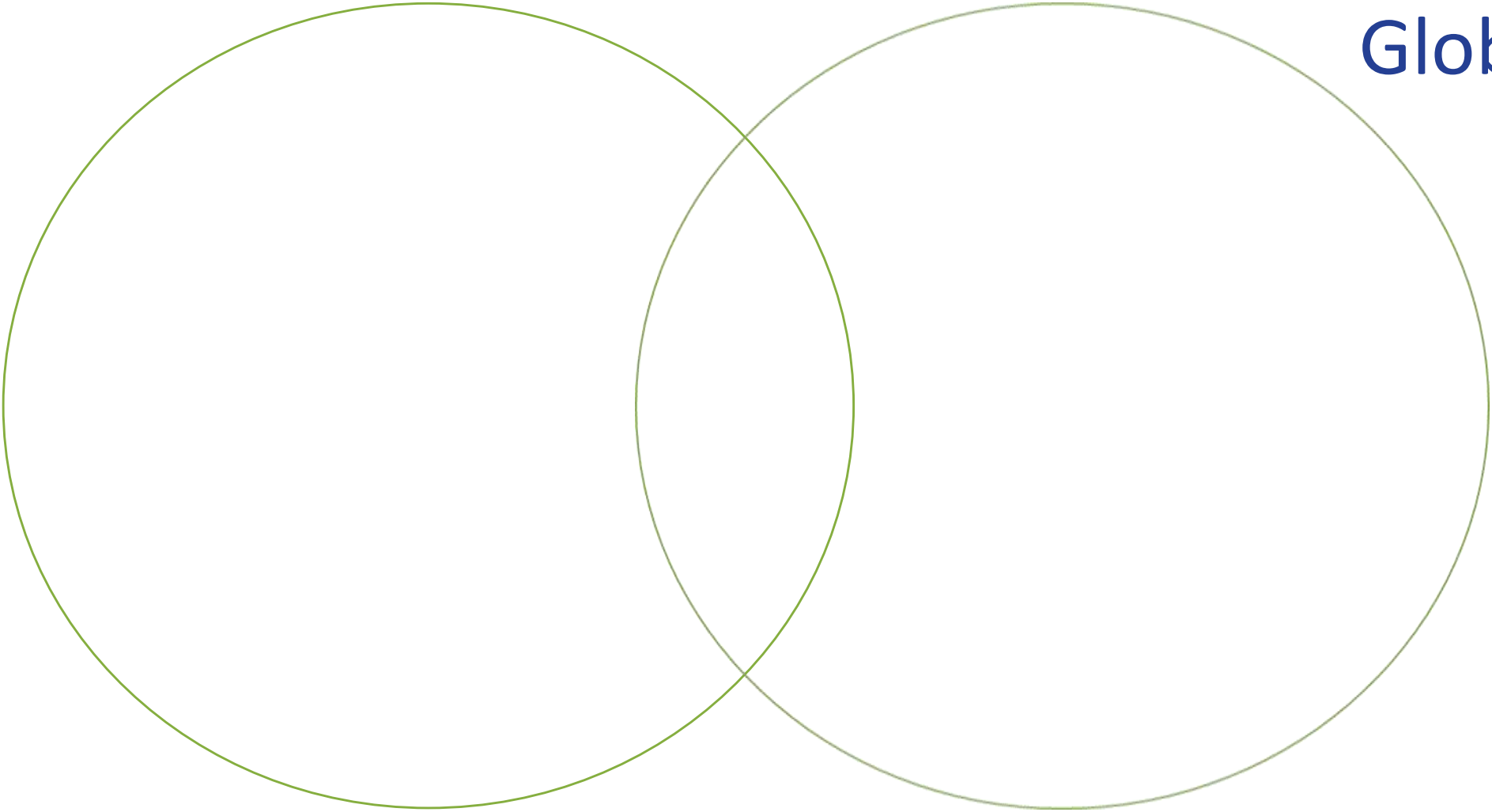
**Changes in
Plant Life Cycles**



Consequences of Climate Change

Local

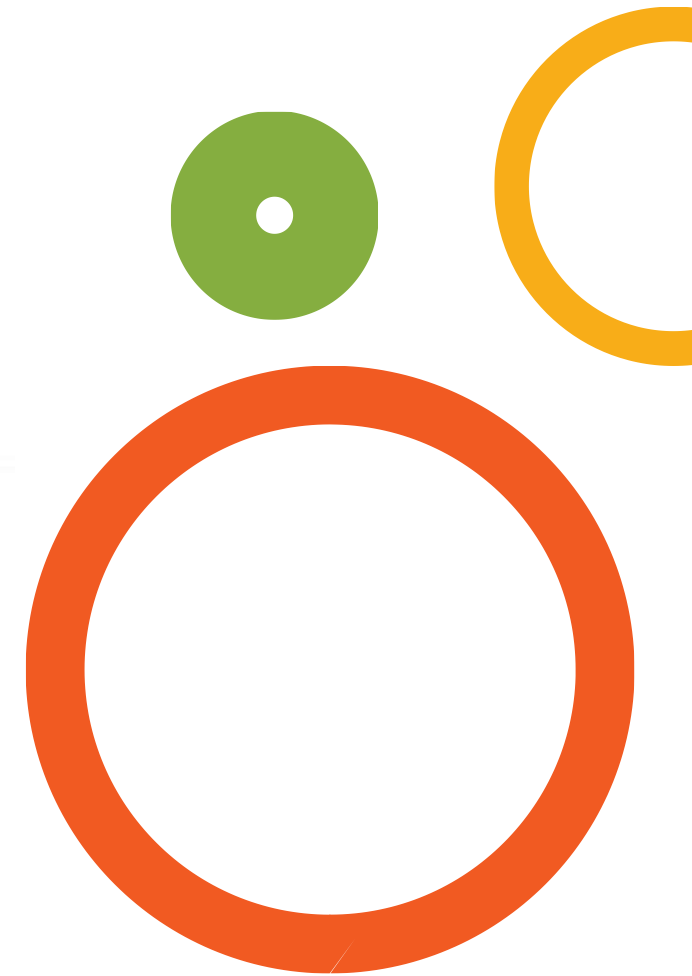
Global



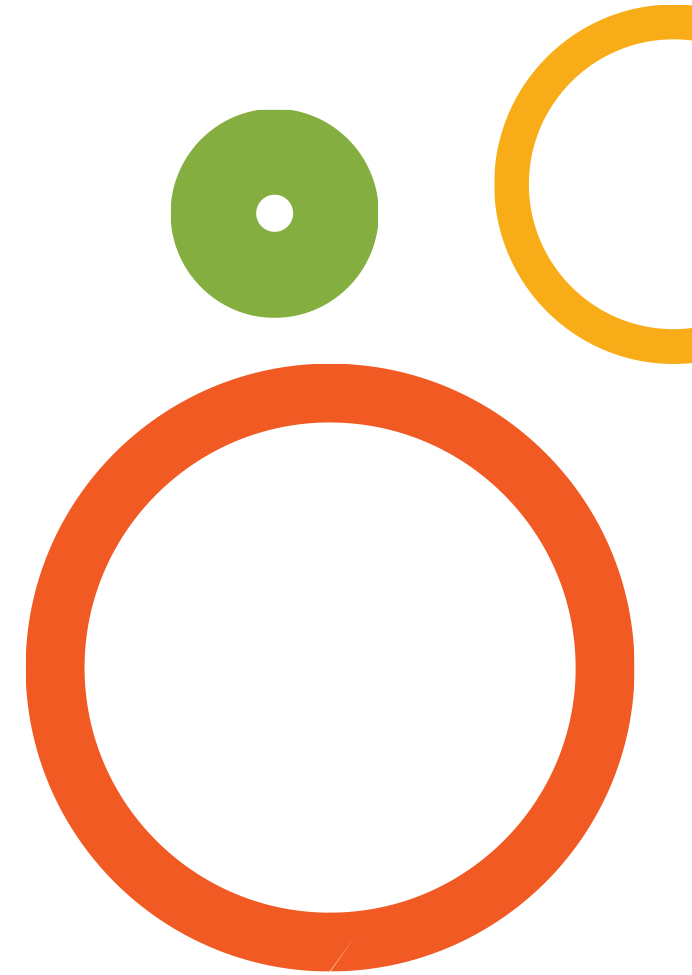
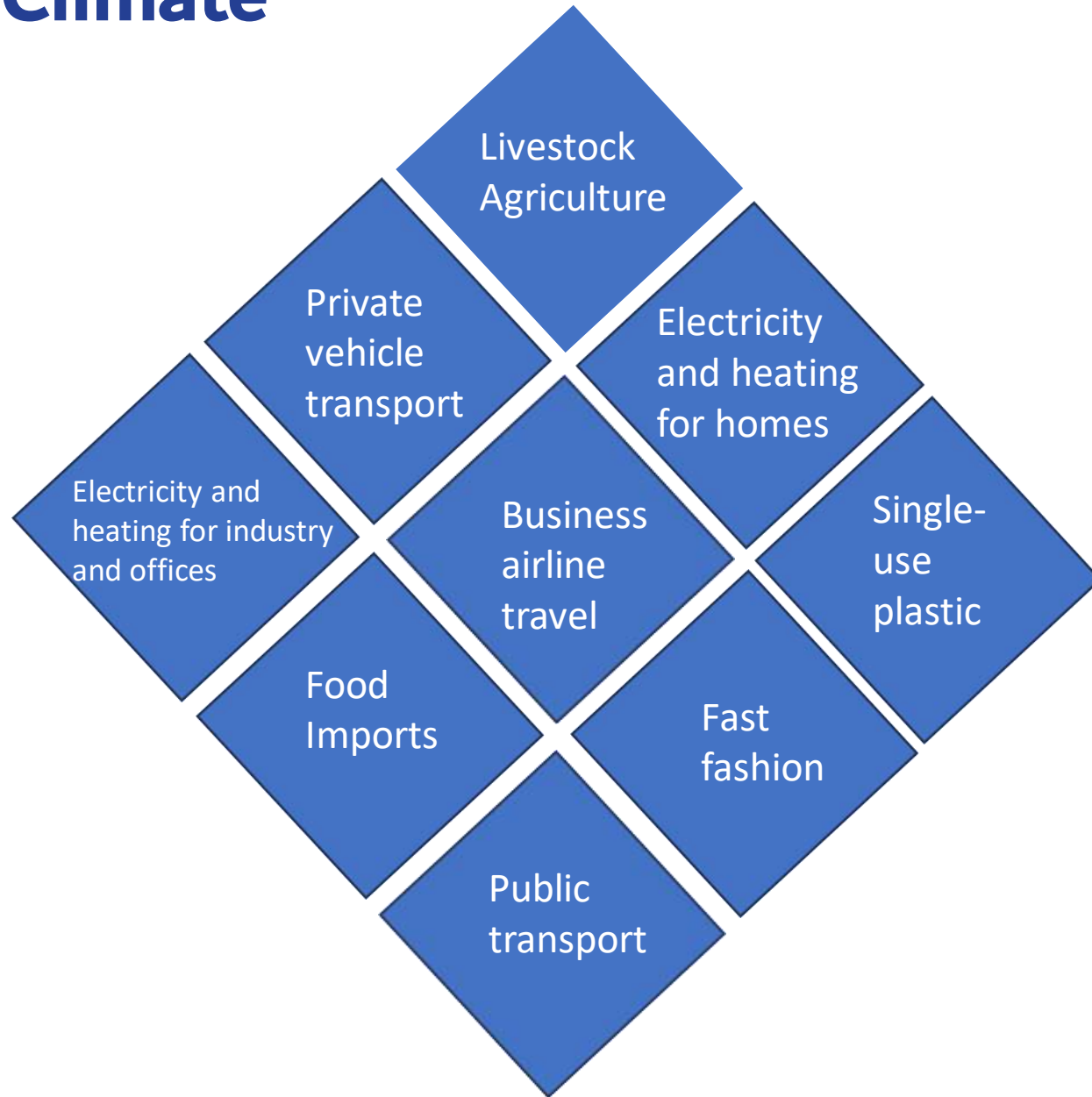
Causes of Climate Change

- ▶ livestock agriculture
- ▶ private vehicle transport
- ▶ electricity and heating for homes
- ▶ business airline travel
- ▶ electricity and heating for industry and offices

- ▶ single-use plastic
- ▶ fast fashion
- ▶ food imports
- ▶ public transport



Causes of Climate Change

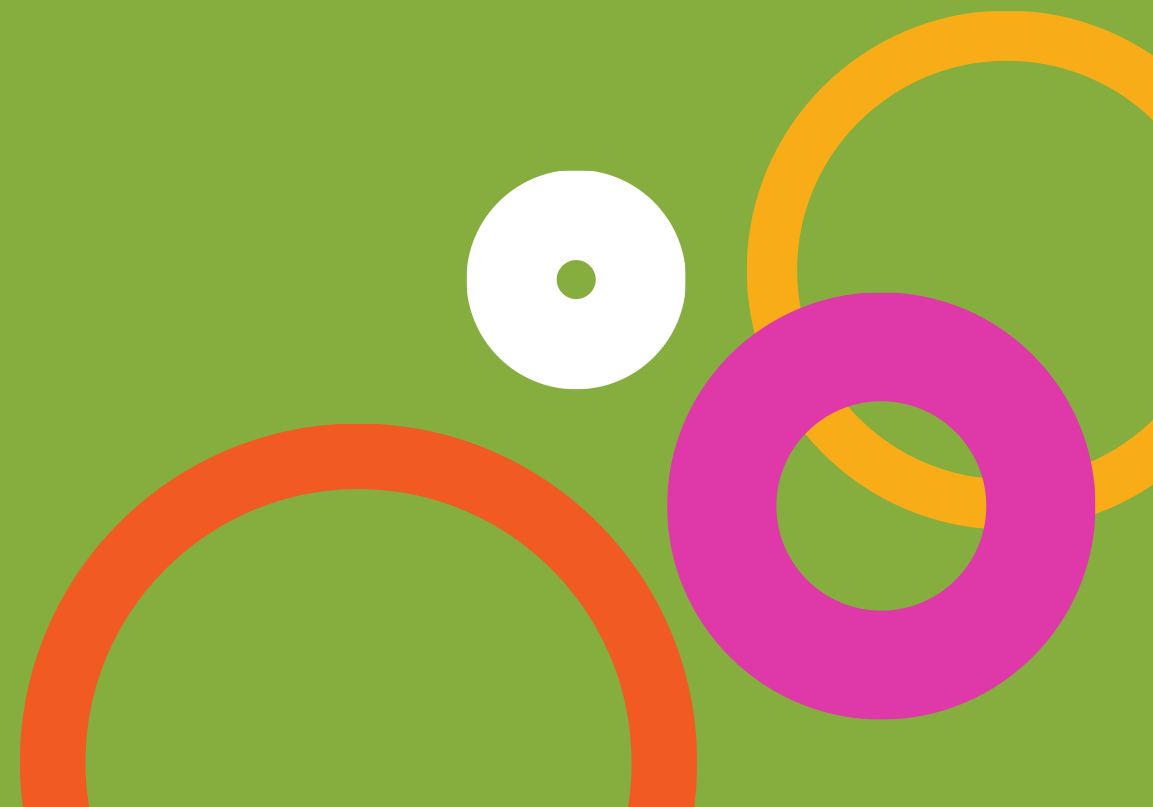


The Three Pillars of Climate Action

Adaptation

Mitigation

Implementation



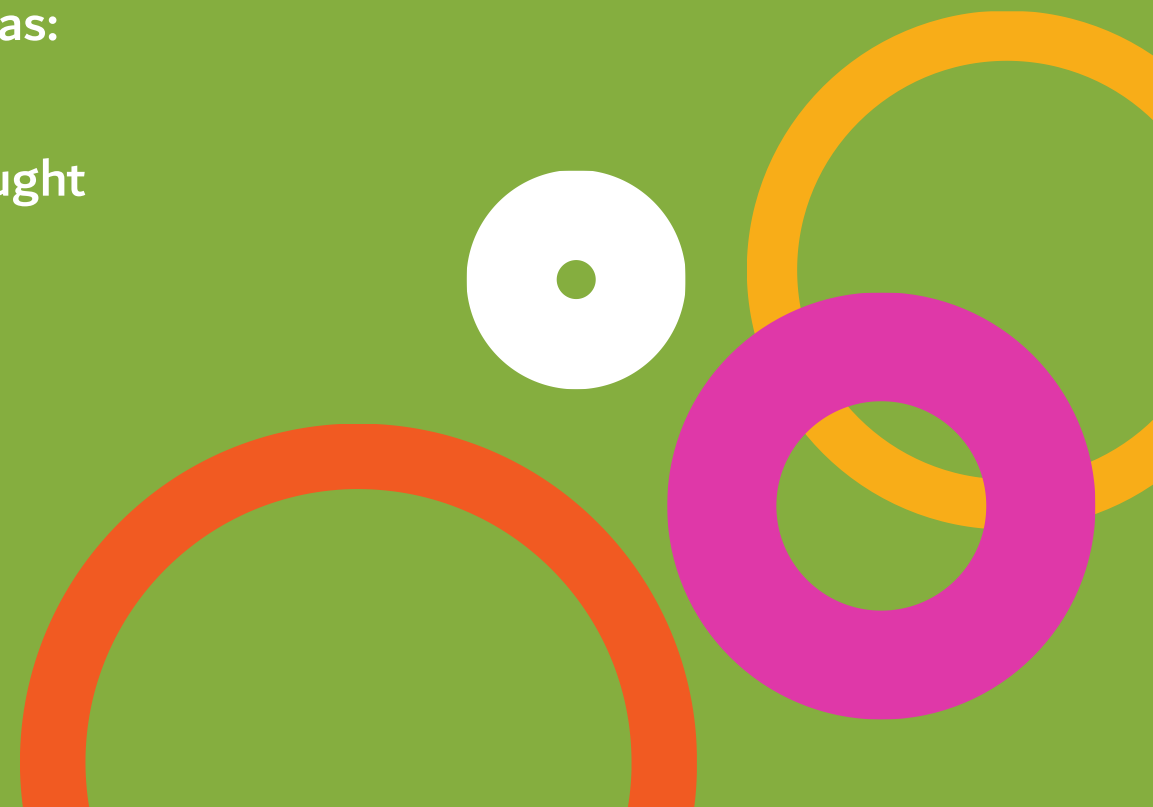
Adaptation

Climate change adaptation refers to measures put in place to reduce the risk of climate change effects.

As the impacts of climate change increase, countries and communities must adapt.

The most important adaptation measures occur locally such as:

- Planting crop varieties that are more resistant to drought
- Practicing regenerative agriculture.
- Improving water storage.
- Managing land to reduce wildfire risks.
- Storm preparation management
- Flood risk management.

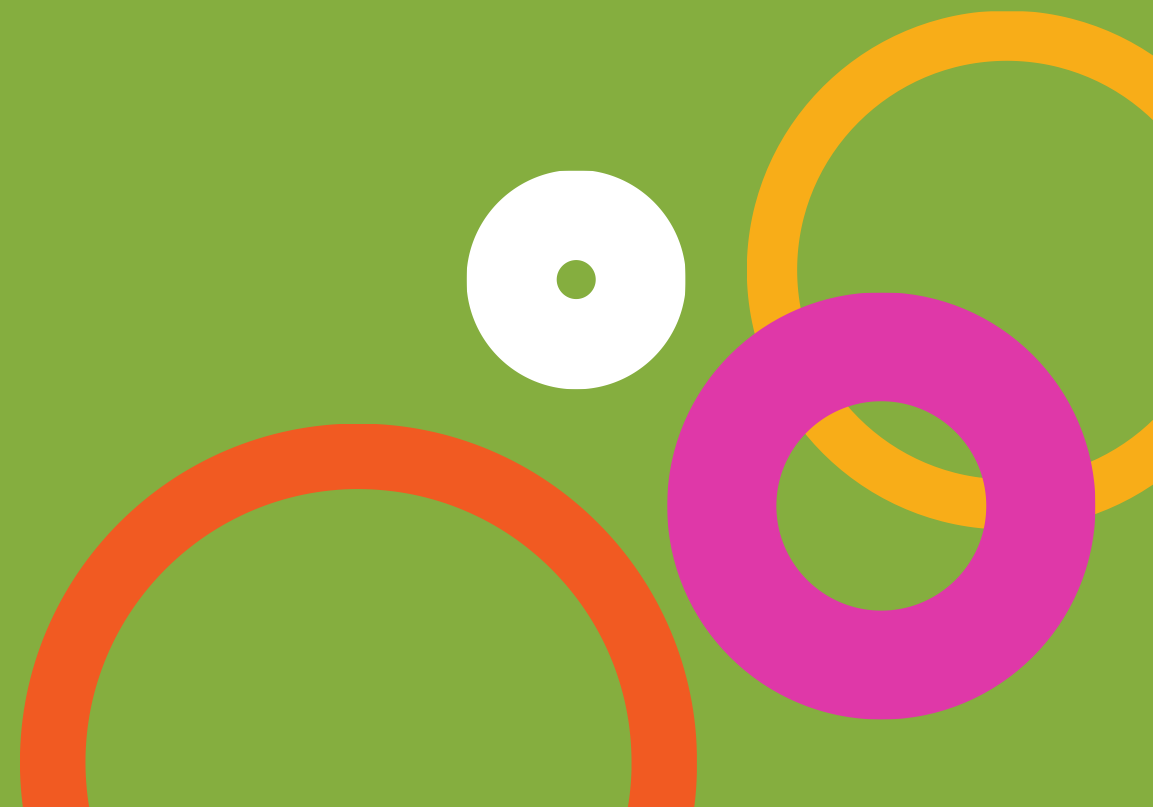


Mitigation

Climate change mitigation involves actions to reduce or prevent greenhouse gas emissions from human activity.

Mitigation efforts include:

- Using renewable energy sources.
- Being more energy efficient.
- Switching to electric vehicles.



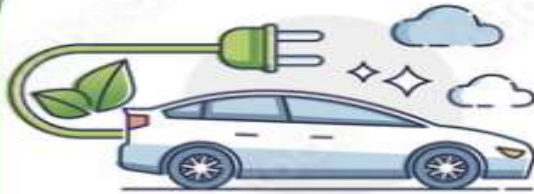
CLIMATE CHANGE

MITIGATION

ACTION TO REDUCE CLIMATE CHANGE

ADAPTATION

ACTION TO MANAGE RISKS OF CLIMATE CHANGE



SUSTAINABLE TRANSPORTATION



ENERGY EFFICIENCY



CLEAN ENERGY



NEW ENERGY SYSTEMS



WATER CONSERVATION



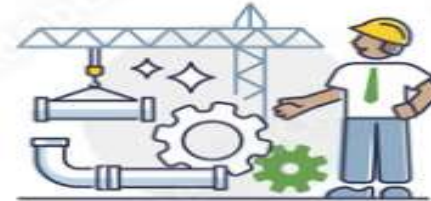
EDUCATION



NATURAL ENVIRONMENT



DISASTER MANAGEMENT AND BUSINESS CONTINUITY



INFRASTRUCTURE UPGRADES



FLOOD PROTECTION

Implementation

Implementation refers putting both adaptation and mitigation actions into effect to help reduce the impacts and risks of climate change.

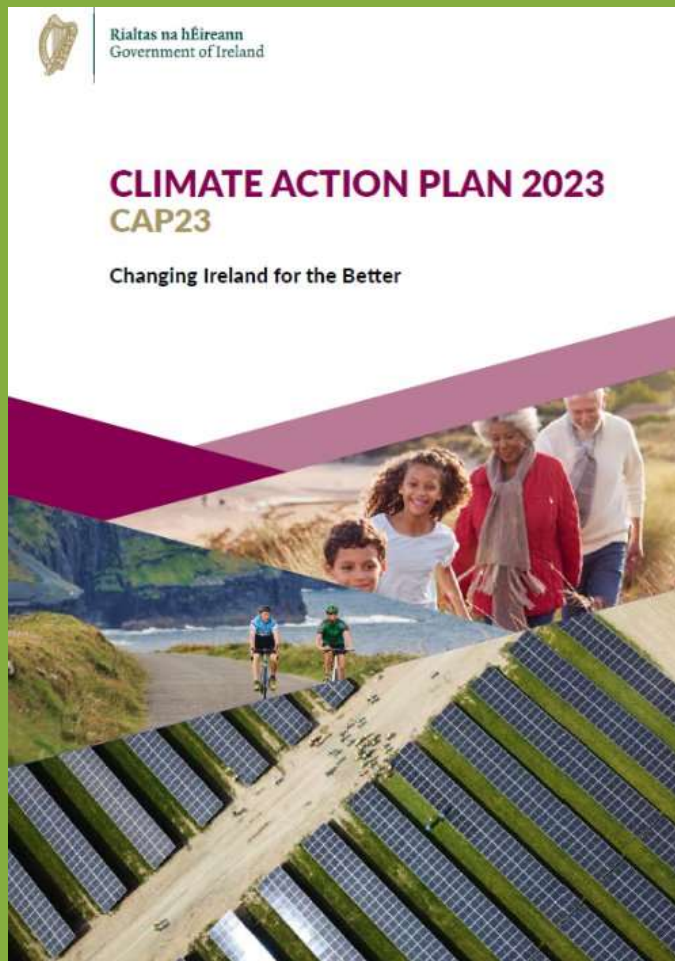
Implementing adaptation and mitigation measures can involve things such as **putting policies, and plans** into action.

Implementation in Ireland

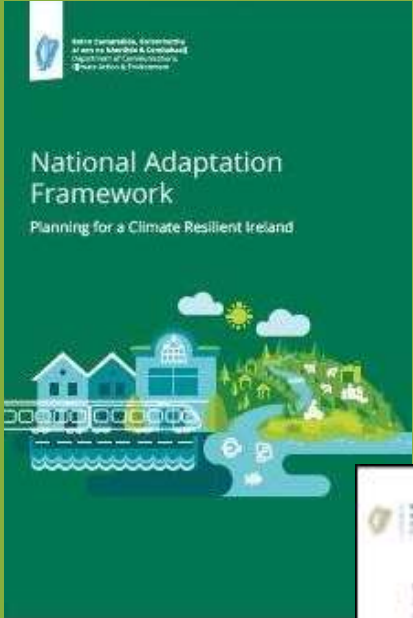


Number 32 of 2021

Climate Action and Low Carbon Development (Amendment) Act 2021



Irish Policies on Ireland to help enable climate adaptation and mitigation



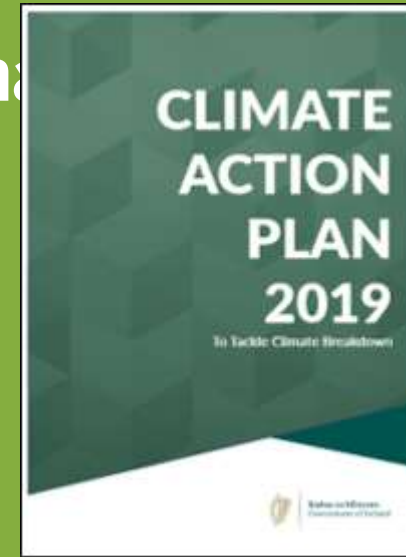
National Adaptation Framework



Offaly Climate Change Adaptation Strategy



Local Authority Adaptation Strategy Development Guidelines

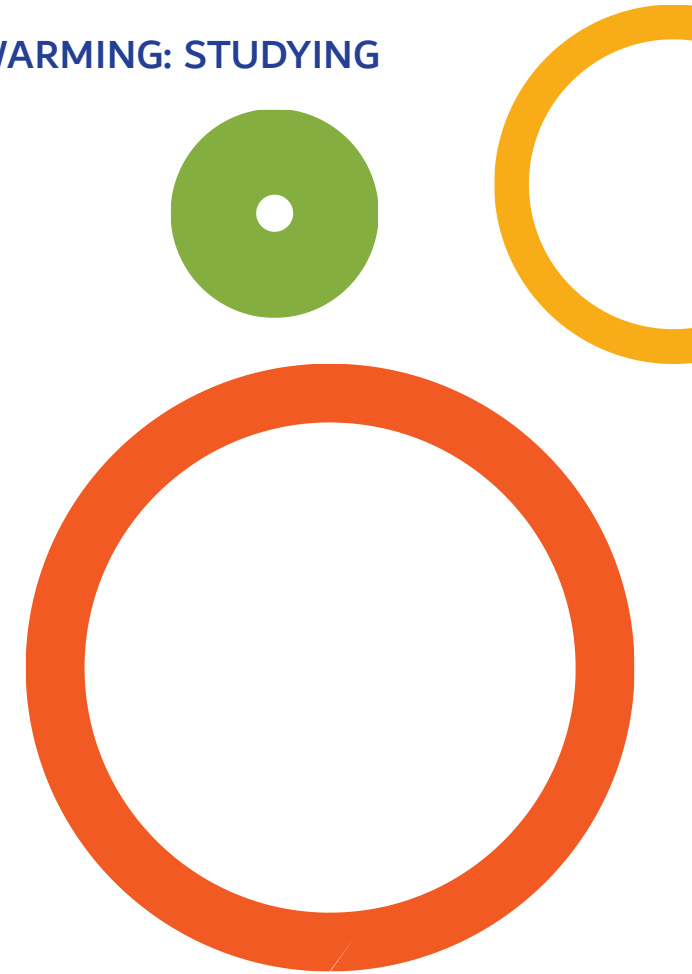


National Mitigation Plan



References

- Rayhan, Abu & Kinzler, Robert & Rayhan, Rajan. (2023). CLIMATE CHANGE AND GLOBAL WARMING: STUDYING IMPACTS, CAUSES, MITIGATION, AND ADAPTATION. 10.13140/RG.2.2.23746.76489.
- City of Dublin Climate Justice Education in Practice – Tudor handbook



Key Definitions

Weather	Weather refers to day-to-day temperature, precipitation and other atmospheric conditions.
Climate	Climate refers to the patterns of weather we see over a much longer period - thirty years or more. Climate describes the weather conditions we can expect to see at a certain time of the year. The climate of Ireland is mild, humid and changeable with lots of rain. Our winters are not too cold, and our summers are not too hot.
Climate Change	Climate change is the shift in temperature and weather patterns over a long period of time due to human behaviour.
Precipitation	Any liquid or frozen water that forms in the atmosphere and falls back to earth.
Temperature	How hot or cold something is. This is measured by degrees Celsius in Ireland.
Humidity	The amount of moisture or water that forms in the atmosphere and falls back to earth.
Greenhouse Gas	A greenhouse gas is a gas in Earth's atmosphere that's traps in heat, preventing some of the heat from leaving the atmosphere therefore warming the planet.
Methane	Methane is a gas, and the main ingredient in "natural gas." Most of the methane released in Ireland is caused by our large cattle herd.
Fossil Fuels	Fossil fuels are the underground remains of plants and animals that lived millions of years ago, which can be processed and burned for energy use. Examples include oil, bitumen, coal and natural gas.
Carbon Dioxide	Carbon dioxide (CO ₂) is the main greenhouse gas worrying climate scientists. A growing build-up of CO ₂ from burning fossil fuels is warming the Earth.
Global warming	Global warming is the heating up of the Earth caused mainly by the burning of fossil fuels (oil, coal and natural gas), which releases heat, trapping carbon dioxide into the atmosphere.
Renewable Energy	Renewable energy is energy that comes from resources that are constantly replenished, such as sunlight, wind, rain, tides, waves and geothermal heat (heat from the ground). These energy sources do not release harmful greenhouse gases into the atmosphere, so they are considered 'eco-friendly'.
Ecosystem	Is a community of living things like plants and animals interacting with each other and with the environment – (air, soil, water).
Ecosystem Services	Ecosystem services are the benefits that people get from the natural world. Examples include food, water, wood, medicine.
Biodiversity	Biodiversity refers to all living things on earth. This includes all plants, animals, fungi and microorganisms.

Key Definitions

Migration	Migration is the movement of animals or people from one place to another. Animals may migration to warming climates in the winter or due to changes in temperature/environment caused by climate change.
Extinction	Extinction is when a certain living thing or species no longer exists because there are no individuals of that kind left anywhere in the world. Once something is extinct it is gone forever.
Adaptation	
Mitigation	Climate change mitigation refers to action which reduce or prevent greenhouse gas emissions from human activity.
Implementation	Implementation refers putting both adaptation and mitigation actions into effect to help reduce the impacts and risks of climate change.

Key Definitions

Our Role in Climate Action

Date: 23 September 2025
Duration 30/45 minutes

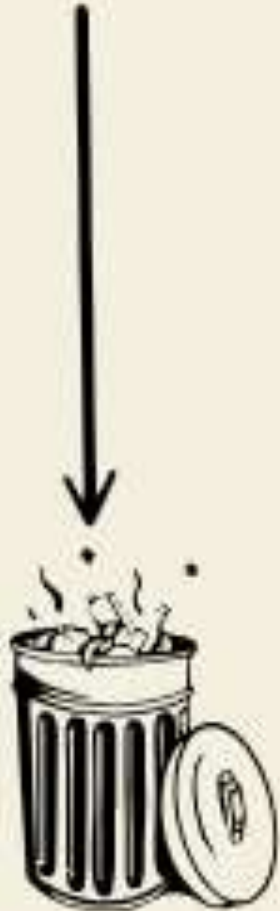
Topics covered:

- Circular Economy
- Reducing Food Waste
- Plastic
- Home energy Saving

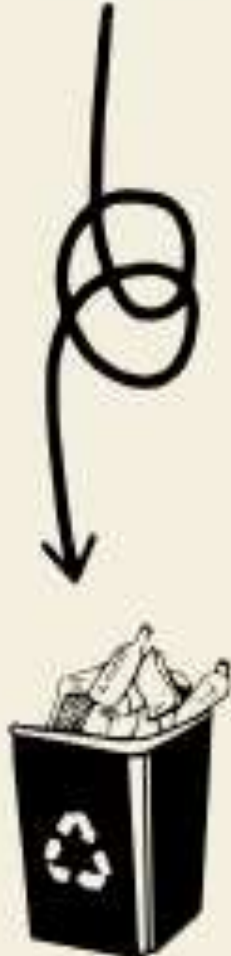


What is Circular Economy ?

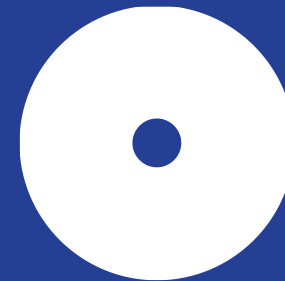
LINEAR
ECONOMY



RECYCLING
ECONOMY



CIRCULAR
ECONOMY





Our Linear Economy

TAKE

MAKE

WASTE



Manufacture



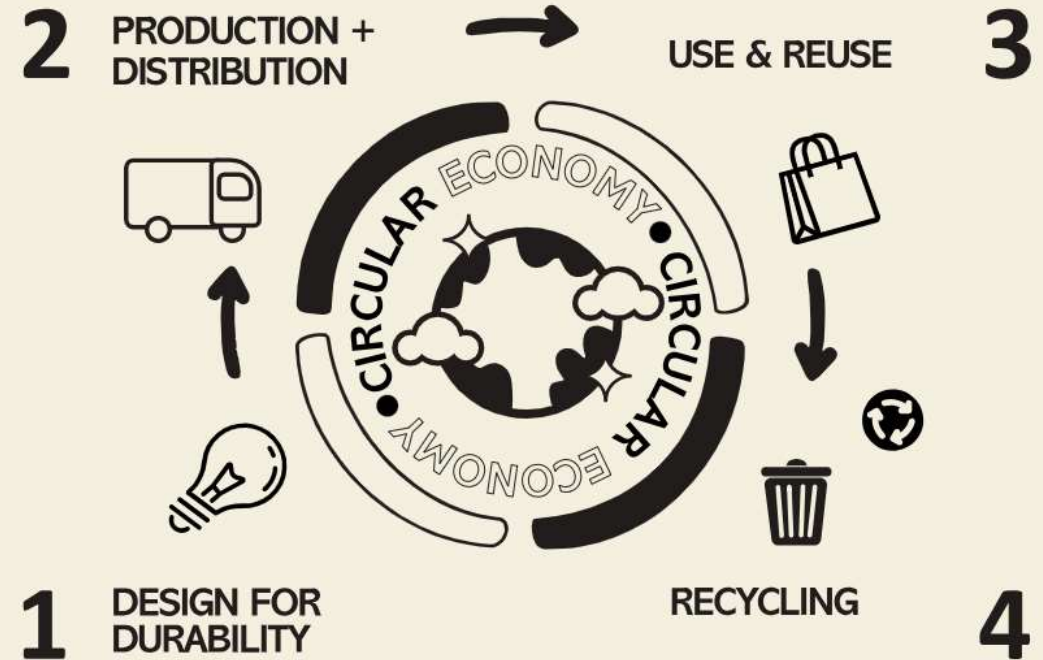
Distribution



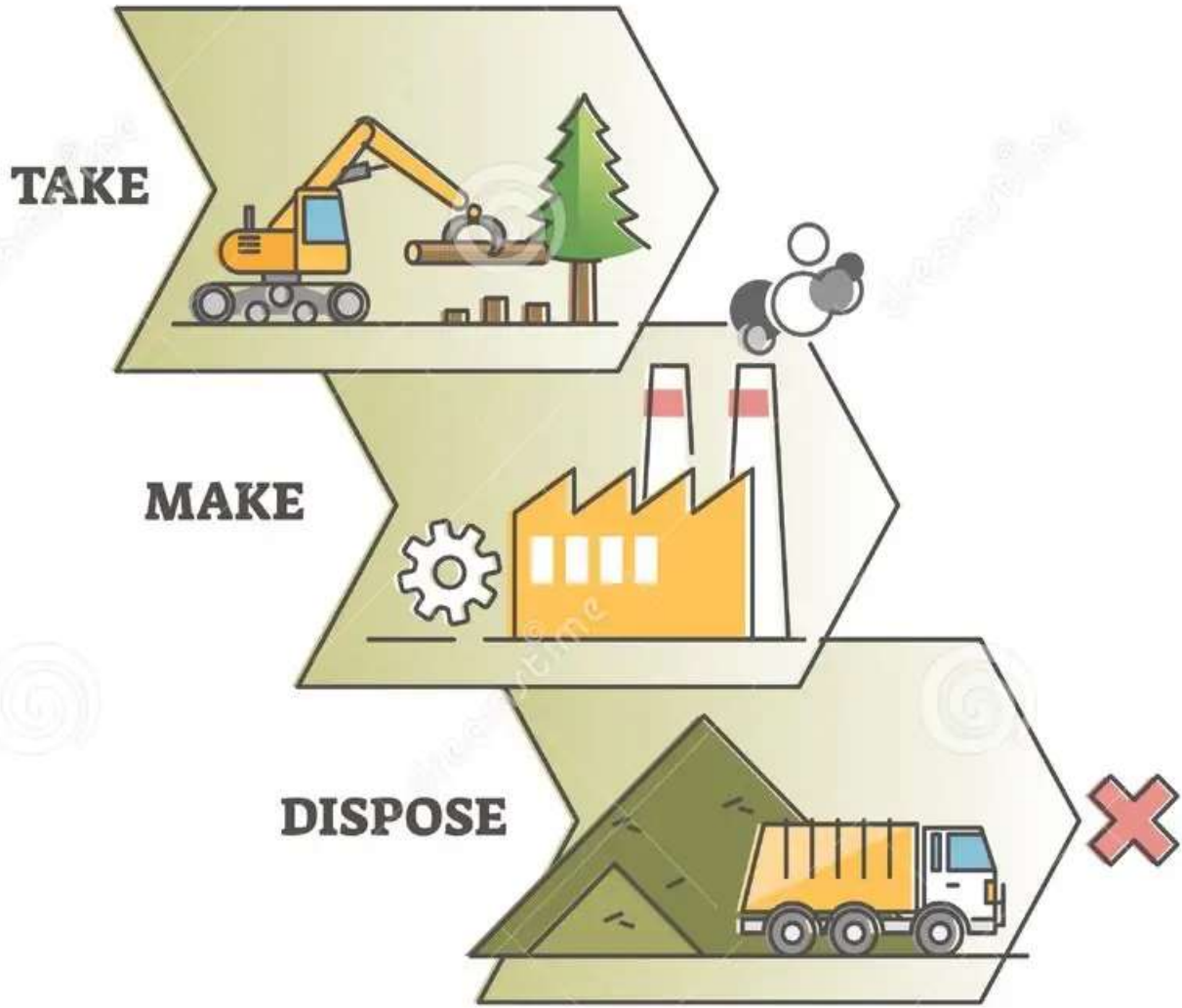
What our Economy is used to



What we need to work towards

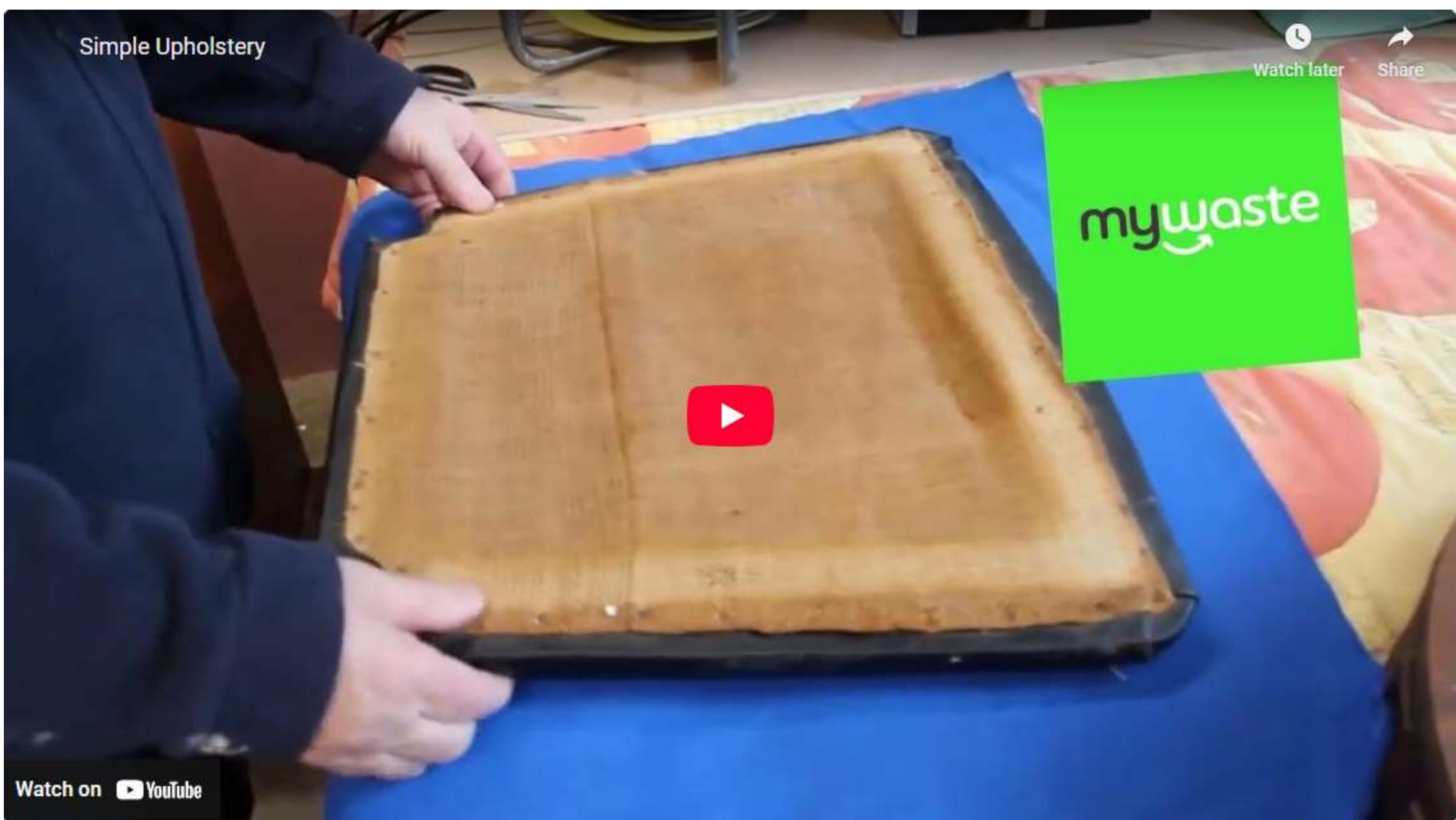


LINEAR ECONOMY



CIRCULAR ECONOMY





[Circular living - My Waste](#)

Estimated food waste per sector on 2023

Food Supply Chain sector	Tonnes of Food Waste	Percentage of Total Food Waste
Primary Production	50,000	6%
Manufacturing and Processing	305,000	37%
Retail and Distribution	84,000	10%
Restaurants and Food Service	175,000	21%
Households	221,000	26%
Total	835,000	100%

Food waste generated in Ireland per sector in 2023



Where does our food waste come from

Households

The average household food waste costs £60 per month or £700

Manufacturing and Processing produces

37% of all food waste in Ireland

Restaurant and Food Services

Primary Production

Retail and Distribution

Do you know where the contents of your food recycling bin go?



<https://youtu.be/ykAORQk4Z-s>

What Food Waste can I recycle?

- **Raw and cooked** food
- Meat, poultry, fish and bones
- Leftover food and plate scrapings
- Fruit and vegetable peelings
- Gone off fruit & vegetables
- Tea bags, coffee grounds and paper filters
- Bread, cakes, biscuits
- Rice, pasta and cereals
- Dairy products such as cheese, butter and yogurts
- Soups and sauces
- Eggs and eggshells
- Soiled paper napkins and kitchen roll
- Small amounts of newspapers, if used to wrap food in
- Any out-of-date foods – remember to remove the packaging



Some waste collectors accept grass clippings and small amounts of garden waste. Contact your waste collector to find out if you can add these items to your food waste recycling bin.

What cannot be placed in your food waste bin?

- Plastic – bags, bottles, tubs and trays
- Glass bottles & jars
- Tin cans
- Nappies
- Soils & stones
- Cardboard
- Ashes, coal or cinders
- Pet faeces and Litter

mywaste

For more information, visit Ireland's Official Guide to Waste Management www.mywaste.ie



No Plastic



No Glass



No Metal

Food Waste



<https://youtu.be/FsV-pxH8VX4>

Plastic



<https://youtu.be/HQTUWK7CM-Y?si=xT3ZynvLhy5XVDI7>



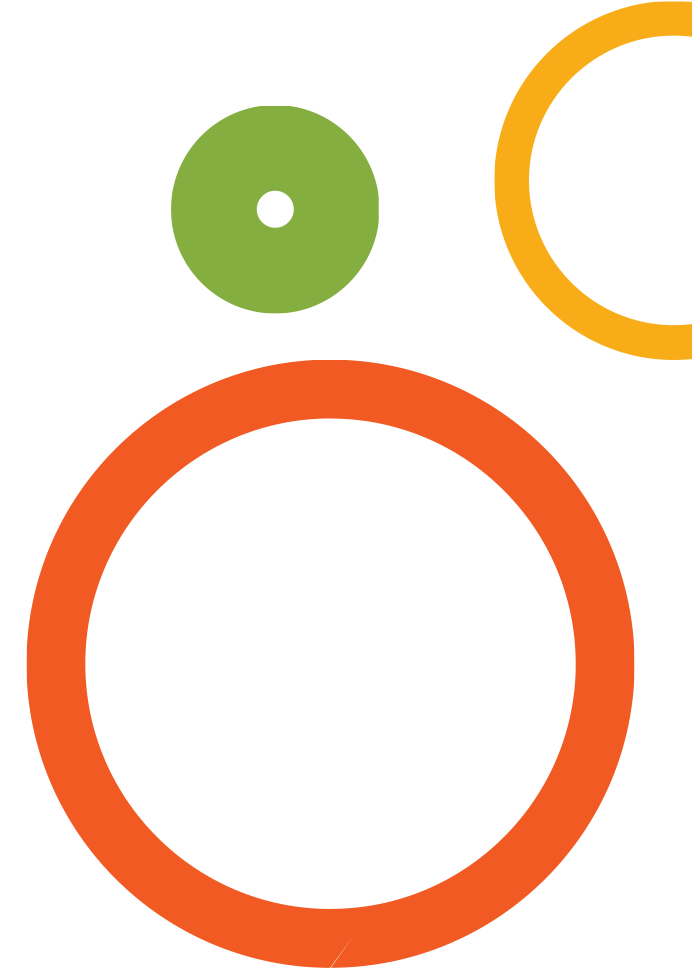
Did you know?

- There are 100 billion stars in our galaxy...but there is up to 358 TRILLION microplastics in the sea.
- Global plastic production has reached 400 million tons per year, with only 9% being recycled.
- 40% of all plastic in the world comes from packaging.
- 99% of plastics are made from fossil fuels. Every stage of plastic production from extraction to disposal has negative affects on the environment



Single-use Plastics

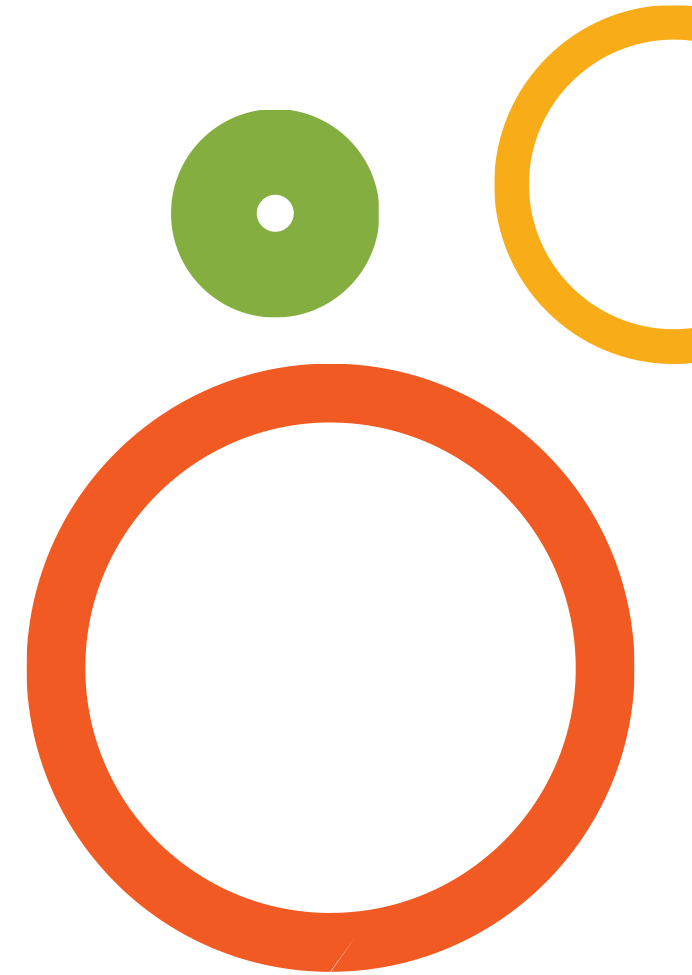
- **What are single use plastics?**
- **Plastic production**
- **How plastic spreads around the world**



Plastic



[The world's plastic pollution crisis, explained | National Geographic](#)



What Can We Do

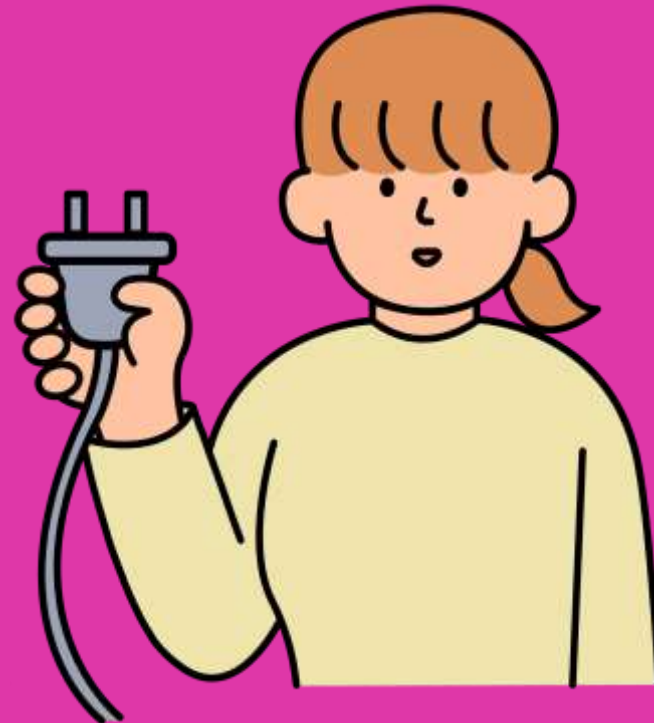
- Bring your own bottle (reusable).
- Coffee/Tea Cups.
- Say no to plastic cutlery and straws.
- Lunch packaging.
- Tea Bags.
- Chewing Gum.
- Keep plastic in use for longer.



Energy Conservation

What is energy conservation?

Energy conservation is the practice of using less energy to accomplish the same tasks or achieve the same results. It is an essential part of responsible and sustainable resource management. Energy conservation is vital for several reasons



Why is Energy Conservation Important?



Environmental Benefits

Conserving energy reduces greenhouse gas emissions, which helps combat climate change and reduces air pollution.



Economic Benefits

Saving energy means lower utility bills and reduced energy costs for individuals, businesses, and governments.



Sustainability

By using less energy, we extend the lifespan of energy resources like fossil fuels and promote the development of cleaner, renewable energy sources.

Energy Sources

Energy from a source that is not depleted when used.

- Solar
- Wind
- Geothermal
- Biomass
- Hydropower



Non-renewable energy comes from sources that will eventually run out (Fossil Fuels).

- Coal
- Oil
- Peat
- Petroleum
- Natural gas



Facts & Figures

- Every time you turn the heating up by 1°C you increase your heating costs by approximately 8%. Turning the temperature down by 2°C would save around €160 on a €1,000 bill.
- Lighting can be responsible for up to 40% of a building's energy use. Changing to Energy Efficient LED lighting is a good way to reduce costs.
- Use the eco setting on all appliances. The power-saving modes can save up to 92% of its typical energy use. Or switch off and unplugged when not in use, electronics can consume significant energy in standby mode.
- By 2030, 80% of our electricity demand is to be generated by renewable energy as set out in the Government's Climate Action Plan (2023).
- The Government is committed to reducing emissions from the public sector by 51% by 2030 and a 50% improvement in energy efficiency by 2030.



The Home Energy Saving Kit

**Borrow a Home Energy Kit From
Your Local Library Today!**



Try out some of the 96 energy savings tips in the Guide to Home Energy Savings

Find out if you have heat escaping or cold air draughts around your home

Find out the humidity levels & temperature in each room to determine if they are too low or too high

Find out the flow rate of your shower heads and taps to determine if you are wasting water & energy

Find out if your fridge and freezer are at the most efficient temperature setting

Determine the energy usage and running cost of the appliances in your home

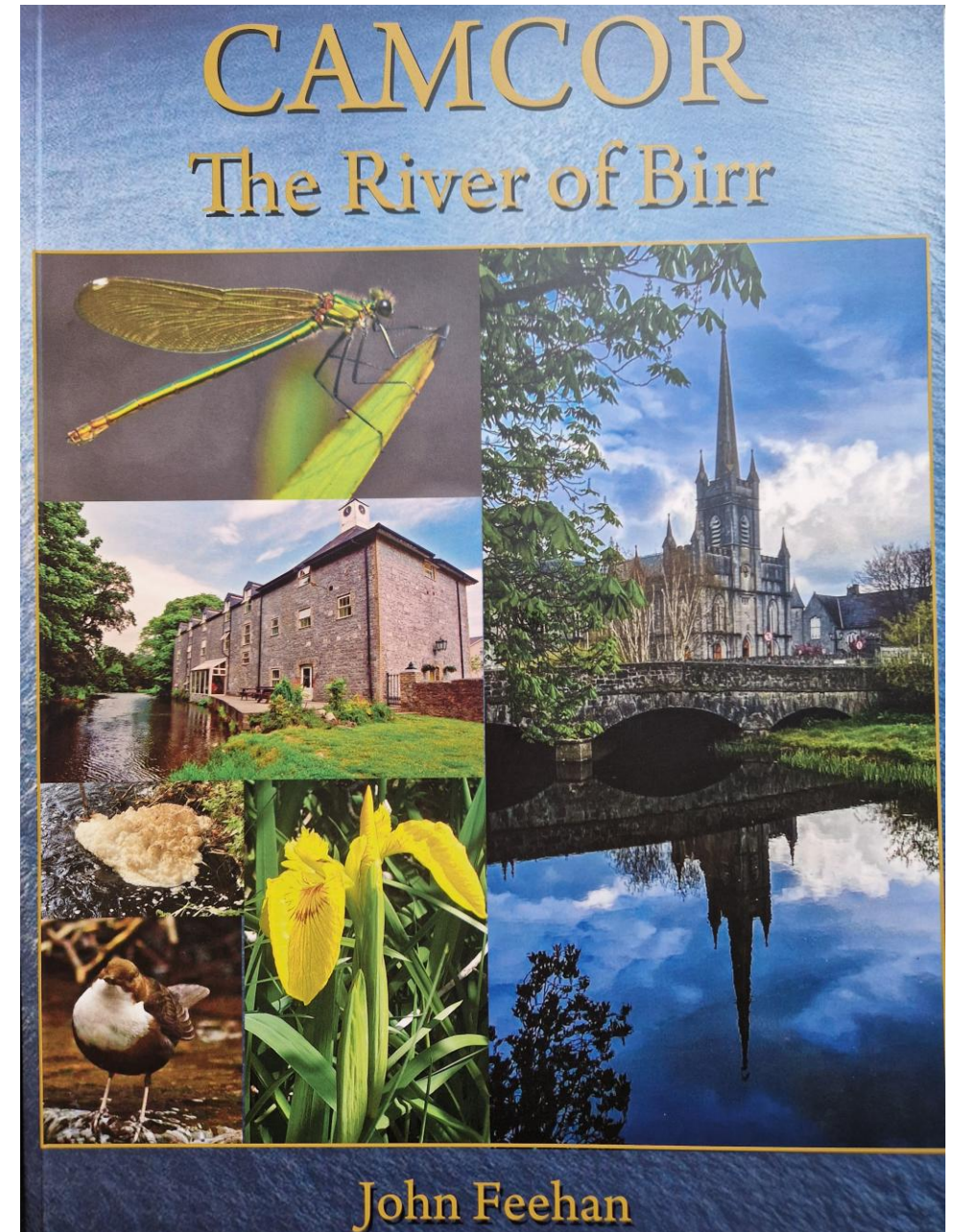
Remove trapped air from your radiators to ensure they are working efficiently



The Camcor River and Blue Dot Area

Outline

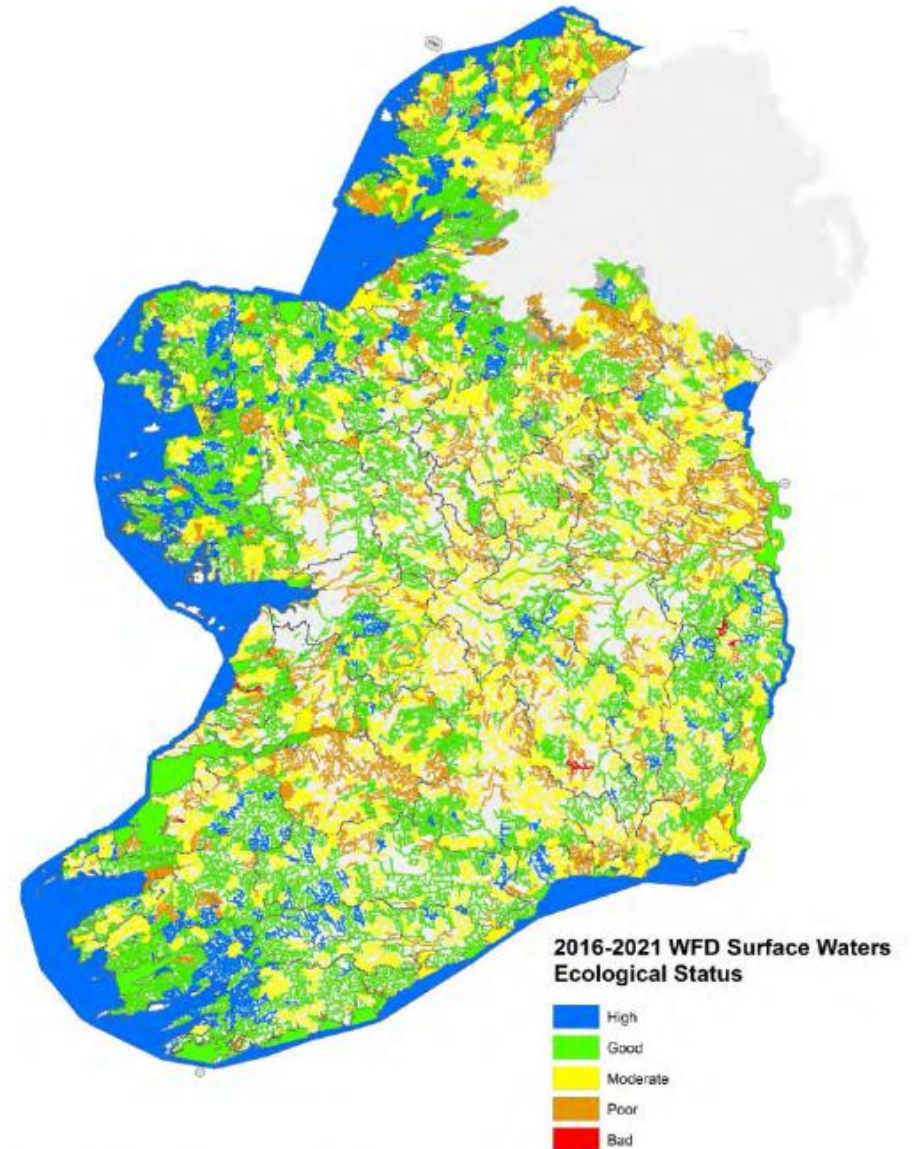
- **11 – 11.15** Tea/Coffee/Scones
- **11.15 – 11.35** Introduction and Camcor Information
- **11.35 – 12.00** Talk from Jerney Casey of Native Woodland Trust on the Camcor Woodlands and the importance of the river
- **12.00 – 12.15** Travel to Kinnitty Castle and walk down to Camcor
- **12.15 – 13.00** Kicktesting with LAWPRO Catchment Scientist
- **13.00 – 13.15** Back to Centre for lunch
- **13.15 – 14.00** Lunch
- **14.00** Return to Clonbulloge



Water Quality 2016-2021

54% of our surface waters are in **Good** or **High** ecological status.

46% are in an **unsatisfactory** ecological status



Water Catchments

WHERE WE LIVE, WORK & PLAY



Agriculture

Properly managed slurry will pose less risk to our waters.
Livestock access to watercourses should be properly managed

Forestry

Properly sited and managed forests help to protect water quality

Rural Dwellings (e.g. septic tanks)

Approximately 30% of private wells are contaminated by E.coli

There is an angling club associated with almost every town and village in Ireland. Angling tourism benefits local communities

Drinking Water Abstraction

Water sources
chemical

Urban Run-Off

Classification for water quality includes five status classes: high, good, moderate, poor and bad.

Properly treated urban wastewater will pose less risk to people and the environment

Waste Water Treatment

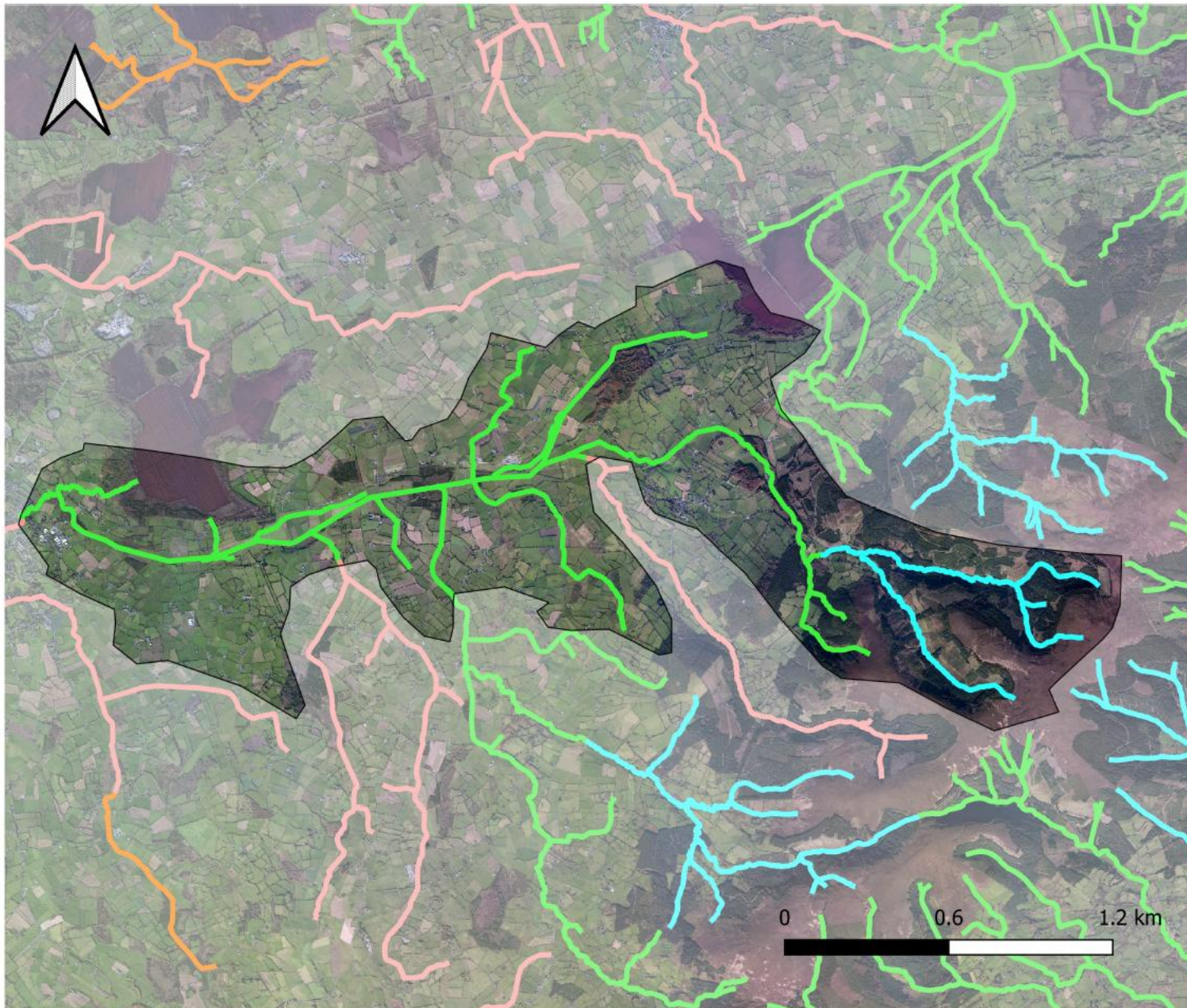
Aquaculture Pressures

Protecting the water environment will benefit future generations

Share Your story.

The River Basin Management Plan – get involved!

Clean coasts are important for water based tourism and recreation



WFD Status: Camcor River

WFD River Status

- High
- Good
- Moderate
- Poor

What is a healthy River

Good Supporting Chemistry Conditions

- Oxygen Conditions
- Nutrient Conditions
- Temperature

Good Ecological Status

- Macroinvertebrates
- Plants
- Fish



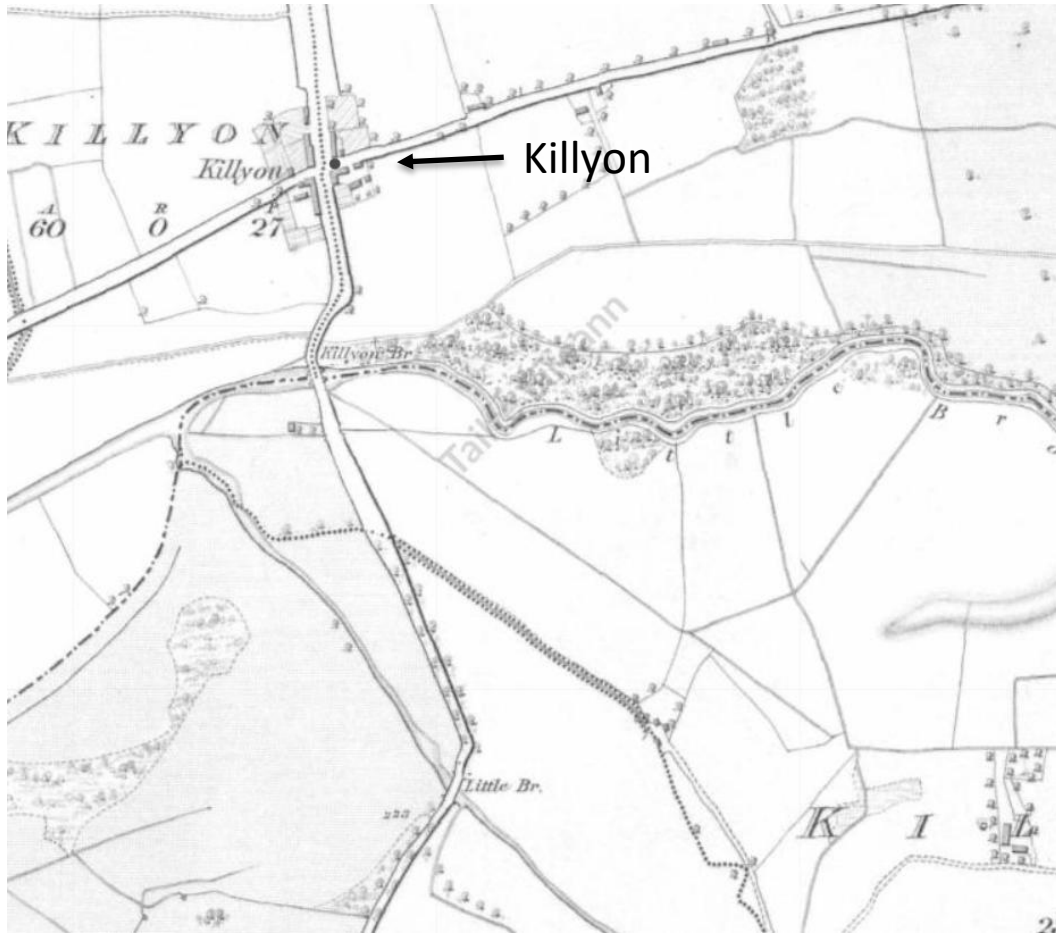
Other good biological indicators of healthy water:

- Otter
- Kingfisher
- dippers

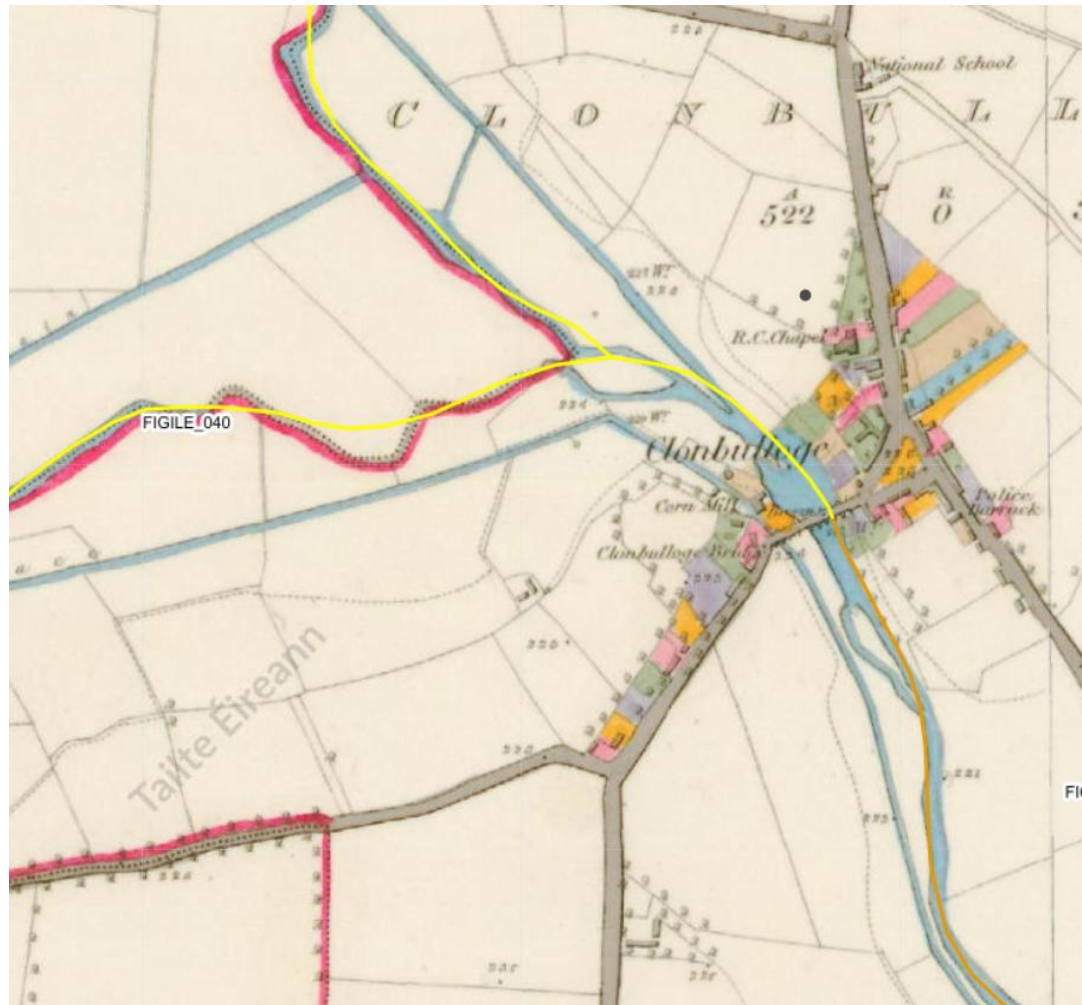
Hydromorphology



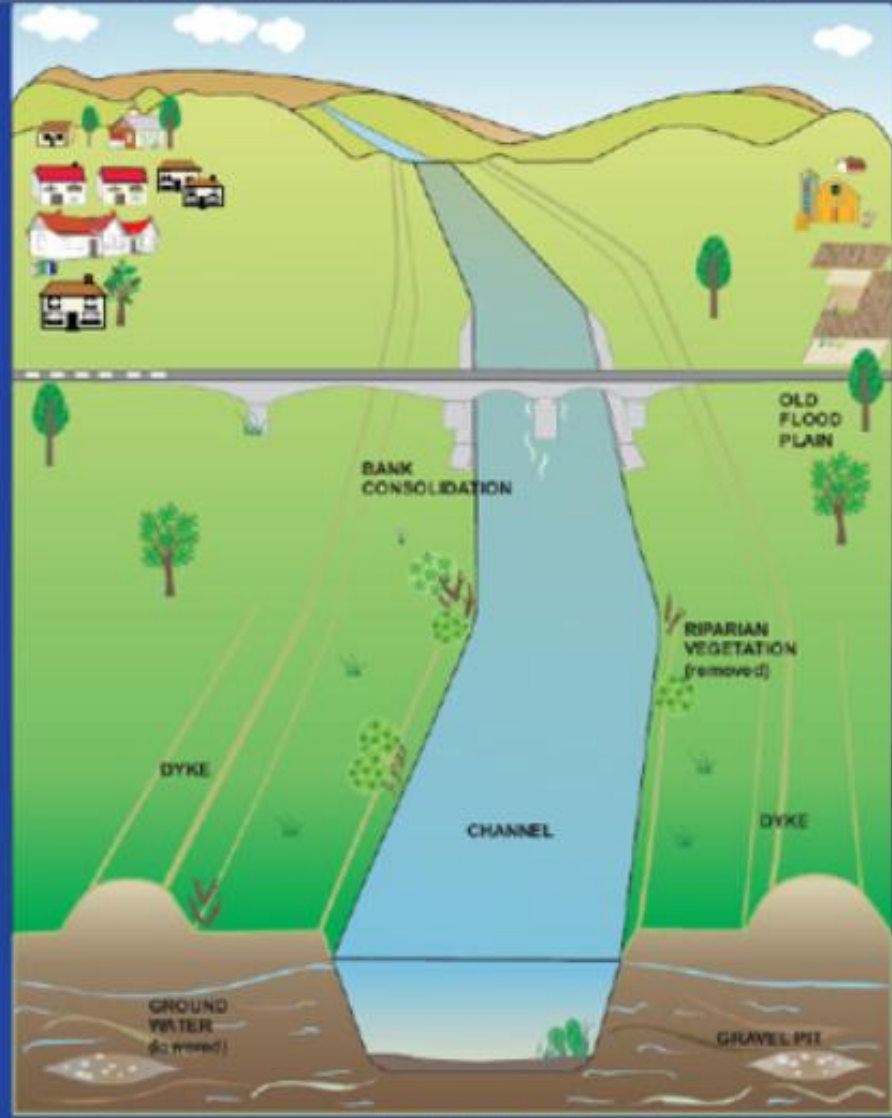
Hydromorphology on the Camcor



Hydromorphology on the Figile



A RIVER IS MORE THAN JUST WATER



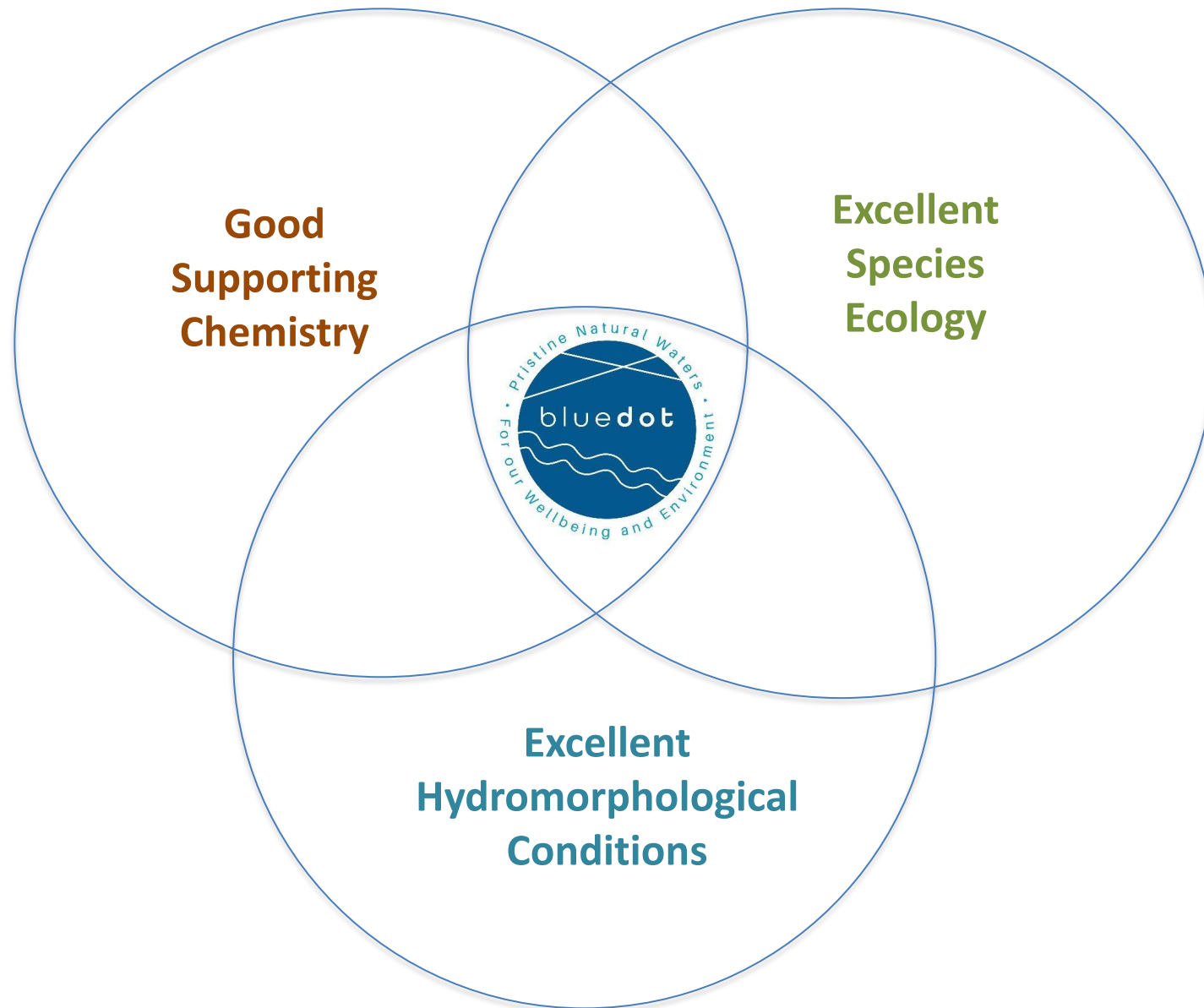
www.wfd-croatia.eu

A RIVER IS MORE THAN JUST WATER

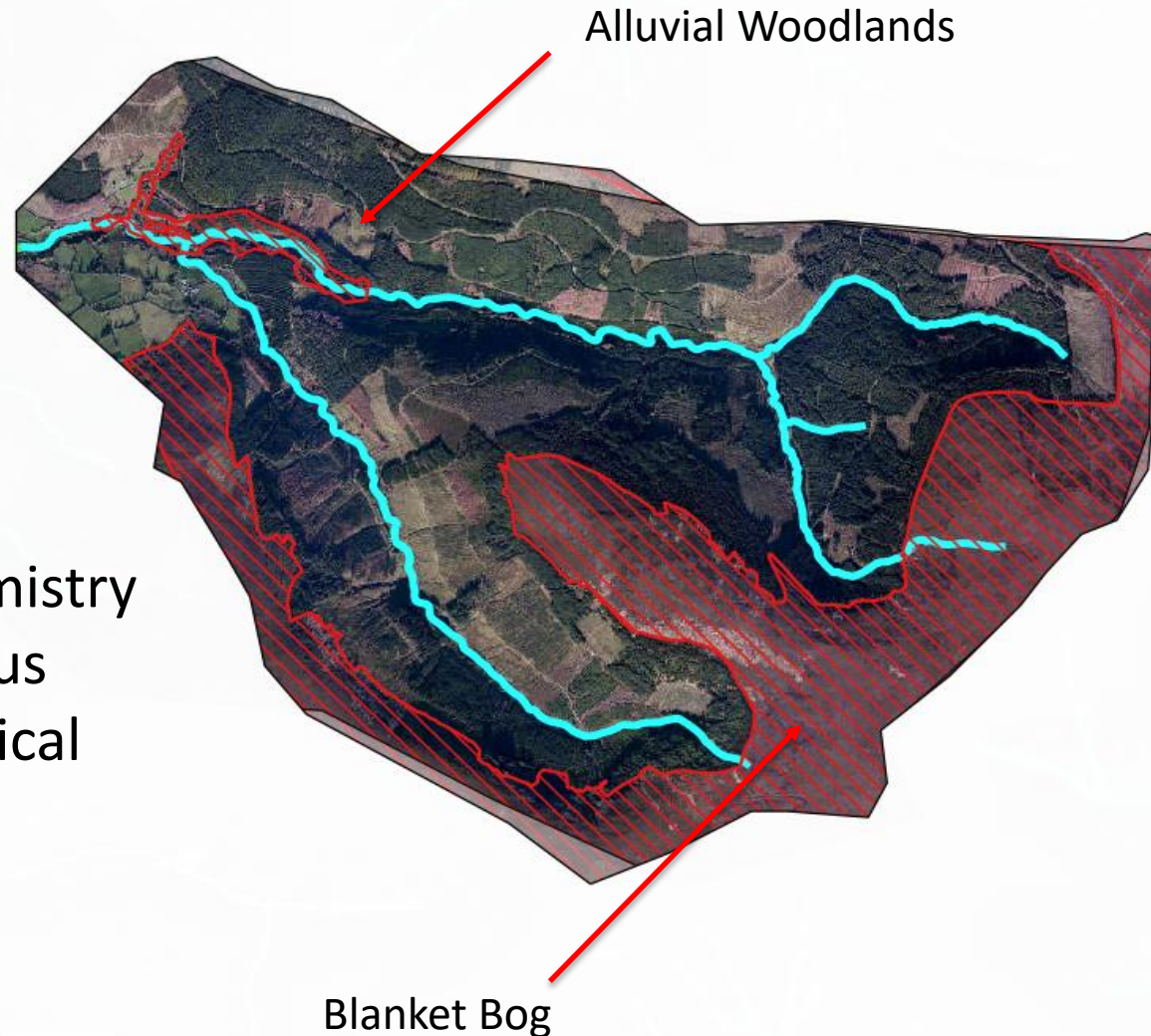


WATER + SHAPE = HYDROMORPHOLOGY

www.wfd-croatia.eu



The Camcor Blue Dot

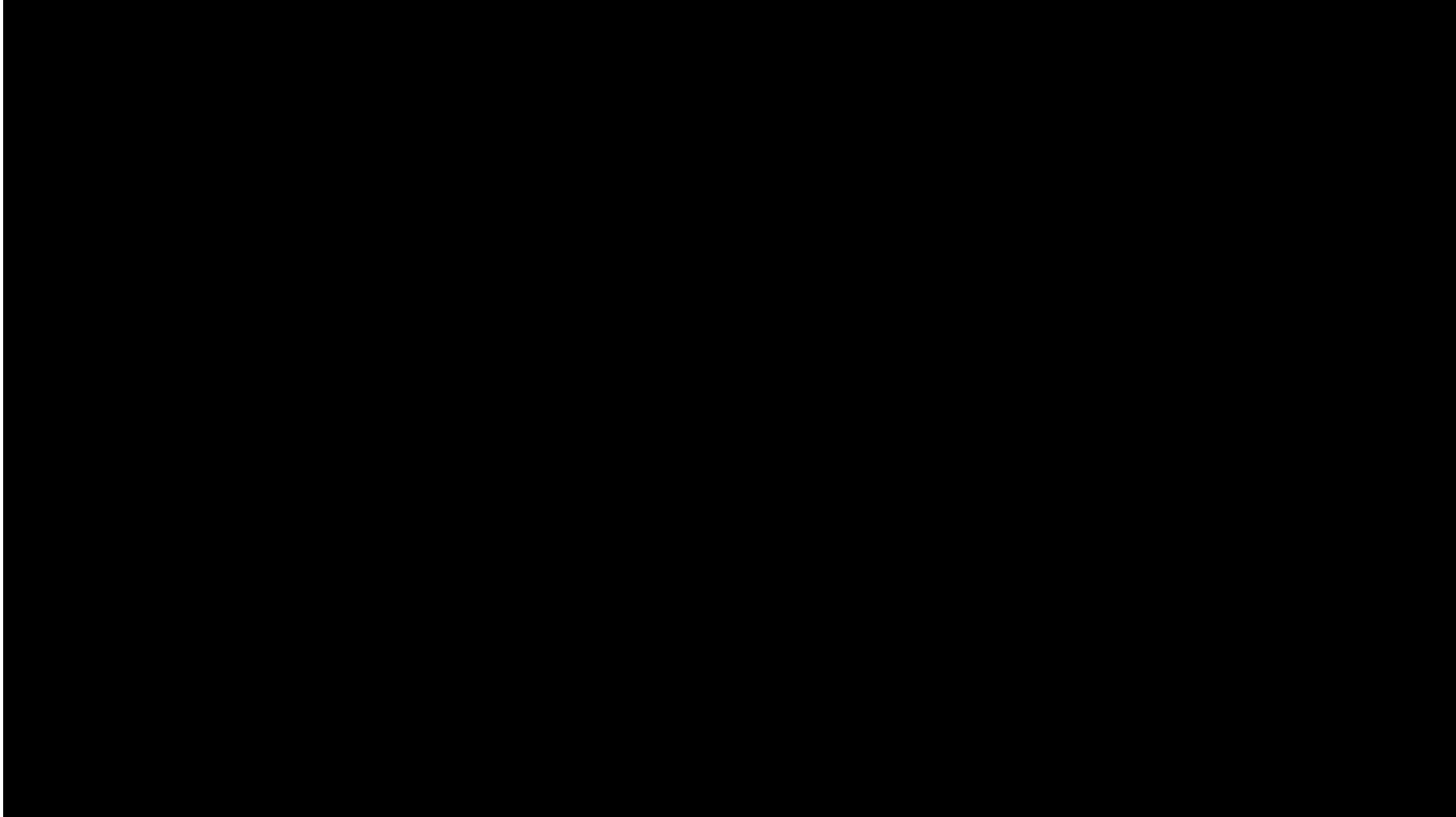


- Good Supporting Chemistry
- High Invertebrate Status
- High Hydromorphological Conditions



Camcor River
An Chamchuart





Thank you!



vibrant communities | catchment assessment | healthy waters

Photo: Juha Kinnunen [Flickr]





Rural Citizens

Climate Justice Programme

Learner Journal

Name: _____



Rialtas na hÉireann
Government of Ireland



Arna chomhchistiú ag
an Aontas Eorpach
Co-Funded by the
European Union

SOLAS
learning works



**Adult
Literacy
for Life**



Offaly Local
Development
Company



Comhairle Chontae Uíbh Fhailí
Offaly County Council



This project was supported by the Collaboration and Innovation Fund as part of the Adult Literacy for Life strategy. Adult Literacy is co-funded by the Government of Ireland and the European Union.



Introduction

Welcome to Rural Citizens!

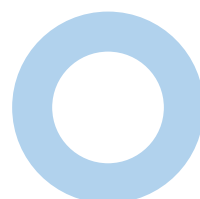
We're delighted that you have joined this programme, and we hope that this booklet will help you reflect on the sessions.

The schedule for the programme is on the next page.

We really hope that you enjoy every session. If you have questions or need more information, please contact Cormac on the details below.

Mobile: 087 665 9267

Email: cmahon@offalyldc.ie



Schedule

Date	Time	Venue
Week 1 August 12	10.30am - 12.30pm	Clonbollogue Hall
Week 2 August 19	10.30am - 3.00pm	Clonbollogue Hall / Figile River
Week 3 August 26	10.30am - 12.30pm	Clonbollogue Hall / Figile River
Week 4 September 2	10.30am - 12.30pm	Meet at Clonbollogue Hall
Week 5 September 9	10.30am - 12.30pm	Clonbollogue Hall
September 16	No Session	
Week 6 September 23	10.30am - 12.30pm	Clonbollogue Hall
Week 7 September 30	10.30 - 3.00pm	Meet at Clonbollogue Hall
Week 8 October 7	10.30am - 12.30pm	Clonbollogue Hall



Week 1

Topic: _____

Date: _____

Reflections

1. What did you learn today?

2. What useful skills did you learn today?



Week 2

Topic: _____

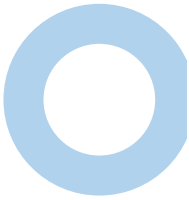
Date: _____

Reflections

1. What did you learn today?

2. What did you enjoy doing today? Why?

3. What skills did you learn today that will help you in the future?





Week 3


Topic: _____

Date: _____

Reflections

1. What did you learn today?


2. How could today's work be good for your community or the environment?



4. How confident do you feel about using the skills learned today in the future?

- Not at all confident
- A little confident
- Fairly confident
- Very confident

5. How likely are you to continue using these skills in the future?

- Not likely
 - Somewhat likely
 - Likely
 - Very likely
- 

Notes



Week 4

Topic: _____

Date: _____

Reflections

1. What did you learn today?

2. How could what you learned today help your community or the environment?



Week 5

Topic: _____

Date: _____

Reflections

1. What did you learn today?

2. How could today's work be good for your community or the environment?



Week 6

Topic: _____

Date: _____

Reflections

1. What did you learn today?

2. How could what you learned today help your community or the environment?





Week 7

Topic: _____

Date: _____

Reflections

1. What did you learn today?

2. What one thing will you tell family or friends about today's trip?



Week 8

Topic: _____

Date: _____

Reflections

1. Thinking about the last eight sessions, what did you enjoy most?

2. What will you keep doing for yourself or your community after taking part in this programme?



Rialtas na hÉireann
Government of Ireland



Arna chomhchistiú ag
an Aontas Eorpach

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