



Biodiversity

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Topic 1: Why and What?

Why are we interested in Biodiversity?

1. Legislation
2. Financial - Agri-Schemes
3. Marketing – green image
4. Health and well-being

2

Why Worry about Biodiversity *now*?

Biodiversity is in decline – Worldwide and Ireland

- ... one million animal and plant species threatened with extinction (IPBES, 2019)
-changes in the past fifty years have been more rapid than at any time in human history (MA, 2005)
- One third of 98 Irish bee species are threatened with extinction



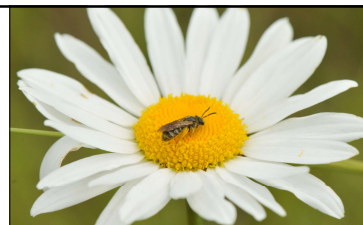
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Honey bee (1)



Bumblebees (20)



Solitary bees (77)

One third of our 98 bee species are threatened with extinction

- ❖ **Reduction in flowers**
 - Pollen (protein)
 - Nectar (carbohydrate)
- ❖ **Lack of continuity of flowers**
 - Bees need food all year round*
 - *a diversity of flowering plants in the landscape*
- ❖ **Less nesting sites**



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All Ireland Pollinator Plan



- Bees need flowers
- The All-Ireland Pollinator Plan is often asked, “should I plant wildflower seed?”
➤ Our answer is always that pollinators themselves would say “no”.



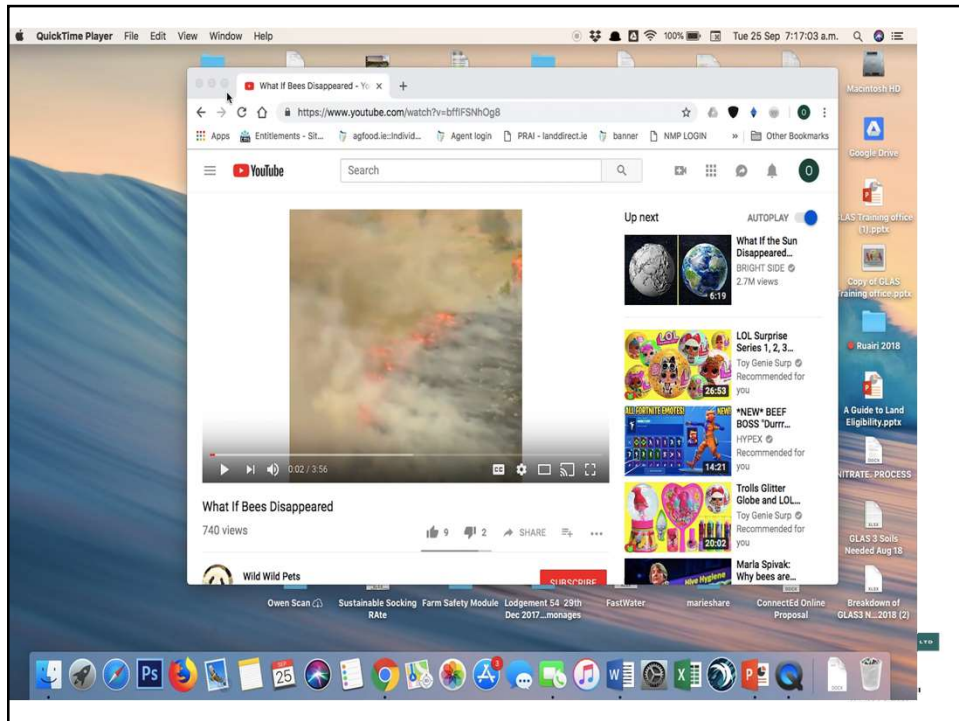
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1960's



**‘Silent Spring’
by
Rachel Carson**

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What is Biodiversity?

Flora

Fauna

Habitats

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Native Irish Flora



Ireland has more than 4,000 plant species.



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Native Irish Flora



Yew

Conifers



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Native Irish Flora



Ferns

11

Native Irish Flora



Mosses & Liverworts

12

Native Irish Flora



Fungi

13

Native Irish Flora



Lichen

14

Native Irish Flora



Algae



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Native Irish Fauna



Hedgehog

Mammals

Ireland has 28 species of land mammal.



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Native Irish Fauna

Birds



Song Thrush

Ireland has over 400 species of birds.



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How birds use hedges



18 Teagasc Presentation Footer

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Native Irish Fauna



Reptile

Common Lizzard

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Native Irish Fauna





Amphibians

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Native Irish Fauna

Fish




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Native Irish Fauna

**11,000
insects**




**1200
moths**

**35
butterflies**

Invertebrates

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Are all Flora and Fauna good? **NO**

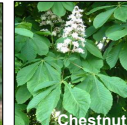
Native **Irish** Biodiversity - *here for 10,000 years*

Excludes:

❖ Ornamental garden plants



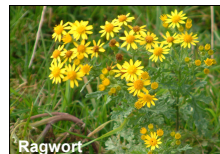
❖ Introduced plants



❖ Invasive alien species



Noxious weeds

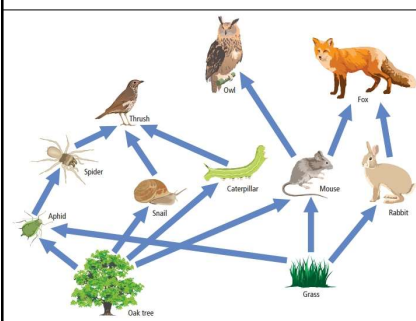


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Native is best for biodiversity

❖ Native Irish species are in tune with each other with timing of flowering suiting associated dependent species.

❖ Irish provenance (plants grown from seed from plants **growing** in Ireland) - Important if planting - species native to Ireland grown in another country **act differently**




Example Food Chain


**Invertebrate Species
associated with various trees**

Willow	300
Oak	280
Birch	220
Whitethorn	140
Non-natives Sycamore	30
Non-natives Chestnut	6


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Chestnut




Beech



Sycamore

Introduced species:

- Not as good to support wildlife
- Cast dense shade
 - Not recommended as trees in or near hedgerows

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Wildlife Value of Trees

Invertebrate species associated with various trees

Willow	300
Oak	280
Birch	220
Whitethorn	140
Non-natives Sycamore	30
Non-natives Chestnut	6

Native is best for biodiversity!

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Invasive Alien Species

- Some native species can be considered pests / invasive to an area such as rushes, blackthorn, hazel in the Burren **but**

Invasive Alien Species (IAS) are:

- Non-native species
- Introduced into Ireland
- Damage our environment
- Serious consequences for farms

❖ Up to 100 IAS in Ireland (Flora & Fauna)

❖ Some more damaging than others



National
Biodiversity
Data Centre

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Invasive Plant Species

- Awareness Campaign by DAFM
- Species Identified as follows:
 - Giant Hogweed
 - Giant Rhubarb
 - Montbretia
 - Himalayan Balsam
 - Japanese Knotweed
 - Old Man's Beard
 - Rhododendron

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Giant Hogweed



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**Giant hogweed produces 20,000 to 50,000 seeds per plant. These are coin sized and paper thin
Some can be spread by the surface run-off of rain or in the wind**

- How to manage Giant hogweed
- Giant hogweed is an invasive species which is extremely difficult to eliminate from a site
- The best time to remove the plant is in late April or early May because the plant is usually less than 30cm tall, easier to dig up, and more susceptible to herbicides.
- Due to the serious health risks associated with Giant hogweed, it is recommended that all methods of control are carried out by trained and experienced personnel.

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Giant Rhubarb



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Giant rhubarb

- Giant rhubarb is a large perennial plant which is native to Chile and Argentina in South America.
- It was first introduced to Ireland in the 1800s as an ornamental garden
- The species can invade native grassland and subsequently reduce the value of the land for grazing. The huge leaves are unpalatable to livestock because of the small spikes on the back of the leaves and along the stems

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Giant rhubarb

- Integrated management using a combination of physical and chemical control measures is generally considered the most effective.
- It is recommended that any attempt to



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Montbretia



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Montbretia

- Montbretia (*Crocasmia X crocosmiflora*) is an invasive perennial plant which was developed in France for ornamental purposes in the 1880s.
- Montbretia displaces native vegetation by smothering ground cover plants and small



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Montbretia

- Non-chemical treatment, chemical treatment or a combination of both can be employed to remove the species
- The most effective time to remove Montbretia is just before full flowering occurs in summer.
- follow-up over a number of years to deal with any re-growth by corms or rhizomes.

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Himalayan Balsam



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Himalayan Balsam

- Himalayan balsam is an invasive annual plant species which is native to the foothills of the Pakistani and Indian Himalayas.
- Himalayan balsam grows rapidly and spreads quickly. From seed it can grow up to 2.5 metres high in a single season.
- Himalayan balsam produces up to 2,500 seeds per plant.
- Non-chemical, chemical or a combination of both can be employed to remove the species.

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Japanese Knotweed



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Japanese knotweed

- Japanese knotweed (*Fallopia japonica*) is an invasive herbaceous perennial plant which is native to Japan and northern China.
- Japanese knotweed poses a number of threats to farms across Ireland. It grows rapidly and growth rates of up to 40mm a day have been recorded.
- One tiny particle blowing in the wind or transported on a car tyre is enough to create an infestation.

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Japanese knotweed

- The species can seriously damage houses, buildings and hard surfaces because it has the ability to grow



Fig. 2: Aggressive growth (www.odonovanagri.com)

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How to manage Japanese knotweed

- Difficult to eradicate
- Physical & Chemical Means
- Do not cut, trim or mow Japanese knotweed. This results in more vigorous growth
- A Fragment the size of a finger nail can spread this species by wind or shoe
- It is recommended that any attempt to control Japanese knotweed should only be carried out by trained persons using herbicide

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Rhododendron



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Rhododendron

- Rhododendron is a large perennial evergreen, acid loving shrub which is native to the Iberian Peninsula and Asia.
- Introduced to Ireland during the 18th Century as an ornamental garden plant because of its attractive flowers.
- Rhododendron is an aggressive coloniser which is both environmentally and ecologically damaging to infected sites.

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How does Rhododendron spread?

- One Rhododendron bush can produce over 1 million seeds per annum.
- Rhododendron seeds are amongst the smallest and lightest of any plant species and are designed primarily for dispersal by wind. Rhododendron seeds can be dispersed up to 100 metres by wind.
- In some cases, infestations have been so expensive to control that land has been abandoned.



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QUIZ



- A.Blackthorn**
- B.Whitethorn**
- C.Holly**
- D.Buckthorn**



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QUIZ



- A.Blackthorn**
- B.Whitethorn**
- C.Holly**
- D.Buckthorn**



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QUIZ



- A.Blackthorn**
- B.Whitethorn**
- C.Holly**
- D.Buckthorn**



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QUIZ



- A. Blueberries**
- B. Bilberries**
- C. Ivy**
- D. Sloes**

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QUIZ



- A. Sloes**
- B. Hips**
- C. Haws**
- D. Rowan berries**

50

QUIZ



- A. Sloes**
- B. Hips**
- C. Haws**
- D. Rowan berries**

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QUIZ



- A. Cockles**
- B. Mussels**
- C. Pearl Mussels**
- D. Sea shells**

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QUIZ



- A. Buzzard**
- B. Sparrowhawk**
- C. Hen Harrier**
- D. Eagle**

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QUIZ



- A. Lapwing**
- B. Curlew**
- C. Redshank**
- D. Hen harrier**

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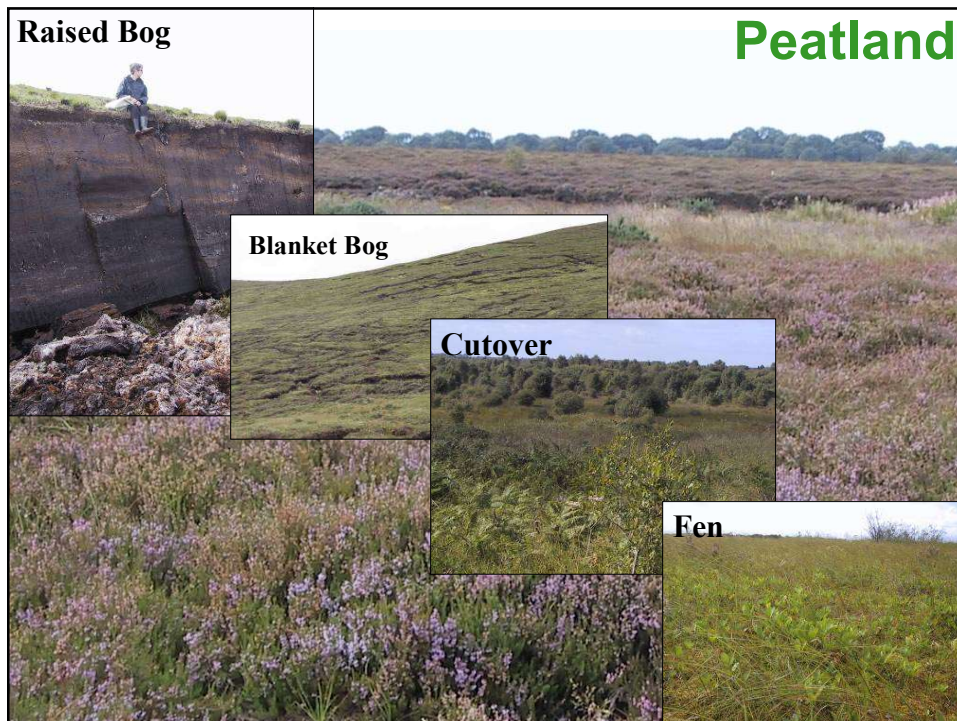
QUIZ



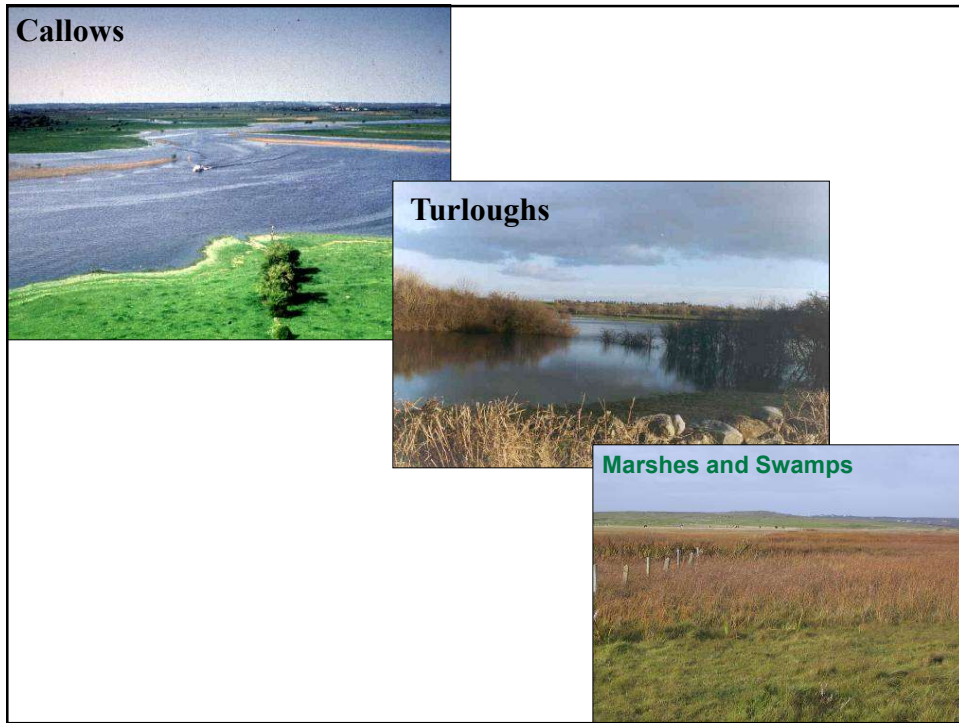
- A. Honey bee
- B. Bumble bee
- C. Solitary bee
- D. Wasp



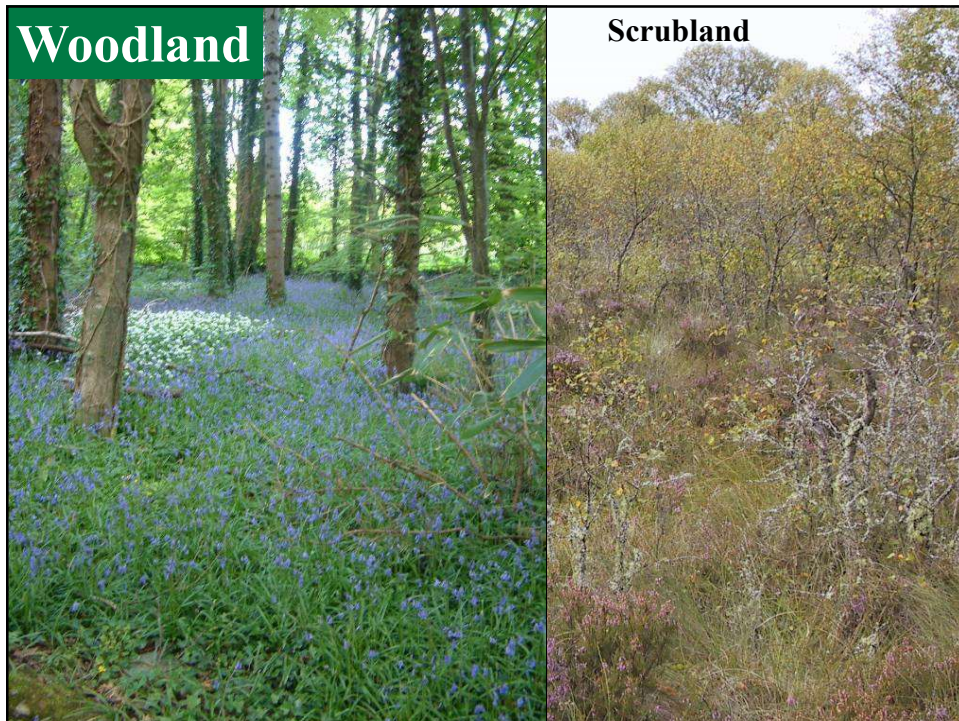
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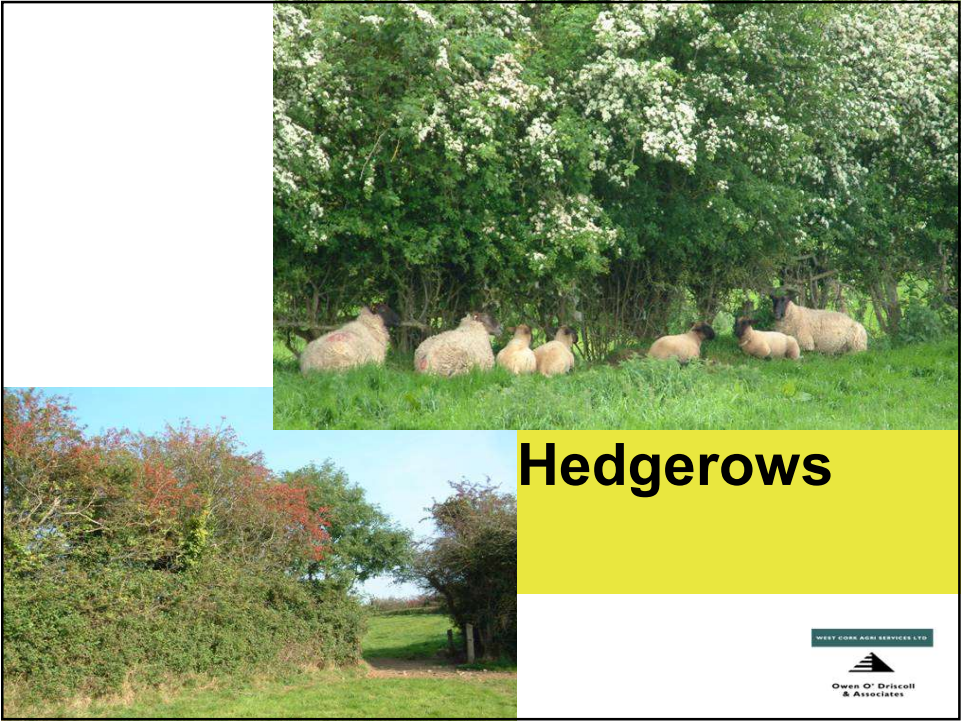
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Topic 2: Legislation and Schemes

Legislation

- EU Habitats Directive
- EU Birds Directive
- Wildlife Act and Wildlife Amendment Act
- Fisheries Act
- EIA (Regulations)



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NATURA 2000 Sites

- **Special Areas of Conservation (SAC's)**
 - EU Habitats Directive
 - Habitats and 25 species (Eg. Salmon, Otter, Freshwater Pearl Mussel, Bottlenose Dolphin and Killarney Fern).
 - 13,500 sq. km (half land / half marine)
- **Special Protection Areas (SPA's)**
 - EU Birds Directive
 - Endangered birds (Eg. Chough, Peregrine, Hen Harrier, Corncrake, Kingfisher, Merlin, Golden Plover, Dunlin and Merlin).
 - 570,000 hectares of marine and terrestrial



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ARC's

38 Activity Requiring Consent in SAC / SPA

Examples:

- Reclamation,
- Turf-cutting,
- Trackways
- Drainage
- Planting trees
- Supplementary feeding
- Burning,
- Topping,
- Clearing scrub or rough vegetation
- Reseeding
- Applying fertiliser.

There are specific circumstances where consent is not required

<https://www.npws.ie/farmers-and-landowners/activities-requiring-consent>

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Wildlife Amendment Act (2000)

■ Natural Heritage Area (NHA)

- Irish designation for wildlife
- Legally protected
- 75 raised bogs 23,000 ha
- 73 blanket bogs, 37,00 ha

■ Proposed NHAs (pNHAs)

- Some legal protection
- 630 sites 65,000ha
- Eg. Bat roost, woodland, lake

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NPWS local wildlife rangers

	Southern Division	South Western Region <i>Kerry, West Cork</i>
		Mid-Southern Region <i>Tipperary, Limerick, Waterford, East Cork</i>
	Northern Division	North Midlands Region <i>Westmeath, Longford, Monaghan, Cavan,</i>
		Northern Region <i>Sligo, N. Leitrim, Donegal</i>
Eastern Division		North Eastern Region <i>Dublin, Louth, Meath, Kildare, Offaly, Laois</i>
		South Eastern Region <i>Wicklow, Wexford, Kilkenny, Carlow</i>
Western Division		Western Region <i>Mayo, west Galway</i>
		Mid-Western Region <i>Clare, east Galway</i>



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- **Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000**
 - **From 1 September - end February: Hedge cutting; scrub removal; burning vegetation is allowed**
- **Fisheries Acts**
 - **Fish and their spawning grounds are protected**
 - **Advise farmers to contact Inland Fisheries Ireland**
- **Environmental Impact Assessment (Agriculture) Regulations 2011**

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EIA (Agriculture) Regulations 2011		
Category of activity	Threshold for:	
	EIA screening	consent and mandatory EIA
1. Re-structuring of rural land holdings:		
OR Length of field boundary to be removed	500 m	4 km
Area of lands to be restructured by removal of field boundaries	5 ha	50 ha
Re-contouring (within farm- holding)	2 ha	5 ha
2. Commencing to use uncultivated land or semi-natural areas for intensive agriculture	5 ha	50 ha
3. Land drainage works on lands used for agriculture (excluding drainage or reclamation of wetlands)	15 ha	50 ha

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<h2>Cross Compliance: Biodiversity</h2> <p>SMR 2: Birds Inspection Report Form</p> <ul style="list-style-type: none"> ➤ Breach of an ARC in an SPA ➤ Disturbance of birds outside an SPA <p>SMR 3: Habitats Inspection Report Form</p> <ul style="list-style-type: none"> ➤ Breach of an ARC in a SAC <p>GAEC 7:</p>					
<p>GAEC 7 - Retention of landscape features, ban on cutting hedges & trees in bird nesting season & encroachment of invasive species</p>					
A	Is there evidence of the damage/removal of designated Landscape Features?				
B	Is there evidence of the cutting of hedges and/or trees during the bird nesting and breeding season (1 March - 31 August)?				
C	Is applicant failing to take appropriate measures to prevent the encroachment/proliferation of invasive/noxious species on to land?				
<p>68</p> <p>Owen O' Driscoll & Associates</p>					

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Landscape Features

- **Hedges and Drains:**
Since 2009 – cannot be removed / piped and closed in ...unless a replacement hedge / drain of similar length is planted / dug at a suitable location on the holding in advance of the removal of the existing hedgerow / drain.
- **REPS 3 or REPS 4 Option 4a habitats**
- **Archaeological Sites and Monuments**

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Where to start: *Follow the principles*

1. Retain



2. Maintain



3. Enhance

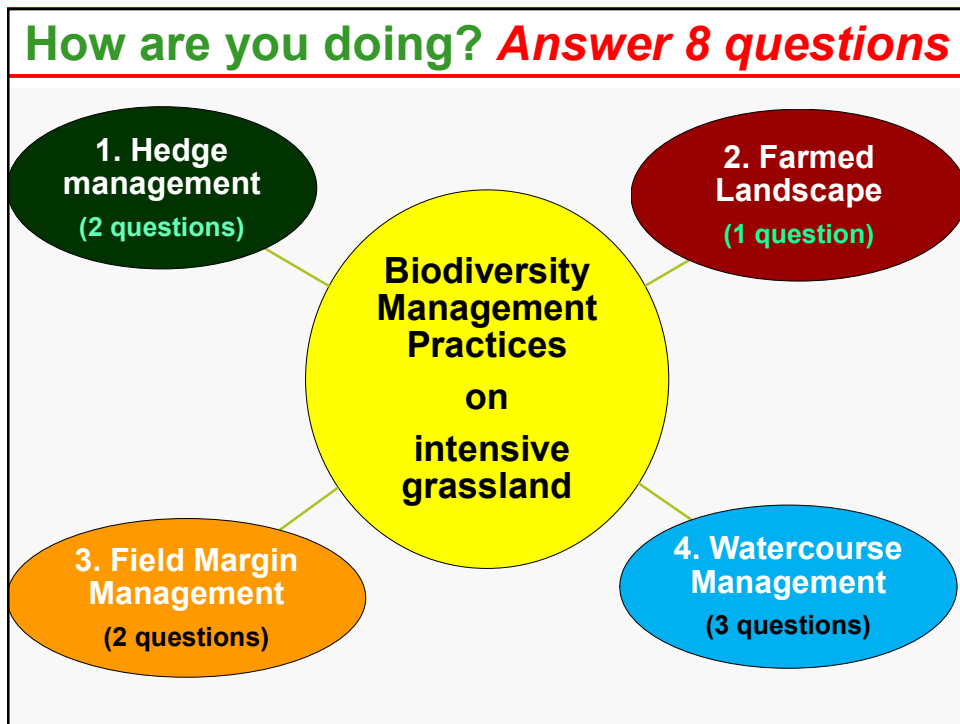


Create



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1. Hedge Management

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Which would you like to own?

A



A. Image of relict hedge

B



B. Image of escaped hedge

C



C. Image of hedge trimmed to a triangular profile sloping from a wider base with occasional trees retained

D



D. Image of low, neat flat-topped treeless hedge

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Which is best for Biodiversity?

A



A. Image of relict hedge

B



B. Image of escaped hedge

C



C. Image of hedge trimmed to a triangular profile sloping from a wider base with occasional trees retained

D



D. Image of low, neat flat-topped treeless hedge

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1. Hedge Management

- Is the average height (above any bank) of your internal hedges over 1.5 m? **Yes / No**
- Do your internal hedges contain mature flowering thorn trees and/or sapling thorn trees? **Yes / No**



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Hedge height

At least 1.5 m high

- for birds to nest
- to have cover over and under the nest



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Flowers in Hedges

Flowering Thorn Trees in hedges

Thorn trees

- for flowers for bees
- and fruit for birds and small mammals



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The Law

Timing of hedge cutting

- Cut hedges from:
1 September – end February

Under Cross Compliance: GAEC 7B

Is there evidence of the cutting of hedges and / or trees during the bird nesting and breeding season (1 March – 31 August)?

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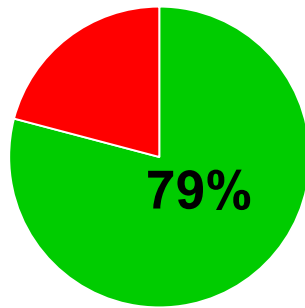
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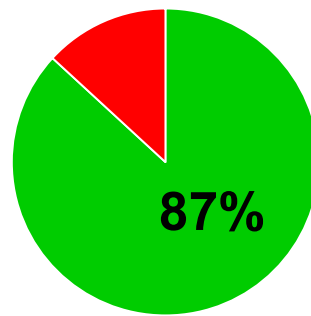
90 Dairy Farmers in Kilkenny / Waterford

(Source: Aoife Leader Walsh Scholar)

Hedge height
over 1.5m



Mature / sapling
thorn trees present



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2. Layout of Farming Platform

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Which would you like to own?

A



A. Image of a grassland prairie farming platform with large hedgeless fields

B



B. Image of a farming platform with low 'short back and side' hedges no trees

C



C. Image of a farming platform with hedges with some trees

D



D. Image of a traditional hedged farming platform with small fields

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82

Which is best for Biodiversity?

A



A. Image of a grassland prairie farming platform with large hedgeless fields

B



B. Image of a farming platform with low 'short back and side' hedges no trees

C



C. Image of a farming platform with hedges with some trees

D



D. Image of a traditional hedged farming platform with small fields

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2. Farming Platform Structure

- Is your Average Field Size Less Than 5ha?

Yes / No

Average Field Size =

Hectares owned ÷ Number of fields

(surrounded by permanent boundaries - *Not wire fences*)



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Farming platform structure

Average field size less than 5 ha

- Provides networks for nature and corridors of movement for birds, bats, bees and mammals to move through the countryside



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Removal of Hedges

Cross Compliance:

Landscape Features (Hedges and Drains)

- Since 2009 – cannot be removed / piped and closed in ...
- Unless a replacement hedge / drain of similar length is planted / dug at a suitable location on the holding in advance of the removal of the hedge or drain

The Law

EIA (Agriculture) Regulations 2011

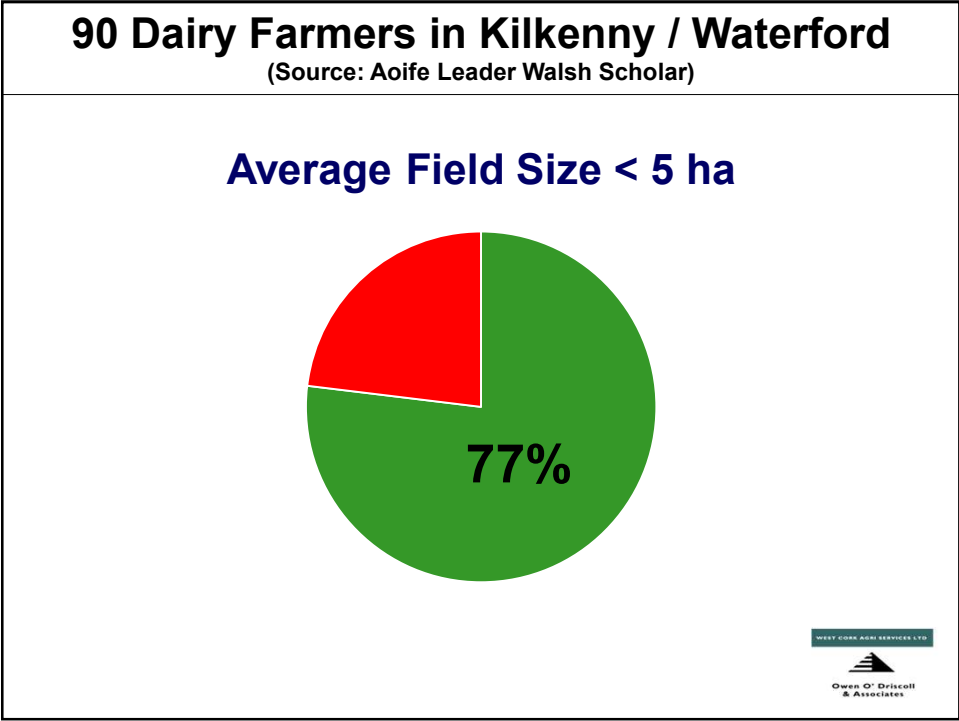
Must apply to DAFM for permission to remove hedges

if

- Newly created field is over 5 ha
- More removing more than 500 m



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3. Field Margin Management

- When reseeding do you retain at least 1.5 m uncultivated field margins? **Yes / No**
- Do you avoid spraying within your field margins (with the exception of spot treating noxious weeds)? **Yes / No**

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Uncultivated field margins

- Allow native wildflowers and grasses to grow providing habitat for biodiversity



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Unsprayed field margins



➤ Allow native wildflowers and grasses to grow providing habitat for biodiversity



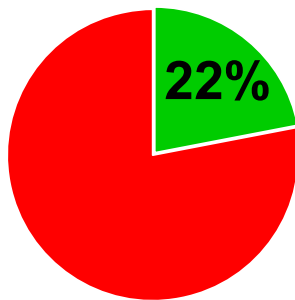
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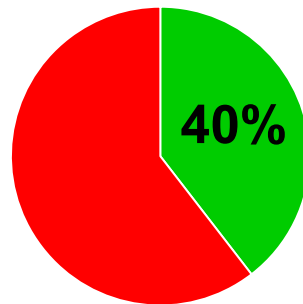
90 Dairy Farmers in Kilkenny / Waterford

(Source: Aoife Leader Walsh Scholar)

Uncultivated field margins retained (>1.5m)



Field margins unsprayed



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4. Watercourse Management

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4. Watercourse Management

- Are all watercourse banks on your farm fenced? **Yes / No**
- Is there a fenced watercourse margin of at least 1.5 m on all watercourses? **Yes / No**
- Do you prevent livestock drinking access to all watercourses? **Yes / No**

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Fenced watercourse banks

- Protect watercourse banks, allowing vegetation to grow and prevents siltation



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Watercourse margins

- Provide further protection for watercourses and allows space for native wildflowers and grasses to grow, providing habitat for biodiversity



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Prevention of livestock drinking access to watercourses

- Prevents siltation of watercourses, and protects the habitat for instream biodiversity



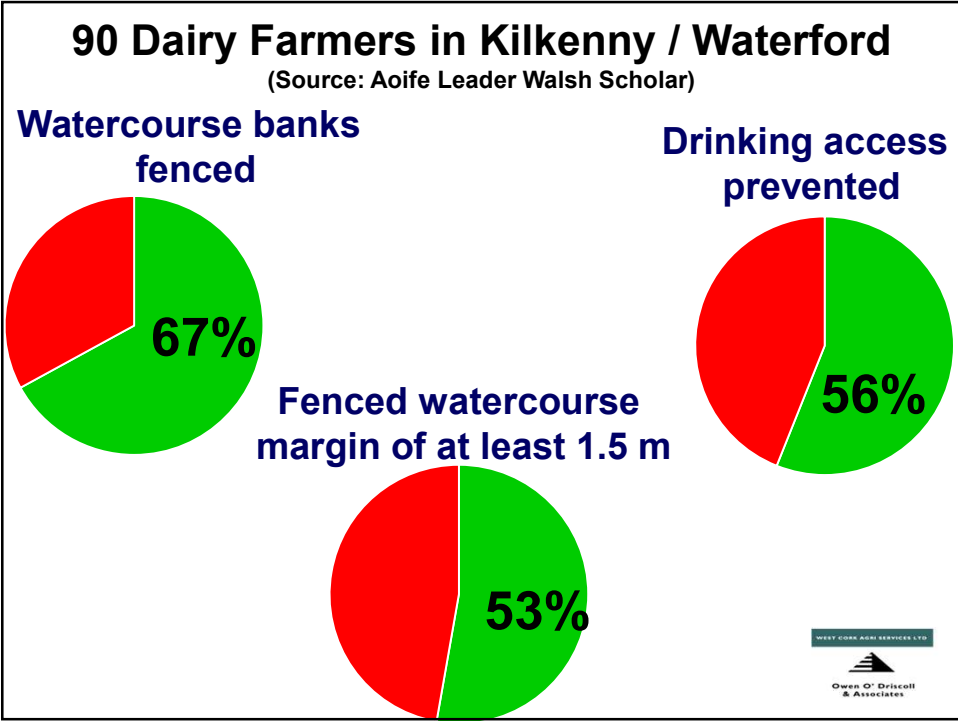
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The Law

Fisheries Acts

- Fish and their spawning grounds are protected
- Advise farmers to contact Inland Fisheries Ireland
- Allowable drainage works are least disruptive to fish when carried out from July to September

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Teagasc BMPI KT Tool (Keena and Kinsella, 2019)			
1. Hedgerow Management			
1.1	Internal Hedge Height ➤ Is the average height of most of your internal hedgerows (above ground level including banks where present) above 1.5 m?	Yes / No	
1.2	Flowering Thorn Trees in Hedges • IF hedge is escaped (line of tall trees) - does hedge contain mature flowering thorn trees OR • IF topped – does hedge contain thorn saplings and trees?	Yes / No	
2. Layout of Farming Platform			
2.1	Average Field Size: How many hectares do you own? How many fields (surrounded by permanent boundaries) are there on your owned land What is your average field size? ➤ Is your average field size is less than 5 ha:	Yes / No	
3. Field Margin Management			
3.1	Uncultivated Field Margin (When reseeding how close do you cultivate to the permanent boundary) ➤ Do you retain at least 1.5 m uncultivated field margins	Yes / No	
3.2	Unsprayed Field Margin ➤ Do you avoid spraying within your field margins (except for spot spraying noxious weeds)?	Yes / No	
4. Watercourse Management			
4.1	Fenced Watercourse Banks ➤ Are all watercourse banks on your farm fenced?	Yes / No	
4.2	Watercourse Margins ➤ Is there a fenced margin over 1.5m on all watercourses?	Yes / No	
4.3	Prevention of Drinking Access ➤ Do you prevent livestock drinking access to all watercourses?	Yes / No	
Your BMPI score (No of Yes's)			

What is your BMPI score?

How many Yes's?

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Call to Action!

- What is **your** BMPI score? / 8

Target BMPI score = 8/8



How do you compare?

90 Dairy farmers in Kilkenny / Waterford

Source: Aoife Leader, Teagasc Walsh Scholar

- **Average BMPI score = 5/8**
- **Range of BMPI scores = 2/8 – 7/8**

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<p>Farm with low BMPI score</p> <ul style="list-style-type: none"> • Few internal hedges • Low hedges without flowering thorn trees • Field margins cultivated and sprayed • Watercourse banks unfenced with drinking points 	<p>Farm with high BMPI score</p> <ul style="list-style-type: none"> • Internal hedges over 1.5 m with flowering trees • Field margins uncultivated and unsprayed • Watercourse banks fenced with margins no drinking points

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Know your Derogation commitments

Adopt at least one measure:

1. Leave at least one mature whitethorn or blackthorn tree within each 300 metres of hedgerow



2. Maintain hedgerows on a minimum 3-year cycle.



Cutting annually
stops flowering
and fruiting



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Go raibh maith agaibh!



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