

nature's way

POLLINATORS IN IRELAND

WHAT IS
POLLINATION?

WHO ARE THE
POLLINATORS?

WHY DO WE
NEED THEM?

THREATS/REASONS
FOR DECLINE



An Taisce
The National Trust for Ireland

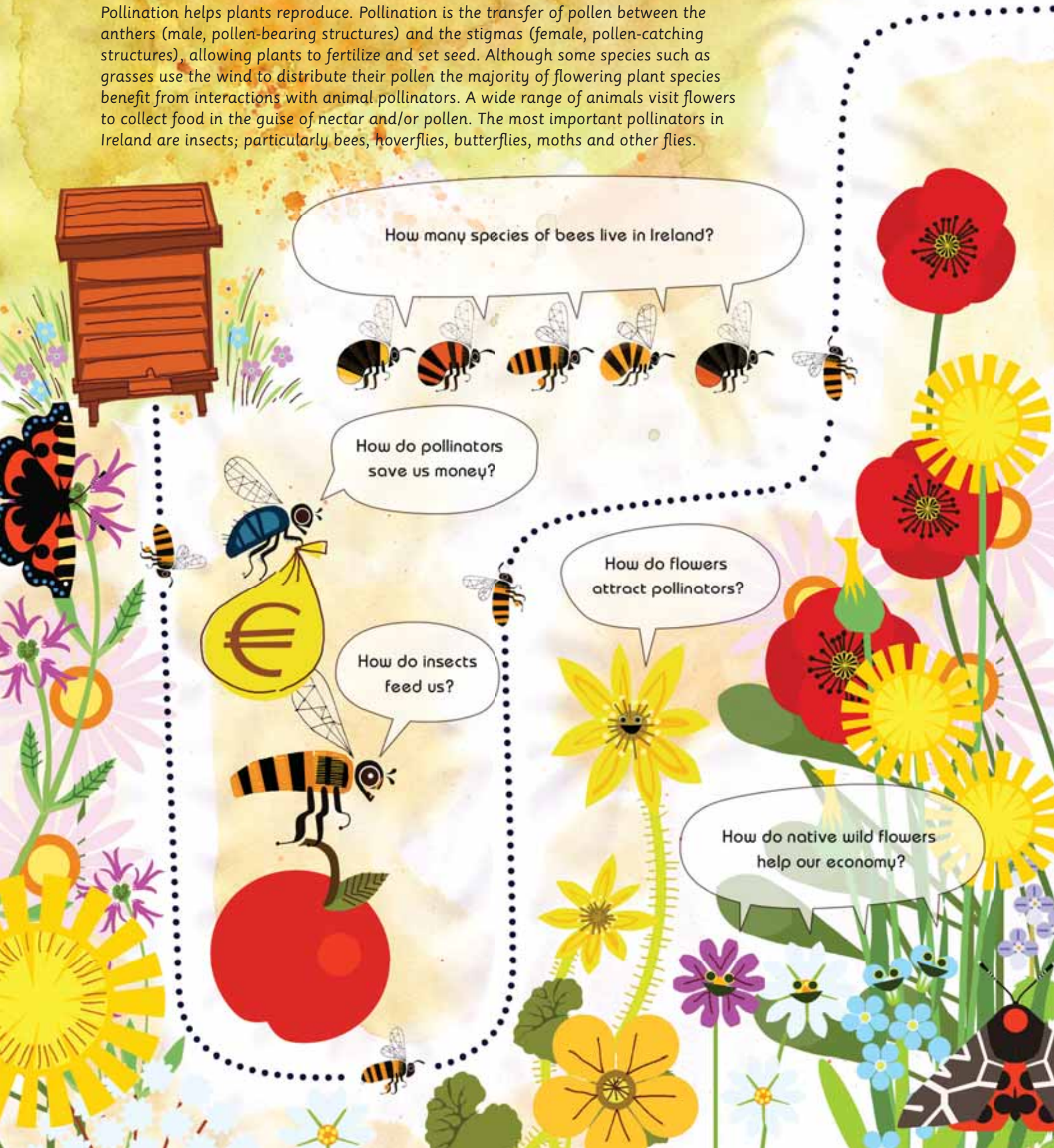


United Nations Decade on Biodiversity



What is Pollination?

Pollination helps plants reproduce. Pollination is the transfer of pollen between the anthers (male, pollen-bearing structures) and the stigmas (female, pollen-catching structures), allowing plants to fertilize and set seed. Although some species such as grasses use the wind to distribute their pollen the majority of flowering plant species benefit from interactions with animal pollinators. A wide range of animals visit flowers to collect food in the guise of nectar and/or pollen. The most important pollinators in Ireland are insects; particularly bees, hoverflies, butterflies, moths and other flies.



How many species of bees live in Ireland?

How do pollinators save us money?

How do insects feed us?

How do flowers attract pollinators?

How do native wild flowers help our economy?



In Ireland, crops such as apples, strawberries, clover and oilseed rape all benefit from pollination and the value of this service to the economy has been estimated at **€53 million per year**.

And globally that's 153 billion Euro!!

This is called an "Ecosystem Service".

Some species have separate male and female plants and some have separate male and female flowers on the same plant. However the majority are **hermaphrodite** with male and female parts on the same flower. Most plants however have developed mechanisms to prevent or reduce self pollination and therefore inbreeding.

Holly trees have separate male and female trees!

I collect nectar and pollen..

...and fertilize the next flower

Bees

Bees are the most important pollinating insect because they visit flowers to collect food for their larvae, as well as feeding on floral resources as adults. Hence their entire life-cycle is dependent on interactions with flowering plants. Of the 100 crops that provide 90% of the worlds food supply, 71 are pollinated by bees.

In Ireland, there are 101 species of bee, including the familiar honeybee (1 species) and bumblebees (20 species). The remaining species are solitary, meaning they do not form colonies.



Bumble bees

In a colony of bumblebees there is generally one queen bee (a fertile female bee). The large queen can often be seen flying in the early spring looking for a suitable nest site.

The first few batches of larvae produced by the queen result in all female or worker bees. These workers then take over the job of rearing the new larvae which then produce males and new Queens. The new Queens then create their own nests the following spring. The different bumble bee species can be identified by their different colours and stripes.

There are 6 bumble bee cuckoo species and 22 solitary bee cuckoo species which lay their larvae in other bee's nests just like the cuckoo bird.



Honey bees

The only bee that produces commercially extractable honey is the honeybee. Recent collapses in honeybees have caused widespread concern with regards to crop pollination, particularly in North America. Honey bees also live in colonies, but unlike our other bees, the queens live for more than one year and her workers also survive the winter.

Honey bees live in complex colonies with each member of the colony having very different roles, e.g. nurse bees, scout bees, pollen gatherers, guard bees etc.

Honey bees perform a bee or waggle dance to tell other workers in their colony where food can be found.

Solitary bees

The tawney mining bee is a large colourful solitary bee that was last seen in Co. Kilkenny in 1925. Unfortunately it is now extinct in Ireland. Unless we are careful, many other species will soon follow it!

Solitary bees on the other hand build nests on their own in hollow reeds or twigs, holes in wood, or in tunnels in the ground. Solitary bees do not care for their larvae and instead leave provisions with the egg.

The importance of wild, non-managed bees as pollinators of not only crops, but also wild plants is becoming more and more apparent. Some studies have shown that a diversity of pollinator types is important for maximizing pollination. Therefore, to provide stable pollination services for our crops, potential future crops and other wild plants, policies to maintain both wild and managed pollinators are needed. Unfortunately, the current status of Irish pollinators appears to be in decline.

Hoverflies & Flies



You can distinguish a hoverfly from a bee by the number of wings; a fly has two wings, while bees have four.

Hoverflies

There are approximately 180 species of hoverfly in Ireland and they are important pollinators in the Irish landscape. Many hoverflies use mimicry to protect themselves from predators and their brightly coloured bodies with spots, stripes, and bands of yellow or brown mean they are often mistaken as bees or wasps. However, they are harmless to people and most other animals. They get their name from hovering around flowers when feeding on nectar and pollen. In addition many species of hoverfly larvae prey upon pest insects, including aphids, making them natural form of pest control.



Flies

A wide variety of other flies visit flowers and are important where the numbers of other pollinators such as bees, wasps hoverflies etc are low or absent e.g. isolated flush sites in vast areas of blanket bogs may have rare species such as *Saxifraga hirculus* which may rely on species of flies for pollination.


The world's chocolate depends on midges, tiny two-winged flies, which pollinate the cacao flowers. If you love chocolate, thank a fly!



Butterflies & Moths

One of our butterfly species is already extinct – the Mountain Ringlet and 18% of the native Irish butterfly fauna are under threat of extinction. A further six species are threatened (Endangered or Vulnerable) and five species are Near Threatened. Over 1350 moth species have been recorded in Ireland.

Butterflies and moths (and many other insect species) go through four distinct stages in their life cycle: egg, caterpillar, pupa and finally a butterfly or moth. Many people are familiar with the caterpillar stage as they are often seen feeding on the leaves of plants and can cause significant damage to many plant species. However once they are fully grown they stop feeding and find a suitable pupation site – often the underside of a leaf. Here they make a button of silk to fasten their body and form a pupa or chrysalis. Inside this they undergo their transformation into a butterfly or moth through metamorphosis. Once they emerge they can be very effective pollinators, feeding on the nectar of flowers or more occasionally pollen. Butterflies and Moths are important as pollinators for some species of plants although in general they do not carry as much pollen as bees. They are however capable of moving pollen over greater distances.

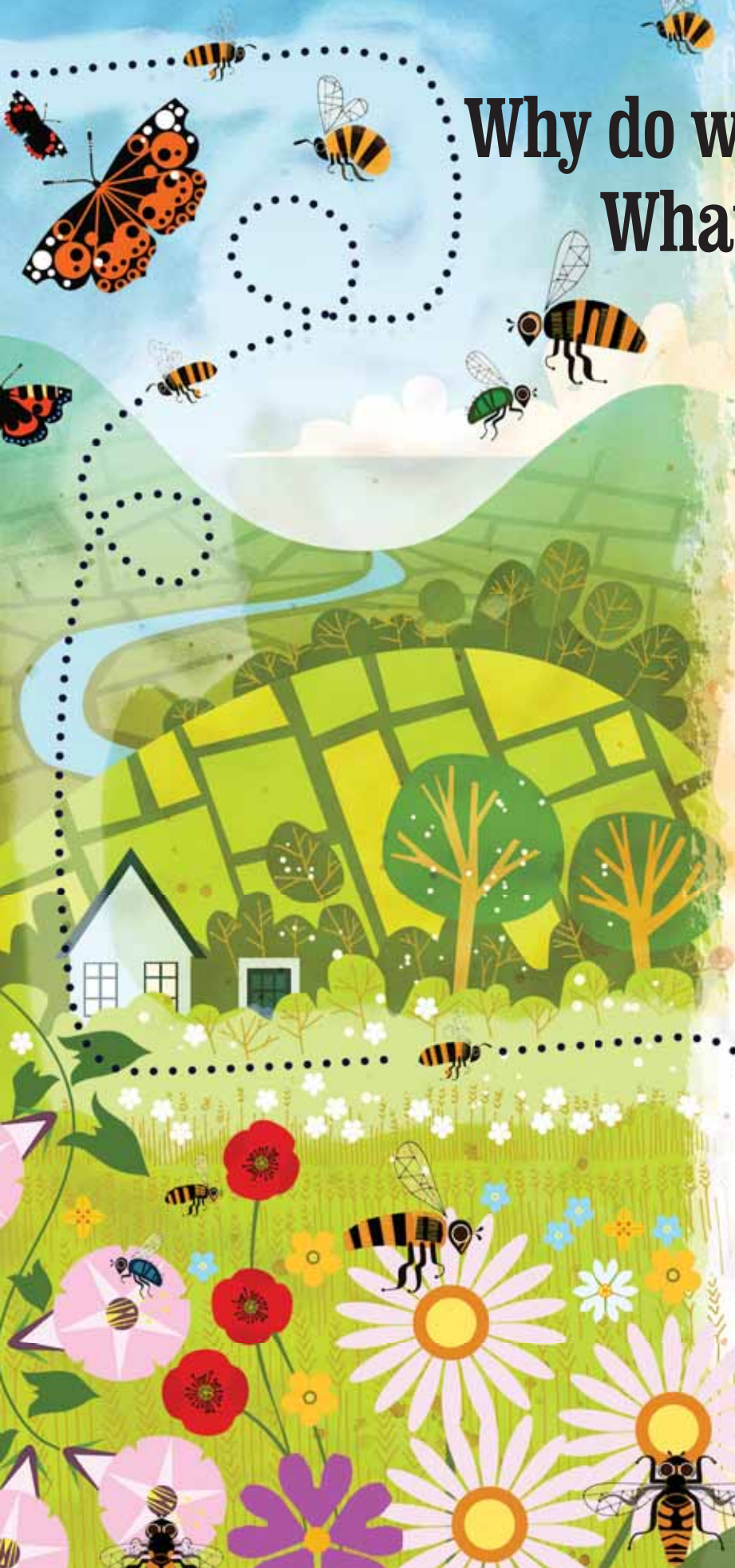


The Marsh Fritillary butterfly is the only insect in Ireland listed in the appendices of the EU Habitats & Species Directive.




The painted lady travels from the desert fringes of Morocco across mainland Europe and the Irish sea to reach Ireland covering over 2000km in a month!

MOROCCO



Why do we need them? What's happening to them?


We need our pollinating insects such as bees, butterflies, moths and flies because of the services they provide us. These services, along with others the natural environment provides us with such as clean water, climate regulation etc, are known as “ecosystem services”.



Our insect pollinators pollinate our crops providing us with food – imagine if we had to hand pollinate all our crops?


Some studies have shown that a wide diversity of pollinators is important for maximizing pollination. Therefore, to provide the best pollination services for both our crops and other wild plants, it is important to protect them. Unfortunately, Irish pollinators appear to be in decline, with 30% of the wild bees and 18% of butterfly species in Ireland considered threatened according to the International Union for Conservation (IUCN).

Like all of our biodiversity, pollinators are negatively affected by a range of human activities, but the primary cause of wild pollinator loss is thought to be the loss and fragmentation of their habitats due to building, new road construction etc. General declines in wildflowers within the landscape also play a role. This is largely due to the changes in our farming practices, for example the creation of larger fields thus removing hedgerows, and the movement from hay to silage production. In addition, invasive alien species, pests and diseases (such as *Varroa destructor* in the honeybee), and pollution (e.g. as a result of agricultural pesticides) negatively effect pollinators too.



Where have all the insects gone?

The future impact of climate change on pollinators is difficult to predict but the observed changes in flowering times and where the flowers are found may present a problem if the pollinators cannot change their life cycles quickly enough to match.



Where have all the flowers gone?



What you can do

Tips for attracting bees and other pollinators

1. Build us nest sites!

2. Dont spray pesticides on us or our homes!

Most pesticides are not selective. You are killing off the beneficial bugs along with the pests.

3. Plant us we're native!

4. Plant lots of us with different colours!
Bees use their strong colour vision to help them find flowers and the nectar and pollen they offer. Blue, purple, violet, white, and yellow are all particularly attractive to bees

5. We flower at different times during the year – plant us! Most bee species will feed on a range of plants throughout their life cycle and this will also allow a range of bee species to be supported.

8. Plant in both the sunniest and the shaded areas.

9. Become a member of an Irish environmental NGO, such as An Taisce, who are working to protect our Biodiversity.

10. Join the Bumblebee Monitoring Scheme

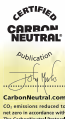
7. Our different shapes encourage different pollinators, again providing a range of flower shapes means more bees species can benefit. However, open cup shaped flowers are the bees' favorites such as foxgloves.

6. Dont plant us alone!
Flowers clustered into clumps (best approximately 4 foot in diameter) of one species will attract more pollinators than individual plants scattered through the habitat patch.

Wider country-side tips for attracting bees and other pollinators

1. **We should avoid pesticide use.** Most pesticides are not selective. You are killing off the beneficial bugs along with the pests.
2. **We need to protect our hedgerows.** Halting the loss of hedgerows through their removal and well as improving their productivity would be two very simple measures to help pollinators. In recent years, Ireland has seen its hedges over-cut resulting in a loss nesting sites (hedge banks) and a reduction in food for bees.
3. **We need to increase biodiversity.** Planting a range of species, promoting diverse hay meadows and flower-rich grasslands instead of intensive grass-lands, would allow for a range of flowering species to persist and therefore a great bee species range.
4. **We need to provide undisturbed habitat areas.** For example, leaving buffer zones around hedges and woodlands in farming reduces the effects of fragmentation and increases biodiversity. Maintain a mosaic of interconnected 'wild' habitats.
5. **Our roadside verges and motorway embankments should be managed to encourage wildflowers,** and cut less often.

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Contacts and further information:

An Taisce: An environmental charity with a focus on conserving Ireland's built and natural heritage - www.antisce.org

The Federation of Irish Bee Keepers: An Association concerned with the keeping and protection of bees - www.irishbeekeeping.ie

Birdwatch Ireland: An NGO committed to the conservation of wild birds and their habitats throughout Ireland - www.birdwatchireland.ie

Biology.ie: A web based resource for people interested in biodiversity in Ireland - www.biology.ie

Crann: Environmental charity working for the promotion and protection of Ireland's trees, hedgerows and woodlands - www.crann.ie

ECO-UNESCO: Ireland's environmental education and youth organisation - www.ecounesco.ie

Friends of the Irish Environment: A network dedicated to protecting Ireland's environment - www.friendsoftheishenvironment.net

The Hedgelaying Association of Ireland: Promotes appropriate management and conservation of hedgerows - www.hedgelaying.ie

Heritage in Schools Scheme: A Heritage Council initiative aimed at educating primary school children - www.heritagecouncil.ie/education

Irish Environmental Network: A network of Irish non-governmental environmental organisations - www.ien.ie

Irish Wildlife Trust: An environmental charity whose functions relate wildlife conservation and education - www.iwt.ie

Irish Seed Savers Association: Research, locate and preserve traditional varieties of fruit, vegetables and grains - www.irishseedsavers.ie

Moths Ireland: A group dedicated to recording Irelands moths. www.mothsireland.com

National Biodiversity Data Centre: Collects, manages and analyses data and information on Ireland's biodiversity. www.biodiversityireland.ie Join their butterfly monitoring scheme at <http://butterflies.biodiversityireland.ie>

National Parks and Wildlife Service: A statutory body responsible for the conservation of a range of habitats and species in Ireland - www.npws.ie

Notice Nature: A campaign to increase public awareness of the importance of Ireland's biodiversity - www.noticenature.ie

The Heritage Council: A statutory body who promote interest, education, knowledge and pride in our national heritage- www.heritagecouncil.ie

Tree Council of Ireland: A voluntary organisation formed to promote the planting, care and conservation of trees - www.treecouncil.ie

Trinity Centre for Biodiversity Research: A research centre focused on understanding biodiversity in the context of a changing world - www.tcd.ie/tcbr

Programmes

Millennium Ecosystem Assessment: Researching the consequences of ecosystem change - www.millenniumassessment.org

TEEB Initiative: The Economics of Ecosystems and Biodiversity, www.teebweb.org

Further Reading

The Economic and Social Aspects of Biodiversity: 'Benefits and Costs of Biodiversity in Ireland'. Department of Arts, Heritage and the Gaeltacht, 2008.

Actions for Biodiversity 2011-2016. Ireland's National Biodiversity Plan. Department of Arts, Heritage and the Gaeltacht

United Nations Environment Programme (2011): 'Global honey bee colony disorders and other threats to insect pollinators' (UNEP.)

