

Introduction

This submission by South Tipperary Beekeepers Association (STBA) is informed by a recognition of the importance of biodiversity protection and enhancement in the context of planning and development in the County. The focus of this paper reflects the importance of the honeybee to the agricultural economy, the necessity to protect the native honeybee *Apis mellifera mellifera* (*A. m. mellifera*) and the interdependence of the natural environment and the apicultural economy. STBA requests these issues are addressed appropriately in the County Development Plan (CDP) 2022 – 2028.

Appendices I and II provide supporting information on agriculture practices and on the importance of the native Irish Honeybee, *A. m. mellifera*, in Ireland.

County Tipperary is one of the most significant agricultural counties in terms of land use in Ireland with a growing reputation for quality, natural food production. Pollinator insects are integral to the agriculture and farming sector with the honeybee being the most important managed pollinator for both the natural environment and for agriculture. This importance is acknowledged by the Department of Agriculture, Food and the Marine (DAFM) within which the Horticulture and Plant Health Division is involved in a number of initiatives supporting beekeeping and honey production. There are 4,462 beekeepers in Ireland, maintaining approximately 27,040 colonies of honeybees nationally and involved in the production of an ancient and much valued food source (FIBKA 2019). However, while the honeybee provides an invaluable pollination service, as a species with a perennial colony it is in turn dependent for its very existence on continued access to sufficient and varied foraging spaces throughout the year. Supporting the requirements of honeybees also caters for the needs of the other species of bees *i.e.*, bumble bees and solitary bees which have more limited flight periods.

STBA was established in 1945 and is concerned with the promotion and advancement of beekeeping, education and development of beekeepers in the art of beekeeping, education of beginners and in representing beekeeping and honey production locally, nationally and internationally. Clonmel, Cluain Meala, is so named because of the historical recognition of ideal local conditions for production of honey. This historical connection between County Tipperary and beekeeping continues today. Currently, the Association has 120 full members and 20 associate members from neighboring beekeeping organisations in North Tipperary, Kilkenny, East Waterford, and Limerick. STBA is one of the most active associations in the country with several members who are recognised both nationally and internationally for their expertise in both beekeeping and honey production. STBA has 5 member who are winners of the Gold Cup for honey production at the London Honey Show, widely regarded as the world cup competition for honey.

Beekeeping and honey production is an important economic activity however it also provides valuable benefits to agriculture in general. These benefits can only be fully realised through high standards of beekeeping; the activities of STBA reflect a commitment to the achievement of excellence in this regard. To this end, various educational and promotional activities take place throughout the year including an annual beginner's beekeeping course, a winter lecture series and outdoor open hive demonstrations in the Association apiary in Bulmer's orchards. In addition, the STBA has been running a study group since 1993 and its success is measured by the high number of members who are certified lecturers and who hold the National Diploma in Science (Apiculture), the highest qualification in beekeeping in this country.

STBA has a long-established profile in South Tipperary which has developed and is sustained by the active participation of the Association in various agricultural and community events throughout the year including the annual Clonmel Horse Show as well as all agricultural shows held throughout the county. The renowned Clonmel Honey Show organised by the Association has been an annual event since 1968 and attracts entries and visitors from across the country. Such events provide a forum for STBA to engage with the public, local businesses, community organisations and local representatives and officials with the aim of promoting a greater understanding of beekeeping and its importance in biodiversity conservation and enhancement.

The County Development Plan

STBA strongly believe that it is essential the Tipperary CDP 2022-2028 explicitly acknowledges the important economic and ecological factors inherent in the protection and enhancement of biodiversity.

There are important ecological synergies between agricultural, apiculture and the natural environment in the County. In protecting and enhancing the natural environment on which the honeybee depends, the Tipperary CDP 2022 – 2028 will be supporting the agriculture economy, landscape preservation and environmental sustainability in the County.

In this regard, it is imperative that active development policies and new land uses in the CDP are balanced against policies designed to minimise damage to the sustainability of pollinator species effected by such developments and minimise damage to habitat areas.

County Development Plans set out the statutory framework for future planning and development in a county in accordance with Section 10 of the Planning and Development Act 2000, as amended. Development planning considerations and related actions are set within the framework of national, regional and related local policies and plans and provide spatial expression to the economic, social and cultural needs of the county. As such the CDB strongly influences new developments in relation to industry, commerce, tourism, education, health and housing. The enhancement of recreation and amenity resources, environmental protection and the valuation afforded to heritage are similarly articulated in the CDP.

It is contended that CDPs have, to date, focussed more on development activity and on development control standards. STBA now wish to see an extension of the “normal” scope of the CDP to include a new and dynamic set of policies and objectives giving effect to both the National Biodiversity Plan and recognition of the status of natural countryside as a prime asset which demands protection and enhancement. Such policies and objectives must be integral to both development approval processes and development implementation actions.

All measures concerned with the protection, management and development of the landscape and its resources must give full and explicit recognition to landscape as *home to nature* and give effect to actions to protect and enhance the biodiversity therein.

Importantly, the first strategic objective of the National Biodiversity Action Plan 2017-2021(NDAP) is to strengthen the mainstreaming process, highlighting the necessity for relevant sectors to take biodiversity considerations into account when developing policies and operational plans. The NDAP references the need to raise awareness within the public sector of the implications of policy and

decisions on biodiversity and states that local action is important in tackling biodiversity loss. Local Authorities are requested to review and update their own Biodiversity and Heritage Action Plans as well as their CDPs and policies, giving due consideration to the protection of biodiversity.

*“The Convention on Biological Diversity’s Cancun Declaration (CBD, 2016) focuses on the need for governments at the national, regional and **local levels** to mainstream the conservation and sustainable use of biodiversity for human well-being. This can be achieved through sectoral and cross-sectoral policies, plans and programs, to establish an effective institutional, legislative and regulatory framework that incorporates an approach that is inclusive.” (National Biodiversity Action Plan 2017-2021 pg. 26)*

In making this submission, STBA strongly support this objective and wish to reiterate the importance of developing specific measures to protect the environment, habitats and biodiversity within County Tipperary. Moreover, STBA seeks that the CDP itself be a strong instrument in the implementation of the National Biodiversity plan. STBA sees the initial local Biodiversity, and more latterly Local Heritage Plans, as nothing more than introductions to the concept of biodiversity. The time has now come for real meaningful policy measures on biodiversity to be included in the CDP.

In line with Objective 1, Action 1.1.4 of National Biodiversity Action Plan 2017-2021, Tipperary County Council should establish a biodiversity resource to provide in-house expertise to support the work of the Council and in particular the work of the Heritage Officer in relation to the natural heritage of County Tipperary. In this regard, the appointment of a Biodiversity Officer would be a strong indication of the commitment of County Tipperary to biodiversity protection and enhancement.

Habitats, Ecosystems and Biodiversity

Biodiversity describes the variety of living things and is fundamental to our daily lives. Biodiversity is responsible for the provision of food, raw materials and medicines. Ireland is a land of varied habitats, including farmland, woodland, cliffs and marshes, sand dunes, caves, heath, bracken, grassland, bog, fens and flushes, turloughs, lakes, ponds, springs and swamps. These natural resources create habitats that support the flora and fauna which inhabit them and over time evolve to create unique local ecosystems with all elements both contributing to and depending on the other. In order for the diversity of species to survive and flourish, the habitats on which they depend must be protected and, indeed, enhanced.

The European Union Habitats Directive provides legal protection for habitats and species of European importance. The overall aim is to maintain or restore the “favourable conservation status” of habitats and species of European Community Interest. These habitats and species are listed in the Habitats and Birds Directives with Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated respectively to afford protection to the most valuable and threatened of them.

The loss of biodiversity in agricultural landscapes has been dramatic over the past few decades with negative trends persisting. The Environmental Protection Agency has noted that 85% of EU protected habitats have unfavorable status with 15% of protected species areas in decline (Environmental Protection Agency, 2020). It is further noted that agricultural practices are a key pressure, and habitat changes point towards a deteriorating trend in overall biodiversity. (see Appendix I)

The EU Habitats Directive should continue to be fully incorporated into the new CDP. It is essential that County Tipperary apply and monitor these protections with renewed vigour such that the deteriorating trend is reversed. This renewed focus would be a core element of the work of a dedicated Biodiversity Officer.

However, there are limits to the conservation of habitats in applying the EU Habitats Directive regulations. This legislation applies only to those areas identified and designated. The conservation of the wider countryside is of equal importance with woodlands, hedgerows, rivers, lakes, ponds etc all contributing to the rich diversity of species and habitats in the county. Hedgerows are one of the most widespread natural habitats in the countryside and are critical to the existence of numerous plants and animals. They are particularly important within areas of intensive farming, and for the survival of widespread yet declining species which are dependent on woodland edge, scrub or rough grassland habitats. Such areas contribute to a network of wildlife corridors and habitats which allow wildlife to flourish as well as providing forage areas for managed pollinators such as the honeybee.

It follows therefore, that the CDP should contain objectives to ensure that where greenfield lands are being developed that it is obligatory that a habitat and biodiversity assessment is made of the losses that will occur. Side by side with that a further objective should identify and provide for resources to enable compensatory and mitigation measures to be implemented. This could be achieved by using a part of development levy income for the purposes of restoration of biodiversity and hedgerow loss in such areas. An innovative approach to accommodating such a policy prioritisation of habitat/biodiversity protection would be to provide a dedicated back to nature or re-wilding space within zoned areas.

The importance of rural landscape resources for the protection and enhancement of biodiversity cannot be overstated, however there is also significant and important opportunities for biodiversity measures to be implemented in urban spaces, amenity areas, riverbanks, ponds and along transport routes. Much of this land may be under the direct control and management of the County Council. In implementing specific measures and, importantly, communicating and publicising these measures and the associated actions to local communities and key stakeholders, important benefits will be realised:

- habitats will be protected and improved directly through Council actions.
- the publicity associated with these actions will animate and inspire community groups, schools, sports facilities, local enterprises etc to engage in / replicate biodiversity activities in their own areas.

- Tipperary County Council should identify, conserve and enhance wildlife habitats and species of local importance not otherwise protected by legislation. This includes field boundaries (hedges and ditches), woodlands, rivers, wetlands and grassland areas.
- Land use and spatial development in the County should be subject to a mitigation hierarchy process whereby developments which impacts on biodiversity, landscape or the environment are first, avoided where possible; second, minimised; and third, corrected through restoration or repair.
- The County Council should identify and provide for resources to enable compensatory and mitigation measures to be implemented eg ringfence part of development levy income for the purposes of restoration of biodiversity and hedgerow loss in such areas.
- The County Council must identify and protect existing and potential habitats and spaces in urban areas, towns and villages in the course of its spatial planning and development obligations.
- Tipperary County Council should identify and ring fence resources for upskilling the local authority workforce and community organisations in recognising where habitat damage and biodiversity loss exists and

Species Decline

Biodiversity refers also to species diversity both within a species and between species. Many species are in decline and in some cases their future is endangered. In many cases irreversible losses have already occurred. Many species have become extinct, and it is considered that impending extinction rates are many times greater than those of the past. The extinction of one species results in the irreversible loss of a unique suite of genetic adaptations that have been acquired typically over significant timescales from hundreds to thousands of years. For example, the All Ireland Pollinator Plan 2015-2020 highlighted that more than half of Ireland's bees have undergone substantial decline with 4 out of 21 bumble bees endangered and 2 categorised as vulnerable.

Non Native Species

Biodiversity can be threatened by the introduction of non-native species which can disrupt entire ecosystems and impact populations of native plants or animals. These invaders can adversely affect native species by eating them, infecting them, competing with them, or mating with them. The native honeybee, *A. m. mellifera*, is under such threat. The native Irish honeybee is a subspecies that evolved in north-western Europe and research supported by the DAFM and Native Irish Honey Bee Society (NIHBS) confirmed unambiguously in 2018 that it is genetically distinctive (see Appendix II). This distinctiveness contributes the traits that means it is uniquely adapted to Irish climate and weather patterns. However, *A. m. mellifera* is vulnerable to external threats principally hybridization with bees from a different genetic stock and to diseases that might be imported with bees from abroad. Where introduced sub-species, such as *Apis mellifera ligustica*, *Apis mellifera carnica*, and / or hybrid commercialised strains such as Buckfast bees are present there is potential for genetic changes which undermine the adaptations of the local population to its environment.

A key tool in protecting and augmenting populations of threatened species is the designation of conservation areas in which the organism of interest is accorded special protection by improving supports such as habitats and reducing threats such as competitors or diseases. The use of voluntary conservation areas is a key element of the strategy advocated by NIHBS in support of the native Irish honeybee, *A. m. mellifera*. While fully recognising that designating Tipperary as a conservation area for the native bee can only be achieved on a *voluntary* basis without changes to legislation (nationally and at a European level), the explicit support and recognition by the Council in Tipperary as an element of its biodiversity measures would add support to the efforts of beekeepers in the County. At the very least recognition of the conservation objectives for *A. m. mellifera* in the County is a strong objective of this submission. The support of the County Council in this regard would be consistent with Action 4.4 of the new All Ireland Pollinator Plan, 2021 - 2025 which relates to conservation of *A. m. mellifera* and states “*Ireland has a duty to conserve this genetic resource*” (AIPP 2021-2025 pg. 48).

Tipperary County Council should explicitly support the protection and survival of the native Irish honeybee, *Apis mellifera mellifera* by recognising the conservation objectives of STBA in promoting voluntary conservation areas.

Agriculture and Food Production

As an agricultural county, Tipperary is a large producer of foods. Going forward it is important that the promotion of quality food production is central in the economy of the County. The County already has strategic advantages in production of quality food including its geographical location

with easy access to ports, the quality of the land, a highly developed agricultural sector, and an experienced and trained farming workforce. Ireland also has climate advantageous over many European countries and continues to retain good air, water and soil quality.

It is important that policies and objectives within the CDP reflect the importance of quality food production to the economy and the image of the County. The protection and enhancement of the natural environment and biodiversity on which food production relies for its quality must be central to all development in the County. Tipperary should therefore develop additional focus on specific policies within the life of this CDP to support and enhance quality food production.

Beekeeping is an integral part of an agriculture sector producing high quality food but with scope for further growth and as such can benefit from supportive CDP policies. It should be noted that:

- The value of the honey produced in Ireland in 2019 was estimated by the DAFM to be €4,296,000, based on production of 205 tonnes.
- In 2016, Ireland imported 4,086 tonnes of honey, demonstrating a significant market. Wholesale honey price is estimated at €10,460/tonne or greater, depending on honey type. Except for a very small number of larger honey producers most of the estimated 3,000 registered beekeepers in Ireland operate on small scale.
- Teagasc has calculated a 3-year average yield of 20kg per year per hive. Honey yields vary from year to year, depending on weather, genetics of the individual colony and forage in the locality.

The CDP should give special regard to advantages, opportunities and strengths in County Tipperary for quality food production as an especially strong attribute of the County. This recognition should cover the mainstream large scale food production but also the niche market and smaller scale farm gate producers which includes most honey producers in the County

Climate Change

It is acknowledged that whilst intensive agricultural production systems have contributed to a significant decline in habitat and biodiversity, these matters are not necessarily within the remit of local authorities. However, what happens on farming land can potentially have a significant impact off farm. Environmental issues such as degraded soils, declining air and water quality, increasing water issues including flooding, and biodiversity do present problems which the local authority has to address. (see Appendix I)

This will require active engagement with landowners which goes beyond regulation of hedgerow cutting and scrub land burning activities. It suggests a close partnership with key stakeholders and consideration of inducements to manage natural resources in a way which offers benefits to the wider community and the natural world.

The role of trees, woodlands and hedgerows as habitat and forage areas for pollinators is of particular importance to STBA. However, the role of these resources in providing other ecosystem services should be acknowledged. Hedgerows, trees and woodland soils lock up vast quantities of carbon. Ireland's greenhouse gas emissions profile – with over one-third of emissions coming from agriculture and a high dependency on fossil fuels – is particularly challenging. The commitment of Tipperary County Council in relation to the development of a low carbon society and action on climate change is evident in preparatory documentation for the County Development Plan 2022 – 2028. It is proposed that a low carbon society can be achieved through a range of measures, including

reducing carbon emissions, decreasing reliance on fossil fuels through development of renewable energy resources and increasing energy efficiency.

Combining mitigation measures alongside reducing carbon emissions suggests greater positive climate change impact. Hedgerows and forestry and diversity of plant species (i.e. monoculture in agriculture and in forestry must be recognised as detrimental to climate change objectives) have a significant role to play in this regard. However, hedgerows need to be managed in such a way as to maximise their carbon sequestration capacity. It is proposed that the ‘quality’ of the hedgerows is therefore important on a number of levels and that greater attention is afforded to this aspect of landscape management.

Tipperary County Council could facilitate the promotion and support for improved practices in rural areas by increasing awareness and information sharing between farmers. Promotion of the beneficial initiatives being adopted by individuals and farmer groups would also result in more sustainable farming systems, associated ecosystems services and improved biodiversity for the benefit of residents in and visitors to the county. It is the view of STBA that County Development Planning policies need to come up to date and relate specifically to these issues.

Landscape: Heritage and Habitat

This submission reflects a specific interest in the preservation and enhancement of the natural resources of the County in the interest of protecting ecosystems and biodiversity. However, it would be remiss not to acknowledge the cultural services and natural heritage of the County which nature provides. A key element of this heritage is the landscape and within that, the hedgerows which constitute a defining feature of the rural landscape in particular. Hedgerows create the characteristic structure and patterns of the areas we inhabit and in turn provide a sense of place, the familiar vistas which represent ‘home’ to the people of Tipperary.

The Council should consider designation of Landscape Conservation Areas to protect specific and important landscapes.

Landscape Management

While the Council should fully assess the implications for wildlife, significant trees and hedgerows and waterways located on lands being considered for development, this alone will not reverse the impact of decades of poor management and decline of such resources. It is imperative that such resources are enhanced and increased across the County and not only on land which the local authority has direct control or powers associated with development.

Hedges are exceptionally important as habitats not only for birds and other wildlife but for the flowers, shrubs and trees which provide a significant source of nectar and pollen for all pollinators, including honeybees. The following species are particularly dependent on hedges for food and / or shelter:

- 55 species of birds (35 of which depend on hedges for nesting)
- Mammals – hedgehogs, shrews, pine marten and bats
- 99 species of bees – (77 solitary bees, 21 bumble bees, 1 honeybee)
- 1400+ species of moths
- 35 species of butterflies

(Keena, 2020)

Well-managed hedgerows are a vital resource providing food and a safe place to live for pollinator populations. One third of the 99 bee species are threatened with extinction from the island of Ireland. Even though honeybees are now generally found in apiaries, they, along with all pollinators continue to be dependent on an abundance and diversity of flowering plants and trees on which to forage. To have a healthy balanced diet, they need to be able to feed on pollen and nectar from a range of different flowers from spring to autumn. The wider pollinator family also need plenty of safe nesting habitats - long grass, bare earth, crevices in dry stone walls or wood.

In addition to the role hedgerows play in pollinator survival, it is important to ensure a wide variety of native plants (trees, shrubs, wildflowers) are available across the whole county landscape including riverbanks, woodland, urban and amenity areas and commuter routes. A specific example of the broader benefits of a reconsidered approach to such areas can be demonstrated by a move away from grass lawns in amenities areas. These no doubt have their place, but it must be recognised that for such areas to look well a high level of maintenance, inputs of machinery and manpower is required. Wild meadow type amenity areas are now recognised as having more beneficial value for pollinators and once established have lower maintenance input requirements resulting in a ‘win win’ outcome.

The Council should develop specific measures to:

- ensure all planning approval includes planting schemes with native plant species which contributes to the biodiversity and strengthens networks of wildlife habitats.
- continue the focus on protecting pollinators commenced under the All Ireland Pollinator Plan 2015 – 2020 and continuing with the new All Ireland Pollinator Plan 2021-2025.
- increase planting of native trees, shrubs and wildflowers in all council managed land and amenity areas.
- work in partnership with stakeholders to reward good practice in hedgerow management and consider sponsoring awards / rewards to ‘hedgerow heroes’ who demonstrate outstanding good practice with a focus on *quality* hedgerows.
- renew emphasis on education and direct advise to better support community groups in towns and villages to undertake pollinator friendly planting and biodiversity sensitive enhancement activities.
- eliminate the use of herbicides, pesticides and insecticides, in particular neonicotinoids, which are detrimental to the well-being of pollinators and honeybees on all council managed land and promote the avoidance of same in as far as possible on privately owned land within the County.
- support training measures to upskill contractors involved in hedge cutting activities such that they become advisors / advocates for the appropriate management of hedgerows on private land.

Appendix I

Agriculture: Sustainable Food Production Systems

The Common Agricultural Policy (CAP) has provided the main agricultural policy framework for EU member states for decades. Initially the policy was focused on increasing agricultural output up to the early 1990s when market price and production led support was gradually replaced by supports not linked with farm output but focused on land management practice and improving environmental indicators. The transition has been extremely slow and some would argue ineffective. Today, the CAP is focused on three aspects; ensuring food security, nutrition and public health; having a positive environmental impact and reversing biodiversity decline; and, mitigating climate change and adapting to its impacts. The overarching objective is to support sustainable food production systems.

The EU Green Deal and the Farm to Fork Strategy has set out ambitious targets for agriculture and food production over the coming decade. These targets concern the reduction in artificial and chemical inputs in production systems with concurrent improvements in farm management practices as follows:-

- 50% reduction in pesticide usage by 2030
- 50% reduction in sales of antibiotics for livestock/aquaculture
- 20% reduction in chemical fertiliser use by 2030
- 25% of total farmland in EU under organic production
- 75% of EU soil to have 'healthy' status by 2030

While the thrust of agricultural development and support policy in Ireland has largely focused on commodity production and increased output, the sector is under-developed from an ecosystem services point of view. The loss of biodiversity in agricultural landscapes has been dramatic over the past few decades with negative trends persisting. The EPA has noted that 85% of EU protected habitats have unfavorable status with 15% of protected species areas in decline. It is further noted that agricultural practices are a key pressure, and habitat changes point towards a deteriorating trending in overall biodiversity. Farm enterprise models have been based on intensive production systems using monoculture crops and forages. Such systems may lessen the potential ecosystem services and, in some enterprise models, have damaged landscape biodiversity. Using innovative land management practices that are more resilient to changing climate patterns are desirable for sustainable and profitable production.

Growing mixed species swards, containing grasses, legumes, and herbs with varying rooting depths have proven very effective at farm level in maintaining productivity while reducing chemical input requirements. Conventional monoculture ryegrass swards, used for intensive dairy and drystock systems, have a high nitrogen demand with the shorter rooting depth making them more vulnerable during very wet and/or dry conditions. Not alone are deeper rooting plants, such as clovers, plantains and chicory, good for livestock nutrition, their deep rooting makes such pasture more resilient to inclement weather and drought. Associated flowers in mixed species increases biodiversity and improves habitat for pollinating insects. One of the major impediments to maintaining biodiversity

and habitat for pollinators is the loss of hedgerows and clover-rich swards due to dairy expansion and the monoculture grass-based model being promoted. The alternative biodiverse system offers farmers similar output and productivity levels with reduced fossil fuel input costs leading to more sustainable profit. In addition, there is better retention of water in the soil profile with off-farm benefits including less water demand, less surface water run-off, and spate flooding.

Intensive cultivation systems, ploughing and power-harrowing, often used to establish crops cause a flux in CO₂ emissions, and result in reduced organic matter levels and inherent fertility in agricultural soils. Natural soil structure is damaged and soil is exposed leading to further degradation from weathering, soil surface capping, and poor rain infiltration. The resultant surface water run off leads to nutrient and sediment loss to watercourses. The sediments may also contain nitrate and phosphates residues which lead to declining water quality. They can also settle on gravel beds in streams and rivers so essential for salmon spawning and associated freshwater pearl mussel life cycles. Importantly, the surface water runoff leads to increased water volumes hitting main river channels over shorter periods resulting in flash flooding—on public roads (with road surface damage), in streams and rivers which burst their banks more frequently leading to flood events in villages and towns further downstream. The cost to the local authorities can be prohibitive and can be addressed at source, with encouragement and support for alternative land management techniques. Conservation agriculture systems use minimal soil disturbance for crop establishment leaving soils covered with organic material, use diverse rotations and crop associations, and include the use of mixed species cover crops over fallow and winter periods. Different species flower in late autumn and early spring and provide extra nectar and habitat for pollinators at times when the agricultural landscape is otherwise bare. Increasing soil organic matter levels benefits the farmer with better water retention and reduced crop impacts from dry periods and droughts. The environmental profile of production improves significantly with up to 70% reduced agri-diesel consumption and associated emissions, reduced chemical inputs including insecticide use, and the use of cover crops allows for nutrient cycling allowing for reduction in chemical fertiliser use over time. Farm management benefits with less costs and time and labour requirements also. Some Tipperary crop producers have successfully used these practices and demonstrated their appropriateness to local soil and climate conditions for more widespread adoption.

The national commercial forestry model, including technical and financial support for afforestation, is largely focused on softwood forest plantations that do not harbour the quantity or quality of species needed to address the national biodiversity crisis. On maturity these plantations are clear-felled potentially leading to other environmental issues (water run-off, invasive species etc.). Recent issues relating to licencing of forestry works has caused many farmers to abandon any plans for tree planting. Agroforestry, on the other hand, is a far more flexible approach and enables the landowner to plant trees and establish or maintain hedgerows within the landscape in a manner that is integrated with existing farm enterprises. There has been great success with partially funded initiatives in agri-environment schemes to date e.g., planting of traditional orchards, native tree copses, and hedgerows in fields, hedgerow improvement and maintenance with coppicing and laying, less frequent and timely cutting etc. Many landowners have participated in CAP supported schemes and piloted shrub and tree planting of riparian zones prone to erosion within river catchment areas where significant surface run-off occurs. These forms of tree planting, although not overtly commercial, is both productive and beneficial. Outputs include flower, fruit and nut production, fibre and fuel, livestock

protection with wind breaks, pollination services, surface water runoff management, and water regulation in a biodiverse landscape.

While agricultural production models are not necessarily within the remit of local authorities the fact remains that what happens on land parcels can potentially have a significant impact off farm. And when environmental issues arise such as degraded soils, declining air and water quality, increasing water issues including flooding, and biodiversity loss it is the local authority that has to address associated problems or issues. Many of the long-term solutions needed are rooted in changing farm management practice while not sacrificing productivity or profitability for the farmer. Many farmers within the county have successfully changed their farm practices and are deriving many benefits with more productive soils, better animal productivity and welfare, and reduced input costs yielding more resilient and sustainable production systems. Excellent work has already been carried out with Council engagement with European Innovation Partnership projects (EIPs) in the county and catchment assessment work with the Local Authorities, Water and Communities Office (LAWPRO) and more proactive engagement work like this is needed.

Geraghty, J (2021) Agriculture: Sustainable Food Production Systems, *Unpublished Paper*

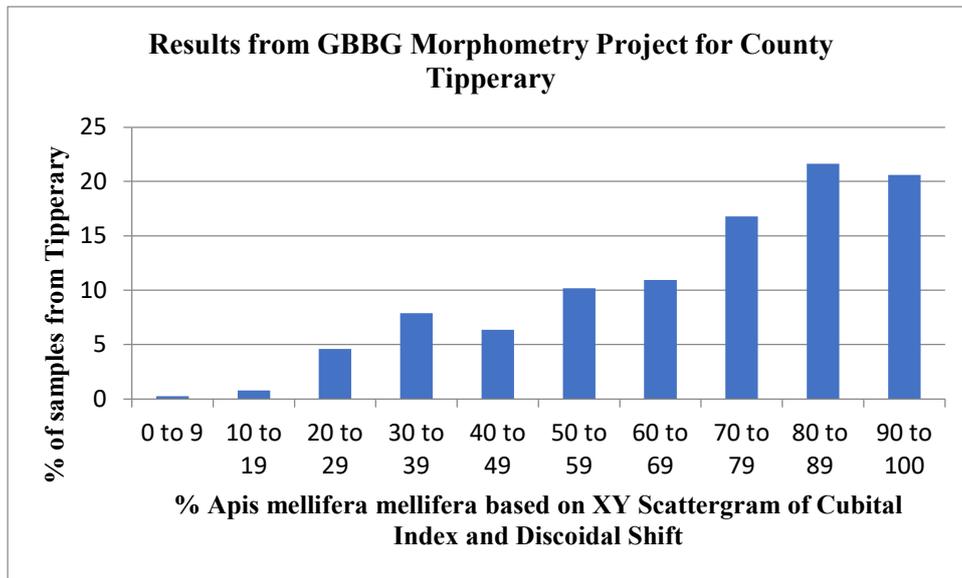
Appendix II

The significance of the Native Black Bee *A. m. mellifera* in the Irish honeybee population

1. An examination of the distribution of native Irish honeybees

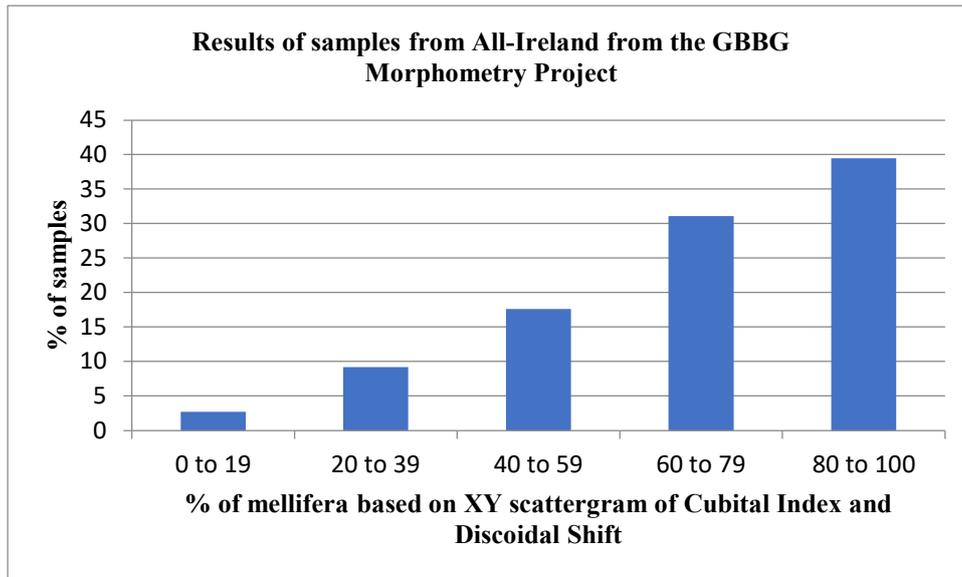
An examination of the distribution of The Native Black Bee in Ireland, by Emma Williams (2013) provides results from examination of a total of 1040 honeybee samples, each of 35 bees, taken from individual hives from 30 counties. The study puts into context just how important the Native Irish Honey Bee is across the island of Ireland. The result shows the extent to which the samples contained *A. m. mellifera* for each county, province, and overall on the island of Ireland.

- 46% of samples having 75% *A. m. mellifera*
- overall, 80% of samples showed greater than 50% *A. m. mellifera*



A total of 393 samples were analysed from County Tipperary as part of the GBBG All-Ireland Morphometry project. The graph above shows that:

- In excess of forty percent of samples from County Tipperary had a result greater than 80 percent *A. m. mellifera*;
- In excess of eighty percent of samples from County Tipperary had a result greater than fifty percent *A. m. mellifera* ; and
- Less than 6 percent of samples from County Tipperary had a result less than thirty percent *A. m. mellifera* .



The graph above illustrates the results of the samples (n = 1047) obtained and analysed as part of the GBBG Morphometry project. It shows that:

- In excess of seventy percent of samples obtained a result greater than sixty percent *Apis mellifera mellifera*;
- Less than twelve percent of samples had a result less than forty percent *Apis mellifera mellifera*; and
- Almost forty percent of samples had a result greater than eighty percent *Apis mellifera mellifera*.

2. A significant pure population of the dark European honeybee (*Apis mellifera mellifera*) remains in Ireland

A recent study undertaken by Hassett *et al* (2018) and published in the *Journal of Apiculture* demonstrated the significant and widespread presence of a pure population of *A. m. mellifera* in Ireland. Molecular data was generated from 412 bees sampled from 24 counties across the island. Mitochondrial data identified 34 different haplotypes, with 63% of bees having sequences identical to three European haplotypes but all other haplotypes being novel. Population structure analysis using microsatellite markers indicates that the Irish population is genetically diverse and that 97.8% of sampled bees were determined to be pure *A. m. mellifera*. Results from cluster analysis using a Bayesian model approach, and the presence of novel alleles, shows evidence of distinctiveness within the Irish population.

The Study concluded:

*“The presence of such a widespread and pure population of *A. m. mellifera* in Ireland is now an incredibly important resource for the protection of this subspecies in Europe. Given the devastating impacts of varroa from introduced bees on this population, particularly on wild bees, efforts should be increased to prevent any impact on this subspecies from introductions of pests and diseases due to the continued imports of non-Irish bees.”*

References

- Environmental Protection Agency (2020) Ireland's Environment: An Integrated Assessment, EPA <https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/Ireland's-Environment-An-Integrated-Assessment-2020-Key-Messages-Booklet.pdf>
- FIBKA (2019) *The Beekeepers Census* <https://assets.gov.ie/130944/94accd3e-aa87-4de6-9ce0-ddce1013c5c6.pdf>
- Fitzpatrick, U. *et al* (2015) All Ireland Pollinator Plan, 2015-2020 *National Biodiversity Data Centre*
- Fitzpatrick, U. *et al* (2021) All Ireland Pollinator Plan, 2021-2025 *National Biodiversity Data Centre*
- Geraghty, J (2021) Agriculture: Sustainable Food Production Systems, *Unpublished Paper*
- Hassett, J., Browne, Keith A., McCormack, Grace P., and Moore, Elizabeth., Native Irish Honey Bee Society, Gabrielle Soland & Michael Geary (2018) A significant pure population of the dark European honey bee (*Apis mellifera mellifera*) remains in Ireland, *Journal of Apicultural Research*, 57:3, 337-350 <https://doi.org/10.1080/00218839.2018.1433949>
- Keena, C. (2020) The Nature of Irish Hedgerows, *Teagasc* www.teagasc.ie/media/website/publications/2020/The-Nature-of-Irish-Hedgerows.pdf
- Williams, E. (2013) An examination of the distribution of native Irish honeybees (*Apis mellifera mellifera*). *The Four Seasons*, 51, 8–13.