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## SUBMISSION TO THE NATIONAL TRANSPORT AUTHORITY

Consultation on the Draft Transport Strategy for the Greater Dublin Area 2022 – 2042

10th January 2022

Dear Madam or Sir,

I would like to add my voice to those concerned and with all due respect asking for re-assessment of the NTA's consideration of a possible route for the Navan Rail Line that would affect Dunsany Nature Reserve; and politely request the NTA withdraw its support for this route option and instead furthers the assessment of other options.

Naturally, for a long list of reasons - a selected few being climate change and its mitigation, biodiversity loss, life quality, mobility, accessibility, and air and particulate matter pollution - the Navan Rail Line is highly welcomed as part of the NTA Draft Transport Strategy 2022-2042.

An alternative, however, is crucially needed for the proposal of any route option cutting through the preserved wildlife habitat of Dunsany Nature Reserve, which would be impacting this invaluable treasure trove of biodiversity, namely flora, fauna and fungi, and its locally and nationally unrivaled capacity for carbon drawdown, storage and sequestration. Thusly, this option would have a very detrimental effect on one of the key goals the NTA has set out itself for the Draft Transport Strategy: Tackling climate change.

As I am neither personally affected by the project nor a professional or scientist in any of the areas this is relevant to, I will not examine the question whether servicing population centers like Ratoath, Ashbourne, Trim and Kells should not be reason enough to make a route further West a much more viable option, which has been suggested by many.

What concerns me personally, and what my studies have focused on, is the climate emergency with climate breakdown or even collapse looming; the environmental and biodiversity emergency we see culminating right in front of our eyes in what scientists call the Sixth Mass Extinction; the protection and conservation of wildlife as well as the preservation and nurturing of Ireland's Natural Heritage; and, finally, the role Ireland and specifically the Irish Government are playing in the greater picture of international and cumulative efforts to prevent the worst from happening.

In August 2021 the Intergovernmental Panel on Climate Change (IPCC) released its Sixth Assessment Report, and the conclusion is unequivocal: We no longer have the luxury of trying to simply halt destruction, we must actively restore natural habitats. In the report, the IPCC estimates that 20% of global greenhouse gas emissions are resulting from the degradation of landscapes, and thus protection of existing natural areas is of paramount importance.

The Irish Government has not only declared a biodiversity crisis, but it has also just recently signed the Kunming Declaration, requiring the protection of natural habitats to be a central part of her government policies. The Declaration calls for "urgent and integrated action", and Malcolm Noonan has welcomed it with what significant enthusiasm: "The time has come for a global shift in the way we see, value and treat nature. The Kunming Declaration sets out the political direction."

This breakthrough has to result in highest efforts being put into actively seeking solutions to restore biodiversity, ways of providing and preserving ecosystems and wildlife habitats, and removing carbon from the atmosphere; as well as ensuring that projects like Dunsany Nature Reserve, with its core goal of protecting and nurturing biodiversity, by default be protected and supported by financial and legal means in their efforts of ecosystem restoration, and more specifically, rewilding.

Dunsany Wood, the native woodland in that would most severely be affected by a the train line, is an old-growth forest, most likely meeting the criteria of an 'ancient woodland', and very definitely those for a long-established woodland, as outlined in "A provisional inventory of ancient and long-established woodland in Ireland" on behalf of the Department of the Environment, Heritage and Local Government in 2010, and as such, should be awarded protected status.

A quick overview of the benefits Dunsany Nature Reserve is providing not only to the local flora and fauna, but also to Ireland, the Irish and humanity as a total, would include carbon drawdown as well as its storage and sequestration, restoring biodiversity, and offering flora and fauna threatened with decline and even extinction a safe haven, and favourable conditions to rebound.

The benefits and positive effects of rewilding in general are almost endless; I will name just a few for a small introduction: Rewilding can draw down carbon from the atmosphere, protect against flooding, clean our air and water, reverse biodiversity loss, and protect and restore thousands of different species, which should be of paramount importance given that of the 3,000 plant and animal species in Ireland, approximately one quarter are facing extinction, and a quarter of birds a serious conservation concern. Of the 1,200 plants we have in Ireland, 100 are threatened with extinction and 20 are critically endangered, and only five of 59 habitat types are in a favourable condition. It can also help wildlife adapt to climate change, which has the potential to save a significant number of species from climate-driven decline or extinction.

As is widely known, Ireland is the second-least forested country in Europe, and the extinction crisis has affected us more than most other countries. Where the British government has just this last week announced a new scheme to support and encourage farmers and landowners to rewild a considerable amount of land by providing financial incentives, the Irish State does not even acknowledge the importance of rewilding - or passive ecosystem restoration - let alone grant incentives to increase the desperately needed acreage under rewilding schemes.

In the words of George Eustice, the British secretary of state for environment, food and rural affairs: "Through our new schemes, we are going to work with farmers and land managers to halt the decline in species, reduce our greenhouse gas emissions, increase woodland, improve water and air quality and create more space for nature."

Dunsany Nature Reserve is Ireland's prime example and her only internationally recognised rewilding project, and, unlike the initially very promising state-owned Wild Nephin scheme, has already garnered significant successes, which are being monitored by scientific and nongovernmental bodies like the University College Dublin, Birdwatch Ireland, and the Irish Wildlife Trust.

(Instead of debating a train line that would cut through Dunsany Nature Reserve and the ecologically invaluable Dunsany Wood, the exact opposite should be considered by the Irish government: To put Dunsany Estate into a financial situation where the whole of its land can be rewilded and added to the nature reserve.)

To approach the detrimental effects the construction a train line would have on the reserve and its inhabitants, I will begin by quoting the recent "Navan Rail Line Assessment Report", and comment on that, adding scientific findings where appropriate (for improved readability, I will condense the citation of sources):

*"The terrestrial ecological assessment undertaken for the 2011 EIS identified a number of potential impacts from the scheme on sensitive ecological receptors, including the loss of habitats for a number of sensitive ecological receptors such as bats, badgers, otter and birds."*

Of the outlined species, all four are present at Dunsany Nature Reserve, with several species of endangered birds and bats residing and nesting in Dunsany Wood, the exact area that would be affected most by the new train line.

*"Since the 2011 EIS, the Dunsany Estate has stopped agricultural practices to allow more natural land use, and joined the Rewilding Europe network, which may require further study on further impacts from the scheme to new potential wildlife in the area."*

New and returned wildlife has been registered regularly in Dunsany Nature Reserve, with an exponential increase in sightings with every subsequent year of rewilding; including more than a dozen Great Spotted Woodpeckers, which had been absent from Co. Meath for over a century; otters, critically endangered pine martens, barn owls, snipes, warblers, sparrow hawks, endangered Red Kites and corncrakes, different types of bats, and a Peregrine Falcon.

Red Kites specifically nest in old high trees, and return to the same nesting area every year from migration. More generally, it has long been scientifically established that nesting birds avoid habitat adjacent to railway tracks (Brotons & Herrando 2001; Foppen & Reijnen 1994; Ingelfinger & Anderson 2004; Reijnen & Foppen 1994; Reijnen & Foppen 1995; Reijnen *et al.* 1997). It is easy to see how a train line would detrimentally effect the recent success of re-establishing Red Kites, other birds of prey, and many other rare and endangered species in the reserve and its surrounding areas.

Given that "a new EIAR, AA screening and a NIS prepared in accordance with current legislation, policy and AECOM standards" would definitely and urgently be needed if the NTA still considers the Navan Rail Line cutting through Dunsany Nature Reserve a possible route at this stage, I am hopeful that all these aspects, as well as the following, will be considered.

Below, I will list some of the scientifically established devastating impacts the construction and operation of train lines have on affected and adjacent nature and wildlife. The list is not meant to be inclusive, but created to give examples of the possible negative effects a train line cutting through, or tangent to, Dunsany Wood and the nature reserve would undoubtedly have on the local flora and fauna.

The negative effects of construction and operation of infrastructure like the proposed train line can be classified in three categories: Disturbance, fragmentation, and cumulative effects.

However, in the scientific literature, the findings are not always categorised according to this model, but instead, findings do overlap; and thusly, will most often fall into the third category of cumulative effects. Subsequently, I will list most as cumulative effects, to avoid confusion.

To begin with, I will again quote the “Navan Rail Line Assessment Report”, and respond with scientific findings in the following:

*“A potential negative impact on existing soils and groundwater was identified, resulting from excavations and the construction of embankments. However, with the development of the proposed rail alignment along the historical alignment, the relatively small take of agricultural land required and the application of mitigation measures would mitigate these impacts.”*

While mitigation measures can lessen some effects of the construction and operation of a train line, including wildlife casualties, and the above statement might be true for agricultural or already sealed lands; in the case of natural landscapes, the area over which significant ecological effects extend outwards from a train line is typically many times wider than the tracks and associated tracksides, and often extends into adjacent woodland areas. (Forman & Alexander 1998; Hawbaker *et al*, 2006).

In addition, the actual width of construction corridor and eventual tracks is much greater than generally assumed. It is not the case that the old road bed and embankments can be re-used; apart from the corridor that has previously been cleared, it is as a construction from scratch. Negative disturbance effects on affected and adjacent natural areas are unavoidable, and can not, or only to a small extent, be mitigated.

*“There will be negative impacts from increases in noise and vibration (related to the construction and operation of the rail service).”*

These negative impacts have been intensively studied, with unanimous results: “There is strong evidence that noise, light, and vibrations that can reach from 85.5 to 97 dB(A), can affect insects, amphibians and birds.” (Lucas, de Carvalho & Grilo, 2017)

A conclusive meta study on the impacts of nearby infrastructure development like train lines and roads on the ecology of ancient woodland came to the result, that “Development in the vicinity of ancient woods may cause direct disturbance effects as a result of: modified local hydrological regimes; vibration; noise and light pollution; vehicular collisions with wildlife; external activity visible from within the wood; an increase in wind-blown litter accumulation; and tree surgery or felling along the woodland edge for safety reasons or subsidence prevention.”

The analysis continues: “Disturbance may result in more frequent biologically-costly flushing events and increased mortality of animal species. Noise and light pollution interfere with interactions between species, affecting foraging and predation, reducing breeding success and thereby affecting ongoing population viability. Disturbance may, therefore, lead to species being eliminated from woods.

And further: “Engineering works or vegetation clearance near to ancient woodland may affect woodland hydrology, increasing the likelihood of water-logging or drought and leading to loss of trees and changes in species composition. Soil compaction adjacent to woodland increases water run-off and soil erosion. It can cause severe damage to tree roots, leading to tree defoliation, crown dieback, and death.

“Studies consistently record that forest specialist bird species are more affected than generalists. It is conceivable that disturbance also deters deer from frequenting roadside woods to some degree, which may have a beneficial impact where browsing would otherwise be detrimental.

“Transport corridors remove habitat, alter adjacent areas, and interrupt and redirect species movement. They subdivide wildlife populations, foster spread of invasive species, change hydrology and water courses and increase human use of adjacent areas (Hawbaker et al. 2006). Although the cumulative effect of these factors is not particularly well-documented, it is unquestionable that transport developments have a potentially profound effect on nearby ancient woods.” (Corney, Smithers, Kirby, Peterken, Le Duc & Marrs, 2008)

Another potential problem that has been touched upon before, is that of artificial light, during construction as well as in operation where the rail tracks will have to be illuminated at night.

“Artificial illumination reduces the visibility of the moon and the stars (Elvidge *et al.* 2001), affects species orientation differentially and may serve to attract or repulse particular species. This affects foraging, reproduction, communication, and other behaviour. It consequently disrupts natural interactions between species (Longcore & Rich 2004). Light pollution near to ancient woodland is, therefore, likely to substantially affect the behaviour of species active during dawn and dusk twilight or nocturnal species, such as moths, bats, and certain species of birds, resulting in the decline of some species (Arlettaz *et al.* 1999; Conrad *et al.* 2005; Longcore & Rich, 2004). (Corney, Smithers, Kirby, Peterken, Le Duc & Marrs, 2008)

The largest number of research shows, however, what has been classified as cumulative effects: “Disturbance from noise, vibration, visual queues, pollution, and predators can cumulatively lead to species avoiding habitats.” (Corney, Smithers, Kirby, Peterken, Le Duc & Marrs, 2008)

A few examples from the scientific literature on this effect, beginning with the devastating decline in affected animal populations noted in studies across the globe:

“Changes in wildlife populations in the proximity of infrastructure have been reported for decades in a number of studies, and have been pointed out in relevant authors’ reviews (Spellerberg, 1998; Trombulak and Frissell, 2000; Forman et al., 2003). Additionally, there have been previous attempts to quantify wildlife population decline in relation to distance from infrastructure.” (Benítez-López, Alkemade & Verweij, 2010)

Various authors have found “pernicious effects of [...] noise on bird populations” (Reijnen and Foppen, 1994; Reijnen et al., 1995, 1996, 1997; Forman et al., 2002; Rheindt, 2003). Benítez-López, Alkemade and Verweij have, in 2010, specifically focused on “the pernicious effects of infrastructure development on animal populations. Reported effects for most bird populations extend over distances up to about 1 km, and for most mammal populations up to about 5 km.

“The available evidence from the meta-analyses and the meta-regression suggests that mammal and bird populations are displaced from infrastructure, and that displacement distance depends on the habitat type and on the species population.” (Benítez-López, Alkemade & Verweij, 2010)

“[T]he use of infrastructure by cars or trains increases the risk of collisions with wildlife and the stress on (breeding) individuals (due to noise and visual stimuli), both of these risks affecting animal populations.” (Van der Zande et al., 1980; Reijnen et al., 1996; Romin and Bissonette, 1996; Boarman and Sasaki, 2005; Parris and Schneider, 2009)

As we see, animal populations, crucial not only to the preservation and increase of diversity in gene pools, drastically decline in the proximity of new train developments.

“Besides roads, other types of infrastructure, such as railways, powerlines, pipelines, hydroelectric developments, oil wells, seismic lines and wind parks, have an impact on wildlife populations.” (Dunthorn and Errington, 1964; McLellan and Shackleton, 1989; Cameron et al., 1992; Van Dyke and Klein, 1996; Mahoney and Schaefer, 2002; Nellemann et al., 2003a; Barrios and Rodriguez, 2004). All these impacts may influence the long-term viability of populations and, eventually, biodiversity. (Benítez-López, Alkemade & Verweij, 2010)

In 2003, Bhattacharya et al found that roads and railroads are also barriers to bumblebee movement in a temperate suburban conservation area; it should be legitimate to extrapolate that this applies to other insects and conservation areas as well. (Bhattacharya, Primack & Gerwein, 2003)

Another main finding of the work of Benítez-López, Alkemade and Verweij was the importance of preserving what they call “sensitive areas” and “relatively undisturbed areas”, culminating in a clear recommendation to planners:

“Our study shows the importance of minimizing infrastructure development for wildlife conservation in relatively undisturbed areas.” (Benítez-López, Alkemade & Verweij, 2010)

With this in mind, it is easy to see that not only Dunsany Wood should be considered and regarded as a sensitive area, but also an area sensitive to infrastructure development, which should, subsequently, be avoided at all cost.

Train lines isolate wildlife, and despite the, thankfully, though only recently, emerging deeper understanding of the importance of ecological connectivity, we are carving up and separating habitats at unprecedented speed - which brings us to the next negative effect, fragmentation:

“Fragmentation means the isolation of natural habitats by creating or increasing barriers to movement (Belisle & Clair 2002). It may be associated with the destruction of semi-natural habitats and movement corridors between ancient woodland fragments, and ancient woods and nearby semi-natural habitats.” (Corney, Smithers, Kirby, Peterken, Le Duc, & Marrs 2008)

So-called barrier effects due to behavioral responses to disturbances or the effects of habitat loss and fragmentation due to railway implementation have been confirmed by a number of researchers. (Barrientos & Borda-de-Água, 2017)

In the case at hand, wildlife would be rendered incapable of crossing over from the reserve and Dunsany Wood to Horseshoe Wood and other wooded areas to the South and South West of Dunsany Wood, or to the open fields in the same area, which would not only restrict natural roaming, grazing and other species-specific behaviour with potentially negative effects on the rewilding process, but also result in a significant reduction of the gene pool, and eventually in a decline in health and immunity of the local herds, which would be a significant conservation problem, given, in the case of deer, for example, that the Dunsany deer are one of only a few remaining herds of native red deer.

To quote the journalist and environmentalist George Monbiot on the topic: “We now know that, even in large reserves, wildlife species can decline towards extinction if they cannot disperse and mix with populations from elsewhere. Their genetic diversity narrows, reducing their breeding success and making them more susceptible to disease. Barriers prevent them from moving as conditions change. Conditions are now changing very quickly, as a result of climate breakdown. A trapped population, in many cases, is a doomed one.”

A final point, sadly as of yet mostly disregarded in environmental impact assessments and the ecological discourse in general, are fungi, especially in the form of mycorrhizal networks, and their ability to absorb and store carbon dioxide. Fungal networks constitute up to 50% of the living biomass of soils, and are essential for soil biodiversity, their structure and fertility, and, most importantly, the global carbon cycle. Ecosystems with thriving mycorrhizal networks have been shown to store eight times as much carbon as ecosystems without such networks.

Mycorrhizal networks connect to plant roots and act as nutrient 'highways', exchanging carbon from plant roots for nutrients. Underground fungal networks can extend for many miles.

A poignant description of mycorrhizal networks was given by Mark Tercek, former CEO of the Nature Conservancy: "Fungal networks underpin life on Earth. If trees are the 'lungs' of the planet, fungal networks are the 'circulatory systems'."

Jeremy Grantham, billionaire funder of various climate research projects, including one studying the role of mycorrhizal networks, explains: "Just below our feet lies an invaluable ally in mitigating climate change: vast hidden fungal networks. Billions of tonnes of carbon dioxide flow annually from plants to fungal networks."

While some of the ancient local mycorrhizal networks will have been damaged during the construction and operation of the old single-track train line, they will at least in part have been restored in the time last few decades; and new, and much more extensive - in width, gravity of impact, and depth - construction works would cause a lot more damage to the fungal networks than the historic train line did, and greatly reduce local fungal diversity. If often omitted, and not yet fully understood, these networks form a serious conservation concern:

"Fungi underpin the functioning of ecosystems across the world, and their contribution to woodland health is increasingly appreciated. However, conservation mycology has largely been held back because of lack of understanding of fungal diversity." (David Satori, founder of Rewilding Mycology)

And lastly, to add a somewhat different touch to the debate, the natural beauty and tranquility of the native and old-grown Dunsany Wood have provided inspiration even to the arts. Last year, an oil painting, named and depicting Dunsany Wood, has been created and was quickly sold by artist Jacinta Eiffe. Does this not show there is value here, that should not be easily discarded, even from a cultural perspective?

To leave the last word to the passionate environmentalist and woodland conservationist who created Dunsany Nature Reserve, Randal Plunkett, the 21st Baron of Dunsany:

"We are coming to a global crossroads, either we as a species change, or we perish."

There is nothing to add to that.

With kind regards,



Nía Timm  
Heartstone Veganic Sanctuary