

September, 2023.

**To the chairperson and members of
the North Central Area Committee**

Report on Storm Betty – Parks Service Response

1. Yellow Warning

Met Éireann issued Status Yellow and Orange alerts for heavy rain and strong winds, extending along coastal regions from Cork to Wicklow for Friday, August 18th 2023

In anticipation of this storm event and the likely impact on trees the Parks Service issued the following warning to the public on Parks social media channels:

"In light of Met Éireann's 'yellow' weather warning, the public is urged to exercise caution and avoid entering areas with large trees during high winds. Vigilance is also urged for roads and paths given the risk of falling trees/branches."

In preparation for the required emergency response after the storm each depot assembled the necessary resources and put available staff on notice to attend once the storm had abated.

2. Immediate Aftermath

The storm made landfall in Dublin at 1am and once it was safe to do so the Parks Service organised all available resources to clear fallen trees and debris from roadways, streets, parks, and open spaces. In response to the significant number of tree failures. Qualified tree surgeon contractors were also to assist in this cleaning-up operation. This operation was assisted by the Road Maintenance Service Division, Dublin Fire Brigade and An Garda Síochána.

At the time of writing the clean-up operation remains ongoing, with probably over 200 tree-related incident sites made secure by Parks. When available, this figure will have to be added to the number of trees the Roads Maintenance Division attended. Although these incidents constitute a fraction of Dublin City Council's tree population, each represents a potential hazard, underlining the imperative to investigate and comprehend the reasons behind this level of tree and branch failures.

3. Contributory Factors

A number of factors are considered to have contributed to the level of tree damage experienced:

Timing and rain: the storm hit in summer when the tree were in full leaf. Such full canopy acts as a sail dramatically increasing the wind loading on the trees as compared to if the same storm struck during the winter months. It is also considered possible that the level of rain that

felled that night also increased the loading on the tree structure exacerbating the effects of the strong winds. In parks and open spaces the heavy rain saturating the soil reducing the efficiency of the tree rooting architecture and leading to increased failures.

Wind direction and strength: This is possibly the most important factor in this wind event. Trees are described as self-optimising structures that prioritize allocations of resources where it is needed most. In Ireland as prevailing wind directions are from the south, south-west and west trees grow to be braced against these wind directions. As Storm Betty's winds were primarily from the east this resulted in far more damage than would be experienced from similar winds from the prevailing direction. In a certain locations a number of trees failed in close proximity to one another and it is possible that local wind tunnel effects could have increased the wind loading locally.

Tree planting locations: Trees growing in tight spaces and/or in compacted soils are considered more likely to wind throw. Shallow roots plates do not provide strong anchoring unless the tree manage to create a well-developed and extensive root system. A significant number of trees that failed were growing in smaller concrete tree pits. Further investigation is required to ascertain the contribution of the restricted rooting environment to specific failures during the storm.

Damage to roots system: Further investigation is also required to ascertain if road or pavement works or new services in the vicinity of failed trees might have damaged or severed roots and contributed to tree failures.

Tree Conditions: Often when trees or major limbs fail due to such storm events underlying defects, cavities or decays are brought to light which would not have been observable during a routine visual tree inspection. While this was the case in a small number of failures in other areas across the city it does not appear to have been a major contributory factor.

4. Next Steps

- The Parks Service is continuing to gather and collate all of the information with regard to tree damage experienced due to Storm Betty.
- Clean-up operation is ongoing and it will take another few weeks to have collected and shredded all arisings from the emergency response.
- Formal recorded and independent inspections have been commissioned for a number of key locations where levels of tree failures were unexpectedly high.
- Debriefs with regard to the emergency response will be held at various levels throughout the parks depot structures.

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