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By: Tim Shaw (DOC) and Craig Trotter (MPI)

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Amended 8/04/15 (scale and number of authorities)

Subject: **West Coast Wind-blown Timber Act**
Environmental Principles, Guidelines and Management Approach

1) Purpose

The West Coast Wind-blown Timber (Conservation Lands) Act 2014 (“the Act”) allows for the removal of timber from trees that were irreversibly damaged by Cyclone Ita from some public conservation lands on the West Coast within the following environmental constraints:

- Adverse effects on the environment are kept to a minimum.
- The activities do not unreasonably affect conservation in the conservation area or reserve within which the specified site or sites are located.
- The activities do not cause significant soil disturbance.
- The effects of activities within the specified site or sites on the environment outside of the specified site or sites are not contrary to the purpose of the Resource Management Act 1991.

The purpose of this document is to outline the Principles and Guidelines that have informed the Management Approach that will be applied by the Department of Conservation (DOC) to achieve the environmental protection required by the Act.

This Management Approach will need to be able to adapt and change as more is learnt through the implementation of the Act. Accordingly this document should be considered as a working draft.

The Standards and Procedures required to ensure the effective implementation of the Management Approach will be defined in the Authority issued to operators and a field booklet.

2) Information to Inform the Principles, Guidelines and Management Approach

The information to inform the approach outlined in this document is based on Principles and Guidelines developed from the following:

- An ecological workshop held in Christchurch on 26 June to specifically address the question of how to apply the Act within environmental constraints. Forest ecologists

and managers from Landcare Research, Lincoln University, Ministry for Primary Industries (MPI) and the Department were present (minutes available).

- Published material on deadwood in NZ forest ecosystems, in particular;
 - Richardson, S. Clinton, P. & Allen, R. 2005. Deadwood removal from indigenous forests. Landcare Research contract report: LC 0405/161
 - Richardson, S. et. al. 2009. Deadwood in New Zealand's indigenous forests. *Forest Ecology and management* 258, 2456–2466.
- Published work on recovery in cyclone-affected tropical forest ecosystems.
- Advice on nutrient cycling in NZ indigenous forests from Scion (P. Clinton, pers. comm.).
- Internationally published work on nutrient transfer and forest recovery in cyclone-affected tropical forest ecosystems¹ (e.g., work by Zimmerman in Puerto Rico)
- Ongoing discussion and specialist advice within and between MPI and DOC.
- Considerations of practicality, health and safety, and timber salvage/extraction work practices.

3) Key Management Objective

The Department will manage the extraction of windblown timbers from Public Conservation Land (PCL) in the West Coast region within the Acts environmental constraints so that:

- The forest ecosystems that re-establish after Cyclone Ita are not significantly different in areas with and without timber removal.
- The survival of all parts of the forest ecosystem is expected after timber removal.

Whilst:

- Enabling the opportunity for timber salvage
- Funding research to improve ecological knowledge regarding timber removal from indigenous forests.
- Providing revenue for conservation.

4) Basic Principles and Guidelines

Principles: disturbance is a natural and essential process in the ecology of indigenous NZ forests. The Cyclone Ita event is part of this natural process and the damaged forest it has produced must be managed sensitively.

- *Guideline: when considering extraction of timber from Cyclone Ita wind-blown forest, the key ecological aspects to be considered are the niche habitats specific to disturbed forest sites, nutrient cycling (particularly of the slowly renewable element phosphorous) and natural vegetation regeneration.*

Principles: there is limited understanding of the diversity, distribution and function of deadwood fungal and invertebrate communities and quantitative knowledge of the rate of regeneration of the critical nutrient phosphorous. The shape and magnitude of population response functions to the progressive removal of deadwood (i.e. population sensitivity) is

¹ Landcare Research forest ecologists have confirmed that studies on tropical rain forest can be expected to be relevant to NZ's temperate rainforest.

similarly little understood. Also, PCL forests are managed first and foremost for conservation purposes. However, the scale of Cyclone Ita is such that removal of a small proportion of wind-blown timber – as required by the Act – is not expected to unreasonably affect conservation values.

- Guideline: a conservative approach is required to setting both the proportion of wind-blown habitat that is targeted for salvage and the proportion of wood salvaged from the specified salvage areas.

Principles: large areas of wind-blown habitat will behave differently in ecological terms than small areas, as will single isolated areas versus multiple adjacent areas, and severely- versus lightly-damaged areas. Conservation of diversity of damage area and type, deadwood structure (i.e. damage intensity), forest ecosystem species composition, forest type, climate and soils is therefore important. The importance of tree-species specificity for fungal and invertebrate communities is unknown, but it is expected that it matters. Deadwood obligate organisms need to maintain their ability to colonise new habitat and in this sense each wind-blown damaged area represents an island (of varying size) in the landscape.

- Guideline: significant areas of Cyclone Ita wind-blown habitat must be left in their as-disturbed state: 'Reserve sites'.
- Guideline: sites targeted for salvage ('Salvage sites') must be managed to preserve diversity of wind-blown timber species and structure, i.e. even in these areas tree species with a good size range of stem diameters (including large-diameter stems that are still intact) must be retained in-situ.
- Guideline: basic reserve design principles should be applied to determining the range of reserve and salvage sites in any given area. The preservation of total wind-blown ecosystem diversity is more likely if larger rather than smaller areas of damaged forest are left without wind-blown timber salvage.
- Guideline: the proportion of salvage appropriate for common species in given deadwood habitat will be different to uncommon species. Often it will not be appropriate to allow the salvage of uncommon species; e.g. if there are only a few widely separated Matai logs identified in a given salvage area, they should not be salvaged.
- Guideline: as well as preserving habitat quantity and diversity, salvage volumes should also be determined on their proportion of total biomass.
- Guideline: only one authority will be granted for any one individual Specified Site.
- Guideline: only forest areas with atypical scale wind-thrown damage will be considered for salvage.

Principles: to achieve the intent of the Act and the key management objective, a 'light ecological footprint' is required. Both the biotic and abiotic qualities of wind-blown habitat must be preserved.

- Guideline: soil compaction and changes in hydrology must be avoided.

- Guideline: ‘pit and mound’ topography of wind-blown root-plate disturbance should be preserved whenever possible.
- Guideline: waterways and saturated ground must be avoided during salvage.
- Guideline: operations should minimise vegetation clearance (live and damaged) to gain access to logs.
- Guideline: effective weed spread management practices must be observed.

5) Management Approach – Salvage Location and Proportion

Management Units

- Timber salvage will occur in spatially discrete Management Units that encompass damaged areas that are expected to be ecologically similar.
- Management Units will be determined by one or more of locality (e.g. Kaniere Scenic Reserve), forest type (e.g. Terrace rimu forest, Lake Kaniere) and species composition/distribution within a forest type².
- The scale of Management Units will be ‘local’ (rather than district or regional) and be in the tens to low hundreds of hectares. In this way there will be many Management Units within an Ecological District.
- Management Units will only be established as the need arises; i.e. only in wind-blown forest where an expression of interest in timber salvage has been expressed.

Wind-blown habitat reserves

- In any given Management Unit a minimum of 50% of wind-blown habitat area will not be available for timber salvage.
- Wind-blown habitat reserves will seek to maintain the diversity of size and intensity of damage in the disturbed habitat throughout the Management Unit.

Wind-blown timber Salvage Sites

- In those wind-blown areas within a Management Unit identified for timber salvage, up to 50% of the wood volume present in large stems may be salvaged for common species (leaving 50% ‘retention volume’ of stems of an equivalent size).
- The proportion of uncommon species available for salvage from any Salvage Site will be considered on a case by case basis; however, a salvage of a proportion much less than 50% may be permitted in exceptional circumstances where small patches of uncommon species occur.

² It is not considered necessary to take soils, altitude and rainfall explicitly into account, as locality, forest type and species composition will co-vary with these parameters – and so implicitly be included,

- No more than 10% of total biomass (expressed as an average per ha figure for the given forest type) may be extracted from any Salvage Site, to conserve especially stocks of the slowly renewable element phosphorus³.

6) Management Approach - Salvage Methodology

Timber extraction

- Heavy machinery will only be permitted on Public Conservation land (PCL) within the footprint of existing road surfaces.
- Where logs can be extracted by machinery without the need for that machinery leaving existing road surfaces by using winches, pulleys etc (including aerial skylines and power operated winches), this will be considered on a site-specific basis and may be approved. Soil disturbance and additional damage to vegetation will be the main determinants. Mitigation options will be considered.
- In all other instances helicopter lifting of timber will be permitted.

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³ Evidence is that nitrogen stocks are expected to be largely or completely renewable at salvage sites. Phosphorous renewal requires release by sub-soil weathering, which takes significant time – though may be more rapid than expected at highly disturbed sites (i.e. where there is greater salvage) due to enhanced exposure of sub-soil in the root pits of over-turned trees.

Roading and loading sites

- No new road or loading site construction will be authorised within PCL.
- Where appropriate and with discretion, old roads and loading sites may be re-opened. This may involve the clearance of wind fallen debris and minor works such as temporarily reinstating culverts or a workable road surface. Only limited clearance of live vegetation will be permitted from previously disused and retired roads – advanced regeneration may not be disturbed. Mitigation of any disturbance may be required.
- Operators will be encouraged to use neighbouring developed/non-PCL land for loading and post salvage processing. No clearance of PCL will be permitted for this function.

Timber preparation

- Logs may be prepared in forest to weights/sizes appropriate for the recovery method.
- This can involve chainsaws and portable mills, hand tools/winches and small motorised machines that can be man-handled. It cannot involve small wheeled or tracked machines such as mini-diggers.
- Fuel must only be transported in standard approved containers with no more than 60lts of oil and petrol present on site.

Management of worksite in and around a salvage log

- Only the minimum of live vegetation may be cleared to allow for safe and effective timber extraction. Dead and irreversibly damaged vegetation that is not being salvaged must be retained in as close to its natural form as possible.
- Logs should be prepared such that the majority of root plates remain standing and root boles remain intact.
- Standing dead trees and in-stream logs will not be available for salvage.
- On completion of work, sawdust and log waste must be distributed around the site to reduce visual impact and encourage natural breakdown. That is, no sawdust piles, or off-cut heaps shall remain. When logs are removed from the top layers of a stack on wind-blown trees, off-cuts must remain on the stack.
- If logs are not to be blown out whole or in large pieces, steps to avoid or mitigate soil compaction due to repeated foot traffic in working areas must be taken. Steps such as laying down the first-cut (half round) or cleared damaged vegetation, to provide a working surface will be required. Removing timber used for a working surface, and restoring it to approximately its original location, will be required when salvage is completed at a site. Mitigation of any compaction from creation of the working surface will be required.
- Natural drainage may not be interfered with. Access to wet sites will likely be restricted, and saturated sites must be avoided.
- In any situation where this management approach cannot be applied, then that log should remain as part of the retention volume for that Salvage Site.