DOUGLAS SHIRE

Coconut Management Plan



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Part 1

Summary

This Coconut Management Plan was developed by the Douglas Shire Council (DSC) to define and document the goals and objectives of the Douglas Shire Council in managing coconuts effectively on council controlled lands. The plan aims to identify the role that coconut palms play in any specific location through assessment and classification based on their location and contribution to a given area. The Coconut Management Plan provides council with a comprehensive understanding of what is required to preserve and enhance that contribution.

The plan also addresses issues such as potential risk, distribution, impacts and associated costs of coconut management. The plan aims to establish a framework to implement and track the progress of council's coconut management for social, economic and environmental outcomes. The plan represents a snapshot of what is known about the distribution of mature coconuts on council controlled lands within the Douglas area and is current as at April 2015.

Introduction

Over the past ten years many Local Governments have had to face the issue of coconut management. Many have chosen to remove all dangerous specimens while others have settled on a program of targeted removal and de-nutting, while other have adopted the more expensive option of de-nutting only.

For many years DSC has been faced with the challenge of how the number of high risk specimens could be managed. Most often the removal of these beautiful, useful but inappropriately planted trees has caused a great deal of concern and anguish within the local community.

To reduce its exposure to public liability claims and to protect visitors and the public the Douglas Shire Council has conducted a de-nutting program, which covered some 847 specimens. This program has been in place since 1997 and is a high cost management approach. The number of coconut trees on Council's de-nutting program has steadily increased to 1,369 (2014) trees being de nutted twice annually. This figure has increased in recent times to 1,452 palms identified to be de nutted over the 2015/2016 maintenance period.

The current cost of this de-nutting program each year has more than doubled in this time to \$192,000 with an additional \$60,000 (approximately) being spent each year in removing fallen trees, fronds and fruit from parks, roads, paths, beaches and storm water drains.

These costs will continue to increase with time and there are numerous other specimens of coconuts that will need to be included in the de-nutting program. This has prompted DSC to conduct an extensive audit of its coconuts and undertake a review of its policy and procedures regarding the management of coconuts on council controlled lands.

The Coconut Management Plan is to be reviewed every 4 years to update GIS distribution data, classification maps, track changes and any trends in distribution. This should include GIS compilation of the Regional Ecosystems which are currently defined as Littoral Rainforest communities within Douglas.

This guiding principles document is a companion document to the *Coconut Management Action Plan 2015/016 (CMAP)*. The CMAP is to provide open and transparent information to all stakeholders relating to operational actions in relation to coconut maintenance for the 2015/2016 financial year. The CMAP is to be reviewed annually prior to each financial year.

The Cost of Coconut Management

Douglas Shire Council encourages the growing of native vegetation wherever possible and supports the rehabilitation of the foreshore in an effort to regain and retain the special character of our coastal villages and natural assets. The beauty and attraction of the Douglas region is reliant on its lush rainforest natural areas and has always been known as a place where the "Rainforest meets the Reef".

The gradual destruction of our native vegetation along our foreshores for views and by the invasive nature of coconut palms is evident on many of our local beaches.



Photo – Newell Beach June 2014

In addition, the coconut palm has displayed an invasive behaviour to native ecosystems along our coastline. They out compete the native species for space and nutrients, the large nuts and fronds cause physical damage to native species when they fall which allows for further expansion of established coconut palm groves.

Consideration must be given to the critically endangered status of our foreshore vegetation, much of which is highly significant or threatened by both coastal development and natural processes. The Douglas region contains many examples of Littoral Rainforest, listed as a critically endangered ecological community under the Australian Governments *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act.*

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Terrain NRM's 2014 *Mapping Littoral Rainforest & Coastal Vine Thickets of Eastern Australia in the Wet Tropics: Mission Beach Pilot Study* identified coconut trees (*Cocos nucifera*) as transformer weeds in littoral rainforest and recommended that transformer species in littoral rainforests in the Wet Tropics be given appropriate weight by government in considering funding applications for control.

The Commonwealth Listing Advice on Littoral Rainforest and Coastal Vine Thickets of Eastern Australia identifies transformer weeds as a threat:

The establishment of transformer weeds in littoral rainforest patches can have a significantly detrimental effect. Transformer weeds are highly invasive taxa with the potential to seriously alter the structure and function of the ecological community. Whilst it is accepted that the ecological community can tolerate a significant amount of weed cover due to its relative resilience, if left unchecked, such weeds will eventually take over and destroy the affected patch.

Coconuts are a popular food source for the white tailed rat *Uromys caudimaculatus,* a creature that is classed as a coconut busting machine. Without any human intervention the white tail rats convert coconuts into perfect mosquito breeding receptacles. *Aedes egypti, Aedes notoscriptus* and *Culex quinquefasciatus* are just 3 dangerous mosquitoes capable of using these coconuts as breeding receptacles. Between them these 3 mosquitoes are capable of carrying serious arbovirus including Dengue, Ross River fever and Barmah Forest virus. The white tail rat is a recognised vector for the lethal disease leptospirosis in this region. Many beach communities also sustain significant populations of the pest species black rat *(Rattus rattus)* thanks to the shelter and food provided by coconuts.



White tailed rat Uromys caudimaculatus

Photo courtesy of Russell Constable



Photo of chewed nut, perfect mosquito breeding receptacle

Photo courtesy of Russell Constable

The risk of serious injury or death from being hit by falling fruit is real with many anecdotal stories telling of near misses. Falling fronds also represent a danger as do fruit dislodged by cyclonic winds.

The danger imposed by falling nuts is usually managed by the removal of the offending tree or by a de-nutting program, which usually involves removal of the developing inflorescence or immature fruit before they become developed enough to pose a danger. This combined with the removal of fallen fronds and nuts from lawns, paths, roads and stormwater drains is an expensive and time-consuming ongoing activity.

The recent coconut audit found that there are approximately 11,639 specimens of coconut palms growing in places where the falling fruit had the potential to cause personal injury to members of the public. The audit included specimens growing on Council controlled land and specimens growing on land in private ownership where such trees were growing in positions close to or overhanging areas to which members of the public had legal access. Council and the owner of the land on which the specimens are growing may be jointly responsible for any personal injury claims caused by falling fruit. The audit found that there were 438 fruiting specimens in this situation and that there were approximately 8,491 fruiting specimens on Council controlled lands. The total number of fruiting specimens in the area surveyed was 8,929.

At present the de-nutting program covers only 1,369 high-risk specimens growing on Council controlled lands. It has been estimated that there are approximately another 2,800 specimens that could be considered high-risk. The remaining 7,470 specimens are at this point in time considered to be a low-risk but this may change with future developments and increases in visitor numbers. The cost of the current de-nutting program is approximately \$192,000 per year. The cost of removing fallen trees, leaves, fruit and nuts from lawns, paths, roads, beaches and stormwater drains is approximately \$60,000 per year.

The audit also found that there were some 2,710 non-bearing specimens with 138 occurring on private land and 2,572 on Council controlled land (this figure does not include seedlings, some of which will die from natural causes before they reach a fruiting age). The cost of de-nutting only a percentage of these trees would be a significant and on-going cost once these palms begin fruit production. Coconut

palms take between four and ten years to bear fruit depending on the variety and reach their maximum fruit bearing potential at about twenty-five years of age. This full fruit bearing potential can be maintained for between forty and forty-five years, after which fruit production slowly declines until the death of the tree. Coconuts can live for in excess of one hundred years. Mature trees can produce between forty and eighty fruit per year depending on the variety.



Photo – Coconut denutting at Rex Smeal Park 2015

Table of Results – Coconut Audit 2014

Coconut Audit 2014

Summary of data

			Private					
Area	Location	Private Bearing	Non Bearing	Public Bearing	Public Non	Total	Denutted	Classification
Port Douglas Area	Port Douglas / Esplanade	255	75	2273	1220	3823	592	olassinoution
T on Douglao / Tou	Craiglie	8	4	8	1	21	3	3
	Ferrero Rd		2	9	7	18	0	Ŭ
Southern Area	Mowbray valley	2	5	27		52		3
Countern and	Yule Point				1	1		2
	Pebbly Beach	1	3	76	48	128		23
	Oak Beach	3	5	249	103	360	10	234
	Pretty Beach	0	0	14	100	14	10	4
	Turtle Cove	16	0	5	3	24		1
	Wangetti	10		42	6	48		234
Central Area	Ocean View Road	1		44	24	69		3
	Killaloe	16	3	5	5	29		3
	Warners Rd	3	3	4	0	10		3
	Upper Cassowary Rd			•	7	7		3
	Shannonvale - Borzi Rd	4	2	13	1	20		3
	Captain Cook Hwy –	•	-	10	•			0
	South Mossman			8		8		3
	Mossman	6	7	22	7	42	17	3
	Finlayvale Rd	2	1	3	3	9		3
	Santacatarina Rd	15				15		3
	North Mossman		4	10		14		2
	Cooya Beach	12	15	458	119	604	282	1,3,4
	Newell Beach	16		413	46	475	157	2,3
	Bells Rd			3		3		3
	Mossman Daintree Rd	6		21	1	28		3
	Sciacca Rd	2		4		6		3
	Bamboo Creek Rd	1		28	1	30		3
	Kingston Rd		1			1		3
	Kahana Rd	1		1	3	5		3
	Whyanbeel Rd	8		1		9		3
	Wonga Beach	27	3	3097	538	3665	272	2,3,4
Northern Area	Daintree River / Village	10		16	1	27	4	3
	Daintree River / Ferry	1		30	2	33	19	3
	Cape Kimberely Beach			156	24	180		2,4
	Cow Bay			14	14	28		2,4
	Thorntons Beach			67	8	75	1	2,4
	South Noah's Beach			54	2	56		4
	Noah's Beach			23		23		2
	Coconut Beach			397	76	473		2
	Myall Beach	3		380	115	498		2
	Cape Tribulation Beach			51	19	70	12	2
	Emmagen Beach			4		4		4
	South Cowie Beach			94	19	113		2
	Cowie Beach			273	92	365		4
	Nicole Drive	7		38	6	51		3
	Camelot Cl	1	2	9		12		3
	Cape Tribulation Rd	5		24	15	44		3
	Stonewood Rd	1				1		3
	Tea Tree Rd	1				1		3
	Mahogany Rd			1	1	2		3

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Total		438	138	8491	2572	11639	1369	
	Buchanan Creek Rd			1	1	2		
	Bloodwood Rd			1	8	9		3
	Silver Ash Rd				1	1		3
	Cedar Rd			1		1		3
	Carbeen Rd			10		10		3
	Thornton Peak Drive			3	1	4		3
	Forest Creek Rd	4	2	5	2	13		3
	George Rd		1			1		3
	Maple Rd			1	3	4		3

Facts & Statistics

- Coconuts can live for over 100 years;
- 1 mature tree can produce up to 80 fruits per year;
- Douglas Shire has 8,491 fruit bearing coconuts on council controlled lands. That's approximately 679,280 nuts each year;
- In many parts of the world coconuts are an extremely valuable crop. Some of the Coconut products include; water, oil, filtration, lauric acid, biodiesel, milk, fibre, husks and shells; and
- Coconuts cost the Douglas ratepayers \$250,000 per year to maintain the current service level.





Part 2

Council Policy

DOUGLAS SHIRE COUNCIL

NO. Enter #

General Policy

Coconut Management Policy

Intent

Provide clear direction regarding the management and maintenance of coconut palms (*Cocos nucifera*) on Council-controlled land.

Scope

This policy applies to all Council-controlled land within the Douglas Shire Council (DSC) area.

This policy should be read in conjunction with:

- Local Law No. 4 (Local Government Controlled Areas, Facilities and Roads) 2011;
- Council's Planning Scheme Policy No. 4:03:02, Policy No 7 Landscaping;
- General Policy No. 01:04:10 Vegetation on Council's Controlled Land Planting, Removal and Maintenance;
- Administration Instruction No. 02:02:09 Dealing with vegetation matters on Council Controlled Land;
- Preferred Suppliers Arrangement 2336 Denutting of Coconut Trees Schedule of Trees;
- Coconut Palm maintenance agreement;
- International Society of Arboriculture Tree Risk Categorization; and
- DSC Coconut Palm assessment tool.

Purpose

It is recognised that coconut palms are an integral component of the aesthetics within the shire and provide benefits in relation to the look and feel of the tropical environment as well as providing benefits to the tourism industry.

This policy aims to provide a practical and balanced approach to coconut management that addresses issues concerning risk mitigation, financial responsibility, conservation, aesthetics and plant maintenance and health.

This policy also aims to adopt a consistent approach towards the improvement of the larger urban forest by addressing the role that coconut palms play in any specific location through assessment and classification based on their location and contribution to a given area.

PROVISIONS

1. General

Due to the large number of coconut palms managed by Douglas Shire Council, it is important as a responsible land manager, that coconut palms are assessed and classified in relation to the following factors:

- Potential to cause harm or damage (based on location);
- Ease of maintenance;
- Practical, aesthetic and tourism values;
- Benefits provided in the larger urban forest;
- Possible damage caused in natural areas; and
- Customer Request Management records.

Based on the assessments and classifications, Council will take appropriate maintenance and management actions. Refer to Table 1 - Management options based on location classification and Appendix 2 – Douglas Shire Council Coconut Palm assessment tool.

2. Risk Management

Due to the risk associated with falling nuts and fronds, all palms selected to be retained in high occupancy locations must be maintained on a twice yearly basis through removal of dead and dying fronds and the removal of inflorescences and developing nuts.

Those palms selected for removal in high occupancy locations must be maintained as described above until such time as removal takes place. If these palms are not maintained, the cost of reactive maintenance increases exponentially the longer the nuts are left on the palm and the associated risk increase is a liability concern.

If coconut palms are found to have structural defects and/or disease infestation they will be removed.

If coconut palms have grown too tall to make climbing impracticable or unsafe (to perform maintenance functions) then the palm will be removed.

3. Establishment

For reasons of risk mitigation and financial responsibility Council will not support an increase in coconut palm numbers.

The planting of any coconut palm on a street verge, within any park, reserve or land controlled or managed by Council is not permitted except as prescribed below.

Residents are encouraged to plant other vegetation as prescribed in General Policy No. 1:04:10 - Vegetation on Council Controlled Land: planting, removal and maintenance (*Provision 1. Vegetation planting and landscaping*).

Establishment of new coconut palm seedlings will only be allowed under the following circumstances:

- To replace a coconut palm that has been selected as a feature palm for retention and that palm has to be removed for one of the reasons cited above, (e.g. it becomes unsafe to climb or diseased); or
- Where a coconut palm that has been selected as a feature palm for retention has failed or been damaged as a result of a severe weather event; or

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 A selected replacement for the purpose of aesthetic improvement (Note: Climbing spikes leave scars on palms and should not be used on palms that have not been previously spiked).

4. Maintenance

All palms selected for retention must be serviced twice per year as per relevant maintenance criteria. Where this is not possible or feasible due to budgetary constraints, practicability or due to classification as low risk of causing harm (i.e. low traffic/occupancy areas), Council will:

- Remove/Selectively thin out the palms; or
- Retain/Erect warning signs regarding the potential for falling nuts.

Where palms are assessed to be in low occupancy areas and not marked for removal in the near future, the area underneath the palms should be serviced to prevent the germination of fallen nuts (i.e. regular inspections carried out to remove fallen nuts and termination of any germinated nuts).

5. Removal or retention

All palms will be classified into management classes based on their location. The location relates to and informs the risk of harm or damage from coconuts and fronds, aesthetic value, value in the urban forest, damage to natural areas and cost benefits. For more details on the classifications please refer to Appendix 1 – International Society of Arboriculture Tree Risk Categorization & Appendix 2 – DSC Coconut Palm Assessment Tool.

Based on this assessment, the following management options will be used:

Table 1: Management options based on location classification	(Refer:	Appendix 2	2 —
Douglas Shire Council Coconut Palm Assessment Tool)			

Class	Location	Value	Risk	Actions
1	High occupancy / use – Beaches / Esplanades / Foreshores / Parks Special interest streetscapes	High aesthetic / tourism	Traffic & pedestrians movements are "High"	Retain and maintain
2	Low occupancy / use – Beaches / Esplanades / Foreshores / Parks	Medium / Low aesthetic Low urban forest value	Traffic & pedestrians movements are "Low"	Remove or Retain with signage
3	Streetscapes (excludes classes 1 & 2)	Low aesthetic / urban forest value	People – Moderate Property - High	Remove or Retain by Agreement
4	Littoral rainforest & coastal vine thickets (excludes classes 1 & 2)	Detrimental	People - Low Environment – High	Remove and rehabilitate

For those palms retained, their condition and density must be assessed in order to ascertain whether they should be retained as is, removed to benefit other palms or replaced as part of a site improvement regime.

 Table 2: Management options based on condition and density assessment (Refer:

 Appendix 2 – Douglas Shire Council Coconut Palm Assessment Tool

Assessment	Action – Retain / Remove / Replace
Healthy with good stability - spiked	Twice annual service
Healthy with good stability – not spiked	Twice annual service (No future spiking)
Defective, damaged, diseased, dangerous	Remove & replant (No future spiking)
Aesthetically poor due to spiking rot pockets	Replace with seedling (No future spiking)
Dense clumps or groupings	Consider thinning and replanting elsewhere

Where palms are to be removed, relevant public notification and/or consultation will be carried out in accordance with other tree removal procedures.

High risk palms removed for safety reasons will not require public consultation, only notification.

6. Appeal against removal

Where residents or businesses do not support the removal of coconut palms (excluding high risk palms) Council may consider entering into a coconut maintenance agreement (Appendix 3 - Coconut Palm maintenance agreement) where the property owner agrees to take over maintenance of the palm as per Council standards for coconut palm maintenance (at their own cost).

Even if a Coconut Palm Maintenance Agreement is in place, public liability remains with Council. Given this public liability responsibility, Council will perform twice annual inspections in accordance with the coconut maintenance schedules. Should Council find upon inspection that the palm is not being serviced as per the conditions set out in the agreement, Council will send the resident a reminder of their agreed maintenance responsibilities allowing a **two-week grace period** for maintenance to be carried out. If maintenance is not carried out by the resident within this timeframe, the palm will be removed as per the original plan.

Should the resident move away, Council will become aware of this fact upon the next inspection period when the new resident receives the notice to arrange the maintenance work.

Council will notify the new resident of the previous agreement and either renegotiate a maintenance agreement with the new owner of proceed to remove the coconut palm.

All palms retained in this fashion are to be registered on the Douglas Shire Council Coconut Database.

7. Replacement

New seedlings may be allowed to grow underneath coconut palms that have been selected for replacement (Refer to Table 2 & Appendix 2 – Douglas Shire Council Coconut Palm Assessment Tool). This can be carried out in any one of the following ways:

• Planting a seedling that has been germinated in a nursery;

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- Placement of two to three viable nuts in the location of the new palm and as soon as germination and establishment occurs, the strongest plant is selected for retention and the others are removed; or
- Transplanting of a juvenile palm from another location as a more advanced specimen.

All replacement palms are to be recorded on the Douglas Shire Council Coconut Database.

All new and other palms that have not been spiked previously may not be spiked in the future. Over time this will allow for improved aesthetics of those palms selected for retention.

Coconut Management Plan 2015 – 452785 - Part 2 Classification / Distribution Maps

In accordance with Table 1 above, the following maps indicate coconut classification /distribution areas for the Douglas Shire Council management areas (Table 3: Coconut Map Reference Table)

Table 3: Reference	table for	coconut	management	maps	(refer	to App	endix	4 for
actual maps)								

Area	Location	Document Number
Southern Area	Wangetti Beach	452165
Southern Area	Turtle Cove	452166
Southern Area	Pretty Beach	452167
Southern Area	Oak Beach	452239
Southern Area	Oak Beach – Reynalds Road	452169
Southern Area	Oak Beach – Northern end (Thala Beach)	452241
Southern Area	Pebbly Beach	452168
Southern Area	Mowbray Valley – Spring Creek Road	452173
Southern Area	Mowbray Valley	452256
Port Douglas Area	Craiglie	452153
Port Douglas Area	Four Mile	452356
Port Douglas Area	Four Mile Beach	452367
Port Douglas Area	Island Point and Macrossan St	452364
Central Area	Ocean View Road	452149
Central Area	Captain Cook Hwy – South Mossman	452171
Central Area	Mossman	452160
Central Area	Finlayvale Road	452158
Central Area	Cooya Beach (Southern End)	452151
Central Area	Cooya Beach (Northern End)	452150
Central Area	North Mossman	452164
Central Area	Newell Beach	452238
Central Area	Newell Beach – Saltwater Creek to Rocky Point	452255
Central Area	Bamboo Creek Road	452036
Central Area	Rocky Point to New Wonga	452162
Central Area	Old Wonga to Vixies Road	452254
Central Area	Wonga Beach- Vixies Road to Helen's Creek	452253
Central Area	Wonga beach – Helen's Creek to Daintree River	452252
Northern Area	Daintree Village	452237
Northern Area	Cape Kimberley	452145
Northern Area	Cow Bay Beach	452152
Northern Area	Thorntons Beach	452251
Northern Area	Noah's Beach	452163
Northern Area	Coconut Beach	452148
Northern Area	Myall Beach	452161
Northern Area	Cape Tribulation Beach	452146
Northern Area	Emmagen Beach	452154
Northern Area	South Cowie Beach	452170
Northern Area	Cowie Beach	452250
Northern Area	Streetscape Cape Tribulation	452147

Appendix 1 – International Society of Arboriculture Tree Risk Categorization

International Society of Arboriculture (ISA) Tree Risk Categorization (Summarised)

The Risk Categorization Process

To estimate risk from trees the following factors need to be considered:

- The targets;
- The presence of a tree or part/s that could fail;
- The likelihood of a the failure occurring (Tree biomechanics and site factors);
- The likelihood of the failure impacting on the target (Target location); and
- The consequence of the failure (Level of impact and target value).

To determine the likelihood of a failure impacting a target, the following two factors must be considered:

- The likelihood of the failure occurring within a specific time frame; and
- The likelihood of the tree or branch impacting the target.

Tree biomechanics and implications of defects and conditions as well as site factors can affect the likelihood of failure and impact.

Once the above factors have been considered, the following procedure needs to be followed:

- Categorise these two factors using the Likelihood Matrix to estimate the likelihood of the combined event: a tree/part failure occurring and impacting the specified target. (Steps 1 – 4 below);
- Combine the likelihood of that event with the expected consequences of a failure to determine a level of risk using the risk matrix (Steps 5 – 7 below);
- 3. Compare the risk category to the level of risk that is acceptable to the client (Council); and
- 4. Present mitigation options if the risk category identified exceeds the level of acceptable risk.

Steps in developing a tree risk rating:

- 1. Identify possible targets;
- 2. Identify tree part(s) that could strike the target;
- 3. Evaluate likelihood for each part to fail:
 - a. Improbable
 - b. Possible
 - c. Probable
 - d. Imminent
- 4. Evaluate the likelihood of tree/part impacting the target:

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- a. Very Low
- b. Low
- c. Medium
- d. High
- 5. For each failure mode, estimate consequences of failure(Matrix 1: Likelihood matrix):
 - a. Unlikely
 - b. Somewhat likely
 - c. Likely
 - d. Very Likely
- 6. For each failure mode, estimate consequences of failure
 - a. Negligible
 - b. Minor
 - c. Significant
 - d. Severe
- 7. For each failure mode, designate the risk (Matrix 2: Risk Rating Matrix)
 - a. Low
 - b. Moderate
 - c. High
 - d. Extreme

Matrix 1: Likelihood matrix

Likelihood of	Likelihood of Impacting Target						
Failure	Very Low	Low	Medium	High			
Imminent	Unlikely	Somewhat likely	Likely	Very Likely			
Probable	Unlikely	Unlikely	Somewhat likely	Likely			
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely			
Improbable	Unlikely	Unlikely	Unlikely	Unlikely			

Matrix 2: Risk Rating Matrix

Likelihood of	Consequences of Failure							
Impact	Negligible Minor		Significant	Severe				
Very Likely	Low	Moderate	High	Extreme				
Likely	Low	Moderate	High	High				
Somewhat likely	Low	Low	Moderate	Moderate				
Unlikely	Low	Low	Low	Low				

Coconut Management Plan 2015 – 452785 - Part 2 Explanation of terms

Likelihood of Failure

Improbable: The tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame.

Possible: Failure could occur, but is unlikely during normal weather conditions within the specified time frame.

Probable: Failure may be expected under normal weather conditions within the specified time frame.

Imminent: Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is an infrequent occurrence for a risk assessor to encounter and may require immediate action to protect people from harm.

Likelihood of Impacting a Target

Very Low: The likelihood of the failed tree or part impacting the specified target is remote. This is the case in a rarely used site fully exposed to the assessed tree (rare occupancy, no protection) or an occasionally used site that is partially protected by trees or structures (occasional occupancy, moderate protection).

Low: It is not likely that the failed tree or part will impact the target. This is the case in an occasionally used area that is fully exposed to the assessed tree, a frequently used area that is partially exposed to the assessed tree, or a constant target that is well protected from the assessed tree.

Medium: The failed tree or part is as likely to impact the target as not. This is the case in a frequently used area that is fully exposed on one side to the assessed tree or a constantly occupied area that is partially protected from the assessed tree. Examples include a suburban street next to the assessed street tree or a house that is partially protected from the assessed tree by an intervening tree.

High: The failed tree or part will most likely impact the target. This is the case when a fixed target is fully exposed to the likely failure (constant occupancy, no protection) or the likely failure is over a high-use road or walkway with an adjacent street tree (frequent occupancy).

Occupancy Rates

Constant occupancy: A target is present at nearly all times, 24 hours a day, 7 days a week

Frequent occupancy: The target zone is occupied for a large portion of a day or week

Occasional occupancy: The target Zone is occupied by people or targets infrequently or irregularly.

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Rare occupancy: The target zone is not commonly used by people.

Consequences of Failure

Consequences of failure and impact are categorized based on the value of the target and harm that may be done to it.

The consequences of failure and impact also depend, in part, on the tree or tree part size, fall characteristics, fall distance, and any factors that may protect the risk target from harm.

The consequences of failure can be categorized using the following guidelines:

Negligible: Consequences that involve low-value property damage or disruption that can be replaced or repaired; they do not involve personal injury. Examples of negligible consequences include:

- A small branch striking a fence
- A medium sized branch striking a shrub bed
- A large part striking a structure and causing low monetary damage
- Disruption of power to landscape lighting

Minor: Consequences that involve low to moderate property damage, small disruptions to traffic or a communication utility, or very minor injury. Examples of minor consequences include:

- A small branch striking a house roof from a high height
- A medium-sized branch striking a deck from a moderate height
- A large part striking a structure and causing moderate monetary damage
- Short-term disruption of power at a service drop to a house
- Temporary disruption of traffic on a neighbourhood street

Significant: Consequences that involve property damage of moderate to high value, considerable disruption, or personal injury. Examples of significant consequences include:

- A medium-sized part striking an unoccupied new vehicle from a moderate or high height.
- A large part striking a structure and resulting in high monetary damage
- Disruption of distribution primary of secondary voltage power lines, including individual services and street-lighting circuits
- Disruption of traffic on a secondary street

Severe: Consequences that could involve serious injury or death, damage to high-value property, or disruption of important activities. Examples of severe consequences include:

- Injury to a person that may result in hospitalization
- A medium-sized part striking an occupied vehicle
- A large part striking an occupied house
- Serious disruption of high-voltage distribution and transmission power line
- Disruption of arterial traffic or motorways

Example: The consequences of a medium-sized dead branch striking a house would be *minor*, the consequences of that branch striking an unoccupied new car would be *significant*, and the consequences of it impacting the driver would be *severe*.

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The consequences are combined with the likelihood of failure and impact to determine the risk ratings.

Levels of Risk

Extreme: Failure is imminent with a high likelihood of impacting the target and the consequences of the failure are severe. The assessor should recommend that mitigation measures be taken as soon as possible. In some cases, this may mean immediate restriction of access to the target zone to avoid injury to people.

High: Consequences are significant and the likelihood is very likely or likely, or consequences are severe and likelihood is likely. The assessor should recommend mitigation matters to be taken.

Moderate: Consequences are minor and likelihood is very likely, or likelihood is somewhat likely and consequences are significant or severe. The assessor may recommend mitigation and/or retaining and monitoring.

Low: Consequences are negligible and likelihood is unlikely, or consequences are minor and likelihood is somewhat likely. Mitigation or maintenance measures may be appropriate for some trees, but the priority for action is low. Assessors may recommend retaining and monitoring these trees, as well as mitigation that does not involve the removal of the tree.



Appendix 2 – Douglas Shire Council Coconut Palm assessment tool

Appendix 3 - Coconut Palm Maintenance Agreement

ENQUIRIES:Enter Enquiry PersonPHONE:Enter Enquiry PhoneYOUR REF:Enter "Your Reference"OUR REF:Document Number

Enter Date DD Month YYYY

Enter Address

Dear Enter Name

RE: Coconut Palm Maintenance Agreement for (Insert Address)

Douglas Shire Council places great value on street and park trees (including palms) as an asset to the region for a range of reasons such as aesthetics, public amenity and shading.

Some of Council's responsibilities as the custodian of trees on public land is ensuring public safety and preventing damage to infrastructure, services and property.

As part of Council's risk mitigation measures under Council General Policy # (to be confirmed), coconut palms (*Cocos nucifera*) that pose an unacceptable risk of injury or damage to property should be removed and replaced with trees in appropriate locations.

The coconut palm on the Council verge in front of your property at (insert address) has been assessed as a high risk tree. In consideration of individual ratepayers' preferences, Council has made provision for you to take over maintenance of the palms as prescribed below.

In this instance it has been noted that you wish to appeal against the removal of this coconut palm and agree to take over maintenance of the palm.

Council must inform you that if the Coconut Palm is to be retained it will be monitored and you will be required to maintain it to the satisfaction of the General Manager Operations and subject to the following conditions:

- 1. The Coconut palm/s must be de-nutted and de-fronded twice per year or upon Council request and to Council standards (to be provided to you prior to signing of this agreement).
- 2. If upon inspection Council finds that the maintenance of the palms is not being performed or is not up to standard, you will be notified in writing to rectify the situation within two weeks. Should you fail to rectify the situation, Council retains the right to remove the palm and replant it with a suitable street tree.

- 3. Any contractor you engage to perform the palm maintenance must:
 - 3.1. Be engaged on the basis that all public liability and workers compensation is current and sighted by Council. Copies to be supplied to Douglas Shire Council prior to signing of this agreement;
 - 3.2. If, during the life of this agreement, you decide to engage a different contractor to the one originally approved by Council, then you are required to provide the above documentation to Council prior to the new contractor starting on-site;
 - 3.3. Be responsible for related claims that may occur as a result of this work. This includes claims of public liability and/or workers compensation;
 - 3.4. Comply with all statutory obligations including Workplace Health and Safety;
 - 3.5. Secure the work site and restrict entry to authorised persons only;
 - 3.6. Remove all debris; and
 - 3.7.Be responsible for making good damage to surrounds to the satisfaction of Council.
- 4. You will indemnify Douglas Shire Council against all liability relating to this agreement, to the extent that such liability is caused by the negligence (or other fault) of yourself, your employees or contractors.
- 5. The agreement will remain active for a period of 5 years at which point it will be reassessed and a new agreement tabled.
- 6. The palm will be removed by Council regardless of the agreement, under the following circumstances:
 - 6.1. The palm has been damaged;
 - 6.2. Has become diseased;
 - 6.3. Is dangerous to service;
 - 6.4. Has been destabilised;
 - 6.5. For any other reason where public safety has been put at risk; and
 - 6.6. As per assessment by a delegated Council officer.

Please confirm your acceptance of the above conditions in order for Council to retain the palm/s by signing in the required areas below and returning the original document to Council as per the above mentioned contact details or by delivery to Council's Administration office at 64-66 Front Street Mossman.

If you have any further enquiries regarding this matter, please do not hesitate to contact the relevant Officer above.

Yours faithfully

Paul Hoye General Manager Operations

I hereby wish to retain the Coconut palm/s on the footpath at:

(Address),

(Location of palm/s).....

I have read the conditions set out as per the letter above and confirm that I agree to maintain the coconut palm/s as per the conditions in order to retain it/them.

Signed

(Resident's Name)

(Date)

This policy is to remain in force until otherwise determined by Council.

General Manager Responsible for Review: General Manager Operations

ADOPTED: Click here to enter a date. DUE FOR REVISION: Click here to enter a date. REVOKED/SUPERSEDED: Click here to enter a date. Coconut Management Plan 2015 – 452785 - Part 2

Appendix 4: All Districts coconut location Distribution / Classification maps

Southern Area – Wangetti Beach



Southern Area –Turtle Cove



Southern Area – Pretty Beach



Southern Area – Oak Beach



Southern Area – Oak Beach – Reynalds Road



Southern Area – Oak Beach – Northern end (Thala Beach)



Southern Area – Pebbly Beach



Southern Area – Mowbray Valley – Spring Creek Road



Southern Area – Mowbray Valley



Port Douglas Area – Craiglie



Port Douglas Area – Four Mile



Port Douglas Area- Four Mile Beach



Port Douglas Area – Island Point



Central Area – Ocean View Road



Central Area – Captain Cook Hwy – South Mossman



Central Area – Mossman



Central Area – Finlayvale Road

Central Area – Cooya Beach (Southern End)

Central Area – Cooya Beach (Northern End)

Central Area – North Mossman

Central Area – Newell Beach

Central Area – Newell Beach – Saltwater Creek to Rocky Point

Central Area – Bamboo Creek Road

Central Area – Rocky Point to New Wonga

Central Area – Old Wonga to Vixies Road

Central Area – Wonga Beach- Vixies Road to Helen's Creek

Northern Area – Daintree Village

Northern Area – Cape Kimberley

Northern Area – Cow Bay Beach

Northern Area – Thorntons Beach

Northern Area – Noah's Beach

Northern Area – Coconut Beach

Northern Area – Myall Beach

Northern Area – Cape Tribulation Beach

Northern Area – Emmagen Beach

Northern Area – South Cowie Beach

Northern Area – Cowie Beach

Northern Area – Streetscape Cape Tribulation

