Appendix F

Impact assessments

List of Appendix F figures

F1. Appendix F introduction

Projects assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* consider the significance of impacts on biodiversity following on the heads of consideration detailed in the draft *Guidelines for Threatened Species Assessment* (Department of Environment and Conservation 2005a), including assessment of the significance of the impacts relative to the conservation importance of the habitat, individuals and populations likely to be affected. Given that it is taken that development is not likely to significantly affect any Threatened species in certified areas (as identified in the biodiversity certification as a result of the certification improving or maintaining biodiversity values), significance assessments under the *Threatened Species Conservation Act 1995* are based on the residual impact to Threatened species in the non-certified areas only.

Threatened biodiversity listed under the *Environment Protection and Biodiversity Conservation Act 1999* are required to be assessed following the *Principal Significant Impact Guidelines* (Department of the Environment and Heritage 2006). As biodiversity certification is not formally recognised by the Department of the Environment, Water, Heritage and the Arts (such as under a bilateral agreement), significance assessments for species listed under the *Environment Protection and Biodiversity Conservation Act 1999* are based on the residual impacts across the entire project area (certified and non-certified and areas outside of the Growth Centres).

Table F-1 provides a summary of the Threatened biodiversity for which significance have been completed. Microchiropteran bats have been assessed collectively because of their similarity of habitats, habits and potential impacts.

Table F-1 Summary of impact assessments for project

Species or community	Conservation Status		Likely to be significantly affected
	State [1]	National [2]	
Cumberland Plain Woodland[3]	CE		No
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest[3]	-	CE	No
River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	E	-	No
Cumberland Land Snail (*Meridolum corneovirens*)	E	-	No
Grey-headed Flying-fox (*Pteropus poliocephalus*)	V	V	No
Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*)	V	-	No
Eastern Freetail-bat (*Mormopterus norfolkensis*)	V	-	No
Eastern Bent-wing Bat (*Miniopterus schreibersii oceanensis*)	V		No
Greater Broad-nosed Bat (*Scoteanax rueppellii*)	V	-	No
Eastern False Pipistrelle *(Falsistrellus tasmaniensis)*	V	-	No

1. State conservation status: CE= critically V= Vulnerable, E = Endangered, (*Threatened Species Conservation Act 1995*). 2. National conservation status: V = Vulnerable, E = Endangered, CE, Critically Endangered (*Environment Protection and Biodiversity Conservation Act 1999*). 3. Although there are similarities between Cumberland Plain Woodland and Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, 9, there are some significant differences and as such these communities have been discussed separately

F2. Cumberland Plain Woodland

F2.1 Cumberland Plain Woodland Profile

Conservation status

Cumberland Plain Woodland is listed as 'critically endangered' under the *Threatened Species Conservation Act 1995.*

Although there are similarities with Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, listed as a 'critically endangered' under *Environmental Protection and Biodiversity Conservation Act 1999,* there are some significant differences and as such these communities have been discussed separately.

Description

Shale Plains Woodland and Shale Hills Woodland are sub-units of the Cumberland Plain Woodland ecological community and occur on soils derived from shale on the Cumberland Plain. The community is characteristically of woodland structure, but may include both more open and dense areas (NSW Scientific Committee 1997). *Eucalyptus moluccana* and *E. tereticornis* are the dominant canopy trees, with *E. crebra*, *Corymbia maculata* and *E. eugenioides* occurring less frequently. The shrub layer is dominated by *Bursaria spinosa*. Diversity is highest in the ground stratum with a high diversity of grasses and other small shrubs and herbaceous species occurring. The composition of the is a good indicator of condition, with native groundcover species, including less common and slower-growing native grasses and herbs, being good indicators of regeneration potential (resilience, Department of Environment and Conservation 2005b).

The definitions of the Cumberland Plain Woodland includes disturbed or modified stands however, only if they have potential to *re-establish the characteristic native understorey* (NSW Scientific Committee 1997).

The original extent of this ecological community is highly reduced with estimates ranging from 6% (NSW Scientific Committee 1997) to 9% remaining (Department of Environment and Climate Change 2007b).

Extent within the study area

A total of 24.5 ha of Cumberland Plain Woodland will be directly affected by the project. A further 10 ha will be subject to new edge effects.

Most patches of Shale Plains Woodland and Shale Hills Woodland are considered to have potential to re-establish a native understorey with native species characteristic of community and therefore consistent with the definitions of the ecological communities (refer Figure F-1). The one exception is the Shale Plains Woodland of support for core habitat conservations significance class on the Ingleburn Defence lands in an area that has been subdivided for housing with a groundcover is dominated by *Pennisetum clandestinum* (Kikuyu) and other exotic species. This patch is unlikely to re-establish a native understorey or near natural structure and as such has been excluded from the extent the ecological community (the adjoining Shale Plains Woodland of core habitat conservations significance

class on the Ingleburn Defence lands, which has a characteristic native understorey, is included in the extent the ecological community).

Important patches of the ecological community are those in good condition, such as within the Ingleburn Defence lands and at Edmondson Park. Although no threatened species of plant were recorded at these locations, the diversity of native species was high, including locally rare species (e.g. *Bossiaea prostrate*) and habitat for the Cumberland Land Snail (a state-listed Endangered species).

Threats and recovery of Cumberland Plain Woodland

Cumberland Plain woodland is subject to a range of ongoing threats, including:

- further clearing for urban or rural development, and the subsequent impacts from fragmentation
- grazing and mowing, which stops regrowth of the community
- inappropriate water run-off entering the site, which leads to increased nutrients and sedimentation
- weed invasion
- inappropriate fire regimes, which have altered the appropriate floristic and structural diversity (Department of Environment and Climate Change 2008).

A draft recovery plan has been prepared for the Cumberland Plain (Department of Environment Climate Change and Water 2009). This plan aims to long-term survival of the threatened biodiversity of the region. The principles of the draft recovery plan are that:

- The protection and management of large, intact remnants is more effective and efficient than for smaller, fragmented remnants
- Recovery efforts need to aim to ensure that a representative sample of biodiversity is conserved
- Active management to best practice standards is needed to prevent the degradation of bushland in a fragmented landscape
- ·Where impacts on biodiversity cannot be avoided, they should be offset using appropriate means.

The recovery actions are grouped into the following themes:

- Building the protected area network
- Delivering best practice management
- Promoting awareness, education and engagement
- Enhancing information, monitoring and enforcement.

The Department of Environment and Climate Change has also identified 18 priority actions specific to Cumberland Plain Woodland to help recover this ecological community (see Table F-2).

Table F-2 Priority actions for the Cumberland Plain Woodland

Description of priority action[1]	Does action relate to the project?
Management of EECs is to be included in school environmental management plans where the school land contains EECs.	Not applicable
Management of EECs to be included in the conditions for Crown land trusts, lease and licence holders.	Not applicable
Prepare and implement community awareness, education and involvement strategy.	Not applicable
Support community conservation by providing nursery or other facilities, for regeneration activities.	Not applicable
Local Govt prepare plans of management in accordance with the Local Government Act for reserves containing EECs, which have conservation as a primary objective, or where conservation is compatible.	Not applicable
Promote best practice management guidelines.	Not applicable
Incorporate consideration of EEC protection in regional open space planning.	The protection of the EEC has been considered in the conditions of biodiversity certification of the State Environmental Planning Policy (Sydney Regional Growth Centres) 2006
Encourage planning authorities to address EECs in development of environmental planning instruments and, where possible, seek biodiversity certification.	The project is predominantly located within the State Environmental Planning Policy (Sydney Regional Growth Centres) 2006 which has biodiversity certification
Manage, to best practice standards, areas of EECs which have conservation as a primary objective, or where conservation is compatible. Priorities are to be based on DECC conservation significance assessment.	Non-certified areas in the State Environmental Planning Policy (Sydney Regional Growth Centres) 2006 are identified for conservation purposes. The Biodiversity certification provides for acceptable outcomes for impacts in these areas.
Encourage and promote best-practice management of EECs on private land.	Not applicable
Develop and implement a coordinated program for removal of African Olive across all tenures.	Weed control along the project will be managed through implementation of a Environmental Management Plan
Ensure the consideration of impacts on EECs when enforcing noxious weed or pest species control in EECs.	Not applicable
Develop and implement Cumberland Plain Reservation Strategy and create a protected bushland network through targeted land acquisition as land becomes available.	The offsets required for impacts to Cumberland Plain Woodland within the non-certified areas will be determined in negotiation with the Growth Centres Commission and contribute to the overall bushland network within the Growth Centre.
Public authorities will promote management agreements to landholders through their ongoing land use planning activities.	Not applicable. Biodiversity certification of the State Environmental Planning Policy (Sydney Regional Growth Centres) 2006 however will assist this action within the Growth Centre.
Investigate the preparation of a recommendation for the declaration of critical habitat.	Not applicable

Description of priority action[1]	Does action relate to the project?
Investigate the development of a regular monitoring program to assess the change in extent of vegetation across the Cumberland Plain.	Not applicable
Finalise the multi-EEC recovery plan as a State priority in accordance with contractual obligations with DEH, by July 2007.	Not applicable
Liaise with institutions to facilitate research relevant to the recovery of Cumberland Plain EECs.	Not applicable

Source: Department of Environment and Climate Change (2008)

1. Actions may apply to one type of geographic area (CMA, LGA and DECC national park administration area) or to specific land managers only (i.e. Catchment Management Authority, Local Council, National Park or private landowners).

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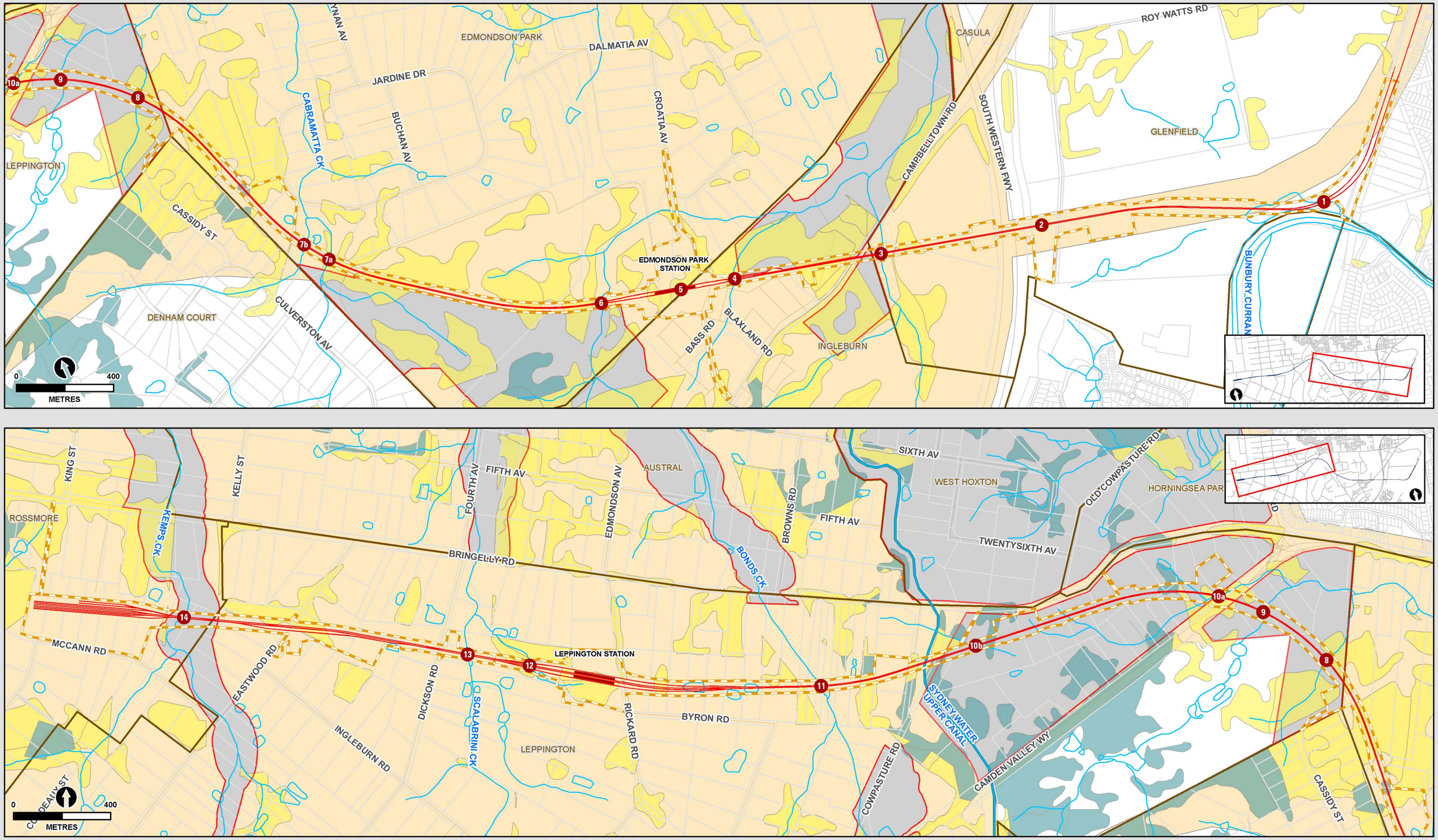

Figure F-1 Cumberland Plain Woodland in the study area

F2.2 Cumberland Plain Woodland state significance assessment

This assessment is based on the extent of Cumberland Plain Woodland in the non-certified areas in the Growth Centre (3.3 ha, refer Figure F-1). While it is recognised that impacts to this community will occur in the certified areas, these and other future impacts have been addressed as part of the certification process. The following assessment therefore considers only those impacts outside of the certified areas.

No Cumberland Plain Woodland will be affected outside of the South West Growth Centre.

How is the proposal likely to affect the lifecycle of a threatened species and/or population?

Not applicable to a Threatened ecological community.

How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal will result in the clearing of 3.3 ha of Cumberland Plain Woodland across four non-certified areas within the South West Growth Centre (refer Figure F-1).

Clearing of Cumberland Plain Woodland will contribute to fragmentation of non-certified patches at Western Sydney Regional Park only. Vegetation to be affected at the Ingleburn Defence lands, Edmondson Park and Kemps Creek are all located on the boundary of the non-certified areas.

The project is likely to result in the introduction of new edge effects to the community remaining in the Ingleburn Defence lands and Edmondson Park within certified areas (approximately 10 ha). At these locations the remnants of vegetation that will be affected are greater than 50 m wide and therefore likely include core areas not currently subject to edge effects (based on the findings of Bali (2000), a distance of 50 m from the edge of the estimated construction footprint has been used as the extent of edge effects). The patches of vegetation at Western Sydney Regional Park and Kemps Creek at already subject to exiting edge effects.

Construction activates have potential to result in conditions that favour the establishment or proliferation of weeds, such as exposed soil and stockpiles. The control of weeds will be managed however through the construction environmental management plan.

Clearing of vegetation required for the project will be a permanent impact. However, the proposal is unlikely to affect natural regeneration and recolonisation of existing species in Cumberland Plain Woodland in the adjoining non-certified areas.

Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

Not applicable to a Threatened ecological community.

How is the proposal likely to affect current disturbance regimes?

The proposal is unlikely to affect the existing disturbance regimes of the Cumberland Plain Woodland. The proposal will not modify the intensity or frequency of fires or the flooding flows in the Cumberland Plain Woodland habitat.

How is the proposal likely to affect habitat connectivity?

Woodland habitats within the study area are already highly fragmented as a result of past land uses and are likely to be fragmented further though future development of lands surrounding the proposal. This vegetation may function as part of a wider local and regional corridor system however, the vegetation along the project alignment does not form part of a clearly defined wildlife corridor between larger areas of Cumberland Plain Woodland or other wildlife habitat.

The project will result in further fragmentation of the remaining Cumberland Plain Woodland in the study area however, this would be unlikely to have a significant impact on the viability of species that occur within most of the fragments. The project will not result in fragmentation of the important Cumberland Plain Woodland patches in the Ingleburn Defence lands or at Edmondson Park.

How is the proposal likely to affect critical habitat?

No critical habitat has been listed for Cumberland Plain Woodland under the *Threatened Species Conservation Act 1995*. The habitat within the study area is not considered to be critical to the survival of Cumberland Plain Woodland in accordance with section 37 of the *Threatened Species Conservation Act 1995*.

Conclusion

The project is will result in the loss of 3.3 ha of Cumberland Plain Woodland in the non-certified areas of the South West Growth Centre. These areas consist of vegetation in good condition along the edges of the Ingleburn Defence Site and Edmondson Parks, and vegetation in moderate to poor condition in the Sydney Western Regional Parklands, Kemps Creek and at Bunburry Curran Creek. Cumberland Plain Woodland that will be affected is not at the limit of its distribution, nor will the impacts result in a change to the community's disturbance regime, significantly affect habitat connectivity or affect critical habitat.

Given suitable offsets are determined in accordance with the biodiversity certification order for the State Environmental Planning Policy (Sydney Regional Growth Centres) 2006, the project should maintain or improve biodiversity outcomes for this community despite the direct impacts to the Cumberland Plain Woodland.

F3. Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest

Conservation status

Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest is listed as 'critically endangered' under the *Environment Protection and Biodiversity Conservation Act 1999.*

Although there are similarities with Cumberland Plain Woodland listed as critically endangered under the *Threatened Species Conservation Act 1995*, there are some significant differences and as such these communities have been discussed separately.

Description

Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest consists of woodland in the Sydney Basin Bioregion which occur on the shale hills and plains. This community includes three vegetation subunits: Shale Plains Woodland, Shale Hills Woodland and Shale Gravel Transition Forest (Threatened Species Scientific Committee 2008a, 2008b).

This community varies from woodland to forest and from grassy to predominantly shrubby. To conform with the listed community, it must have an upper tree layer species present.

The original extent of this ecological community (130,876 ha) is highly reduced with estimates ranging from approximately 9.4% remaining (Threatened Species Scientific Committee 2008a, 2008b). Remaining areas are generally small and highly fragmented with most (approximately 87%) under 10 ha in size and less than 1% over 100 ha. Of the remaining patches, only 40.6% have relatively intact canopy cover (Threatened Species Scientific Committee 2008a, 2008b).

Extent within the study area

An estimated 5.5 ha of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest will be directly affected by the project (Figure F-2). Identification of this community within the study area is based on the Department of Environment, Climate Change and Water mapping (Department for Environment Climate Change and Water 2009) and supported by field data .

Of the total of 5.5 ha, 5.1 ha of this community occur within the Edmondson Park precinct and is covered under the conservation agreement.

Threats and recovery of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest

Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest is subject to a range of ongoing threats, including:

- clearing and fragmentation and resulting edge effects
- rural and peri-urban land management practices including:
  - clearing, mowing and under-scrubbing

    - increased soil phosphorus from fertiliser use
    - dispersal of weed propagules
    - inappropriate fire and grazing regimes
- weed invasion
- climate change (Threatened Species Scientific Committee 2008a, 2008b).

The preparation of a recovery plan for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest is underway, however it has not yet been completed. Conservation priorities for this community include the development of a strategic plan to guide the best possible biodiversity protection and conservation for the region. This would include mapping and analysis of patches to identify the most important remnants for recovery of the community (Threatened Species Scientific Committee 2008a, 2008b).

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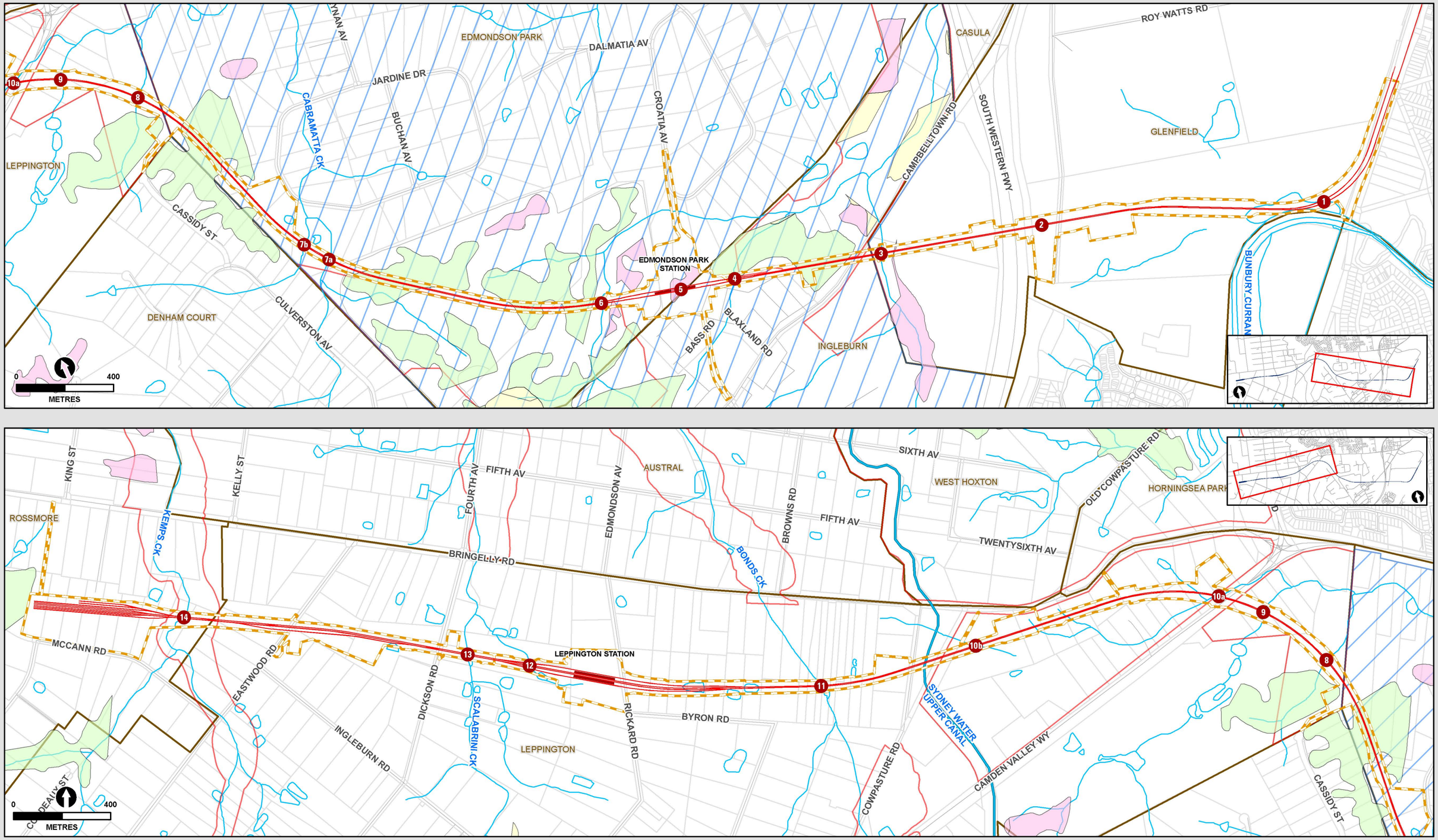

1 Waterway crossing
Cadastre
Suburbs
Drainage
Proposed track
Clearing footprint

EPBC listed communities category A
EPBC listed communities category B
EPBC listed communities category C

Edmondson Park Conservation Agreement

Figure F-2 EPBC-listed Cumberland Plain Woodland

F3.1 Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest Commonwealth Significance Assessment

Of the total of 5.5 ha of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, which would be affected by the Project, 5.1 ha occurs within Edmondson Park precinct. This area is covered by the conservation agreement signed between the Department of the Environment, Water, Heritage and the Arts, the Department of Planning and the Department of Environment, Climate Change and Water. This agreement declares that a project approved under Part 3A of the *Environmental Planning and Assessment Act 1979* within the precinct is not likely to have a significant impact on threatened biodiversity as long as it follows the agreement. The agreement also puts in place an offsetting arrangement funded through the infrastructure contributions of the growth centres. As such, the Project is unlikely to have a significant impact on areas of this community within the Edmondson Park precinct. However, there will be 0.4 ha clearing of this community outside the Edmondson Park Precinct. The significance assessment below relates to the clearing outside Edmondson Park precinct.

Under the *Environment Protection and Biodiversity Conservation Act 1999*, an action is likely to have a significant impact on a critically endangered or endangered community if there is a real chance or possibility that it will result in one or more of the following. This assessment is based on the clearing of 0.4 ha of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, occurring outside the Edmondson Park precinct, for the project.

Reduce the extent of an ecological community

The proposal will result in the loss of 0.4 ha of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest outside the Edmondson Park precinct. The loss of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest resulting from the proposal will result in the clearing from category B patches (larger patch; greater than 5 ha and greater than 30% of the perennial understorey vegetation cover is made up of native species) as well as a small area of category C vegetation. The loss of 0.4 ha of poor condition Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest is not considered significant.

Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

Woodland habitats within the study area are already highly fragmented as a result of past land uses and are likely to be fragmented further though future development of lands surrounding the proposal. This vegetation may function as part of a wider local and regional corridor system however, the vegetation along the project alignment does not form part of a clearly defined wildlife corridor between larger areas of Cumberland Plain Woodland or other wildlife habitat.

The project will result in the clearing of 0.4 ha of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest from the edge of a patch and would not result in further fragmentation.

Adversely affect habitat critical to the survival of an ecological community

Critical habitat under the *Environment Protection and Biodiversity Conservation Act 1999* is habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long term evolutionary development
- for the reintroduction of populations or recovery of the species or ecological community (Department of the Environment and Heritage 2006).

Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the Minister under the *Environment Protection and Biodiversity Conservation Act 1999*.

No critical habitat has been listed for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the *Environment Protection and Biodiversity Conservation Act 1999*. The habitat within the study area is not considered to be critical to the survival of Cumberland Plain Woodland in accordance with *Environment Protection and Biodiversity Conservation Act 1999*.

Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.

The proposal will adversely modify the soil profile in the areas that require clearing of vegetation such as within the construction footprint and associated ancillary areas (0.4 ha). The project will not however significantly modify abiotic factors such as the soil profile, groundwater levels or surface water drainage patters necessary for the survival of remaining Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest surrounding the project.

Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting

The project will not result in an adverse change of species composition to the remaining Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest surrounding the project. The proposal does not involve actions that would significantly change the exiting disturbance regime such as the intensity or frequency of fires, the intensity or frequency floods, or routine clearing of vegetation.

Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to assisting invasive species, that are harmful to the listed ecological community, to become established; or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community

Changes to the microhabitat conditions associated with edge effects have the potential to result in increases in the establishment, density and diversity of exotic species of plant (weeds). However, weed control will be monitored and managed through the project Environmental Management Plan.

Interfere with the recovery of an ecological community

A recovery plan has not been prepared for Cumberland Plain Woodland.

Conclusion

The project will result in the loss of 0.4 ha of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (outside the area covered by the Edmondson Park precinct conservation agreement). This impact will occur across a landscape that is already highly modified as a result of habitat fragmentation and land management practices. The area of the ecological community that will be cleared is on the edge of a grazed and poor condition patch. Given the small and degraded nature of the vegetation to be removed, the project is considered unlikely to represent a significant impact to the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community as listed under the *Environment Protection and Biodiversity Conservation Act 1999.*

F4. River-Flat Eucalypt Forest on Coastal Floodplains

F4.1 River-Flat Eucalypt Forest on Coastal Floodplains Profile

Conservation status

River-Flat Eucalypt Forest on Coastal Floodplain of the NSW North Coast, Sydney Basin and South East Corner bioregions is listed as an Endangered Ecological Community under the *Threatened Species Conservation Act 1995*. This ecological community is not listed under the *Environment Protection and Biodiversity Conservation Act 1999.*

Description

River-Flat Eucalypt Forest on Coastal Floodplains is a variable community consisting of a tall open tree layer of eucalypts associated with silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains. The structure of the community may vary from tall open forests to woodlands, although partial clearing may have reduced the canopy to scattered trees. Typically these forests and woodlands form mosaics with other floodplain forest communities and treeless wetlands, and often they fringe treeless floodplain lagoons or wetlands with semi-permanent standing water.

River-Flat Eucalypt Forest on Coastal Floodplains is distinguished from other floodplain Threatened ecological communities by its dominance of either a mixed or single species eucalypt tree layer (including *Angophora* spp.), with few *Casuarina* spp. or *Eucalyptus robusta*, and a prominent groundcover of soft leaved herbs and grasses (Department of Environment and Climate Change 2007a). While the composition of the tree stratum varies considerably, the most widespread and abundant dominant trees include *Eucalyptus tereticornis*, *E. amplifolia*, *Angophora floribunda* and *A. subvelutina*. *Casuarina cunninghamiana* subsp. *cunninghamiana* was also locally dominant along some drainage lines in the study area.

Extent within the study area

A total of 4.4 ha of River-Flat Eucalypt Forest on Coastal Floodplains will be directly affected by the proposal where the project will cross, or lies near, the following drainage lines (refer Figure F-3):

- Bunburry Curran Creek (watercourse crossing number 1)
- unnamed tributary of Maxwells Creek South east of Campbelltown Rd (watercourse crossing number 3)
- tributary of Maxwells Creek, Edmondson Park, 300 m west of station (watercourse crossing number 6)
- Cabramatta Creek, Edmondson Park (watercourse crossing number 7)
- Bonds Creek, West of Cowpasture Rd, Leppington (watercourse crossing number 11)
- Kemps Creek, North of McCann Rd (watercourse crossing number 14).

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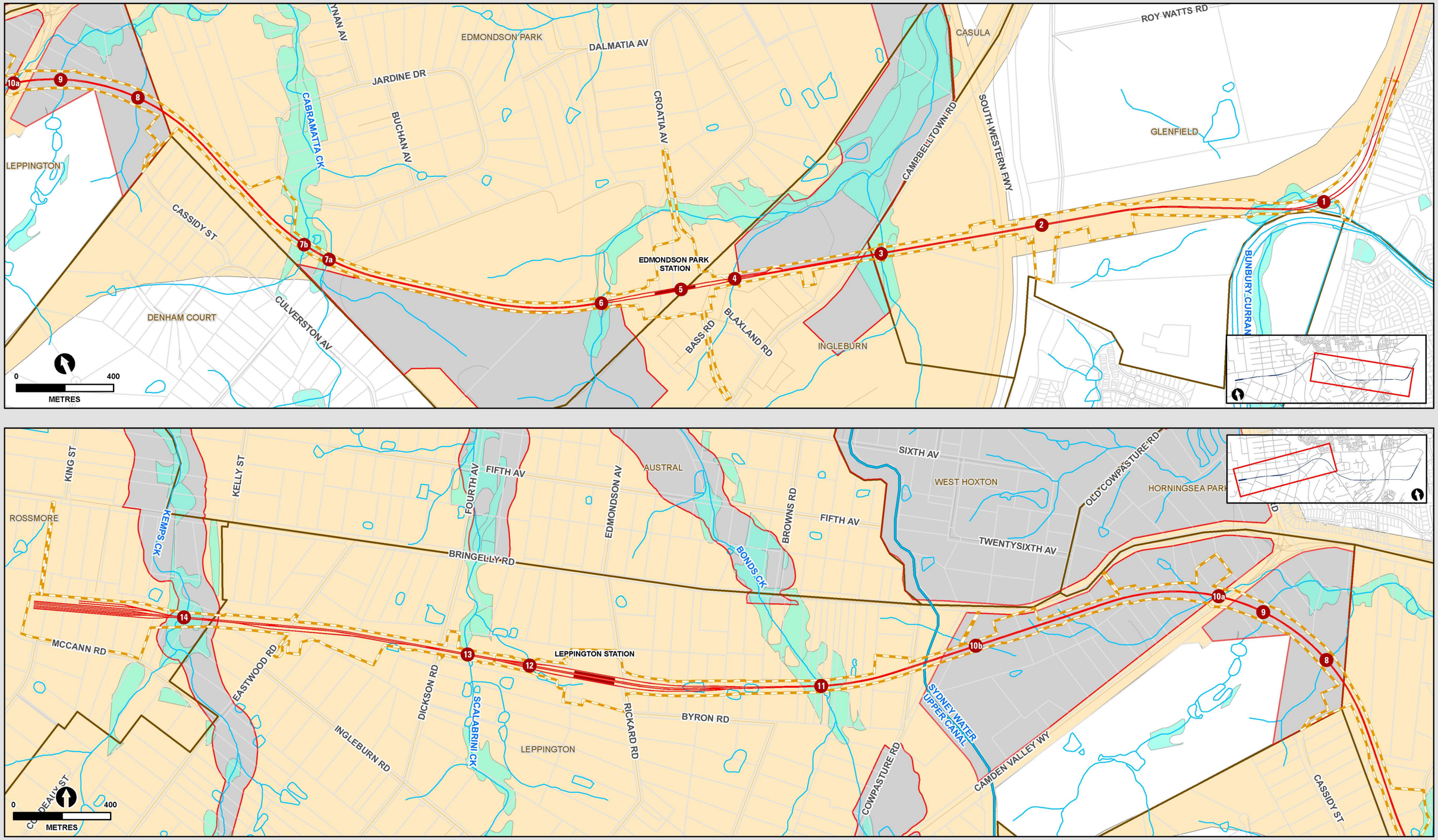

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1 Waterway crossing
Cadastre
Suburbs
Drainage
Proposed track
Clearing footprint
Non-certified areas
Certified areas
River-Flat Eucalypt Forest on Coastal Floodplains

Figure F-3 River-Flat Eucalypt Forest on Coastal Floodplains in the study area

The extend of River-Flat Eucalypt Forest on Coastal Floodplains that will be adversely affected by the proposal includes 2.7 ha in certified areas of the Growth Centre and 1.7 ha in non-certified areas of the Growth Centre.

Threats and recovery of River-Flat Eucalypt Forest on Coastal Floodplains

River-Flat Eucalypt Forest on Coastal Floodplains is subject to a range of ongoing threats, including:

- Further clearing for urban and rural development, and the subsequent impacts from fragmentation
- Flood mitigation and drainage works
- Landfilling and earthworks associated with urban and industrial development
- Grazing and trampling by stock and feral animals (particularly pigs)
- Changes in water quality, particularly increased nutrients and sedimentation
- Weed invasion
- Climate change
- Activation of acid sulfate soils
- Removal of dead wood
- Rubbish dumping
- Frequent burning which reduces the diversity of woody plant species (Department of Environment and Climate Change 2008).

A draft recovery plan has been prepared for the Cumberland Plain (Department of Environment Climate Change and Water 2009) which includes occurrences of this community within the Cumberland Plain. The principles of the draft recovery plan are that:

- The protection and management of large, intact remnants is more effective and efficient than for smaller, fragmented remnants
- Recovery efforts need to aim to ensure that a representative sample of biodiversity is conserved
- Active management to best practice standards is needed to prevent the degradation of bushland in a fragmented landscape
- ·Where impacts on biodiversity cannot be avoided, they should be offset using appropriate means.

Specific actions for this community have been identified by the Department of Environment, Climate Change and Water (see Table F-3).

Table F-3 Priority actions to help recover River-Flat Eucalypt Forest on Coastal Floodplains

Description of priority action[1]	Does action relate to the project?
Collect seed for NSW Seedbank. Develop collection program in collaboration with Botanical Gardens Trust - all known provenances (conservation collection).	Not applicable
Investigate seed viability, germination, dormancy and longevity (in natural environment and in storage).	Not applicable
Enhance the capacity of persons involved in the assessment of impacts on this EEC to ensure the best informed decisions are made.	Relevant available information has been used in the determination and assessment of the assessment of the impact of the project on the ecological community.
Liaise with landholders and undertake and promote programs that ameliorate threats such as grazing and human disturbance.	Not applicable
Prepare identification and impact assessment guidelines and distribute to consent and determining authorities.	The identification guidelines (Department of Environment and Climate Change 2007a) were used in determining the extent of the ecological community in the study area.
Where this EEC occurs in western Sydney, implement relevant Priorities Action Statement actions identified for Cumberland Plain Woodland.	See Table F-1
Undertake weed control for Bitou Bush and Boneseed at priority sites in accordance with the approved Threat Abatement Plan.	No Bitou Bush and Boneseed was recorded in the study area. General weed control and monitoring along the project will be managed through implementation of an Environmental Management Plan.
Use mechanisms such as Voluntary Conservation Agreements to promote the protection of this EEC on private land.	Not applicable. Biodiversity certification of the State Environmental Planning Policy (Sydney Regional Growth Centres) 2006 will assist this action within the Growth Centre.
Determine location, species composition and threats to remaining remnants to assist with prioritising restoration works.	Not applicable.
Collate existing information on vegetation mapping and associated data for this EEC and identify gaps in knowledge. Conduct targeted field surveys and ground truthing to fill data gaps and clarify condition of remnants.	Not applicable.

Source: Department of Environment and Climate Change (2008)

1. Actions may apply to one type of geographic area (CMA, LGA and DECC national park administration area) or to specific land managers only (i.e. Catchment Management Authority, Local Council, National Park or private landowners).

F4.2 River-Flat Eucalypt Forest on Coastal Floodplains state assessment

This assessment is based on the extent of River-Flat Eucalypt Forest on Coastal Floodplains in the non-certified areas in the Growth Centre (1.7 ha, refer Figure F-2).

How is the proposal likely to affect the lifecycle of a threatened species and/or population?

Not applicable to a Threatened ecological community.

How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal will result in the clearing of 1.7 ha of River-Flat Eucalypt Forest on Coastal Floodplains across four areas of non-certified areas within the South West Growth Centre (refer Figure F-3).

River-Flat Eucalypt Forest on Coastal Floodplains occurs along larger drainage lines in the study area that also correspond generally with local wildlife corridors. The project will result in a new movement barrier within these corridors. The use of fish-friendly waterway crossing, such as bridges, will however maintain connectivity for many faunal species utilising these wildlife corridors. In addition, the hydraulic capacity of the waterway crossings have been designed so as to minimise changes to the frequency or intensity of flooding events.

Construction activates have potential to result in conditions that favour the establishment or proliferation of weeds, such as exposed soil and stockpiles. The control of weeds will be managed however through the construction environmental management plan.

Clearing of vegetation required for the project will be a permanent impact to the River-Flat Eucalypt Forest on Coastal Floodplains. However, the proposal is unlikely to affect natural regeneration and recolonisation of existing species in River-Flat Eucalypt Forest on Coastal Floodplains in the adjoining non-certified areas.

Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

River-Flat Eucalypt Forest on Coastal Floodplains occurs in the NSW North Coast, Sydney Basin and South East Corner bioregions and the study area is not at the limit of its distribution.

How is the proposal likely to affect current disturbance regimes?

The proposal is unlikely to affect the existing disturbance regimes of the community. The proposal will not modify the intensity or frequency of fires, nor is it likely to modify the flooding flows.

How is the proposal likely to affect habitat connectivity?

River-Flat Eucalypt Forest on Coastal Floodplains occurs along larger drainage lines in the study area that also correspond generally with local wildlife corridors. The project will represent a new barrier in these corridors. However, the proposal is unlikely to form a barrier to the dispersal of plant propagules (such as seeds) or pollinators (birds, insects and wind) that would reduce the viability of the community.