

6 Threatened fauna

This section provides a detailed assessment of the presence and potential impacts of development on four EPBC listed fauna species that occur within the Growth Centres. These fauna species are:

- Swift Parrot (*Lathamus discolor*);
- Green and Golden Bell Frog (*Litoria aurea*);
- Large-eared Pied Bat (*Chalinolobus dwyeri*); and
- Grey-headed Flying-fox (*Pteropus poliocephalus*)

For each species the following issues are addressed:

- the values of the species in relation to the Growth Centres (e.g. distribution, presence, important areas etc);
- potential impacts to the species;
- proposed measures to mitigate and manage potential impacts;
- proposed offset measures; and
- the conservation outcome for the species.

The information that has been used to inform this assessment has come from a variety of sources. Relevant species profiles, recovery plans and scientific journal articles have provided background information on each species. The key resource used to provide information on species known presence within the Growth Centres was the NSW Wildlife Atlas, as well as any ecological survey reports prepared as part of the detailed precinct planning of the Program.

6.1 SWIFT PARROT

6.1.1 SPECIES DESCRIPTION

The Swift Parrot (*Lathamus discolor*) is listed as endangered under both the EPBC Act and NSW TSC Act. It is also listed as a marine species under the EPBC Act.

The Swift Parrot breeds in Tasmania and over-winters on mainland Australia. The principal over-wintering habitat on the mainland are the box-ironbark forests and woodlands inland of the Great Dividing Range in Victoria and NSW and along the coastal plains (DEWHA 2009c). On the mainland the species occurs in areas where eucalypts are flowering profusely and favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens* (DEC 2005g). It is a highly mobile species able to utilise a variety of nectar sources over large areas.

As a large-scale migrant, the species has the ability to cover vast areas of its winter range seeking suitable flowering eucalypt habitat (DEWHA 2009j). Winter surveys across vast areas of the mainland have recorded markedly different results for sites in any given year. Swift Parrots may stay in an area from a few days to several months. This variability is thought to be driven by changes in food availability across the landscape from one year to the next (DEWHA 2009j).

The *Swift Parrot Recovery Plan* (Swift Parrot Recovery Team 2001) states that while some priority areas have been identified for the species, the variability in the extent and distribution of food sources between years means that many important habitats and sites are still unknown. An action within the Recovery Plan is to identify the extent and quality of foraging habitat for the Swift Parrot.

On the mainland the main threat to Swift Parrots is loss of habitat through clearing for agriculture, urban and industrial development. Collisions with wire netting fences, windows and cars during the breeding season and winter migration (especially where such obstacles are in close proximity to suitable habitat) are also a threat to this species (DEC 2005g).

6.1.2 SWIFT PARROTS WITHIN THE GROWTH CENTRES

The NSW Wildlife Atlas records (NSW Wildlife Atlas 2009) for the Swift Parrot within the Growth Centres and surrounding areas are shown in Figure 53. The species has been recorded twice within the South West Growth Centre in the Edmondson Park Precinct, and once within the North West Growth Centre in the Shanes Park Precinct.

In a regional context, the number of records of Swift Parrot within the Growth Centres is low. Greater numbers of Swift Parrot records occur to the west and south-east of the North West Growth Centre. Within the local area, habitat for this species is conserved in Scheyville National Park, Windsor Downs Nature Reserve and Castlereagh Nature Reserve (NPWS 2007).

The Growth Centres are not known to provide important habitat for the species. However, woodland vegetation across the Cumberland Plain is recognised as providing potential habitat (DEWHA 2009j).

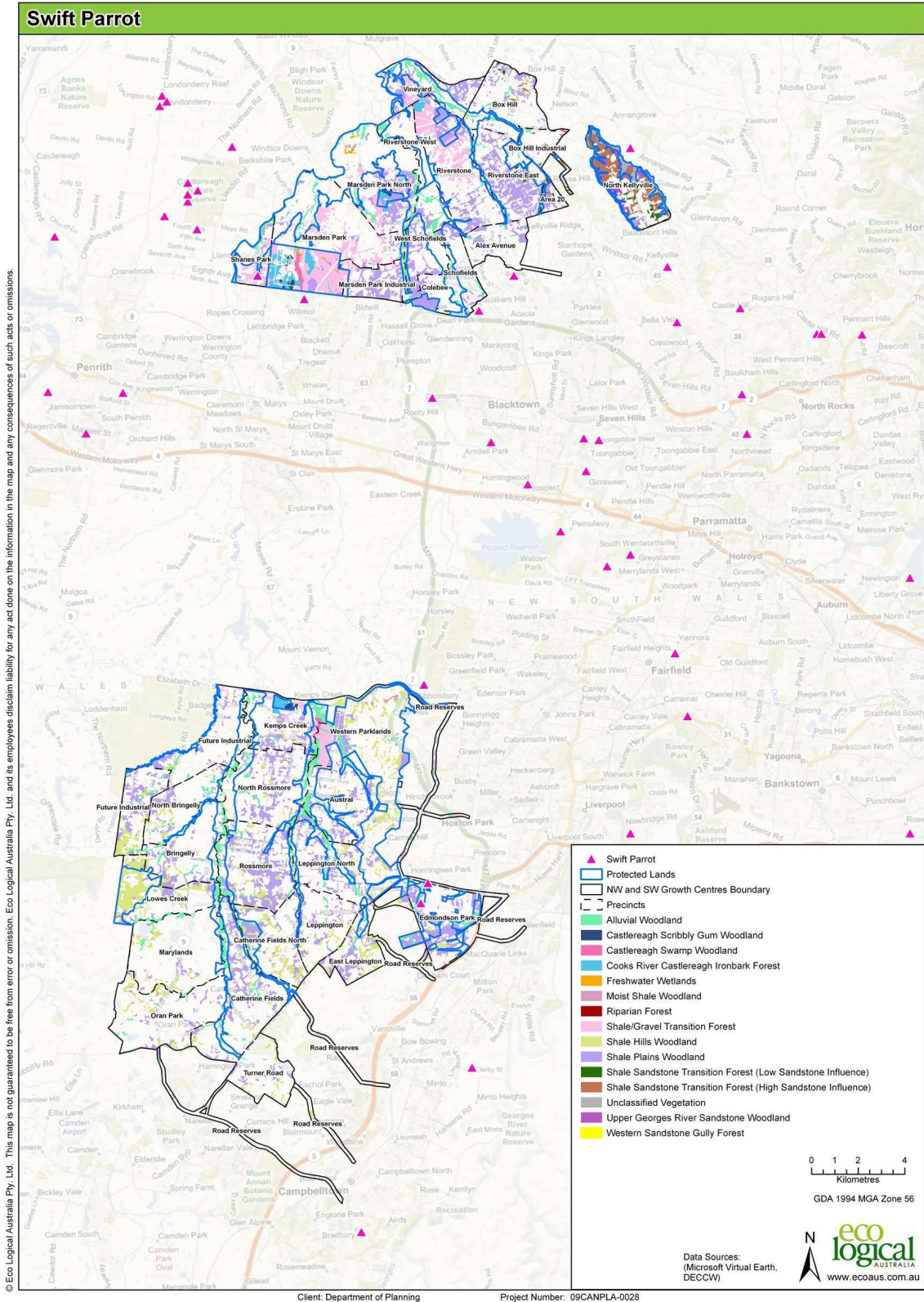


Figure 53: Species distribution and location of NSW Wildlife Atlas records for the Swift Parrot within and surrounding the Growth Centres

6.1.3 POTENTIAL IMPACTS TO SWIFT PARROTS AS A RESULT OF DEVELOPMENT WITHIN THE GROWTH CENTRES

The Program will result in the removal of a range of potential woodland foraging habitat across both the North West and South West Growth Centres. However, these impacts are considered to be low at a landscape scale because:

- the Growth Centres are not known to provide important habitat for the species;
- the species is highly mobile and is able to use a variety of woodland habitats across the landscape;
- much of the vegetation to be lost consists of Low Management Viability areas which are unlikely to persist in the long term; and
- the Program provides for the protection and management of substantial areas of High and Moderate Management Viability woodland both within and outside of the Growth Centres.

6.1.4 PROPOSED MEASURES TO PREVENT, MITIGATE AND MANAGE POTENTIAL IMPACTS TO SWIFT PARROTS

Within the Growth Centres, the Program will ensure the retention of 2,000 ha of native vegetation, including areas of potential foraging habitat for the Swift Parrot. In particular, the areas zoned for conservation through the Growth Centres SEPP contain significant areas of Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest, which is recognised as important habitat for the species (DEWHA 2009j). These areas which will be managed, enhanced and protected in perpetuity include:

- the Air Services Australia site at Shanes Park;
- Environment Conservation areas in Marsden Park North and Riverstone West;
- areas zoned for Public Recreation within Riverstone East, Kemps Creek and Catherine Fields; and
- the proposed Regional Park within the Edmondson Park Precinct.

6.1.5 PROPOSAL TO OFFSET POTENTIAL IMPACTS TO SWIFT PARROTS

Given that potential impacts to the Swift Parrot are expected to be low, offsets specifically targeting habitat for the species is not considered necessary. However, it is recognised that the proposed offset areas outside of the Growth Centres, including areas of Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest, will include potential foraging habitat for the Swift Parrot, and will contribute towards the long-term conservation of potential habitat for the species within the Sydney Basin.

6.1.6 CONSERVATION OUTCOME FOR SWIFT PARROTS

While areas of potential foraging habitat within the Growth Centres will be lost, the Growth Centres are not known to be important for the species and the loss of potential habitat will be small relative to the species' broader range. Potential foraging habitat for the species in the local area is conserved in Scheyville National Park, Windsor Downs Nature Reserve and Castlereagh Nature Reserve (NPWS 2007). The fact that most regional records of the species occur outside of the Growth Centres, and

that habitat is conserved in a number of locations in surrounding areas, suggests that potential habitat within the Growth Centres is not vital for the species.

Within the Growth Centres, 2,000 ha of native vegetation will be retained including significant areas of Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest (which is recognised as important habitat for the species). These conservation areas will be managed, enhanced and protected. Furthermore, offsets outside of the Growth Centres will also contain Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest and other potential foraging habitat for the Swift Parrot and will contribute further towards the conservation of habitat within the Sydney Basin Bioregion.

The Swift Parrot is a highly mobile species that is able to utilise a variety of woodland habitats, and as such it is considered likely that the species will use remaining vegetation remnants within and outside of the Growth Centres with little disturbance to their current activity.

6.2 GREEN AND GOLDEN BELL FROG

6.2.1 SPECIES DESCRIPTION

The Green and Golden Bell Frog (*Litoria aurea*) is listed as vulnerable under both the EPBC Act and endangered under the NSW TSC Act.

The species has been recorded along the south-east coast of Australia, from East Gippsland in Victoria, north to approximately Byron Bay in north-east NSW. There are 43 known key populations in mainly near-coastal locations, including eight within the Sydney region (DEC 2005i). The geographic spread of these locations highlights the highly fragmented distribution of this species.

The Green and Golden Bell Frog requires a number of habitat components for different parts of its life cycle. These include breeding, foraging and refuge habitat (DEC 2005i). The species is found in association with almost every type of water body except fast flowing streams.

Optimum habitat includes water-bodies that are shallow, still or slow flowing, ephemeral and/or widely fluctuating, unpolluted, unshaded, free of predatory fish such as *Gambusia holbrooki*, and contain emergent reeds/sedges. Other associated terrestrial habitat attributes include extensive grassy areas nearby with diurnal sheltering sites such as tussock vegetation, rocks and logs. Some sites, particularly in the Greater Sydney region, occur in highly disturbed areas and can include stormwater detention basins, bunded areas, farm dams, drains and ditches (DEC 2005i).

There are a number of threats to the ongoing survival of the Green and Golden Bell Frog. These include destruction of wetlands and alteration of drainage patterns, predation by exotic fish and other feral animals, herbicides and other weed control measures, road mortality and frog chytrid fungus (DEC 2005h).

6.2.2 GREEN AND GOLDEN BELL FROGS WITHIN THE GROWTH CENTRES

The NSW Wildlife Atlas records (NSW Wildlife Atlas 2009) for Green and Golden Bell Frogs within the Growth Centres and surrounding areas are shown in Figure 54. The species has been recorded in the North West Growth Centre at Riverstone, and there are numerous records outside of the Growth Centres within the broader Western Sydney region. There are no records for the species within the South West Growth Centre.

One of the key populations identified in the *Draft Green and Golden Bell Frog Recovery Plan* (DEC 2005i) is a Western Sydney population believed to be operating as a “metapopulation” (spatially separated populations that are linked by dispersal and interbreeding), with population elements transiently identified at St Marys, Mt Druitt, Prospect and Riverstone. The sub-populations are said to be transient in terms of how reliably their population can be detected at a given time. The distance between some sites and the barriers to connectivity may mean that some are operating as isolated entities (DEC 2005i).

Targeted surveys to verify the presence and extent of the known population within the non-certified area of the Riverstone Precinct are a requirement of the Relevant Biodiversity Measures under the Biodiversity Certification. These targeted surveys were undertaken at Riverstone in 2008 (GHD 2008) and 2009 (ELA 2009c) as part of the detailed precinct planning to further determine whether individuals were present at that location, and to define the habitat requirements of the species were it found to be present.

The 2008 surveys consisted of a habitat assessment, tadpole and metamorph surveys, call playback and auditory surveys, and spotlight surveys. No Green and Golden Bell Frogs were recorded during the surveys. Several dams and smaller water bodies across the Riverstone area were found to have the potential habitat values required by the Green and Golden Bell Frog. Very high numbers of *Gambusia* (Plague Minnow) were evident in almost all water bodies as were high levels of algal growth. The presence of these factors limits the suitability of these sites for the species (GHD 2008).

As no individuals were recorded during the survey, a recommendation was provided that further surveys should be undertaken across Riverstone and other areas of the Growth Centres during spring/summer, when the species is more active, to fully establish the extent of the abundance and distribution of the Green and Golden Bell Frog population. Several measures to design and manage suitable Green and Golden Bell Frog habitat values were also recommended.

A survey in the relevant part of the Riverstone Precinct in 2009 (ELA 2009c) used survey techniques that followed the Green and Golden Bell Frog Environment Impact Assessment Guidelines (NPWS 2004) and included three temporally separated survey efforts. Survey techniques included diurnal targeted surveys of potential habitat, call playback, dip netting for tadpoles, and a community survey to identify suspected observations by community members. This survey recorded the presence of two juvenile Green and Golden Bell Frogs on the margins of an ephemeral breeding area, with another possible sighting recorded in a second location. A survey of community members provided another three unconfirmed observations. The report also stated that areas of similar habitat also exist elsewhere within the Riverstone precinct outside of the non-certified area and the wider North West Growth Centre (ELA 2009c).

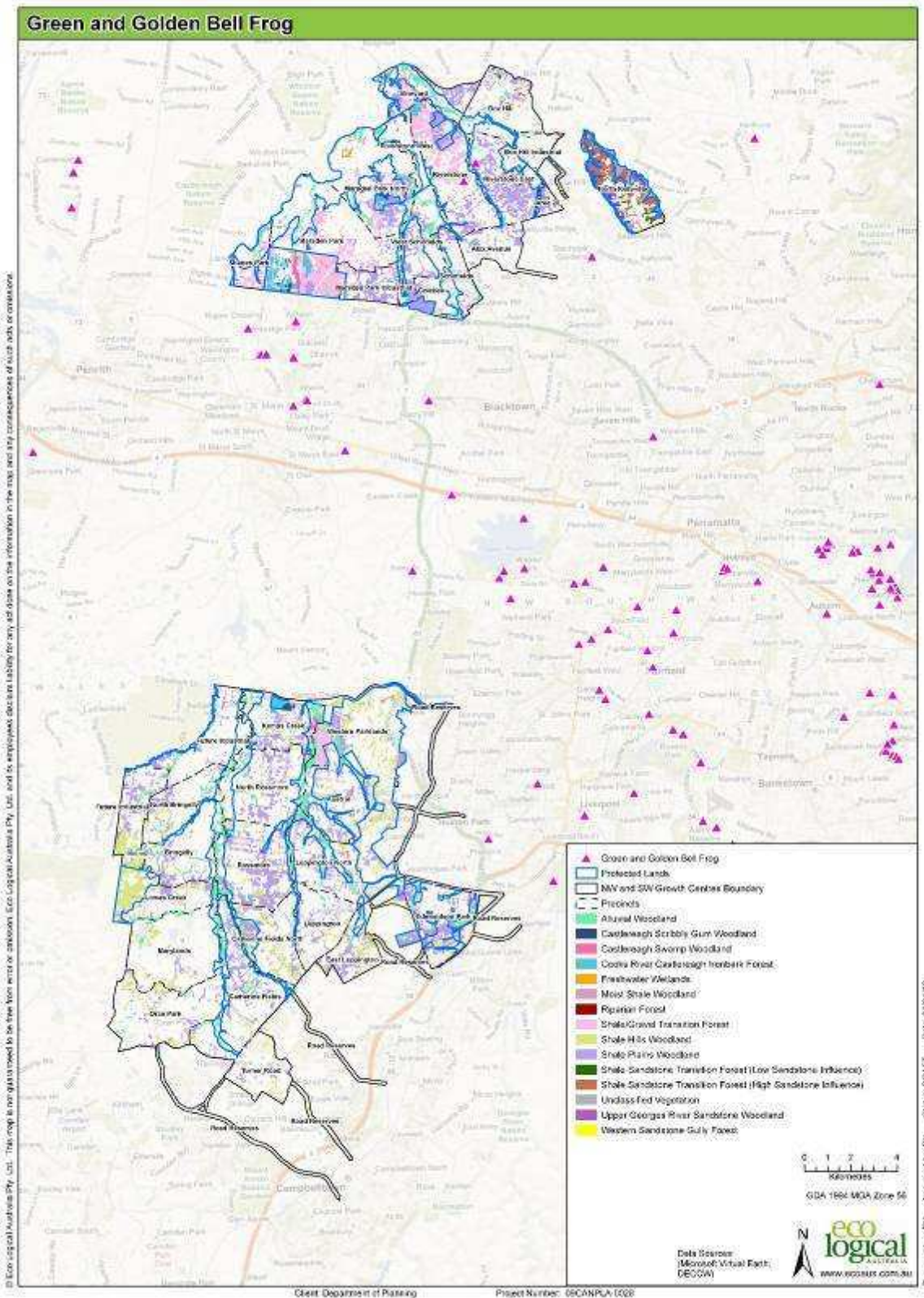


Figure 54: Species distribution and location of NSW Wildlife Atlas records for the Green and Golden Bell Frog within and surrounding the Growth Centres

It was noted in the 2009 study that a residual population of Green and Golden Bell Frogs occurs in a semi-captive situation in a residential property within Riverstone. The yard of this property is set aside almost entirely to provide various habitat elements for the species including numerous ponds surrounded by long kikuyu grass. This population is large and demonstrates regular breeding events and recruitment (ELA 2009c). The high densities of frogs being produced are able to escape from and return to the residential property, and may be responsible for observations of the species in Riverstone as such movements are well within the species movement range (ELA 2009c).

Much of the potential habitat that occurs within Riverstone is located within the vicinity of First Ponds Creek, adjacent to farm dams and associated with other drainage features on the creek floodplain (ELA 2009c). Potential habitat consists of the predominantly cumbungi-lined and pooled sections of the creek itself and around the similarly vegetated flood plain features that retain water after heavy rain and following flooding events. These features include ox-bows, overflow depressions and swales that are likely to be filled during heavy flow events. Some of the floodplain features have been created or modified by human activities, including farm dams, diversion channels, and other bunded areas. Similar habitat features were observed to occur along flood prone areas of other parts of the precinct (ELA 2009c).

The individuals observed during the 2009 study were juveniles but no evidence of functional breeding habitat was found during the survey period. It is possible that the recorded individuals were present due to dispersal from the nearby residential property rather than onsite breeding. Most of the likely breeding habitat in Riverstone was either dry leading up to and during the survey period or otherwise heavily infested with *Gambusia* and Carp (such as the permanent water along First Ponds Creek) that render it less suitable for breeding. No tadpoles were detected in the permanent water bodies. Whilst none of these render the habitat unusable by the Green and Golden Bell Frog, the likelihood is that breeding efforts in these sites would be severely curtailed by predatory threats on eggs and larvae as well as possible chytrid infection that appears to be prevalent in permanent water bodies (ELA 2009c).

The bunded swale area where the juveniles were detected appears to receive overland and partially channelled flow after rain. After a heavy rain event, or a series of smaller ones, this area would collect and hold water for some time. This area, when filled by more substantial inflows, could become an ideal area of ephemeral breeding habitat, free (at least initially) of *Gambusia* and likely to retain water for a suitable period for breeding. Areas that contained permanent water such as farm dams and suitable fringing habitat could provide potential foraging habitat but appear less suitable than ephemeral locations as breeding habitat (ELA 2009c).

6.2.3 POTENTIAL IMPACTS TO GREEN AND GOLDEN BELL FROGS AS A RESULT OF DEVELOPMENT WITHIN THE GROWTH CENTRES

The habitat supporting the two records of Green and Golden Bell Frog in the Riverstone Precinct are located on non-certified land (ELA 2009c). DoP and DECCW have agreed to develop provisions relating to the rehabilitation of habitat for the Green and Golden Bell Frog rather than to protect existing habitat which is generally degraded. Given the urban context, reconstruction of habitat for the species will provide a better environmental outcome than retention of the existing habitat.

However, given the existence of areas of similar habitat elsewhere within the Riverstone Precinct (along much of the flood prone areas) and the wider North West Growth Centre (ELA 2009c) there is some potential for impacts to the species outside of the non-certified area. It is important to note the context of this potential habitat, with many sites likely to be currently degraded. A DECCW sponsored survey of historical Green and Golden Bell Frog sites in Western Sydney (Jurd 2008) failed to detect the species at any of these historical sites and documented the generally degraded or altered habitat condition that was present. Most had factors that reduced habitat quality including lack of fringing

vegetation, presence of predatory fish (*Gambusia*, Carp and Eels), shading by emergent vegetation and lack of over-wintering shelter or basking sites.

Potential impacts to Green and Golden Bell Frog habitat within the Growth Centres include potential small scale disturbances from activities along creeks and within flood prone lands and potential indirect impacts from the adjacent urban areas, such as weed infestation.

6.2.4 PROPOSED MEASURES TO PREVENT, MITIGATE AND MANAGE POTENTIAL IMPACTS TO GREEN AND GOLDEN BELL FROGS

As mentioned above, following the confirmation of Green and Golden Bell Frogs in the Riverstone Precinct (ELA 2009c), DECCW and DoP will determine the most appropriate means of protecting habitat for the Green and Golden Bell Frog as part of the precinct planning.

Provisions are expected to be included in the Precinct Plan to require the protection of Green and Golden Bell Frog habitat to be considered in the assessment of development applications and for future development to be required to be consistent with any recovery plan for the Green and Golden Bell Frog. Provisions are expected to be included in the Precinct DCP that will ensure that surrounding development does not impact on the long term viability of the habitat.

The *Best Practice Guidelines for Green and Golden Bell Frog Habitat* (DECC 2008b) provide advice on how various habitat components (breeding, foraging, refuge and connectivity habitat) can be provided for or enhanced in conjunction with land use requirements. Features such as flood mitigation, drainage and detention devices, can be enhanced to provide habitat features for the Green and Golden Bell Frog, and provide connectivity between remaining populations (DECC 2008b). These will be considered by DECCW and DoP in the finalisation of the precinct planning package.

The Guidelines note that design and rehabilitation works around these Green and Golden Bell Frog habitat should consider factors such as:

- modification of Water Sensitive Urban Design features to include habitat features for the Green and Golden Bell Frog;
- creating or enhancing habitat in or near detention and drainage easements;
- the use of suitable habitat plants in and near water bodies;
- water quality management, including the management of chemical use, such as herbicides, pesticides and fertilisers, as well as excess sediments and nutrients, in runoff from adjacent areas; and
- vegetation management, including considerations of weed and pest control, and not slashing areas with sedges and rushes;

Many water sensitive urban design features are quite compatible with Green and Golden Bell Frog Habitat needs, or could easily be adapted to them (DECC 2008b).

Within the broader North West Growth Centre, potential habitat for the Green and Golden Bell Frog predominantly occurs along creeks and within flood prone lands. As discussed above, many of these potential habitat areas are likely to be currently degraded through the presence of predatory fish and possibly the chytrid fungus, but may provide pockets of suitable habitat.

6.2.5 PROPOSAL TO OFFSET POTENTIAL IMPACTS TO GREEN AND GOLDEN BELL FROGS

Given that creeks, flood prone areas and their associated riparian vegetation will largely be protected, especially in the Riverstone Precinct where an element of the Western Sydney key population occurs, impacts to the species as a result of the Program are expected to be low. As such an offset specifically targeting the Green and Golden Bell Frog is not considered appropriate.

6.2.6 CONSERVATION OUTCOME FOR GREEN AND GOLDEN BELL FROGS

Known and potential habitat for the Green and Golden Bell Frog occurs within the North West Growth Centre. However, much of the potential habitat is likely to be currently degraded due to the presence of weed infestation, agricultural uses, predatory fish and possibly the chytrid fungus. The individuals recorded within Riverstone form part of the Western Sydney key population for the species (DEC 2005c), and it is possible that the North West Growth Centre may contain further sub-populations of this broader population.

No breeding was observed at the Riverstone population and it is possibly sustained by the persistence of a “hotspot” population element existing at a private residence nearby (ELA 2009c). This is most likely emulating what happens at other “more natural” locations and fits the “metapopulation” model of expansion during favourable conditions and contraction to important hot spot areas that operate as refugia during less favourable episodes (DEC 2005i).

Habitat within the Riverstone Precinct is expected to be required to re-established through development controls that require habitat protection and enhancement features to be incorporated, and require development in subject lands to be consistent with any recovery plan for the species and the *Best Practice Guidelines for Green and Golden Bell Frog Habitat* (DECC 2008b). To ensure long term viability of the Green and Golden Bell Frog habitat it is expected that the Precinct Plan will ensure that surrounding development will not adversely affect the quality and condition of the habitat. Major drainage lines and associated vegetation throughout the Growth Centres will also be retained through the development controls applying to flood prone areas. It is considered that these measures will provide improved conditions for potential Green and Golden Bell Frog habitat.

6.3 LARGE-EARED PIED BAT

6.3.1 SPECIES DESCRIPTION

The Large-eared Pied Bat (*Chalinolobus dwyeri*) is listed as vulnerable under both the EPBC Act and NSW TSC Act.

The current and former distributions of the Large-eared Pied Bat are poorly known (DEWHA 2009I). Records exist from Shoalwater Bay (north of Rockhampton, Queensland) through to the vicinity of Ulladulla, NSW. Much of the known distribution of the Large-eared Pied Bat occurs in NSW, where it is generally rare with a very patchy distribution (DEC 2005j).

It is not currently feasible to estimate the total number of mature individuals across the species' range. Within NSW, based on available records, the largest concentration of populations would appear to be in the sandstone escarpments of the Sydney basin and northwest slopes of NSW (DEWHA 2009f). These populations are thought to be important as they support higher numbers of individuals. The Large-eared Pied Bat is unlikely to undergo extreme natural fluctuations in population numbers, extent of occurrence or area of occupancy (DEWHA 2009I).

Little is known about the habitat and roosting requirements of the Large-eared Pied Bat, but natural roosts may depend heavily on sandstone outcrops (DEWHA 2009I). The species is thought to roost in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Hirundo ariel*). The Large-eared Pied Bat may also possibly roost in tree hollows (DEWHA 2009I).

These bats forage in low to mid-elevation dry open forest and woodland close to roosting features and are also found in well-timbered areas containing gullies (DEC 2005j). In NSW the species has been recorded from a large range of vegetation types including dry and wet sclerophyll forest, Cyprus-pine dominated forest, tall open eucalypt forest with a rainforest sub-canopy, sub-alpine woodland, and sandstone outcrop country.

The diet and foraging behaviour of the Large-eared Pied Bat has not been well studied. The relatively short broad wings of this bat suggest that it is manoeuvrable and forages below the canopy. The species has been noted to forage for insects at night around roost sites for a distance of up to several kilometres, however, it is not known if it targets particular groups of insects, such as moths (DEWHA 2009I).

Threats to this species in NSW include (DEC 2005j):

- clearing and isolation of forest and woodland habitats near cliffs, caves and old mine workings for agriculture or development;
- loss of foraging habitat close to cliffs, caves and old mine workings from forestry activities and too-frequent burning, usually associated with grazing;
- damage to roosting and maternity sites from mining operations, and recreational caving activities; and
- use of pesticides.

6.3.2 LARGE-EARED PIED BATS WITHIN THE GROWTH CENTRES

The NSW Wildlife Atlas records (NSW Wildlife Atlas 2009) for Large-eared Pied Bat within the Growth Centres and surrounding areas are shown in Figure 55. There is one record of the species in the North West Growth Centre at Schofields. There are no known records within the South West Growth Centre, and few records from the broader region.

The only area within the Growth Centres that contains sandstone escarpments (thought to be important for roosting) occurs along Cattai Creek in the North Kellyville Precinct. There are no records of the species within this area. However, this does not necessarily negate the area as roosting habitat, as targeted surveys have not been undertaken. Records of the species within several kilometres of the creek could indicate foraging individuals flying in from roosts in surrounding areas containing sandstone escarpments, such as Cattai Creek, however, this is purely speculative.

6.3.3 POTENTIAL IMPACTS TO LARGE-EARED PIED BATS AS A RESULT OF DEVELOPMENT WITHIN THE GROWTH CENTRES

There are a small number of scattered records of the Large-eared Pied Bat within Western Sydney, suggesting that some habitat elements for the species exist within the region. As the bat forages within a range of vegetation types, it is possible that the removal of vegetation within the Growth Centres may remove areas of potential foraging habitat. However, no important populations or important habitat for the species has been identified within the Growth Centres, and as such it is considered that the impact to the species from the loss of vegetation will be low. The Large-eared Pied Bat is a highly mobile species and is able to utilise a variety of habitats, and is therefore expected to be able to utilise remaining habitat patches within and outside the Growth Centres.

The record of the Large-eared Pied Bat at Schofields does not indicate that the site contains important habitat, only that the species uses habitat in the broader area. Even so, the immediate vegetation surrounding this site will be retained as it occurs within flood prone lands. Potential roosting habitat in the sandstone outcrops near Cattai Creek in the North Kellyville Precinct, as well as immediately adjacent potential foraging habitat, will also be retained as the creek and adjacent vegetation are designated as Environmental Management and Environmental Living zones.

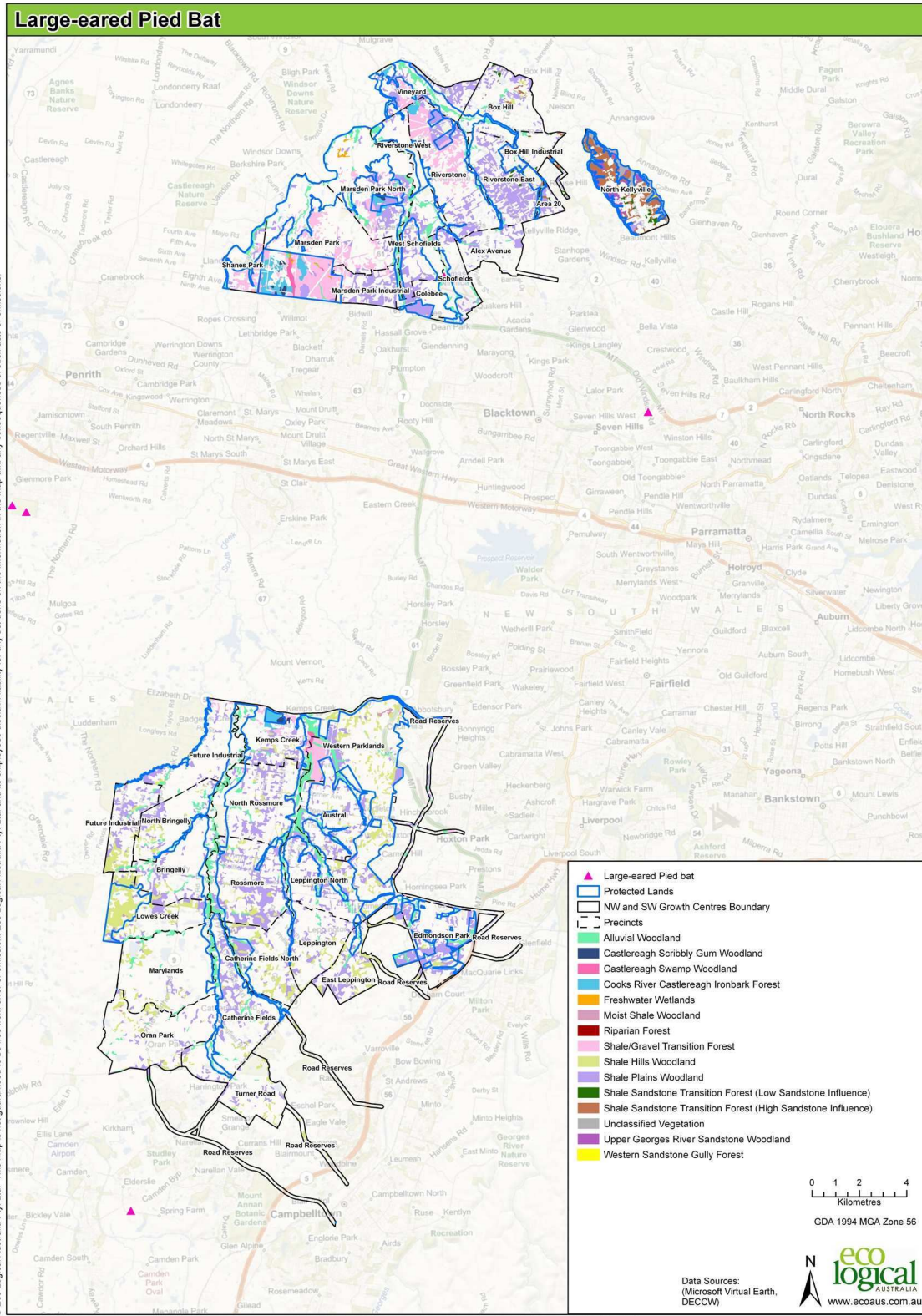


Figure 55: Distribution and location of NSW Wildlife Atlas records for the Large-eared Pied Bat within and surrounding the Growth Centres

6.3.4 PROPOSED MEASURES TO PREVENT, MITIGATE AND MANAGE POTENTIAL IMPACTS TO LARGE-EARED PIED BATS

As stated previously, the one area within the Growth Centres that has recorded the Large-eared Pied-bat will be retained as flood prone land. Potential, but unconfirmed, roosting habitat near Cattai Creek will also receive protection through its Environmental Management and Environmental Living zoning.

The objectives of the Environmental Management zone in North Kellyville are to protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values. It aims to provide for a limited range of development that does not have an adverse effect on those values.

The objectives of the Environmental Living zone in North Kellyville are to provide for low-impact residential development in areas with special ecological, scientific or aesthetic values, and to ensure that residential development does not have an adverse effect on those values.

The clearing and fragmentation of vegetation near roosts is a particular threat to the species (DEC 2005j). Although there is potential roosting habitat in sandstone escarpments on the edge of the North West Growth Centre, it is not known whether the species is actually present there, and greater areas of sandstone escarpment outside of the Growth Centres are considered likely to provide more substantial habitat for the species.

Although the loss of vegetation across the Growth Centres may remove areas of potential foraging habitat for the species, as the Large-eared Pied Bat is highly mobile and able to forage up to several kilometres from its roost (DEWHA 2009l), any individuals present are considered likely to use habitat within the native vegetation that will be retained throughout the Growth Centres.

Within the Growth Centres, the Program will ensure the retention and protection of 2,000 ha of native vegetation, including potential foraging habitat for the Large-eared Pied Bat. In particular, the areas zoned for conservation through the Growth Centres SEPP contain significant areas of woodland which will be managed, enhanced and protected in perpetuity. These areas include:

- the Air Services site at Shanes Park;
- Environment Conservation areas in Marsden Park North and Riverstone Precincts;
- areas zoned for Public Recreation within Riverstone East, Kemps Creek and Catherine Fields Precincts; and
- the proposed Regional Park within the Edmondson Park Precinct.

6.3.5 PROPOSAL TO OFFSET POTENTIAL IMPACTS TO LARGE-EARED PIED BATS

Due to the limited potential roosting habitat within the Growth Centres, and few records of the species within the region, impacts to the species as a result of the Program are expected to be low. Given the retention of vegetation at the site where the species has been recorded (flood prone lands at Schofields), the retention of potential roosting habitat in North Kellyville through designation as Environmental Management and Environmental Living zones, and the retention of areas of potential foraging habitat throughout the Growth Centres, it is considered unlikely that there will be a residual impact to the species and as such an offset specifically targeting the Large-eared Pied Bat is not considered appropriate.

6.3.6 CONSERVATION OUTCOME FOR LARGE-EARED PIED BAT

The NSW Wildlife Atlas records one sighting of the Large-eared Pied Bat within the Growth Centres. Potential, although unconfirmed, roosting habitat also occurs in sandstone outcrops along Cattai Creek. There are no known important populations or important areas of habitat for the Large-eared Pied Bat within the Growth Centres.

The vegetation surrounding the recorded sighting, and vegetation near the potential roosting habitat at Cattai Creek, will be retained through development controls and zoning.

Although the loss of vegetation across other areas of the Growth Centres may remove potential foraging habitat for the species, as the Large-eared Pied Bat is highly mobile and able to forage up to several kilometres from its roost (DEWHA 2009), any individuals present are considered likely to use habitat within the native vegetation that will be retained throughout the Growth Centres.

Within the Growth Centres 2,000 ha of native vegetation will be retained and protected, including significant areas of woodland within conservation zones. These conservation areas will be managed, enhanced and protected in perpetuity. The Large-eared Pied Bat is a highly mobile species that is able to utilise a variety of habitats, and it is therefore considered likely that the species can utilise remaining habitat patches within and outside the Growth Centres.

6.4 GREY-HEADED FLYING-FOX

6.4.1 SPECIES DESCRIPTION

The Grey-headed Flying-fox (*Pteropus poliocephalus*) is listed as vulnerable under both the EPBC Act and NSW TSC Act.

The species is known to occur along the eastern coast of Australia from Bundaberg in Queensland to Melbourne in Victoria (DEC 2005k). Due to the high mobility of the species, there are no separate or distinct populations as individuals move between camps and throughout its geographic distribution (DEWHA 2009m). The most recent national count of Grey-headed Flying-fox numbers was conducted in 2005 and estimated 674,000 individuals (DEWHA 2009m).

The species inhabits a wide range of habitats including rainforest, mangroves, paperbark forests, wet and dry sclerophyll forests and cultivated areas (Churchill 1998, Eby 1998). The Grey-headed Flying-fox is a canopy-feeding frugivore and nectarivore which utilises a range of vegetation types. Its primary food source is the pollen and nectar of native trees, in particular eucalyptus (including the genera *Eucalyptus*, *Corymbia* and *Angophora*), melaleuca and banksia, and the species will also utilise a range of rainforest fruits (DECC 2005k, Eby 1998). Urban gardens and fruit crops also provide foraging habitat for the Grey-headed Flying-fox.

The species roosts in aggregations of various sizes on exposed branches of trees which are often located in gullies, typically close to water, in vegetation with a dense canopy (Churchill 1998). Grey-headed Flying-fox roosting camps are generally located within 20 kilometres of a regular food source, although they can travel up to 50 kilometres in a night to forage (DECC 2005k).

Thirty-nine camps used by Grey-headed Flying-foxes are currently known in the south-east region of NSW, the majority of which occur along the coastal lowlands and ranges (Eby and Law 2008). A small number of camps in the Sydney metropolitan area are occupied continuously, and the majority of these have been established in recent years, apparently in response to increasing volumes of food in the gardens and streetscapes of Sydney. All camps associated with native vegetation in the region have less consistent patterns of occupation and the majority are occupied occasionally or rarely (Eby and Law 2008).

The main threat to the survival of the species is habitat loss and disturbance through the clearing of foraging habitat and roosting locations for development and farming (DEWHA 2009m). Loss of important areas of habitat has also caused increased fragmentation of suitable habitat, resulting in the species having to travel greater distances for food or resorting to alternative sources such as food crops (DEWHA 2009g). Other threats to the species include unregulated shooting and electrocution on powerlines.

6.4.2 GREY-HEADED FLYING-FOXES WITHIN THE GROWTH CENTRES

The NSW Wildlife Atlas records (NSW Wildlife Atlas 2009) for the Grey-headed Flying-fox within the Growth Centres and surrounding areas are shown in Figure 56. The species has been recorded in the eastern portions of the North West and South West Growth Centres. These records do not necessarily indicate that preferred habitat or an important population is present at the site. As the species is highly mobile, these records only indicate that the Grey-headed Flying-fox uses habitat within the area. No camps, important populations or important areas of habitat for the Grey-headed Flying-fox are known to occur within the Growth Centres.

In a regional context, the number of records from within the Growth Centres is relatively low. Higher numbers of records have been recorded outside of the Growth Centres (refer to Figure 56).

There are a number of camps whose occupants may use vegetation within the Growth Centres. The largest and nearest of these are Parramatta, Clyde and Cabramatta. Counts at these camps in 2007 gave averages of approximately 9,000, 7,000 and 16,000 Grey-headed Flying-foxes respectively (Smith 2007). Other large camps exist at Gordon (30,500 individuals), the Royal Botanic Gardens (16,000) and Kurnell (7,750 – now at Kareela) (Smith 2007).

The species uses a broad range of food sources across numerous ecological communities (Eby and Law 2008) and as such it is considered likely that the species uses foraging habitat within the Growth Centres. The importance of potential foraging habitats within the Growth Centres is difficult to assess as the Grey-headed Flying-fox's diet consists of up to 100 species and the timing and location of flowering/fruited species can vary seasonally and between years (DEWHA 2009m). Important foraging sites at any one given time or year may not be visited again in following years. In most months it is not possible to predict what localities will be productive, and therefore what localities will provide essential habitat for the species (DECCW 2009a). However the *Draft National Recovery Plan for the Grey-headed Flying-fox* (DECCW 2009a) states that all foraging habitat has the potential to be productive during general food shortages and to therefore provide a resource critical to survival.

The Growth Centres do not include any known camps or specific foraging areas that are important for this species. While all foraging habitat has the potential to be used, similar foraging habitat for this highly mobile species occurs outside the Growth Centres in numerous conservation reserves and habitat remnants throughout Western Sydney.

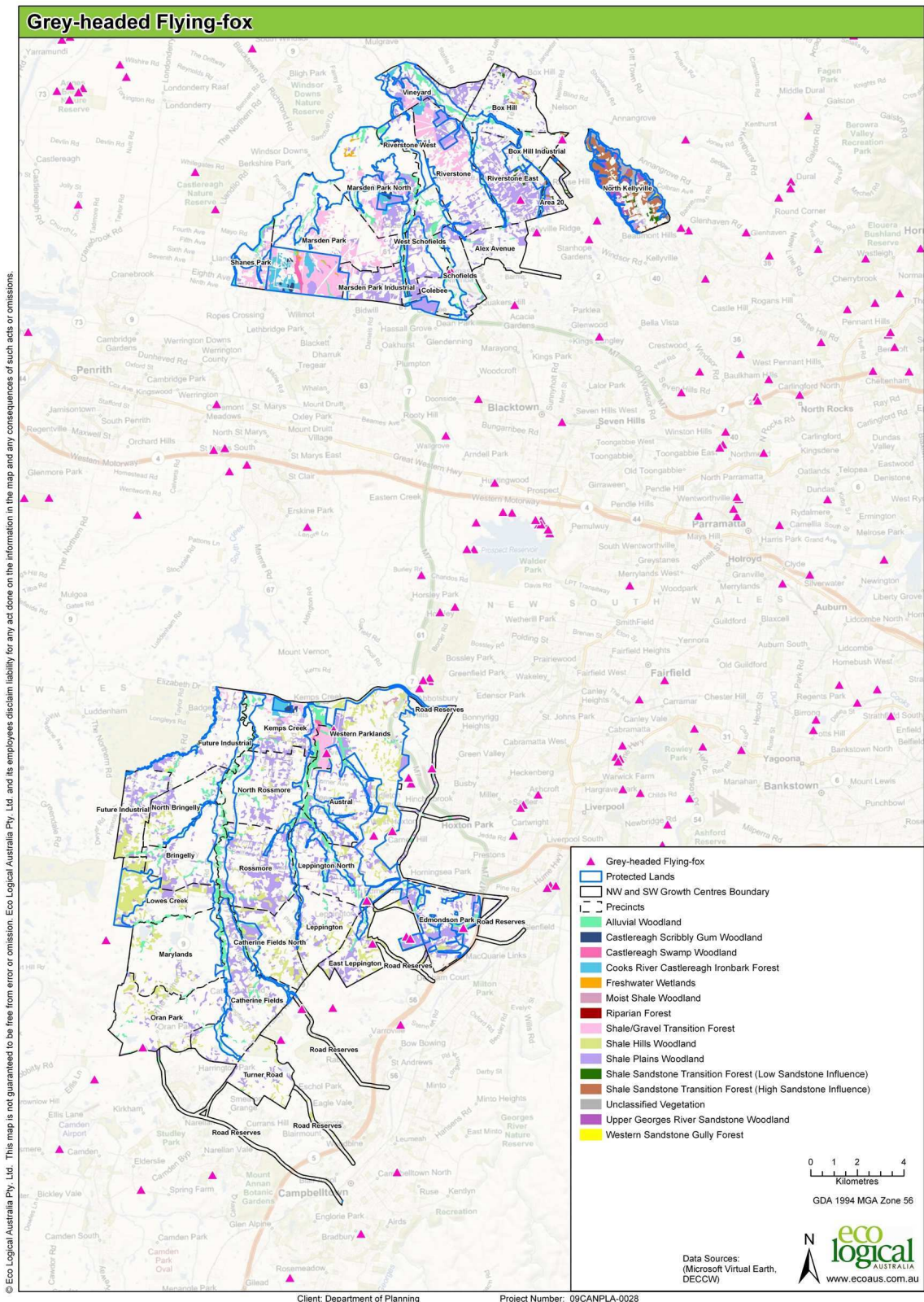


Figure 56: Species distribution and location of NSW Wildlife Atlas records for the Grey-headed Flying-fox within and surrounding the Growth Centres.

6.4.3 POTENTIAL IMPACTS TO GREY-HEADED FLYING-FOXES AS A RESULT OF DEVELOPMENT WITHIN THE GROWTH CENTRES

The Program will remove areas of potential foraging habitat for the Grey-headed Flying-fox. However, no important populations or important areas of habitat for the species have been identified within the Growth Centres, and as such it is considered that the impact to the species due to the loss of vegetation will be low.

The species is highly mobile and is able to utilise a variety of foraging resources in numerous ecological communities. As the nightly foraging movements of the species can cover tens of kilometres, and as there are relatively few records of the species within the Growth Centres compared to surrounding areas of Western Sydney (refer to Figure 56), any Grey-headed Flying-foxes that utilise foraging habitat within the Growth Centres are considered likely to use remaining vegetation remnants and similar habitat within the Growth Centres and the broader region.

6.4.4 PROPOSED MEASURES TO PREVENT, MITIGATE AND MANAGE POTENTIAL IMPACTS TO GREY-HEADED FLYING-FOX

Within the Growth Centres, the Program will ensure the retention of 2,000 ha of native vegetation, including large areas of potential foraging habitat for the Grey-headed Flying-fox. In particular, the areas zoned for conservation through the Growth Centres SEPP contain significant areas of potential foraging habitat. These areas which will be managed, enhanced and protected in perpetuity include:

- the Air Services site at Shanes Park;
- Environment Conservation areas in Marsden Park North and Riverstone Precincts;
- areas zoned for Public Recreation within Riverstone East, Kemps Creek and Catherine Fields Precincts; and
- the proposed Regional Park within the Edmondson Park Precinct.

6.4.5 PROPOSAL TO OFFSET POTENTIAL IMPACTS TO GREY-HEADED FLYING-FOXES

As there are no known camps within the Growth Centres, no important populations are likely to be detrimentally impacted by the Program. While some potential foraging habitat within the Growth Centres will be removed, this habitat is not considered to be important habitat, and the species' high mobility in nightly foraging movements suggests that it may travel between areas of vegetation retained within the Growth Centres as well as between vegetation remnants in the broader Western Sydney region. Impacts to the Grey-headed Flying-fox are expected to be low, and as such offsets specifically targeting habitat for the species are not considered necessary.

However given the broad range of habitat that the species will forage in, it is recognised that the proposed offset areas outside of the Growth Centres will include potential roosting and foraging habitat for the Grey-headed Flying-fox, and will contribute towards the long-term conservation of potential habitat for the species within the Sydney Basin Bioregion.

6.4.6 CONSERVATION OUTCOME FOR GREY-HEADED FLYING-FOXES

The NSW Wildlife Atlas records a number of sightings of the Grey-headed Flying-fox across the eastern portion of the North West and South West Growth Centres, however these records are relatively low in number compared to areas outside of the Growth Centres (refer to Figure 56). The Growth Centres are not known to support any camps, important populations or important areas of habitat for the species.

While some potential foraging habitat within the Growth Centres will be removed, this habitat is not considered to be important habitat, and the species' high mobility in nightly foraging movements suggests that it may travel between areas of vegetation retained within the Growth Centres as well as between vegetation remnants in the broader Western Sydney region.

The 2,000 ha of native vegetation that will be retained and protected within the Growth Centres is likely to provide continued access to foraging habitat for this broad ranging species. In particular, the areas zoned for conservation through the Growth Centres SEPP contain significant areas of woodland habitat. These areas, including the Air Services site at Shanes Park, Environment Conservation areas in Marsden Park North and Riverstone, and the areas zoned for Public Recreation within Riverstone East, Kemps Creek and Catherine Fields, will all be managed, enhanced and protected in perpetuity.

The Grey-headed Flying-fox forages on a considerable range of species and through many different ecological communities. Lands retained as offsets are likely to provide security to more foraging sites for the species, providing a beneficial outcome for the species.

PART C – ESD & INFORMATION REVIEW

7 Promoting ecologically sustainable development

The Sydney Growth Centres Program represents a new approach to greenfield land release that aligns population growth with the development of housing, employment, infrastructure and services. The socio-economic analysis of the Program aims to explain how this approach will derive strong environmental, social and economic outcomes from well integrated, efficient and effective planning that balances the needs for conservation with population growth.

7.1 UNDERSTANDING THE NEED FOR THE PROGRAM

Western Sydney is an important contributor to the national economy. The region generates around 9% of the national gross domestic product and is significant in scale terms nationally (Urban Research Centre 2008). The share of GDP is closely related to the share of population, therefore as the population of Western Sydney continues to grow the contribution towards the nation's GDP is also expected to grow. Therefore the success of Western Sydney is considered to be significant on a national scale.

Greenfield land release in Sydney has traditionally occurred in an ad-hoc and uncoordinated way, which has meant the NSW Government and local councils have had limited ability to consider issues at a regional scale, including ecologically sustainable outcomes in development approaches. An uncoordinated approach also meant that development occurred across different local government areas creating a simultaneous need and demand for infrastructure provision (DoP 2005). Funding of which was wholly borne by the Government and competed for funding with other critical services such as education, health and transport.

In addition to these challenges, the NSW Government also identified a range factors involved in greenfield land release that needed to be addressed in order to deliver ecologically sustainable development in Western Sydney. These included:

- Increasingly large houses on small blocks of land, with little space available between the dwellings for landscaping that would add to the amenity of the area;
- Houses not designed to use energy and other resources efficiently;
- Lack of housing diversity to cater for an ageing population and smaller sized households;
- Lack of local jobs;
- Lack of facilities and services within easy reach of local residents;
- The inability of new development to support good public transport services leading to significant car dependency;

- High rates of car travel contributing to poor air quality;
- Poor quality walking and cycling facilities; and
- Inability to achieve well connected large scale conservation outcomes as issues are addressed on a site by site basis, without the ability to connect larger areas together (DoP 2005).

In 2005, the NSW Government announced the Growth Centres Program as a new approach to land release that aligns the projected population growth with the provision of infrastructure and services. A key change to the legislative and institutional arrangements that enabled a more focussed and coordinated approach, was the introduction of new funding arrangements, through a Special Infrastructure Contribution, for regional infrastructure which requires developers to contribute to the funding of infrastructure.

The Sydney Metropolitan Strategy (State of NSW 2005b) outlines significant expected population growth in the Sydney metropolitan region over the next 25 years. Recent Census data has been analysed and Sydney's population is now forecast to grow to 5.7 million by 2031 and 6 million by 2036. This is an increase of 1.7 million people from 2006 (DoP 2010). The highest level of growth is expected to occur in Western Sydney and by 2036, almost half of Sydney's population (49%) will live in Western Sydney (DoP 2010).

This population growth has an immediate impact on housing, employment, infrastructure and open space requirements. The increase in population will lead to a demand for an estimated 770,000 new dwellings by 2036. The bulk of these will be provided for within existing urban areas (60-70%). It is anticipated that 30-40% of the required dwellings will be constructed within greenfield land release programs, predominantly in the Growth Centres. This increase in population will also generate demand for employment and it is projected that over 760,000 new jobs will be required by 2036 (DoP 2010).

The decision to identify the Growth Centres for urban development was made in the broader Metropolitan Sydney context, in particular the need to focus greenfield development in specific areas to enable the protection of agricultural lands and natural resources in other locations. Concentrating urban growth in the North West and South West Growth Centres will reduce the potential for land use conflict to arise through poorly planned development of residential and rural residential land uses within rural areas.

The anticipated level of population growth requires structured and clear planning to ensure that ecologically sustainable development is successfully delivered for future communities. This is captured in the aims of the Sydney Metropolitan Strategy which are to: enhance liveability; strengthen economic competitiveness; ensure fairness; protect the environment; and improve governance. The Growth Centres are a key component of the Metropolitan Strategy and are central to the Strategy's aim to accommodate 30% of housing growth in sustainable greenfield areas.

Another key driver for the development of the Program is the need to address housing affordability, as strong economic growth over the last ten years has seen house prices rise across Sydney (NSW Government 2010). A key priority of the NSW State Plan is to improve housing affordability through increasing the supply of affordable housing for low and moderate income households. To achieve this, the target is for the NSW Government to provide land for 55,000 dwellings, zoned and serviced with trunk infrastructure with potential for development (NSW Government 2010). The Growth Centres is a key contributor to this target.

7.2 THE PROGRAM VERSUS THE ALTERNATIVE

The Growth Centres Program was developed to ensure that the high level of growth in the Sydney Metropolitan region was planned and managed in a structured and coordinated way, which responded to the challenges of greenfield land release.

The urban development of the Growth Centres will achieve the principles of ecologically sustainable development through:

- The orderly sequencing of land release in time with the provision of infrastructure, to ensure the efficient use of Government resources;
- A sustainable urban structure including a mix of housing types; employment areas; open spaces, community services and infrastructure;
- Focus greenfield development in areas either already or proposed to be connected to the Sydney rail network
- The protection of biodiversity, regional open space and water resources; and
- Contributions from new development for regional and local infrastructure in recognition of the value uplift created through the rezoning.

The alternative to the Program would be the continuation of uncoordinated land release and site by site assessment of conservation values. Managing growth in such an ad-hoc way would be unable to achieve or promote the principles of ecologically sustainable development at the scale that can be achieved through the Growth Centres Program and be unable to deliver significant and real conservation outcomes. In addition, the costs to Government and industry in undertaking site by site assessments would be significantly higher.

Planning for the Growth Centres involves a whole of government approach, to ensure that the provision of infrastructure can be incorporated into wider State agency planning and budgets so that elements like new roads, public transport, parks, water, sewer and community services are in place to meet the needs of new residents.

The NSW Government is committed to undertaking a strategic assessment for the Growth Centres. By addressing biodiversity at the strategic planning stage, unavoidable impacts can be assessed and resources can be pooled to obtain offsets which are viable and cost-effective. Development can then proceed without further assessment, streamlining the process, significantly improving housing supply and affordability. The administration costs of piecemeal assessment and compliance assurance, which can be costly and deliver less significant outcomes, is avoided. This approach is new, requiring flexibility to enable real, not paper, biodiversity conservation outcomes to be secured. These benefits would be unable to be achieved through site by site assessment.

7.3 PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The EPBC Act emphasises the importance of the principles of ecologically sustainable development. These principles are based on the 1992 *Inter-Governmental Agreement on the Environment* and have been integrated into the approach and planning of the Growth Centres. This agreement defines the goal of ecologically sustainable development as 'development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends'.

Both the EP&A Act and the NSW TSC Act include objectives 'to encourage ecologically sustainable development' and 'to conserve biological diversity and promote ecologically sustainable development'.

The Growth Centres Program incorporates a range of mechanisms to achieve and promote the five principles of ecologically sustainable development and these are discussed in this section.

Integration of both long and short-term economic, environmental, social and equitable considerations

Both short and long term economic, environmental, social and equitable considerations have been considered in the development of the Program.

The Program has a key role to play in ensuring the efficient management of population growth in Sydney. The Program and associated transport projects will improve access to areas within the Growth Centres and areas with dense economic activity. A key element of the Metropolitan Strategy and the NSW State Plan is the provision of jobs closer to home. This approach will be implemented in the Growth Centres through the development of employment lands, industrial areas and a range of town centres. The need for new dwellings has led to the establishment of the Growth Centres and the planning delivery approach being implemented in the Growth Centres will generate sustainable communities. Employment land will be strategically located, town centres and walkable neighbourhoods, along with conservation, open space and infrastructure, will be intrinsic to the urban fabric and create communities not just housing. The identification and location of employment lands will enable the development of local jobs and support economic development within the Growth Centres. Productivity will also be enhanced by reducing journey to work travel times.

Efficient and timely provision of regional and local infrastructure such as transport links has broad benefits. Focusing Government investment where new communities are being developed will ensure the best utilisation of infrastructure and services. Infrastructure will be provided sequentially to support precinct release and NSW Government agencies such as Department of Planning, Roads and Traffic Authority, Sydney Water and Transport Infrastructure Development Corporation are working together to coordinate infrastructure delivery and planning. One example of this is the NSW Government's substantial investment into transport infrastructure to support Sydney's Growth Centres. Infrastructure investment to support the Growth Centres includes: land acquisitions for the North West and South West Rail Links and road upgrades including, Windsor Road, Quakers Hill Parkway, Camden Valley Way, and Narellan Road.

This investment will increase over the next five years with the South West Rail Link, commuter car parks and further road upgrade programs. This scale of investment into infrastructure to allow for Sydney's Growth Centres to develop in a coordinated strategic approach would have been unlikely if the alternative ad hoc approach to greenfield development continued.

It is essential that this investment has an adequate population to support the level of investment. In relation to sustainable transport modes such as rail and bus, patronage should be maximised by focussing growth and infrastructure together. Any potential reduction in housing or employment capacity within the Growth Centres could trigger the need for greenfield development elsewhere with its associated environmental and infrastructure impacts.

From an environmental viewpoint, the urban development of the Growth Centres will result in less consumption of energy and other resources through:

- Providing for employment opportunities locally that will reduce the demand for travel and journey to work times. For example in the North West Growth Centre, Riverstone West, Marsden Park Industrial and Box Hill Industrial Precincts will provide key employment areas and the planning for these precincts has been undertaken in the early stages of the implementation of the Program.

- Promotion of cycling and walking through the design of the street networks and subdivision layout
- Use of BASIX, the NSW wide building sustainability index, to reduce energy and water consumption in individual dwellings by 40 per cent.
- Recycled water initiatives being developed by the NSW Government through the Metropolitan Water Plan for Sydney.

By including the above considerations, the Program has integrated economic, environmental, social and equitable considerations.

If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation

The precautionary principle has been considered in the development of the Growth Centres Program. Impacts on biodiversity were a major factor in the development of the Growth Centres SEPP. When the SEPP was first made in 2006, key areas of high biodiversity value were zoned and protected through development controls. The Growth Centres Development Code provides for further consideration of biodiversity and conservation at the precinct planning stage.

Through the Biodiversity Certification of the Growth Centres, better conservation outcomes are achieved through the consideration of cumulative impact, ecological sustainability and the longer term conservation vision for the area, at a landscape scale early in the planning process.

The goal of the Growth Centres Offset Program is to contribute to the protection and long-term management of high conservation value native vegetation within the Cumberland Plain and surrounding regions (DECCW 2009). It is considered that the conservation fund and the Growth Centres Offset Program overcome the threat of serious environmental damage related to the urban development of the Growth Centres.

The Growth Centres Biodiversity Certification resolves biodiversity issues early in the planning process. This ensures that all future development is undertaken with consideration to prevent environmental degradation. The \$530 million (in 2005/06 dollars) conservation fund established through the Special Infrastructure Contribution is a direct response to the expected biodiversity impact.

The Program's early assessment process provides cost and resource efficiencies and also ensures scientific understanding of the biodiversity requirements at the outset of planning, with the aim to avoid isolated site-focused assessment late in the development process.

Conservation outcomes are stated and reported throughout the implementation of the Program which will assist the NSW Government in monitoring the progress of environmental protection and apply measures to reach the outcomes efficiently.

The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations

The Growth Centres are established to support the principle of inter-generational equity. The planning for the Growth Centres is carried out with regard to the Metropolitan Strategy's sustainability criteria (NSW Government 2005). The decision to release and undertake the detailed planning of a precinct is made with regard to the following considerations:

- Infrastructure provision with mechanisms in place to ensure utilities, transport, open space and communication are provided in a timely and efficient way;
- Access – accessible transport options for efficient and sustainable travel between homes, jobs, services and recreation;
- Housing diversity – provide a range of housing choices to ensure a broad population can be housed;
- Employment lands – provide regional/local employment opportunities to support Sydney’s role in the global economy;
- Avoidance of Risk – avoid land use conflicts and risk to human health and life;
- Natural Resources – natural resource limits not exceed / environmental footprint minimised;
- Environmental Protection – protect and enhance biodiversity, air quality, heritage and waterway health; and
- Quality and Equity in Services – quality health, education, legal, recreational, cultural and community development and other government services are accessible.

The criteria provide a clear framework for promoting the principle of inter-generational equity, as well as integrating long and short-term economic, environmental, social and equitable considerations. It is considered that the urban development of the growth centres in accordance with these principles will promote ecologically sustainable development.

Supporting new housing development with adequate infrastructure and services is crucial in meeting the broader social goal of liveability. A major benefit of the Program is the Special Infrastructure Contribution which provides funding for investment in infrastructure to support these new communities. This will ensure investment is not diverted and discontinued due to ad hoc development, but can be focused on the areas that require transport, service and facility investment to ultimately enhance liveability for residents in the new areas.

The biodiversity offsets package established through the Certification includes major commitments to protect lands of biodiversity value both within and outside the Growth Centres. These lands will deliver significant long term benefits for future generations by protecting lands that will provide a biodiversity and recreational resource within the Growth Centres and targets the best condition remnants for conservation purposes outside the Growth Centres. These lands will be owned and managed by Government for the primary purpose of conserving biodiversity values.

Through the retention of 2,000 ha of existing native vegetation within the Growth Centres and the establishment of the \$530 million (in 2005/06 dollars) conservation fund to protect the best and most viable remnants of vegetation, the Program provides opportunities for the long term survival of threatened ecological communities and threatened species in the Cumberland Plain. Furthermore, the scale of the offsets package will ensure the protection of significant conservation areas in perpetuity.

The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making.

The Growth Centres Program focuses on the conservation of biological diversity and ecological integrity of the ecological communities and threatened species that occur within the region, while still enabling sustainable urban development to be delivered.

As described above, conservation of key areas of biodiversity was an important consideration in the development of the Growth Centres SEPP. Remnant vegetation with a High Management Viability was identified and zoned for protection, and a commitment was made to retain 2,000 ha of native

vegetation across the two Growth Centres. In addition, the biodiversity offsets package aims to provide long term biodiversity outcomes within the Sydney Basin and Hawkesbury Nepean Catchment area.

Part B of this report provides an analysis of the outcomes of the Program in relation to matters of national environmental significance. It is concluded that the combination of biodiversity conservation measures within and outside the Growth Centres will provide appropriate outcomes for the matters protected by the EPBC Act.

Overall it is considered that the framework for the implementation of the Program provides equitable consideration of environmental, social and economic objectives and demonstrates that urban development to meet the needs of population growth can be delivered while protecting biodiversity values.

Improved valuation, pricing and incentive mechanisms should be promoted

The Special Infrastructure Contribution (SIC) allows the NSW Government to identify regional infrastructure needs over time whilst providing certainty for developers. The SIC removes uncertainty as contributions are explicitly documented. Transaction costs will be minimised by imposing a one-off payment rather than an ongoing levy. This has a positive impact on housing affordability

The biodiversity offsets program is one of the leading programs in Australia linking offsets directly with development. The conservation fund for the Growth Centres Offset Program is established through the SIC. The SIC applies to developable lands across the Growth Centres, resulting in the costs of conservation outcomes being equitably shared across the Growth Centres.

8 Addressing uncertainty

The Program will be implemented over a 30+ year time frame and conservation actions will continue in an ongoing way once this period ends. Long timeframes such as this are subject to an inherent level of variability and uncertainty.

This section outlines:

- The key uncertainties in relation to the protection of matters of national environmental significance and discusses the proposed responses to these issues. It should be noted that the adequacy of information used in this strategic assessment is discussed in detail in section 9, and is therefore not discussed in this section; and
- The circumstances and procedures in which the Program will be reviewed, modified or abandoned.

8.1 KEY UNCERTAINTIES

SECURING OFFSETS

Perhaps the major uncertainty in relation to the Program is the exact nature of offsets to be delivered over the next 30+ years. Securing offsets (either through acquisition or conservation agreements) relies on a range of factors, including the willingness of both private and public landholders to engage in the Program. This uncertainty means that it is very difficult to specify the exact biodiversity outcomes to be achieved through the offsets component of the Program.

Despite the difficulty in predicting the final outcome in relation to offsets, it is considered that the offsets package will provide substantial biodiversity outcomes for the Cumberland Plain and more broadly in the Sydney Basin Bioregion and Hawkesbury-Nepean Catchment.

NSW Government measures that are in place to ensure the success of the offsets package include:

- Dedicated and secure funding - \$132.5 million (in 2005/05 dollars) for the purchase of conservation areas within the Growth Centres and \$397.5 million (in 2005/06 dollars) for the purchase of offsets within similar ecological values outside of the Growth Centres;
- Sound governance arrangements around the program including management of the funding by DECCW;
- Linking of offsets funding to development to ensure that the pace of conservation is linked to the pace of environmental impact;
- A balanced approach to securing offsets within and outside of the Cumberland Plain to ensure the maximum biodiversity benefit is provided; and
- A minimum commitment to offsetting EPBC listed Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest.

CLIMATE CHANGE

The NSW Government has recognised the challenges of protecting biodiversity within the context of climate change (e.g. DECC 2007). However, there is a level of uncertainty about the extent that climate change may exacerbate the potential impacts of the Program on matters of national environmental significance.

Given the long time frames involved and the uncertainty associated with climate change predictions, it is difficult to determine how climate change may further impact issues such as Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest. However, it is certainly possible that issues such as increasing variability in climate will place additional pressure on these matters.

The NSW Government's approach under the Program to focus on the conservation of the larger more viable remnants of vegetation (both within and outside the Growth Centres) is considered to provide the best opportunity to protect ecosystems within the Cumberland Plain within the context of climate change. As discussed previously throughout this report, protection of larger areas of vegetation that can be managed for conservation enables robust, long term conservation outcomes for matters of national environmental significance.

8.2 REVIEW, MODIFICATION OR ABANDONMENT

A review framework for the Program is outlined in Section 2.7 of the report. This framework provides for a review every four years and would provide the opportunity to modify the Program where it was considered necessary.

Abandonment of the Program is not envisaged. It could be expected that only in exceptional circumstances would abandonment be considered and only after all other options had been exhausted.

It is considered that the implementation of the mechanisms outlined in the Program including regular monitoring and reporting will reduce the possibility of abandonment and significantly reduce the possibility of unforeseen substantial impacts to matters of national environmental significance.

9 Information sources

A wide range of information was used to inform the development of this Draft Strategic Assessment Report. The information base is considered to be appropriate for a landscape level analysis of the values, impacts and conservation outcomes for matters of national environmental significance.

This section provides a brief discussion of the adequacy of the key information sources that have been used, including:

- the source of the information;
- how recent the information is; and
- the reliability and limitations of the information.

Referencing is used throughout the text and a full reference list is available at the end of the report.

9.1 CONTEXT

The report draws on a large number of sources to provide contextual information about the Program and the environment in Western Sydney. The currency of these sources varies widely. However, their reliability is considered to be generally high. Information that was considered to be of low reliability was excluded from use in the report.

Key sources, their content and reliability are summarised in Table 16. Specific discussions in relation to vegetation mapping and threatened species records are presented in Sections 9.2 and 9.3 respectively.

Table 16: Key information sources for matters of national environmental significance

SOURCE	SCOPE	CURRENCY, RELIABILITY & LIMITATIONS
Australian Heritage Database	<ul style="list-style-type: none"> • Contains information about more than 20,000 natural, historic and Indigenous places • Includes (among other things): <ul style="list-style-type: none"> ○ places in the World Heritage List ○ places in the National Heritage List ○ places in the Commonwealth Heritage list ○ places in the Register of the National Estate 	<ul style="list-style-type: none"> • Range of publication dates • High reliability in relation to listed heritage places and their values within the Growth Centres • Low uncertainty
Draft and final recovery plans for threatened species and specifically for the Cumberland Plain	<ul style="list-style-type: none"> • Provide important contextual information in relation to threatened species and ecological communities • Identify (where possible) important populations or habitat areas within the landscape • Outline the key threats and recovery actions for species and ecological communities 	<ul style="list-style-type: none"> • Range of publication dates • Moderate to high reliability in relation to broad level information • Key limitation relates to site level information • However, site level information is presented for some species. Particularly in relation to the location of important areas (populations, habitat etc)

<p>Draft Growth Centres Conservation Plan</p>	<ul style="list-style-type: none"> • Outlined the biodiversity values of the Growth Centres relating to NSW legislation • Proposed a range of conservation mechanisms 	<ul style="list-style-type: none"> • Published in 2007 • Considered reliable in relation to issues protected under NSW legislation and the majority of matters protected under the EPBC Act • Out of date in relation to the new listing of EPBC Act <i>Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest</i>
<p>Draft Sydney Growth Centres Program Report</p>	<ul style="list-style-type: none"> • Provides a detailed description of the Sydney Growth Centres Program and its implementation mechanisms • Presents proposed conservation outcomes for matters of national environmental significance • Outlines the monitoring and reporting framework associated with the Program 	<ul style="list-style-type: none"> • Current draft report • High reliability • Low uncertainty
<p>EPBC Act Environmental Reporting Tool</p>	<ul style="list-style-type: none"> • Provides a list of the potential matters of national environmental significance occurring within the vicinity of the Growth Centres 	<ul style="list-style-type: none"> • Based on data with a range of currency • Useful for broad level context, but moderate to high uncertainty for site specific information
<p>EPBC Act threatened species and ecological community listing information</p>	<ul style="list-style-type: none"> • Provide important contextual information in relation to threatened species and ecological communities • Provide further detail about the reasons for listing 	<ul style="list-style-type: none"> • Range of publication dates • Moderate to high reliability in relation to broad level information • Key limitation relates to site level information
<p>NSW and Commonwealth profiles for threatened and migratory species, and ecological communities</p>	<ul style="list-style-type: none"> • Provide important contextual information in relation to threatened and migratory species, and ecological communities • Establish a baseline understanding of issues affecting these matters across their range 	<ul style="list-style-type: none"> • Range of publication dates • Moderate to high reliability in relation to broad level information • Key limitation relates to site level information
<p>Other publications (including journal articles and NSW Government technical reports) in relation to threatened species and ecological communities</p>	<ul style="list-style-type: none"> • Provide both contextual and specific information in relation to species and ecological communities 	<ul style="list-style-type: none"> • Range of publication dates • Reliability of this information varies from moderate to high. Low reliability information was excluded • Journal articles and technical reports from the NSW Government are considered to provide high reliability information

9.2 VEGETATION MAPPING

Vegetation mapping used in the report is drawn from NSW Government data on remnant vegetation across the Cumberland Plain (NPWS 2002). Further detail can be found in the *Native Vegetation Maps of the Cumberland Plain Western Sydney – Interpretation Guidelines* (NPWS 2002).

In summary, the mapping was developed for all remnant vegetation across the Cumberland Plain using a combination of both aerial photograph interpretation (API) and on-ground data. The mapping identifies all intact remnants greater than 0.5 ha in size from 1:16 000 scale stereo aerial photographs (taken in Nov 97 – March 98). Field surveys were carried out at over 400 sites to provide detailed floristic information to input into the mapping. A range of attributes (e.g. canopy species and understory characteristics) were applied to the mapped vegetation data.

Since the completion of the original mapping in 2002, the mapped extent of Cumberland Plain Woodland (as listed in NSW) was updated using 2007 imagery, and in 2009 the extent of clearing in the Growth Centres was monitored.

The limitations of API mapping are well understood. For example, mapping across large landscapes will always result in some level of misinterpretation of the vegetation on the ground. However, in order to conduct a landscape scale assessment, mapping at this scale is essential. Site by site survey data is not possible for a range of reasons (e.g. access to land, cost) and the NSW mapping is recognised as providing an outstanding resource for mapping native vegetation across the Cumberland Plain.

The update of the extent of Cumberland Plain Woodland using 2007 imagery provides the required currency to the data, increasing its reliability for this assessment.

The mapping has been used to identify the extent of the relevant EPBC Act listed ecological communities. The NSW and Commonwealth definitions for *Shale Sandstone Transition Forest* and *Turpentine-Ironbark Forest in the Sydney Basin Bioregion* are very similar and the correlation of the mapping was considered to be high.

As discussed in Section **Error! Reference source not found.**, the EPBC Act definition of *Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest* was recently changed by the Commonwealth Government. DECCW (2009) developed an agreed approach with the Commonwealth (for the purposes of the strategic assessment) to use the NSW mapping data to identify the extent of the EPBC listed ecological community. It is considered that the results of this approach provide sufficient reliability for the landscape scale assessment applied in this report.

9.3 THREATENED SPECIES RECORDS

Comprehensive site by site survey information for threatened species within the Growth Centres is not available. The analysis undertaken in this report uses various sources of information to understand the importance of the Growth Centres as potential threatened species habitat.

A key part of this approach is information from the NSW Wildlife Atlas (the Atlas). The Atlas is a database of flora and fauna records across NSW. It currently holds over 4 million records and is managed and maintained by DECCW. Atlas records come from a variety of sources and can be subject to varying of certainty. The records used in this project were 'cleaned' by DECCW to ensure that low reliability records were not used.

Given that the Cumberland Plain has been the subject of extensive monitoring over the years, the Atlas records provide a strong (if not complete) indication of the potential importance of the Growth

Centres for threatened species. It is recognised however that areas of the Growth Centres have not been surveyed and may provide habitat for threatened species.

In order to supplement the Atlas information, two additional sources of information on threatened species were used:

1. survey data that is available for Precincts that have been or are undergoing detailed planning;
and
2. input from experts in relation to selected threatened species.

Discussions with species experts (e.g. in relation to Green and Golden Bell Frog and the majority of the flora species) provided the opportunity to undertake a risk based approach to identifying potentially important areas within the Growth Centres that had not been identified through the Atlas records. There is a wealth of unpublished information available through academics, consultants and DECCW staff. Where possible, relevant experts were consulted to supplement the published information.

While comprehensive site by site information is not available for the Growth Centres, it is considered that the approach as described above is adequate for a landscape scale assessment of the potential impacts to threatened species.

10 ToR & Endorsement Criteria

This section outlines how the draft strategic assessment report addresses the ToR and Endorsement Criteria:

10.1 TERMS OF REFERENCE

The ToR establish the scope for the strategic assessment (refer to Appendix A). They form part of the Strategic Assessment Agreement between the NSW and Commonwealth Governments. Table 17 lists the ToR and relates them to the relevant sections within this report.

Table 17: Strategic assessment Terms of Reference

ToR	SECTION NO.
<p>1. PURPOSE AND DESCRIPTION OF THE PROGRAM BEING ASSESSED</p> <p>The Report, referred to in clause 6 of the Agreement, must describe the Program, including:</p> <ul style="list-style-type: none"> a) how the Program has been developed and its legal standing; b) the regional context (natural and human); c) the land use planning (zoning) arrangements and outcomes; d) the actions that will take place under the Program over the short, medium and long term. This may include relevant construction and operational aspects associated with urban development; e) a description of the areas proposed for development and those to be protected within the Growth Centres, as well as other conservation measures associated with the Program; and f) the State management, planning and approval arrangements and the person(s) or authority responsible for the adoption or implementation of the Program. 	<p>Addressed in Section 2 of this report. These issues are also addressed in more detail in the <i>Sydney Growth Centres Program Report</i> (the Program Report) which can be viewed in conjunction with this draft strategic assessment report.</p>
<p>2. PROMOTING ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND BIODIVERSITY CONSERVATION</p> <hr style="border-top: 1px dashed black;"/> <p>2.1 Environment affected by the Program</p> <p>The Report must provide a detailed description of the environment likely to be affected by the Program. This description must identify the environmental assets and characteristics, including biophysical processes, associated with the area set to be affected by the Program as well as the surrounding terrestrial, riparian and aquatic environments likely to be directly or indirectly impacted, including:</p> <ul style="list-style-type: none"> a) components of biodiversity and maintenance of important ecological processes recognising the potential importance of large intact areas and landscape connectivity in protecting and maintaining ecological processes; 	<p>Addressed in Section 3 of this report.</p>

- b) listed threatened and migratory species under the Act;
- c) listed ecological communities under the Act;
- d) other matters of national environmental significance and Commonwealth land under the Act that may be affected by the Program; and
- e) other areas of biodiversity values – e.g. species or ecological communities listed as threatened under the *Threatened Species Conservation Act 1995*.

In addition the report will make specific reference to areas of environmental values that will provide a long term and viable contribution to the conservation of biodiversity and ecological processes.

2.2 Planning for and promoting ecologically sustainable development

The Report must describe the social and economic factors and considerations associated with development under the Program. The Report must include an analysis of how socio-economic issues and implications might relate to, or integrate with, environmental values of the Program area and the choice of alternative options to maintain or enhance these values.

In particular the Report must describe how the following principles of ecologically sustainable development have been considered in the Program development process and that the Program promotes these principles as described in the Act:

- a) Decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.
- b) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.
- e) Improved valuation, pricing and incentive mechanisms should be promoted.

The Report must identify the mechanisms in the Program that seek to achieve ecologically sustainable development including actions to maintain or enhance biodiversity, having regard for species diversity and abundance, and the extent, condition, connectivity and protection of native vegetation.

Addressed in Section 7 of this report.

3. PREVENTING IMPACTS ON MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE, AND PROMOTING THE PROTECTION AND CONSERVATION OF BIODIVERSITY AND HERITAGE VALUES

3.1 Nature and magnitude of impacts

The Report must include a comprehensive analysis of the potential impacts of the Program on matters protected by the EPBC Act. The analysis must include:

- a) A description of the nature of any potential impacts, including any indirect impacts, that may occur under the Program;
- b) An assessment of whether any impacts will be: short, long term or permanent; local or regional in extent; discrete or cumulative, or exacerbated by the likely impacts of climate change; and
- c) An assessment of the scientific confidence associated with the likelihood and consequence(s) of potential impacts, including reference to technical data and other information relied upon in identifying and assessing those impacts.

Addressed in Sections 1.1, 4, 5, and 6.

3.2 Management, mitigation or offset of likely impacts

The Report must describe the management measures and undertakings (e.g. on-ground actions regulatory interventions, management plans, market based instruments) that will be implemented to prevent, minimise, rehabilitate or offset the potential environmental impacts on matters protected by the Act.

For management measures and undertakings, the Report must set out:

- a) the approach taken to addressing the impacts of the actions or classes of actions;
- b) the predicted effectiveness of proposed measures and undertakings and a description of the methodology used to formulate these predictions/confidence limits;
- c) ongoing maintenance or operational requirements associated with proposed measures;
- d) who is responsible for the proposed measures and undertakings;
- e) compliance arrangements for ensuring the measures are undertaken;
- f) the budgetary, regulatory and other arrangements in place or proposed to implement the measures and undertakings, including ongoing compliance, maintenance or operational requirements; and
- g) timelines and accountabilities for implementing proposed measures and undertakings, and associated compliance and maintenance requirements.

Addressed in Section 2.4 of this report. These issues are also addressed in more detail in the *Sydney Growth Centres Program Report* (the Program Report) which can be viewed in conjunction with this draft strategic assessment report.

<p>4 ADAPTIVE MANAGEMENT: ADDRESSING UNCERTAINTY AND MANAGING RISK</p> <p>The Report must identify key uncertainties associated with the management measures and undertakings for protecting matters protected by the Act, and the responses for addressing these uncertainties and adapting to changed circumstances.</p> <p>The Report must set out:</p> <ul style="list-style-type: none"> a) key uncertainties (for example uncertainty about timing, effectiveness, or capacity to enforce measures); b) the responses to addressing these uncertainties; c) the circumstances in which the Program will be reviewed and modified (for example new information or changing standards); and d) the procedures which would be undertaken to review, modify or abandon the Program, including regular reviews. 	<p>Addressed in Section 8 of this report.</p>
<p>5 AUDITING AND REPORTING</p> <p>The Report must set out monitoring, public reporting processes and auditing to be undertaken in the Program's implementation.</p>	<p>Addressed in Section 2.7 of this report. These issues are also addressed in more detail in the <i>Sydney Growth Centres Program Report</i> (the Program Report) which can be viewed in conjunction with this draft strategic assessment report.</p>
<p>6 ENDORSEMENT CRITERIA</p> <p>The Report must describe how the Program meets the criteria set out in Attachment C – Endorsement Criteria.</p>	<p>Addressed in Section 10 of this report.</p>
<p>7 INFORMATION SOURCES</p> <p>For information used in the assessment, the Report must state:</p> <ul style="list-style-type: none"> a) the source of the information; b) how recent the information is; and c) the reliability and limitations of the information. 	<p>Addressed in Section 9 of this report.</p>

10.2 ENDORSEMENT CRITERIA

The endorsement criteria are a set of criteria that must be met in order for the Commonwealth Government Minister for the Environment to endorse the Program (refer to Appendix A). They form part of the Strategic Assessment Agreement between the NSW and Commonwealth Governments. Table 18 lists the endorsement criteria and relates them to the relevant sections within this report.

Table 18: EPBC Act endorsement criteria

ENDORSEMENT CRITERIA	SECTION NO.
The Strategic Assessment Report adequately addresses potential impacts on matters protected by the EPBC Act	Sections 1.1, 4, 5 and 6 address the nature and significance of impacts to matters protected by the EPBC Act
Recommendations to modify the Plan have been responded to (note this will only occur after the Minister has reviewed the draft report)	<i>Not applicable at this stage of the process.</i>
<p>The Program meets the Objectives of the Act, in particular</p> <ul style="list-style-type: none"> • Protects the environment, especially matters of national environmental significance • Promotes ESD • Promotes conservation of biodiversity • Provides for the protection and conservation of heritage 	<p>The following sections provide a discussion of the planning process, values of the area, potential impacts, management measures and offsets that illustrate how the Program meets the objectives of the Act:</p> <ul style="list-style-type: none"> • Section 1.1 – describes the matters of national environmental significance • Sections 4, 5 and 6 – analyses the potential impacts to matters of national environmental significance and outlines the management and offset measures • Section 7 – describes the planning process including the incorporation of ESD
<p>The Program:</p> <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Avoids actions from being taken in any location that have an impact on matters of national environmental significance or of high biodiversity or heritage values where ever possible <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Where potential impacts cannot be avoided, then the impacts should be minimised <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Provides for effective mitigation or offsetting where the likely impacts cannot be avoided <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Contain effective arrangements for adaptive management for conservation measures <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Contain a system for monitoring, auditing and publicly reporting on implementation 	<p>Addressed through Sections 1.1, 4, 5 and 6 which analyse the potential impacts to matters of national environmental significance, and outlines management and offset measures</p> <hr style="border-top: 1px dashed black;"/> <p>Outlined in Section 2.7.</p>

<p>The Minister will also consider the extent to which the Program adequately:</p>	
<ul style="list-style-type: none"> • Incorporates the precautionary principle • Incorporates other principles of ecologically sustainable development, such as intergenerational equity 	<p>Addressed Section 7.</p>
<ul style="list-style-type: none"> • Identifies and includes management measures for matters the Minister considers to have a high likelihood of being potentially eligible for listing as matters of national environmental significance 	<p>Addressed in Section 3.</p>

11 Conclusion

The Sydney Growth Centres Program has been developed to ensure that the high level of growth in the Sydney Metropolitan region is planned and managed in a structured and coordinated way. The Program provides for both:

- the required growth in greenfield housing, employment and infrastructure over the next 30+ years; and
- a focus on the conservation of high biodiversity value areas inside and outside the Growth Centres through implementation of the \$530 million biodiversity offsets package.

It is clear that, looking to the future, planning for the conservation of biodiversity in Western Sydney must be linked to planning for future population growth. This linkage is already well established through the Growth Centres Biodiversity Certification under the NSW TSC Act, which ensures that a levy on development contributes to a fund for conservation offsets (the Growth Centres Conservation Fund).

The EPBC Act strategic assessment provides the opportunity to address matters of national environmental significance in a strategic way focusing on landscape scale outcomes within the Cumberland Plain and broader Sydney region. In the absence of such a planned approach in the Growth Centres, incremental planning decisions and individual actions would result in inferior conservation outcomes. Past experience suggests that site-by-site decision making results in “paper offsets” – such as protection and management of very small areas which have little ecological function. Without active management, small areas of vegetation on private land are likely to be neglected, allowing weed infestations and other degradation to progress. Site by site processes offer no prospect of big picture offset thinking, are costly to both the private sector and Government and allow development to erode areas which are of greatest ecological value regionally, such as the high management viability areas to be retained in the Growth Centres. Court processes and consultants’ reports squander resources which might otherwise have been directed toward outcomes. In addition, uncoordinated and ad hoc land release does not provide the opportunity for strategic landscape scale conservation outcomes.

The EPBC Act strategic assessment means early consideration of matters of national environmental significance in the planning process and the identification and delivery of significant and real conservation outcomes. Cumulative impacts are considered and addressed and environmental, social and economic issues are balanced at the strategic level. The strategic assessment builds upon the Growth Centres Biodiversity Certification, and if approved will further streamline the development assessment process and reduce costs associated with land and housing supply, by providing greater certainty to communities and developers by removing the need for site based assessment of matters of national environmental significance.

The analysis in this report has determined that the matters of national environmental significance protected by the EPBC Act that were likely to, or had the potential to be impacted through implementation of the Program were a number of nationally listed: threatened species and ecological communities; and migratory species.

No other matters of national environmental significance were considered likely to be impacted.

The Program addresses potential impacts to the relevant matters of national environmental significance through a range of mechanisms including: avoidance, mitigation and management; and offsets. The key outcomes of this approach include:

- The retention of 2,000 ha of existing native vegetation within the Growth Centres. This includes the retention of the majority of High and Moderate Management viability vegetation listed as threatened ecological communities under the EPBC Act.
- A commitment to prioritise 70% of the offsets package outside of the Growth Centres (i.e. 70% of \$397.5 million in 2005/06 dollars) on matters listed under the EPBC Act. In particular the NSW Government will make every effort to ensure that:
 - at least 2,400 ha of either Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest or other grassy woodland communities are protected outside of the Growth Centres (preference will be given to Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest followed by White Box, Yellow Box, Blakely's Red Gum Grassy Woodland and Derived Native Grassland);
 - at least 132 ha of Shale Sandstone Transition Forest are protected; and
 - offsets for other matters of NES are obtained through the expenditure of the Growth Centres Conservation Fund.

The Program meets the principles of Ecologically Sustainable Development by ensuring that viable ecosystems are managed, and people have access to healthy lifestyle options, accessible public transport, and strong communities and a successful outcome for the strategic assessment will allow development to proceed without further assessment, streamlining approval processes, and significantly improving housing supply and affordability. The administration costs of piecemeal assessment which can be costly and deliver less significant environmental outcomes will be avoided. The strategic assessment approach is new, requiring flexibility to enable real, not paper, biodiversity conservation outcomes to be secured. These benefits would be unable to be achieved through site by site assessment.

This strategic assessment under the EPBC Act comprises two key documents: the Draft Strategic Assessment Report (this report) which provides a comprehensive assessment of the impact of the Program on matters of national environmental significance; and the Draft Program Report which identifies the elements of the Program and the commitments and undertakings of the NSW Government for the protection and management of matters of national environmental significance protected under the EPBC Act.

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Appendices

APPENDIX A – STRATEGIC ASSESSMENT AGREEMENT



ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

***Part 10 Strategic Assessments
Section 146 (1) Agreement***

Relating to the assessment of the impacts of the Program to develop the Growth Centres in
Western Sydney, NSW

between

THE COMMONWEALTH OF AUSTRALIA

and

THE STATE OF NEW SOUTH WALES

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1. PARTIES

1.1. The Parties to this Agreement are:

The Commonwealth of Australia, represented by the Minister for the Environment, Heritage and the Arts

and

The State of New South Wales, represented by both the Minister for Climate Change and the Environment and the Minister for Planning.

2. DEFINITIONS

2.1. Unless stated otherwise in this Agreement, the definitions, meanings and terms in the *Environment Protection and Biodiversity Conservation Act 1999* apply to this Agreement and its attachments.

2.2. In this Agreement:

DECC means the NSW Department of Environment and Climate Change.

DEWHA means the Australian Government Department of the Environment, Water, Heritage and the Arts.

DoP means the NSW Department of Planning.

EP&A Act means the *Environmental Planning and Assessment Act 1979* (NSW).

Growth Centres means the North West Growth Centre and the South West Growth Centre as defined by the *NSW State Environmental Planning Policy (Sydney Region Growth Centres) 2006* (and as depicted in the map at Attachment A).

Minister means the Minister for the Environment, Heritage and the Arts.

Parties means the parties to this Agreement.

Program means urban development in the Sydney Region Growth Centres as described in the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* and the relevant biodiversity measures under Part 7 of Schedule 7 to the *Threatened Species Conservation Act 1995*.

State means the State of New South Wales.

The Act means the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).

TSC Act means the *Threatened Species Conservation Act 1995* (NSW).

Working days means a business day as measured in Canberra, ACT.

3. PREAMBLE

- 3.1 The Parties agree that the Growth Centres contain significant environmental values, as well as significant social and economic values in relation to the future growth of Sydney.

Recognising these significant values and the benefits that may be derived from implementing the Program, the Parties commit to:

- a) undertaking an assessment of the impacts of actions under the Program on all matters protected by Part 3 of the Act; and
- b) sharing information and working collaboratively to undertake the activities within this Agreement.

4. BACKGROUND

- 4.1 Section 146(1) of the Act allows the Minister to agree in writing with a person responsible for the adoption or implementation of a policy, plan or program that an assessment be made of the impacts of actions under that policy, plan or program on a matter protected by a provision of Part 3 of the Act. The policy, plan or program for the purposes of this Agreement is the Program as defined in Clause 2 of this Agreement.
- 4.2 The Program has, among other things, identified conservation measures and development areas to manage and accommodate Sydney's population growth through the identification and development of the Growth Centres.
- 4.3 Assessment of the impacts of the Program will be undertaken through a report prepared in accordance with section 146(2) of the Act. This will include preparation of Terms of Reference for a report on the impacts of the Program, preparation of the report and consideration by the Minister of that report. The Minister may then endorse the Program under Section 146(2)(f).
- 4.4 After considering the report, the Minister may decide to endorse the Program if satisfied that the requirements stated in section 146(2)(f) of the Act have been met. Importantly, the Parties acknowledge that the endorsement of the Program, of itself, does not constitute any approval under the Act for the taking of actions for which approval is required under the Act.
- 4.5 If the Minister decides to endorse the program under section 146(2)(f) of the Act, the Minister may then, under section 146B of the Act, decide to approve the taking of an action, or a class of actions, in accordance with the Program. The effect of this decision is that actions or classes of actions (if any) approved under section 146B would not need further approval from the Minister under the Act. The Parties acknowledge that, where proponents propose to take an action in accordance with the Program that is not the subject of an approval under section 146B, they are still capable of seeking approval for that action via the ordinary channels for assessment and approval established under Parts 7, 8 and 9 of the Act.

5. TERMS OF REFERENCE FOR THE REPORT

5.1 DoP shall as soon as practicable seek public comment on the Draft Terms of Reference (Attachment B) for the preparation of a report on the impacts of actions under the Program.

DoP shall provide the Draft Terms of Reference for public comment by notice:

- a) posted on the DoP website; and
- b) published in newspapers circulating in NSW.

5.2 The notice in 5.1 must advise that the Draft Terms of Reference are available and how copies may be obtained, provide contact details and invite public comments on the Draft Terms of Reference for not less than 28 days.

5.3 The Parties may each notify other organisations or individuals of the public comment notice and of the availability of the Draft Terms of Reference. Each Party will make copies of the notice and Draft Terms of Reference available electronically through its website.

5.4 Following the consideration of public comments on the Draft Terms of Reference the State will submit to the Minister:

- a) public responses relating to the Draft Terms of Reference;
- b) the Revised Draft Terms of Reference; and
- c) comments on how the public responses have been taken into account in the Revised Draft Terms of Reference.

5.5 Following receipt of the Revised Draft Terms of Reference, the Minister shall as soon as practicable notify the State that the Revised Draft Terms of Reference (for assessment of the impacts of the actions under the Program):

- a) are approved; or
- b) are not approved. In this instance the Minister will:
 - i) notify the State of his concerns and invite the State to provide a further Revised Draft Terms of Reference which take those concerns into account; and
 - ii) within 15 working days of receipt of the further Revised Draft Terms of Reference mentioned above, either:
 - (A) notify the NSW Government of his approval of the further Revised Draft Terms of Reference; or
 - (B) provide approved Terms of Reference that meet his requirements.

6. PREPARATION OF THE REPORT

6.1 The State will cause a Draft Report to be prepared in accordance with this Agreement and the Terms of Reference once approved in accordance with Clause 5 of this Agreement.

DoP shall provide the Draft Report for public comment by notice:

- a) posted on the DoP website; and
- b) published in news papers circulating in NSW.

- 6.2 The notice in 6.1 must advise that the Draft Report is available and how copies may be obtained, provide contact details for obtaining further information, invite public comments on the Draft Report and set a period of not less than 28 days within which comments must be received.

The Parties:

- a) may each notify interested parties of the notice and of the availability of the Draft Report; and
 - b) will each make copies of the notice and Draft Report available electronically through their websites.
- 6.3 The State will prepare, following closure of the public comment period, a Revised Draft Report, or a Supplementary Report to the Draft Report, taking account of the comments received.

7. CONSIDERATION OF THE REPORT

7.1 The State will submit to the Minister:

- a) public responses relating to the Draft Report;
- b) the Final Report, comprised of:
 - i) the Revised Draft Report; or
 - ii) the Draft Report and a Supplementary Report;
- c) comments on how the public responses have been taken into account in the Final Report; and
- d) the Program.

7.2 The Minister will consider the Final Report.

- a) The Minister may make recommendations to the State, as he considers appropriate, regarding the Final Report and/or the Program.
- b) The State may provide the Minister with advice, or seek clarification from the Minister on recommendations in subclause (a).
- c) The State will provide to the Minister a summary of the recommendations, advice or clarification in subclauses (a) and (b), and how those recommendations, advice or clarification are given effect through modifications to the Program.
- d) The Minister will consider the revised Program and supporting material and may accept the Final Report or request further information or clarification if not satisfied that it addresses adequately the impacts of the actions to which this Agreement relates.

8. ENDORSEMENT OF PROGRAM

8.1 The Minister will endorse the Program if satisfied that:

- a) the Report adequately addresses the impacts to which this Agreement relates;
- b) any recommended modifications to the Program or modifications having the same effect have been made; and
- c) the requirements set out in the endorsement criteria in Attachment C are met.

9. APPROVAL OF ACTIONS

- 9.1 If the requirements of Sections 146F-M of the Act and the endorsement criteria at Attachment C are met, the Minister may approve, or approve with conditions, the taking of an action or class of actions in accordance with the endorsed Program under Section 146B of the Act.

10. VARIATION

- 10.1 This Agreement may only be varied by written agreement (including electronic communications) between the Parties or otherwise in accordance with the Act.

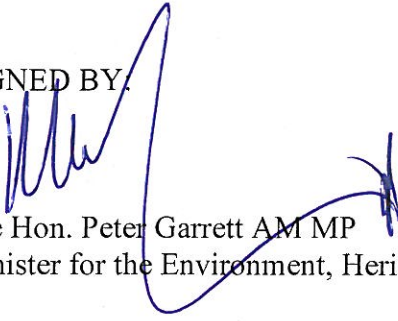
11. DISPUTE RESOLUTION

- 11.1 Where there is a dispute between the Parties to this agreement on a particular matter, the Parties will consult in a spirit of mutual cooperation in relation to that matter and will use their best endeavours to negotiate a mutually acceptable resolution.

12. TERMINATION

- 12.1 This Agreement may be terminated by written agreement (including by way of electronic communication) between the Parties.

SIGNED BY:



The Hon. Peter Garrett AM MP
Minister for the Environment, Heritage and the Arts

Dated 22nd August 2009

John Robertson MLC

The Hon. ~~Carmel Tebbutt MP~~
Minister for Climate Change and the Environment



Dated

11 November 2009

The Hon. Kristina Keneally MP
Minister for Planning

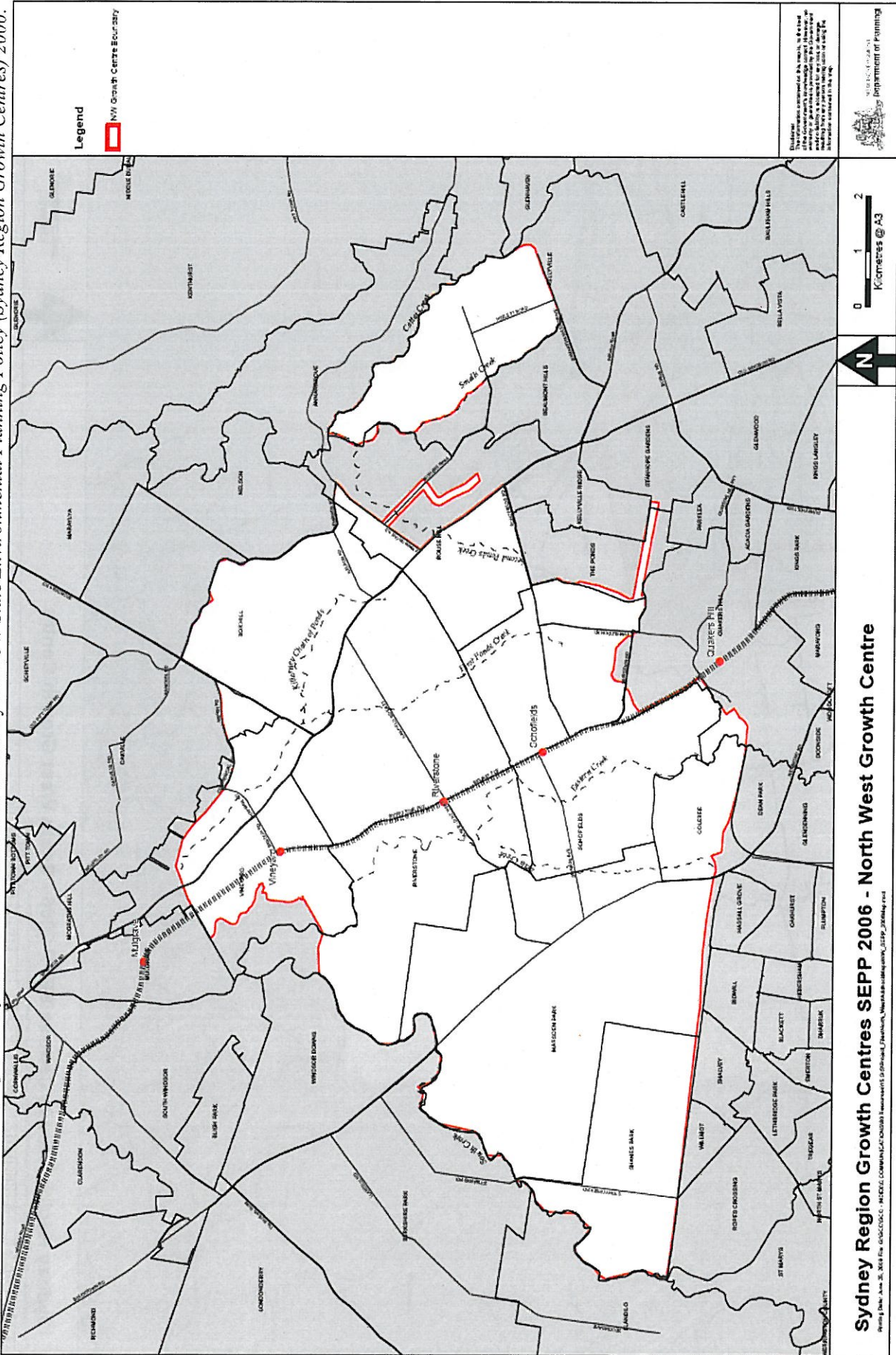


Dated

20/2/09

Attachment A: Locality of the Growth Centres

NB: this map is for illustrative purposes only. The Growth Centres are defined by the NSW State Environmental Planning Policy (Sydney Region Growth Centres) 2006.



Attachment B: Terms of Reference

Terms of Reference for Strategic Assessment of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* and relevant biodiversity measures under Part 7 of Schedule 7 to the *Threatened Species Conservation Act 1995*

1. PURPOSE AND DESCRIPTION OF THE PROGRAM BEING ASSESSED

The Report, referred to in clause 6 of the Agreement, must describe the Program, including:

- a) how the Program has been developed and its legal standing;
- b) the regional context (natural and human);
- c) the land use planning (zoning) arrangements and outcomes;
- d) the actions that will take place under the Program over the short, medium and long term. This may include relevant construction and operational aspects associated with urban development;
- e) a description of the areas proposed for development and those to be protected within the Growth Centres, as well as other conservation measures associated with the Program; and
- f) the State management, planning and approval arrangements and the person(s) or authority responsible for the adoption or implementation of the Program.

2. PROMOTING ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND BIODIVERSITY CONSERVATION

2.1 Environment affected by the Program

The Report must provide a detailed description of the environment likely to be affected by the Program. This description must identify the environmental assets and characteristics, including biophysical processes, associated with the area set to be affected by the Program as well as the surrounding terrestrial, riparian and aquatic environments likely to be directly or indirectly impacted, including:

- a) components of biodiversity and maintenance of important ecological processes recognising the potential importance of large intact areas and landscape connectivity in protecting and maintaining ecological processes;
- b) listed threatened and migratory species under the Act;
- c) listed ecological communities under the Act;
- d) other matters of national environmental significance and Commonwealth land under the Act that may be affected by the Program; and
- e) other areas of biodiversity values – e.g. species or ecological communities listed as threatened under the *Threatened Species Conservation Act 1995*.

In addition the report will make specific reference to areas of environmental values that will provide a long term and viable contribution to the conservation of biodiversity and ecological processes.

2.2 Planning for and promoting ecologically sustainable development

The Report must describe the social and economic factors and considerations associated with development under the Program. The Report must include an analysis of how socio-economic issues and implications might relate to, or integrate with, environmental values of the Program area and the choice of alternative options to maintain or enhance these values.

In particular the Report must describe how the following principles of ecologically sustainable development have been considered in the Program development process and that the Program promotes these principles as described in the Act:

- a) Decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.
- b) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.
- e) Improved valuation, pricing and incentive mechanisms should be promoted.

The Report must identify the mechanisms in the Program that seek to achieve ecologically sustainable development including actions to maintain or enhance biodiversity, having regard for species diversity and abundance, and the extent, condition, connectivity and protection of native vegetation.

3. PREVENTING IMPACTS ON MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE, AND PROMOTING THE PROTECTION AND CONSERVATION OF BIODIVERSITY AND HERITAGE VALUES

3.1 Nature and magnitude of impacts

The Report must include a comprehensive analysis of the potential impacts of the Program on matters protected by the EPBC Act. The analysis must include:

- a) A description of the nature of any potential impacts, including any indirect impacts, that may occur under the Program;
- b) An assessment of whether any impacts will be: short, long term or permanent; local or regional in extent; discrete or cumulative, or exacerbated by the likely impacts of climate change; and
- c) An assessment of the scientific confidence associated with the likelihood and consequence(s) of potential impacts, including reference to technical data and other information relied upon in identifying and assessing those impacts.

3.2 Management, mitigation or offset of likely impacts

The Report must describe the management measures and undertakings (e.g. on-ground actions regulatory interventions, management plans, market based instruments) that will be implemented to prevent, minimise, rehabilitate or offset the potential environmental impacts on matters protected by the Act.

For management measures and undertakings, the Report must set out:

- a) the approach taken to addressing the impacts of the actions or classes of actions;
- b) the predicted effectiveness of proposed measures and undertakings and a description of the methodology used to formulate these predictions/confidence limits;
- c) ongoing maintenance or operational requirements associated with proposed measures;
- d) who is responsible for the proposed measures and undertakings;
- e) compliance arrangements for ensuring the measures are undertaken;
- f) the budgetary, regulatory and other arrangements in place or proposed to implement the measures and undertakings, including ongoing compliance, maintenance or operational requirements; and
- g) timelines and accountabilities for implementing proposed measures and undertakings, and associated compliance and maintenance requirements.

4 ADAPTIVE MANAGEMENT: ADDRESSING UNCERTAINTY AND MANAGING RISK

The Report must identify key uncertainties associated with the management measures and undertakings for protecting matters protected by the Act, and the responses for addressing these uncertainties and adapting to changed circumstances.

The Report must set out:

- a) key uncertainties (for example uncertainty about timing, effectiveness, or capacity to enforce measures);
- b) the responses to addressing these uncertainties;
- c) the circumstances in which the Program will be reviewed and modified (for example new information or changing standards); and
- d) the procedures which would be undertaken to review, modify or abandon the Program, including regular reviews.

5 AUDITING AND REPORTING

The Report must set out monitoring, public reporting processes and auditing to be undertaken in the Program's implementation.

6 ENDORSEMENT CRITERIA

The Report must describe how the Program meets the criteria set out in Attachment C – Endorsement Criteria.

7 INFORMATION SOURCES

For information used in the assessment, the Report must state:

- a) the source of the information;
- b) how recent the information is; and
- c) the reliability and limitations of the information.

Attachment C: Strategic Assessment - Endorsement Criteria

When deciding whether to endorse a policy, plan, or program the Minister must be satisfied that the assessment report adequately addresses the impacts to which the agreement relates, and that any of his recommendations to modify the policy, plan or program have been responded to appropriately.

In determining whether or not to endorse the Program the Minister will also have regard to the extent to which the Program meets the Objects of the Act. In particular, that it:

- protects the environment, especially matters of national environmental significance;
- promotes ecologically sustainable development;
- promotes the conservation of biodiversity; and
- provides for the protection and conservation of heritage.

Accordingly, the Program should:

- avoid actions from being taken in any location that have an impact on matters of national environmental significance or of high biodiversity or heritage values where ever possible; or
- where potential impacts can not be avoided, then the impacts should be minimised; and
- provide for effective mitigation or offset where the likely impacts cannot be avoided; and
- contain effective arrangements for adaptive management for conservation measures; and
- contain a system for monitoring, auditing and publicly reporting on implementation.

The Minister will also consider the extent to which the Program adequately:

- incorporates the precautionary principle;
- incorporates other principles of ecologically sustainable development, such as intergenerational equity; and
- identifies and includes management measures for matters the Minister considers to have a high likelihood of being potentially eligible for listing as matters of national environmental significance.