THE VERTEBRATE FAUNA OF BENNETT BROOK AND SUCCESS HILL RESERVE, CAVERSHAM

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INTRODUCTION

Recent work especially that by the Western Australian Museum has illustrated the significance of urban bushland remnants to the survival of vertebrate fauna of the Perth region (How and Dell 1989, 1993, 1994, How *et al.* 1996, Harvey *et al.* 1997 and Cooper 1995). There is a relationship between size of remnant bushland and the number of species surviving with reserves as small as 4 ha having been shown to be important for faunal assemblages (Turpin 1990, 1991). However many species persist on even smaller reserves (Cooper 1995).

This study was initiated by the Success Hill Action Group (Inc.) to determine the vertebrate fauna of the small remnant of native bushland at Success Hill and the adjacent and contiguous Bennett Brook area northwards to Benara Road, in Caversham (Figure 1).

STUDY AREA

Success Hill Reserve (Figure 1) is vested with the Bassendean Town Council and occupies an elevated area overlooking the Swan River. It is bounded by the Swan River to the east and housing to the west. The area has been isolated by roads to the west for many decades but is contiguous with the riverine woodlands of Bennett Brook to the north. The study area is located at the interface of the Bassendean Dune System and the Pinjarra Plain (Keighery 1996) and consequently the soils are a mixture of sands and clayey silts. In the past, clay has been mined in several places.

Success Hill Reserve is situated on the Bassendean Dune System. It is a remnant Banksia woodland consisting of Candlestick Banksia, *Banksia attenuata* and Firewood Banksia, *B. menziesii* with an overstorey of Jarrah, *Eucalyptus marginata*. There is a shrub and heath understorey. The Swan River has a fringing forest of Flooded Gum, *E. rudis*, Paperbark, *Melaleuca rhaphiophylla* and She-oak, *Casuarina obesa*. This riverine forest extends, patchily, along the entire length of Bennett Brook. Additionally, the Paperbark has extensive woodlands associated with the swamp system on the eastern side of Bennett Brook. These vegetation types are described by Keighery (1996).

Much of the shrub vegetation along Bennett Brook has been modified or eliminated by various land use practices especially cattle and horse grazing.

SAMPLING SITES AND METHODS

This study aimed to record the vertebrate assemblage of each vegetation type in the Success Hill Reserve and nearby parts of the Bennett Brook area. In order to obtain

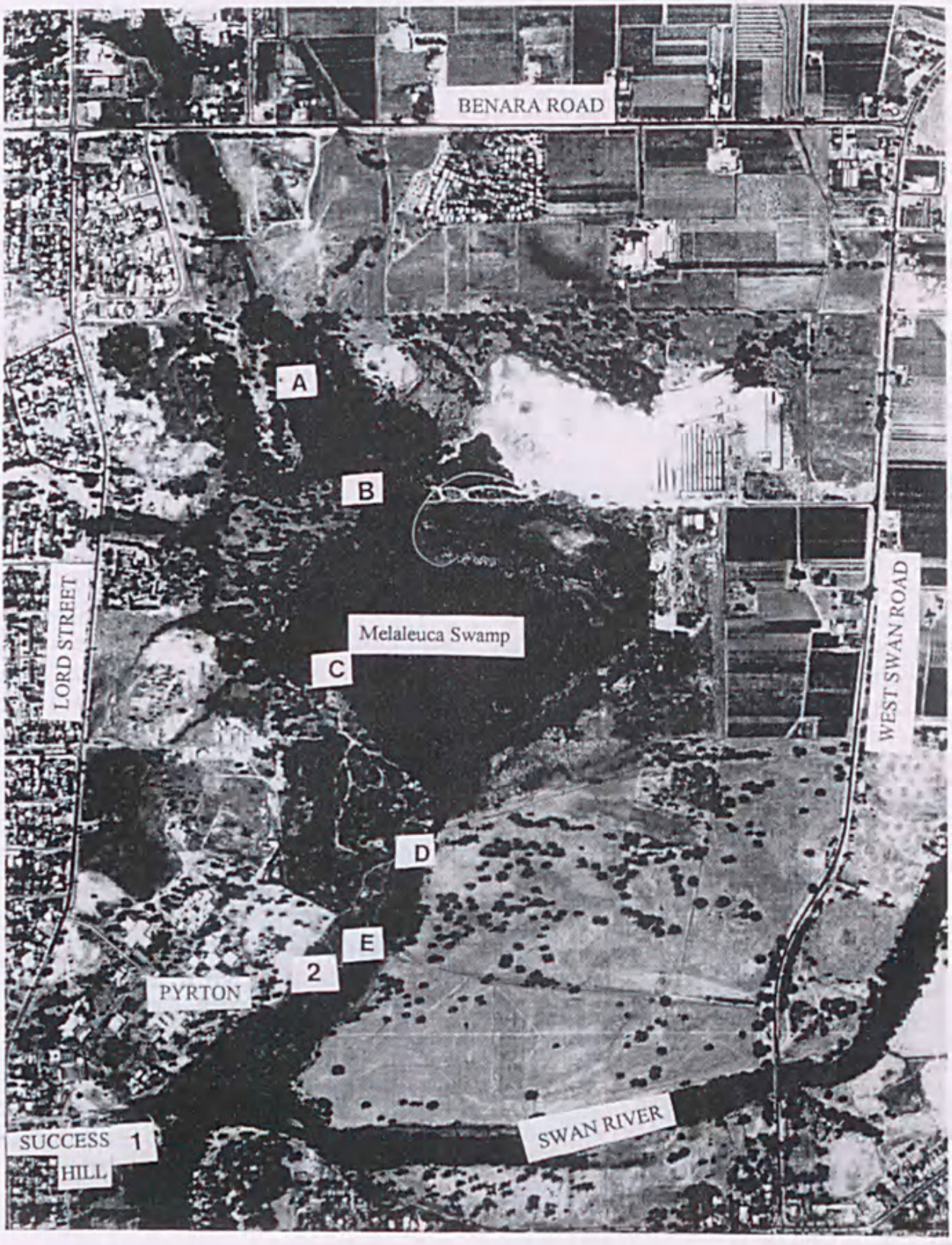

Figure 1. Aerial photograph of the Success Hill/Bennett Brook area showing locations of vertebrate trapping sites (marked 1 and 2) and the fish shampling sites marked (A, B, C, D, E).

an assessment of the seasonal faunal assemblage it was decided to undertake sampling surveys at several times of the year. Accordingly, surveys were undertaken to examine the fauna during September and November 1994, January, February, March, April, May, July, October and November 1995.

Terrestrial vertebrate sampling sites were established in January 1995 when nine 20 litre buckets, placed 10 metres apart, were used as pitfall traps. A seven metre long flywire fence standing 30 cm high was placed vertically over each trap when they were opened and operational. Two sites were chosen for intensive sampling, one on Success Hill and one on the slopes below Pyrton (Figure 1).

These two sites were chosen to represent the range of habitats available in the elevated dry sandy areas. The lowland sites close to Bennett Brook were not chosen for intensive sampling as pitfall traps cannot be located in areas that become waterlogged during winter rains.

The traps were opened and examined on seven consecutive days during February, March, July, October and November 1995. Traps were closed and sealed and the flywire fence removed between trapping periods. Traps were examined daily and all reptiles, amphibians and mammals were identified, measured, and released.

Extensive searches were also made of the entire area to record reptiles and amphibians. In particular all surface rubbish and timber, bark and leaf litter was turned over and examined to reveal hidden species. Nocturnal surveys were undertaken with headtorches on three occasions to reveal species which are only active at night.

Frogs were sampled during favourable weather conditions throughout the year and fish were sampled on two occasions at set sample sites (Figure 1) along the lower reaches of Bennett Brook in autumn and the beginning of winter. Afternoon and evening surveys were also conducted on four occasions to record calling frogs. All surface fresh water was examined with nets for the presence of tadpoles.

Birds were recorded opportunistically whilst checking the fenced pitlines and during all other reptile and frog surveys.

A search was carried out of relevant literature to find distributional records of vertebrates from the region. In particular we used How and Dell (1993) for mammals, Bush *et al.* (1995) and How and Dell (1993, 1994) for reptiles, Storr and Johnstone (1988) and How and Dell (1993) for birds, Tyler *et al.* (1994) for amphibians, and Sarti and Allen (1978) for freshwater fish. Museum databases were also searched for additional mammal and reptile data.

RESULTS

MAMMALS

During these surveys the only mammal trapped was the introduced House Mouse, *Mus musculus*. Numerous signs of House Mice were recorded throughout the area where old nests and burrows were located under various large items of rubbish. Both Success Hill Reserve and the Bennett Brook area are used by domestic cats and dogs. Rabbits, *Oryctolagus cuniculus*, were widespread but not abundant in the area. Signs of Foxes, *Vulpes vulpes*, were widespread in the area. A fox den had the remains of Swamphens, Black Ducks, Ring-necked Parrots, Dusky Moorhens and freshwater crustaceans, indicating the wide range of prey items taken.

Table 1. Frogs and Reptiles sampled systematically by trapping and observed opportunistically in each of the habitats at Bennett Brook/ SuccessHill . **SH,** Success Hill; **PY**, Pyrton; SO, Sheoak; BB, Bennett Brook; SS, Small Swamps; SA, Samphire area; OB, Old Bridge; MS, Main Swamp.

Species	Systematic		Opportunistic							
	SH	PY	SH	PY	SH	BB	SS	SA	OB	MS
AMPHIBIANS										
Slender Tree Frog *Litoria adelaidensis*		X				X	X			
Motorbike Frog *L. moorei*		X								
Quacking Frog *Crinia georgiana*	X	X	X	X	X	X	X		X	
Glauert's Froglet *C. glauerti*			X	X	X		X		X	X
Squelching Froglet *C. insignifera*					X	X	X		X	X
Moaning Frog *Heleioporus eyrei*	X	X		X						
Banjo Frog *Limnodynastes dorsalis*	X	X					X			
REPTILES										
Swamp Skink *Bassiana trilineata*								X	X	
Wall Skink *Cryptoblepharus plagiocephalus*			X	X	X	X	X	X	X	X
Striped Skink *Ctenotus fallens*	X	X						X		
Limestone Skink *C. australis*	X									
Two-toed Skink *Hemiergis quadrilineata*		X								
Elegant Lerista *Lerista elegans*	X									
Worm Lerista *L. praepedita*	X									
Grey's Skink *Menetia greyi*	X		X	X	X	X	X	X	X	
Flecked Morethia *Morethia obscura*					X					
Gould's Monitor *Varanus gouldi*									X	
Tiger Snake *Notechis scutatus*					X	X	X	X		
Dugite *Pseudonaja affinis*				X	X			X		
Long-necked Tortoise *Chelodina oblonga*						X	X		X	X

The Quenda or Southern Brown Bandicoot, *Isoodon obesulus*, was recorded. Characteristic feeding diggings were located around the edges of the inundated areas after the heavy rains during the winter of 1995. These animals were presumably forced out of their habitat along Bennett Brook and the Swan River. Two dead Quendas were also located on Benara Road near the junction of Bennett Brook at the northern end of the study area during heavy rain.

Although not sighted in the study area several Common Brush possums, *Trichosurus vulpecula* were reported in the Flooded Gums, *Eucalyptus rudis* along the banks of the Swan River just downstream of our study area (K. Pearson, pers. comm). It is likely that Water Rats, *Hydromys chrysogaster* occur in the lower reaches of the Bennett Brook as there are old museum records from nearby localities including Belmont Park, as well as unspecified localities on the Swan River.

No other species of terrestrial mammal was recorded during this survey although introduced Black Rats, *Rattus rattus* are likely to be widespread in the area. Historically, seven species of native terrestrial mammals (Kitchener and Vicker 1981) are known from the Bassendean Sand System but most of these are now locally extinct in the region (How and Dell 1993).

One species of bat was heard calling in the area during nocturnal surveys This was the White-striped Mastiff Bat, *Nyctinomus australis*, which is the only local bat whose echolocation sounds can be heard by the human ear. A search of the literature, especially Strahan (1995) and the Museum database indicates that as many as nine other bat species were originally known from the region but How and Dell (1993) suggest that many may no longer be found in the region.

AMPHIBIANS

Seven species of amphibians were recorded during these surveys. They are listed on Table 1 together with habitat types in which they were recorded. Each species is also briefly discussed below.

Slender Tree Frog *Litoria adelaidensis*

At Bennett Brook, it breeds in early spring in the bullrush swamps at the base of the hill below Pyrton. Calling males were abundant in these swamps between August and October. The egg masses were attached to the rush stems just below the surface of the water. Tadpoles were present in late spring and summer. When not breeding they tend to disperse widely and can be found throughout Bennett Brook and the adjacent Melaleuca swamps and were trapped in February mainly in the Bracken Fern on the slopes below Pyrton.

Motorbike Frog *Litoria moorei*

Only one Motorbike Frog was trapped in the Bracken Ferns below Pyrton during this survey.

Quacking Frog *Crinia georgiana*

Many individuals were captured in the pit traps both on Success Hill and below Pyrton. They were captured in all sampling periods.

This frog breeds in shallow seepages along the entire western side of Bennett Brook northwards from the base of Success Hill. The large eggs are laid from mid-winter and were found throughout the shallow seepage areas.

Glauert's Froglet *Crinia glauerti*

This frog is common along Bennett

Brook especially in the bulrush swamps and the seasonally inundated areas that occurred in the winter of 1995. This frog bred in large numbers in all the freshwater areas that remained after these heavy rains.

Squelching Froglet *Crinia insignifera*

This is the commonest frog in the area and was present throughout the Melaleuca swamps. It bred in large numbers in the inundated areas after the heavy winter rains in 1995. The eggs are laid in water in the same manner as Glauert's Froglet.

Moaning Frog *Heleioporus eyrei*

Only 3 individuals were trapped in the Success Hill and Pyrton areas. Although not recorded breeding on this survey, they probably breed around the margins of the seepage areas.

Banjo Frog *Limnodynastes dorsalis*

They were captured at both Success Hill and below Pyrton and calling males were heard in the Melaleuca swamp in winter and spring.

Most of the frog species recorded in the study area have widespread distributions in suitable habitat on the Coastal Plain. One species, the Quacking Frog, is mainly a Darling Range species with populations extending onto the Coastal Plain on alluvial soils associated with stream zones. One additional species, the Turtle Frog, *Myobatrachus gouldii*, is known from the Bassendean Dune System (How & Dell 1993) and may occur at Success Hill.

REPTILES

Thirteen species of reptiles were recorded during these surveys. They are discussed below and listed on Table 1 together with habitat types in which they were recorded.

Swamp Skink *Bassiana trilineata.*

Several individuals were located in winter under rubbish around the margins of the inundated areas at the base of the slopes above the old bridge.

Wall Skink *Cryptoblepharus plagiocephalus.*

This species is widespread in the area and found on many trees including Paperbark, *Melaleuca rhaphiophylla*, Swamp Sheoak, *Casuarina obesa*, Flooded Gum, *Eucalyptus rudis*. It occupies crevices and gaps among peeling bark.

Striped Skink *Ctenotus fallens*

This fast-running, diurnal species is widespread throughout Success Hill and the slopes northwards to Pyrton.

Limestone Skink *Ctenotus australis*

It is scarce in the area and only two individuals were trapped at Success Hill.

Two-toed Skink *Hemiergis quadrilineata*

Only one individual was trapped in May on the slopes below Pyrton.

Elegant Lerista *Lerista elegans*

This tiny lizard is widespread in the area and was trapped on Success Hill and located among leaf litter under the flooded gums along Bennett Brook.

Worm Lerista *Lerista praepedita*

This elongated, burrowing lizard is probably rare in the area as only one was trapped on Success Hill.

Grey's Skink *Menetia greyii*

They live among fallen leaves and are widespread and probably the most abundant lizard in the area.

Flecked Morethia *Morethia obscura*

This lizard is scarce in the area as only one was sighted among the she-oaks near the brickworks on the eastern side of Bennett Brook.

Gould's Monitor *Varanus gouldii*

Only one subadult was sighted under the remains of an old car on the slopes below Pyrton after the fire in January 1995.

Tiger Snake *Notechis scutatus*

Tiger snakes are scarce but widespread in the area especially around the Melaleuca swamps and the seasonally inundated areas.

Dugite *Pseudonaja affinis*

It is widespread in the area and several were observed during the survey.

Long-necked Tortoise *Chelodina oblonga*

This tortoise is common throughout the fresh water swamps along Bennett Brook and also occasionally occurs in the brook itself. When the peripheral waters evaporate in summer, some individuals aestivate in the drying mud to emerge with the following winter rains. Adult females leave the water to lay their eggs in dry sandbanks particularly along the western side of Bennett Brook.

Another 31 species of reptiles are known from the Bassendean Dune System (How & Dell 1993) but are unlikely to be present in the study area as suitable habitat does not occur.

FISH

Five species of native and two introduced fish species were recorded in Bennett Brook during these surveys. Each species is listed below together with comments on their status at Bennett Brook.

Western Minnow *Galaxias occidentalis*

These small eel-like fish were often seen swimming close to the surface against the current in the fastest running parts of Bennett Brook. They are relatively common in Bennett Brook in the upper parts of the study area, downstream at least to the old bridge. This is a common endemic species in the southwest extending from the Moore River to the east of Albany (Allen 1982).

Mosquito Fish *Gambusia holbrooki*

This is an exotic species which is extremely abundant in Bennett Brook and the extensive Melaleuca Swamps, even in the shallow weedy seasonal wetlands around the margins. Populations fluctuate markedly in Bennett Brook as this is a very fecund species which produces up to 375 live young up to six times during the year (Cadwallader and Backhouse 1983). It is regarded as a pest on native species and in some cases its effect on the native fish fauna has been profound (Allen 1982). In eastern Australia it also has an impact on amphibian populations by predating on tadpoles (Webb & Joss 1997).

Nightfish *Bostockia porosa*

This nocturnal species prefers running water and was found in the upper reaches of Bennett Brook downstream to the old bridge. During the day time it is very hard to find as it secretes itself

away among stones or vegetation at the bottom of the stream. This is an endemic species found in coastal streams, lakes and ponds from the Moore River to Albany (Allen 1982).

Western Pygmy Perch *Edelia vittata*

This small fish was found throughout the length of Bennett Brook downstream to where the freshwater meets the tidal waters of the Swan River. It was found among water weeds and vegetation debris This is an endemic species found in coastal streams, lakes and ponds from the Moore River to Hopetoun (Allen 1982).

Swan River Goby *Pseudogobius olorum*

This small species is abundant in the Swan River and was found in the lower reaches of Bennett Brook. This fish is a slow swimming species and was hard to locate as it spends most of its time resting among submerged vegetation. This species is commonly found in streams and estuaries of the South-west (Allen 1982).

Long Thin Goby *Favonigobius lateralis*

This larger fish was found in the same sites as the Swan River Goby.

Golden Carp *Cyprinus auratus*

Only two juveniles of this exotic species were found in the middle sections of Bennett Brook. It feeds on insects, crustaceans, molluscs and aquatic vegetation (Allen 1982). The seasonal nature of Bennett Brook suggests that it is unlikely to become abundant and therefore not likely to become a major problem here.

BIRDS

Seventy-eight species of birds were recorded during this survey. They are listed in Table 2. Not surprisingly, most species are associated with the extensive swamp system on the eastern side of Bennett Brook. Wooded wetlands such as these are now relatively scarce on the eastern side of the Swan Coastal Plain. Accordingly, this swampland is a significant feeding and roosting area for many species of bird especially herons, cormorants and ducks.

Table 2 also includes a number of small insectivorous landbirds such as thornbills, fairy-wrens, scrub-wrens and Grey Fantails which require natural vegetation for their survival. Each of the species in this group have declined markedly on the Swan Coastal Plain as a result of habitat fragmentation (How and Dell, 1993). The corridor of mature trees along Bennett Brook provides an important linkage between the riverine corridor of the Swan River and conservation reserves, especially Ellen Brook to the north.

CONSERVATION SIGNIFICANCE

The study area has been recognised as having important conservation significance and is recommended for conservation in Perth's Bushplan (Government of Western Australia 1998) as the largest and most diverse relatively intact lagoonal system on the Swan-Canning River Estuary and is one of a very limited number of bushland areas on the Swan Estuary in providing habitat for fauna as well as linkages between different bushland areas.

The study area has five species of native fish all of which have declined on the Swan Coastal Plain. The frog fauna which includes seven species is moderately rich for a coastal plain wetland. The area has a rich lizard fauna with nine species of skink lizards. The

most significant species is the Swamp Skink which is now rarely recorded on Swan Coastal Plain bushlands (How and Dell, 1994).

The conservation significance of the area for birds has been highlighted above. The swamplands support a large number of waterbirds and the riverine forest is an important transit corridor linking the Swan River with conservation reserves to the north.

MANAGEMENT CONSIDERATIONS

The Success Hill/Bennett Brook area needs specific management planning and practices to protect the multiple objectives of conservation (both wildlife and flora) and human recreation and aesthetic values. In particular, the damaging processes of fire, environmental weeds, feral animals, grazing animals and human disturbance need addressing. Some need immediate attention e.g. wildfire control and others need longer term considerations as disturbance processes increase with time.

Fire has both short-term as well as long-term effects on native fauna. These were summarised in a symposium organised by the Urban Bushland Council in 1995, and highlighted in a paper by Dell and How (1995). They indicated that vertebrate as well as invertebrate animals were inimically affected by fire. In particular, habitat specific, dietary specialist, sedentary species were worst affected. Some species disappeared completely after fire and others were slow to recolonise burnt areas from unburnt patches.

The severe wildfire of January 1995 had a devastating effect on native fauna at Success Hill. Many slow moving, above-ground reptile species such as Bobtails, legless lizards and some skinks were killed outright by the fire. Others which occupied burrows emerged after the fire to face considerably increased predator pressure because their protective cover had been removed.

A large number of exotic grasses and other plants occur in the Success Hill/Bennett Brook area and all contribute to changes to native plant and animal communities, displace sensitive native species, reduce regeneration of native species, disposess native animals of habitat or food resources, increase flammability of native vegetation and result in more frequent and increased fire intensity. They also affect the soil surface and change natural water and nutrient cycles.

Non-native species of vertebrates such as foxes, cats, rabbits and Golden Carp compete for resources against native species and a number of them predate on native fauna. Rabbit overgrazing can result in soil erosion, weed invasion and the loss of native plant species. Foxes and cats prey upon ground animals and can seriously affect the population of the Quenda. They also destroy nests of ground-nesting birds or those that nest close to the ground.

Native vegetation is easily damaged by human trampling. This also causes increased erosion and spread of weeds. Fertiliser and chemical use (herbicide and pesticide) should be discouraged in adjacent areas to reduce their effects in Bennett Brook as these affect water quality and the consequent survival of native fish and frogs.

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Table 2. List of birds recorded at Success Hill/Bennett Brook during surveys in 1994-1995
+ = species which have colonised the area through natural expansion
* = species which have been introduced by man

ANATIDAE
Black Swan *Cygnus atratus*
Australian Shelduck *Tadorna tadornoides*
Pacific Black Duck *Anas superciliosa*
Grey Teal *Anas gracilis*
Australian Wood Duck *Chenonetta jubata*
Blue-billed Duck *Oxyura australis*
Musk Duck *Biziura lobata*

PODICIPEDIDAE
Australasian Grebe *Tachybaptus novaehollandiae*

ANHINGIDAE
Darter *Anhinga melanogaster*

PHALACROCORACIDAE
Little Black Cormorant *Phalacrocorax sulcirostris*
Great Cormorant *Phalacrocorax carbo*
Little Pied Cormorant *Phalacrocorax melanoleucos*

PELECANIDAE
Australian Pelican *Pelecanus conspicillatus*

ARDEIDAE
White-necked Heron *Ardea pacifica*
White-faced Heron *Ardea novaehollandiae*
Great Egret *Egretta alba*
Rufous Night Heron *Nycticorax caledonicus*

THRESKIORNITHIDAE
+Sacred Ibis *Threskiornis aethiopicus*
+Straw-necked Ibis *Threskiornis spinicollis*
+Yellow-billed Spoonbill *Platalea flavipes*

ACCIPITRIDAE
Black-shouldered Kite *Elanus caeruleus*
Whistling Kite *Haliastur sphenurus*
Brown Goshawk *Accipiter fasciatus*

FALCONIDAE
Peregrine falcon *Falco peregrinus*
Australian Kestrel *Falco cenchroides*

RALLIDAE
Dusky Moorhen *Gallinula tenebrosa*
Purple Swamphen *Porphyrio porphyrio*
Eurasian Coot *Fulica atra*
Buff-banded Rail *Gallirallus philippensis*
Spotless Crake *Porzana tabuensis*

CHARADRIIDAE
Black-fronted Dotterel *Charadrius melanops*

COLUMBIDAE
*Spotted Turtle-Dove *Streptopelia chinensis*
*Laughing Turtle-Dove *Streptopelia senegalensis*
*Domestic Pigeon *Columba livia*

PSITTACIDAE
*Rainbow Lorikeet *Trichoglossus haematodus*
Australian Ringneck *Platycercus zonarius*
Red-capped Parrot *Platycercus spurius*
Carnaby's Cockatoo *Calyptorhynchus latirostris*
+Galah *Cacatua roseicapilla*
*Corella *Cacatua* spp.

CUCULIDAE
Pallid Cuckoo *Cuculus pallidus*
Fan-tailed Cuckoo *Cacomantis flabelliformis*
Shining Bronze Cuckoo *Chrysococcyx lucidus*

HALCYONIDAE
*Laughing Kookaburra *Dacelo novaeguineae*
Sacred Kingfisher *Todiramphus sanctus*

MEROPIDAE
Rainbow Bee-eater *Merops ornatus*

MALURIDAE
Splendid Fairy-wren *Malurus splendens*

PARDALOTIDAE
Spotted Pardalote *Pardalotus punctatus*
Striated Pardalote *Pardalotus striatus*

ACANTHIZIDAE
Western Gerygone *Gerygone fusca*
Weebill *Smicornis brevirostris*
Broad-tailed Thornbill *Acanthiza apicalis*
Yellow-rumped Thornbill *Acanthiza chrysorrhoa*
White-browed Scrubwren *Sericornis frontalis*

MELIPHAGIDAE
Brown Honeyeater *Lichmera indistincta*

Table 2. (continued)

Singing Honeyeater *Meliphaga virescens*
White-cheeked Honeyeater *Phylidonyris nigra*
Tawny-crowned Honeyeater *Phylidonyris melanops*
New Holland Honeyeater *Phylidonyris novaehollandiae*
Western Spinebill *Acanthorhynchus superciliosus*
Western Little Wattlebird *Anthochaera lunulata*
Red Wattlebird *Anthochaera carunculata*
White-fronted Chat *Epthianura albifrons*

PACHYCEPHALIDAE
Rufous Whistler *Pachycephala rufiventris*

DICRURIDAE
Grey Fantail *Rhipidura fuliginosa*
Willy Wagtail *Rhipidura leucophrys*
Magpie-lark *Grallina cyanoleuca*

CAMPEPHAGIDAE
Black-faced Cuckoo-shrike *Coracina novaehollandiae*

CRACTICIDAE
Grey Butcherbird *Cracticus torquatus*
Australian Magpie *Cracticus tibicen*

CORVIDAE
Australian Raven *Corvus coronoides*

HIRUNDINIDAE
Welcome Swallow *Hirundo neoxena*
Tree Martin *Hirundo nigricans*

ZOSTEROPIDAE
Grey-breasted White-eye *Zosterops lateralis*

SYLVIIDAE
Clamorous Reed-Warbler *Acrocephalus stentoreus*
Little Grassbird *Megalurus gramineus*

DICAEIDAE
Mistletoebird *Dicaeum hirundinaceum*

MOTACILLIDAE
Richard's Pipit *Anthus novaeseelandiae*

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REFERENCES

ALLEN, G.R. 1982. *A Field Guide to Inland Fishes of Western Australia.* W.A. Museum. Perth.

BUSH, B., MARYAN, B., BROWNE-COOPER, R. and ROBINSON, D. 1995. *Reptiles and Frogs of the Perth Region.* University of Western Australia Press.

CADWALLADER, P.L. and BACKHOUSE, G.N. 1983. *A Guide to the Freshwater Fish of Victoria.* Government Printer. Melbourne.

COOPER, N.K. 1995. Vertebrate Fauna of an Isolated Bushland Reserve (No 18325) in Inner Perth. *Western Australian Naturalist.* **20:** 21-28.

DELL, J. and HOW, R.A. 1995. Faunal Responses to Fire in Urban Bushland. pp. 35-41 *In: Burning our Bushland.* Proceedings of a Conference about Fire and Urban Bushland. Urban Bushland Council (W.A.).

GOVERNMENT OF WESTERN AUSTRALIA 1998. *Perth's Bushplan Volume Two Part B.* Department of Environmental Protection Perth.

HARVEY, M.S., DELL, J. HOW, R.A.., & WALDOCK, J.M. 1997 *Ground Fauna of Bushland Remnants on the Ridge Hill Shelf and Pinjarra Plain Landforms,*

Perth. Report to the Australian Heritage Commission. NEP Grant N95/49. 56 pp.

HOW, R.A. & DELL, J. 1989. Vertebrate Fauna of Bold Park. *Western Australian Naturalist*. 18: 122-131.

HOW, R.A. & DELL, J. 1993. Vertebrate Fauna of the Perth Metropolitan Region: Consequences of a Modified Environment. pp 28-47. *In:* M. Hipkins (ed) *Urban Bush Management*. Australian Institute of Urban Studies, Perth.

HOW, R.A. and DELL, J. 1994. The Zoogeographic Significance of Urban Bushland Remnants to Reptiles in the Perth region, Western Australia. *Pacific Conservation Biology*. 1: 132-140.

HOW, R.A., HARVEY, M.S., DELL, J. and WALDOCK, J.M. 1996. *Ground Fauna of Urban Bushland Remnants in Perth*. Report to the Australian Heritage Commission. NEP Grant N93/04.

KEIGHERY, B.J. 1996. A Description of Remnant Vegetation of Bennett Brook (System Six Area M41). Report prepared for the Department of Environmental Protection, Perth, Western Australia.

SARTI, N. and ALLEN, G. 1978. Freshwater Fishes of the Northern Swan Coastal Plain. Pp. 204-220, *In* : R.A. How (ed), *Faunal Studies of the Northern Swan Coastal Plain: a consideration of Past and Future changes*. W.A. Museum. Perth.

STORR, G.M. and JOHNSTONE, R.E. 1988. Birds of the Swan Coastal Plain. *Records of the Western Australian Museum*. Supplement 28.

STORR, G.M., HAROLD, G. and BARRON, G. 1978. Amphibians and Reptiles of the Northern Swan Coastal Plain. Pp. 173-203. *In:* R.A. How (ed), *Faunal Studies of the Northern Swan Coastal Plain: a Consideration of Past and Future Changes*. W.A. Museum, Perth.

STORR, G.M., SMITH, L.A. and JOHNSTONE, R.E. 1981. *Lizards of Western Australian. I. Skinks*. Western Australian Museum, Perth.

STRAHAN, R. 1995. *The Mammals of Australia*. The Australian Museum/ Reed Books, Sydney.

TURPIN, M.C. 1990. Ecological Appraisal of an Isolated *Banksia* Woodland Reserve No. 3694 South of the Swan River, Perth. *Western Australian Naturalist*, 18: 131-138.

TURPIN, M.C. 1991. Additions to the Fauna of Reserve 3694, Victoria Park. *Western Australian Naturalist*, 18: 168-169.

TYLER, M.J., SMITH, L.A. and JOHNSTONE, R.E. 1994. *Frogs of Western Australia*. Western Australian Museum, Perth.

WEBB, C. and JOSS, J. 1997. Does Predation by the Fish *Gambusia holbrooki* (Atheriniformes: Poeciliidae) Contribute to Declining Frog Populations. *Australian Zoologist*, 30: 316-324.