

Scientific name	Family	Common name
<i>Caustis flexuosa</i>	Cyperaceae	Grandfather's Beard
<i>Centella asiatica</i>	Apiaceae	Pennywort
<i>Chamaesyce drummondii</i>	Euporbiaceae	Flat Spurge, Caustic
<i>Cotula australis</i>	Asteraceae	Common Cotula
<i>Cryptostylis erecta</i>	Orchidaceae	Hooded Orchid
<i>Cyperus gracilis</i>	Cyperaceae	Slender Sedge
<i>Cyperus laevis</i>	Cyperaceae	
<i>Cyperus leiocaulon</i>	Cyperaceae	
<i>Cyperus mirus</i>	Cyperaceae	
<i>Dendrobium speciosum</i>	Orchidaceae	Rock Orchid
<i>Dianella caerulea producta</i>	Phormiaceae	Flax Lily
<i>Dianella caerulea caerulea</i>	Phormiaceae	Flax Lily
<i>Dianella revoluta</i>	Phormiaceae	Spreading Flax Lily
<i>Dichelachne inaequiglumis</i>	Poaceae	Plume Grass
<i>Dichondra repens</i>	Convolvulaceae	Kidney Weed
<i>Digitaria parviflora</i>	Poaceae	Smallflower Fingergrass
<i>Dipodium punctatum</i>	Orchidaceae	Hyacinth Orchid
<i>Dracophyllum secundum</i>	Epacridaceae	
<i>Echinocloa colona</i>	Poaceae	Awnless Barnyard Grass
<i>Echinopogon caespitosus</i>	Poaceae	Tufted Hedgehog Grass
<i>Echinopogon ovatus</i>	Poaceae	Forest Hedgehog Grass
<i>Einadia hastata</i>	Chenopodiaceae	Berry Saltbush
<i>Entolasia marginata</i>	Poaceae	Margined Panic Grass
<i>Entolasia stricta</i>	Poaceae	Wiry Panic Grass
<i>Epilobium billardierianum</i>	Onagraceae	Willow Herb
<i>Geranium homeanum</i>	Geraniaceae	Native Geranium
<i>Geranium solanderi</i>	Geraniaceae	Native Geranium
<i>Gonocarpus tetragynus</i>	Haloragaceae	Poverty Raspwort
<i>Gonocarpus teucroides</i>	Haloragaceae	Germander Raspwort
<i>Goodenia heterophylla</i>	Goodeniaceae	Variable-leaf Goodenia
<i>Hydrocotyle laxiflora</i>	Apiaceae	Stinking Pennywort
<i>Hydrocotyle peduncularis</i>	Apiaceae	Pennywort
<i>Imperata cylindrica</i>	Poaceae	Blady Grass

Scientific name	Family	Common name
<i>Isolepis inundatus</i>	Cyperaceae	Swamp Club-rush
<i>Juncus homalocaulis</i>	Juncaceae	
<i>Juncus planifolius</i>	Juncaceae	Broad-leaf Rush
<i>Juncus prismatocarpus</i>	Juncaceae	Branching Rush
<i>Juncus usitatus</i>	Juncaceae	Common Rush
<i>Lepidosperma laterale</i>	Cyperaceae	A Sword Sedge
<i>Lepyrodia scariosa</i>	Restionaceae	Scale Rush
<i>Lobelia alata</i>	Lobeliaceae	Angled Lobelia
<i>Lomandra multiflora</i>	Lomandraceae	Many-flowered Mat Rush
<i>Lomandra longifolia</i>	Lomandraceae	Spiny-headed Mat Rush
<i>Lomandra obliqua</i>	Lomandraceae	Fish Bones
<i>Microlaena stipoides</i>	Poaceae	Weeping Grass
<i>Opercularia aspera</i>	Rubiaceae	Stinkwort
<i>Oplismenus aemulus</i>	Poaceae	Basket Grass
<i>Oplismenus imbecillis</i>	Poaceae	Australian Basket Grass
<i>Oxalis perennans</i>	Oxalidaceae	Yellow Sucking Clover
<i>Panicum simile</i>	Poaceae	Panic Grass
<i>Patersonia sericea</i>	Iridaceae	Silky Purple Flag
<i>Persicaria decipiens</i>	Polygonaceae	Slender knotweed
<i>Persicaria lapathifolia</i>	Polygonaceae	Pale Knotweed
<i>Persicaria strigosa</i>	Polygonaceae	Spotted Knotweed
<i>Plantago debilis</i>	Plantaginaceae	Native Plantain
<i>Plectranthus parviflorus</i>	Lamiaceae	Cockspur Flower
<i>Pomax umbellata</i>	Rubiaceae	Pomax
<i>Poranthera microphylla</i>	Euphorbiaceae	Small Poranthera
<i>Prasophyllum sp.</i>	Orchidaceae	
<i>Pratia purpurascens</i>	Lobeliaceae	White-root
<i>Pseuderanthemum variabilis</i>	Acanthaceae	Pastel Flower
<i>Pseudognaphalium luteoalbum</i>	Asteraceae	Jersey Cudweed
<i>Pterostylis nutans</i>	Orchidaceae	Nodding Greenhood Orchid
<i>Ptilothrix deusta</i>	Cyperaceae	
<i>Scaevola calandulaceae</i>	Goodeniaceae	Scented Fan Flower
<i>Schelhammera undulata</i>	Uvulariaceae	Lilac Lily

Scientific name	Family	Common name
<i>Schoenus apogon</i>	Cyperaceae	Fluke Bog Rush
<i>Selaginella uliginosa</i>	Selaginellaceae	Swamp Selaginella
<i>Senecio hispidulus</i>	Asteraceae	Hill Fireweed
<i>Sigesbeckia orientalis</i>	Asteraceae	Indian-weed
<i>Stipa pubescens</i>	Poaceae	Tall Spear Grass
<i>Stylidium graminifolium</i>	Stylidiaceae	Trigger Plant
<i>Themeda australis</i>	Poaceae	Kangaroo Grass
<i>Tricoryne simplex</i>	Antheriacaceae	Yellow Rush Lily
<i>Veronica plebeia</i>	Scrophulariaceae	Trailing Speedwell
<i>Viola hederaceae</i>	Violaceae	Native Violet
<i>Wahlenbergia gracilis</i>	Campanulaceae	Native Bluebell
<i>Xanthorrhoea sp</i>	Xanthorrhoeaceae	Grass Tree
<i>Xanthosia pilosa</i>	Apiaceae	Hairy Xanthosia
<i>Xanthosia tridentata</i>	Apiaceae	Rock Xanthosia
<i>Youngia japonica</i>	Asteraceae	
Vines		
<i>Billardiera scandens</i>	Pittosporaceae	Common Appleberry
<i>Cassytha pubescens</i>	Cassythaceae	Devil's Twine
<i>Cayratia clematidea</i>	Vitaceae	Slender Grape
<i>Cissus hypoglauca</i>	Vitaceae	Five-leaf Water Vine
<i>Clematis aristata</i>	Ranunculaceae	Clematis
<i>Clematis glycinoides</i>	Ranunculaceae	Clematis
<i>Convolvulus erubescens</i>	Convolvulaceae	Blushing Bindweed
<i>Desmodium rhytidophyllum</i>	Fabaceae	Rusty Tic-trefoil
<i>Desmodium varians</i>	Fabaceae	Variable Tic-trefoil
<i>Eustrephus latifolius</i>	Luzuriagaceae	Wombat Berry
<i>Geitonoplesium cymosum</i>	Luzuriagaceae	Scrambling Lily
<i>Glycine clandestina</i>	Fabaceae	Twining Glycine
<i>Glycine tabacina</i>	Fabaceae	Love Creeper
<i>Hardenbergia violaceae</i>	Fabaceae	False Sarsparilla
<i>Hibbertia dentata</i>	Dilleniaceae	Twining Guinea Flower
<i>Kennedia rubicunda</i>	Fabaceae	Dusky Coral Pea

Scientific name	Family	Common name
<i>Marsdenia rostrata</i>	Asclepiadaceae	Twining doubah
<i>Marsdenia suaveolens</i>	Asclepiadaceae	Sweet Marsdenia
<i>Morinda jasminoides</i>	Rubiaceae	Jasmine Morinda
<i>Pandorea pandorana</i>	Bignoniaceae	Wonga Vine
<i>Parsonia straminea</i>	Apocynaceae	Common Silkpod
<i>Polymeria calycina</i>	Convolvulaceae	Swamp Bindweed
<i>Smilax glyciophylla</i>	Smilacaceae	Native Sarsparilla
<i>Stephania japonica</i>	Minispermaceae	Snake Vine
<i>Tylophora barbata</i>	Asclepiadaceae	Bearded Tylophora
Native Epiphytes		
<i>Asplenium astralasicum</i>	Aspleniaceae	Bird's Nest Fern
<i>Cymbidium suave</i>	Orchidaceae	Snake Orchid
<i>Platynerium bifucatum</i>	Polypodiaceae	Elkhorn Fern
<i>Pyrrosia rupestris</i>	Polypodiaceae	Rock Felt Fern

Source: This list is based on those compiled by Indigenous Regeneration Co (Madeleine Schofield, Gordon Limburg and Melissa Medo) with contributions from Robin Buchanan, Nancy Pallin & Sally Fisher. List maintained by Nancy Pallin since 1998.

Appendix 4: Management considerations for the KFFR

1: Protecting the Flying-foxes

- **Impacts of companion and feral animals**

Companion and domestic animals, such as cats and dogs, are occasionally seen in the Reserve. Cats and dogs can disturb and kill fauna such as small birds, small mammals and reptiles. It is unlikely that their activities would have a major detrimental impact on healthy Flying-foxes, but they may scavenge sick or dead animals or take young during the breeding season. With the recent identification of disease-causing viruses in Flying-fox populations there is some concern, though considered unlikely, by scientists, that these viruses might in time be transmitted from Flying-foxes to mammals.

The Conservation Agreement does not permit domestic animals or pets within the Reserve. Council will undertake measure to control or limit the impacts of introduced pest and feral animals, as resources allow, on regional control programs in conjunction with other agencies such as the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) and the Livestock Health and Pest Authorities (LHPA) (formerly the Rural Lands Protection Board).

- **Heat stress impacts**

When ambient temperatures rise above 35°C Grey-headed Flying-foxes alter their behaviour to reduce exposure to heat. First they adjust roosting spots to escape direct sun then they move to lower layers of vegetation, such as dense shrubs and vines. If temperatures exceed 42°C or continue over several days above 35°C deaths occur, young being the first to die. The impact of high temperatures is increased by low humidity. An extreme heat event occurred on 18 January 2013 where 385 dead Flying-foxes were recovered in the reserve and in past events.

- **Public access**

As the camp is within an urban residential area, close to public transport in a city with a population of over 4 million people, there is a potential for major disturbance of the Flying-foxes causing distress and harm to the animals and causing noise nuisance impacts on neighbouring residents.

There is potential for neighbouring properties and those higher in the catchment to impact on the reserve. These potential impacts include disposing of stormwater pollutants, growing invasive introduced plants and not controlling companion animals.

The colony is particularly vulnerable during the birthing months of October to December. Therefore the Plan has concentrated on satisfying the public interest in ways which directs attention from the site and provides educational opportunities off site.

2: Maintaining habitat quality

- **Impact of the Flying-fox camp on the vegetation in the KFFR**

Roosting animals defoliate trees and break end branches. Soil nutrient levels are elevated by faecal material. Trees located in the core part of the camp are occupied frequently and are more likely to be affected than those in transient areas. Cumulative impacts over several years can lead to death of roost trees. Sydney Bluegums (*Eucalyptus saligna*), Coachwood (*Ceratopetalum apetalum*), *Ficus rubiginosa* and *Acmena smithii* are more

resilient to these nutrients than others tree species. Blackbutts (*Eucalyptus pilularis*) and Smooth barked apple (*Angophora costata*) are more sensitive to impacts from Flying-foxes and in areas occupied by or recently nutrient enriched by Flying-foxes. The canopy tree replacement strategy (identified as an action within this plan) will include planting these nutrient tolerant trees species in areas where Flying-foxes have camped.

- **Native vines and new growth**

Native vine species such as *Parsonsia* and *Kennedia* are normally not a problem in bushland but can impede the growth of new planted or naturally regenerating canopy tree saplings. A successful strategy has been to remove native vines from young trees (until the trees reach a height / size where they are no longer affected by the vines) and keep the density of vine plants low in open areas where canopy trees are being established.

- **Wallabies and new growth**

Swamp wallabies were not recorded in the reserve until recently (from about 2004) and are becoming more regular and common visitors the Ku-ring-gai Flying-fox Reserve. Swamp wallabies are unusual in that they are browsers not grazers like most kangaroos so they favour young shrubs or new growth on older shrubs rather than grass to feed on. Recently planted canopy trees and shrubs may die from browsing by wallabies. Once the lowest branches of trees / shrubs are over 2.5m tall and stems diameter is over 100mm they are generally safe from browsing wallabies.

The only effective way to protect new shrubs and trees is to enclose them in a rigid enclosure of wire firmly staked to the ground. If the enclosures cannot be bent over, have wire with mesh small enough to prevent wallabies pushing their mouth through and are at 1.5 metres high are effective at protecting plants during their vulnerable early growth stages. The enclosures can be removed (and reused) once the plants are large enough to survive wallaby attacks.

- **Stormwater pollutants and nutrient levels**

The vegetation in the reserve is being impacted by elevated nutrients and pollutants from various sources including faeces, stormwater and runoff from adjacent urban areas. This can impact native plants directly via toxic effects and indirectly by promoting weed growth. Strategies to address this could include planting nutrient / pollutant tolerant plant species in the short term. In the longer term trying to reduce or eliminate the sources of pollutants in stormwater, where feasible by use of devices to remove debris and nutrients.

- **Plant pathogens**

Phytophthora and Myrtle rust pose a serious risk to native plants and hence to the habitat of many fauna species and both are recognised as threatening processes therefore they need to be considered in the management of the KFFR.

All Council staff, contractors and volunteers must take reasonable measures to prevent introduction and spread of plant diseases. This includes implementing and following prevention programs and following current best practice hygiene protocols such as sterilising footwear and tools. Phytophthora is spread in water and on tool and machinery. Myrtle rust is harder to control as it can spread by airborne spores.

3: Managing bushfire risks

Records of bush fires are not available prior to 1979 but oral history indicates the whole valley has not been burnt since the 1940s. A fire was reported in the eastern end of the

Reserve in 1947. The absence of fire has led to the growth of closed forest with emergent eucalypts. This habitat is favoured by the Flying-foxes.

In 1991, as part of habitat restoration, piles of woody weeds that had been manually cleared were burnt. This was found to increase the diversity of native plant species germinating, including *Acacia*, *Dodonea*, and *Lasiopetalum* species. This practice has continued occasionally and weed piles are burned by fire agencies in winter when only a small number of Flying-foxes are in the valley. A hazard reduction burn was undertaken in the winter of 2006 near Bell Street, Gordon when most bats had vacated and wind conditions were favourable. See Fire hazard reduction history map of KFFR (Figure 6).

The Conservation Agreement specifically excludes hazard reduction burning from being carried out in the Reserve without written consent from the Director-General of National Parks and Wildlife Service or its equivalent. However, to retain the species diversity of the open forest on the upper slopes fire will need to be used occasionally as directed by identified fire thresholds.

Fire should be excluded from the closed forest / riparian vegetation and in some areas planting will be needed to maintain emergent eucalypts.

Council has a responsibility to manage bushfire on Council owned land, but works in collaboration with fire agencies, private landholders, community groups and utility services. Fuel management activity is guided by environmental legislation and codes. No single method of management used in isolation will appropriately reduce the risks of bushfire. A variety of methods may need to be applied including burning, mechanical works on the residential bushland interface and community education.

Due to the site constraints of the KFFR, that is, steep slopes over 18 degrees (according to RFS guidelines works on slopes over 18 degrees are ineffective for fire suppression and may cause accelerated erosion), fire trail access and mechanical works to maintain a fuel reduced zone are not recommended or even possible over the majority of the Reserve (including interface areas).

As the frequency of hazard reduction burning is also restricted it is necessary that residents remain vigilant in undertaking fuel reduction activities on their land (following receipt of appropriate approvals).

See Figure 6 (below) for bushfire prone lands mapping in the KFFR and Figure 7 (below) for past areas in the KFFR considered for Asset Protection Zone creation.

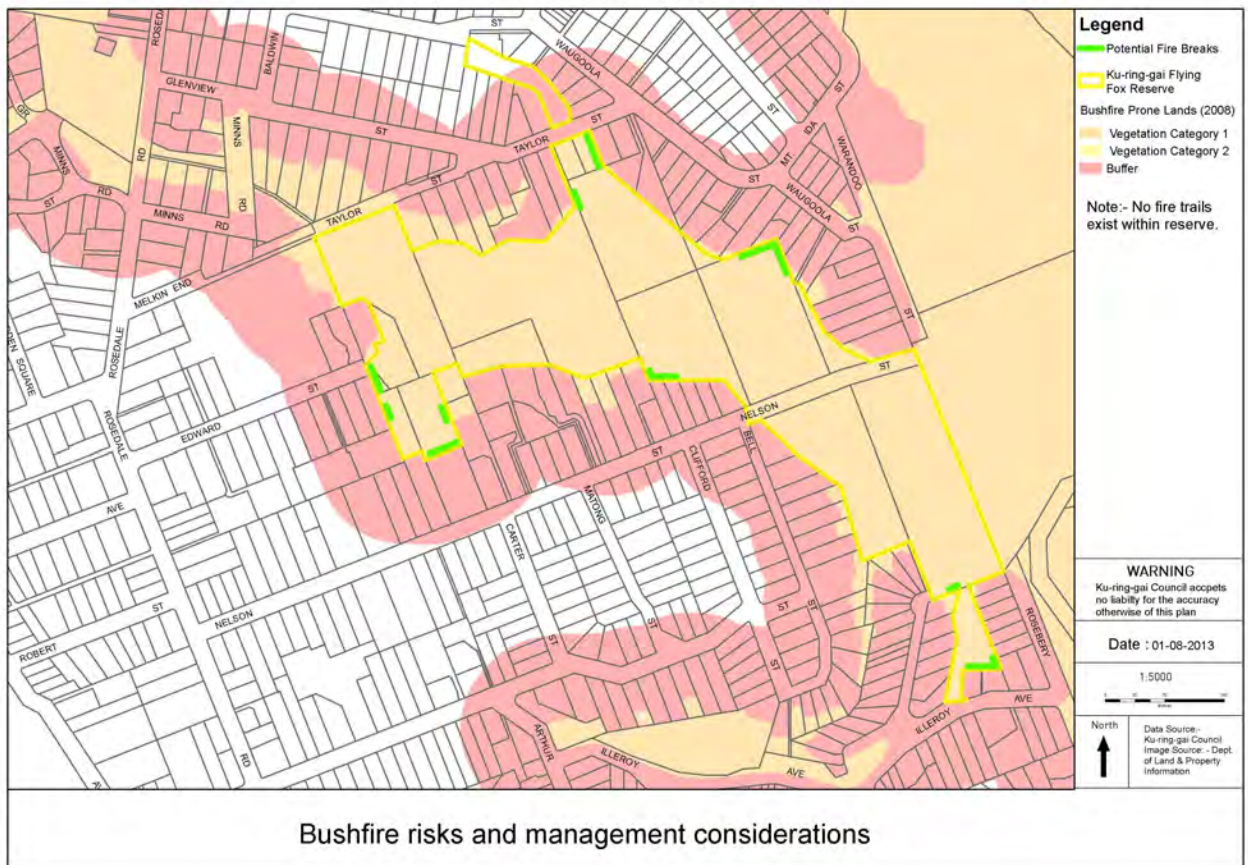


Figure 6: Bushfire prone lands mapping in the KFFR

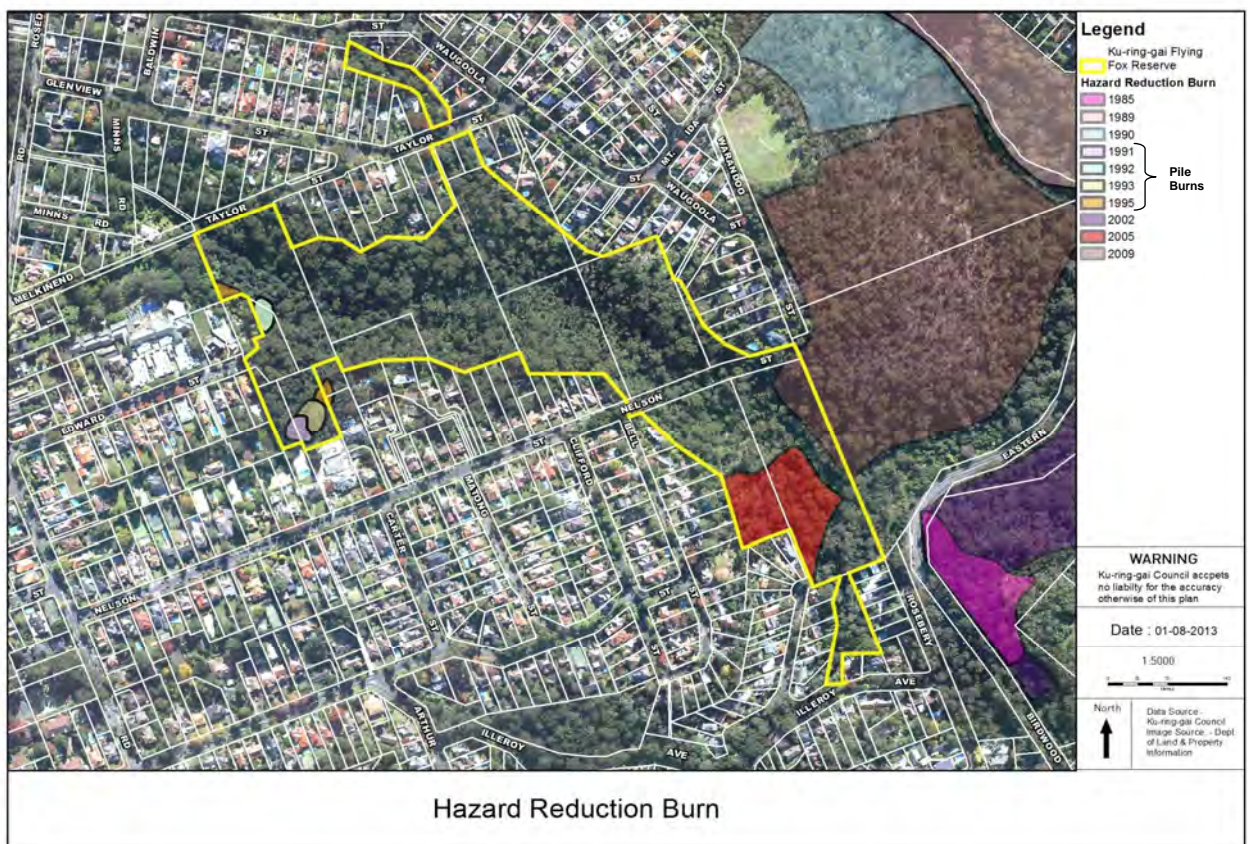


Figure 7: Fire hazard reduction history map of the KFFR

4: Managing community interactions

- **Community involvement**

The community increasingly recognises the importance of Flying-foxes as part of the conservation of our natural heritage. This is evident by the volunteers that support activities to protect Flying-foxes, not only in Ku-ring-gai but also in other parts of Sydney. Volunteers assist as bush regenerators, bat speakers, Flying-fox counters and in fund-raising projects. The ecological importance of Flying-foxes is being widely recognised. Licensed wildlife rehabilitation groups co-operate in Flying-fox rescue and rehabilitation programs.

The NSW OEH and Ku-ring-gai Council will foster and maintain public support for Flying-foxes through consultation with community networks. Community interest in the Reserve will be encouraged and facilitated through existing programs and networks.

- **Community concerns**

The KFFR is within an urban residential area and bounded by approximately 100 residential properties. Increasing concerns have been raised by residents adjacent to the Reserve regarding the impacts of the Flying-foxes, as a result of the noise, droppings and odour when the Flying-foxes are present at the KFFR.

- **Potential health issues**

Australian Bat Lyssavirus (ABL) and Hendra virus (HeV) are both very rare diseases in humans that Flying-foxes and some microbats (ABL) are known to carry. Both diseases are potentially fatal to humans.

Research* has shown that Hendra virus is only transmitted to humans through contact with infected horses. There are no known cases of transmission from human to human or from any other animal to humans. It is suspected that horses feeding under Flying-fox food trees pick up the virus from contaminated spats (chewed fruit remnants or urine) however this is yet to be proven. There is no evidence that bats can pass Hendra to humans through their droppings. Not all Flying-foxes carry this virus and it is more likely that sick or stressed bats will carry the disease. In November 2012 a vaccine against Hendra virus for horses was released which will greatly reduce the risk of spread of this virus to humans if horses are vaccinated.

Australian Bat Lyssavirus (ABL) can be contracted via bites or scratches from infected bats that break the skin. This is only likely to occur if people handle live (or dead) bats. Both Flying-foxes and microbats are known to carry this virus but only a small number of Australian bat species are known to be natural hosts.. Less than 1% of wild Flying-foxes have been found to carry active virus, but the proportion is higher in sick or injured animals. Australian Bat Lyssavirus is related to the rabies virus and can be vaccinated against with the rabies vaccine. There have only been three known human deaths from this virus and two were animal carers who were not vaccinated against rabies.

Health risk, prevention and bat fact information can be obtained from Universities, the CSIRO, bat researchers, the Australasian Bat Society, Biosecurity Queensland and NSW Health. As a precaution, no bats live or dead, should be handled with bare hands. Any injured or sick live bats should only be handled by registered and vaccinated bat carers / handlers such as some members of the KBCS, WIRES and the Metropolitan Wildlife Service. Living near a Flying-fox camp or having them feed in your garden does not pose a significant health risk. Should you be bitten by any type of bat seek medical advice immediately.

* As published in sources including: NSW Department of Health - *Fact Sheet for Hendra Virus and Control Guidelines for Hendra Virus*; and NSW Department of Health - *Fact Sheet for Rabies and Bat Lyssavirus Infection*.

- **Access for education, interpretation and research**

While recognising the potential of the site for environmental education, the topography of the valley does not allow for the provision of safe or easy visitor access, and visitor access will impact adversely on the colony.

Therefore to promote and satisfy the public interest in Flying-foxes and to deflect attention from the colony site, an off-site education program has been developed. This provides information on the ecology of Flying-foxes and caters for all age groups. Evening Flying-fox viewings including a talk, meeting a Flying-fox and watching the evening fly-out from Rosedale Road Bridge are conducted in conjunction with Council in the summer months. Other venues are fairs and environmental open days where the public meets a Flying-fox. KBCS in conjunction with Council has undertaken direct information programs via doorknocking and letters. Council has posted information about Flying-foxes and the reserve on its website.

Interpretive signage was erected at Edward Street entrance, and on Rosedale Road Bridge in 1998 and was a co-operative project between the then NSW National Parks and Wildlife Service, Ku-ring-gai Council and the Ku-ring-gai Bat Conservation Society.

From time to time requests are received from special interest groups to view the colony. These include professional film makers and photographers and special research project requests from Universities, TAFE or other professional bodies. These visits can result in undue disturbance to the camp and local residents. Permission must be obtained from Council to enter the reserve.

Appendix 5: Draft protocol for release of Flying-foxes into the KFFR

Protocol for Release of Flying-foxes into Ku-ring-gai Flying-fox Reserve

Preamble

This protocol incorporates the principle of mirroring the development of wild flying-foxes for the release of hand-reared, orphaned ones. It is based on observations and experience of members of Ku-ring-gai Bat Conservation Society Inc (KBCS) and on the findings of research.

The release procedures in this protocol conform to the Ku-ring-gai Flying-fox Reserve Management Plan (1999) developed under the Voluntary Conservation Agreement 1991 between the NSW Minister for the Environment and Ku-ring-gai Municipal Council.

Section 7.8.2 of the Management Plan states that “the release of flying-foxes into the Reserve must be co-ordinated through the Ku-ring-gai Bat Conservation Society and must only be undertaken in accordance with licence conditions of the NSW National Parks and Wildlife Service”.

Rescue and hand-rearing of infant flying-foxes to weaning and flying stage is undertaken by wildlife care organisations (not currently by KBCS) so that the juveniles are ready for crèche at the date to be fixed in January.

Juvenile flying-foxes are banded by a qualified bander prior to release into the wild at Gordon and at other release sites in NSW under the Australian Bird and Bat Banding Scheme.

The release of hand-reared grey-headed flying-foxes into Ku-ring-gai Flying-fox Reserve has been carried out by KBCS since 1987. Although small numbers of banded flying-foxes have been found in other parts of the Sydney region following release, the fates of most hand-reared flying-foxes, their survival and behaviour after release remained unknown until the three year radio tracking research undertaken by M Augee and D. Ford.

Prior to this there were many times when young flying-foxes were reported roosting on neighbouring properties, being fed by neighbours and even entering houses. To avoid this dependency on humans the individually hand-reared flying-foxes were housed in groups (crèches) during January prior to transfer to the release enclosure close to the wild colony. The creching reduced the numbers of young flying-foxes visiting neighbouring properties. Following the implementation of recommendations from the three year radio-tracking study in 1994 - 97 the incidence of juvenile flying-foxes roosting on private property has been almost eliminated.

Refer to the attached paper:

**M.L Augee and Denise Ford (1999) Radio-tracking Studies of Grey-headed Flying-foxes, *Pteropus poliocephalus*, from the Gordon Colony, Sydney
Proceedings of the Linnean Society of New South Wales Vol 121 pp 61 - 70.**

This research was funded by a grant from the NSW National Parks and Wildlife Service under the Voluntary Conservation Agreement. The KBCS acknowledges the assistance of Dr Mike Augee of the University of NSW, Stefan Rose and Dr Peggy Eby.

Protocol for Release of Grey-headed Flying-foxes into Ku-ring-gai Flying-fox Reserve, Gordon

Rescue and hand-rearing of infant flying-foxes to weaning and flying stage is undertaken by wildlife care organisations so that the juveniles are ready for crèche at the date to be fixed each year in early January.

The release into the flying-fox colony is the final stage in the process of reducing human contact with hand reared orphan flying-foxes so that they have the best chance to integrate with the wild flying-foxes. This Protocol has been formulated to achieve this chance for their survival.

The radio-tracking studies of hand-reared grey-headed flying-foxes released at the Gordon colony have shown that successful integration of hand-reared flying-foxes with a wild colony depends on timing of release. Complete integration occurred when release was timed to coincide with independent foraging behaviour of wild juveniles. The findings demonstrated that the optimum time for release is around mid February, with only a short period of support feeding to encourage hand-reared flying-foxes to seek wild foods by flying out of the colony with the wild juveniles each evening.

1. The release of flying-foxes into Ku-ring-gai Flying-fox Reserve will be undertaken according to this protocol.
2. Unless changes to the release procedures have been agreed to in prior discussions between all parties involved in the release the release enclosure will be opened in early to mid-February. Support feeding will be gradually reduced over one month according to consumption levels, then reduced to every second, then every third day and terminated by mid March.
3. **To minimise the impact of the release on neighbouring residents** the release procedures will be undertaken with due care.
 - Timing of the release in mid February has been shown to significantly reduce the number of flying-foxes seeking human contact;
 - Minimising contact with humans during the crèche period and time in the release cage also significantly contributes to this result.
4. **The security of the release facility** will be fully considered in arranging the feeding of the flying-foxes during the release.
 - It is important that there is no publicity regarding the location of the release enclosure
 - People delivering food to the release site will be fully briefed to ensure that visitation to this site does not occur other than for the purpose of support feeding or monitoring of the release. Feeders will be personally asked not to refer to the exact location or to take there any person not involved in the release. This system has worked well since 1987.

- People entering the enclosure must be vaccinated for Australian Bat Lyssavirus.
- The immediate neighbours at No. 14 Taylor Street will be advised prior to the commencement of the release each year and be given contact details for reporting any unusual activity by people or flying-foxes.

5. **A Volunteer Manager and a Deputy Manager of the Release will be appointed each year** by the wildlife care groups intending to use the release facilities in Ku-ring-gai Flying-fox Reserve. The Volunteer Manager may be one person or several people with responsibilities divided between them. She/he/they will be responsible for overseeing the entire release including

- transfer of flying-foxes from carers to crèche,
- collecting crèche fees from carers,
- transfer of flying-foxes to the release enclosure,
- banding,
- rosters of feeders,
- purchase of food and its preparation,
- instruction of feeders
- liaison with KBCS
- The manager of the release will contact a bat bander approved by the Australian Bird and Bat Banding Scheme in plenty of time to arrange for the purchase of bands and for an authorised bander to attend at Gordon on the banding day.
- report in writing at the end of the season to KBCS and the participating wildlife care groups on the number of flying-foxes rescued, number placed in release enclosure, their band numbers, date enclosure opened, date support feeding terminated, any unusual observations and any untoward incidents which are known to have occurred.

The Bander is responsible for forwarding band numbers and the records of sex, forearm measurements and weight of each flying-fox to the Australian Bird and Bat Banding Scheme.

6. **Responsibilities of KBCS**

- KBCS will appoint a member of its committee to liaise with the Volunteer Manager of the Release each season. The Volunteer Manager of Release and their deputy will be invited to attend KBCS meetings during the season.
- KBCS will liaise with Ku-ring-gai Municipal Council and the NSW National Parks and Wildlife Service regarding management of the Ku-ring-gai Flying-fox Reserve.
- KBCS will be the final arbiter on any management decisions during the final release period after the juvenile flying foxes are transferred to the release cage, and are the responsibility of both KBCS and the wildlife care group Volunteer Manager.
- KBCS will annually deliver to all neighbours of the Reserve a leaflet advising them of the impending release and providing contact names and telephone numbers of people to call for information or to report a flying-fox on their property.

Appendix 6: Statistical data and camp maps for the Grey-headed Flying-fox

Variation in Flying-fox population numbers

As a part of local and national research the Ku-ring-gai Flying-fox Reserve camp population size has been monitored since the 1980s by members of the KBCS and / or by researchers. This data has been incorporated into national population monitoring programs to help us understand trends in Flying-fox movements and to measure possible declines in numbers. This vital information has also been used as scientific evidence to suggest that the species is in decline and under threat of extinction and has helped to have the species listed as threatened at a state and national level. Locally, the information has been useful to Council and the KBCS to monitor the status of the maternal camp at the KFFR and to track population fluctuations.

The population in the camp can range from zero (0) in winter to over 70,000 in late summer. Typically the camp is around 20,000 to 30,000 bats in summer and in winter the number is usually less than 1,000 animals. There seems to be a trend that the average numbers in the camp are in decline, as shown by the regression line in the graph below.



Flying-fox population seasonal 1998 to 2012 variation At Ku-ring-gai Flying Fox Reserve at Gordon NSW

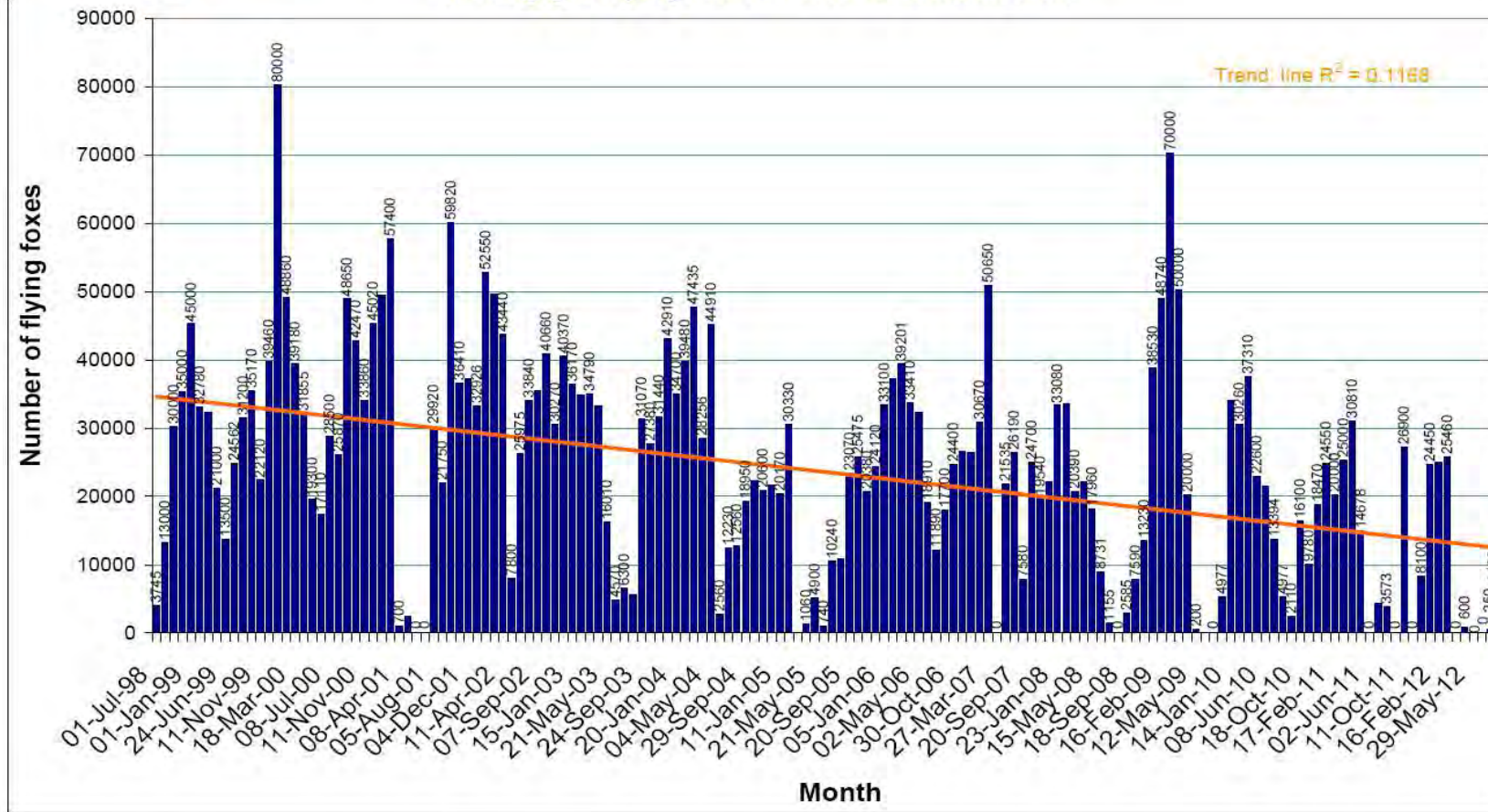


Figure 8: Flying-fox numbers recorded from 1998 - 2012

(Source Ku-ring-gai Bat Conservation Society)

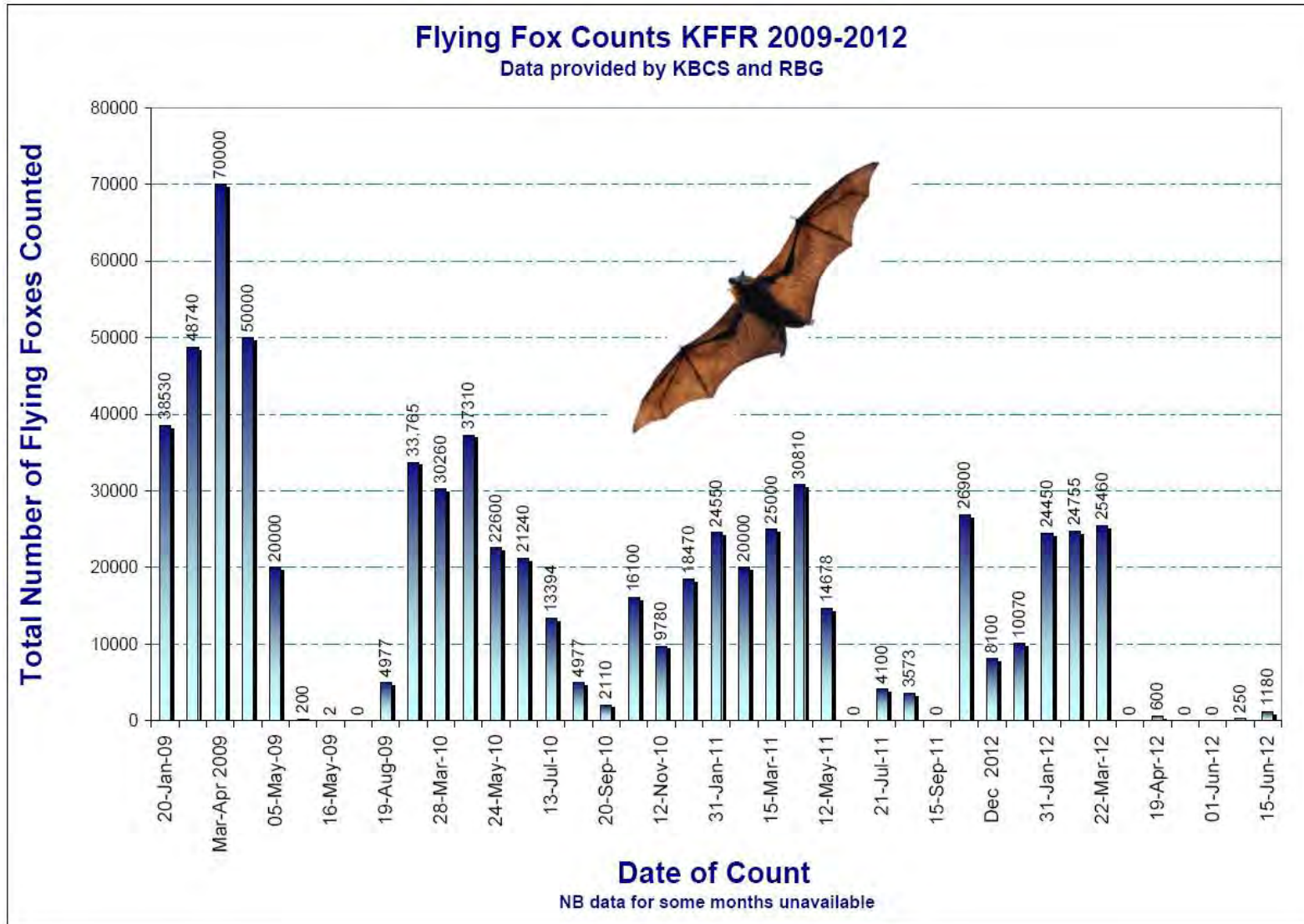
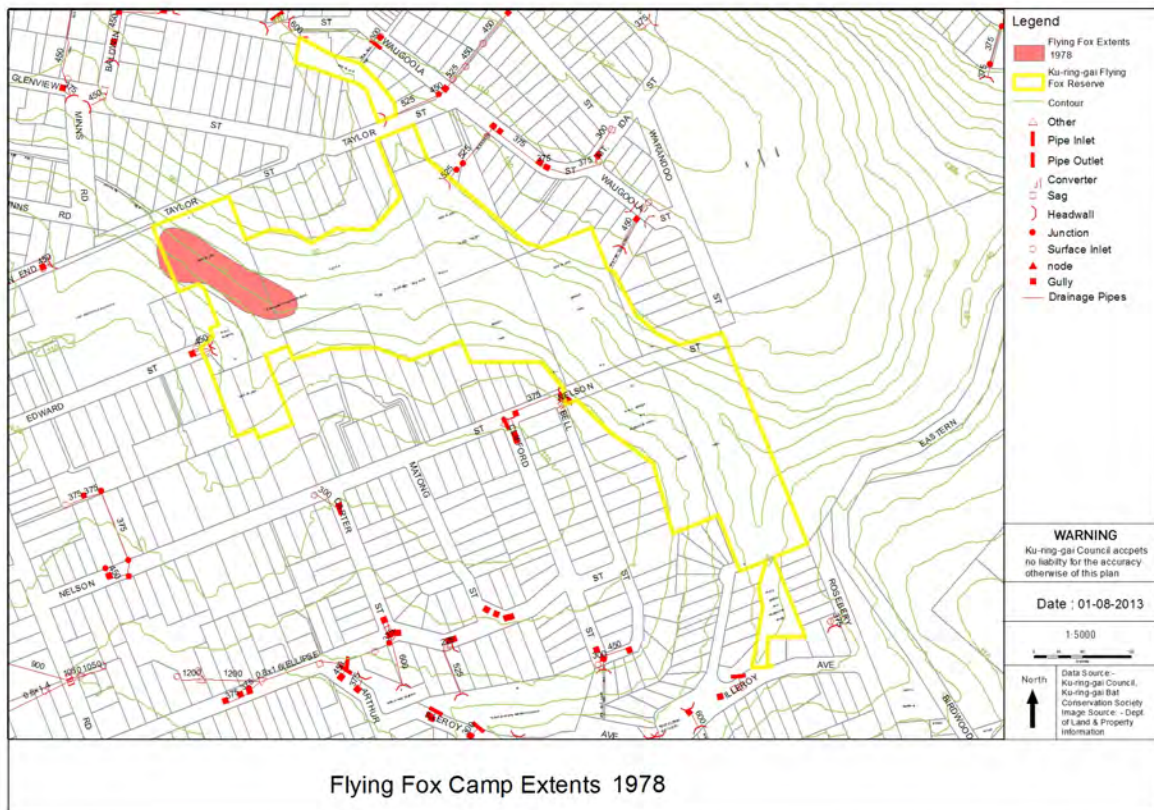
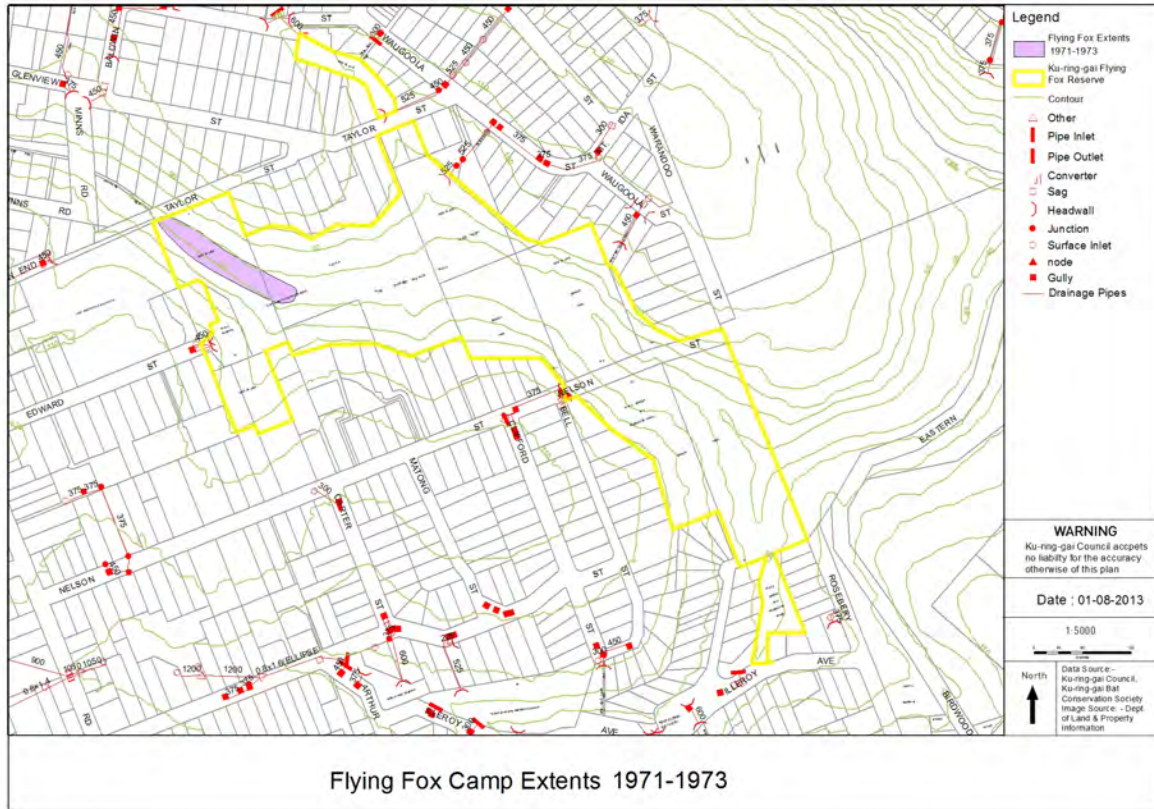
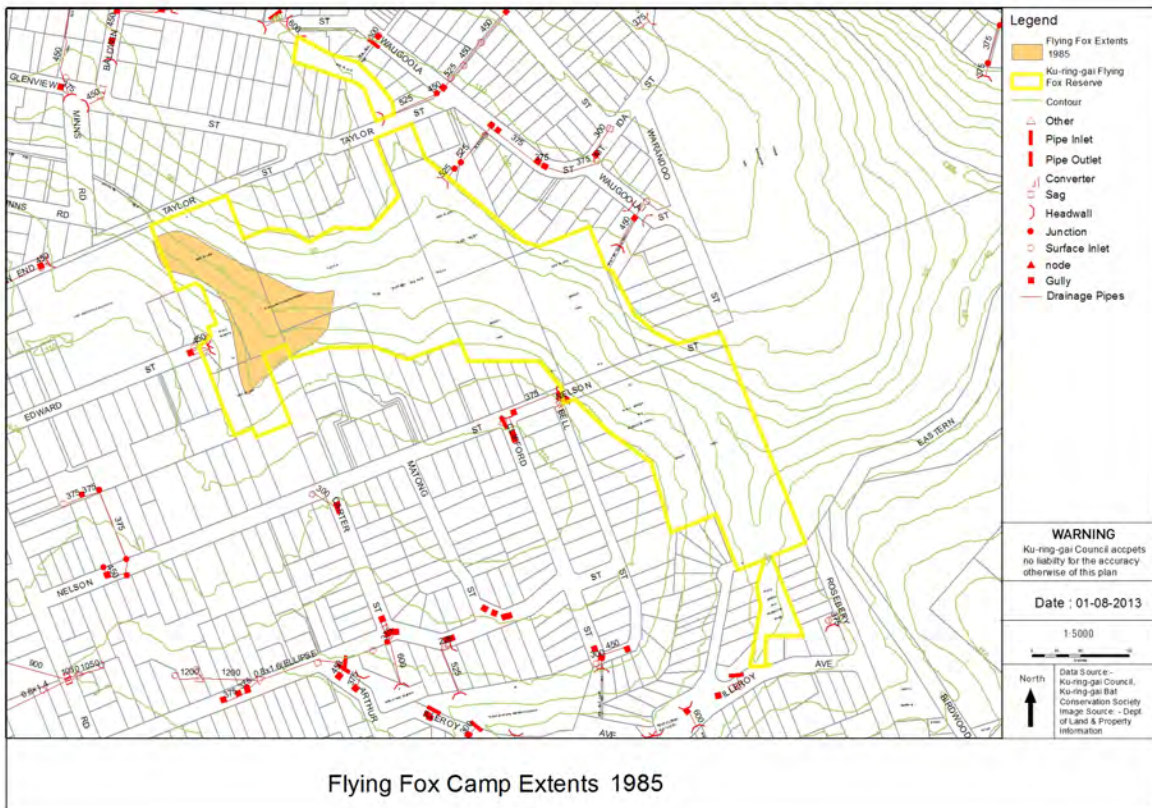
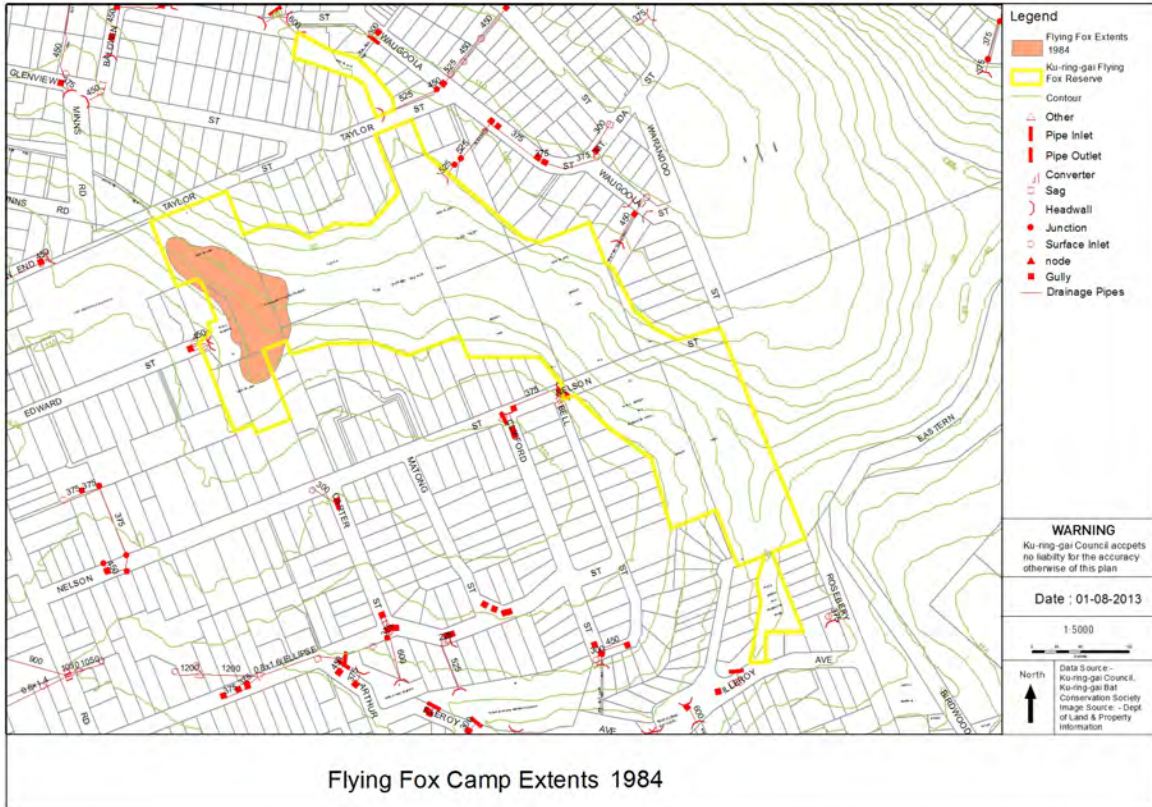


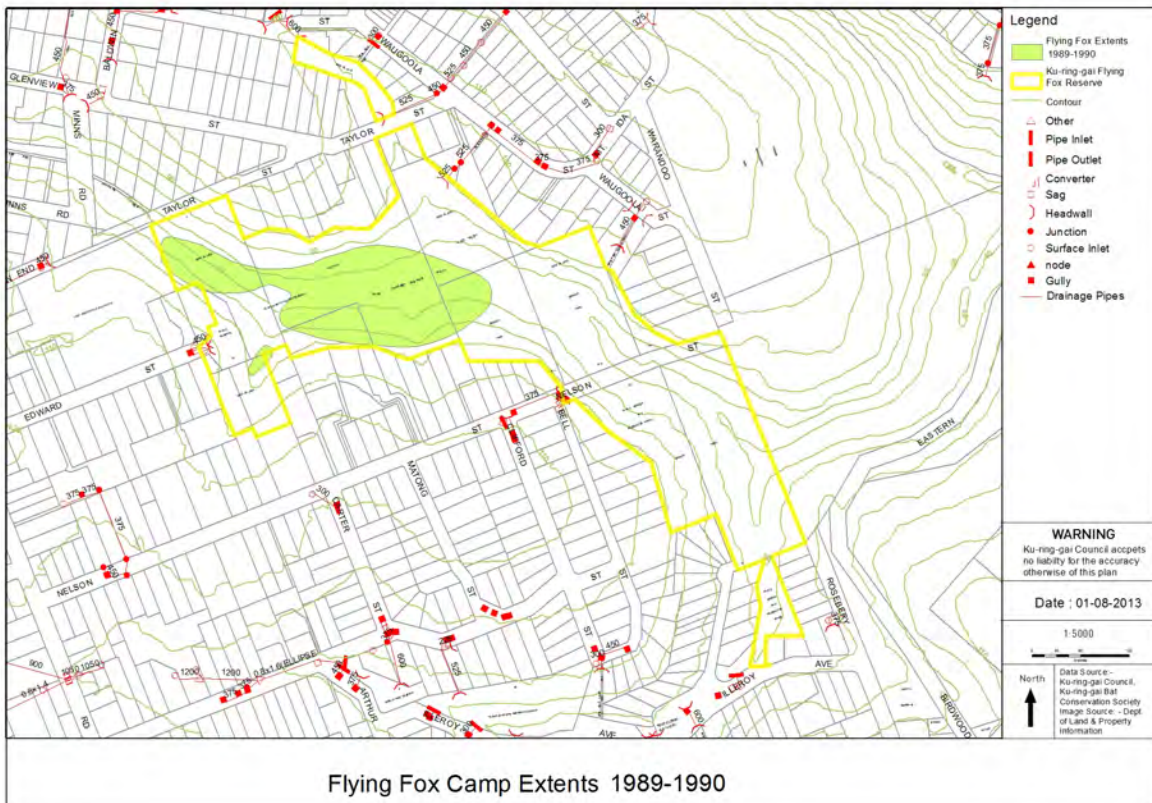
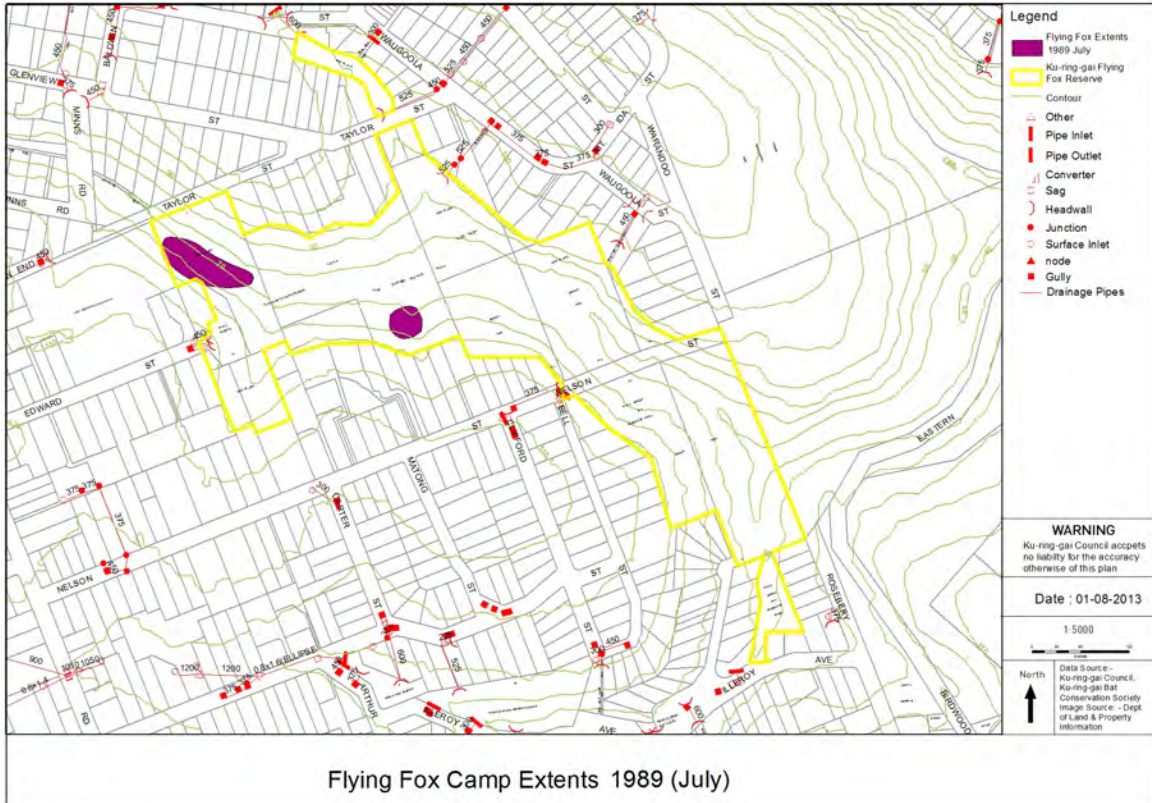
Figure 9: Flying-fox counts in the KFFR 2009 –2012

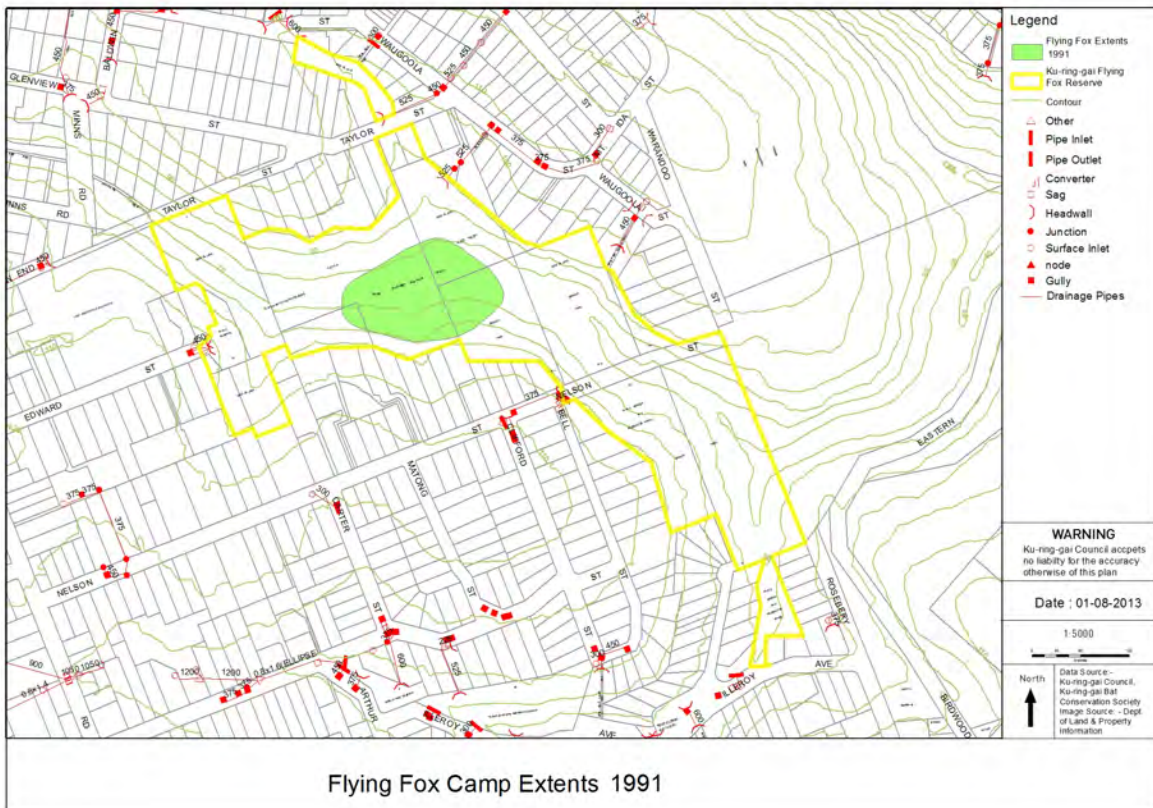
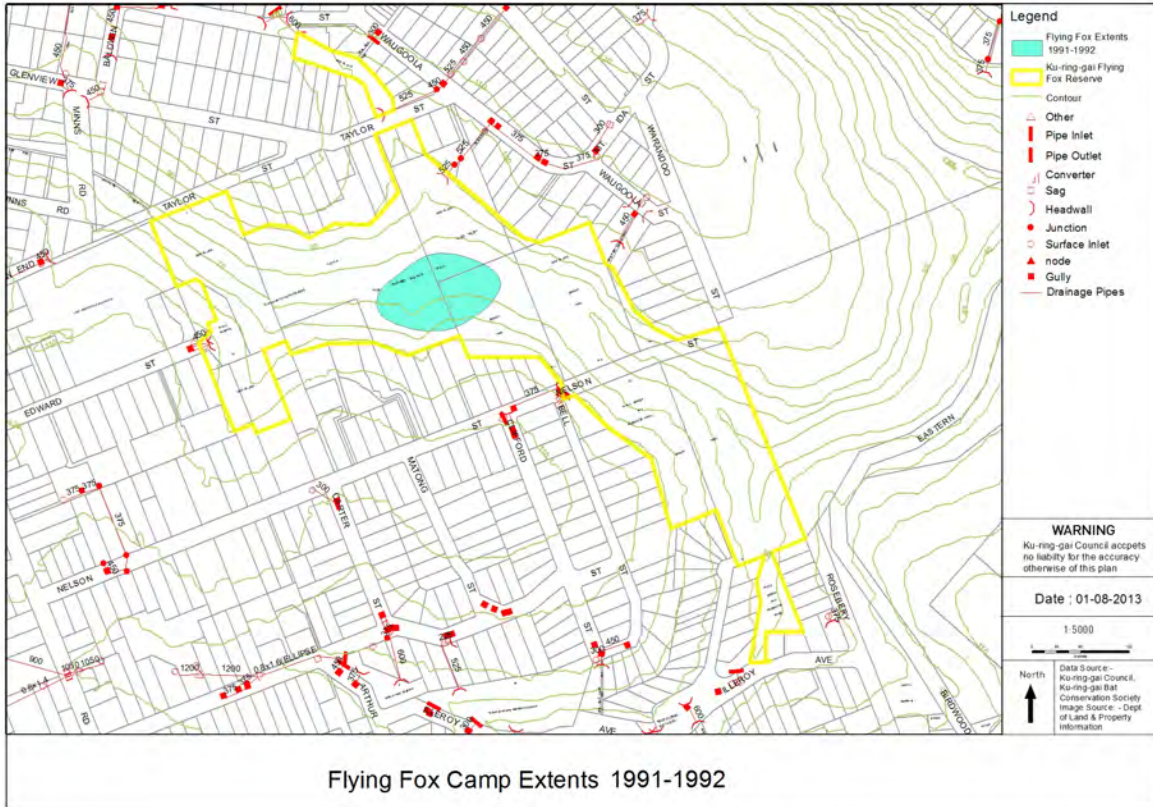
(Source Ku-ring-gai Bat Conservation Society and Botanic Gardens Trust)

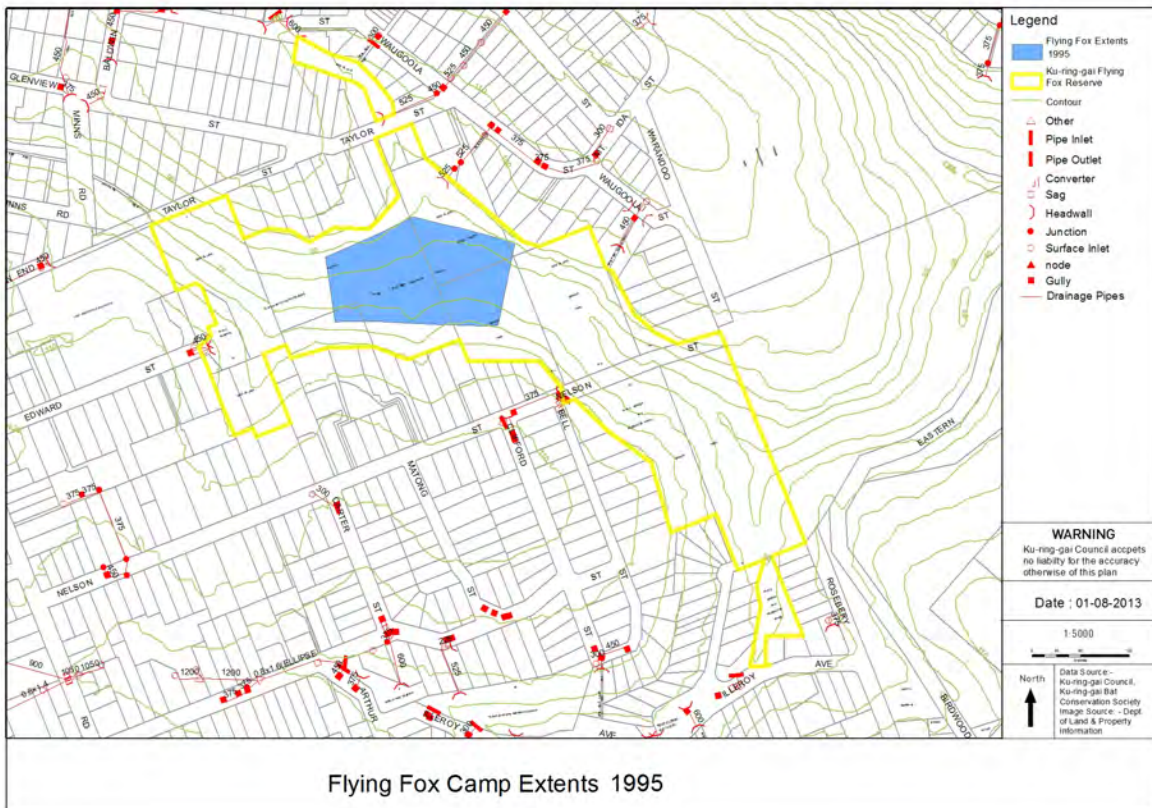
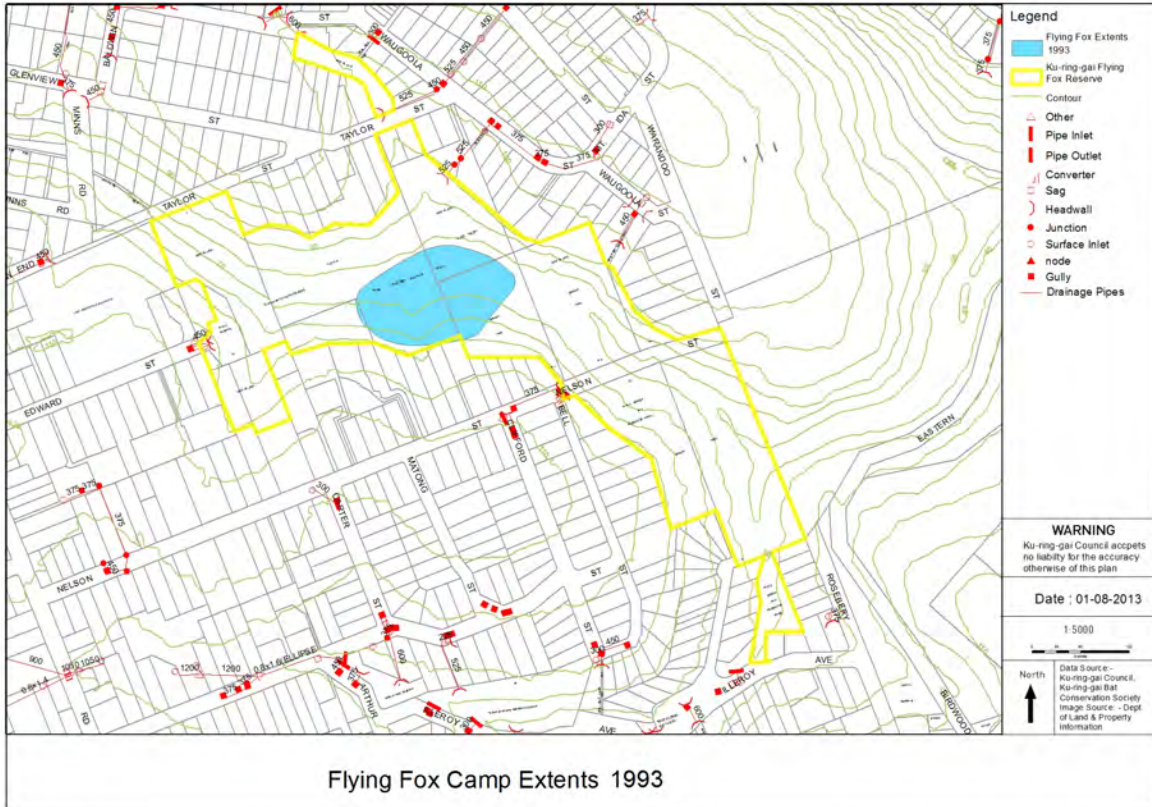
Location of Flying-fox camp in the KFFR over time

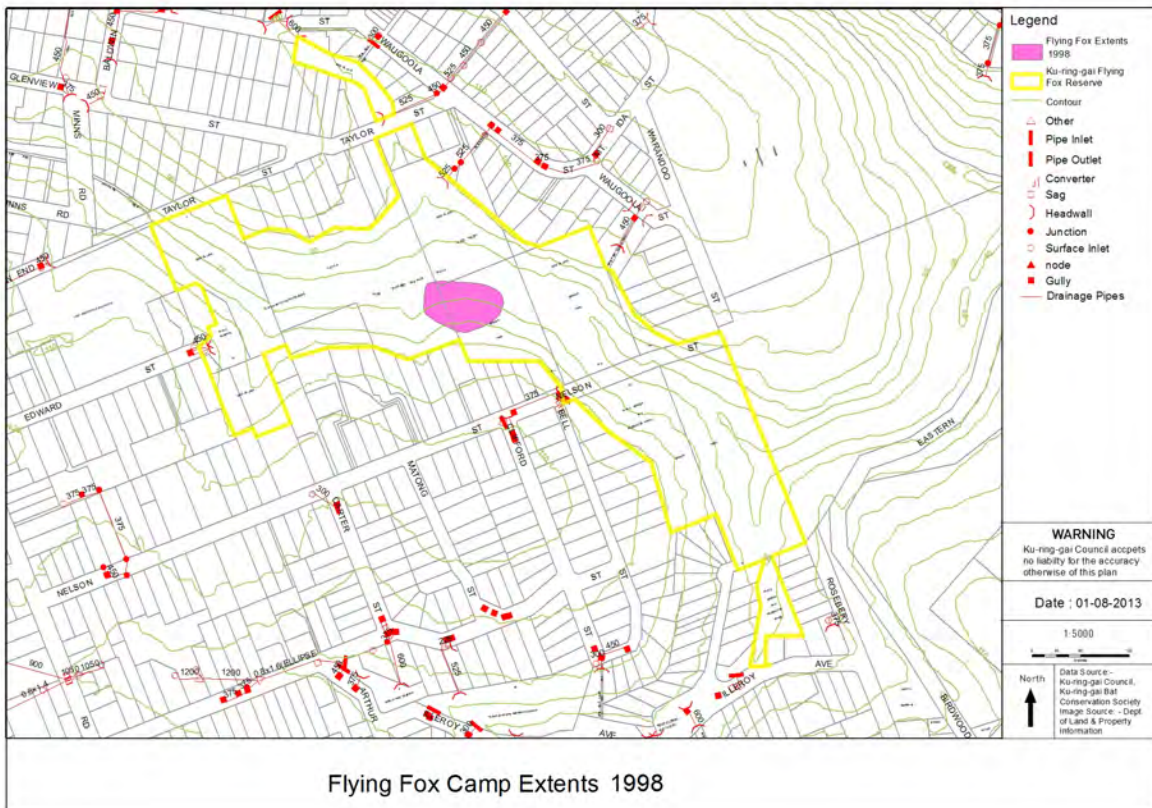
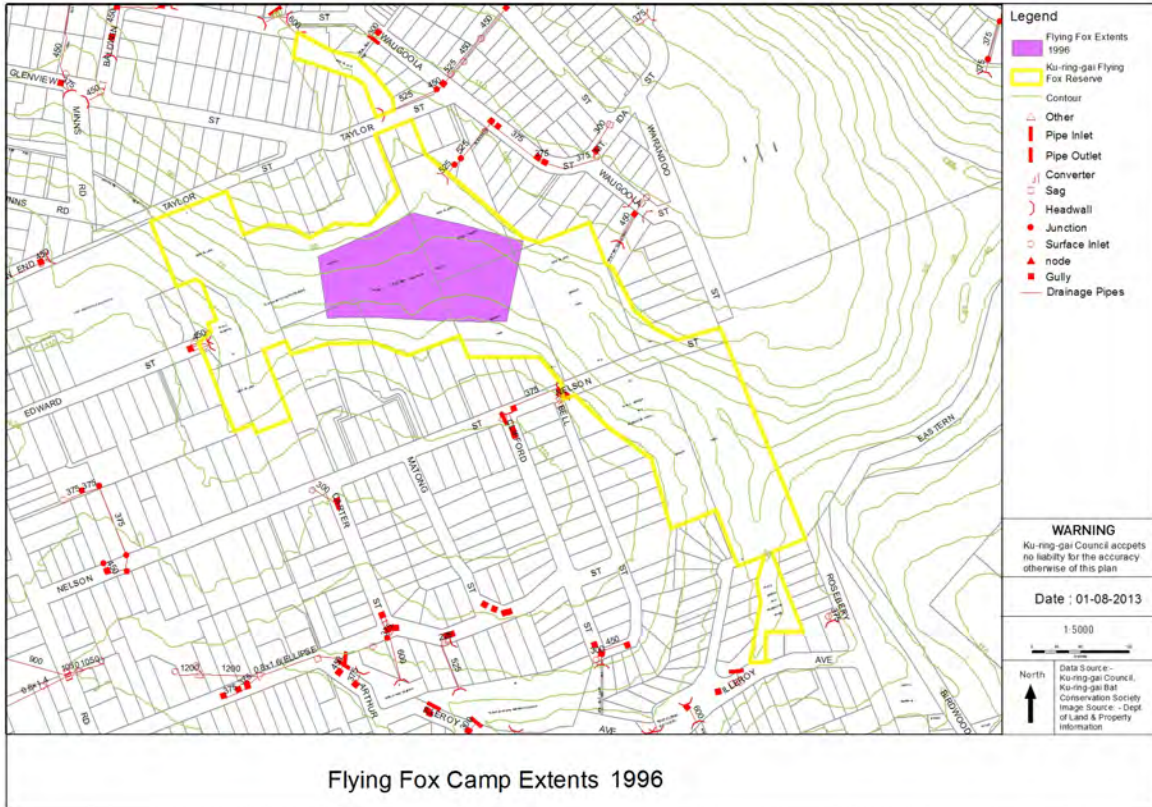


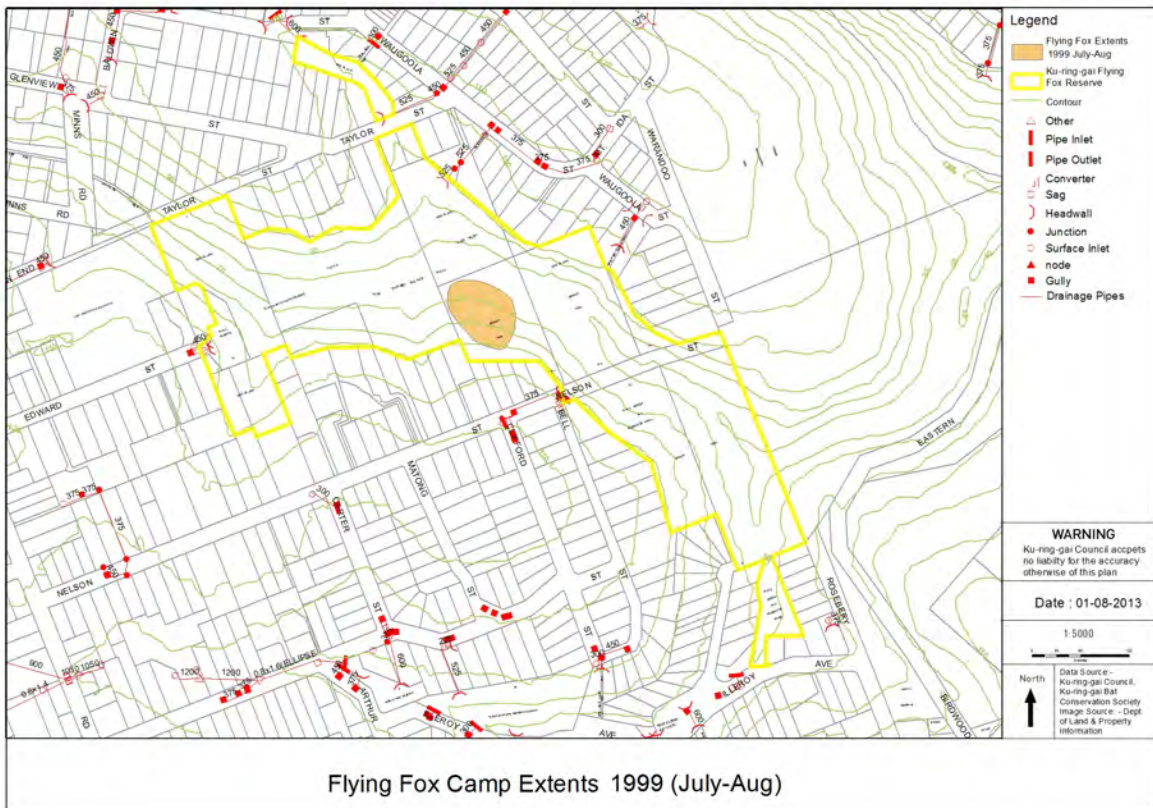
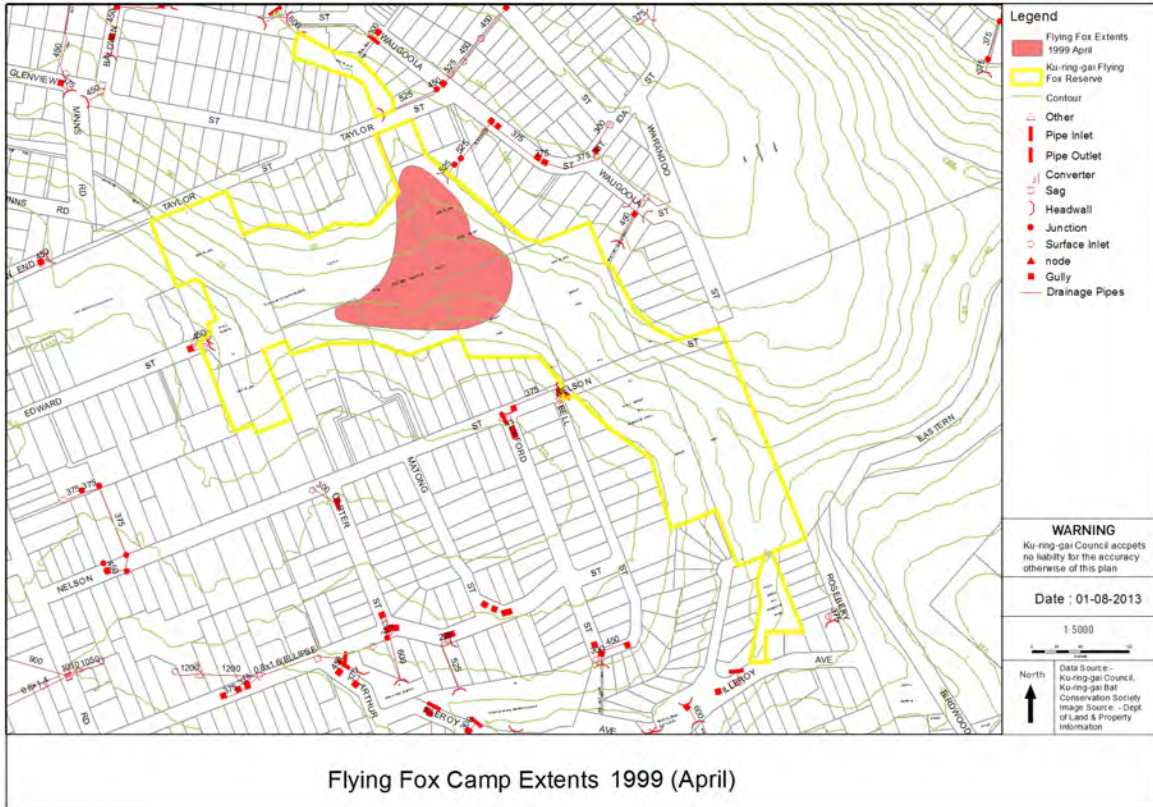


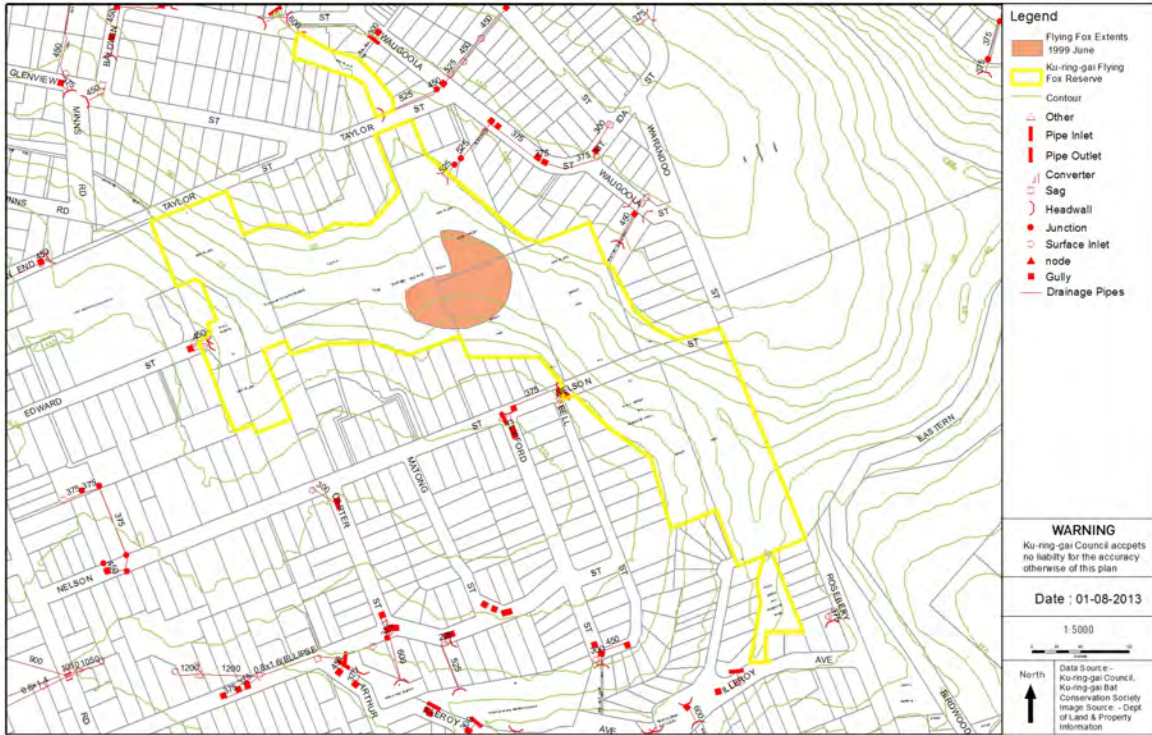








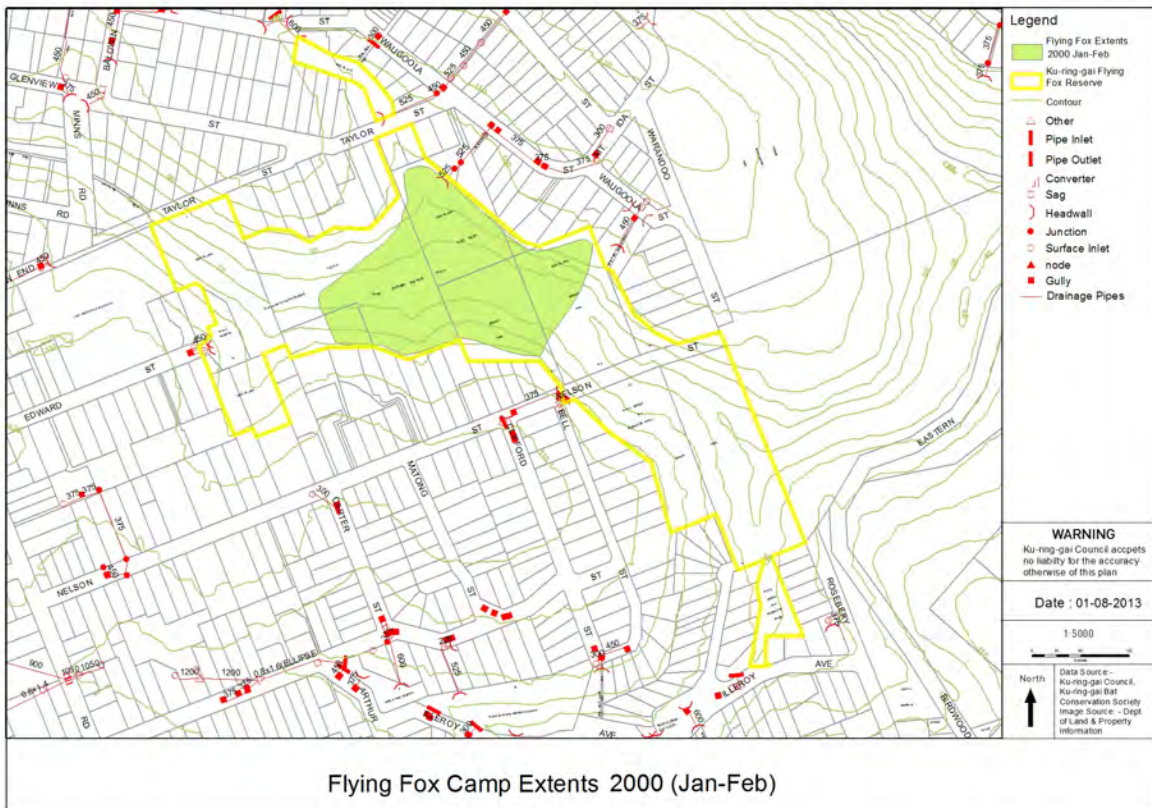
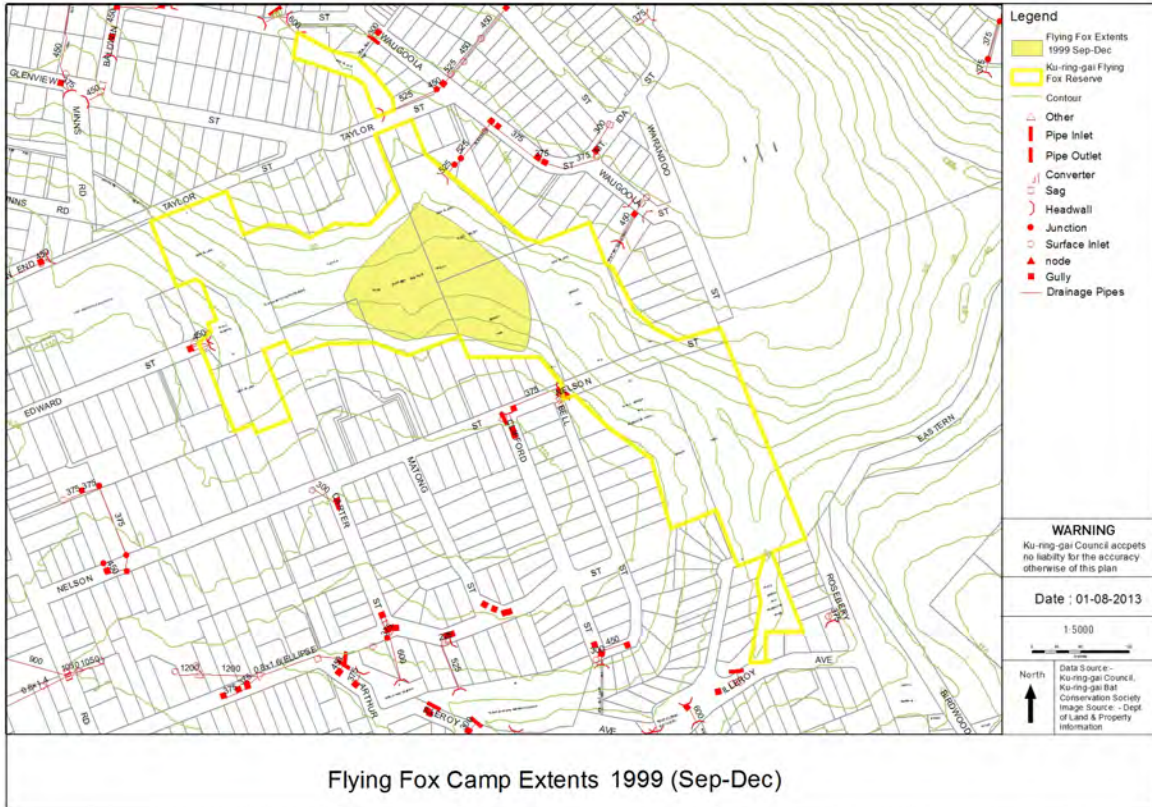


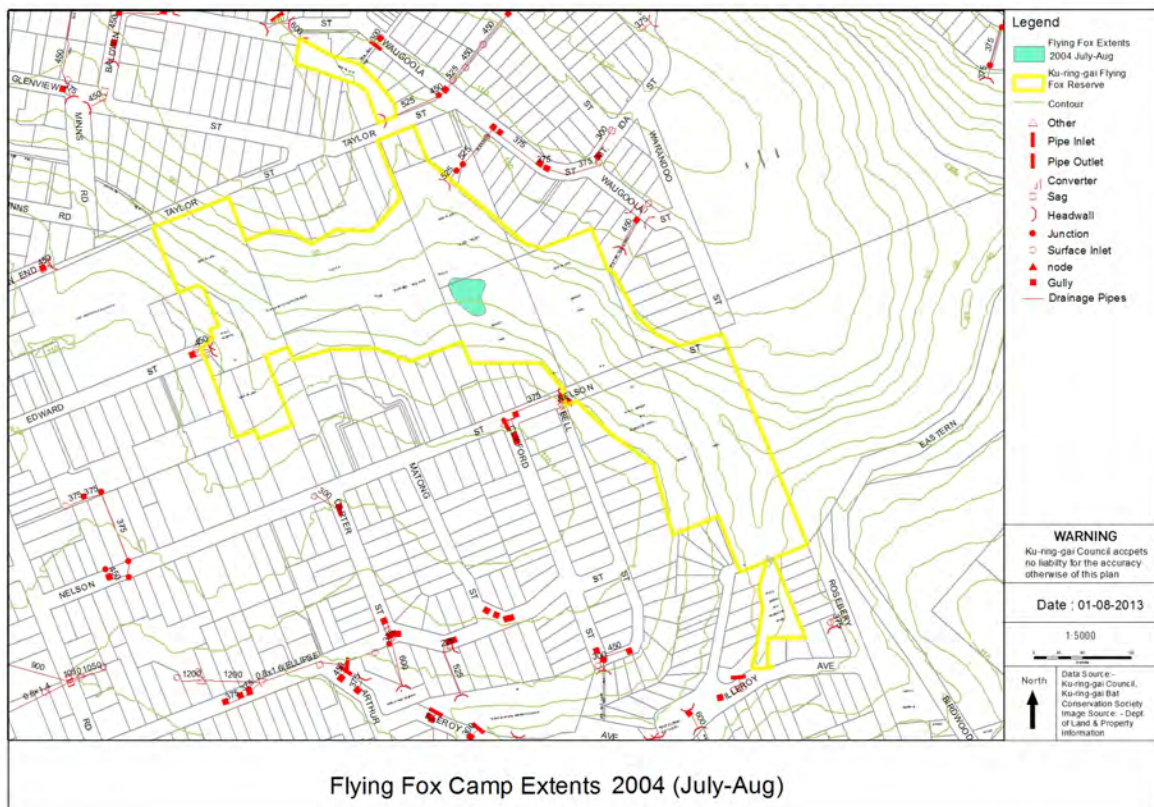
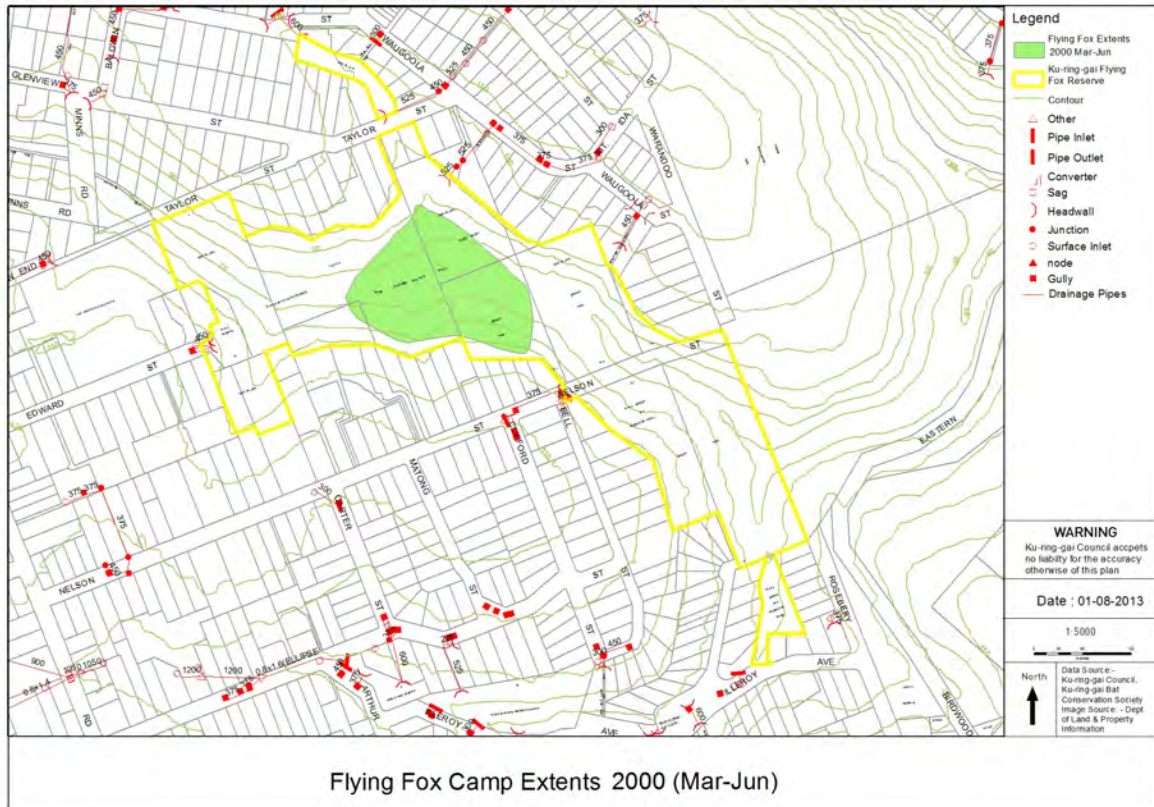


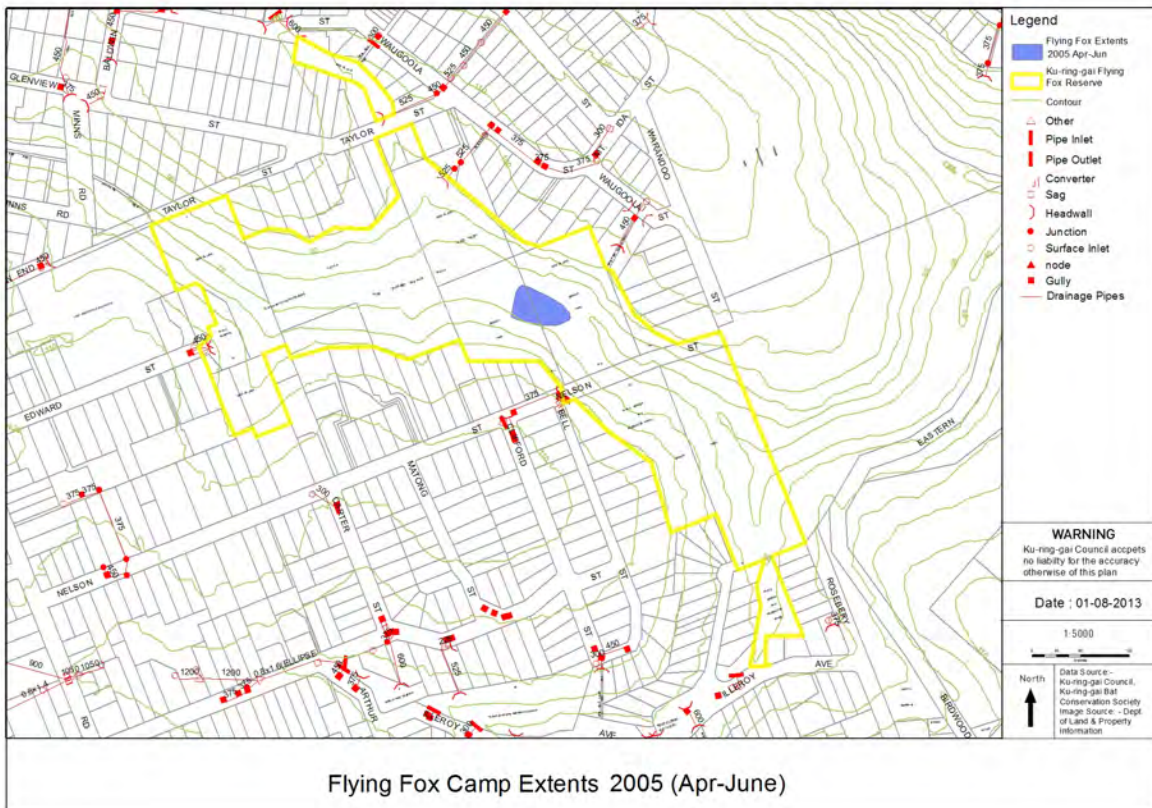
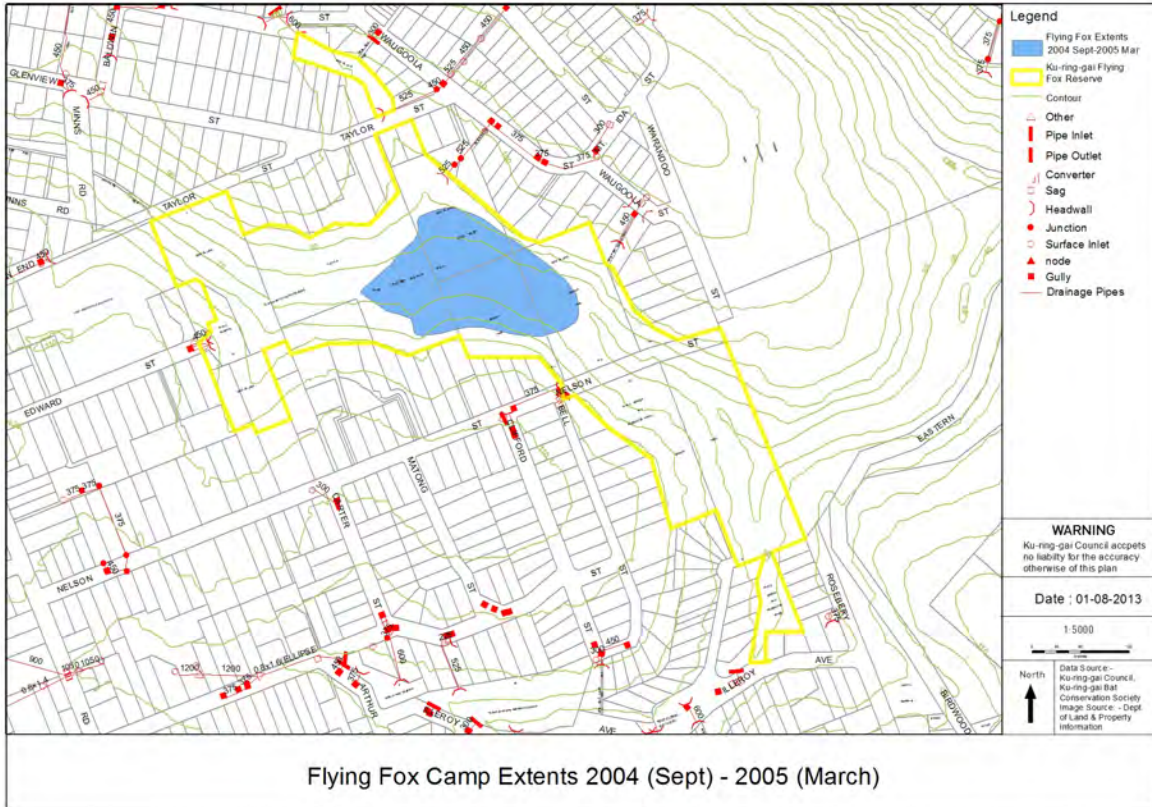
Flying Fox Camp Extents 1999 (June)

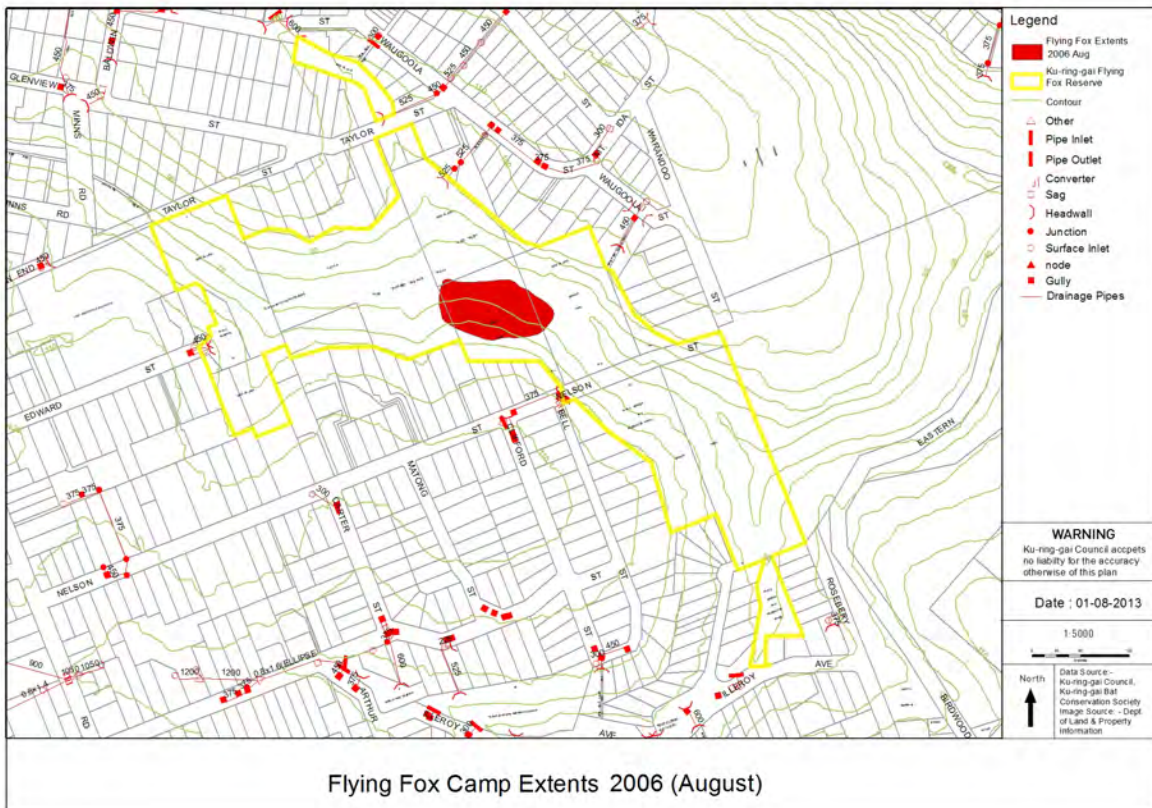
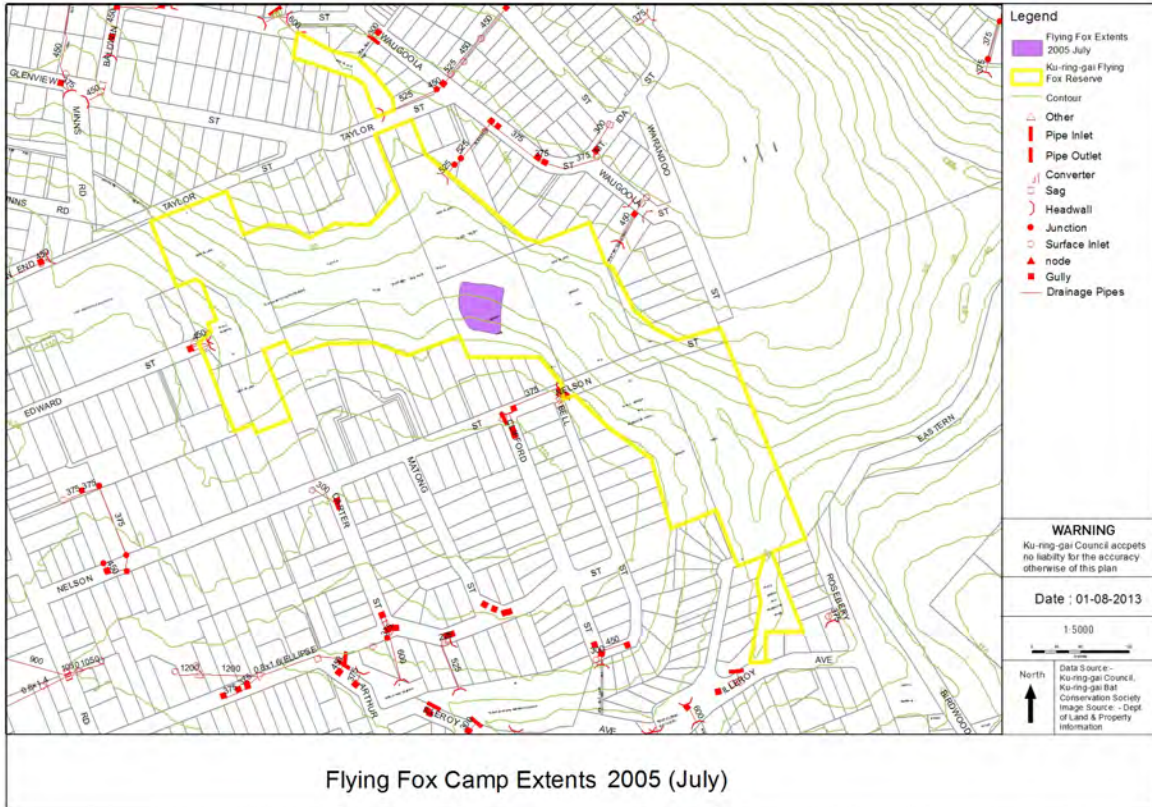


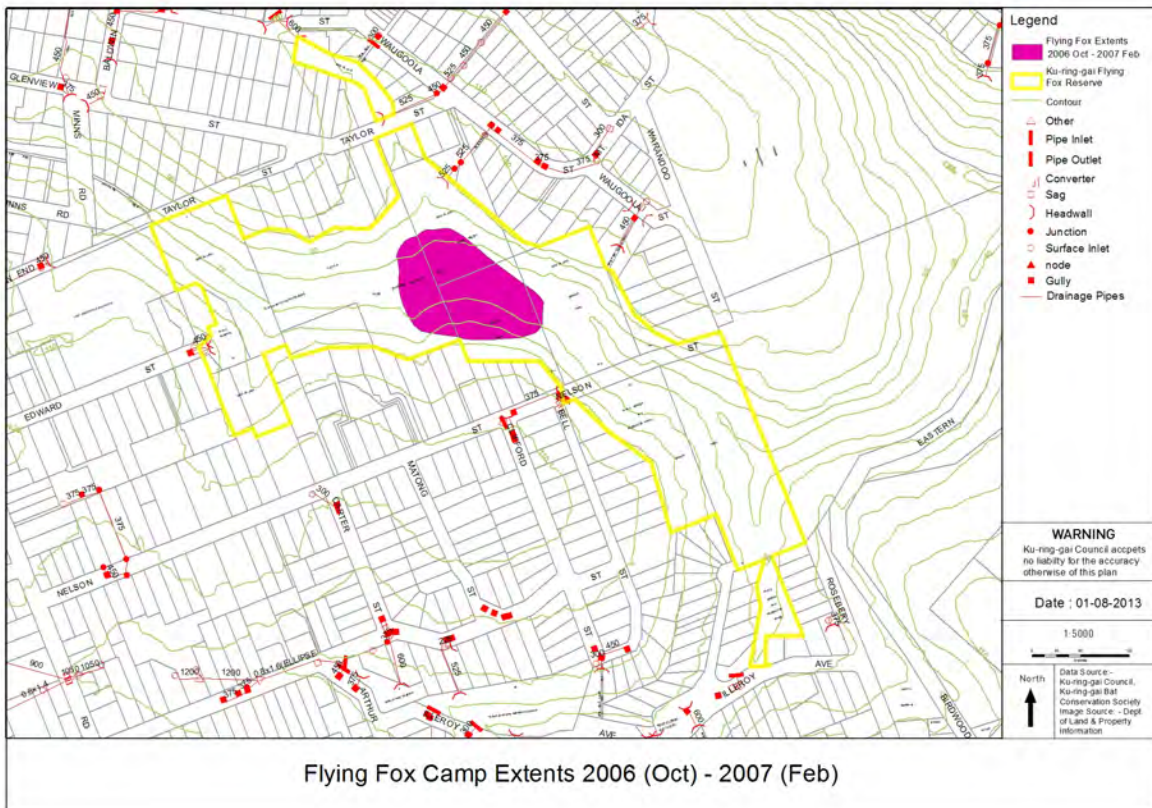
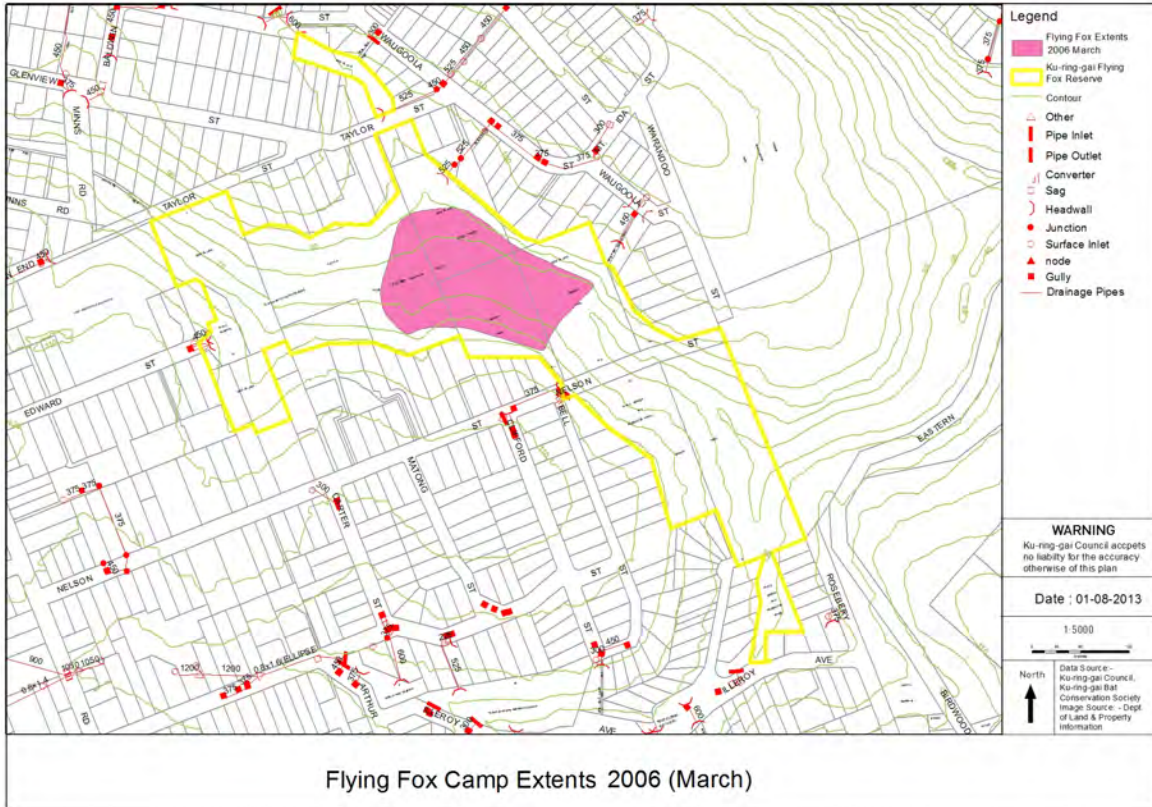
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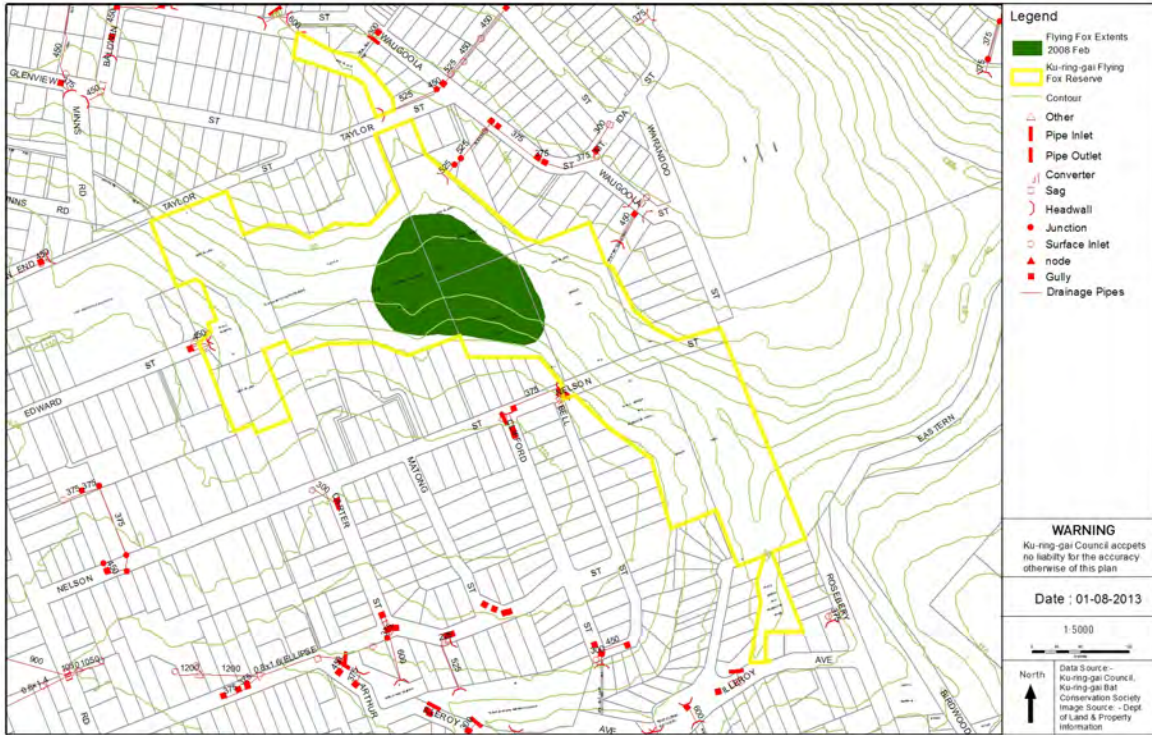




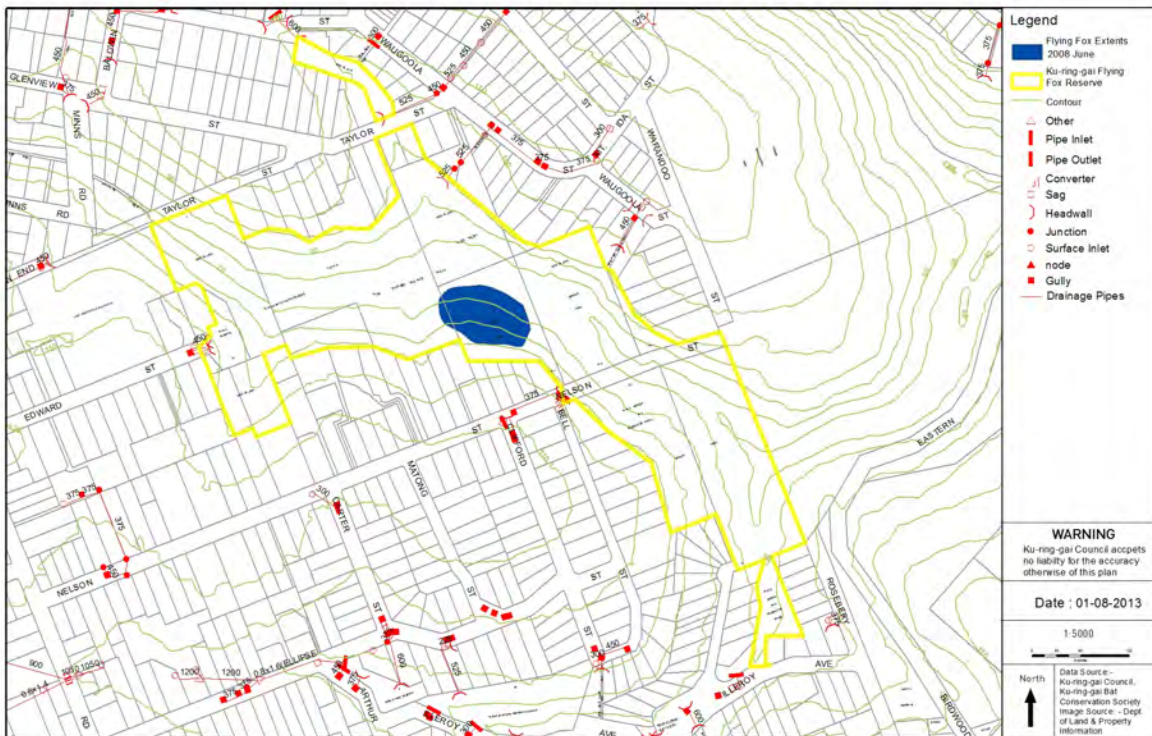




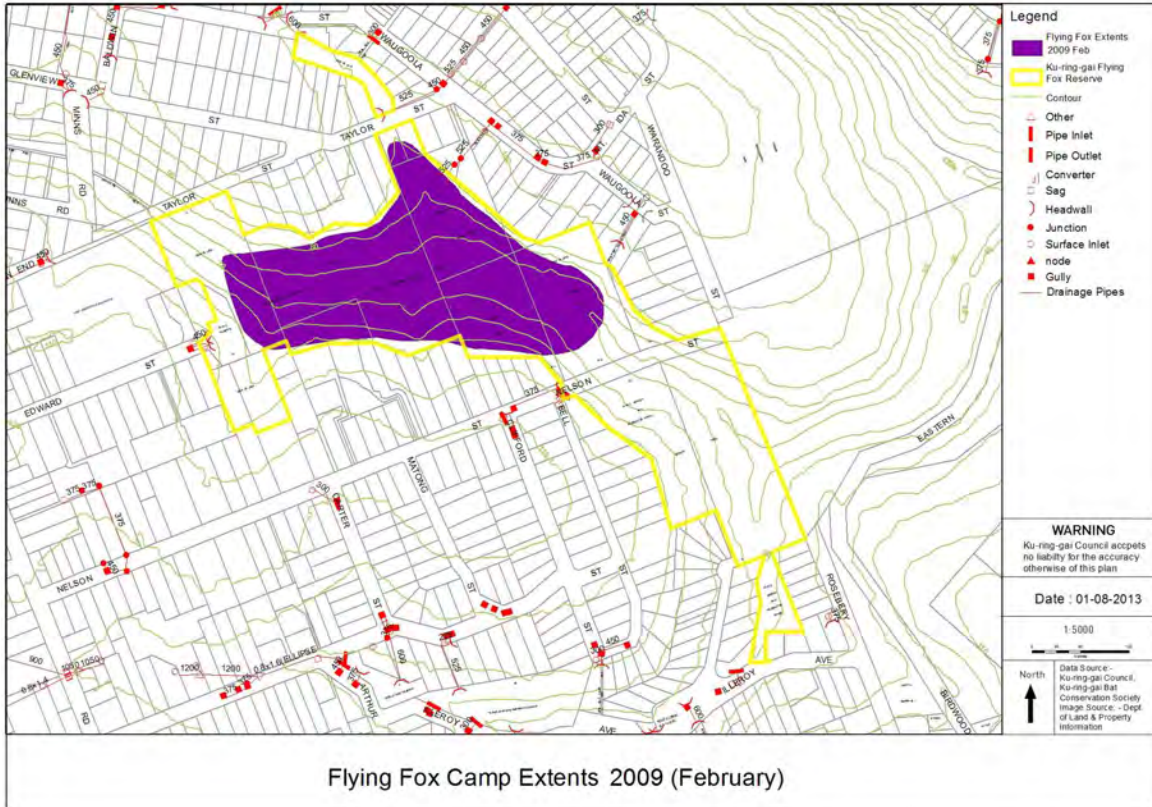




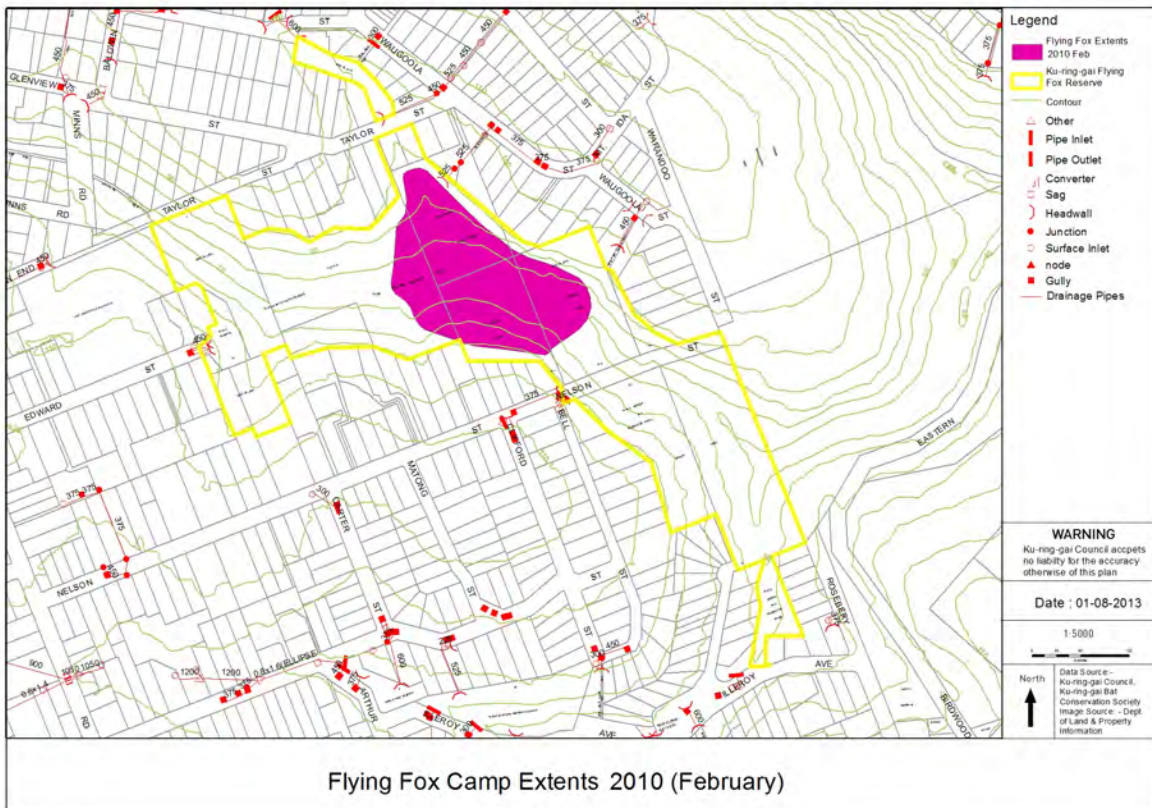
Flying Fox Camp Extents 2008 (February)



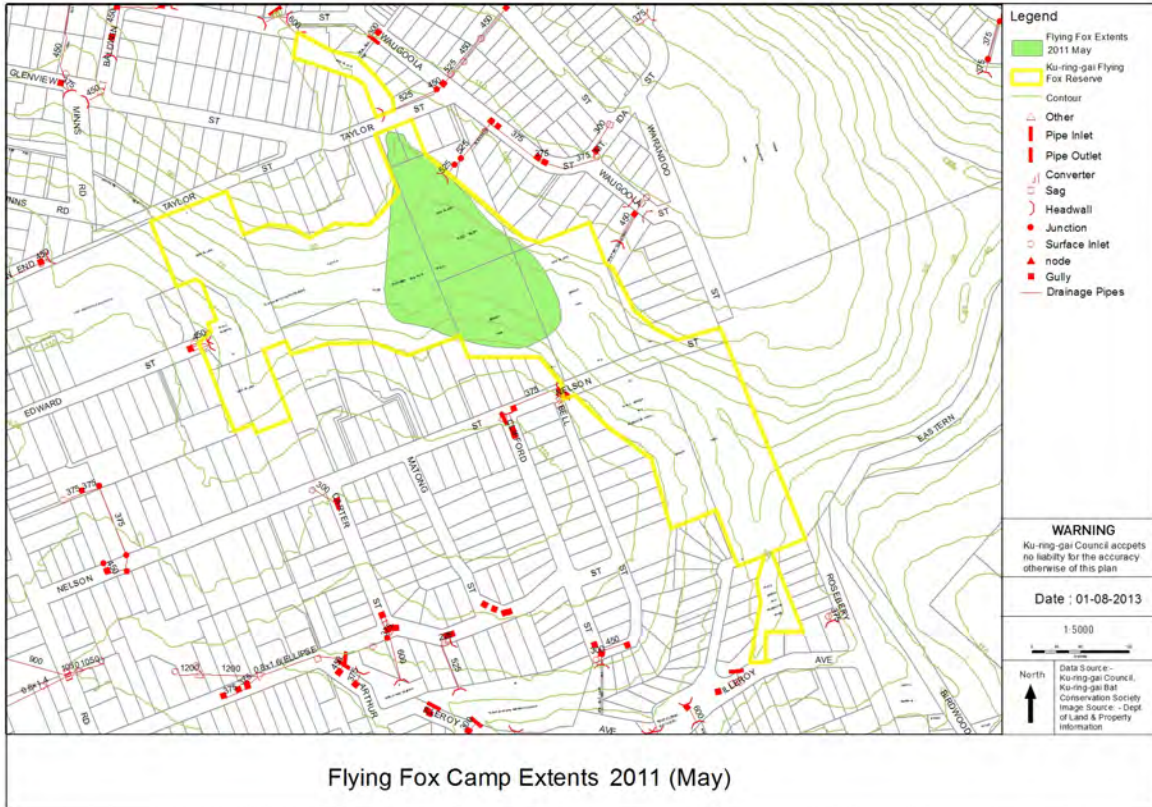
Flying Fox Camp Extents 2008 (June)



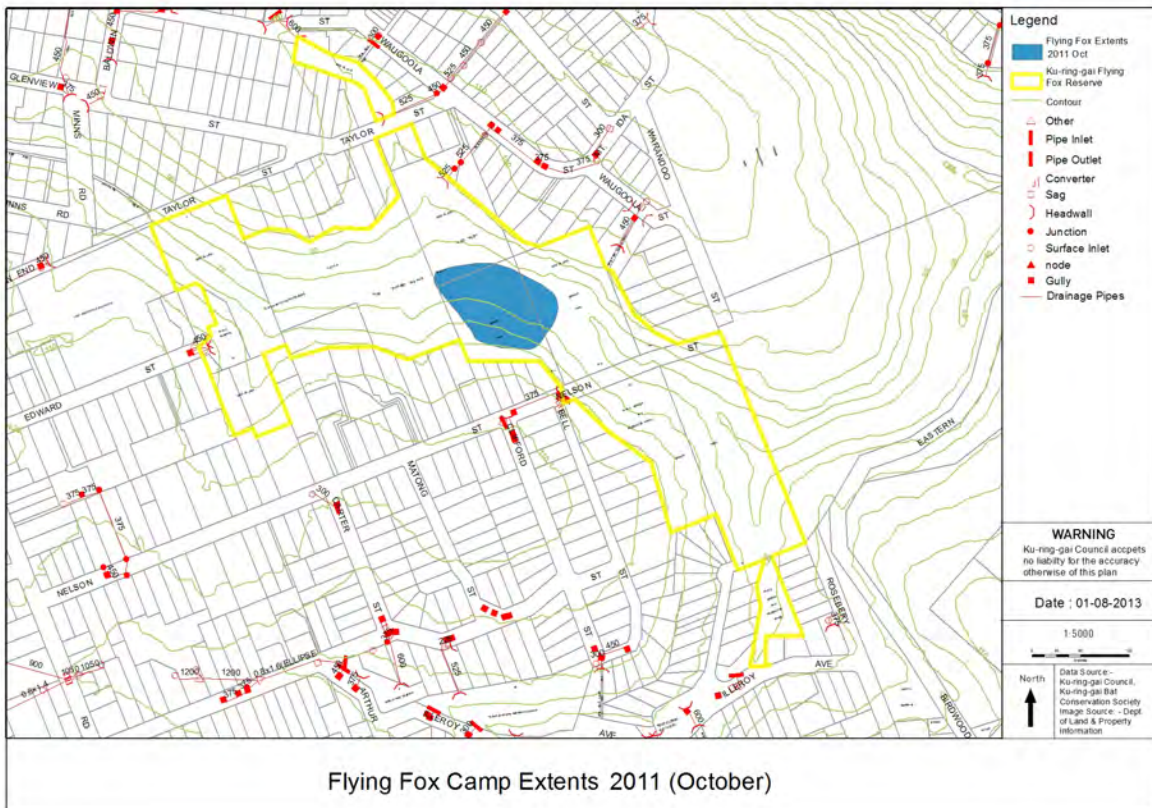
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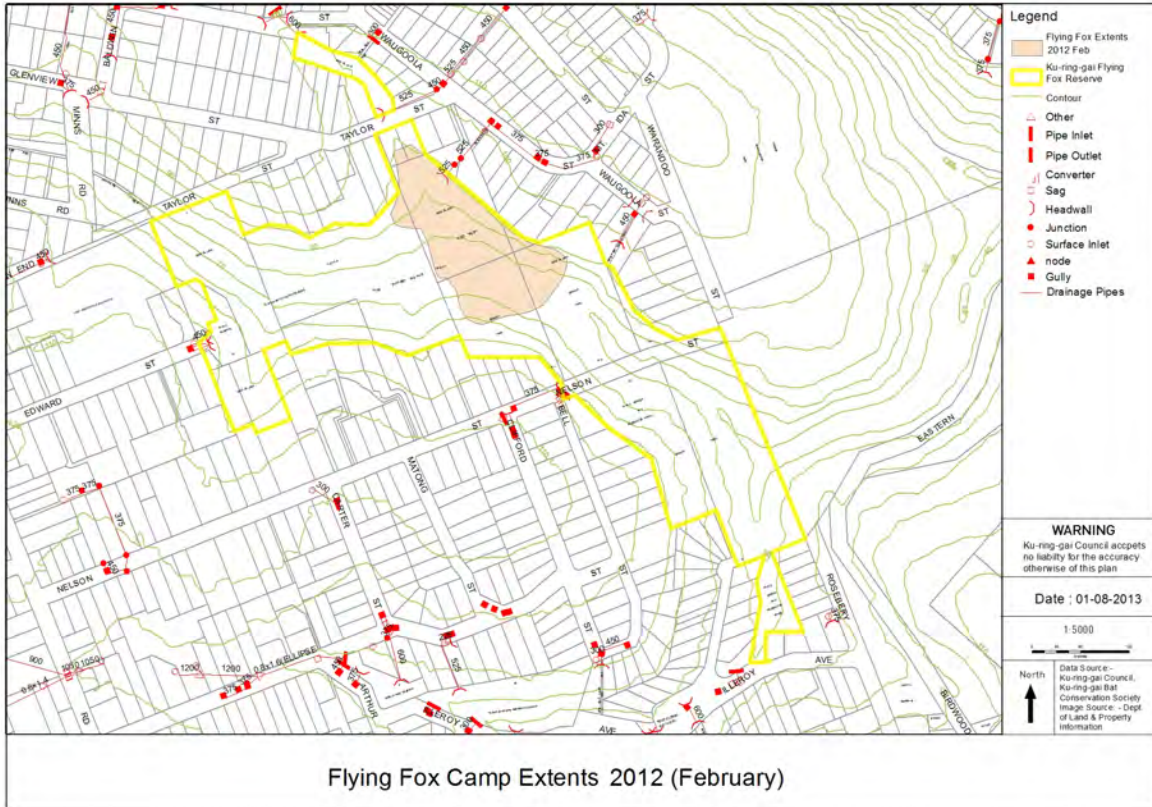
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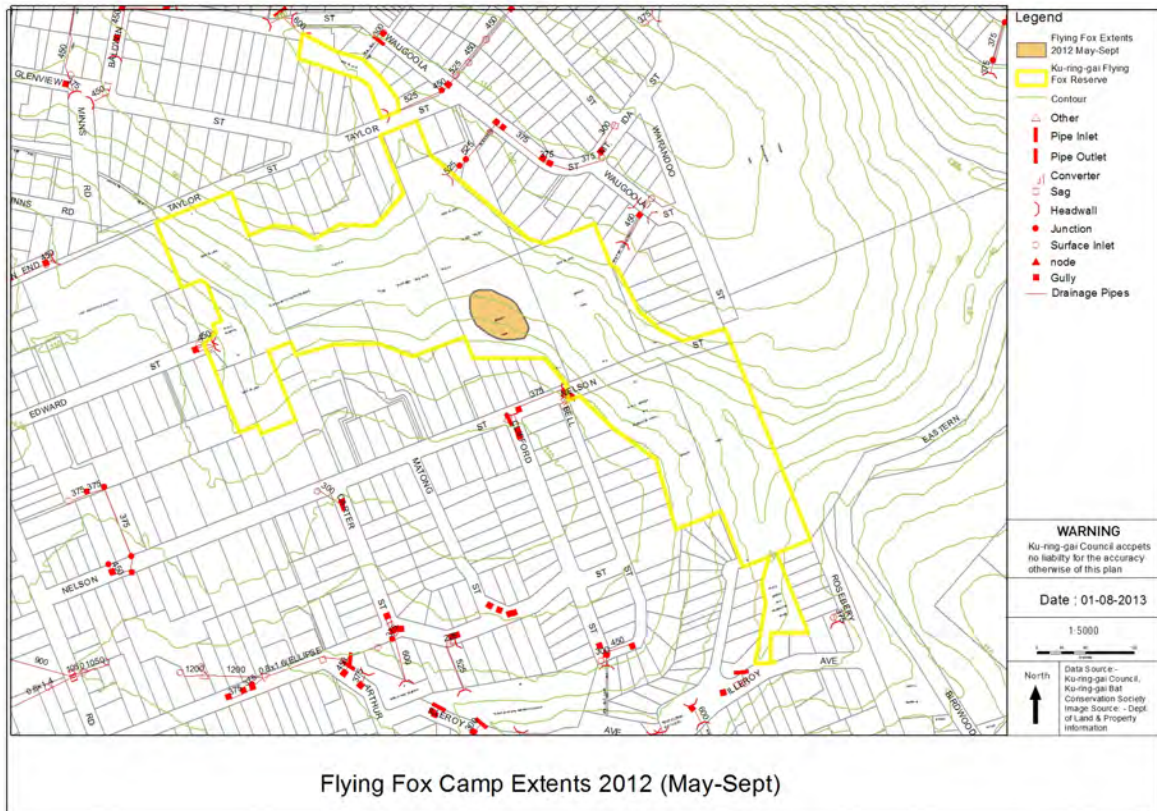
Flying Fox Camp Extents 2011 (May)



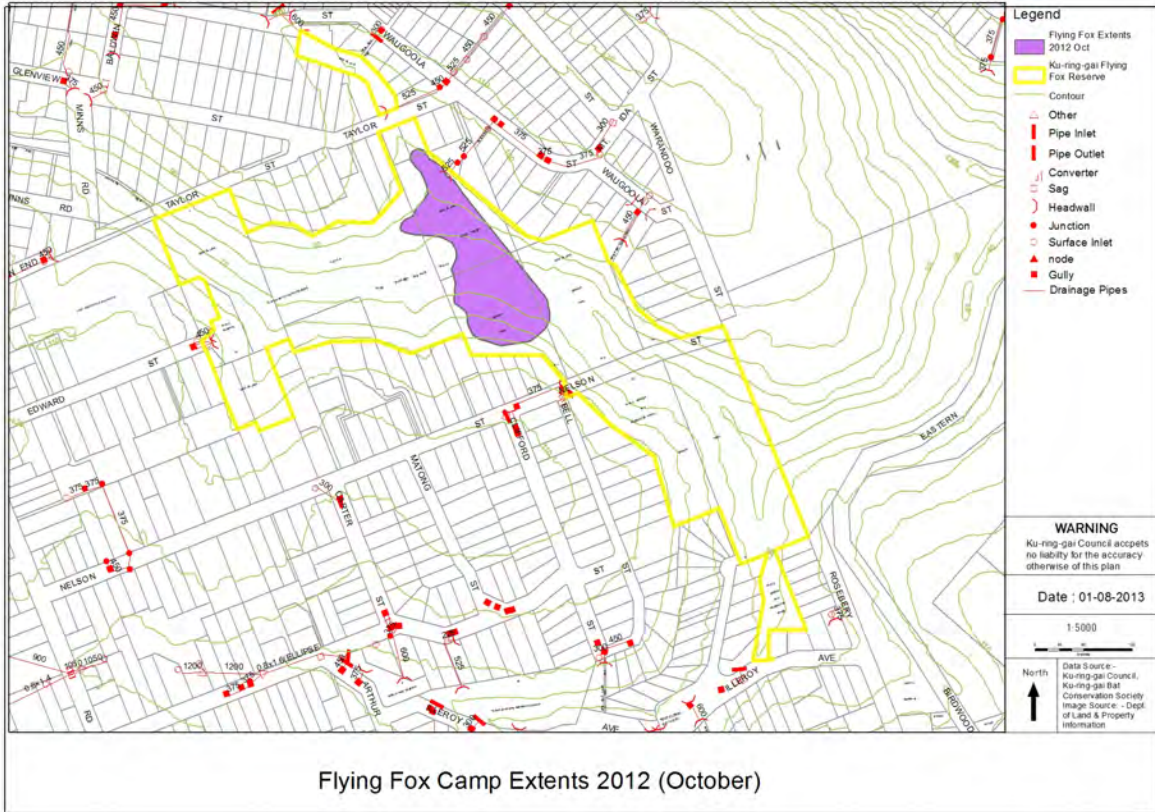
Flying Fox Camp Extents 2011 (October)



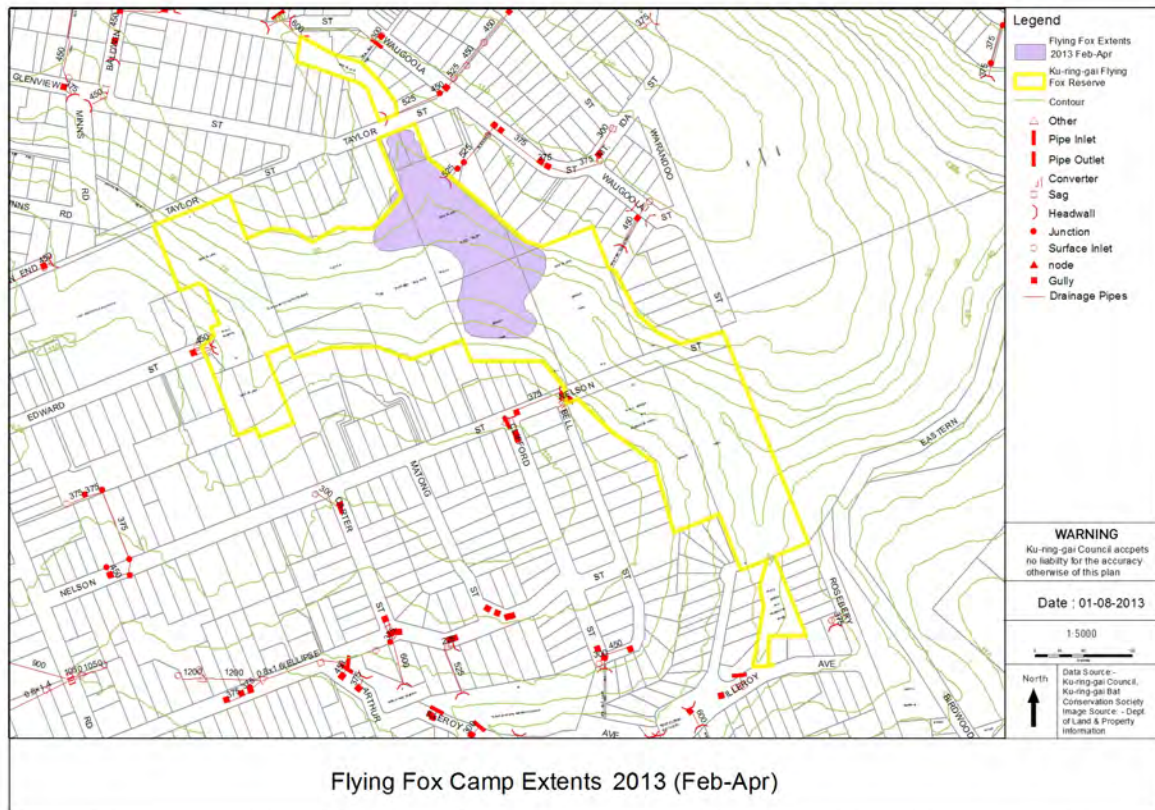
Flying Fox Camp Extents 2012 (February)



Flying Fox Camp Extents 2012 (May-Sept)



Flying Fox Camp Extents 2012 (October)



Flying Fox Camp Extents 2013 (Feb-Apr)

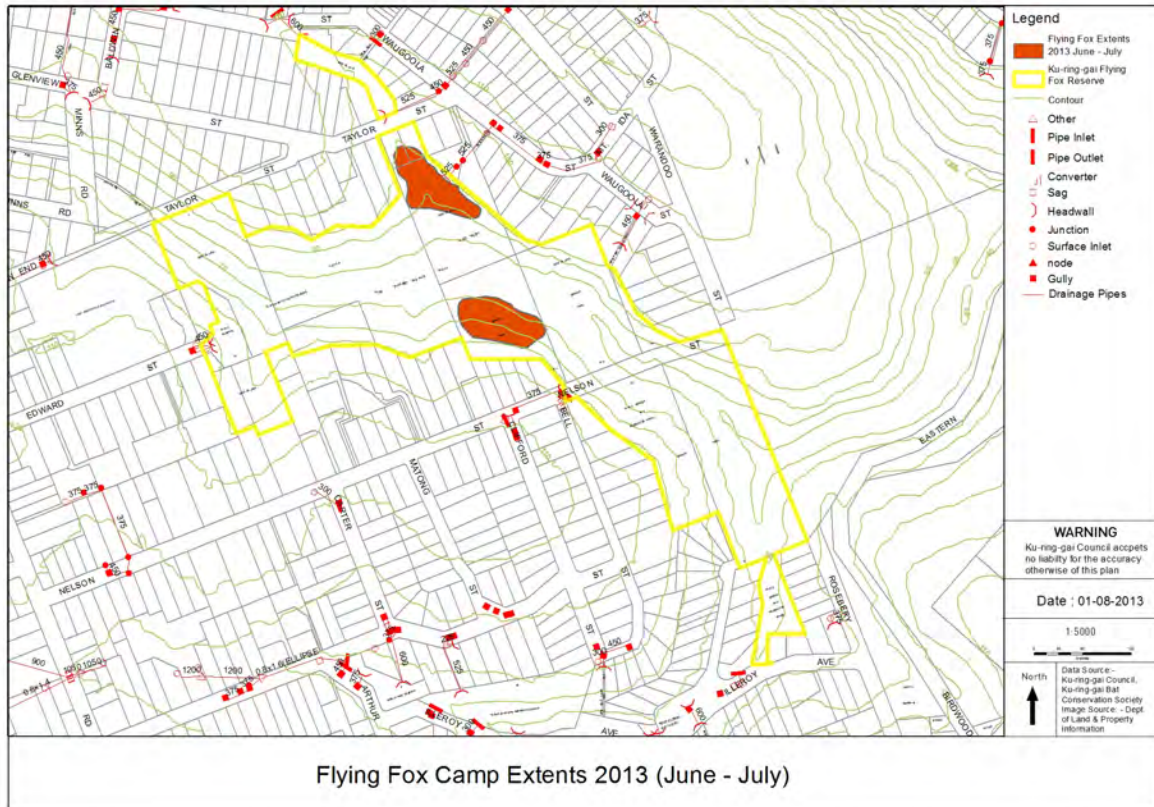


Figure 10: Location of Flying-fox camp in the KFFR 1971-2013

Appendix 7: Resource List

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