Reserve Action Plan
Flat Rock Gully

2023

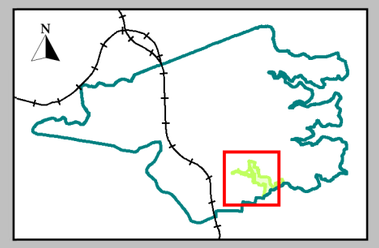
WILLOUGHBY
CITY COUNCIL
City of Diversity

Flat Rock Gully Bushland Management Actions

Priorities will be given to programs for the long term benefit to the reserve. Natural assets at greatest risk will be given priority to avert irreversible deterioration. All measures cannot be implemented simultaneously - resources may not be available or it may not be appropriate.

1. Planting at West Street and on Bicentennial pathway to be maintained by FRG contractors.
2. Bushcare group to continue management of site in accordance with the Bushcare Action Plan. Contract mower to maintain lawn area and edges.
3. Improvement of stormwater swales and flow paths to reduce erosion and define flow path.
4. FRG contractors to maintain entrances to the reserve.
5. Woody weeds and vines to be controlled by FRG contractors in the meantime.
6. FRG contractors to control weeds on landscaped areas. Create habitat for small birds and reptiles where possible.
7. Bushland Contractors (BC) to continue the control of privets and manage other weed species below Pyalla Street.
8. FRG contractors to continue maintenance of Calbina Road entrance ensuring stormwater impacts are reduced.
9. FRG contractors to continue ongoing maintenance of woody weed and vines.
10. FRG contractors to maintain track that crosses private property.
11. FRG contractors to continue the targeting of invasive species in the lower slopes of the creek line. Assisted regeneration to be carried out on these areas.
12. FRG contractors to progressively regenerate bushland to stabilize former tip face.
13. Area below Dawson Street to have vines and privets controlled by bushland contractors encouraging native canopy.
14. Bushland contractors to carry out secondary weeding with attention given to the control of vines.
15. Assisted regeneration in post fire area adjacent to property boundaries.
16. Contractors to continue regeneration work along stormwater line and embankment. The targeting of isolated Blue Gums will also commence in this area.
17. FRG contractors to continue maintenance of ruins area. Implement measures to protect ruins from fire (refer Bushfire Risk Management Plan).
18. Revegetation and bank stabilization along creek line managed by FRG contractors.
19. Contractors to carry out secondary weeding and assisted regeneration in this area. Seating area also to be maintained by contractors.
20. Contractor mower to maintain lawn areas adjacent to West Street.
21. Investigate the possibility of a track upgrade from the West Street entrance to ruins.
22. Contractors to continue secondary weeding. The end of West Street through to Quarry Street to be maintained by Streetscapes staff.
23. FRG contractors and bushland staff to maintain areas for interpretive events.
24. Bushland contractors to continue restoration of vegetation around stormwater outlet and adjacent areas.
25. Investigate and minimise floating gross pollutants.
26. Contractors to ensure areas are mown. Tree staff to under prune trees when required on the corner of Strathallen Avenue and Cliff Avenue.
27. Assisted regeneration focusing along property edge by bushland contractors.
28. Gradual removal of Camphor Laurel trees protecting Smooth-barked Apple vegetative community.
29. Ongoing assisted regeneration by contractors below Lower Cliff Avenue.
30. FRG and Bushland contractors to consult with wildlife and habitat officers on installation of arboreal, terrestrial and other features to improve wildlife habitat.
31. FRG and Bushland contractors to consult with wildlife and habitat officers on strategic plans to improve habitat connectivity with adjoining areas.
32. Stormwater infrastructure works to commence in 2024-25 financial year followed by revegetation of impacted area.
33. Liaise with FRNSW to implement proposed prescribed burn.

RESERVE ACTION PLAN FLAT ROCK GULLY



Plan details

Status: Final
Prepared by: N. Yu
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Legend

- 16 Property number
- 12 Action plan activity
- Stormwater node
- Approximate fire hydrant location
- 35 5m contours
- Stormwater network - Underground *
- Stormwater network - Overground / Unknown *
- Bush track / Path *
- Property boundary
- Reserve / bushland
- Council bush regeneration contractors
- Council staff regeneration site
- Prescribed Burn
- Bushcare Group

* The accuracy of this data is not guaranteed and must be verified prior to use.

The information contained herein has been provided in good faith. Effort has been made to ensure it's accuracy and completeness.

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Flat Rock Gully Reserve Action Plan

Reserve Profile

Flat Rock Gully (FRG) encompasses a total area of 22.3 ha inclusive of a portion of Bicentennial Reserve. Remnant bushland, approximately 14 ha, occurs within the Flat Rock Creek Catchment Area. It is bounded by Flat Rock Drive to the west and extends beyond the historic Cammeray Bridge to the east, adjacent to Tunks Park. Private property backs on to the remaining boundaries of the Reserve. FRG contributes to a habitat linkage (non-continuous) that includes Tunks Park, Northbridge Park, Cliff Ave Reserve, Bicentennial Reserve and Artarmon Reserve. FRG is dominated by Hawkesbury Sandstone with areas classified as Disturbed Terrain. Part of the Gully was used as a tip from the 1930s until 1985 when the rubbish was covered over with landfill and then revegetated.

PLANT COMMUNITY: The reserve is largely dominated by Coastal Sandstone Foreshores Forest (S_DSF06) on its northern and eastern boundaries. This vegetative community consists of large trees, shrub layer and ground cover of ferns, rushes and grasses. The canopy is predominantly Smooth barked apple (*Angophora costata*) with a layer of hardy mesic small trees and shrubs including Sweet pittosporum (*Pittosporum undulatum*), Cheese tree (*Glochidion ferdinandi*) and Blueberry ash (*Elaeocarpus reticulatus*). Coastal Enriched Sandstone Moist Forest (S_WSF02) dominates the southern and western boundaries of the reserve. This community is a tall open eucalypt forest with a distinctive mesic shrub and small tree layer. The canopy is dominated by various combinations of eucalypts including Blackbutt (*Eucalyptus pilularis*) and Sydney peppermint (*Eucalyptus piperita*). Smooth-barked apple (*Angophora costata*) is invariably present in this area of the reserve. Tall and small trees present closer to Flat Rock Creek are rainforest plants such as coachwood (*Ceratopetalum apetalum*) and blueberry ash (*Elaeocarpus reticulatus*). Located in the north-west corner of the reserve Hornsby Enriched Sandstone Exposed Woodland (S_DSF10). This is low open eucalypt woodland with an open to dense shrub layer. It is one of a suite of heath sandstone woodlands found in Sydney coastal environments. Sydney peppermint (*Eucalyptus piperita*) is prominent on exposed slopes in this vegetative community. The shrub layer carries a diverse mix of sclerophyllous shrubs that are typical in other Sydney sandstone woodlands. A constructed wetland has been established at the end of Flat Rock Creek, at culverts leading through to Long Bay under Tunks Park, to reduce stormwater runoff impacts.

Statement of Significance

Flat Rock Gully is classified as bushland as defined in State Environmental Planning Policy No 19 (*Vol 1, 1.4), and is protected under State and Commonwealth Legislation (*Vol 1, 1.5.2). It is zoned as E2 Environmental Conservation.

ABORIGINAL CULTURAL SIGNIFICANCE: Prior to European settlement, the area was inhabited by the Cammeraygal people. Evidence of Aboriginal occupation, in and around FRG, is found in caves, axe grinding grooves, middens, rock carvings and paintings. A layer of shells in a midden was dated to 5,850 years. The last aboriginal encampment was recorded in the 1880s near Flat Rock Bridge.

NATURAL HERITAGE SIGNIFICANCE: FRG is significant due to its diverse range of plant species. The deeper, more sheltered gully, nature of the landscape facilitates a large stand of coachwood trees and some tree ferns. Significant rock outcrops are home to recorded wildlife species including the locally rare Gully Shadeskink, Bibrons Toadlet, Short-beaked Echidna and Brown Antechinus. Burton's Legless Lizard is found on the south side of Bicentennial Reserve. FRG is classified as a Wildlife Protection Area because of its significant habitats. It is a major and central part to the east-west ecological linkage between Middle Harbour and Lane Cove River Catchments. It is significant that diverse remnant habitats present in this reserve are interconnected and provide continuity through various complex habitats which are home to many animal species. These natural habitats have been complemented by rehabilitation of the former tip site to create a unique and functional landscape which supports a wide range of small birds, reptiles and frogs.

HISTORIC CULTURAL SIGNIFICANCE: Quarrying of sandstone commenced along Flat Rock Creek in the 1880s. Sandstone retaining walls, including the L-shaped walls and drain line below Market St East, were built during the early Depression (c.1930). Terraced gardens and dry walling can be found near the Henry Lawson Cave. Ruins of a pioneer's cottage exist today. It belonged to "Fatty" Dawson who had a piggery and ran cattle in what is now West St Reserve. Land clearing along the edge of FRG for orchards and market gardens also occurred. In 1892 a suspension bridge across Flat Rock Creek opened. In 1936 the bridge was closed and reopened in 1939 with a reinforced concrete arch replacing the suspension cables. The Suspension bridge, "Fatty" Dawson's ruins and two stonework sites below Dawson Street are listed as local heritage items in the Willoughby Local Environmental Plan 2012. Tipping of waste material commenced in the area in the 1930s and in 1934 an incinerator was built from designs by Walter Burley Griffin, now listed on the NSW State Heritage Register. More bushland including the Naremburn Waterfall disappeared under rubbish as tipping continued and expanded into FRG during the 1940s. This practice did not cease until 1985 by order from the EPA.

Reserve Impacts

There are 16 culverts and stormwater outlets draining into FRG. Water quality issues mainly relate to deposition of litter from the upper catchment to the lower creek. Upstream from the Gully is highly urbanised and includes a major industrial area. Stormwater runoff has high litter loads and contaminants. Sewage overflow and leachate from landfill have also contributed to poor water quality. A significant problem downstream is the siltation of the lower channel and of Long Bay. Further information on the impacts of flooding in area can be found in Council's Flat Rock Creek Flood Study from 2018. Dumping of rubbish and garden waste, theft of bush rock and firewood, and encroachment by local residents (Pyalla St and Dawson St) are additional impacts. Graffiti, vandalism and dogs off leashes are ongoing management issues.

ENCROACHMENTS: All encroachments at Cliff Ave, Pyalla St and Dawson St to be removed at an appropriate time. New encroachments forwarded to Council Compliance for swift action.

Wildlife Habitat Issues

FRG contains a number of recreated habitats including areas of shrubland and grassland. These areas are valuable habitat for small birds and mammals. An ephemeral creek channel has been created in the upper section of Flat Rock Creek with three detention ponds. This seepage area is significant for frog and lizard populations. The small area of remnant Hornsby Enriched Sandstone Exposed Woodland should be expanded and enhanced as it is essential habitat for fauna. Exotic predators that pose the most serious threat to native wildlife in FRG are foxes, cats and dogs off leashes. The Regional Fox Baiting Program has seen fox numbers gradually decline and this program is expected to continue. Further, ecological burns could be implemented to improve the woodland and regeneration of grassland and woodland habitats.

Achievements

A Gross Pollutant Trap was installed at the bottom of Flat Rock Creek in 2018.

Signage regarding dog on leash requirements were upgraded below the Market St East entrance and at the top of Wilksch's Walk in 2020.

Initial track upgrades from West Street entrance to ruins were completed in 2020.

Bushland Management Goals – Flat Rock Gully Reserve

The following aims from the Urban Bushland Plan of Management 2014 are priority objectives:

5.3b: To create and or maintain conditions in which creek and drainage lines are protected from increased erosion and / or sedimentation due to urban impacts.
6.2f: To preserve and increase ecological links across the LGA and regionally to assist the movement of fauna.
6.2g: Maintain natural habitat formations and supplement with manufactured structures where natural habitat has been depleted.
6.3b: To implement weed control programs which are based on regeneration and restoration principles and which increase the bushland resilience to further weed infestation.
7.1g: To manage fire such that the fire regime and implementation of the burn is beneficial to flora and fauna diversity and habitat.

Bushland Management – General Principles and Actions

a. Bush regeneration is a long term process that requires staged weed removal to ensure establishment of native plant communities. Work should proceed from good bush to degraded areas with techniques that encourage regeneration, including flame weeding, rather than spraying with herbicide.
b. If possible, all weed refuse and natural debris to be composted or retained on-site.
c. When natural regeneration is deemed inadequate, supplementary plantings to mimic local plant communities and landscapes will be used with local provenance species.
d. Standing dead trees and forest litter (including logs and branches) to be kept for wildlife habitat unless deemed a risk to safety.
e. Monitor, maintain and enhance vegetation connectivity for wildlife habitat within the reserve and reserve networks.
f. *Phytophthera cinnamomi* (a root rot pathogen) is listed as a key threatening process in NSW and has been identified as a threat to a number of species. Bushland workers are to use hygiene protocols to minimise risk.
g. Report and record all reserve encroachments. Also monitor for tree vandalism and/or removal within the reserve and report to Council Compliance for appropriate action.
h. Continue to monitor wildlife habitat requirements and supplement where necessary.
i. Monitor feral animal activity and implement appropriate management actions where necessary.
j. Encourage the community to report wildlife sightings to Council via the Wildlife Watch program to increase the understanding of native wildlife populations.
k. Monitor and protect cultural heritage sites within the reserve with Aboriginal heritage to be protected at all times. Bushland staff to notify Aboriginal Heritage Office prior to each burn to identify sites and implement protection measures and post-fire survey.
l. Bushfire management will be achieved through implementation of a strategic hazard reduction program consistent with the Bushfire Risk Management Plan.
m. Species diversity will be maintained by an ecological burn program in a mosaic pattern.
n. This reserve has a valuable role as an educational resource. Preserve natural features used for educational purposes and continue to inform the community of bushland issues through on-site educational activities and signage. Maintain appropriate signage.
o. Formal tracks to be regularly maintained and informal tracks closed to prevent damage to habitat and to impede access of feral animals, unless used for access by bushland workers.
p. Establish photo points to monitor the progress of reserve management actions.
q. Reserve Action Plan progress to be reviewed annually and updated after five years.

Animal List for Flat Rock Gully Reserve

Flat Rock Gully Reserve provides habitat for a number native animals. A list of these species can be found at: https://www.willoughby.nsw.gov.au/Residents/Parks-and-recreation/Parks-reserves-and-playgrounds/Flat-Rock-Gully

Native Plant List for Flat Rock Gully and Bicentennial Reserve

FERNS	*Dracophyllum secundum*	*Banksia integrifolia subsp. integrifolia*
ASPLENIACEAE	*Epacris longiflora*	*Banksia serrata*
Asplenium australasicum	*Epacris microphylla*	*Banksia spinulosa*
Asplenium flabellifolium	*Epacris pulchella*	*Grevillea buxifolia subsp. buxifolia*
BLECHNACEAE	*Leucopogon amplexicaulis*	*Grevillea linearifolia*
Blechnum cartilagineum	*Leucopogon ericoides*	*Grevillea speciosa*
CYATHEACEAE	*Leucopogon juniperinus*	*Hakea dactyloides*
Cyathea australis	*Styphelia tubiflora*	*Hakea propinqua*
DAVALLIACEAE	*Woollsia pungens*	*Hakea sericea*
Davallia solida var. pyxidata	EUPHORBIACEAE	*Lambertia formosa*
DENNSTAEDTIACEAE	*Homalanthus populifolius*	*Lomatia myricoides*
Histiopteris incisa	FABACEAE-FABOIDEAE	*Lomatia silaifolia*
Hypolepis muelleri	*Bossiaea heterophylla*	*Persoonia levis*
Pteridium esculentum	*Grona varians*	*Persoonia linearis*
DICKSONIACEAE	*Dillwynia floribunda*	*Persoonia pinifolia*
Calochlaena dubia	*Dillwynia glaberrima*	RHAMNACEAE
GLEICHENIACEAE	*Dillwynia retorta*	*Pomaderris discolor*
Gleichenia dicarpa	*Glycine clandestina*	RUBIACEAE
Gleichenia rupestris	*Gomphobolium latifolium*	*Pomax umbellata*
LINDSAEACEAE	*Hardenbergia violacea*	RUTACEAE
Lindsaea linearis	*Hovea longifolia*	*Crowea saligna*
Lindsaea microphylla	*Indigofera australis subsp. australis*	*Phebalium dentatum*
OSMANDACEAE	*Kennedia rubicunda*	*Zieria smithii*
Todea barbara	*Mirbelia rubiifolia*	SAPINDACEAE
POLYPODIACEAE	*Phyllota phylicoides*	*Dodonaea triquetra*
Platycerium bifurcatum	*Platylobium formosum*	STERCULIACEAE
Pyrrosia rupestris	*Pultenaea daphnoides*	*Lasiopetalum ferrugineum var. ferrugineum*
PTERIDACEAE	*Pultenaea tuberculata*	STYLIDIACEAE
Adiantum aethiopicum	*Pultenaea flexilis*	*Stylidium productum*
Pteris umbrosa	*Pultenaea stipularis*	THYMELIACEAE
Cheilanthes austrotenuifolia	*Viminaria juncea*	*Pimelea linifolia subsp. linifolia*
Cheilanthes sieberi subsp. sieberi	FABACEAE-MIMOSOIDEAE	VITACEAE
THELYPTERIDACEAE	*Acacia decurrens*	*Cissus hypoglauca*
Christella dentata	*Acacia elongata*	***MONOCOTS***
DICOTS	*Acacia linifolia*	ASPHODELACEAE
ACANTHACEAE	*Acacia longifolia subsp. longifolia*	*Dianella caerulea var. caerulea*
Pseuderanthemum variabile	*Acacia longissima*	*Dianella longifolia var. longifolia*
APIACEAE	*Acacia suaveolens*	ASPARAGACEAE
Actinotus helianthi	*Acacia terminalis subsp. Long inflorescences*	*Lomandra longifolia*
Actinotus minor	*Acacia ulicifolia*	*Lomandra multiflora*
Centella asiatica	GOODENIACEAE	*Lomandra obliqua*
Platysace linearifolia	*Dampiera stricta*	*Xanthorrhoea media*
Xanthosia pilosa	HALORAGACEAE	*Xanthorrhoea resinosa*
Xanthosia tridentata	*Gonocarpus teucrioides*	*Xanthorrhoea sp.*
APOCYNACEAE	*Haloragis heterophylla*	COLCHICACEAE
Marsdenia suaveolens	LAURACEAE	*Schelhammera undulata*
Parsonsia straminea	*Wahlenbergia communis*	COMMELINACEAE
ARALIACEAE	*Wahlenbergia gracilis*	*Commelina cyanea*
Astrotricha latifolia	*Cassytha paniculata*	CYPERACEAE
Polyscias sambucifolia subsp. Long leaflets	LAMIACEAE	*Cyathochaeta diandra*
ASTERACEAE	*Clerodendrum tomentosum*	*Cyperus polystachyos*
Ozothamnus diosmifolius	*Prostanthera linearis*	*Gahnia erythrocarpa*
BIGNONIACEAE	*Lobelia andrewsii*	*Gahnia spp*
Pandorea pandorana	*Lobelia purpurascens*	*Lepidosperma laterale*
CANNABACEAE	MYRSINACEAE	*Schoenus melanostachys*
Trema tomentosa var. aspera	*Myrsine variabilis*	DIOSCOREACEAE
CASUARINACEAE	MYRTACEAE	*Dioscorea transversa*
Allocasuarina distyla	*Angophora costata subsp. costata*	IRIDACEAE
Allocasuarina littoralis	*Austromyrtus tenuifolia*	*Patersonia sericea var. sericea*
Allocasuarina torulosa	*Corymbia gummifera*	JUNCACEAE
Casuarina glauca	*Eucalyptus pilularis*	*Juncus kraussii subsp. australiensis*
CONVOLVULACEAE	*Eucalyptus piperita*	*Juncus usitatus*
Dichondra repens	*Eucalyptus resinifera subsp. resinifera*	ORCHIDACEAE
CUNONIACEAE	*Eucalyptus sieberi*	*Cryptostylis erecta*
Bauera microphylla	*Kunzea ambigua*	*Dipodium punctatum*
Bauera rubioides	*Leptospermum trinervium*	*Pterostylis nutans*
Callicoma serratifolia	*Tristaniopsis laurina*	*Pterostylis acuminata*
Ceratopetalum apetalum	OLEACEAE	POACEAE
Ceratopetalum gummiferum	*Notelaea longifolia f. longifolia*	*Aristida vagans*
DILLENIACEAE	*Notelaea ovata*	*Dichelachne crinita*
Hibbertia aspera subsp. aspera	PHYLLANTHACEAE	*Entolasia marginata*
Hibbertia dentata	*Breynia oblongifolia*	*Entolasia stricta*
Hibbertia empetrifolia subsp. empetrifolia	*Glochidion ferdinandi var. ferdinandi*	*Imperata cylindrica*
Hibbertia linearis	*Phyllanthus hirtellus*	*Microlaena stipoides var. stipoides*
Hibbertia nitida	PICRODENDRACEAE	*Rytidosperma longifolium*
Hibbertia scandens	*Micrantheum ericoides*	*Oplismenus imbecillis*
DROSERACEAE	PITTOSPORACEAE	*Oplismenus aemulus*
Drosera auriculata	*Billardiera scandens*	*Themeda triandra*
Drosera spatulata	*Pittosporum undulatum*	RESTIONACEAE
ELAEOCARPACEAE	POLYGONACEAE	*Lepyrodia scariosa*
Elaeocarpus reticulatus	*Persicaria decipiens*	SMILACACEAE
ERICACEAE-EPACRIDOISEAE	PROTEACEAE	*Smilax glyciphylla*
Brachyloma daphnoides subsp. daphnoides	*Banksia ericifolia subsp. ericifolia*	