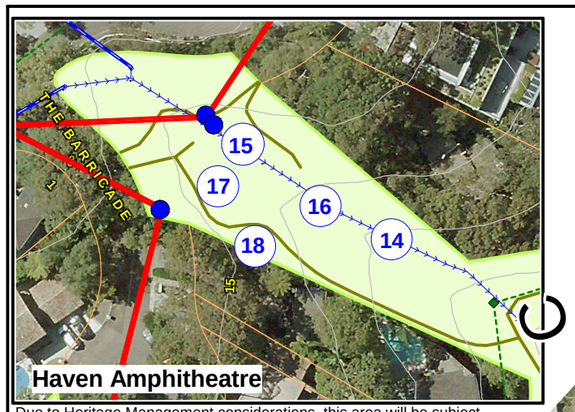


Due to Heritage Management considerations, this area will be subject to a separate Plan of Management

Castlehaven Reserve Actions

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

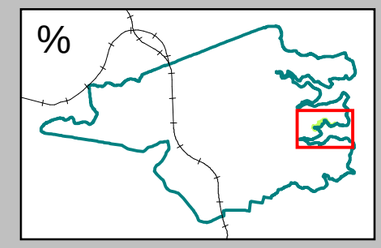
Castlehaven Reserve Actions

1. Council bush regeneration contractors to carry out secondary weeding encouraging regeneration of native flora.
2. Bushcare group to continue management of site in accordance with the Bushcare Action Plans.
3. Continued contractor secondary weeding and monitoring of drainage lines and flow paths to maintain access and reduce erosion.
4. Council bush regeneration contractor to carry out maintenance weeding.
5. Post-fire maintenance to be carried out by Council's Bush Regeneration staff.
6. Contractor mower to maintain lawn areas behind 7-9 The Scarp.
7. Council bush regeneration contractors to continue to work along creekline and encourage re-emergence of Coastal Enriched Sandstone Moist Forest species.
8. Contractors to continue restoration of vegetation around stormwater outlet and monitor any further subsidence.
9. Council bush regeneration contractors to continue maintenance weeding between stormwater lines and along track.
10. Council bush regeneration contractors to remove woody, vine and herbaceous weeds while also carrying out secondary weeding. Carry out work from areas of high resilience to low resilience particularly along sewer lines.
11. Kayak storage to monitored and managed.
12. Minimize impact of access tracks to waterfront from individual residences.
13. Monitor encroachments at The Scarp, The Barricade and Linden Way and refer priorities to Compliance Section.

Haven Amphitheatre (inset)

14. Develop Amphitheatre operation systems to minimalize site impacts in accordance with its listing as a heritage item and its land use zoning of E2-Environmental Protection in Willoughby Local Environmental Plan 2012. Ensure that the new POM for the Haven Amphitheatre recognises the principles of this RAP, and conserves the natural and cultural values of this part of the Reserve.
15. Repair and improve access when required for future performance area in keeping with existing Griffin heritage and bushland aesthetic.
16. Contractors to continue weed maintenance and encourage native plant regeneration.
17. Temporary safety fencing to be installed adjacent to former stage.
18. Contractors to plant native species as required to stabilize the verge bank. Exotic species to be replaced over time with local species.

RESERVE ACTION PLAN
CASTLEHAVEN RESERVE



Plan details

Status:	Draft
Prepared by:	N. Yu
Drawn by:	N. Prasad
Date printed:	09/03/2020
Approximate Scale:	1:2000 (main map)
	1:1000 (inset)

Legend

- 16 — Property number
- 12 — Action plan activity
- Stormwater node
- Sewer access chamber **
- & — Approximate fire hydrant location
- Power pole
- 35 — 5m contours
- Stormwater network - Underground *
- Stormwater network - Overground / Unknown *
- Council access track
- Sewer mains **
- Energy Australia & internal overhead & underground power lines ***
- Property boundary
- Reserve / bushland
- Bush Regeneration Contractors
- Council Staff Regeneration Site

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

** Data as at 14-07-2007. Please check with Dial Before You Dig prior to any earth works.

*** No responsibility is taken for the accuracy of this data. Please check with Energy Australia, Dial Before You Dig or any other relevant authorities prior to undertaking any work.

References

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Draft Castlehaven Reserve Action Plan

Reserve Profile

Castlehaven Reserve is a linear foreshore reserve of natural bushland (2.9 ha) on the southern side of the Castlecrag peninsular. It adjoins Sailors Bay Park and Retreat Reserve in the west and extends east to Beverley Blacklock Reserve. The land slopes down, sometimes steeply, from the rear of residential properties in Castlecrag to the foreshore of Sailors Bay. Geology is dominated by Hawkesbury Sandstone with rocky outcrops throughout the reserve. It has large patches of bushland in good condition. Areas of weed are found along stormwater drainage lines and residential boundaries adjoining the reserve. An area below the junction of The Scarp and The Barricade has been used since 1930s as an open-air theatre called the Haven Amphitheatre.

PLANT COMMUNITY: Coastal Sandstone Foreshores Forest (S_DSF06) is the most well-established plant community in Castlehaven Reserve. It is an open forest with a moist shrub layer and a ground cover of ferns, rushes and grasses. The flora of this community has a maritime influence given its exposure to prevailing harbour breezes. There are stands of Smooth-barked Apple (*Angophora costata*) with some Coast Banksia (*Banksia integrifolia*). Sydney Peppermint (*Eucalyptus piperita*) and Blackbutt (*Eucalyptus pilularis*) are found in more protected locations within the reserve. Small trees and shrubs include Sweet Pittosporum (*Pittosporum undulatum*); Cheese Tree (*Glochidion ferdinandi*) and Blueberry Ash (*Elaeocarpus reticulatus*). Coastal Enriched Sandstone Moist Forest (S_WSF02) is located in the west part of Castlehaven Reserve and the mid-northern boundary. This plant community is a tall open eucalypt forest with a distinctive mesic shrub and small tree layer. The canopy is largely dominated by Sydney Peppermint (*E. piperita*) and various other eucalypts. Rainforest trees such as Coachwood (*Ceratopetalum apetalum*) and Blueberry Ash (*E. reticulatus*) are common.

HABITAT: The reserve contains a range of habitats including Coachwood forests and fern-lined gullies to sclerophyll vegetation which support a diversity of native woodland and forest mammals and birds. Steep terrain to the foreshore provides protected habitat pockets that are connected along the reserve creating an effective bushland linkage. There are several rocky freshwater creeks with ponds that lead to foreshore areas with Grey Mangroves and seagrasses. Intertidal areas along the foreshore support saltwater ecological communities.

Statement of Significance

Castlehaven Reserve has bushland as defined in State Environmental Planning Policy No 19, and is protected under State and Commonwealth Legislation. All areas discussed in this Reserve Action Plan are zoned E2 Environmental Conservation in the Willoughby Local Environment Plan (WLEP) 2012. The Haven Amphitheatre is listed as an item of local heritage significance in WLEP 2012. Most of Castlehaven Reserve, including the Haven Amphitheatre, lies within the Griffin Heritage Conservation area which comprises both the Castlecrag and Haven Estates.

ABORIGINAL CULTURAL SIGNIFICANCE: Prior to European settlement the area was inhabited by the Camaraigal clan of the Guringai nation. Evidence of Aboriginal occupation is found in caves and middens located along the reserve's foreshore. These areas will not be promoted to the public, to protect them from disturbance.

NATURAL HERITAGE SIGNIFICANCE: Castlehaven Reserve is part of the Sailors Bay group of reserves that form a continuous corridor along the southern foreshore of Castlecrag. Some locally-significant wildlife that may be found in Castlehaven Reserve includes the Superb Lyrebird, Swamp Wallaby and the threatened Powerful Owl.

HISTORIC CULTURAL SIGNIFICANCE: The Castlecrag and Haven Estates (from which Castlehaven Reserve derives its name) were residential estates designed to be unified with the natural environment by architects Walter Burley Griffin and his wife Marion Mahony Griffin in the 1920s.The open space system of reserves,

pathways, drainage reserves and road islands were an integral part of the design. A key component of the Griffin vision was the reservation of foreshore land to preserve its natural environment.

In 1943 Marion Mahony Griffin gifted the title deeds of Castlehaven Reserve to Willoughby Council for public use. Smaller lots at the eastern end were acquired in the late 20th century. Traces of a cottage and boatsheds remain. Three boatsheds that still exist are privately leased from NSW Roads and Maritime Services.

Marion Mahony Griffin established the Haven Valley Scenic Theatre in the early 1930s. Community performances in the gully used natural features as the stage and rough stone seats built in terrace formation to complement surrounding natural bushland are still in use. The 1943 Deed of Trust permitted continued use of part of the reserve as a natural open-air theatre. After falling into disrepair in the early 1970s, the seating was restored and a timber stage built by the Castlecrag community. In 1976 a committee was appointed by Council to run the open-air theatre. In 1992 the stage was enlarged, performance facilities installed underneath and seating. The stage was removed and development approval issued for a replacement stage..

HABITAT SIGNIFICANCE: Castlehaven Reserve is part of the ecological linkage created by the continuous bushland reserve system running along much of Willoughby's Middle Harbour foreshore. It provides important habitat for both terrestrial and arboreal species and permanent habitat for some species, particularly mammals, reptiles and bird species like the Powerful Owl. Steep slopes meeting the foreshore contain rocky outcrops, overhangs and rock-lined creeks. Freshwater and dense canopy support species such as the Eastern Water Dragon, Golden-crowned Snake, Buff-banded Rail, and many invertebrate species important to insectivores including the Superb Lyrebird. Lower areas near the foreshore where human access is restricted provide habitat for many species including the Rakali (native Water Rat), Fishing Bat, Swamp Wallaby, Echidna and Lace Monitor.

Reserve Impacts

Nine urban stormwater outlets drain onto the reserve, six feeding into existing creek lines with occasional dislodgment of sandstone boulders and increased erosion during heavy rainfall. Three drainage lines flow directly overland, causing some degradation of native vegetation.

Overflowing sewer lines within the reserve intermittingly increase nutrient levels in water and soils. This encourages weeds to grow, which then compete with native vegetation. A maintenance track runs along the line of the sewer and is also used by locals. Impacts on the reserve from adjoining properties include dumping of rubbish and garden waste, garden plant escapes, illegal clearing for views, and encroachments including access tracks to the foreshore from individual residences . Along the foreshore edge of the reserve dinghies, kayaks and canoes causing degradation of vegetation and habitat.

Encroachments: 17, 19, 23, 41, 43 The Scarp, 7 The Barricade, 38 Linden Way.

Wildlife Habitat Issues

As this reserve is narrow and steep, incursions by encroachments and clearing of nearby vegetation have more significant impacts. Predation by foxes and companion animals also pose a serious threat to native wildlife in the reserve.

Achievements

Extensive bush regeneration and noxious weed control have improved the quality of the bushland.

Armouring of several creek beds in the Reserve has helped reduce erosion during heavy rain events. The maintenance access track from the west end at Sailors Bay Park to Beverley Blacklock Reserve has been upgraded to improve safety. The installation of watercraft racks has reduced impacts to bushland while providing more suitable storage. The track and sandstone steps in and around the Haven Amphitheatre have been upgraded.

Bushland Management Goals – Castlehaven Reserve

This bushland Reserve Action Plan has identified the following management aims from the Urban Bushland Plan of Management 2014 as 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.

5.4b: To maintain the integrity of bushland reserves through the reduction of encroachments and other boundary 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 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.

10.1b: To ensure that leases and licences for activities undertaken in, or adjoining, or impacting on, bushland areas are compatible with the sustainable management of bushland.

Bushland Management – General Principles for all Reserves

a. Bushland regeneration is a long term process requiring staged weed removal to ensure restoration of native ecological communities. Work will proceed from good bush to degraded areas with techniques that encourage regeneration.

b. If possible, weed refuse and natural debris composted on-site.

c. If 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/branches) to be retained for fauna habitat unless deemed a risk to safety.

e. Monitor, maintain and enhance vegetation connectivity for wildlife habitat within the reserve and reserve networks.

f. *Phytophthora cinnamomi* (a root rot pathogen) is listed as a key threatening process in NSW. Bushland workers are to use hygiene protocols to minimise risk.

g. Report and record all reserve encroachments. Monitor for tree vandalism and/or removal and report to Council Compliance for appropriate action.

h. Monitor wildlife habitat and supplement where necessary.

i. Monitor feral and companion animal activity and implement appropriate management actions where necessary.

j. Encourage the community to report wildlife sightings via the Wildlife Watch Program.

k. Bushfire management will be achieved through implementation of a strategic hazard reduction program consistent with the Bushfire Risk Management Plan.

l. Species diversity will be maintained by an ecological burn program in a mosaic pattern.

m. Monitor and protect Aboriginal cultural heritage sites. Bushland staff to notify Aboriginal Heritage Office prior to a burn to identify sites and implement protection measures.

n. Preserve natural features for educational purposes and continue to inform the community of bushland issues through on-site activities and signage. Maintain appropriate signage.

o. Formal tracks to be maintained and unwanted tracks to be closed to prevent damage to bushland and to impede access of feral animals, unless used for access by bushland workers.

p. Establish photo points to monitor work and review annually.

q. Protection of habitat is required for flora and fauna species found in reserves listed under State and Commonwealth legislation as threatened species.

r. The collection of rubbish from bushland is carried out by council contractors and bushland field staff as required.

NATIVE PLANT LIST FOR CASTLEHAVEN RESERVE

CLUB MOSS/QUILL WORT

SELAGINELLACEAE
Selaginella uliginosa

FORK FERNS

PSILOTACEAE
Psilotum nudum

CONIFERS

CUPRESSACEAE
Callitris rhomboidea
PODOCARPACEAE
Podocarpus spinulosus

FERNS

ADIANTACEAE
Adiantum aethiopicum
ASPLENIACEAE
Asplenium flabellifolium
BLECHNACEAE
Blechnum ambiguum
Blechnum cartilagineum
Doodia caudata
CYATHEACEAE
Cyathea australis
Cyathea cooperi
DAVALLIACEAE
Davallia pyxidata
DENNSTAEDTIACEAE
Histiopteris incisa
Hypolepis glandulifera
Hypolepis muelleri
Pteridium esculentum
DICKSONIACEAE
Calochlaena dubia
GLEICHENIACEAE
Gleichenia dicarpa
Gleichenia microphylla
Gleichenia rupestris
Sticherus flabellatus
HYMENOPHYLLACEAE
Hymenophyllum cupressiforme
LINDSAEACEAE
Lindsaea linearis
Lindsaea microphylla
POLYPODIACEAE
Pyrrosia rupestris
PTERIDACEAE
Cheilanthes sieberi
SCHIZAEACEAE
Schizaea bifida
Schizaea dichotoma

DICOTS

ACANTHACEAE
Pseuderanthemum variabile
ACANTHACEAE
Avicennia marina
APIACEAE
Actinotus helianthi
Actinotus minor
Platysace lanceolata
Platysace linearifolia
Platysace stephensonii
Xanthosia pilosa
Xanthosia tridentata
APOCYNACEAE
Parsonsia straminea
ARALIACEAE
Astrotricha floccosa
Astrotricha longifolia
Polyscias sambucifolia
ASCLEPIADACEAE
Marsdenia suaveolens
ASTERACEAE
Lagenifera stipitata
Ozothamnus diosmifolium
Senecio hispidulus
Sigesbeckia orientalis
BIGNONIACEAE
Pandorea pandorana
CAMPANULACEAE
Wahlenbergia gracilis
CASSYTHACEAE
Cassytha glabella
Cassytha pubescens
CASUARINACEAE
Allocasuarina distyla
Allocasuarina littoralis
Casuarina glauca
CONVOLVULACEAE
Calystegia marginata
Polymeria calycina
CUNONIACEAE
Bauera rubioides
Callicoma serratifolia
Callicoma serratifolia
Ceratopetalum apetalum
Ceratopetalum gummiferum
DILLENIACEAE
Hibbertia dentata
Hibbertia empetrifolia
Hibbertia fasciculate
Hibbertia linearis
Hibbertia scandens
Leucopogon amplexicaulis
Leucopogon lanceolatus
Leucopogon microphyllus
Lissanthe strigosa
Monotoca scoparia
Sprengelia incarnata
Styphelia longifolia
Styphelia tubiflora
Woollsia pungens
Acrotriche divaricate
DROSERACEAE
Drosera spathulata
Drosera auriculata
Drosera peltata
ELAEOCARPACEAE
Elaeocarpus reticulatus
ERICACEAE
STYPHELIOIDEAE
Epacris longiflora
Epacris microphylla
Epacris pulchella
EUPHORBIACEAE
Breynia oblongifolia
Glochidion ferdinandi
Micrantheum ericoides
Omalanthus populifolius
Poranthera microphylla
Ricinocarpos pinifolius
FABACEAE FABOIDEAE
Aotus ericoides
Bossiaea ensata
Bossiaea heterophylla
Bossiaea obcordata
Bossiaea scolopendria
Dillwynia floribunda
Dillwynia retorta
Gompholobium latifolium
Hardenbergia violacea
Hovea linearis
Kennedia rubicunda
Mirbelia rubiifolia
Phyllota phylicoides
Platylobium formosum
Pultenaea daphnoides
Pultenaea elliptica
Pultenaea flexilis
Pultenaea polifolia
Pultenaea stipularis
FABACEAE-MIMOSOIDEAE
Acacia linifolia
Acacia longifolia
Acacia longissima
Acacia myrtifolia
Acacia suaveolens
Acacia terminalis
Acacia ulicifolia
GOODENIACEAE
Dampiera stricta
Goodenia bellidifolia
Goodenia heterophylla
Goodenia stelligera
Scaevola ramosissima
Gonocarpus micranthus
HALORAGACEAE
Gonocarpus teucrioides
LAMIACEAE
Hemigenia pupurea
Plectranthus parvifolius
Prostanthera denticulata
LAURACEAE
Endriandra seiberi
LOBELIACEAE
Lobelia dentata
Pratia purpurascens
LOGANIACEAE
Logania albiflora
Mitrasacme polymorpha
MELIACEAE
Synoum glandulosum
Stephania japonica
MORACEAE
Ficus rubiginosa
MYRSINACEAE
Myrsine (Rapanea) variabilis
MYRTACEAE
Acmena smithii
Angophora costata
Angophora hispida
Austromyrtus tenuifolia
Backhousia myrtifolia
Baeckea diosmifolia
Baeckea imbricata
Callistemon linearis
Calytrix tetragona
Corymbia gummifera
Darwinia fascicularis
Eucalyptus botryoides
Eucalyptus haemastoma
Eucalyptus piperita
E. luehmanniana
Eucalyptus obstans
Eucalyptus punctata
Eucalyptus sieberi
Kunzea capitata
Leptospermum arachnoides
L. polygalifolium
Leptospermum squarrosum
Leptospermum trinervium
Tristaniopsis collina
Tristaniopsis laurina
OLACACEAE
Olax stricta
Notelaea longifolia
Notelaea venosa
PITTOSPORACEAE
Billardiera scandens
Pittosporum revolutum
Pittosporum undulatum
POLYGALACEAE
Comesperma ericinum
PRIMULACEAE
Samolus repens
PROTEACEAE
Banksia ericifolia
Banksia integrifolia
Banksia marginata
Banksia oblongifolia
Banksia serrata
Banksia spinulosa
Conospermum longifolium
Grevillea buxifolia
Grevillea linearifolia
Grevillea sericea
Grevillea speciosa
Hakea dactyloides
Hakea gibbosa
Hakea propinqua
Hakea sericea
Hakea teretifolia
Isopogon anethifolius
Lambertia formosa
Lomatia myricoides
Lomatia silaifolia
Persoonia lanceolata
Persoonia levis
Persoonia linearis
Persoonia pinifolia
Petrophile pulchella
Telopea speciosissima
Xylomelum pyriforme
RANUNCULACEAE
Clematis aristata
RHAMNACEAE
Pomaderris intermedia
Pomaderris lanigera
Pomaderris spp.
RUBIACEAE
Morinda jasminoides
Opercularia aspera
Pomax umbellata
RUTACEAE
Boronia ledifolia
Boronia pinnata
Boronia serrulata
Correa reflexa
Crowea saligna
Eriostemon australasius
Phebalium dentatum
Phebalium squamulosum
Philotheca salsolifolia
Zieria laevigata
Zieria pilosa
SANTALACEAE
Leptomeria acida
SAPINDACEAE
Dodona a triquetra
STACKHOUSIACEAE
Stackhousia viminea
STERCULIACEAE
Lasiopetalum ferrugineum
Rulingia dasyphylla
STYLIDIACEAE
Stylidium productum
Stylidium graminifolium
Stylidium lineare
THYMELIACEAE
Pimelea linifolia
TREMANDRACEAE
Tetratheca ericifolia
VERBENACEAE
Chloanthes stoechadis
Clerodendrum tomentosum
VIOLACEAE
Hybanthus vernonii
VIOLACEAE
Viola hederacea
VITACEAE
Cissus hypoglauca

MONOCOTS

ANTHERICACEAE
Caesia parviflora var vittata
Thysanotus tuberosus
BLANDFORDIACEAE
Blandfordia nobilis
COLCHICACEAE
Burchardia umbellata
COMMELINACEAE
Commelina cyanea
CYPERACEAE
Caustis flexuosa
Caustis pentandra
Cyathochaeta diandra
Gahnia clarkei
Gahnia erythrocarpa
Gahnia spp.
Ficinia nodosa
Lepidosperma filiforme
Lepidosperma flexuosum
Lepidosperma laterale
Ptilanthelium deustum
Schoenus imberbis
Schoenus melanostachys
Schoenus paludosus
IRIDACEAE
Patersonia glabrata
Patersonia sericea
Patersonia sp. aff. fragilis
JUNCACEAE
Juncus continuus
Juncus kraussii
Juncus planifolius
LUZURIAGACEAE
Eustrephus latifolius
PHORMIACEAE
Dianella caerulea var caerulea
Dianella caerulea var producta
UVULARIACEAE
Schelhammera undulata
LOMANDRACEAE
Lomandra brevis
Lomandra filiformis
Lomandra glauca
Lomandra gracilis
Lomandra longifolia
Lomandra obliqua
ORCHIDACEAE
Acianthus fornicatus
Caladenia carnea
Calochilus campestris
Calochilus paludosus
Corybas aconitiflorus
Cryptostylis erecta
Cryptostylis subulata
Dendrobium linguiforme
Dendrobium speciosum
Dipodium punctatum
Dipodium variegatum
Liparis reflexa
Pterostylis grandiflora
Pterostylis longifolia
Pterostylis nutans
Pterostylis pedunculata
Rimacola elliptica
Spiranthes sinensis
Thelymitra carnea
Thelymitra ixioides
Thelymitra nuda
Thelymitra pauciflora
PHILESIACEAE
Geitonoplesium cymosum
Philydrum lanuginosum
POACEAE
Anisopogon avenaceus
Aristida vagans
Cymbopogon refractus
Danthonia tenuior
Echinopogon caespitosus
Entolasia marginata
Entolasia stricta
Eragrostis trachycarpa
Imperata cylindrica
Microlaena stipoides
Oplismenus imbecillis
Panicum simile
Phragmites australis
Themeda australis
RESTIONACEAE
Empodisma minus
Lepyrodia scariosa
Restio complanatus
Restio dimorphus
Restio tetraphyllus
SMILACACEAE
Smilax australis
Smilax glyciphylla
XANTHORRHOEACEAE
Xanthorrhoea arborea
XYRIDACEAE
Xyris gracilis
Xyris operculata

All actions within this plan relate directly to the Willoughby City Council Urban Bushland Plan of Management, 2014 (http://www.willoughby.nsw.gov.au/Plan-of-Management.html)