A floristic survey of the Whicher Scarp dataset

A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.) and Department of Biodiversity, Conservation and Attractions using survey data originally from the Swan Bioplan Project at the Department of Environment and Conservation.

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PREFACE TO THE 2020 UPDATE

This dataset is an update to the one submitted to NatureMap after the publication of 'A Floristic Survey of the Whicher Scarp' (BJ Keighery et al. *2008). It includes floristic data with the same taxonomy (as at 2008), for the same 124 quadrats, but in this dataset the locations of 14 quadrats, previously withheld because they were on private land, are now made public. Previous and updated names are also included. The ability to link the human observation data in this dataset to herbarium specimens that were collected during the surveys and are now housed at the Western Australian Herbarium, in order to easily access the latest taxonomic determinations for these specimens, is also now available. BJ Keighery* et al. *(2008) comprehensively documented many flora attributes including growth and life forms and conservation status, but here these are listed for species at the quadrat level, rather than just in a combined flora list. Results of recent geoprocessing with the latest versions of freely available shapefiles are also included.*

INTRODUCTION

This dataset is based on the one accompanying the report *A Floristic Survey of the Whicher Scarp* (BJ Keighery *et al.* 2008) and presents the results of more than ten years survey by the Departments of Environmental Protection (DEP) and Conservation and Land Management (CALM) and their superseding nature conservation agencies, and the Wildflower Society of Western Australia (Inc.). It combines the results of a number of floristic studies conducted on plant communities in and around the Whicher Scarp on the Interim Biogeographic Regionalisation for Australia (IBRA) Swan Coastal Plain bioregion and on the Darling and Whicher Scarp portions of the IBRA Jarrah Forest bioregion (DAWE 2020). The studies included are *A Floristic Survey of the southern Swan Coastal Plain* (Gibson *et al.* 1994), the System 6 and Part System 1 Update Program (DEP 1996) and the Swan Bioplan Project. Many of the surveys that were undertaken in these studies involved the participation of the Wildflower Society of Western Australia Bushland Plant Survey Program team. Reporting was completed as part of Swan Bioplan and resulted in a detailed reference outlining the conservation status of species and communities that occur in the area.

This dataset comprises sampling site attributes regarding their geology, geography, vegetation, tenure and vesting, and the flora recorded at, and the floristic community type assigned to, these sites. The quadrats in this dataset were the group analysed by BJ Keighery *et al.* (2008), resulting in the identification of 20 Whicher Scarp floristic community types. The taxonomy of the flora is as it was in the database in 2008 when this dataset was compiled, although previous and updated names are also provided for many taxa.

The 2008 dataset and accompanying documentation has been available on NatureMap and Atlas of Living Australia since publication; these and other data repositories will be provided with this latest version (a database, a shapefile and documentation).

This is one of five datasets produced or updated in 2020 by the Wildflower Society of Western Australia to further promote knowledge of Western Australian flora.

STUDIES

This dataset is derived from the results of several floristic studies conducted between 1992 and 2006 and described in BJ Keighery *et al*. (2008). Some of the studies are further divided here into smaller 'sub-studies', or groups of quadrats which can be neatly grouped because they are for the same area, they were conducted at the same time, or they have been reported on together. The studies and sub-studies are summarised in Table 1.

SAMPLING SITES

The studies involved the use of 44 quadrats selected from those established in Gibson *et al.* (1994) and the System 6 and Part System 1 Update (DEP 1996), as well as the establishment of 80 further quadrats. All floristic sampling sites were measured and permanently located 10 m x 10 m quadrats. Quadrat establishment and survey procedures followed those in BJ Keighery (1994). See Map 1 and Table 2 for the 124 sampling sites included in this dataset.

The quadrats in this dataset are listed in Table 3, with study codes and Whicher Scarp and Swan Coastal Plain floristic community type codes (WHSFCT and SWAFCT respectively), where applicable. There are both SWAFCT and WHSFCT listed for 44 quadrats that have been analysed in both analysis datasets. The WHSFCTs resulted from analysis of species in this dataset with some reconciliations (Appendix 3a in BJ Keighery *et al*. 2008) to account for nomenclature differences and for taxa groups known to have been confused or potentially confused in the field and between studies. WHSFCT codes are described in Table 4 and SWAFCT codes are described in Table 5.

As previously mentioned, this dataset is one of five produced or updated in 2020 by the Wildflower Society of Western Australia. A list of all 1560 quadrats in all five datasets, and an explanation behind the grouping, is in Table 6.

LIST OF SPECIES

The native and weed species[1] recorded in each quadrat are listed in this dataset. Species adjacent to quadrats, and in the same plant community, were recorded during the surveys and are presented in one of the three species database tables in this dataset (see database descriptions in Appendix A). The identification and taxonomy of adjacents have not been afforded the same scrutiny as have those plants recorded *in* the quadrats. A small number of taxa that were missed in the 2008 release of this dataset (BJ Keighery *et al.* 2008) are listed in Appendix B (see NAME field) but have not been added to this release of the dataset.

Taxonomy used here (including family names) is that which was current in 2008, when this list was compiled. Previous and updated names, conservation status, herbarium specimen numbers and growth and life forms are also included.

DATABASE

The Microsoft Access database has five tables of quadrat species and attributes (see Appendix A). The fields in the tables of the database are listed in Appendix B and the database metadata is in Appendix C.

SPATIAL INFORMATION

A shapefile of quadrat locations is available (see shapefile metadata in Appendix C) and latitudes and longitudes are listed in the database. As GPS position systems were inherently inaccurate prior to 2000, further work was undertaken to improve the spatial accuracy of the quadrat positions of the older studies (SCP and SYS6ENV2), as detailed in Table 7. Despite the authors doing their best to ensure the accuracy of the quadrat locations, and although it is expected that many of the quadrat locations on the shapefile are within 30 m of their true location after the refinement process, a default positional accuracy of 100 m is still allocated to these quadrats. It is not known what degree of checking was done for the SB and SB/WSBPS studies and a positional accuracy of 100 m is allocated to these quadrats.

CITATION

This report should be cited as:

Keighery BJ, Keighery GJ, Webb A, Longman VM and Griffin EA 2020 *A floristic survey of the Whicher Scarp dataset.* A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.) and Department of Biodiversity, Conservation and Attractions using survey data originally from the Swan Bioplan Project at the Department of Environment and Conservation.

The database and shapefile are called WhicherScarp.

ACKNOWLEDGEMENTS

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1 Note that 'species' is used here to include all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category such as subspecies, variety or forma.

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Key:

References can have the following annotations after the date in the reference:

GIS	Geographic Information System (GIS) dataset
Database	A database

Acronyms used in the references:

CALM – Department of Conservation and Land Management (formed: 22/03/1985; dissolved: 30/06/2006)

DAFWA – Department of Agriculture and Food Western Australia.

DAWE – Department of Agriculture, Water and the Environment

DBCA – Department of Biodiversity, Conservation and Attractions Conservation (formed: 1/07/2017)

DCE – Department of Conservation and Environment

DEC – Department of Environment and Conservation (formed: 1/07/2006; dissolved: 30/06/2013)

DEE – Department of the Environment and Energy

DEWHA – Department of the Environment, Water, Heritage and the Arts

DIIS – Department of Industry, Innovation and Science

DoE – Department of Environment

DPaW – Department of Parks and Wildlife (formed: 1/07/2013; dissolved: 30/06/2017)

DPIRD – Department of Primary Industries and Regional Development

DWER – Department of Water and Environmental Regulation

EPA – Environmental Protection Authority

OEPA – Office of the Environmental Protection Authority

WSWA – Wildflower Society of Western Australia (Inc.)

Department of Agriculture and Food Western Australia - DAFWA

Department of Agriculture, Water and the Environment - DAWE

Department of Biodiversity, Conservation and Attractions Conservation (formed: 1/07/2017) - DBCA

Department of Conservation and Environment - DCE

Department of Conservation and Land Management (formed: 22/03/1985; dissolved: 30/06/2006) - CALM

Department of Environment - DoE

Department of Environment and Conservation (formed: 1/07/2006; dissolved: 30/06/2013) - DEC

Department of Industry, Innovation and Science - DIIS

Department of Parks and Wildlife (formed: 1/07/2013; dissolved: 30/06/2017) - DPaW

Department of Primary Industries and Regional Development - DPIRD

Department of the Environment and Energy - DEE

Department of the Environment, Water, Heritage and the Arts - DEWHA

Department of Water and Environmental Regulation - DWER

Environmental Protection Authority - EPA

Office of the Environmental Protection Authority - OEPA

Wildflower Society of Western Australia (Inc.) - WSWA

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DAWE 2020 *Australia's Bioregions (IBRA) on the website of the Department of Agriculture, Water and the Environment.* Available at http://www.environment.gov.au/land/nrs/science/ibra. [Accessed on 10/03/2020]

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DBCA 2016b GIS *Forest Blocks (DBCA-025).* Published 28/01/2016; last updated 21/09/2018. Available at https://catalogue.data.wa.gov.au/dataset/forest-blocks. [Sourced 31/10/2019]

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TABLES

Table 1. Floristic studies and sub-studies used in the preparation of this dataset with relevant reports, coverage, years of survey and custodian.

Studies are coded SCP, SYS6ENV2, SB and SB/WSBPS. Years of survey include both the range of years for the whole study and the years for the subset used here in this dataset.

D = Report is available in the Department of Biodiversity, Conservation and Attractions library. DBCA = Department of Biodiversity, Conservation and Attractions. DEP = Department of Environmental Protection. DoE = Department of Environment. PMR = Perth Metropolitan Region. WSWA = Wildflower Society of Western Australia (Inc.).

STUDY_CODE and study reference	STUDY_COVERAGE	STUDY_YEARS_OF_SURVEY	STUDY_CUSTODIAN	SUB_STUDY_CODE	SUB_STUDY_DESC	SUB_STUDY_REF_SUMMARY	SUB_STUDY_YEARS_OF_SURVEY
SCP Regional flora/plant community survey using permanently located quadrats (10mx10m) for CALM/Conservation Council/Wildflower Society on mostly public lands Gibson *et al.* (1994) **D**	Mostly public lands on the southern Swan Coastal Plain between Seabird/Gingin Brook, Dunsborough and the foothills of the Whicher Scarp	1990-1993 But quadrats in this dataset surveyed 1992-1993	Karen Clarke DBCA				
SYS6ENV2 Regional flora/plant community survey using permanently located quadrats (10mx10m) for DEP DEP (1996), Government of Western Australia (2000b)	Southern Swan Coastal Plain, on the Swan Coastal Plain System 6/1 area on public & private lands	1995-1996 Project continued 2001-2004 with CALM, on much reduced basis, for SCP (excluding PMR) But quadrats in this dataset surveyed 1995	Karen Clarke DBCA				
SB Swan Bioplan Project for DEP (and its superseding nature conservation agencies) DEC (2006)	Swan Coastal Plain south of Moore River (excluding Bush Forever area), and the Darling and Whicher Scarps	1997-2007 But quadrats in this dataset surveyed 2002-2006	Karen Clarke DBCA				
SB/WSBPS Swan Bioplan Project for DEP (and its superseding nature conservation agencies) / WSWA Bushland Plant Survey Program	Swan Coastal Plain south of Moore River (excluding Bush Forever area), and the Darling and Whicher Scarps[2]	1996-2014 But quadrats in this dataset surveyed 1996-2005	Karen Clarke DBCA	WSBPS1996-3	Dardanup	Keighery BJ *et al.* (2008) **D** WSWA *et al.* 2005	1996
				WSBPS2005-2	Whicher Range	Keighery BJ *et al.* (2008) **D** WSWA *et al.* 2005	2005
				WSBPS2004-2	Whicher Range	Keighery BJ *et al.* (2008) **D** WSWA *et al.* (2005)	2004

2 There can be some exceptions, e.g. some north of Moore River, but not in this dataset.

Table 2. Floristic sampling site codes, protocols and number for each study.

Codes in bold indicate quadrats used in this dataset since not all quadrats in the study are necessarily presented here. There have occasionally been slight variations in quadrat names since quadrat establishment but Table 2 shows the more commonly used names; all names are listed for comparison in the database. The number of sampling sites used in this dataset are bracketed.

Quadrat = measured an permanently located 10 m x 10 m sampling site.

STUDY_CODE	STUDY_QUAD_GROUPS	STUDY_QUAD_NO and SAMPLING_PROTOCOL
SCP	ACTIV,**ACTON**,AMBR,AMBRAL,APBF,AUSTB,AUSTRA,BAMBUN,BANK,BOLD,**boyan**,brick,BRIX,**buffer**,BULL,BULLER,BURN,BURNRD,BYRD,C58,C71,**CAPEL**,CARAB,**CARB**,card,CHIDPT,CLIFT,cool,CORON,CRAMPT,**dard**,DEJONG,DEPOT,DRAIN,DUCK,DUNS,ELDO,ELLEN,ELLIS,FISH,FL,GARD,**gibson**,GINGIN,GOLF,GUTHR,HARRY,hurst,hymus,IOPP,**iron**,**kelly**,KEME,**kemp**,KERO,KING,KOOLJ,KOON,lamb,LAND,LESCH,low,LYONS,M53,**MANEA**,MCLART,MEAL,MEELON,MELA,MHENRY,MILT,MINN,MODO,MPK,MTB,MUCK,MUD,MYALUP,NAVB,NEER,NINE,NPRES,NWIL,**OATES**,PAGA,PAYNE,PB,PEARCE,PEPB,PEPGRV,PLINE,Possum,PRES,PTWALT,RAAF,REDL,RIVD,rowe,**RUAB**,SANDON,SEAB,SHE,SHENT,SINT,**smith**,SULT,SVH,talb,TAM,THOM,TRIG,TWIN,WABL,WAND,WARB,WARI,waro,WATER,WATERRD,WELL,welr,WHILL,WHITE,**wicher**,**will**,WIRR,**WONN**,WOODP,WOODV,YALG,YALLIN,YAN,yarl,**YIRON**,YOON,YULE	518 quadrats (37 used in this dataset)
SYS6ENV2	activ,airf,bibra,Bmaid,boot,bunb,Bushm,Cavs,**Chid**,colriv,Cresw,davies,Della,dillo,Ellib,gelor,gill,GMaid,Guild,Hamp,hart,Hay,Hepb,kailis,Kens,Light,maida,**MGK**,Mill,Nmaid,**Norm**,page,perth,Pind,Pinn,**Plant**,Punr,**R1167**,raven,Ravs,Redh,Rush,SF12,sult,Sunday,Swamp,Tele,vines,xbeer,xlamb,yang,ytip	149 quadrats (7 used in this dataset)
SB	XGWAL,ACRE,**ACTN**,**BOYA**,BUBY,CBAU,**CHAM**,CoolillupRd,CRPB,DALB,**davies**,DECI,FAIR,FARR,GELC,**GIBB**,HAFL,ISPT,JOSB,**KOJE**,MUDD,MURR,RACE,RAILRD,ROSE,**TAYL**,TOBY,VASS,WA,WARG,**WH**,WRAU	87 (79 quadrats, 8 relevés) (22 quadrats used in this dataset)
SB/WSBPS	ANDG,ASHW,BARR,BAUD,BETT,BILL,BLACK,**DARP**,**DAVE**,**GAV**,**GOOD**,**GOUL**,**GWINDR**,**HAPP**,IOPP,JEE,**KOJE**,MAR,MOGU,OAK,RGUL,**SABI**,TEMP,**TREE**,**UCL**,WASS,WATK,YALG,YARA,YLCN,YLKP	178 quadrats (58 used in this dataset)

Table 3. Study, sampling protocol and Whicher Scarp and Swan Coastal Plain floristic community type codes for each of the 124 quadrats in this dataset.

Sampling protocols include 10 m x 10 m quadrat or relevé. The Whicher Scarp floristic community types (WHSFCT) listed in Table 3 are those determined in BJ Keighery *et al*. (2008) and described in Table 4; the Swan Coastal Plain floristic community types (SWAFCT) listed are those determined in Gibson *et al*. (1994) and DEP (1996), and described in Government of Western Australia (2000b) and Table 5. Quadrats that have been newly added in the 2020 update are indicated as 'NEW' in the notes field.

For the quadrats that are new in this dataset: Priv = not in previous release due to being on private property.

QUAD	NOTES	STUDY_CODE	SAMPLING_ PROTOCOL	SUITABLE_FOR_ ANALYSIS	ANALYSED	SWAFCT	WHSFCT
ACTN01		SB	Quadrat	y	y		A1
ACTN02		SB	Quadrat	y	y		C1
ACTON-1		SCP	Quadrat	y	y	01a	C2
BOYA01		SB	Quadrat	y	y		C2
boyan 01		SCP	Quadrat	y	y	21b	B1
boyan 02		SCP	Quadrat	y	y	01a	C3
buffer01		SCP	Quadrat	y	y	21b	B1
CAPEL-1		SCP	Quadrat	y	y	21b	B1
CAPEL-2		SCP	Quadrat	y	y	21b	B1
CARB-3		SCP	Quadrat	y	y	21b	B1
CHAM01	NEW (Priv)	SB	Quadrat	y	y		C4
CHAM02	NEW (Priv)	SB	Quadrat	y	y		C4
CHAM03	NEW (Priv)	SB	Quadrat	y	y		B2
Chid01	NEW (Priv)	SYS6ENV2	Quadrat	y	y	21b	B1
Chid02	NEW (Priv)	SYS6ENV2	Quadrat	y	y	21b	B1
dard01		SCP	Quadrat	y	y	01a	C5
dard02		SCP	Quadrat	y	y	21b	B1
dard03		SCP	Quadrat	y	y	01a	C5
DARP01		SB/WSBPS	Quadrat	y	y		C4
DARP02		SB/WSBPS	Quadrat	y	y		A2
DARP03		SB/WSBPS	Quadrat	y	y		C4
DARP04		SB/WSBPS	Quadrat	y	y		C4
DARP05		SB/WSBPS	Quadrat	y	y		C4
DARP06		SB/WSBPS	Quadrat	y	y		A3
DARP07		SB/WSBPS	Quadrat	y	y		A3
DARP08		SB/WSBPS	Quadrat	y	y		C3
DAVE01		SB/WSBPS	Quadrat	y	y		C2
DAVE02		SB/WSBPS	Quadrat	y	y		C2
DAVE03		SB/WSBPS	Quadrat	y	y		A5
DAVE04		SB/WSBPS	Quadrat	y	y		C3
DAVE05		SB/WSBPS	Quadrat	y	y		C3
DAVE06		SB/WSBPS	Quadrat	y	y		C3
davies04	NEW (Priv)	SB	Quadrat	y	y		E
GAV01		SB/WSBPS	Quadrat	y	y		A3
GAV02		SB/WSBPS	Quadrat	y	y		C3
GAV03		SB/WSBPS	Quadrat	y	y		C4
GAV04		SB/WSBPS	Quadrat	y	y		C4
GAV05		SB/WSBPS	Quadrat	y	y		B1

QUAD	NOTES	STUDY_CODE	SAMPLING_ PROTOCOL	SUITABLE_FOR_ ANALYSIS	ANALYSED	SWAFCT	WHSFCT
GIBB01	NEW (Priv)	SB	Quadrat	y	y		G1
GIBB02	NEW (Priv)	SB	Quadrat	y	y		C4
GIBB03	NEW (Priv)	SB	Quadrat	y	y		G2
GIBB06	NEW (Priv)	SB	Quadrat	y	y		C4
gibson01		SCP	Quadrat	y	y	21b	B1
gibson02		SCP	Quadrat	y	y	01a	C2
GOOD01		SB/WSBPS	Quadrat	y	y		E
GOOD02		SB/WSBPS	Quadrat	y	y		A2
GOOD03		SB/WSBPS	Quadrat	y	y		C3
GOOD04		SB/WSBPS	Quadrat	y	y		C3
GOUL01		SB/WSBPS	Quadrat	y	y		C1
GOUL02		SB/WSBPS	Quadrat	y	y		C4
GWINDR01		SB/WSBPS	Quadrat	y	y		A3
GWINDR02		SB/WSBPS	Quadrat	y	y		B1
GWINDR03		SB/WSBPS	Quadrat	y	y		B1
HAPP01		SB/WSBPS	Quadrat	y	y		C2
HAPP02		SB/WSBPS	Quadrat	y	y		B1
iron01		SCP	Quadrat	y	y	10b	H
iron02		SCP	Quadrat	y	y	10b	H
kelly01		SCP	Quadrat	y	y	01a	C3
kelly02		SCP	Quadrat	y	y	21b	B1
kemp01		SCP	Quadrat	y	y	01a	C1
KOJE01		SB	Quadrat	y	y		D
KOJE02		SB	Quadrat	y	y		D
KOJE03		SB	Quadrat	y	y		D
KOJE04		SB	Quadrat	y	y		D
KOJE05		SB/WSBPS	Quadrat	y	y		D
KOJE06		SB/WSBPS	Quadrat	y	y		D
KOJE07		SB/WSBPS	Quadrat	y	y		D
KOJE08		SB/WSBPS	Quadrat	y	y		D
KOJE09		SB/WSBPS	Quadrat	y	y		D
KOJE10		SB/WSBPS	Quadrat	y	y		D
MANEA-3		SCP	Quadrat	y	y	21b	B1
MGK03		SYS6ENV2	Quadrat	y	y	21b	B1
MGK04		SYS6ENV2	Quadrat	y	y	21b	B1
Norm02	NEW (Priv)	SYS6ENV2	Quadrat	y	y	01a	C6
OATES-1	NEW (Priv)	SCP	Quadrat	y	y	21b	A2
Plant03	NEW (Priv)	SYS6ENV2	Quadrat	y	y	21b	B1
R116702		SYS6ENV2	Quadrat	y	y	21b	B1
RUAB-1		SCP	Quadrat	y	y	21b	B1
RUAB-2		SCP	Quadrat	y	y	21b	B1
SABI01		SB/WSBPS	Quadrat	y	y		C4
SABI02		SB/WSBPS	Quadrat	y	y		C4
SABI03		SB/WSBPS	Quadrat	y	y		F1
SABI04		SB/WSBPS	Quadrat	y	y		C4

QUAD	NOTES	STUDY_CODE	SAMPLING_ PROTOCOL	SUITABLE_FOR_ ANALYSIS	ANALYSED	SWAFCT	WHSFCT
SABI05		SB/WSBPS	Quadrat	y	y		F1
SABI06		SB/WSBPS	Quadrat	y	y		C4
SABI07		SB/WSBPS	Quadrat	y	y		A1
SABI08		SB/WSBPS	Quadrat	y	y		A1
SABI09		SB/WSBPS	Quadrat	y	y		A1
SABI10		SB/WSBPS	Quadrat	y	y		C1
SABI11		SB/WSBPS	Quadrat	y	y		C1
SABI12		SB/WSBPS	Quadrat	y	y		A1
smith01		SCP	Quadrat	y	y	10b	H
smith02		SCP	Quadrat	y	y	01a	C2
smith03		SCP	Quadrat	y	y	01a	C1
smith04		SCP	Quadrat	y	y	10b	H
TAYL01		SB	Quadrat	y	y		F2
TREE01		SB/WSBPS	Quadrat	y	y		C3
TREE02		SB/WSBPS	Quadrat	y	y		C1
TREE03		SB/WSBPS	Quadrat	y	y		C1
TREE04		SB/WSBPS	Quadrat	y	y		C1
UCL01		SB/WSBPS	Quadrat	y	y		A5
UCL02		SB/WSBPS	Quadrat	y	y		A5
UCL03		SB/WSBPS	Quadrat	y	y		A5
UCL04		SB/WSBPS	Quadrat	y	y		F2
UCL05		SB/WSBPS	Quadrat	y	y		C4
UCL06		SB/WSBPS	Quadrat	y	y		A2
WH01		SB	Quadrat	y	y		E
WH02		SB	Quadrat	y	y		A5
WH03		SB	Quadrat	y	y		C4
WH04		SB	Quadrat	y	y		A1
WH05		SB	Quadrat	y	y		C3
WH06		SB	Quadrat	y	y		A1
wicher01		SCP	Quadrat	y	y	01a	C1
will01		SCP	Quadrat	y	y	10b	H
will02		SCP	Quadrat	y	y	01a	A4
will03		SCP	Quadrat	y	y	10b	H
will04		SCP	Quadrat	y	y	01a	A5
WONN-1		SCP	Quadrat	y	y	01a	C2
WONN-2	NEW (Priv)	SCP	Quadrat	y	y	01b	A2
WONN-4		SCP	Quadrat	y	y	10b	H
WONN-5		SCP	Quadrat	y	y	10b	H
WONN-6		SCP	Quadrat	y	y	10b	H
YIRON-1		SCP	Quadrat	y	y	10b	H
YIRON-2		SCP	Quadrat	y	y	10b	H

Table 4. Whicher Scarp floristic community types.

These are as determined in BJ Keighery *et al*. (2008).

Whicher Scarp Groups and Floristic Community Types		
A	**Whicher Scarp woodlands of grey/white sands**	
	A1	Central Whicher Scarp Mountain Marri woodland
	A2	North Whicher Scarp Jarrah and Woody Pear woodland
	A3	North Whicher Scarp Banksia and Woody Pear woodland
	A4	Whicher Scarp *Banksia grandis*, Jarrah and Marri woodland
	A5	Central/North Whicher Scarp Mountain Marri woodland
B	**Swan Coastal Plain centred woodlands of grey/white sands**	
	B1	Swan Coastal Plain/North Whicher Scarp *Banksia attenuata* woodland
	B2	West Whicher Scarp Banksia attenuata woodland
C	**Whicher Scarp woodlands of coloured sands and laterites**	
	C1	Central Whicher Scarp Jarrah woodland
	C2	Whicher Scarp Jarrah woodland of deep coloured sands
	C3	Whicher Scarp Jarrah and Mountain Marri woodland on laterites
	C4	Whicher Scarp/Blackwood Plateau Jarrah and Marri woodland
	C5	Dardanup Jarrah and Mountain Marri woodland on laterite
	C6	Swan Coastal Plain Foothills Jarrah woodland on laterite
D	**Woodlands of the Harvey Swan Coastal Plain Foothills and Darling Scarp**	
E	**Jarrah and Marri woodland wetland type 1**	
F	**Jarrah and Marri woodland wetland type 2**	
	F1	Sabina River Jarrah and Marri woodland
	F2	Miscellaneous Wetlands
G	**West Whicher Scarp wetlands**	
	G1	Creekline Blackbutt *(Eucalyptus patens)* and Marri forest
	G2	Shrublands of near permanent wetlands in creeklines
H	**Busselton Ironstones**	

Table 5. Swan Coastal Plain floristic community types.

These are as determined in Gibson *et al*. (1994) and in the System 6 and Part System 1 Update (DEP 1996) and described in Government of Western Australia (2000b).

Key

Column 1: **Swan Coastal Plain floristic community type codes**
The numbers of the types additional to Gibson *et al.* (1994) are italicised if they are subsets of an existing group (in types 19, 20, 23 and 30), and italicised and preceded by an S if they are supplementary groups.

Column 2: **General description of Swan Coastal Plain floristic community types**
Descriptions are based on generalised information from all plots in the group. Structural units are categorised into forest, woodlands, shrublands, sedgelands and herblands after Gibson *et al.* (1994).

Supergroup 1 - Foothills/Pinjarra Plain

1a	*Eucalyptus haematoxylon - E. marginata* woodlands on Whicher foothills
1b	Southern *Eucalyptus calophylla* woodlands on heavy soils
2	Southern wet shrublands
3a	*Eucalyptus calophylla - Kingia australis* woodlands on heavy soils
3b	*Eucalyptus calophylla - Eucalyptus marginata* woodlands on sandy clay soils
3c	*Eucalyptus calophylla - Xanthorrhoea preissii* woodlands and shrublands
S8	*Eucalyptus wandoo* woodlands (Scarp)

Supergroup 2 - Seasonal Wetlands

4	*Melaleuca preissiana* damplands
5	Mixed shrub damplands
6	Weed dominated wetlands on heavy soils
7	Herb rich saline shrublands in clay pans
8	Herb rich shrublands in clay pans
9	Dense shrublands on clay flats
10a	Shrublands on dry clay flats
10b	Shrublands on southern ironstones
11	Wet forests and woodlands
12	*Melaleuca teretifolia* and/or *Astartea* aff. *fascicularis* shrublands
13	Deeper wetlands on heavy soils
14	Deeper wetlands on sandy soils
15	Forests and woodlands of deep seasonal wetlands
16	Highly saline seasonal wetlands
17	*Melaleuca rhaphiophylla - Gahnia trifida* seasonal wetlands
18	Shrublands on calcareous silts
19a	Sedgelands in Holocene dune swales
19b	Woodlands over sedgelands in Holocene dune swales
S1	*Astartea* aff. *fascicularis*/*Melaleuca* species dense shrublands
S2	Northern *Pericalymma ellipticum* dense low shrublands
S3	Wet sedgelands on sandy clays
S4	*Regelia ciliata* Dandaragan Plateau wetlands
S5	*Acacia saligna* wetlands
S6	Northern dense low shrublands
S7	Northern woodlands to forests over tall sedgelands alongside permanent wetlands
S17	*Eucalyptus rudis*/*Agonis linearifolia* wetlands in Bassendean Dunes

S19	Dense tall shrublands
S20	Northern shrublands on sandy clays

Supergroup 3 - Uplands centred on Bassendean Dunes and the Dandaragan Plateau

20a	*Banksia attenuata* woodlands over species rich dense shrublands
20b	Eastern *Banksia attenuata* and/or *Eucalyptus marginata* woodlands
20c	Eastern shrublands and woodlands
20d	Dandaragan Plateau shrublands and woodlands
21a	Central *Banksia attenuata - Eucalyptus marginata* woodlands
21b	Southern *Banksia attenuata* woodlands
21c	Low lying *Banksia attenuata* woodlands or shrublands
22	*Banksia ilicifolia* woodlands
23a	Central *Banksia attenuata - Banksia menziesii* woodlands
23b	Northern *Banksia attenuata - Banksia menziesii* woodlands
23c	North-eastern *Banksia attenuata - Banksia menziesii* woodlands
S9	*Banksia attenuata* woodlands over dense low shrublands
S10	*Calothamnus sanguineus* dense low shrublands on sandy laterites
S16	Mixed dense shrublands on yellow brown sands
S18	*Eucalyptus marginata*/*Eucalyptus calophylla* woodlands on laterites

Supergroup 4 - Uplands centred on Spearwood and Quindalup Dunes

Centred on Spearwood Dunes	
24	Northern Spearwood shrublands and woodlands
25	Southern *Eucalyptus gomphocephala – Agonis flexuosa* woodlands
26a	*Melaleuca huegelii - Melaleuca acerosa* shrublands on Limestone ridges
26b	Woodlands and mallees on Limestone
27	Species poor mallees and shrublands on Limestone
28	Spearwood *Banksia attenuata* or *Banksia attenuata - Eucalyptus* woodlands
Centred on Quindalup Dunes	
29a	Coastal shrublands on shallow sands
29b	*Acacia* shrublands on taller dunes
30a2	*Callitris preissii* and/or *Melaleuca lanceolata* forests and woodlands
30c2	Woodlands and shrublands on Holocene dunes (re-allocated from 30c)
30b	Quindalup *Eucalyptus gomphocephala* and/or *Agonis flexuosa* woodlands
S11	Northern *Acacia rostellifera - Melaleuca acerosa* shrublands
S12	Rottnest Island *Melaleuca lanceolata* and/or *Callitris preissii* forests and woodlands
S13	Northern *Olearia axillaris - Scaevola crassifolia* shrublands
S14	*Spinifex longifolius* grassland and low shrublands
S15	Weed group Not allied with any supergroup

Table 6. Quadrats in the five datasets the Wildflower Society of Western Australia has produced or updated in 2020.

Some 390 quadrats are newly published in 2020 (indicated as 'new 2020'); the rest have previously been published (BJ Keighery *et al*. 2012; BJ Keighery *et al.* 2008), but have been updated for this 2020 release. Some 44 quadrats are in two datasets. This dataset's 124 quadrats are in bold font.

R = relevé; Q = quadrat; Q Rv = quadrat revisit many years later.

References for 2020_DATASET field are:

1 = Keighery BJ, Keighery GJ, Longman VM and Clarke KA 2020 *Native and weed flora of the southern Swan Coastal Plain: 2005 dataset.* A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.) and Department of Biodiversity, Conservation and Attractions using survey data originally from the Bush Forever Project work at the Department of Environmental Protection. Database and shapefile are called **SouthernSCP**.

2 = Keighery BJ, Keighery GJ, Webb A, Longman VM and Griffin EA 2020 *A floristic survey of the Whicher Scarp dataset.* A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.) and Department of Biodiversity, Conservation and Attractions using survey data originally from the Swan Bioplan Project at the Department of Environment and Conservation. Database and shapefile are called **WhicherScarp**.

3 = Keighery BJ, Keighery GJ, Longman VM and Clarke KA 2020 *Swan Bioplan floristic studies of the southern Swan Coastal Plain dataset.* A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.) and Department of Biodiversity, Conservation and Attractions using survey data originally from the Swan Bioplan Project at the Department of Environment and Conservation. Database and shapefile are called **SwanBioplan**.

4 = Keighery BJ, Keighery GJ, Longman VM and Clarke KA 2020 *Wildflower Society of Western Australia Bushland Plant Survey Program Swan Coastal Plain surveys.* A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.), in collaboration with the Department of Biodiversity, Conservation and Attractions. Database and shapefile are called **WSWASCP**.

5 = Keighery BJ, Keighery GJ, Gunness AG, Longman VM and Clarke KA 2020 *Wildflower Society of Western Australia Bushland Plant Survey Program Wheatbelt surveys*. A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.), in collaboration with the Department of Biodiversity, Conservation and Attractions. Database and shapefile are called **WSWAWheatbelt**.

The rationale behind the quadrat composition in the five datasets follows.

The **SouthernSCP** dataset consists almost in its entirety of those quadrats which were analysed to determine Swan Coastal Plain floristic community types (Gibson *et al.* 1994; DEP 1996). In 2012, 1121 of these quadrats were compiled into a dataset (BJ Keighery *et al*. 2012) but some quadrat locations were suppressed, for example due to being on private property. In this 2020 version of the dataset those suppressed locations are being made public and there are also some extra quadrats included. These extras are from surveys conducted in the same era as the others and include quadrats not suitable for analysis; requiring permission before publication; revisited 14 - 18 years after the original visits to survey changes over time; or other reasons (see Appendix B Table B29).

The **WhicherScarp** dataset is comprised entirely of the quadrats which were analysed to determine Whicher Scarp floristic community types (BJ Keighery *et al.* 2008).

The **SwanBioplan** dataset is comprised of all the quadrats surveyed by or for the Swan Bioplan Project but not including the ones that are in the WhicherScarp dataset or the revisits in the SouthernSCP dataset.

The **WSWASCP** datasest is comprised of quadrats surveyed by the Wildflower Society of Western Australia Bushland Plant Survey Program team on the Swan Coastal Plain.

The **WSWAWheatbelt** dataset is comprised of quadrats surveyed by the Wildflower Society of Western Australia Bushland Plant Survey Program team in the Wheatbelt.

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
1GWAL01	R	3	new 2020
2GWAL01	Q	3	new 2020
3GWAL01	Q	3	new 2020
3GWAL02	Q	3	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
3GWAL03	Q	3	new 2020
3GWAL04	Q	3	new 2020
3GWAL05	Q	3	new 2020
3GWAL06	Q	3	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
3GWAL07	Q	3	new 2020
4M01	R	1	
4M02	R	1	
4M03	R	1	
4M04	R	1	
5A01	R	1	
5C01	R	1	
5C02	R	1	
5C03	R	1	
5C04	R	1	
5C05	R	1	
5C06	R	1	
5C07	R	1	
5D01	R	1	
5E01	R	1	
5E02	R	1	
5F01	R	1	
5G01	R	1	
ACRE01	Q	3	new 2020
ACRE02	Q	3	new 2020
ACRE03	Q	3	new 2020
activ01	Q	1	
activ02	Q	1	
activ03	Q	1	
ACTIV-1	Q	1	new 2020
ACTN01	**Q**	**2**	
ACTN02	**Q**	**2**	
ACTON-1	**Q**	**1, 2**	**in 2 datasets**
airf01	R	1	
airf02	Q	1	
alfr01	Q	1	
alfr02	Q	1	
AMBR-1	Q	1	
AMBR-2	Q	1	
AMBR-3	Q	1	
AMBR-4	Q	1	
AMBR-5	Q	1	
AMBR-6	Q	1	
AMBR-7	Q	1	
AMBR-9	Q	1	
AMBRAL-1	Q	1	
ANDG01	Q	3	new 2020
ANDG02	Q	3	new 2020
ANDG03	Q	3	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
ANDG04	Q	3	new 2020
ANDG05	Q	3	new 2020
ANDG06	Q	3	new 2020
ANDG07	Q	3	new 2020
ANDG08	Q	3	new 2020
ANDG09	Q	3	new 2020
ANDG10	Q	3	new 2020
ANDG11	Q	3	new 2020
ANDG12	Q	3	new 2020
ANDG13	Q	3	new 2020
ANDG14	Q	3	new 2020
APBF-1	Q	1	
APBF-2	Q	1	
ASHW01	Q	3	new 2020
ASHW02	Q	3	new 2020
AUSTB-1	Q	1	
AUSTB-2	Q	1	
AUSTB-3	Q	1	
AUSTB-4	Q	1	
AUSTB-5	Q	1	
AUSTB-6	Q	1	
AUSTB-7	Q	1	
AUSTB-8	Q	1	
AUSTRA-1	Q	1	
AVON01	Q	5	new 2020
AVON02	Q	5	new 2020
AVON03	Q	5	new 2020
AVON04	Q	5	new 2020
AVON05	Q	5	new 2020
AVON06	Q	5	new 2020
AVON07	Q	5	new 2020
AVON08	Q	5	new 2020
AVON09	Q	5	new 2020
AVON10	Q	5	new 2020
AVON11	Q	5	new 2020
BAMBUN-1	Q	1	
BAMBUN-2	Q	1	
BAMBUN-3	Q	1	
BANK-1	Q	1	
BANK-2	Q	1	
BANK-3	Q	1	
BANK-4	Q	1	new 2020
BARR01	Q	3	new 2020
BARR02	Q	3	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
BARR03	Q	3	new 2020
BARR04	Q	3	new 2020
BARR05	Q	3	new 2020
BARR06	Q	3	new 2020
BARR07	Q	3	new 2020
BARR08	Q	3	new 2020
BARR09	Q	3	new 2020
BARR10	Q	3	new 2020
BAUD01	Q	3	new 2020
BAUD02	Q	3	new 2020
BAUD03	Q	3	new 2020
BAUD04	Q	3	new 2020
BAUD05	Q	3	new 2020
BC1	R	1	
BC2	R	1	
BC3	R	1	
BC4	R	1	
BC5	R	1	
BC6	R	1	
BC7	R	1	
BCF01	Q	4	new 2020
BCF02	Q	4	new 2020
BCF03	Q	4	new 2020
BCF04	Q	4	new 2020
BCF05	Q	4	new 2020
BCF06	Q	4	new 2020
BCF07	Q	4	new 2020
BCF08	Q	4	new 2020
BCF09	Q	4	new 2020
BCF12	Q	4	new 2020
beel01	Q	1	
beel02	Q	1	
beel03	Q	1	
benn01	Q	1	
benn02	Q	1	
benn03	Q	1	
BETT01	Q	3	new 2020
bibra01	Q	1	
BILL01	Q	3	new 2020
BILL02	Q	3	new 2020
BLACK01	Q	3	new 2020
BLACK02	Q	3	new 2020
BLACK03	Q	3	new 2020
BLACK04	Q	3	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
BMaid02	Q	1	
BNR01	R	1	
BNR02	R	1	
BNR03	R	1	
BNR04	R	1	
BNR05	R	1	
BNR06	R	1	
BNR07	R	1	
BNR08	R	1	
BNR09	R	1	
BNR10	R	1	
BNR11	R	1	
BNR12	R	1	
BNR13	R	1	
BNR14	R	1	
BNR15	R	1	
BNR16	R	1	
BNR17	R	1	
BNR18	R	1	
BNR19	R	1	
BNR20	R	1	
BNR21	R	1	
BNR22	R	1	
BNR23	R	1	
BNR24	R	1	
BNR25	R	1	
BNR26	R	1	
BNR27	R	1	
BNR28	R	1	
BNR29	R	1	
BNR30	R	1	
BNR31	R	1	
BNR32	R	1	
BNR33	R	1	
BOCK1	Q	5	new 2020
BOCK2	Q	5	new 2020
BOCK3	Q	5	new 2020
BOCK4	Q	5	new 2020
bold05	R	1	
bold06	R	1	
bold07	R	1	
bold08	R	1	
bold09	R	1	
BOLD-1	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
bold10	R	1	
bold11	R	1	
bold12	R	1	
bold13	R	1	
bold14	R	1	
bold16	R	1	
bold17	R	1	
bold18	R	1	
bold19	R	1	new 2020
BOLD-2	Q	1	
bold20	R	1	new 2020
bold21	R	1	
bold22	R	1	
bold23	R	1	
BOLD-3	Q	1	
BOLD-4	Q	1	
boot01	Q	1	
boot02	Q	1	
boot03	Q	1	
BOYA01	**Q**	**2**	
boyan 01	**Q**	**1, 2**	**in 2 datasets**
boyan 02	**Q**	**1, 2**	**in 2 datasets**
brick1	Q	1	
brick2	Q	1	
brick3	Q	1	
brick4	Q	1	
brick5	Q	1	
brick6	Q	1	
brick7	Q	1	
brick8	Q	1	
BRIX-1	Q	1	
BRIX-2	Q	1	
BRIX-3	Q	1	
BRIX-4	Q	1	
BRIX-5	Q	1	
BU01	R	1	
BU02	R	1	
BU03	R	1	
BU04	R	1	
BUBY01	Q	3	new 2020
buck01	Q	1	
buffer01	**Q**	**1, 2**	**in 2 datasets**
BULL-1	Q	1	
BULL-10	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
BULL-11	Q	1	
BULL-12	Q	1	
BULL-3	Q	1	
BULL-4	Q	1	
BULL-5	Q	1	
BULL-6	Q	1	
BULL-7	Q	1	
BULL-8	Q	1	
BULL-9	Q	1	
BULLER-1	Q	1	
BULLER-2	Q	1	
BULLER-3	Q	1	
bunb01	Q	1	
BURN-1	Q	1	
BURN-2	Q	1	
BURNRD01	Q	1	
BURNRD02	Q	1	
Bushm01	Q	1	
Bushm02	Q	1	
BW01	R	1	
BW02	R	1	
BW03	R	1	
BW04	R	1	
BW05	R	1	
BYRD-1	Q	1	
C 97PU.R	R	1	
C 98PU.R	R	1	
C 99PU.R	R	1	
C58-1	Q	1	
C58-2	Q	1	
C58-3	Q	1	
C58-4	Q	1	
C71-1	Q	1	
C71-2	Q	1	
C71-3	Q	1	
C71-4	Q	1	
canto01	Q	1	new 2020
CAPEL-1	**Q**	**1, 2**	**in 2 datasets**
CAPEL-2	**Q**	**1, 2**	**in 2 datasets**
CAPEL-3	Q	1	
CAPEL-4	Q	1	
CAPEL-5	Q	1	
CAPEL-6	Q	1	
CAPEL-7	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
CAPEL-8	Q	1	
CAPEL-9	Q	1	
CARAB-1	Q	1	
CARAB-2	Q	1	
CARAB-3	Q	1	
CARB-1	Q	1	
CARB-2	Q	1	
CARB-3	**Q**	**1, 2**	**in 2 datasets**
CARB-4	Q	1	
card1	Q	1	
card10	Q	1	
card11	Q	1	
card12	Q	1	
card12-2009	Q Rv	1	new 2020
card13	Q	1	
card13-2009	Q Rv	1	new 2020
card2	Q	1	
card2-2009	Q Rv	1	new 2020
card3	Q	1	
card4	Q	1	
card5	Q	1	
card6	Q	1	
card7	Q	1	
card8	Q	1	
card9	Q	1	
cas01	Q	1	
cas02	Q	1	
cas03	Q	1	
cas04	Q	1	
Cavs01	Q	1	
Cavs02	Q	1	
Cavs06	Q	1	
Cavs07	Q	1	
Cavs09	Q	1	
Cavs10	Q	1	
Cavs11	Q	1	
CBAU01	Q	3	new 2020
CH049CUL	R	1	
CH050CUL	R	1	
CH054ASH	R	1	
CH055ASH	R	1	
CH056ASH	R	1	
CH057ASH	R	1	
CH058ASH	R	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
CH059ASH	R	1	
CH060ASH	R	1	
CH156TEE	R	1	
CH157TEE	R	1	
CHAM01	**Q**	**2**	**new 2020**
CHAM02	**Q**	**2**	**new 2020**
CHAM03	**Q**	**2**	**new 2020**
Chid01	**Q**	**1, 2**	**new 2020; in 2 datasets**
Chid02	**Q**	**1, 2**	**new 2020; in 2 datasets**
Chid03	Q	1	new 2020
Chid04	Q	1	new 2020
Chid05	Q	1	new 2020
Chid06	Q	1	
CHIDPT-1	Q	1	
CLAK1	Q	5	new 2020
CLAK2	Q	5	new 2020
CLAK3	Q	5	new 2020
CLAK4	Q	5	new 2020
CLAK5	Q	5	new 2020
CLAK6	Q	5	new 2020
CLAK7	Q	5	new 2020
CLAK8	Q	5	new 2020
CLIFT01	Q	1	
CLIFT02	Q	1	
CLIFT03	Q	1	
colriv01	Q	1	
cool 01	Q	1	
cool 02	Q	1	
cool 03	Q	1	
cool 04	Q	1	
cool 08	Q	1	
cool 09	Q	1	
cool 11	Q	1	
cool14	R	1	
cool15	R	1	
CoolillupRd	Q	3	new 2020
CORON-1	Q	1	
CORON-2	Q	1	
CRAMPT-1	Q	1	
CRAMPT-2	Q	1	
Cresw01	Q	1	
CROS1	Q	5	new 2020
CROS2	Q	5	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
CROS3	Q	5	new 2020
CROS4	Q	5	new 2020
CROS5	Q	5	new 2020
CROS6	Q	5	new 2020
CRPB01	Q	3	new 2020
DALB01	Q	3	new 2020
DALB02	Q	3	new 2020
DALB03	Q	3	new 2020
dard01	**Q**	**1, 2**	**in 2 datasets**
dard02	**Q**	**1, 2**	**in 2 datasets**
dard03	**Q**	**1, 2**	**in 2 datasets**
DARP01	**Q**	**2**	
DARP02	**Q**	**2**	
DARP03	**Q**	**2**	
DARP04	**Q**	**2**	
DARP05	**Q**	**2**	
DARP06	**Q**	**2**	
DARP07	**Q**	**2**	
DARP08	**Q**	**2**	
DAVE01	**Q**	**2**	
DAVE02	**Q**	**2**	
DAVE03	**Q**	**2**	
DAVE04	**Q**	**2**	
DAVE05	**Q**	**2**	
DAVE06	**Q**	**2**	
davies01	Q	1	new 2020
davies02	Q	1	new 2020
davies03	Q	3	new 2020
davies04	**Q**	**2**	**new 2020**
davies05	Q	3	new 2020
DECI01	Q	3	new 2020
DECI02	Q	3	new 2020
DECI03	Q	3	new 2020
DECI04	Q	3	new 2020
DECI05	Q	3	new 2020
DEJONG01	Q	1	
DEJONG02	Q	1	
Della01	Q	1	
DEPOT-1	Q	1	
dian01	Q	1	
dian02	Q	1	
dillo01	Q	1	
DRAIN-1	Q	1	
DSHS02	Q	4	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
DUCK-1	Q	1	
DUCK-2	Q	1	
DUCK-3	Q	1	
DUNB	Q	4	new 2020
DUNS-1	Q	1	
elbr01	Q	1	
elbr02	Q	1	
elbr03	Q	1	
ELDO-1	Q	1	
ELE01	R	1	
ELE02	R	1	
ELE03	R	1	
ELE04	R	1	
ELE05	R	1	
ELE06	R	1	
ELE07	R	1	
ELE08	R	1	
ELE09	R	1	
ELE10	R	1	
ELE11	R	1	
ELE12	R	1	
ELE13	R	1	
ELE14	R	1	
ELE15	R	1	
ELE16	R	1	
ELE17	R	1	
ELE18	R	1	
ELE19	R	1	
ELE20	R	1	
ELE21	R	1	
ELE22	R	1	
ELE23	R	1	
ELE24	R	1	
ELE25	R	1	
ELE26	R	1	
ELE27	R	1	
ELE28	R	1	
ELE29	R	1	
ELE30	R	1	
ELE31	R	1	
ELE32	R	1	
ELE33	R	1	
ELE34	R	1	
ELE35	R	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
ELE36	R	1	
ELE37	R	1	
ELE38	R	1	
ELE39	R	1	
ELE40	R	1	
ELLEN-1	Q	1	
ELLEN-2	Q	1	
ELLEN-3	Q	1	
ELLEN-4	Q	1	
ELLEN-5	Q	1	
ELLEN-6	Q	1	
ELLEN-7	Q	1	
Ellib01	Q	1	
Ellib02	Q	1	
Ellib03	Q	1	
Ellib04	Q	1	
Ellib05	Q	1	
Ellib06	Q	1	
ELLIS-1	Q	1	
ELLIS-2	Q	1	
ELLIS-3	Q	1	
FAIR01	Q	3	new 2020
FAIR02	Q	3	new 2020
FAIR03	Q	3	new 2020
FARR01	Q	3	new 2020
FISH-1	Q	1	
FISH-2	Q	1	
FISH-3	Q	1	
FISH-4	Q	1	
FISH-5	Q	1	
FL-1	Q	1	
FL-10	Q	1	
FL-2	Q	1	
FL-3	Q	1	
FL-4	Q	1	
FL-5	Q	1	
FL-6	Q	1	
FL-7	Q	1	
FL-8	Q	1	new 2020
FL-9	Q	1	
for01	R	1	new 2020
for02	R	1	new 2020
for03	R	1	new 2020
for04	R	1	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
for05	R	1	new 2020
for06	R	1	new 2020
for07	R	1	new 2020
for08	R	1	new 2020
for09	R	1	new 2020
for10	R	1	new 2020
FYR01	R	1	
FYR02	R	1	
FYR03	R	1	
GARD01	Q	1	
GARD02	Q	1	
GARD03	Q	1	
GARD04	Q	1	
GAV01	**Q**	**2**	
GAV02	**Q**	**2**	
GAV03	**Q**	**2**	
GAV04	**Q**	**2**	
GAV05	**Q**	**2**	
GELC01	Q	3	new 2020
gelor01	Q	1	
gelor02	Q	1	
GIBB01	**Q**	**2**	**new 2020**
GIBB02	**Q**	**2**	**new 2020**
GIBB03	**Q**	**2**	**new 2020**
GIBB06	**Q**	**2**	**new 2020**
gibson01	**Q**	**1, 2**	**in 2 datasets**
gibson02	**Q**	**1, 2**	**in 2 datasets**
gill01	Q	1	
GINGIN-1	Q	1	
GINGIN-2	Q	1	
GINGIN-3	Q	1	
GMaid01	Q	1	
GMaid02	Q	1	
GMaid03	Q	1	
GMaid04	Q	1	
gnan01	Q	1	
gnan02	Q	1	
gnan03	Q	1	
GOLF-1	Q	1	
GOOD01	**Q**	**2**	
GOOD02	**Q**	**2**	
GOOD03	**Q**	**2**	
GOOD04	**Q**	**2**	
gosn01	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
gosn02	Q	1	
gosn03	Q	1	
gosn04	Q	1	
gosn05	Q	1	
gosn06	Q	1	
gosn07	Q	1	
gosn08	Q	1	
gosn09	Q	1	
gosn10	Q	1	
gosn11	Q	1	
gosn12	Q	1	
gosn13	Q	1	
GOUL01	**Q**	**2**	
GOUL02	**Q**	**2**	
Guild01	Q	1	new 2020
Guild02	Q	1	
Guild03	Q	1	new 2020
Guild04	Q	1	new 2020
Guild05	Q	1	new 2020
Guild06	Q	1	
Guild07	Q	1	new 2020
Guild08	Q	1	new 2020
Guild09	Q	1	
Guild10	Q	1	new 2020
guild11	R	1	new 2020
guild12	R	1	new 2020
guild13	R	1	new 2020
guild14	R	1	new 2020
guild15	R	1	new 2020
guild16	R	1	new 2020
GUTHR-1	Q	1	
GUTHR-2	Q	1	
GUTHR-3	Q	1	
GUTHR-4	Q	1	
GUTHR-5	Q	1	
GUTHR-6	Q	1	
GWINDR01	**Q**	**2**	
GWINDR02	**Q**	**2**	
GWINDR03	**Q**	**2**	
HAFL01	Q	3	new 2020
HAFL02	Q	3	new 2020
HAFL03	Q	3	new 2020
Hamp01	Q	1	
Hamp02	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
Hamp03	Q	1	
Hamp04	Q	1	
HAPP01	**Q**	**2**	
HAPP02	**Q**	**2**	
HARRY-1	Q	1	
HARRY-2	Q	1	
HARRY-3	Q	1	
HARRY-4	Q	1	
HARRY-5	Q	1	
HARRY-6	Q	1	
hart01	Q	1	
hart02	Q	1	
hart03	Q	1	
hart04	Q	1	
Hay01	Q	1	
Hay02	Q	1	
Hay03	Q	1	
Hay04	Q	1	
Hay05	Q	1	
Hepb01	Q	1	
Hepb02	Q	1	
Hepb03	Q	1	
hurst01	Q	1	
hurst02	Q	1	
hurst03	Q	1	
hurst04	Q	1	
hymus01	Q	1	
hymus02	Q	1	
hymus03	Q	1	
hymus04	Q	1	
hymus05	Q	1	
hymus06	Q	1	
IOPP	Q	1	new 2020
IOPP01	Q	3	new 2020
IOPP02	Q	3	new 2020
IOPP03	Q	3	new 2020
IOPP04	Q	3	new 2020
IOPP05	Q	3	new 2020
IOPP06	Q	3	new 2020
IOPP07	Q	3	new 2020
IOPP08	Q	3	new 2020
IOPP09	Q	3	new 2020
IOPP10	Q	3	new 2020
IOPP11	Q	3	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
IOPP12	Q	3	new 2020
IOPP13	Q	3	new 2020
IOPP14	Q	3	new 2020
IOPP15	Q	3	new 2020
IOPP16	Q	3	new 2020
IOPP17	Q	3	new 2020
IOPP17A	Q	3	new 2020
IOPP19	Q	3	new 2020
IOPP21	Q	3	new 2020
IOPP22A	Q	3	new 2020
IOPP22B	Q	3	new 2020
IOPP23	Q	3	new 2020
iron01	**Q**	**1, 2**	**in 2 datasets**
iron02	**Q**	**1, 2**	**in 2 datasets**
ISPT01	Q	3	new 2020
ISPT02	Q	3	new 2020
ISPT03	Q	3	new 2020
ISPT04	Q	3	new 2020
jand01	Q	1	
jand02	Q	1	
jand03	Q	1	
jand04	Q	1	
jand05	Q	1	
jand06	Q	1	
jand07	Q	1	
jand08	Q	1	
JCCA01	Q	4	new 2020
JCCA02	Q	4	new 2020
JCCA03	Q	4	new 2020
JCCA04	Q	4	new 2020
JEE01	Q	3	new 2020
JEE02	Q	3	new 2020
JEE03	Q	3	new 2020
JEE04	Q	3	new 2020
JEE05	Q	3	new 2020
JEE06	Q	3	new 2020
JEE07	Q	3	new 2020
JEE08	Q	3	new 2020
JEE09	Q	3	new 2020
JEE21	Q	3	new 2020
JEE22	Q	3	new 2020
JEE23	Q	3	new 2020
JEE25	Q	3	new 2020
JOSB01	Q	3	new 2020
JOSB02	Q	3	new 2020
kailis01	Q	1	
kailis02	Q	1	
kailis03	Q	1	
kelly01	**Q**	**1, 2**	**in 2 datasets**
kelly02	**Q**	**1, 2**	**in 2 datasets**
KEME-1	Q	1	
KEME-2	Q	1	
KEME-3	Q	1	
kemp01	**Q**	**1, 2**	**in 2 datasets**
Kens01	Q	1	
KERO-1	Q	1	
KERO-2	Q	1	
KING-1	Q	1	
KING-2	Q	1	
KOJE01	**Q**	**2**	
KOJE02	**Q**	**2**	
KOJE03	**Q**	**2**	
KOJE04	**Q**	**2**	
KOJE05	**Q**	**2**	
KOJE06	**Q**	**2**	
KOJE07	**Q**	**2**	
KOJE08	**Q**	**2**	
KOJE09	**Q**	**2**	
KOJE10	**Q**	**2**	
KONO1	Q	5	new 2020
KONO10	Q	5	new 2020
KONO11	Q	5	new 2020
KONO12	Q	5	new 2020
KONO13	Q	5	new 2020
KONO14	Q	5	new 2020
KONO15	Q	5	new 2020
KONO16	Q	5	new 2020
KONO17	Q	5	new 2020
KONO18	Q	5	new 2020
KONO19	Q	5	new 2020
KONO2	Q	5	new 2020
KONO20	Q	5	new 2020
KONO3	Q	5	new 2020
KONO4	Q	5	new 2020
KONO5	Q	5	new 2020
KONO6	Q	5	new 2020
KONO7	Q	5	new 2020
KONO8	Q	5	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
KONO9	Q	5	new 2020
KOOLJ-1	Q	1	
KOOLJ-2	Q	1	
KOOLJ-3	Q	1	
KOOLJ-4	Q	1	
KOOLJ-5	Q	1	
KOOLJ-6	Q	1	
KOOLJ-7	Q	1	
KOON-1	Q	1	
KOON-2	Q	1	
lamb1	Q	1	
lamb2	Q	1	
LAND-1	Q	1	
leda01	Q	1	
leda02	Q	1	
leda03	Q	1	
leda04	Q	1	
LESCH-1	Q	1	
LESCH-2	Q	1	
LESCH-3	Q	1	
LESCH-4	Q	1	
LESCH-5	Q	1	
LESCH-6	Q	1	
Light01	Q	1	
Light02	Q	1	
Light03	Q	1	
Light04	Q	1	
low01	Q	1	
low04	Q	1	
low06a	Q	1	
low06b	Q	1	
low07	Q	1	
low08	Q	1	
low09a	Q	1	
low09a-2008	Q Rv	1	new 2020
low09b	Q	1	
low10a	Q	1	
low10a-2008	Q Rv	1	new 2020
low10b	Q	1	
low12a	Q	1	
low12a-2008	Q Rv	1	new 2020
low12b	Q	1	
low13a	Q	1	
low13b	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
low14a	Q	1	
LYONS-1	Q	1	
LYONS-2	Q	1	
m4601	R	1	
m4602	R	1	
M53	Q	1	
m5302	Q	1	
m5303	Q	1	
m5304	Q	1	
m5305	Q	1	
m5306	Q	1	
maida01	Q	1	
maida02	Q	1	
MANEA-1	Q	1	
MANEA-2	Q	1	
MANEA-3	**Q**	**1, 2**	**in 2 datasets**
MAR01	Q	3	new 2020
MAR02	Q	3	new 2020
MAR03	Q	3	new 2020
MCLART-1	Q	1	
MEAL-1	Q	1	
MEAL-2	Q	1	
MEELON-1	Q	1	
MEELON-2	Q	1	
MELA-1	Q	1	
MELA-10	Q	1	
MELA-2	Q	1	
MELA-3	Q	1	
MELA-5	Q	1	
MELA-6	Q	1	
MELA-7	Q	1	
MELA-8	Q	1	
MELA-9	Q	1	
MERR1	Q	5	new 2020
MERR2	Q	5	new 2020
MERR3	Q	5	new 2020
MERR4	Q	5	new 2020
MGK01	Q	1	
MGK02	Q	1	
MGK03	**Q**	**1, 2**	**in 2 datasets**
MGK04	**Q**	**1, 2**	**in 2 datasets**
MHENRY-1	Q	1	
MHENRY-2	Q	1	
MHR01	R	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
MHR02	R	1	
MHR03	R	1	
MI002MOR	R	1	
MI003MOR	R	1	
MI01	R	1	
MI02	R	1	
MI03	R	1	
MI04	R	1	
MI05	R	1	
MI06	R	1	
MI07	R	1	
MI08	R	1	
MI09	R	1	
MI10	R	1	
MI11	R	1	
MI12	R	1	
MI13	R	1	
MI14	R	1	
MI15	R	1	
MI16	R	1	
MI17	R	1	
MI18	R	1	
MI19	R	1	
MI20	R	1	
MI21	R	1	
MI22	R	1	
MI23	R	1	
Mill01	Q	1	
MILT-1	Q	1	
MILT-2	Q	1	
MILT-3	Q	1	
MILT-4	Q	1	
MILT-5	Q	1	
MILT-6	Q	1	
MILT-7	Q	1	
MILT-8	Q	1	
MIME 01	R	1	
MIND-1	Q	4	new 2020
MINN-1	Q	1	
MINN-2	Q	1	
MINN-3	Q	1	
MNP01	R	1	
MNP02	R	1	
MNP03	R	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
MODO-1	Q	1	
MODO-2	Q	1	
MODO-3	Q	1	
MODO-4	Q	1	
MODO-5	Q	1	
MODO-6	Q	1	
MOGU01	Q	3	new 2020
MOGU02	Q	3	new 2020
MOGU03	Q	3	new 2020
MOGU04	Q	3	new 2020
MOGU05	Q	3	new 2020
MOOR 01	R	1	
MOOR 02	R	1	
MOOR 03	R	1	
MOOR 04	R	1	
MOOR 05	R	1	
MOOR 06	R	1	
MOOR 07	R	1	
MOOR 08	R	1	
MOOR 09	R	1	
moore01	Q	1	
moore02	Q	1	
moore03	Q	1	
MP01	R	1	
MP02	R	1	
MP03	R	1	
MP04	R	1	
MP05	R	1	
MP06	R	1	
MP07	R	1	
MP08	R	1	
MP09	R	1	
MP10	R	1	
MP11	R	1	
MPK01	Q	1	
MPK02	Q	1	
MPK03	Q	1	
MR01	R	1	
MR02	R	1	
MR03	R	1	
MR04	R	1	
MR05	R	1	
MR06	R	1	
MR07	R	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
MR08	R	1	
MR09	R	1	
MR10	R	1	
MR11	R	1	
MR12	R	1	
MR13	R	1	
MR14	R	1	
MR15	R	1	
MR16	R	1	
MR17	R	1	
MR18	R	1	
mrnp01	Q	1	
mrnp02	Q	1	
mrnp03	Q	1	
mrnp04	Q	1	
MSF01	R	1	
MSF02	R	1	
MSF03	R	1	
MTB-1	Q	1	
MTB-2	Q	1	
MTB-3	Q	1	
MTB-4	Q	1	
MTB-5	Q	1	
much01	Q	1	
much02	Q	1	
much03	Q	1	
much04	Q	1	
much05	Q	1	
MUCK-1	Q	1	
MUCK-2	Q	1	
MUD-2	Q	1	
MUD-3	Q	1	
MUD-4	Q	1	
MUD-5	Q	1	
MUD-6	Q	1	
MUD-7	Q	1	
MUD-9	Q	1	
MUDD01	R	3	new 2020
MUDD02	R	3	new 2020
MUK01	R	1	
MUK02	R	1	
MURR01	Q	3	new 2020
MURR02	Q	3	new 2020
MURR03	Q	3	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
MWR01	R	1	
MWR02	R	1	
MWR03	R	1	
MWR04	R	1	
MWR05	R	1	
MWR06	R	1	
MWR07	R	1	
MWR08	R	1	
MWR09	R	1	
MWR10	R	1	
MYALUP-2	Q	1	
NAB1	Q	5	new 2020
NAB2	Q	5	new 2020
NAB3	Q	5	new 2020
NAB4	Q	5	new 2020
NAVB-1	Q	1	
NAVB-2	Q	1	
NAVB-3	Q	1	
NAVB-4	Q	1	
NEER-1	Q	1	
NEER-10	Q	1	
NEER-11	Q	1	
NEER-2	Q	1	
NEER-20	Q	1	
NEER-21	Q	1	
NEER-22	Q	1	
NEER-23	Q	1	
NEER-3	Q	1	
NEER-4	Q	1	
NEER-5	Q	1	
NEER-6	Q	1	
NEER-7	Q	1	
NEER-8	Q	1	
NEER-9	Q	1	
NINE-1	Q	1	
NINE-2	Q	1	
Nmaid01	Q	1	
Nmaid03	Q	1	
Nmaid04	Q	1	
Nmaid05	Q	1	
Norm01	Q	1	new 2020
Norm02	**Q**	**1, 2**	**new 2020; in 2 datasets**
Norm03	Q	1	
Norm04	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
Norm05	Q	1	new 2020
Norm06	Q	1	
Norm07	Q	1	
NPRES-1	Q	1	
NWIL-1	Q	1	
NWIL-2	Q	1	
NWIL-3	Q	1	
NYAM1	Q	5	new 2020
NYAM10	Q	5	new 2020
NYAM11	Q	5	new 2020
NYAM12	Q	5	new 2020
NYAM13	Q	5	new 2020
NYAM14	Q	5	new 2020
NYAM15	Q	5	new 2020
NYAM16	Q	5	new 2020
NYAM2	Q	5	new 2020
NYAM3	Q	5	new 2020
NYAM4	Q	5	new 2020
NYAM5	Q	5	new 2020
NYAM6	Q	5	new 2020
NYAM7	Q	5	new 2020
NYAM8	Q	5	new 2020
NYAM9	Q	5	new 2020
OAK01	Q	3	new 2020
OAK02	Q	3	new 2020
OAK03	Q	3	new 2020
OAK04	Q	3	new 2020
OATES-1	**Q**	**1, 2**	**new 2020; in 2 datasets**
OYR01	R	1	
OYR02	R	1	
PAGA-1	Q	1	
PAGA-2	Q	1	
PAGA-3	Q	1	
PAGA-4	Q	1	
PAGA-5	Q	1	
PAGA-6	Q	1	
PAGA-7	Q	1	
PAGA-8	Q	1	
page01	Q	1	new 2020
PAGL1	Q	4	new 2020
PAGL2	Q	4	new 2020
PAGL3	Q	4	new 2020
PAGS1	Q	4	new 2020
PAGS2	Q	4	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
PAGS3	Q	4	new 2020
PAGS4	Q	4	new 2020
PAGS5	Q	4	new 2020
PAGS6	Q	4	new 2020
PAGS7	Q	4	new 2020
PAGS8	Q	4	new 2020
PAGS9	Q	4	new 2020
PAR1	R	1	
PAYNE-1	Q	1	
PB-1	Q	1	
PB-2	Q	1	
PB-3	Q	1	
PB-4	Q	1	
PB-5	Q	1	
PB-6	Q	1	
PEARCE-1	Q	1	
PEARCE-2	Q	1	
PEPB-1	Q	1	
PEPGRV-1	Q	1	
PEPGRV-2	Q	1	
perth01	Q	1	
perth02	Q	1	
perth03	Q	1	
perth04	Q	1	
perth05	Q	1	
perth06	Q	1	
perth07	Q	1	
perth08	Q	1	
perth09	Q	1	
perth10	Q	1	
Pind01	Q	1	
Pind02	Q	1	
pinj01	Q	1	
pinj02	Q	1	
pinj03	Q	1	
pinj04	Q	1	
pinj05	Q	1	
pinj06	Q	1	
pinj07	Q	1	
pinj08	Q	1	
pinj09	Q	1	
pinj10	Q	1	
pinj11	Q	1	
pinj12	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
pinj13	Q	1	
pinj14	Q	1	
pinj15	Q	1	
Pinn01	Q	1	
Pinn02	Q	1	
Pinn03	Q	1	
pip01	R	1	
Plant01	Q	1	
Plant02	Q	1	
Plant03	**Q**	**1, 2**	**new 2020; in 2 datasets**
PLINE-1	Q	1	
PLINE-2	Q	1	
PLINE-3	Q	1	
PLINE-4	Q	1	
PLINE-5	Q	1	
PLINE-6	Q	1	
PLINE-7	Q	1	
POPO1	Q	5	new 2020
POPO10	Q	5	new 2020
POPO11	Q	5	new 2020
POPO12	Q	5	new 2020
POPO13	Q	5	new 2020
POPO14	Q	5	new 2020
POPO15	Q	5	new 2020
POPO16	Q	5	new 2020
POPO17	Q	5	new 2020
POPO18	Q	5	new 2020
POPO19	Q	5	new 2020
POPO2	Q	5	new 2020
POPO20	Q	5	new 2020
POPO3	Q	5	new 2020
POPO4	Q	5	new 2020
POPO5	Q	5	new 2020
POPO7	Q	5	new 2020
POPO8	Q	5	new 2020
POPO9	Q	5	new 2020
Possum1	Q	1	
Possum2	Q	1	
Possum3	Q	1	
Possum4	Q	1	
Possum5	Q	1	
PRES-1	Q	1	
PTWALT-1	Q	1	
Punr01	Q	1	
Punr02	Q	1	
Punr03	Q	1	
quinn01	Q	1	
quinn02	Q	1	
quinn03	Q	1	
quinn04	Q	1	new 2020
quinn05	Q	1	
quinn06	Q	1	
quinn07	Q	1	
quinn08	Q	1	
quinn09	Q	1	
R116701	Q	1	
R116702	**Q**	**1, 2**	**in 2 datasets**
R116703	Q	1	
RAAF-1	Q	1	
RAAF-2	Q	1	
RAAF-3	Q	1	
RACE01	Q	3	new 2020
RACE02	Q	3	new 2020
RAILRD01	R	3	new 2020
RAILRD02	R	3	new 2020
RAILRD03	R	3	new 2020
RAILRD04	R	3	new 2020
RAILRD05	R	3	new 2020
raven02	Q	1	
raven03	Q	1	
raven04	Q	1	
raven05	Q	1	
Ravs01	Q	1	
Redh01	Q	1	
Redh02	Q	1	
Redh03	Q	1	
Redh04	Q	1	
Redh05	Q	1	
Redh06	Q	1	
Redh07	Q	1	
Redh09	Q	1	
Redh10	Q	1	
REDL-1	Q	1	
RGR01	R	1	
RGR02	R	1	
RGR03	R	1	
RGR04	R	1	
RGR05	R	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
RGR06	R	1	
RGUL01	Q	3	new 2020
RGUL03	Q	3	new 2020
RGUL03A	Q	3	new 2020
RGUL04	Q	3	new 2020
RGUL05	Q	3	new 2020
rich01	Q	1	
rich02	Q	1	
RIVD-1	Q	1	
RIVD-2	Q	1	
ROSE01	Q	3	new 2020
ROSE02	Q	3	new 2020
ROSE03	Q	3	new 2020
rott01	R	1	
rott02	R	1	
rott03	R	1	
rott04	R	1	
rott05	R	1	
rott06	R	1	
rowe01	Q	1	
rowe02	Q	1	
RUAB-1	**Q**	**1, 2**	**in 2 datasets**
RUAB-2	**Q**	**1, 2**	**in 2 datasets**
RUAB-3	Q	1	
RUAB-4	Q	1	
Rush01	Q	1	
Rush02	Q	1	
Rush03	Q	1	
SABI01	**Q**	**2**	
SABI02	**Q**	**2**	
SABI03	**Q**	**2**	
SABI04	**Q**	**2**	
SABI05	**Q**	**2**	
SABI06	**Q**	**2**	
SABI07	**Q**	**2**	
SABI08	**Q**	**2**	
SABI09	**Q**	**2**	
SABI10	**Q**	**2**	
SABI11	**Q**	**2**	
SABI12	**Q**	**2**	
sams01	Q	1	
sand01	Q	1	
SANDON-1	Q	1	
SAPP01	Q	4	new 2020
SAPP02	Q	4	new 2020
SAPP03	Q	4	new 2020
SAPP04	Q	4	new 2020
SAPP05	Q	4	new 2020
SAPP06	Q	4	new 2020
SAPP07	Q	4	new 2020
SAPP08	Q	4	new 2020
SAPP09	Q	4	new 2020
SAPP10	Q	4	new 2020
SAPP11	R	4	new 2020
SEAB-1	Q	1	
SEAB-2	Q	1	
SEAB-3	Q	1	
SEAB-4	Q	1	
SEAB-5	Q	1	
SEAB-6	Q	1	
SEAB-7	Q	1	
SEAB-8	Q	1	
serp01	Q	1	
serp02	Q	1	
serp03	Q	1	
serp04	Q	1	
SF01	R	1	
SF02	R	1	
SF03	R	1	
SF04	R	1	
SF1201	Q	1	
SHE-1	Q	1	
SHE-2	Q	1	
SHE-3	Q	1	
SHE-4	Q	1	
SHE-5	Q	1	
SHE-6	Q	1	
SHENT-1	Q	1	
SINT-1	Q	1	
smith01	**Q**	**1, 2**	**in 2 datasets**
smith02	**Q**	**1, 2**	**in 2 datasets**
smith03	**Q**	**1, 2**	**in 2 datasets**
smith04	**Q**	**1, 2**	**in 2 datasets**
SNEL1	Q	5	new 2020
SNEL2	Q	5	new 2020
SNEL3	Q	5	new 2020
SNEL4	Q	5	new 2020
SNEL5	Q	5	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
SNEL6	Q	5	new 2020
SNEL7	Q	5	new 2020
SNEL8	Q	5	new 2020
star01	Q	1	
star02	Q	1	
star03	Q	1	
SULT-1	Q	1	new 2020
SULT-2	Q	1	new 2020
sultaa	Q	1	new 2020
Sunday01	Q	1	
Sunday02	Q	1	
SVH-1	Q	1	
SVH-2	Q	1	
SW01	R	1	
SW02	R	1	
SW03	R	1	
SW04	R	1	
SW05	R	1	
SW06	R	1	
SW07	R	1	
SW08	R	1	
SW09	R	1	
SW10	R	1	
SW11	R	1	
Swamp01	Q	1	
Swamp02	Q	1	
Swamp03	Q	1	
talb1	Q	1	
talb10	Q	1	
talb11	Q	1	
talb12	Q	1	
talb13	Q	1	
talb2	Q	1	
talb3	Q	1	
talb4	Q	1	
talb5	Q	1	
talb6	Q	1	
talb7	Q	1	
talb8	Q	1	
talb9	Q	1	
TAM-1	Q	1	
TAYL01	**Q**	**2**	
Tele01	Q	1	
TEMP01	Q	3	new 2020

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
THOM-1	Q	1	new 2020
THOM-2	Q	1	
TOBY01	Q	3	new 2020
tokyu01	Q	1	
tokyu02	Q	1	
tokyu03	Q	1	
tokyu04	Q	1	
tokyu05	Q	1	
tokyu06	Q	1	
tokyu07	Q	1	
TR01	R	1	
TR02	R	1	
TR03	R	1	
TR04	R	1	
TR05	R	1	
TR06	R	1	
TR07	R	1	
TR08	R	1	
TREE01	**Q**	**2**	
TREE02	**Q**	**2**	
TREE03	**Q**	**2**	
TREE04	**Q**	**2**	
TRIG-1	Q	1	
TRIG-2	Q	1	
TRIG-3	Q	1	
TRIG-4	Q	1	
TRIG-5	Q	1	
TRIG-6	Q	1	
trigg08	R	1	
TWIN-1	Q	1	
TWIN-10	Q	1	
TWIN-11	Q	1	
TWIN-2	Q	1	
TWIN-3	Q	1	
TWIN-4	Q	1	
TWIN-5	Q	1	
TWIN-6	Q	1	new 2020
TWIN-7	Q	1	
TWIN-8	Q	1	
UCL01	**Q**	**2**	
UCL02	**Q**	**2**	
UCL03	**Q**	**2**	
UCL04	**Q**	**2**	
UCL05	**Q**	**2**	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
UCL06	**Q**	**2**	
VASS01	Q	3	new 2020
vines01	Q	1	
vines02	Q	1	
WA01	Q	3	new 2020
WA03	Q	3	new 2020
WA04	Q	3	new 2020
WA05	Q	3	new 2020
WABL-1	Q	1	
WABL-2	Q	1	
WABL-3	Q	1	
WABL-4	Q	1	
WAND-1	Q	1	
WARB-1	Q	1	
WARB-2	Q	1	
WARB-3	Q	1	
WARB-4	Q	1	
WARG01	Q	3	new 2020
WARG02	Q	3	new 2020
WARI-1	Q	1	
WARI-2	Q	1	
waro 01	Q	1	
waro 02	Q	1	
waro 03	Q	1	
waro 04	Q	1	
waro 05	Q	1	
waro 06	Q	1	
WASS01	Q	3	new 2020
WASS02	Q	3	new 2020
WATER-1	Q	1	
WATER-2	Q	1	
WATER-3	Q	1	
WATER-4	Q	1	
WATERRD1	Q	1	
WATK10	Q	3	new 2020
WATTLE01	Q	4	new 2020
WATTLE02	Q	4	new 2020
WATTLE03	Q	4	new 2020
WATTLE04	Q	4	new 2020
WATTLE05	Q	4	new 2020
WELL-1	Q	1	
WELL-2	Q	1	
welr 01	Q	1	
welr 02	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
WH01	**Q**	**2**	
WH02	**Q**	**2**	
WH03	**Q**	**2**	
WH04	**Q**	**2**	
WH05	**Q**	**2**	
WH06	**Q**	**2**	
WHILL-1	Q	1	
WHILL-2	Q	1	
WHILL-3	Q	1	
WHILL-4	Q	1	
WHILL-5	Q	1	
white03	Q	1	
white04	Q	1	
white05	Q	1	
white06	Q	1	
white07	Q	1	
white08	Q	1	
WHITE-1	Q	1	
WHITE-2	Q	1	
wicher01	**Q**	**1, 2**	**in 2 datasets**
wilb01	Q	1	
wilb02	Q	1	
wilb03	Q	1	
wilb04	Q	1	
wilb05	Q	1	
wilb06	Q	1	
wilb07	Q	1	
wilb08	Q	1	
wilb09	Q	1	
wilb10	Q	1	
wilb11	Q	1	
wilb12	Q	1	
wilb13	Q	1	
will01	**Q**	**1, 2**	**in 2 datasets**
will02	**Q**	**1, 2**	**in 2 datasets**
will03	**Q**	**1, 2**	**in 2 datasets**
will04	**Q**	**1, 2**	**in 2 datasets**
wire01	Q	1	
wire02	Q	1	
WIRR-1	Q	1	
WIRR-2	Q	1	
WN019MNR	R	1	
WN020MNR	R	1	
WN021MNR	R	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
WN084CHE	R	1	
WN085CHE	R	1	
WN086CHE	R	1	
WN087CHE	R	1	
WN088CHE	R	1	
WN089CHE	R	1	
WN090HED	R	1	
WN091HED	R	1	
WN092HED	R	1	
WN093HED	R	1	
WN094HED	R	1	
WN095HED	R	1	
WN096HED	R	1	
WN097HED	R	1	
WN098WNR	R	1	
WN099WNR	R	1	
WN100WNR	R	1	
WN101WNR	R	1	
WN102MNR	R	1	
WN103MNR	R	1	
WN104MNR	R	1	
WN105MNR	R	1	
WN106MNR	R	1	
WN107MNR	R	1	
WN108MNR	R	1	
WN109MOR	R	1	
WN110MOR	R	1	
WN111MOR	R	1	
WN112MOR	R	1	
WN113MOR	R	1	
WN114MOR	R	1	
WN115MOR	R	1	
WN116MOR	R	1	
WN117MOR	R	1	
WONN-1	**Q**	**1, 2**	**in 2 datasets**
WONN-2	**Q**	**1, 2**	**new 2020; in 2 datasets**
WONN-3	Q	1	
WONN-4	**Q**	**1, 2**	**in 2 datasets**
WONN-5	**Q**	**1, 2**	**in 2 datasets**
WONN-6	**Q**	**1, 2**	**in 2 datasets**
WOODP-1	Q	1	
WOODP-2	Q	1	
WOODV-1	Q	1	
WOODV-2	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
WRAU01	Q	3	new 2020
WRAU02	Q	3	new 2020
xbeer01	Q	1	
xbeer02	Q	1	
xlamb01	Q	1	
xpearce01	Q	1	
xpearce02	Q	1	
xpearce03	Q	1	
xpearce04	Q	1	
xpearce05	Q	1	
xyan08	R	1	
xyan10	R	1	
YALG09	Q	3	new 2020
YALG-1	Q	1	
YALG10	Q	3	new 2020
YALG11	Q	3	new 2020
YALG12	Q	3	new 2020
YALG-2	Q	1	
YALG-2-2007	Q Rv	1	new 2020
YALG-3	Q	1	
YALG-3-2007	Q Rv	1	new 2020
YALG-4	Q	1	
YALG-4-2007	Q Rv	1	new 2020
YALG-5	Q	1	
YALG-5-2007	Q Rv	1	new 2020
YALG-6	Q	1	
YALG-6-2007	Q Rv	1	new 2020
YALG-7	Q	1	
YALG-7-2007	Q Rv	1	new 2020
YALG-8	Q	1	
YALG-8-2007	Q Rv	1	new 2020
YALLIN-1	Q	1	
YAN-1	Q	1	
YAN-10	Q	1	
YAN-11	Q	1	
YAN-12	Q	1	
YAN-13	Q	1	
YAN-14	Q	1	
YAN-15	Q	1	
YAN-16	Q	1	
YAN-17	Q	1	
YAN-18	Q	1	
YAN-19	Q	1	
YAN-2	Q	1	

QUAD	SAMPLING_PROTOCOL	2020_DATASET	NOTES
YAN-20	Q	1	
YAN-21	Q	1	
YAN-22	Q	1	
YAN-23	Q	1	
YAN-24	Q	1	
YAN-25	Q	1	
YAN-3	Q	1	
YAN-4	Q	1	
YAN-5	Q	1	
YAN-6	Q	1	
YAN-8	Q	1	
YAN-9	Q	1	
yang01	Q	1	
yang02	Q	1	
yang03	Q	1	
YARA01	Q	3	new 2020
YARA02	Q	3	new 2020
YARA03	Q	3	new 2020
YARA04	Q	3	new 2020
YARA05	Q	3	new 2020
yarl01	Q	1	
yarl02	Q	1	
yarl03	Q	1	
yarl04	Q	1	
yela01	Q	1	
yela02	Q	1	
yela03	Q	1	
YIRON-1	**Q**	**1, 2**	**in 2 datasets**
YIRON-2	**Q**	**1, 2**	**in 2 datasets**
YLCN04-4b	Q	3	new 2020
YLKP03	Q	3	new 2020
YLKP04	Q	3	new 2020
YOON-1	Q	1	
YOON-2	Q	1	
YOON-3	Q	1	
ytip01	Q	1	new 2020
ytip02	Q	1	new 2020
YULE-1	Q	1	
YULE-2	Q	1	
YULE-3	Q	1	
YULE-4	Q	1	
YULE-5	Q	1	
YUR01	R	1	
YUR02	R	1	
yuri01	Q	1	
yuri02	Q	1	
yuri03	Q	1	
yuri04	Q	1	
yuri05	Q	1	
zBEER 01	R	1	
zBEER 02	R	1	
zBEER 03	R	1	
zBEER 04	R	1	
zYAN2	R	1	
zYAN4	R	1	
zYAN5	R	1	
zYAN6	R	1	

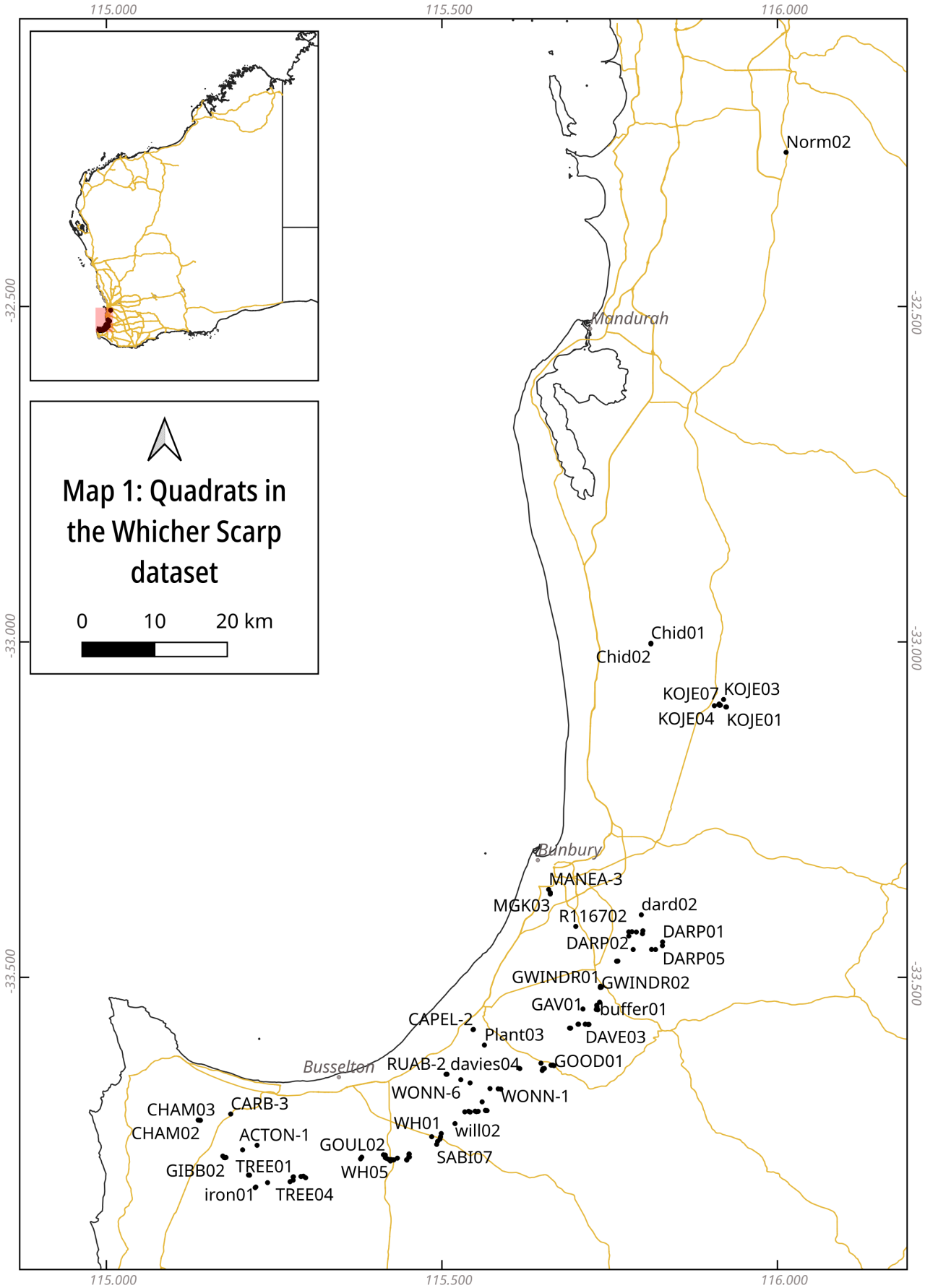
Table 7. Accuracy of quadrat positions for the studies.

STUDY_CODE	Accuracy and methodology for positioning of quadrats
SCP	100 m Quadrats initially positioned from GPS data provided in Gibson *et al.* (1994) then repositioned on the GIS system by N Thorning, M Lyons and BJ Keighery from mud maps on field datasheets (includes quadrat sheets and maps drawn and notes made in the field) and field knowledge of the quadrats. Quadrats included in the PRPBP Reference Sites were reassessed in 2004 by K Clarke with the support of BJ Keighery and repositioned where there were still discrepancies between the original mud maps on field datasheets, original marking of quadrat locations on 1:20 000 aerial photographs and the original description of the vegetation unit on field datasheets in conjunction with revisits to the sites.
SYS6ENV SYS6ENV2	100 m Quadrats initially positioned from GPS data collected in the field then repositioned on the GIS system by N Thorning and BJ Keighery from mud maps on field datasheets (includes quadrat sheets and maps drawn and notes made in the field) and field knowledge of the quadrats. Quadrats included in the PRPBP Reference Sites were reassessed in 2004 by K Clarke with the support of BJ Keighery and repositioned where there were still discrepancies between the original mud maps on field datasheets, original marking of quadrat locations on 1:20 000 aerial photographs and the original description of the vegetation unit on field datasheets in conjunction with revisits to the sites.
SB (for the quadrats in this dataset)	100 m Quadrats were positioned from GPS data collected in the field. It is unknown how much checking of these quadrats was done. The locations were put into a QGIS package (QGIS Development Team 2019) and then overlaid on the satellite view option of Google Maps (Google n.d.). Quadrats previously on private property, whose locations are newly added in this update, were added with the help of maps and field knowledge from B.J. Keighery.
SB/WSBPS (for the quadrats in this dataset)	100 m Quadrats were positioned from GPS data collected in the field. It is unknown how much checking of these quadrats was done. The locations were put into a QGIS package (QGIS Development Team 2019) and then overlaid on the satellite view option of Google Maps (Google n.d.).

MAPS

Map 1: Quadrats in the Whicher Scarp dataset.

Map of quadrats in this dataset. Not all quadrats are labelled with QUAD codes.


115.000
115.500
116.000
-32.500
-33.000
-33.500
Map 1: Quadrats in the Whicher Scarp dataset
0
10
20 km
Norm02
Mandurah
Chid01
Chid02
KOJE07
KOJE03
KOJE04
KOJE01
Bunbury
MANEA-3
MGK03
dard02
R116702
DARP01
DARP02
DARP05
GWINDR01
GWINDR02
GAV01
buffer01
CAPEL-2
Plant03
DAVE03
Busselton
RUAB-2
davies04
GOOD01
WONN-6
WONN-1
CHAM03
CARB-3
WH01
will02
CHAM02
ACTON-1
GOUL02
SABI07
GIBB02
TREE01
WH05
iron01
TREE04

APPENDICES

APPENDIX A: Data files

The data in the WhicherScarp dataset include a database and a shapefile.

Database: WhicherScarp.accdb

See Appendix C Part 1 for database metadata. Tables in the database are described below.

Species table	Species table description	Number of records	Number of taxa	Field descriptions
tblWhicherScarpSpecies_WithAdj	Native and weedy plants, including plants found in as well as adjacent to the quadrat or relevé. Plants are only called 'adjacent' when they are found growing in the same plant community as is represented in the quadrat. Adjacents are searched for to varying degrees during a survey so do not represent a thorough inventory at every survey. There can be duplicates of some species for some quadrats (due to duplicate recordings or specimen collections in the quadrat or after redetermination of species names).	8,415	901 862 taxa on master list; 39 on supplementary list	Appendix B Part 1
tblWhicherScarpSpecies_WithoutAdj	Native and weedy plants found rooted in the quadrat or relevé, not including plants found adjacent. There can be duplicates of some species for some quadrats (due to duplicate recordings or specimen collections in the quadrat or after redetermination of species names).	8,021	855 830 on master list; 25 on supplementary list	Appendix B Part 1
tblWhicherScarpSpecies_WithoutAdj_Unique	Native and weedy plants found rooted in the quadrat or relevé, not including plants found adjacent. There are less fields than in tblWhicherScarpSpecies_WithoutAdj and no duplicates.	7,856	855 830 on master list; 25 on supplementary list	Appendix B Part 1

Quadrat table	Quadrat table description	Number of records	Number of taxa	Field descriptions
tblWhicherScarpQuadrats_1, tblWhicherScarpQuadrats_2	Attributes associated with the quadrat. They can be attributes recorded in the field, or the result of geoprocessing. Both tblWhicherScarpQuadrats_1 and tblWhicherScarpQuadrats_2 contain all the quadrats in the dataset but the attributes are spread over the two tables as together they are too big. The table tblWhicherScarpQuadrats_1 is concerned mainly with location information; tblWhicherScarpQuadrats_2 is concerned with all other attributes.	124	N/A	Appendix B Part 2

Shapefile: WhicherScarp.geojson

See Appendix C Part 2 for shapefile metadata.

APPENDIX B: Field descriptions for the database and the shapefile

Fields for the database and the shapefile are explained below. Part 1 is the list of fields in the species database tables; part 2 is the list of fields in the quadrat database tables and the shapefile. The fields are presented here in the order in which they appear in the database tables.

The same database and shapefile templates have been used for this and the other four datasets produced in 2020 by the Wildflower Society of Western Australia (BJ Keighery *et al.* 2020a, b, c, d, e) but not all the fields are used in each dataset. The fields that are not applicable to this dataset are normally indicated below by 'N/A'. These empty fields may, or may not, appear in the database tables.

Key:

FIELD_NAME	Field name in the database tables.
(fieldName)	Equivalent Darwin Core standard field name or term, according to Biodiversity Information Standards (2020). These are only available for some fields and, when listed, are enclosed in round brackets.
[field_name]	Field name in the shapefile. These are enclosed in square brackets and are shorter in length in order to suit shapefile field naming conventions.
Recorded in field	Data recorded in the field on quadrat sheets (also called data sheets or datasheets).
Derived	Data resulting from interpretation of quadrat sheets (also called data sheets or datasheets), field knowledge and/or regional datasets.
Generated in GIS program (shapefile: *XXXX*)	Data generated from intersection of the quadrat location shapefile with a regional dataset (*shapefile name*).

Part 1: Species database tables fields

These are the fields for tables tblWhicherScarpSpecies_WithAdj and tblWhicherScarpSpecies_WithoutAdj (see Appendix A).

ID

A unique number for the record in the dataset.

QUAD

Unique quadrat or relevé name. This name is as it appears on the current floristic databases and recent GIS shapefiles. It can differ slightly from the equivalent quadrat name (QUAD_GIS) that appears on the original Department of Conservation and Land Management (CALM)/Department of Environmental Protection (DEP) GIS files, and a few differ slightly from the names in the Gibson *et al.* (1994) list of quadrats analysed. See QUAD_GIS, QUAD_ORIG_DOM_DB_WHEN_DIFF and QUAD_ORIG_FLORISTIC_DB_WHEN_DIFF for alternative quadrat names that have been used in the past.

ADJ

Plant recorded outside the quadrat, that is, a plant with its roots in the ground outside the quadrat, but in the same vegetation community as *in* the quadrat.

Warning: The identification and taxonomy of adjacents has not been afforded the same scrutiny as that of those plants recorded in the quadrats.

NAME_ID (taxonID)

A unique numeric identifier for each taxon or combination of genus, species and infraspecies name and authority. Positive NAME_IDs are from the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019); negative NAME_IDs are supplementary taxa names from a copy of the database of supplementary numbers started by the *A Floristic Survey of the southern Swan Coastal Plain* (Gibson *et al.* 1994) team and subsequently maintained by V Longman.

Some taxon names at the time of data entry were added as supplementary names since there was, at that time, no corresponding name on the Census of Western Australian Plants. Since that time, some of these names have been added to the Census. For example, *Amblysperma spathulata* (NAME_ID -20751) became available on the Census as *Amblysperma spathulatum* (NAME_ID 25843); *Juncus acutus* subsp. *acutus* (NAME_ID -20271) as NAME_ID 20454; *Tetrapanax papyifer* (NAME_ID -20433) as NAME_ID 20649. Even some names which were on the Western Australian Census have been superseded with new very similar names, different perhaps by minor spelling changes. For example *Goodenia caerulea* (NAME_IDs 7497, 32099) is now known as *Goodenia coerulea* (29362); *Echinochloa crusgalli* (330) became *Echinochloa crus-galli* (11105). These NAME_ID numbers have not been updated for the main plant names in this dataset as it is the intention here to keep names and NAME_IDs consistent with the previously released BJ Keighery *et al.* (2012) dataset and the Longman (2005) dataset which comprises species lists for each floristic community type (FCT), showing species presence by quadrat for each FCT and quadrat percentage occurrence of each species for each FCT (Longman 2008); but the new updated NAME_IDs are used in the NAME_UPDATE_NAME_ID field (see later in Appendix B).

SPECIES_CODE

A non-unique code composed of the first three characters of genus, species and infraspecies names respectively as developed by the Western Australian Herbarium's data entry and management programme, Max (Gioia 2005), and according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019). The SPECIES_CODE was developed to enable easy access to the NAME_ID without needing to remember or directly use the NAME_ID during data entry. In earlier versions of Max, the SPECIES_CODE was 3, 3 and 2 characters of genus, species and infraspecies respectively.

NATURALISED

Flag indicating if this taxon is naturalised in Western Australia according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019). Weed or naturalised species, or species planted outside their range, are indicated by an asterisk (*). All unmarked taxa are naturally occurring in Western Australia.

GENUS (genus)

Genus name according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

SPECIES (specificEpithet)

Species name according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

INFRA_RANK (taxonRank)

Rank of first or only infraspecific name according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

INFRA_NAME (infraspecificEpithet)

First or only infraspecific name according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019). Not all taxa are taken to the same specific or infraspecific level within the dataset. The name in the source document databased (e.g. quadrat sheet, report) generally determined the taxon name in the dataset.

I**NFORMAL**

Flag indicating informal names according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019). Published names are null for this field. Previously acceptable values were MS (manuscript name) and PN (phrase name). Any new species is now given phrase names rather than manuscript names but a few species still possess manuscript names under the understanding that they are soon to be published.

NAME (scientificName)

Scientific plant name, comprising GENUS + SPECIES + INFRA_RANK + INFRA_NAME + INFORMAL according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019). Taxonomy is generally current as it was in 2008, as it was at the time of the Whicher report (BJ Keighery *et al.* 2008). Some records that missed data entry have been discovered since 2008. They were not in the 2008 version of the dataset and haven't been added to this 2020 version but should be noted. They are *Pericalymma ellipticum* (NAME_ID 6006, quadrat will04), *Leucopogon* aff. *polymorphus* (NAME_ID -20546, buffer01), *Adenanthos meisneri* (NAME_ID 1790, buffer01) and *Bossiaea* sp. Waroona (NAME_ID 18497, boyan 02). Also *Schoenus efoliatus* in WH04 was accidentally entered as *Schoenus curvifolius*; the correct name (*S. efoliatus*) is listed in NAME_UPDATE_NAME.

AUTHOR (scientific Name Authorship)

Name author according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

VERNACULAR_NAME (vernacularName)

Comon name, based on the normal language of everyday life, contrasted with scientific name. Sources of vernacular name include FloraBase, coded here as 'FB' and accessed using the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019), and a dataset of common names selected by BJ and GJ Keighery (coded here as BJK). The latter was compiled after consideration of common names suggested by Bennett (1993), Hoffman and Brown (1998), G Keighery and Longman (2004) and Powell and Emberson (1996).

Vernacular names in this edition of the Whicher Scarp dataset is the same as in the 2008 edition, except for 7 species: *Amblysperma spathulatum* (Native Gerbera in 2008; Forest Native Gerbera in 2020); *Cyathochaeta equitans* (Cyathochaeta in 2008; Sand Cyathochaeta in 2020); *Cyathochaeta teretifolia* (Cyathochaeta in 2008; Terete Leaved Swamp Cyathochaeta in 2020); *Hypolaena exsulca* (Hypolaena in 2008; Common Hypolaena in 2020); *Hypolaena pubescens* (Hypolaena in 2008; Hairy Hypolaena in 2020); *Loxocarya magna* (Loxocarya in 2008; Tall Ironstone Loxocarya in 2020); *Opercularia vaginata* (Opercularia in 2008; Ironstone Opercularia in 2020).

NOONGAR NAME

Sources of Noongar name include Abbott (1983), Bennett (1993), Bindon and Chadwick (1992), CALM Indigenous Heritage Unit (n.d.) and BJ Keighery and Huston (1994).

IS_CURRENT (taxonomicStatus)

Indicates if the name is an accepted name according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019). Further information about the non-current names is available on FloraBase (Western Australian Herbarium 1998a-, Western Australian Herbarium 1998c-). There is no currency information for plants which are not listed on the Census of Western Australian Plants, that is, for plants that are on the supplementary list (see NAME_ID).

A listing of endemism and growth and life form attributes for plants of the south-west of Western Australia was initially developed by the team of BJ Keighery, GJ Keighery and KA Clarke for the Perth Region Plant Biodiversity Project. This listing has been greatly expanded for many more species over the years by the team and V Longman.

ENDEMIC

Taxa endemic to Western Australia (WA) or Australia (AUST; or >AUST = cosmopolitan). No records are given for weeds (see Hussey *et al.* 2007 for country of origin). The endemic field has a few more entries in the updated version compared to BJ Keighery *et al.* (2008).

GROWTH_FORM_1_CODE

Structural category describing the habit of growth of a plant. Main growth form codes are listed and described in Table B1.

GROWTH_FORM_1_DESCRIPTION

See GROWTH_FORM_1_CODE and Table B1.

GROWTH_FORM_2_CODE

Further growth form codes are listed and described in Table B2.

GROWTH_FORM_2_DESCRIPTION

See GROWTH_FORM_2_CODE and Table B2.

LIFE_FORM_CODE

Plants use a number of regeneration strategies to ensure their survival (see Table B3). In this dataset, taxa that are perennial and renew annually from underground or above ground storage organs are distinguished from the rest.

LIFE_FORM_DESCRIPTION

See LIFE_FORM_CODE and Table B3.

LIFE_FORM_AQUATICS_CODE

Life form codes for aquatic plants are listed and described in Table B4.

Warning: This field has not comprehensively been considered for all species and many aquatic species will have been missed.

LIFE_FORM_AQUATICS_DESCRIPTION

See LIFE_FORM_AQUATICS_CODE and Table B4.

Warning: This field has not comprehensively been considered for all species and many aquatic species will have been missed.

SUPRA_CODE_2019

A broad family code indicating broad supra-family classification including Alga, Dicot, Fern, Fungus, Gymnosperm, Lichen, Liverwort, Monocot, Moss, Slimemould according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

KINGDOM_2019 (kingdom)

The highest of the ranks of taxa according to the International Code of Nomenclature for algae, fungi and plants (Turland *et al.* 2018) according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019). The most important ranks are Kingdom, Division, Class, Order, Family, Genus and Species.

DIVISION_2019

The second-highest taxonomic rank (Turland *et al.* 2018) according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

CLASS_2019 (class)

The third-highest taxonomic rank (Turland *et al.* 2018) according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

ORDER_2019 (order)

The fourth-highest taxonomic rank (Turland *et al.* 2018) according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

FAMILY_CODE_PRE_2010

Family codes before the Western Australian Herbarium adopted the systematic sequence of families according to the APGIII phylogenic arrangement in 2010-2011 (Western Australian Herbarium 1998b-) according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

FAMILY_PRE_2010

Family names before the Western Australian Herbarium adopted the systematic sequence of families according to the APGIII phylogenic arrangement in 2010-2011 (Western Australian Herbarium 1998b-) according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

FAMILY_NAME_ID_2019

Unique numeric identifier for families according to the new APGIII phylogenic arrangement (Western Australian Herbarium 1998b-) and as appearing in the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

FAMILY_2019 (family)

Family name according to the new APGIII phylogenic arrangement (Western Australian Herbarium 1998b) and as appearing in the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019).

CONSV_CODE_STATUS_2008

The conservation status of the taxon at a state level with listings current at or around the time of survey, the time of the original publication of data on NatureMap or the time of reporting.

In this dataset, conservation code status is dated at January 2008, as it was at the time of preparation for *A Floristic Survey of the Whicher Scarp* (BJ Keighery *et al.* 2008). Listings are current as they were under the State Wildlife Conservation Act 1950 (Government of Western Australia 2008), by the Department of Environment and Conservation (Atkins 2006), and as it appeared in the version of the WA Plant Census as at January 2008 (Western Australian Herbarium 2008). This historic field is included since contemporary conservation code listings may miss significant flora in this list because the taxonomy in this list is not current. For example, *Dryandra nivea* subsp. *uliginosa* in 2008 was listed as Rare (CONSV_CODE_STATUS_2008) and Endangered (CONSV_CODE_RANK_2008) but by 2019 the name of this taxon has changed to *Banksia nivea* subsp. *uliginosa* and its Threatened and Endangered status does not show in CONSV_CODE_STATUS_2019 and CONSV_CODE_RANK_2019 because there is not a match in name; similarly *Dryandra squarrosa* subsp. *agillacea* was in 2008 listed as Rare (CONSV_CODE_STATUS_2008) but by 2019 the name of this taxon has changed to *Banksia squarrosa* subsp. *argillacea* and its Threatened status does not show for this field (CONSV_CODE_STATUS_2019) because there is not a match in name.

Codes are described in Table B5 and defined in Atkins (2006, 2008).

CONSV_CODE_STATUS_2019

The conservation status of the taxon at a state level as listed under the State Wildlife Conservation Act 1950 (Government of Western Australia 2018), by the Department of Biodiversity, Conservation and Attractions (Smith and Jones 2018), in the version of the WA Plant Census dated 26/09/2019 (Western Australian Herbarium 2019). Codes are described in Smith and Jones (2018) and DBCA (2019). See Table B6.

Warning: Contemporary conservation code listings such as this may miss significant flora in this dataset because the taxonomy in the dataset is not current. See CONSV_CODE_STATUS_2008.

CONSV_CODE_RANK_2008

The threat category for the taxon as recognised in Western Australia according to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species as of December 2006 (see Table B7). Taxa are listed on the IUCN website (IUCN 2007).

This information is taken from Appendix 5a in BJ Keighery *et al.* (2008). This historic field is included since contemporary conservation code listings may miss significant flora in this list because the taxonomy in this list is not current. For example, *Dryandra squarrosa* subsp. *agillacea* was in 2008 listed as Vulnerable (CONSV_CODE_RANK_2008) but by 2019 the name of this taxon has changed to *Banksia squarrosa* subsp. *argillacea* and its rank as Vulnerable does not show for this field (CONSV_CODE_RANK_2019) because there is not a match in name.

CONSV_CODE_RANK_2019

The threat category for the taxon as recognised in Western Australia, dependent on the taxon's national extent and according to the IUCN Red List categories and criteria, as listed in Smith and Jones (2018). Codes are described in Smith and Jones (2018) and DBCA (2019). See Table B7.

Warning: Contemporary conservation code listings such as this may miss significant flora in this dataset because the taxonomy in the dataset is not current. For example Dryandra squarrosa subsp. agillacea was in 2008 listed as Vulnerable (CONSV_CODE_RANK_2008) but by 2019 the name of this taxon has changed to Banksia squarrosa subsp. argillacea and its Vulnerable status does not show for this field (CONSV_CODE_RANK_2019) because there is not a match in name.

CONSV_CODE_EPBC_2008

The category to which the taxon is allocated according to the Commonwealth's *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* as of December 2006 (see Table B8). Taxa were listed on the Department of the Environment, Water, Heritage and the Arts website (DEWHA 2007).

This information is taken from Appendix 5a in BJ Keighery *et al.* (2008). This historic field is included since contemporary conservation code listings may miss significant flora in this list because the taxonomy in this list is not current. For example, *Dryandra squarrosa* subsp. *agillacea* was in 2008 listed as Vulnerable (CONSV_CODE_EPBC_2008) but by 2019 the name of this taxon has changed to *Banksia squarrosa* subsp. *argillacea* and its rank as Vulnerable does not show for this field (CONSV_CODE_EPBC_2019) because there is not a match in name.

CONSV_CODE_EPBC_2019

The category to which the taxon is allocated according to the Commonwealth's *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999*, as listed in Smith and Jones (2018). Codes are as for CONSV_CODE_EPBC_2008 (Commonwealth of Australian 2019). See Table B8.

Warning: Contemporary conservation code listings such as this may miss significant flora in this dataset because the taxonomy in the dataset is not current. For example Dryandra squarrosa subsp. agillacea was in 2008 listed as Vulnerable (CONSV_CODE_EPBC_2008) but by 2019 the name of this taxon has changed to Banksia squarrosa subsp. argillacea and its Vulnerable status does not show for this field (CONSV_CODE_EPBC_2019) because there is not a match in name.

CONSV_CODE_DBCA_DISTRICT_2019

The state of Western Australia is divided into 18 Department of Biodiversity, Conservation and Attractions (DBCA) districts. The districts in which the plant with conservation code ranking occurs as at 2019 are listed (Smith and Jones 2018). This information may help highlight any errors in identification of species.

CONSV_CODE_DISTRIBUTION_2019

More detailed location information for plants with conservation code rankings in 2019 (Smith and Jones 2018).

OTHER_SIGNIFICANCE

Other categories of significance according to a system developed by BJ and GJ Keighery and used in Bush Forever Volume 2 (Government of Western Australia 2000b) and the reports on the Whicher Scarp (BJ Keighery *et al.* 2008), Busselton Plain (Webb *et al.* 2009) and the Peel Harvey Eastern Estuary Area Catchment (BJ Keighery *et al.* 2006). This system draws on information about the plant species' population location within its range (e.g. range ends), abundance, endemism, ecological preferences and morphological and/or genetic variation, amongst other attributes. See Table B9 for more information.

This information is taken from BJ Keighery *et al.* (2008).

Up to two previous identifications of the taxon are listed. See NAME_ID, SPECIES_CODE, etc. fields above for descriptions. The previous names can be both old names and incorrectly assigned names.

PREVIOUS_NAME_1_NAME_ID

PREVIOUS_NAME_1_SPECIES_CODE

PREVIOUS_NAME_1_NATURALISED

PREVIOUS_NAME_1_NAME (previousIdentification1)

PREVIOUS_NAME_1_AUTHOR

PREVIOUS_NAME_2_NAME_ID

PREVIOUS_NAME_2_SPECIES_CODE

PREVIOUS_NAME_2_NATURALISED

PREVIOUS_NAME_2_NAME (previousIdentification2)

PREVIOUS_NAME_2_AUTHOR

A suggested name update is listed. See NAME_ID, SPECIES_CODE, etc. fields above for descriptions. The NAME_UPDATE fields list plant names with taxonomy updated to around 2010 in this dataset. Many of the plants will need further name updates but the process of updating to 2019 taxonomy has not been done.

NAME_UPDATE_NAME_ID

NAME_UPDATE_SPECIES_CODE

NAME_UPDATE_NATURALISED

NAME_UPDATE_NAME

NAME_UPDATE_AUTHOR

NAME_UPDATE_IS_CURRENT

Indicates if the updated name is an accepted name according to the Census of Western Australian Plants dated 26/09/2019 (Western Australian Herbarium 2019). Further information about the non-current names is available on FloraBase (Western Australian Herbarium 1998a-, Western Australian Herbarium 1998c-). There is no currency information for plants which are not listed on the Census of Western Australian Plants, that is, for plants that are on the supplementary list (see NAME_ID).

QUAD_SHEET_NO (catalogueNumber) *Recorded in field*

A number often, but not always, recorded in the field against each plant entry onto the quadrat sheet.

SPECIMEN

A 'y' indicates a specimen was lodged with the Western Australian Herbarium (Index herbariorum code PERTH). Specimens were searched for in the Western Australian Herbarium's FloraBase Specimen Search page (Western Australian Herbarium 1998a-) by entering all or part of the quadrat name, with an asterisk wild card, in the locality field.

All quadrat names in this dataset were searched for corresponding specimens in the Western Australian Herbarium. Neither the plant name NAME, nor the NAME_UPDATE_NAME, is updated to the current (2019) taxonomic determination of the specimen.

Some herbarium specimens could not, for a variety of reasons, be connected with certainty to a record in the dataset, so it must be noted that this dataset is not comprehensive in its listing of herbarium specimens.

COLLECTORS_NO

Collector's number, chosen by the collector, and as it appears on the Western Australian Herbarium (Index herbariorum code PERTH) specimen label on FloraBase. Multiple collector's numbers are listed when more than one specimen for that species has been lodged from that quadrat.

HERB_SHEET_NO

The barcode number allocated to the specimen by the Western Australian Herbarium (Index herbariorum code PERTH) at lodgement. This number is useful for searching for the specimen on FloraBase and getting the current determination of the plant's name. The current name according to the herbarium specimen is not necessarily included in this dataset (see SPECIMEN). Multiple sheet numbers are listed when more than one specimen for that species has been lodged from that quadrat.

BASIS_OF_RECORD (basisOfRecord)

The basis of the record here is human observation.

NOTES

General notes regarding the databasing of the quadrats' flora and the taxonomy. These notes are to be regarded with caution as they can relate to issues brought up after 2010, after the taxonomy date of this dataset.

QUERY

Queries regarding the databasing of the quadrats' flora and the taxonomy. These queries are to be regarded with caution as they can relate to issues brought up after 2010, after the taxonomy date of this dataset.

CURR_QUERY

Current query, as at 2010, with 'y' = current query; 'f" = finished or resolved.

Part 2: Quadrat database tables and shapefile fields

These are the fields for tables tblWhicherScarpQuadrats_1, tblWhicherScarpQuadrats_2 and shapefile WhicherScarp.geojson (see Appendix A).

ID [id]

A unique number for the quadrat in the dataset.

QUAD [quad]

See QUAD in Part 1 above.

QUAD_GIS

Unique quadrat or relevé name, as it appears on the original GIS shapefiles created at Department of Conservation and Land Management (CALM)/Department of Environmental Protection (DEP). It can differ slightly from the equivalent quadrat name (QUAD) that is used in the floristic databases.

QUAD_ORIG_DOM_DB_WHEN_DIFF

Quadrat name as it appeared on the original dominants databases (pre-2000). Only the quadrat names that are different to QUAD are mentioned here. No dominants data from the original dominants database is presented in this dataset.

QUAD_ORIG_FLORISTIC_DB_WHEN_DIFF

Quadrat name as it appeared on the original floristic database (as reported in Gibson *et al.* 1994). Only the quadrat names that are different to QUAD are mentioned here.

STUDY_CODE [study_code]

Quadrats were surveyed as part of a number of studies or survey programmes. See Table 1 for more information on the studies.

SUB_STUDY_CODE [sub_study_]

Studies were sometimes divided into smaller subsets of quadrats and called sub-studies. See Table 1 for more information on the sub-studies.

STUDY+SUB_STUDY

Study and sub-study fields concatenated.

STUDY_CUSTODIAN (institutionCode) [study_cust]

Custodian of the dataset. This includes a person and an institution. Also see Table 1.

X [x] *Derived*

The quadrat's X coordinate in the Universal Transverse Mercator (UTM) system (mE). Some X are directly from GPS coordinates recorded in the field and some are corrected locations. Quadrats were located with variable base accuracy (see ACCURACY_M_INFERRED). See GEOREF_SOURCES and GEOREF_VERIF_STATUS for details on the processes used for placement at the level of individual quadrats.

Y [y] *Derived*

The quadrat's Y coordinate in UTM (mN). Some Y are directly from GPS coordinates recorded in the field and some are corrected locations. Quadrats were located with variable base accuracy (see ACCURACY_M_INFERRED). See GEOREF_SOURCES and GEOREF_VERIF_STATUS for details on the processes used for placement at the level of individual quadrats.

LONGITUDE (decimalLongitude) [longitude] *Derived*

The quadrat's X coordinate in decimal degrees. Some LONGITUDE are directly from GPS coordinates recorded in the field and some are corrected locations. Quadrats were located with variable base accuracy (see ACCURACY_M_INFERRED). See GEOREF_SOURCES and GEOREF_VERIF_STATUS for details on the processes used for placement at the level of individual quadrats.

LATITUDE (decimalLatitude) [latitude] *Derived*

The quadrat's Y coordinate in decimal degrees. Some LATITUDE are directly from GPS coordinates recorded in the field and some are corrected locations. Quadrats were located with variable base accuracy (see ACCURACY_M_INFERRED). See GEOREF_SOURCES and GEOREF_VERIF_STATUS for details on the processes used for placement at the level of individual quadrats.

ZONE [zone] Generated in GIS program (shapefile: *World UTM Grid*. ArcGIS Hub 2018)

World UTM grid zone.

GPS_DATUM (geodeticDatum) [gps_datum] Generated in GIS program (QGIS Development Team 2019)

The datum is GDA 94.

GPS_USED *Recorded in field*

Indication if a GPS device was used to record the location of the quadrat in the field. GPS positioning was inherently inaccurate prior to 1996, with at least 100 m inaccuracy. Some quadrat locations in X, Y, LONGITUDE and LATITUDE are simply the GPS reading made in the field but many have been corrected since that time (see GEOREF_SOURCES and GEOREF_VERIF_STATUS). Codes include n (no), u (unknown) and y (yes).

ACCURACY_M_INFERRED (coordinateUncertaintyInMetres) [accuracy_m]

Inferred accuracy of the position of the quadrat. Quadrats were located with variable base accuracy but, since many quadrats have had their position manually corrected, the accuracy of the GPS reading in the field is not necessarily relevant here. See GEOREF_SOURCES, GEOREF_VERIF_STATUS and Table 7 for more details on the refinement of quadrat positions. For this dataset, the inferred accuracy is 100 m.

GEOREF_SOURCES (georeferenceSources) [georef_sou]

Sources used, and procedures done, to check and correct quadrat locations. Also see Table 7.

GEOREF_VERIF_STATUS (georeferenceVerificationStatus) [georef_ver]

Notes on whether the quadrat location as presented here has been verified, with name of verifier when available. Location of 39% quadrats have been verified; 3% of quadrats need to be verified and 58% of quadrats have unknown verification status. Verifiers include BJ Keighery (BJK), N Thorning (NT), M Lyons (ML) and V Longman (VL).

IBRA 7.0 represents a landscape based approach to classifying the land surface of Australia into 89 biogeographic regions and 419 subregions (DAWE 2020). Each region and subregion reflects a unifying set of major environmental influences which shape the occurrence of flora and fauna.

IBRA_REG_7_CODE Generated in GIS program (shapefile: *Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions)*, DEE 2016)

Interim Biogeographical Regionalisation for Australia IBRA region 7.0 code. IBRA regions include SWA and JAF for this dataset.

Warning: IBRA boundaries on the shapefile are continually being refined and the current boundaries do not necessarily represent the situation on the ground. The IBRA region codes listed here for each quadrat, especially when the quadrats are near IBRA boundaries, may not be the same as would be interpreted by a botanist with field experience of the quadrat.

IBRA_REG_7_NAME Generated in GIS program (shapefile: *Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions)*, DEE 2016)

Interim Biogeographical Regionalisation for Australia IBRA region 7.0 name. IBRA regions include Swan Coastal Plain and Jarrah Forest for this dataset.

Warning: IBRA boundaries on the shapefile are continually being refined and the current boundaries do not necessarily represent the situation on the ground. The IBRA region names listed here for each quadrat, especially when the quadrats are near IBRA boundaries, may not be the same as would be interpreted by a botanist with field experience of the quadrat.

IBRA_SUBREG_7_CODE [ibra_sub_c] Generated in GIS program (shapefile: *Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions)*, DEE 2016)

Interim Biogeographical Regionalisation for Australia IBRA subregion 7.0 code. IBRA subregions include SWA02 and JAF02 for this dataset.

Warning: IBRA boundaries on the shapefile are continually being refined and the current boundaries do not necessarily represent the situation on the ground. The IBRA subregion codes listed here for each quadrat, especially when the quadrats are near IBRA boundaries, may not be the same as would be interpreted by a botanist with field experience of the quadrat.

IBRA_SUBREG_7_NAME [ibra_sub_n] Generated in GIS program (shapefile: *Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions)*, DEE 2016)

Interim Biogeographical Regionalisation for Australia IBRA subregion 7.0 name. IBRA subregions include Perth and Southern Jarrah Forest for this dataset.

Warning: IBRA boundaries on the shapefile are continually being refined and the current boundaries do not necessarily represent the situation on the ground. The IBRA subregion names listed here for each quadrat, especially when the quadrats are near IBRA boundaries, may not be the same as would be interpreted by a botanist with field experience of the quadrat.

The Environmental Protection Authority (EPA) recommended areas for conservation, and published them as a series of maps and text in the Red Book status report (EPA 1993) which were subsequently digitized (shapefile: DBCA 2016a). The state of Western Australia was divided into 12 broad environmental 'system' areas, each reviewed and assessed for areas of potential conservation reserves over the years 1976-1991. See Figure 0.0 in EPA (1976) and Figure 2 in Webb et al. *(2009) for a map of the System boundaries. System 6 areas were used as the basis for the Bush Forever Programme. For the System 6 areas in the Perth Metropolitan Region, updates on the implementation status as at 2000 are listed in Appendix 3 of Bush Forever (Government of Western Australia 2000b).*

SYS_CODE_GIS Generated in GIS program (shapefile: *EPA Redbook Recommended Conservation Reserves 1976-1991 (DBCA-029)*, DBCA 2016a)

System code.

Warning: A description of the shapefile warns that there are some discrepancies in the dataset and that it should be used with caution and with reference to the 1993 Red Book publication (EPA 1993).

SYS_NAME_GIS Generated in GIS program (shapefile: *EPA Redbook Recommended Conservation Reserves 1976-1991 (DBCA-029)*, DBCA 2016a)

System name.

Warning: A description of the shapefile warns that there are some discrepancies in the dataset and that it should be used with caution and with reference to the 1993 Red Book publication (EPA 1993).

SYS_AREA_NO_GIS Generated in GIS program (shapefile: *EPA Redbook Recommended Conservation Reserves 1976-1991 (DBCA-029)*, DBCA 2016a)

System bushland area number.

Warning: A description of the shapefile warns that there are some discrepancies in the dataset and that it should be used with caution and with reference to the 1993 Red Book publication.

SYS6_AREA_NO_DB

System 6 (Darling System) bushland area number as it appears on the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies.

SYS6_AREA_NAME_DB

System 6 (Darling System) bushland area name as it appears on the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies.

SYS6_AREA_NEW_NO_DB

A new suggested System 6 (Darling System) bushland area number as it appears on the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies. It is thought that this new numbering system was not implemented.

SYS6_AREA_NEW_NAME_DB

A new suggested System 6 (Darling System) bushland area number as it appears on the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies. It is thought that this new numbering system was not implemented.

Bush Forever provides a policy and implementation framework to ensure bushland protection and management issues in the Perth Metropolitan Region are appropriately addressed, securing long-term protection of biodiversity and associated environmental values (Government of Western Australia 2000a, b). See Map 4 in Government of Western Australia (2000a) for the Bush Forever site study area boundary.

BFS_NO_DB [bfs_no_db]

Bush Forever Site (BFS) number (Government of Western Australia 2000b) as it appears on the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies. It is thought this information is current as at the year 2000, at the time of publishing of Bush Forever (Government of Western Australia 2000 a, b).

BFS_NAME_DB [bfs_name_d]

Bush Forever Site (BFS) name (Government of Western Australia 2000b) as it appears on the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies. It is thought this information is current as at the year 2000, at the time of publishing of Bush Forever (Government of Western Australia 2000 a, b).

BFS_NO_GIS Generated in GIS program (shapefile: *Bush Forever Areas 2000 with names* (DEC 2009a)

Bush Forever Site (BFS) number.

BFS_NAME_GIS Generated in GIS program (shapefile: *Bush Forever Areas 2000 with names* (DEC 2009a)

Bush Forever Site (BFS) name.

The DBCA Legislated Lands and Waters dataset shows all lands and waters defined under acts which are applicable to DBCA.

DBCA_LEGISLATED_LANDS_AND_WATERS_IDENTIFIER [dbca_ident] Generated in GIS program (shapefile: *DBCA - Legislated Lands and Waters (DBCA-011).* DBCA 2017a)

Reserve number, lease number or volume and folio number to identify the land parcel.

DBCA_LEGISLATED_LANDS_AND_WATERS_CATEGORY Generated in GIS program (shapefile: *DBCA - Legislated Lands and Waters (DBCA-011).* DBCA 2017a)

DBCA tenure type.

DBCA_LEGISLATED_LANDS_AND_WATERS_TENURE Generated in GIS program (shapefile: *DBCA - Legislated Lands and Waters (DBCA-011).* DBCA 2017a)

Land tenure as held by Landgate.

DBCA_LEGISLATED_LANDS_AND_WATERS_PURPOSE Generated in GIS program (shapefile: *DBCA - Legislated Lands and Waters (DBCA-011).* DBCA 2017a)

Reserve purpose.

DBCA_LEGISLATED_LANDS_AND_WATERS_NAME [dbca_name] Generated in GIS program (shapefile: *DBCA - Legislated Lands and Waters (DBCA-011).* DBCA 2017a)

Name of tenure parcel.

The DBCA Lands of Interest dataset shows all other lands to which DBCA is recognised as the manager, but which are not vested under any Act that is adminstered by DBCA. These lands comprise of Crown land and Freehold land which DBCA has been acknowledged by the Department of Lands as the responsible agency.

DBCA_LANDS_OF_INTEREST_IDENTIFIER Generated in GIS program (shapefile: *DBCA - Lands of Interest (DBCA-012).* DBCA 2017b)

Reserve number, lease number or registration number to identify land parcel.

DBCA_LANDS_OF_INTEREST_CATEGORY Generated in GIS program (shapefile: *DBCA - Lands of Interest (DBCA-012).* DBCA 2017b)

DBCA tenure type.

DBCA_LANDS_OF_INTEREST_TENURE Generated in GIS program (shapefile: *DBCA - Lands of Interest (DBCA-012).* DBCA 2017b)

Land tenure as held by Landgate.

DBCA_LANDS_OF_INTEREST_NAME Generated in GIS program (shapefile: *DBCA - Lands of Interest (DBCA-012).* DBCA 2017b)

Name of ex pastoral Lease.

TENURE_2008 *Derived*

Tenure (BJ Keighery *et al.* 2008).

REGIONAL_PARK_2019 [regional_p] Generated in GIS program (shapefile: *Regional Parks (DBCA-026).* DBCA 2016c)

DBCA's Regional Park name. DBCA's Regional Parks Unit was set up in 1997 to coordinate the management of eight regional parks which represent the majority of land reserved for parks and recreation in the Perth Metropolitan Region.

LOCATION_HERB_SPEC_OR_COLL_BK

Location as written in the Locality field of Western Australian Herbarium specimen labels or collecting books. A collecting book is a database with Plant and Site Description, Collection Date, Collector Name and Number and GPS Location as well as a word description of Locality; these fields are taken from the quadrat sheets and are submitted to become a herbarium label upon lodgement of a new specimen at the herbarium. Collecting book information was collated by V Longman but not always submitted to the herbarium as not all specimens ended up being lodged. Source of information (collecting book or herbarium label) is also listed.

Warning: The information in this field is as it was when the corresponding specimen was lodged. Sometimes the information is outdated, for example, a quadrat may have been private property at the time of lodgement but is on land that has subsequently been acquired for conservation.

LOCATION_GRIFFIN

Location description for the Griffin study quadrats (Griffin 1994).

N/A

BUSH_AREA_WHS_REPORT [bush_area]

Location description (BJ Keighery *et al.* 2008).

FOREST_AREA_2008 [forest_are] *Derived*

Forest area, often the forest block name (BJ Keighery *et al.* 2008). Adjacent forest areas are also listed.

FOREST_AREA_GIS_2019 Generated in GIS program (shapefile: *Forest Blocks (DBCA-025).* DBCA 2016b)

Forest area. The forest block names. The boundaries are administrative boundaries by which DBCA manages its Sustainable Forest Management.

OTHER_LOCATION_INFO

Other location information. Note that there may be yet further notes about the location of quadrats and how to find them on the quadrat sheets (see QUAD_SHEET_AVAILABLE field). There is some duplication between this field and some of the other fields, particularly BUSH_AREA_WHS_REPORT.

ROAD_AND_DISTANCE_FROM_TOWN

Distance and direction from nearest gazetted road, nearby towns and various other landmarks in order to help find the quadrat. Distances are approximate.

ROAD_WHS_REPORT

Distance and direction from nearest gazetted road and nearby towns in order to help find the quadrat (BJ Keighery *et al.* 2008). There is some duplication of information between ROAD_AND_DISTANCE_FROM_TOWN and ROAD_WHS_REPORT.

SUBURB_OR_LOCALITY_2019 [suburb_or_] Generated in GIS program (shapefile: *WA Suburb/Locality Boundaries - PSMA Administrative Boundaries.* DIIS 2014)

Suburb or locality name.

LGA_2019 [lga_2019] Generated in GIS program (shapefile: *Local Government Authority (LGA) Boundaries (LGATE-233).* Landgate 2018)

Local Government Authority name.

COUNTRY

STATE

Australian state.

Swan Bioplan was a biodiversity conservation project initiated in 2004 and undertaken by the Department of Environmental Protection (DEP) and its superseding nature conservation agencies as part of the update of System 6 conservation planning on the Swan Coastal Plain. The Swan Bioplan Project identified landscape, habitat, vegetation and flora values on the Swan Coastal Plain between the Moore River and Dunsborough (excluding the Bush Forever area), and the Darling and Whicher Scarps. Using this information, regionally significant natural areas were identified in the Peel Harvey Eastern Estuary catchment (BJ Keighery et al. *2006), Whicher Scarp (BJ Keighery* et al. *2008) and Busselton Plain (Webb* et al. *2009). The study area was divided into 'sectors' for reporting purposes and bushland areas were named 'remnants'.*

SB_SECTOR Generated in GIS program (shapefile: *Busselton Plain reference areas* DEC 2009b, *Swan Bioplan working dataset* DEC 2009c, *Peel reference area* DEC 2010) with Whicher sector quadrats manually added

Swan Bioplan (SB) sector or area name. Although 13 Swan Bioplan sectors were originally defined (see Table B10), quadrats have been allocated here to only 'Busselton', 'Peel' and "Whicher' sectors. Other quadrats for which there is remnant number and name have here only been allocated to an 'Other' category.

Warning: Not all quadrats have been allocated to their corresponding sector due to lack of a suitable shapefile.

SB_REMNANT_NO Generated in GIS program (shapefile: DEC 2009b, DEC 2009c, DEC 2010)

Swan Bioplan remnant numbers. There have been two Swan Bioplan shapefiles released on the web: the spatial boundary of the Swan Bioplan Peel Sector (DWER 2016a) and the Peel Sector's regionally significant bushland areas (DWER 2016b, EPA 2010). However, these were not used to populate the SB_REMNANT_NO and SB_REMNANT_NAME fields in this dataset as they do not have remnant numbers in these shapefiles. Instead, unreleased shapefiles that also list the remnant numbers were used (DEC 2009b, DEC 2009c, DEC 2010). There are differences in the spatial boundaries between the released and unreleased shapefiles but the discrepancies are minor.

SB_REMNANT_NAME Generated in GIS program (shapefile: *Busselton Plain reference areas* DEC 2009b, *Swan Bioplan working dataset* DEC 2009c, *Peel reference area* DEC 2010)

Swan Bioplan remnant names. See more information in the SB_REMNANT_NO field.

MAP

Map name and number, when available.

Warning: This field is largely incomplete since, with the advent of the use of GPS devices, map details were not consistently recorded in the field.

The Perth Region Plant Biodiversity Project (PRPBP) was a collaboration between the Department of Environment (DoE), the Department of Conservation and Land Management (CALM) and the Western Australian Local Government Association's (WALGA) Perth Biodiversity Project. The PRPBP established reference sites in the Perth Metropolitan Region in regionally significant Bush Forever areas that represent the major variations found in plant communities on the Swan Coastal Plain and in Jarrah forests on the Darling Plateau. Extensive existing plant biodiversity information available for these reference sites (including quadrat information from floristic studies) was collected, collated, interpreted and developed to aid Local Government and others to understand, protect and manage Perth's unique biodiversity. The PRPBP has collated and made available quadrat sheets, photo reference points, species lists and maps for quadrats located in PRPBP reference sites (DoE et al. *2006a).*

PRPBP_REF_SITE_QUAD [prpbp_ref_]

Quadrats chosen to be representative of the reference sites in the Perth Region Plant Biodiversity Project (DoE *et al.* 2006a) are indicated with 'y'.

PRPBP_REF_SITE_QUAD_VEG_INFO

A vegetation description is provided for most of the Perth Region Plant Biodiversity Project's reference site quadrats (see DoE *et al.* 2006a). The quadrats for which this information is available are indicated with 'y'. See later (**VEG_DESC**) for the vegetation description.

SAMPLING_PROTOCOL (samplingProtocol) [sampling_p]

The method used to sample the plant community. The flora surveys were mainly conducted according to the protocol outlined in BJ Keighery (1994). Care was taken to locate quadrats in the least disturbed vegetation available in the area being sampled. Quadrats were squares of dimensions 10 m x 10 m, with area 100 m^2, normally permanently located with a metal stake in each of the four corners, and with rope strung around the area to delineate the boundary of the quadrat during the survey. Relevés were approximately the same size as quadrats but no ropes and no metal stakes were employed or left behind. Within each quadrat all vascular plants were recorded. In this document, for simplicity the sampling sites are all referred to as quadrats.

SAMPLE_SIZE_VALUE (sampleSizeValue) [sample_val]

A numeric value for a measure of the size of the sample (quadrat/relevé) in the survey. All are 100 here. This field is used in conjunction with the SAMPLE_SIZE_UNIT field.

SAMPLE_SIZE_UNIT (sampleSizeUnit) [sample_uni]

The unit of measurement of the size of the sample (quadrat/relevé) in the survey. All are square metre here. This field is used in conjunction with the SAMPLE_SIZE_VALUE field.

SAMPLING_EFFORT (samplingEffort)

Most quadrats were visited more than once; most relevés were visited only once. Sampling effort is mainly sourced from the quadrat sheets (occasionally from reports). See Table B11 for SAMPLING_EFFORT descriptions.

Warning: Sampling effort in this dataset will be an underestimate since revisit information was only normally, not always, recorded on the quadrat sheet. Previsits were not recorded on the quadrat sheet so may not appear in the database.

Overall about 70% of quadrats were visited at least twice. See Table B12 for a sampling effort breakdown by study for quadrats in this dataset.

The following data was recorded in the field. Field data from most but not all studies was recorded on quadrat sheets as described in the Wildflower Society of Western Australia's guide to plant community surveys (BJ Keighery 1994), or on earlier versions of quadrat sheets. The data are presented here.

A summary of further quadrat physical attribute information, not databased directly from the quadrat sheets, is available in the SITE_DESCRIPTION field.

PHYSICAL_ATTRIBUTES

Indicates if a quadrat's physical attributes recorded in the field (e.g. slope, aspect, surface and subsurface soils, vegetation condition) are available in this dataset. Normally this information has been entered from quadrat sheets; other sources can include reports when quadrat sheets weren't available. All quadrats in this dataset have physical attributes listed.

DATE01 [date01] *Recorded in field*

Date of first main survey.

DATE02 [date02] *Recorded in field*

Date of second survey.

DATE03 [date03] *Recorded in field*

Date of third survey.

BOTAN01 *Recorded in field*

Botanist (code) on the first survey. There may have been more than one botanist present but here one is chosen to be the main botanist.

BOTANIST_01 *Recorded in field*

Name of botanist on the first survey. There may have been more than one botanist present but here one is chosen to be the main botanist.

BOTAN02 *Recorded in field*

Botanist (code) on the second survey.

BOTANIST_02 *Recorded in field*

Name of botanist on the second survey.

BOTAN03 *Recorded in field*

Botanist (code) on the third survey.

BOTANIST_03 *Recorded in field*

Name of botanist on the third survey.

RECORDERS_01 *Recorded in field*

Recorders on the first survey. Recorders include all the workers at the survey, other than the main botanist recorded in BOTAN01 and BOTANIST_01.

RECORDERS_02 *Recorded in field*

Recorders on the second survey. Recorders include all the workers at the survey, other than the main botanist recorded in BOTAN02 and BOTANIST_02.

RECORDERS_03 *Recorded in field*

Recorders on the third survey. Recorders include all the workers at the survey, other than the main botanist recorded in BOTAN03 and BOTANIST_03.

PHOTO *Recorded in field*

Indicates if a representative photo of the quadrat was taken.

Warning: This field is often not completed in the field.

PHOTOGRAPHER_CODE *Recorded in field*

Photographer's name (code).

Warning: This field is often not completed in the field.

PHOTOGRAPHER *Recorded in field*

Photographer's name.

Warning: This field is often not completed in the field.

PHOTO_NO *Recorded in field*

Photograph number.

Warning: This field is often not completed in the field.

UPLAND_OR_WETLAND_CODE *Recorded in field (some)*

Upland or wetland (or variation on this) code (see Table B13). Quadrats which were revisited as part of the Perth Region Plant Biodiversity Project use a more sophisticated array of options, rather than just 'upland' or 'wetland' (definitions are in the UPLAND_OR_WETLAND_DEFINITION field).

Warning: This field is sometimes not completed in the field.

UPLAND_OR_WETLAND *Recorded in field*

Upland or wetland (or variation on this) name. See Table B13.

Warning: This field is sometimes not completed in the field.

UPLAND_OR_WETLAND_DEFINITION

Upland or wetland (or variation on this) definition. See Table B13.

SLOPE *Recorded in field*

An approximate measure of the degree of slope. See Table B14.

ASPECT *Recorded in field*

Direction of the quadrat's slope.

Generally surface soil was observed by scraping back the litter.

SOIL_SURFA_1 *Recorded in field*

Surface soil type 1 (see BJ Keighery 1994 for information on soil and how to classify it, and Table B15). Often, but not always, the first-mentioned soil (SOIL_SURFA_1) is the predominant soil type, and SOIL_SURFA_2 and SOIL_SURFA_3 are in decreasing order of dominance. Note that gravel/laterite should be, but is not always, classed as a soil rather than a rock type.

SOIL_SURFA_2 *Recorded in field*

Surface soil type 2. See SOIL_SURFA_1.

SOIL_SURFA_3 *Recorded in field*

Surface soil type 3. See SOIL_SURFA_1.

SOIL_SURFA_NOTES *Recorded in field*

Other surface soil notes, including descriptions of soils that don't fit the categories of Table B15.

SOIL_SURFA_COLOUR *Recorded in field*

Colour of the surface soil.

ROCK_EXP *Recorded in field*

Indicates if there is exposed rock on the surface.

ROCK_EXP_TYPE *Recorded in field*

Type of exposed rock.

ROCK_EXP_PCT_SURF *Recorded in field*

Percentage cover of exposed rock in the quadrat.

SOIL_SUBSURFA_1 *Recorded in field*

Sub-surface soil type 1 (see BJ Keighery 1994 for information on soil and how to classify it) and Table B15. Often, but not always, the first-mentioned soil (SOIL_SUBSURFA_1) is the predominant soil type, and SOIL_SUBSURFA_2 and SOIL_SUBSURFA_3 are in decreasing order of dominance. Note that gravel/laterite should be, but is not always, classed as a soil rather than a rock type.

SOIL_SUBSURFA_2 *Recorded in field*

Sub-surface soil type 2. See SOIL_SUBSURFA_1.

SOIL_SUBSURFA_3 *Recorded in field*

Sub-surface soil type 3. See SOIL_SUBSURFA_1.

SOIL_SUBSURA_NOTES *Recorded in field*

Other sub-surface soil notes, including descriptions of soils that don't fit the categories of Table B15.

SOIL_SUBSURA_COL *Recorded in field*

Colour of the sub-surface soil.

ROCK_SUBSURFA *Recorded in field*

Indicates if there is any sub-surface rock.

ROCK_SUBSURFA_TYPE *Recorded in field*

Type of sub-surface rock.

DEPTH_TO_ROCK_CM *Recorded in field*

Depth (in centimetres) to the sub-surface rock.

DRAINAGE *Recorded in field*

The ability of the site to drain after rain. This relates to soil type as well as topography. See Table B16 for the classes of drainage used.

WATER_DEPTH_CM *Recorded in field*

Depth (in centimetres) of free-standing water in the quadrat.

WET *Recorded in field*

The duration through the year of surface water and/or waterlogged soils. The options suggested are permanent (all year) or temporary (winter or winter/spring).

LITTER_PCT *Recorded in field*

A visual estimate of litter cover in percentage cover classes (see Table B17).

LITTER_DEPTH_CM *Recorded in field*

Depth of the litter. It is normally expressed in centimetres or in layers of leaves.

BARE_GROUND_PCT *Recorded in field*

A visual estimate of the amount of the quadrat with no litter cover over it, in percentage cover classes (see Table B17).

SITE_DESCRIPTION

A description of the quadrat's physical attributes including slope, aspect, soil, drainage, all summarised in the one field. There are several sources of site description in the dataset (see SITE_DESCRIPTION_SOURCE). The field SITE_DESCRIPTION boosts the number of quadrats for which there is physical attribute information available because not all quadrat sheets have always been databased.

SITE_DESCRIPTION_SOURCE

The source of the site description that is listed in the SITE_DESCRIPTION field. Sources in this dataset include Western Australian Herbarium specimen labels and collecting books (see LOCATION_HERB_SPEC_OR_COLL_BK field for an explanation of collecting books).

NOTES *Recorded in field*

Further notes regarding physical attributes of the quadrat, especially when the information doesn't fit any of the previously listed fields or field codes. For example, precise percentages (rather than ranges) for litter and bare ground covers.

VEG_DESC

Vegetation description for the quadrat, from various sources and in various styles which are described in VEG_DESC_SOURCE and VEG_DESC_STYLE. Normally, but not always, layers of vegetation in the quadrat are described according to growth form, height, cover and dominant species. The taxonomy of the species in the vegetation description normally, but not always, matches the taxonomy in this dataset.

VEG_DESC_SOURCE

Vegetation description sources in this dataset include Western Australian Herbarium specimen labels, reports and collecting books (see LOCATION_HERB_SPEC_OR_COLL_BK field for an explanation of collecting books).

VEG_DESC_STYLE

Vegetation descriptions presented in this dataset are according to the structural classification system developed by BJ Keighery (1994, adapted from Muir 1977 and Aplin 1979) in which up to twenty layers can be described with respect to growth form, height, cover and dominant species (see Table B18). Even the earlier quadrats which had vegetation descriptions originally described in the style of Muir (1977, see Table B19) have been reconciled for this study to follow Keighery. Normally many less than twenty layers are described. See BJ Keighery (1994) for more information on describing vegetation.

VEG_DESC_STYLE_REF

The reference for the vegetation description style listed in VEG_DESC_STYLE. The main references are Muir (1977) and BJ Keighery (1994, adapted from Muir 1977 and Aplin 1979).

MAP_UNIT_CODE

Mapping unit code. Mapping units normally differentiate areas based on vegetation, underlying geology or hydrology. The code is normally composed of a few letters to define the location then a few letters to define the dominant species, geology or hydrology conditions. Although there are mapping units recorded on some of the quadrat sheets, very few of the units have been databased.

MAP_UNIT_DESC *Derived*

A mapping unit full description. Mapping units normally differentiate areas based on vegetation, underlying geology or hydrology.

VEG_COND_CODE *Recorded in field*

Vegetation condition code according to BJ Keighery (1994) which rates the impact of disturbance on vegetation structure and floristics, and consequently on the ability of the community to regenerate. See Table B20 for the BJ Keighery (1994) vegetation condition scale.

VEG_COND *Recorded in field*

Vegetation condition according to BJ Keighery (1994) which rates the impact of disturbance on vegetation structure and floristics, and consequently on the ability of the community to regenerate. See Table B20.

VEG_COND_NOTES *Recorded in field*

Notes that contributed to the decision on vegetation condition. These can be notes regarding weed invasion, grazing or fire.

WEED_PCT *Recorded in field*

A visual estimate of weed cover, in percentage cover classes (see Table B17). Weed percentage cover has been recorded for 19% of quadrats in this dataset.

Warning: Weed percent is seldom recorded as this field doesn't appear on all versions of the quadrat sheet. Weed notes on the newer versions of the quadrat sheet are normally recorded as part of VEG_COND_NOTES.

WEED_NOTES *Recorded in field*

Weed notes have been recorded for 31% of quadrats in this dataset.

Warning: Weed notes are seldom recorded in the field as it doesn't appear on all versions of quadrat sheet. Weed notes on the newer versions of the quadrat sheet are normally recorded as part of VEG_COND_NOTES.

DIEBACK *Derived*

Phytophthora dieback status in or adjacent to the quadrat. This was interpreted from quadrat sheets and field knowlege by GJ Keighery and BJ Keighery (BJ Keighery *et al.* 2008).

TOPO_POS *Derived*

Topographic position. See Table B21. This gives a general landscape position on the Whicher Scarp and was determined after consideration of the slope, aspect, surface and subsurface soil and any rock substrate recorded at each quadrat (BJ Keighery *et al.* 2008).

SOIL_UNCON *Derived*

Unconsolidated soil. These include sand, loam/clay or a combination of sand & loam &/or clay (BJ Keighery *et al.* 2008). Like TOPO_POS, SOIL_UNCON was determined after consideration of relevant attributes recorded at each quadrat (BJ Keighery *et al.* 2008).

SOIL_CON *Derived*

Consolidated soil. These include gravel/laterite and ironstone (BJ Keighery *et al.* 2008). Like TOPO_POS, SOIL_CON was determined after consideration of relevant attributes recorded at each quadrat (BJ Keighery *et al.* 2008).

SOIL_COL *Derived*

Soil colour. Like TOPO_POS, this field was determined after consideration of relevant attributes recorded at each quadrat (BJ Keighery *et al.* 2008).

ROCKS_SURF_SUBSURF *Derived*

Surface or sub-surface rock presence. Like TOPO_POS, this field was determined after consideration of relevant attributes recorded at each quadrat (BJ Keighery *et al.* 2008).

MLU_CODE_2006 *Derived*

Major landform unit code as it was in 2006 in the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation

agencies. See MLU_2006 for its corresponding unit name. See Table B22. MLU_CODE_2006 is listed for 90% of quadrats in this dataset.

Warning: The source of the data in this field is currently unreferenced. There are inconsistencies between this field and other MLU fields.

MLU_2006 *Derived*

Major landform unit as it was in 2006 in the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies. See Table B22 and MLU_CODE_2006 for more information.

Warning: The source of the data in this field is currently unreferenced. There can be inconsistencies between this field and other MLU fields in this dataset. Take MLU_2008 as the most correct out of MLU_2006, MLU_2008 and MLU_2010.

MLU_2008 *Derived*

Major landform unit as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008).

MLU_CODE_2010 *Derived*

Major landform unit code as it was in 2010 in the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies. See MLU_2010 for its corresponding unit name. See Table B22. MLU_CODE_2010 is listed for 83% of quadrats in this dataset.

Warning: The source of the data in this field is currently unreferenced. There can be inconsistencies between this field and other MLU fields in this dataset. Take MLU_2008 as the most correct out of MLU_2006, MLU_2008 and MLU_2010.

MLU_2010 *Derived*

Major landform unit as it was in 2010 in the database maintained by the Department of Conservation and Land Management (CALM) and the Department of Environmental Protection (DEP) and their superseding nature conservation agencies. See Table B22 and MLU_CODE_2010 for more information.

Warning: The source of the data in this field is currently unreferenced. There can be inconsistencies between this field and other MLU fields in this dataset. Take MLU_2008 as the most correct out of MLU_2006, MLU_2008 and MLU_2010.

SOILS_SUBSYSTEM_MAPPING_UN_CODE_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map unit code in 2007 in the Whicher Scarp study (BJ Keighery *et al.* 2008). In BJ Keighery *et al.* (2008) the field is Subsystem MAPPING_UN. See Table B23. The field SOILS_SUBSYSTEM_MAPPING_UN_CODE_2007 is equivalent to 2019's field SOILS_SUBSYSTEM_MU_SYMBOL_2019.

SOILS_SUBSYSTEM_MU_RANK_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map rank or level in the map unit hierarachy in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). Values include phase, subsystem and system. In BJ Keighery *et al.* (2008) the field is MU_RANK.

SOILS_SUBSYSTEM_MU_NAME_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map unit name in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). In BJ Keighery *et al.* (2008) the field is MU_NAME. This field SOILS_SUBSYSTEM_MU_NAME_2007 is equivalent to 2019's field SOILS_SUBSYSTEM_MU_NAME_2019.

SOILS_SUBSYSTEM_MU_STATUS_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map unit status in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). Values include current, provisional or discontinued. In BJ Keighery *et al.* (2008) the field is MU_STATUS.

SOILS_SUBSYSTEM_MU_SUM_DESC_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem summary map unit description in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). It is a text description of the characteristics of the map unit including brief descriptions of landform/geomophology, geology, soils, vegetation and location. In BJ Keighery *et al.* (2008) the field is MU_SUM_DESC. This field SOILS_SUBSYSTEM_MU_SUM_DESC_2007 is equivalent to 2019's field SOILS_SUBSYSTEM_MU_SUM_DESC_2019.

SOILS_SUBSYSTEM_MU_LFORM_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map unit landform description in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). In BJ Keighery *et al.* (2008) the field is MU_LFORM.

SOILS_SUBSYSTEM_MU_GEOL_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map unit geology description in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). In BJ Keighery *et al.* (2008) the field is MU_GEOL.

SOILS_SUBSYSTEM_MU_SOIL_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map unit soil description in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). In BJ Keighery *et al.* (2008) the field is MU_SOIL.

SOILS_SUBSYSTEM_MU_VEG_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map unit vegetation description in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). In BJ Keighery *et al.* (2008) the field is MU_VEG.

SOILS_SUBSYSTEM_MU_LOCAT_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem map unit location description in 2007 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). In BJ Keighery *et al.* (2008) the field is MU_LOCAT.

SOILS_SUBSYSTEM_EXTRACTED_2007 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Soil-landscape mapping in South-Western Australia.* DAFWA 2007)

Soil-landscape subsystem mapping extraction date (3/04/2007) in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). In BJ Keighery *et al.* (2008) the field is EXTRACTED.

SOILS_SUBSYSTEM_MU_SYMBOL_2019 Generated in GIS program (shapefile: *Soil Landscape Mapping - Best Available (DPIRD-027)* DPIRD 2019)

Soil-landscape subsystem map unit symbol in 2019. See Table B23 for a description of the map unit code or symbol. This field SOILS_SUBSYSTEM_MU_SYMBOL_2019 is equivalent to 2007's field SOILS_SUBSYSTEM_MAPPING_UN_CODE_2007.

SOILS_SUBSYSTEM_MU_ID_2019 Generated in GIS program (shapefile: *Soil Landscape Mapping - Best Available (DPIRD-027)* DPIRD 2019)

Soil-landscape subsystem map unit unique polygon identifier in 2019.

SOILS_SUBSYSTEM_MU_NAME_2019 Generated in GIS program (shapefile: *Soil Landscape Mapping - Best Available (DPIRD-027)* DPIRD 2019)

Soil-landscape subsystem map unit name in 2019. This field SOILS_SUBSYSTEM_MU_NAME_2019 is equivalent to 2007's field SOILS_SUBSYSTEM_MU_NAME_2007.

SOILS_SUBSYSTEM_MU_SUM_DESC_2019 Generated in GIS program (shapefile: *Soil Landscape Mapping - Best Available (DPIRD-027)* DPIRD 2019)

Soil-landscape subsystem summary map unit description in 2019. It is a text description of the characteristics of the map unit including brief descriptions of landform/geomophology, geology, soils, vegetation and location. This field SOILS_SUBSYSTEM_MU_SUM_DESC_2019 is equivalent to 2007's field SOILS_SUBSYSTEM_MU_SUM_DESC_2007.

ENV_GEOL_CODE_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: unknown but references include Anon 1981 and 1982, Belford 1987a and b, Jordan 1986, Leonard 1991)

Environmental and urban geology code as it was in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). Each code can have more than one description (see Table B24). In BJ Keighery *et al.* (2008) the field is EnvGeol CODE.

RFA_VEG_COMP_CODE_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Mapping of Vegetation Complexes in the South West forest region of Western Australia*. CALM 1998)

Regional Forest Agreement vegetation complex mapping unit code as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B25. In BJ Keighery *et al.* (2008) the field is rfaVEGCOMP.

RFA_VEG_CLASS_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Mapping of Vegetation Complexes in the South West forest region of Western Australia*. CALM 1998)

Regional Forest Agreement vegetation class code as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B25. In BJ Keighery *et al.* (2008) the field is VEG_CLASS.

RFA_ZONE_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Mapping of Vegetation Complexes in the South West forest region of Western Australia*. CALM 1998)

Regional Forest Agreement zone as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B25. In BJ Keighery *et al.* (2008) the field is ZONE.

RFA_UNIT_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Mapping of Vegetation Complexes in the South West forest region of Western Australia*. CALM 1998)

Regional Forest Agreement unit as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B25. In BJ Keighery *et al.* (2008) the field is UNIT.

RFA_VEG_DESC_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Mapping of Vegetation Complexes in the South West forest region of Western Australia*. CALM 1998)

Regional Forest Agreement vegetation complex description as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B25. In BJ Keighery *et al.* (2008) the field is VEGDESC. Taxonomy does not necessarily match the taxonomy of this dataset.

RFA_VEG_NAME_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: *Mapping of Vegetation Complexes in the South West forest region of Western Australia*. CALM 1998)

Regional Forest Agreement vegetation complex name as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B25. In BJ Keighery *et al.* (2008) the field is VEGNAME.

HEDDLE_VEG_TYPE_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: Vegetation of the Darling System after Heddle EM, Loneragan OW and Havel JJ 1980. DCE 1990)

Heddle vegetation type mapping unit as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B26. In BJ Keighery *et al.* (2008) the field is HeddleVEGTYPE.

HEDDLE_VEG_TYPE_STRUCTURE_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: Vegetation of the Darling System after Heddle EM, Loneragan OW and Havel JJ 1980. DCE 1990)

Heddle vegetation type structure description as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B26. In BJ Keighery *et al.* (2008) the field is STRUCTURE.

HEDDLE_VEG_TYPE_ZONE_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: Vegetation of the Darling System after Heddle EM, Loneragan OW and Havel JJ 1980. DCE 1990)

Heddle vegetation type zone as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B26. In BJ Keighery *et al.* (2008) the field is ZONE.

HEDDLE_VEG_TYPE_UNIT_2008 Generated in GIS program as reported in BJ Keighery *et al.* (2008) (shapefile: Vegetation of the Darling System after Heddle EM, Loneragan OW and Havel JJ 1980. DCE 1990)

Heddle vegetation type unit as it was in 2008 in the report on the Whicher Scarp (BJ Keighery *et al.* 2008). See Table B26. In BJ Keighery *et al.* (2008) the field is UNIT.

VEG_COMP_SCP_VEG_TYPE_2019 Generated in GIS program (shapefile: *Vegetation Complexes - Swan Coastal Plain (DBCA_046).* DBCA 2016d)

Swan Coastal Plain vegetation complex as at 2019. Vegetation complexes are those defined by Heddle *et al.* (1980), and include the area of the Swan Coastal Plain south of Lancelin, with an extension in the far southern section of the Plain recently added by Webb *et al.* (2016). Swan Coastal Plain vegetation complex has been recorded for 29% of quadrats in this dataset. See Table B27.

VEG_COMP_SCP_STRUCTURE_2019 Generated in GIS program (shapefile: *Vegetation Complexes - Swan Coastal Plain (DBCA_046).* DBCA 2016d)

Swan Coastal Plain vegetation complex structure description as at 2019. Vegetation complexes are those defined by Heddle *et al.* (1980), and include the area of the Swan Coastal Plain south of Lancelin, with an extension in the far southern section of the Plain recently added by Webb *et al.* (2016). See Table B27.

VEG_COMP_SCP_UNIT_2019 Generated in GIS program (shapefile: *Vegetation Complexes - Swan Coastal Plain (DBCA_046).* DBCA 2016d)

Swan Coastal Plain vegetation complex unit name as at 2019. Vegetation complexes are those defined by Heddle *et al.* (1980), and include the area of the Swan Coastal Plain south of Lancelin, with an extension in the far southern section of the Plain recently added by Webb *et al.* (2016). See Table B27.

VEG_COMP_SW_FOREST_VEG_TYPE_2019 Generated in GIS program (shapefile: *Vegetation Complexes - South West forest region of Western Australia (DBCA-047).* DBCA 2016e)

South west forest region of Western Australia vegetation complex as at 2019. Vegetation complexes result from mapping undertaken by Mattiske and Havel (1998) and the area covered includes the south west forest region, beyond the RFA boundary, as updated by Webb *et al.* (2016). See Table B28. South west forest region of Western Australia vegetation complex has been recorded for 71% of quadrats in this dataset.

VEG_COMP_SW_FOREST_ZONE_2019 Generated in GIS program (shapefile: *Vegetation Complexes - South West forest region of Western Australia (DBCA-047).* DBCA 2016e)

South west forest region of Western Australia vegetation complex zone as at 2019. Vegetation complexes result from mapping undertaken by Mattiske and Havel (1998) and the area covered includes the south west forest region, beyond the RFA boundary, as updated by Webb *et al.* (2016). See Table B28.

VEG_COMP_SW_FOREST_SUBCAT_2019 Generated in GIS program (shapefile: *Vegetation Complexes - South West forest region of Western Australia (DBCA-047).* DBCA 2016e)

South west forest region of Western Australia vegetation complex broad landform as at 2019. Vegetation complexes result from mapping undertaken by Mattiske and Havel (1998) and the area covered includes the south west forest region, beyond the RFA boundary, as updated by Webb *et al.* (2016). See Table B28.

SUITABLE_FOR_ANALYSIS [suitable_f]

The quadrat's suitability for analysis. Features that determine whether results from a survey of a quadrat can be analysed include correct sampling protocol; correct quadrat location (within a single vegetation community, rather than on the interface between two communities; correct placement in bush that is not too disturbed or too weedy); timing (annuals are present and preferably the majority of plants are flowering); and sufficient survey effort (see BJ Keighery 1994, EPA 2016). All quadrats in this dataset are suitable for analysis.

ANALYSED [analysed]

The quadrat has been analysed using multivariate analysis in a major study. All quadrats in this dataset have been analysed (Gibson *et al.* 1994, Government of Western Australia 2000b, BJ Keighery *et al.* 2008). See SWAFCT and WHSFCT for the allocation of floristic community types resulting from this analysis.

SWAFCT [swafct] *Derived*

Swan Coastal Plain floristic community type code. Some quadrats in this dataset have SWAFCTs listed. These resulted from analysis of flora from a detailed survey of the Swan Coastal Plain south of the Gingin Brook (Gibson *et al.* 1994) and analysis of a further group of quadrats for the System 6 and Part System 1 Update Program (DEP 1996; Government of Western Australia 2000b). In total, 66 SWAFCTs are now recognised (see Table 3 and Table 5). About 35% of quadrats in this dataset have been allocated a SWAFCT code. Note that species reconciliations were done before analysis to account for nomenclature differences and for taxa groups known to have been confused or potentially confused in the field and between studies (Gibson *et al.* 1994).

Warning: Plant names presented here are not as in the dataset analysed by Gibson et al. *(1994) nor as in the System 6 and Part System 1 Update Program dataset analysed for Bush Forever (DEP 1996). It would be very difficult to reconcile all the taxonomic changes that have occurred over time to allow floristic community type analysis so consequently it is advised that this dataset not be used for such analysis.*

INFERRED_SWAFCT *Derived*

Inferred Swan Coastal Plain Floristic Communiy Type code.

N/A

WHSFCT [whsfct] *Derived*

Whicher Scarp floristic community type code. These result from analysis of results from a detailed survey of these Whicher Scarp quadrats (BJ Keighery *et al.* 2008). In total, 20 WHSFCTs are recognised (see Table 3 and Table 4). All quadrats in this dataset have been allocated a WHSFCT code. Note that species reconciliations were done before analysis to account for nomenclature differences and for taxa groups known to have been confused or potentially confused in the field and between studies (BJ Keighery *et al.* 2008).

WHS_SP_LIST

The quadrat's floristic survey results contributed to the Whicher Scarp species list in the Whicher Scarp report (Appendix 5 in BJ Keighery *et al.* 2008). About 71% of quadrats in this dataset contribute to the Whicher Scarp species list. Not all quadrats in this dataset contributed to this list because some quadrats from outside the boundary of the Whicher Scarp were included in the analysis for comparison.

no. *Derived*

The number of native taxa in the quadrat (taken from the analysis dataset; see Appendix 2a in BJ Keighery *et al.* 2008). There are between 7 and 97 native taxa recorded in the quadrats.

Wd *Derived*

The number of weed taxa in the quadrat (taken from the analysis dataset; see Appendix 2a in BJ Keighery *et al.* 2008). There are between 0 and 17 weed taxa recorded in the quadrats.

S. *Derived*

The number of singleton native taxa (taken from the analysis dataset; see Appendix 2a in BJ Keighery *et al.* 2008). There are between 0 and 10 singleton native taxa recorded in the quadrats.

R. *Derived*

The number of native taxa in 2, 3 or 4 quadrats (taken from the analysis dataset; see Appendix 2a in BJ Keighery *et al.* 2008). There are between 0 and 23 native taxa in 2, 3 or 4 quadrats recorded in the quadrats.

C. *Derived*

The number of native taxa in greater than 50 quadrats from analysis dataset (taken from the analysis dataset; see Appendix 2a in BJ Keighery *et al.* 2008). There are between 0 and 21 native taxa in greater than 50 quadrats recorded in the quadrats.

QUAD_SHEET_AVAILABLE

A copy of the quadrat sheet is available from the DBCA Library or the custodian of the dataset. All of the quadrat sheets are available for this dataset.

ENTERED_FM

The source from which the floristic data was entered. About 35% of the quadrats in this dataset were already databased and given to V Longman from N Gibson, M Lyons and BJ Keighery prior to 2000. Over the following decade, V Longman made

updates to these databases under direction of BJ and GJ Keighery. About 65% of the quadrats in this dataset were entered from quadrat sheets by V Longman.

DB_QUAD_EXTRACTED_FROM_2020

The database from which V Longman extracted the data in the creation of this dataset.

2020_DATASET [2020_datas]

Code indicates to which dataset and subgroup the record belongs (see Table B29).

2020_TO_GIVE_TO_NATUREMAP

Codes used to distinguish datasets and groupings within the datasets. See Table B29.

APPENDIX B TABLES

Table B1. Growth form codes, descriptions and key.

Taken from BJ Keighery *et al.* (2008).

GROWTH_FORM_1_CODE	GROWTH_FORM_1_DESCRIPTION
Woody Plants	
T	Tree
M	Mallee
M/T	Mallee or tree
SH	Shrub
SH/T	Shrub or tree
SH-H	Shrub which is often called a herb
Non-woody Plants: non-grass-like	
H	Herb
H/SH	Herb or shrub
H-SH	Herb which is often called a shrub
Non-woody Plants: grass-like	
G	Grass
S-C	Sedge - Centrolepidaceae, Cyperaceae, Hydatellaceae or Juncaginaceae
S-J	Sedge - Juncaceae, Typhaceae or Xyridaceae
S-R	Sedge - Anarthriaceae or Restionaceae.

Key to growth form descriptions follow. Definitions are adapted from BJ Keighery (1994), McDonald *et al.* (1990) and Executive Steering Committee for Australian Vegetation Information (2003).

WOODY PLANTS
Plants with special thick-walled cells in their trunks and stems that form wood to support the plant. Trees are able to build up layer upon layer of this woody support tissue to form trunks and branches. All woody plants are perennial.

Tree	Plants with a single trunk and a canopy. The canopy is less than or equal to two thirds of the height of the trunk. No lignotuber is evident.
Mallee	Plants with many trunks (usually 2-5) arising from a lignotuber. The canopy is usually well above the base of the plant. Most are from the genus Eucalyptus.
Shrub	Plants with one or more woody stems and foliage all or part of the total height of the plant. Includes palms, grass trees (*Xanthorrhoea* and *Kingia* species) and cycads (*Zamia* species).
Shrub-Herb	Shrub that appears herb-like. Plants with a woody stem/s that is lax enough to give the shrub a non-woody herb-like appearance, often called sub-shrubs.

NON-WOODY PLANTS
Plants with no (or insufficient) special thick-walled support cells in their stems to form wood for support. May be either annuals or perennials. Sub-divided according to growth form, pollination method and plant family.

NON-WOODY PLANTS – NON GRASS-LIKE	**Generally not pollinated by wind, monocots and dicots**
Herb	Plants with non-woody stems that are not grasses or sedges. Generally under half a metre tall. Most monocots are herbs except for the larger ones which are classed as shrubs such as palms, grass trees (*Xanthorrhoea* and *Kingia* species) and cycads (*Zamia* species).
Herb-Shrub	Herb that appears shrub-like. Plants with non-woody stems that are stiff enough to give the herb a woody shrub-like appearance, often called sub-shrubs.
NON-WOODY PLANTS – GRASS-LIKE	**Generally pollinated by wind and from the families Poaceae, Cyperaceae, Centrolepidaceae, Hydatellaceae, Juncaginaceae, Restionaceae, Juncaceae, Typhaceae or Xyridaceae.**
Grasses	**Leaf sheath always split, ligule present, leaf usually flat, stem cross-section circular, evenly spaced internodes.**
Grass	Tufted or spreading plants from the family Poaceae. Some species form hummocks but none of these occur in south-west Western Australia.
Sedges	**Leaf sheath never split (except in some Restionaceae), usually no ligule, leaf not always flat, extended internode below inflorescence.**
Sedge – Cyperaceae and others	Tufted or spreading plants from the families Cyperaceae, Centrolepidaceae, Hydatellaceae or Juncaginaceae.
Sedge – Juncaceae and others	Tufted or spreading plants from the families Juncaceae, Typhaceae or Xyridaceae. Some of these are also called rushes.
Sedge – Restionaceae	Tufted or spreading plants from the family Restionaceae. Commonly called rushes.

Table B2. Further growth form codes and descriptions.

Taken from BJ Keighery *et al.* (2008).

GROWTH_FORM_2_CODE	GROWTH_FORM_2_DESCRIPTION	Notes
CL	Climber	A plant in need of other plants or objects for support.
PR	Prostrate	Spreading plants, often supported by the ground.

Table B3. Life form codes and descriptions.

Taken from BJ Keighery *et al.* (2008).

LIFE_FORM_CODE	LIFE_FORM_DESCRIPTION
A	Annual
A/A2	Annual or biennial
A2	Biennial
P	Perennial
A/P	Annual or perennial
PAA	Perennial annually renewed from above ground part
PAB	Perennial annually renewed from below ground part
PAA/A	Perennial annually renewed from above ground part or annual
A-PAR	Annual - parasite or semi-parasite
P-PAR	Perennial - parasite or semi-parasite

Table B4. Life form codes and descriptions.

Taken from BJ Keighery *et al.* (2008).

LIFE_FORM_AQUATICS_CODE	LIFE_FORM_AQUATICS_DESCRIPTION	Notes
AQD	Aquatic – damp flowering	Grows in water, flowers in damp mud
AQE	Aquatic – emergent	Grows and flowers in water with some parts emergent above water (e.g. leaves, flowers)
AQF	Aquatic – floating	Whole plant floats on water
AQS	Aquatic – supported	Grows and flowers in water with most parts supported by water (e.g. leaves); flowers may be emergent above water

Table B5. Categories used to define the conservation status of flora taxa at state level, under the *Wildlife Conservation Act 1950*.

Categories are defined in Atkins (2006, 2008) and are listed here in the style of the era 2005-2010. This table is taken from BJ Keighery *et al.* (2008). Note, the need for further survey of poorly known taxa is prioritised into the three categories depending on the perceived urgency for determining the conservation status of those taxa, as indicated by the apparent degree of threat to the taxa based on the current information.

CONSV_CODE_STATUS_2008	Description
R	**R Declared Rare Flora – Extant Taxa** Taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.
X	**X Declared Rare Flora - Presumed Extinct Taxa** Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such.
1	**P1 Priority One - Poorly Known Taxa** Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey
2	**P2 Priority Two - Poorly Known Taxa** Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey
3	**P3 Priority Three - Poorly Known Taxa** Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.
4	**P4 Priority Four – Rare Taxa** Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
C	Taxa recently removed from the list of conserved flora.

Table B6. Conservation codes (including ranking) for Western Australian Flora.

From Smith and Jones (2018), DBCA (2019).

CONSV_CODE_STATUS_2019	Description
T	**T: Threatened Flora (Declared Rare Flora - Extant)** Specially protected under the Wildlife Conservation Act 1950, listed under Schedules 1, 2 and 3 of the Wildlife Conservation (Rare Flora) Notice (which may also be referred to as Declared Rare Flora). Taxa which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of these species is based on their national extent. Threatened flora are ranked according to their level of threat using IUCN Red List categories and criteria. For example Acacia splendens is specially protected as Declared Rare Flora under the Wildlife Conservation Act 1950 and is a threatened species with a ranking of Critically Endangered. Ranking: CR · Schedule 1 - taxa that are extant and considered likely to become extinct or rare, as critically endangered flora, and therefore in need of special protection. EN · Schedule 2 - taxa that are extant and considered likely to become extinct or rare, as endangered flora, and therefore in need of special protection. VU · Schedule 3 - taxa that are extant and considered likely to become extinct or rare, as vulnerable flora, and therefore in need of special protection.
X	**X: Presumed extinct Flora (Declared Rare Flora - Extinct)** Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 4 of the Wildlife Conservation (Rare Flora) Notice (which may also be referred to as Declared Rare Flora). Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such. EX · Schedule 4 - taxa that are presumed to be extinct in the wild and therefore in need of special protection. A list of the current rankings can be downloaded from the Department of Biodiversity, Conservation and Attractions Threatened Species and Communities webpage at http://dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/.
	Taxa that may be threatened or near threatened, but are data deficient or have not yet been adequately surveyed to be listed under the Wildlife Conservation (Rare Flora) Notice, are added to the Priority Flora List under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status, so that consideration can be given to their declaration as threatened flora. Taxa that are adequately known and are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These taxa require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
1	**1: Priority One: Poorly-known species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations, but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
2	**2: Priority Two: Poorly-known species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations, but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
3	**3: Priority Three: Poorly-known species** Species that are known from several locations, and the species do not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations, but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
4	**4: Priority Four: Rare, Near Threatened and other species in need of monitoring** (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation

	Dependent, but that are close to qualifying for Vulnerable. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy. * Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies, variety or forma).

Table B7. Categories used to define the conservation status of flora taxa at an international level, according to the *IUCN Red List of Threatened Species.*

Source is IUCN (2001). This table is taken from BJ Keighery *et al*. (2008).

CONSV_CODE_RANK_2008 (2019)	Description
EX	**Extinct** A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycles and life form.
EW	**Extinct In The Wild** A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
CR	**Critically Endangered** A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.
E (EN)	**Endangered** A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.
V (VU)	**Vulnerable** A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.
NT	**Near Threatened** A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
LC	**Least Concern** A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
DD	**Data Deficient** A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.
NE	**Not Evaluated** A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

Table B8. Categories used to define the conservation status of flora taxa at the Commonwealth level, under the *Environment Protection and Biodiversity Conservation Act 1999.*

Categories are defined in Section 179 of the EPBC Act (Commonwealth of Australia 2007). This table is taken from BJ Keighery *et al*. (2008). In some instances, the codes for the CONSV_CODE_EPBC_2008 and the CONSV_CODE_RANK_2008 for a taxon differ; in these cases, the discrepancy is indicated by an asterisk in the 'CONSV_CODE_EPBC_2008' field.

CONSV_CODE_EPBC_2008 (2019)	Commonwealth Flora Conservation Codes
EX	**Extinct** A native species is eligible to be included in the Extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
EW	**Extinct In The Wild** A native species is eligible to be included in the Extinct In The Wild category at a particular time if, at that time: a. it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or b. it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CR	**Critically Endangered** A native species is eligible to be included in the Critically Endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E (EN)	**Endangered** A native species is eligible to be included in the Endangered category at a particular time if, at that time: a. it is not critically endangered; and b. it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
V (VU)	**Vulnerable** A native species is eligible to be included in the Vulnerable category at a particular time if, at that time: a. it is not critically endangered or endangered; and b. it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent** A native species is eligible to be included in the Conservation Dependent category at a particular time if, at that time: a. the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or b. the following subparagraphs are satisfied: i. the species is a species of fish; ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory; iv. cessation of the plan of management would adversely affect the conservation status of the species.

Table B9. Other categories of significance.

This table is taken from BJ Keighery *et al.* (2008).

OTHER_SIGNIFICANCE	Description
z	Recently recognised taxa
	Significant due to geographical location
r	Populations at the northern (N) or southern (S) limit of their known geographic range, limit indicated as follows Example: r (N or S, Locality, Region)
d	Populations disjunct from their known geographic range
P	Poorly reserved as is known from only a few populations in reserves (applies to all Declared Rare Flora and Priority taxa)
s	Significant populations in reference to location, population size, diversity of ages and/or health (applies to all Declared Rare Flora and Priority taxa)
u	Uncommon in the area (generally applies to disjunct populations)
	Taxa with regional and/or ecological preferences
	Endemic taxa
e	Local endemic, less than 100 km range, not in a particular region/landform unit
e(AREA)	AREA after Map 3 (Biogeographic region or subregion) **SWA** Swan Coastal Plain (Swan Coastal Plain) **SWA(B)** Busselton area of the Swan Coastal Plain (Swan Coastal Plain) **WHS** Whicher Scarp (Jarrah Forest South) **BP** Blackwood Plateau (Jarrah Forest South) **SC** Scott Coastal Plain (Warren) **MP** Margaret River Plateau (Warren and Jarrah Forest South) **JF** Jarrah Forest (Jarrah Forest)
Ne	Extends well north from WHS
Se	Extends well south from WHS (and adjacent Busselton Plain at times)
	Taxa with ecological preferences
h	Taxa with distinct habitat preference Example: h (ironstone)
a	Relictual species (monotypic genera are annotated)
	Taxa with morphological and/or genetic variation
v	Morphological variant, unsure of significance at taxonomic level
t	Morphological variant, significant taxonomically
g	Genetic variant

Table B10. Swan Bioplan sectors.

PMR = Perth Metropolitan Region. SSWA01 = southern SWA01 Interim Biogeographic Regionalisation for Australia (IBRA) subregion. SSWA02 = southern SWA02 IBRA subregion. NSWA01 = northern SWA01 IBRA subregion. NSWA02 = northern SWA02 IBRA subregion. N = north.

SB_SECTOR	Sector name	Sector Description
BUNB	Bunbury Sector	Capel River to S boundary Peel Region (Planning)
BUSS	Busselton Sector	Busselton Plain (N boundary Capel River)
BW	Blackwood Sector	Blackwood Plateau outside Whicher Sector
DAND	Dandaragan Plateau Sector	Dandaragan Plateau
DARL	Darling Sector	Darling Scarp
NPMR-DAND	Northern Perth Metropolitan Region (NPMR) - Dandaragan Plateau Sector	Dandaragan Plateau (SSWA01) part of NPMR; Dandaragan Plateau N from PMR to System 6 N boundary
NPRM-not DAND	Northern Perth Metropolitan Region (NPMR) - Non-Dandaragan Plateau Sector	Non-Dandaragan Plateau (SSWA02) part of NPMR; SSWA02 N from PMR to System 6 N boundary
NSWA-DAND	Northern Swan Coastal Plain - Dandaragan Plateau Sector	NSWA01
NSWA-not DAND	Northern Swan Coastal Plain - Non-Dandaragan Plateau Sector	NSWA02
PEEL	Peel Sector	Peel Region (Planning)
PMR	Perth Metropolitan Region (PMR) - Non-Dandaragan Plateau Sector	Non-Dandaragan Plateau (SSWA02) part of Bush Forever area (minus the Wilbinga-Caraban area to the north of Perth)
PMR-DAND	Perth Metropolitan Region (PMR) - Dandaragan Plateau Sector	Dandaragan Plateau (SSWA01) part of Bush Forever area
WH	Whicher Sector	Whicher Scarp

Table B11. Sampling effort code and description.

SAMPLING_EFFORT	Description
pre	Previsit - a reconnaisance trip during which time some species information may or may not be collected.
survey	Main survey, ideally in spring.
revisit	Revisit during the same calendar year as the main survey. This gives the opportunity to record or collect specimens that may flower or seed later in the year; having flowering or fruiting material helps in the quadrat to distinguish plants that might otherwise be unnoticeable and it also helps with the process of plant identification.
revisit + revisit	Sometimes there were two revisits after the main survey, during the same year as the main survey. This could be for particularly diverse quadrats, or for wet quadrats where access was difficult or when flowering, which requires the quadrat to dry out sufficiently, is slower than expected.
foll yr	Revisit during the year after the survey.
foll yr + foll yr	Revisits twice in the following year.
2 yrs later	Revisit 2 years after the main survey.
X yrs later	Revisit X years later.

Table B12. Number of quadrat visits by study.

Visit percentages are very likely to be underestimates since revisit information is not always recorded on the quadrat sheet. BJ Keighery's estimates are also included (bracketed) as they give an idea of the more accurate visitation rates.

STUDY	>1 visit	1 visit
SB	45%	55%
SB/WSBPS	83%	17%
SCP	78%	22%
SYS6ENV2	14%	86%
OVERALL	**71% (>66%)**	**29%**

Table B13. Upland and wetland codes, definitions and sources of information.

UPLAND_OR_WETLAND_CODE	UPLAND_OR_WETLAND	UPLAND_OR_WETLAND_DEFINITION	Source of upland or wetland information for the quadrat
t	Upland wet patch	Upland wet patch	quadrat sheets
u	Upland	Areas not subject to seasonal and/or intermittent waterlogging and/or inundation, these lands are also called drylands (on rare occasions an upland area may contain a wetland)	quadrat sheets and/or PRPBP (DoE *et al.* 2006)
u/(w)	Upland/(Wetland)	Community predominantly contains upland species but a few typical wetland dependant species are also present	PRPBP (DoE *et al.* 2006)
u/w	Upland/Wetland	Community predominantly contains upland species, species characteristic of both wetland and upland conditions and wetland dependant species	PRPBP (DoE *et al.* 2006)
w	Wetland	Areas subject to seasonal and/or intermittent waterlogging and/or inundation	quadrat sheets and/or PRPBP (DoE *et al.* 2006)
w/(u)	Wetland/(Upland)	Community predominantly contains wetland dependant species but a few more typical upland species are present	PRPBP (DoE *et al.* 2006)
w/u	Wetland/Upland	Community predominantly contains wetland dependant species but upland species are also present	PRPBP (DoE *et al.* 2006)
wiu	Wet Depression in Upland	Wet Depression in Upland	PRPBP (DoE *et al.* 2006)

Table B14. Slope classes.

Adapted from BJ Keighery *et al.* (1994).

SLOPE
Flat
Very gentle
Gentle
Moderate
Steep

Table B15. Common soil types.

SOIL_TYPE
Clay
Clayey loam
Clayey sand
Gravel/laterite
Loam
Loamy clay
Loamy sand
Sand
Sandy clay
Sandy loam

Table B16. Drainage classes.

Some or all of these may be used in this dataset. Taken from BJ Keighery (1994).

DRAINAGE
Well
Well-moderate
Moderate
Moderate-poor
Poor

Table B17. Cover classes.

Taken from BJ Keighery 1994.

COVER CLASSES
<2%
2-10%
10-30%
30-70%
>70%

Table B18. Vegetation structural classes.

According to BJ Keighery (1994), as adapted from Muir (1977) and Aplin (1979). Each row indicates a different vegetation layer.

Growth Form/Height Class	Canopy Cover			
	100-70%	**70-30%**	**30-10%**	**10-2%**
Trees over 30m	Closed Tall Forest **CTF**	Open Tall Forest **OTF**	Tall Woodland **TW**	Open Tall Woodland **OTW**
Trees 10-30m	Closed Forest **CF**	Open Forest **OF**	Woodland **W**	Open Woodland **OW**
Trees under 10m	Closed Low Forest **CLF**	Open Low Forest **OLF**	Low Woodland **LW**	Open Low Woodland **OLW**
Mallee over 8m (Tree Mallee)	Closed Tree Mallee **CTM**	Tree Mallee **TM**	Open Tree Mallee **OTM**	Very Open Tree Mallee **VOTM**
Mallee under 8m (Shrub Mallee)	Closed Shrub Mallee **CSM**	Shrub Mallee **SM**	Open Shrub Mallee **OSM**	Very Open Shrub Mallee **VOSM**
Shrubs over 2m	Closed Scrub **CSC**	Open Scrub **OSC**	Tall Shrubland **TS**	Open Tall Shrubland **OTS**
Shrubs 1-2m	Closed Heath **CH**	Open Heath **OH**	Shrubland **S**	Open Shrubland **OS**
Shrubs under 1m	Closed Low Heath **CLH**	Open Low Heath **OLH**	Low Shrubland **LS**	Open Low Shrubland **OLS**
Grasses	Closed Grassland **CG**	Grassland **G**	Open Grassland **OG**	Very Open Grassland **VOG**
Herbs	Closed Herbland **CHB**	Herbland **HB**	Open Herbland **OHB**	Very Open Herbland **VOHB**
Sedges	Closed Sedgeland **CSG**	Sedgeland **SG**	Open Sedgeland **OSG**	Very Open Sedgeland **VOSG**
Ferns	Closed Fernland **CFL**	Fernland **FL**	Open Fernland **OFL**	Very Open Fernland **VOFL**
Climbers	Closed Climbers **CC**	Climbers **C**	Open Climbers **OC**	Very Open Climbers **VOC**

Table B19. Vegetation strucutural classes.

According to Muir (1977).

	Density Class (Canopy Cover)			
Life Form/Height Class	**Dense 70-100%**	**Mid-dense 30-70%**	**Sparse 10-30%**	**Very Sparse 2-10%**
Trees >30m	Dense Tall Forest	Tall Forest	Tall Woodland	Open Tall Woodland
Trees 15-30m	Dense Forest	Forest	Woodland	Open Woodland
Trees 5-15m	Dense Low Forest A	Low Forest A	Low Woodland A	Open Low Woodland A
Trees <5m	Dense Low Forest B	Low Forest B	Low Woodland B	Open Low Woodland B
Mallee tree form	Dense Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Mallee shrub form	Dense Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs >2m	Dense Thicket	Thicket	Scrub	Open Low Scrub A
Shrubs 1.5-2.0m	Dense Heath A	Heath A	Low Scrub A	Open Low Scrub B
Shrubs 1.0-1.5m	Dense Heath B	Heath B	Low Scrub B	Open Dwarf Scrub C
Shrubs 0.5-1.0m	Dense Low Heath C	Low Heath C	Dwarf Scrub C	Open Dwarf Scrub D
Shrubs 0.0-0.5m	Dense Low Heath D	Low Heath D	Dwarf Scrub D	Open Scrub
Mat Plants	Dense Mat Plants	Mat Plants	Open Mat Plants	Very Open Mat Plants
Hummock Grass	Dense Hummock Grass	Mid-dense Hummock Grass	Hummock Grass	Open Hummock Grass
Bunch Grass >0.5m	Dense Tall Grass	Tall Grass	Open Tall Grass	Very Open Tall Grass
Bunch Grass <0.5m	Dense Low Grass	Low Grass	Open Low Grass	Very Open Low Grass
Herbaceous spp.	Dense Herbs	Herbs	Open Herbs	Very Open Herbs
Sedges >0.5m	Dense Tall Sedges	Tall Sedges	Open Tall Sedges	Very Open Tall Sedges
Sedges <0.5m	Dense Low Sedges	Low Sedges	Open Low Sedges	Very Open Low Sedges

Table B20. Vegetation condition scale.

According to BJ Keighery (1994).

VEG_COND_CODE	VEG_COND	Description
1	**Pristine**	Pristine or nearly so, no obvious signs of disturbance.
2	**Excellent**	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
3	**Very Good**	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4	**Good**	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
5	**Degraded**	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
6	**Completely Degraded**	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Table B21. Topographic position.

Taken from BJ Keighery *et al*. (2008).

TOPO_POS
Blackwood Plateau
Blackwood Plateau riverine
Darling Scarp
Foothills breakaway
Foothills mid-slope
Foothills ridge
Foothills riverine
Foothills/Darling plateau
Foothilss lower-slope
Swan Coastal Plain
Whicher lower-slope
Whicher mid-slope
Whicher riverine
Whicher upper-slope

Table B22. Major landform units.

Not all major landform units (MLU) are shown (this is a subset only) and not all MLU shown here are necessarily used in this dataset.

MLU_CODE	MLU
BD	Bassendean Dunes
BP	Blackwood Plateau
DP	Dandaragan Plateau
DS	Darling Scarp
E	Estuarine
F	Foothills
GCWS	Geographe Coastal Wetland System
GS	Gingin Scarp
M	Marine
MRP	Margaret River Plateau
PP	Pinjarra Plain
QD	Quindalup Dunes
R	Rivers
REC	Rivers, estuarine and creeks
River	River
SD	Spearwood Dunes
W	Wetlands
WHS	Whicher Scarp

Table B23. Symbols used for map unit labels, showing the map unit hierarchy.

Relates to the fields SOILS_SUBSYSTEM_MAPPING_UN_CODE_2007 and SOILS_SUBSYSTEM_MU_SYMBOL_2019. Adapted from Table 2.3 (Purdie *et al.* 2004).

Level	Unit rank	Unit code or symbol	Examples	
1	Region	single-digit number	**2**	**2**
2	Province	single-digit number	2**5**	2**1**
3	Zone	single-digit number	25**6**	21**5**
4	System	2 characters, alpha, title case	256**Jc**	215**Sr**
5	Subsystem	2 characters, numeric or alpha upper case	256Jc_**3**	215Sr**BL**
6	Phase	Up to 13 characters, alphanumeric	256Jc_3**d**	215SrBL**wy**

Table B24. Environmental Urban Geology.

Not all attributes are shown (this is a subset only) and not all attributes shown here are necessarily used in this dataset. Taken from Appendix 2a in BJ Keighery *et al.* (2008). Codes are not unique.

ENV_GEOL_CODE_ORIG	DESCRIPTION	REFERENCE
Anb	Quartz-feldspar-biotite (-garnet) gneiss ARCHAEAN	Harvey-Lake Preston Sheet part Sheets 2031 I and 2031 IV, Urban Geology Series (Anon 1982)
Csg	GRAVELLY SANDY CLAY - variable with lenses of silt and gravel quartz sand sub-angular with eolian rounded component heavy minerals common gravel rounded of colluvial origin	Serpentine Sheet part of Sheets 2033 II and 2133 III Environmental Geology Series (Jordan 1986)
Czc	Lateritic conglomerate PHANEROZOIC CAINOZOIC? TERTIARY	Harvey-Lake Preston Sheet part Sheets 2031 I and 2031 IV, Urban Geology Series (Anon 1982)
Czl	Laterite massive or pisolitic	Bunbury - Burekup Sheet 2031 III - 2031 II, Urban Geology Series (Anon 1981)
Czl	Laterite massive or pisolitic PHANEROZOIC CAINOZOIC	Bunbury - Burekup Sheet 2031 III - 2031 II, Urban Geology Series (Anon 1981)
Czll	Laterite lower level PHANEROZOIC CAINOZOIC	Bunbury - Burekup Sheet 2031 III - 2031 II, Urban Geology Series (Anon 1981)
FS3	IRONSTONE - red-brown limonitic gravel cemented in a limonite quartz sand matrix of alluvial origin	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
G2	GRAVEL - brown and reddish brown ferruginous pisolitic occasionally cemented in a clay silt matrix moderately sorted	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
G2	GRAVEL - brown and reddish brown ferruginous pisolitic; occasionally cemented in a clay silt matrix moderately sorted of colluvial origin	Busselton Sheet 1930 I, 1:50 000 Environmental Geology Series (Belford 1987a)
LA1	LATERITE - massive and cemented occasionally vesicular up to c. 4 m in thickness overlies a zone of mottled and/or pallid clays sometimes overlain by a ferruginous gravel set in a clay-sand matrix	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
LA1	LATERITE - massive and cemented; occasionally vesicular; up to c. 4 m in thickness overlies a zone of mottled and/or pallid clays sometimes overlain by a ferruginous gravel set in a clay-sand matrix	Busselton Sheet 1930 I, 1:50 000 Environmental Geology Series (Belford 1987a)
Mgs3	GRAVELLY SILT - ferruginous gravel set in a clay sand mix of colluvial and residual origin	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
Qc	Colluvium some eluvial soils	Bunbury - Burekup Sheet 2031 III - 2031 II, Urban Geology Series (Anon 1981)
Qc	Colluvium some eluvial soils PHANEROZOIC CAINOZOIC QUATERNARY	Bunbury - Burekup Sheet 2031 III - 2031 II, Urban Geology Series (Anon 1981)
Qpb	BASSENDEAN SAND: low rounded dunes	Bunbury - Burekup Sheet 2031 III - 2031 II, Urban Geology Series (Anon 1981)
Qpb	BASSENDEAN SAND; low rounded dunes	Harvey-Lake Preston Sheet part Sheets 2031 I and 2031 IV, Urban Geology Series (Anon 1982)
Qpry	YOGANUP FORMATION: younger element	Bunbury - Burekup Sheet 2031 III - 2031 II, Urban Geology Series (Anon 1981)
Qpry	YOGANUP FORMATION: younger element PHANEROZOIC CAINOZOIC QUATERNARY	Bunbury - Burekup Sheet 2031 III - 2031 II, Urban Geology Series (Anon 1981)
S10	SAND over SILT and SANDY SILT - sand as S8 overlying silts and sandy silts	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
S12	SAND - white medium- to very coarse-grained sub-rounded to rounded quartz; well sorted; local concentrations of heavy minerals CAINOZOIC QUATERNARY PLEISTOCENE	Yallingup Sheet 1930 IV and part Sheet 1830 I, 1:50 000 Environmental Geology Series (Leonard 1991)
S5	SAND - very pale brown medium to coarse-grained well sorted little fines sub-angular to rounded quartz and feldspar of colluvial origin	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
S6	SAND - light grey fine to coarse angular to sub-rounded quartz with some feldspar moderately sorted loose of elluvial origin modified by colluvial processes	Busselton Sheet 1930 I, 1:50 000 Environmental Geology Series (Belford 1987a)
S6	SAND - light grey fine to coarse angular to sub-rounded quartz with some feldspar moderately sorted loose of elluvial origin modified by colluvial processes	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
S6	SAND - light grey fine- to coarse-grained angular to sub-rounded quartz with some feldspar; moderately sorted loose CAINOZOIC	Yallingup Sheet 1930 IV and part Sheet 1830 I, 1:50 000 Environmental Geology Series (Leonard 1991)

ENV_GEOL_CODE_ORIG	DESCRIPTION	REFERENCE
	QUATERNARY PLEISTOCENE	
S8	SAND - very light grey at surface yellow at depth fine to medium-grained sub-rounded quartz local concentrations of heavy minerals local development of coffee rock moderately well sorted	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
S8	SAND - very light grey at surface yellow at depth fine- to medium-grained sub-rounded quartz; moderately well sorted; local concentrations of heavy minerals local development of coffee rock	Yallingup Sheet 1930 IV and part Sheet 1830 I, 1:50 000 Environmental Geology Series (Leonard 1991)
Sm6	SILTY SAND - red-brown fine to medium-grained angular to rounded sand quartz variable silt content occasional occurrence of pisolitic gravels	Busselton Sheet 1930 I, 1:50 000 Environmental Geology Series (Belford 1987a)
Sm6	SILTY SAND - red-brown fine to medium-grained angular to rounded sand quartz variable silt content occasional occurrence of pisolitic gravels	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
Smg1	GRAVELLY SANDY SILT - dark yellowish brown tough silty medium to coarse quartz sand in places is abundant medium to coarse-grained pisolitic laterite (G2) pebbles	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)
Spc1	CLAYEY PEATY SAND - grey to black quartz sand with variable organic content minor clays of lacustrine origin	Capel Sheet 2030 IV, 1:50 000 Environmental Geology Series (Belford 1987b)

Table B25. Regional Forest Agreement attributes.

Not all attributes are shown (this is a subset only) and not all attributes shown here are necessarily used in this dataset. This table was created from CALM (1998), as reported in BJ Keighery *et al.* (2008).

RFA_VEG_COMP_CODE_2008	RFA_VEG_CLASS_2008	RFA_ZONE_2008	RFA_UNIT_2008	RFA_VEG_DESC_2008	RFA_VEG_NAME_2008
Abba (AB)	AB	Swan Coastal Plain	Uplands	Woodland and open forest of Corymbia calophylla on flats and low rises in the humid zone.	Abba
Abba (Ad)	Ad	Swan Coastal Plain	Uplands	Woodland of Corymbia calophylla-Agonis flexuosa-Allocasuarina fraseriana-Nuytsia floribunda on mild slopes in the humid zone.	Abba
Abba (AF)	AF	Swan Coastal Plain	Valleys and Swamps	Woodland of Corymbia calophylla-Agonis flexuosa and tall shrubland of Myrtcaeae-Proteaceae spp. on terraces and valley floors in the humid zone.	Abba
Abba (Aw)	Aw	Swan Coastal Plain	Valleys and Swamps	Mosaic of tall shrubland of Melaleuca viminea and woodland of Eucalyptus rudis-Melaleuca rhaphiophylla with occasional Corymbia calophylla on broad depressions in the humid zone.	Abba
Cartis (CSs)	CSs	Blackwood Plateau and Plain	Uplands	Low open forest to open forest of Eucalyptus marginata subsp. marginata-Corymbia calophylla-Corymbia haematoxylon with some Banksia attenuata and Xylomelum occidentale on slopes of escarpment in the humid zone.	Cartis
Darling Scarp (DS)	DS	Darling Plateau	Uplands	Mosaic of open forest of Eucalyptus marginata subsp. marginata-Corymbia calophylla, with some admixtures with Eucalyptus laeliae in the north (subhumid zone), with occasional Eucalyptus marginata subsp. elegantella (mainly in subhumid zone) and Corymbia haematoxylon in the south (humid zone) on deeper soils adjacent to outcrops, woodland of Eucalyptus wandoo (subhumid and semiarid zones), low woodland of Allocasuarina huegeliana on shallow soils over granite outcrops, closed heath of Myrtaceae-Proteaceae species and lithic complex on or near granite outcrops in all climate zones.	Darling Scarp
Forrestfield (Fo)	Fo	Swan Coastal Plain	Uplands	Mosaic of open forest of Corymbia calophylla-Eucalyptus wandoo-Eucalyptus marginata subsp. elegantella and open forest of Eucalyptus marginata subsp. marginata.	Forrestfield
Jalbaragup (JL)	JL	Blackwood Plateau and Plain	Valleys	Open forest of Eucalyptus marginata subsp. marginata-Corymbia calophylla-Eucalyptus patens on slopes with some Eucalyptus rudis on broad terraces in perhumid and humid zones.	Jalbaragup
Kingia (KI)	KI	Blackwood Plateau and Plain	Uplands	Open forest of Eucalyptus marginata subsp. marginata-Corymbia calophylla-Allocasuarina fraseriana-Banksia grandis-Xylomelum occidentale on lateritic uplands in perhumid and humid zones.	Kingia
Rosa (RO)	RO	Blackwood Plateau and Plain	Valleys	Woodland to open forest of Corymbia calophylla-Eucalyptus marginata subsp. marginata-Xylomelum occidentale on slopes and tall shrubland of Agonis linearifolia in valley floors in the humid zone.	Rosa
Treeton (T)	T	Blackwood Plateau and Plain	Uplands	Woodland of Eucalyptus marginata subsp. marginata-Corymbia calophylla with some Allocasuarina fraseriana on mild slopes in the perhumid zone.	Treeton
Treeton (Tw)	Tw	Blackwood Plateau and Plain	Valleys	Open forest of Eucalyptus patens-Corymbia calophylla-Eucalyptus marginata subsp. marginata on lower slopes and on floors of minor valleys in the perhumid zone.	Treeton
Whicher Scarp (WCv)	WCv	Blackwood Plateau and Plain	Uplands	Open forest of Eucalyptus marginata subsp. marginata-Corymbia calophylla with some Xylomelum occidentale on valleys dissecting escarpment in the humid zone.	Whicher Scarp
Whicher Scarp (WC)	WC	Blackwood Plateau and Plain	Uplands	Open forest of Eucalyptus marginata subsp. marginata-Corymbia calophylla on escarpment with some Corymbia haematoxylon, Banksia attenuata and Xylomelum occidentale in the humid zone.	Whicher Scarp
Yelverton (Y)	Y	Blackwood Plateau and Plain	Uplands	Woodland of Eucalyptus marginata subsp. marginata-Corymbia calophylla-Allocasuarina fraseriana-Agonis flexuosa and open woodland of Corymbia calophylla on low undulating uplands in the humid zone.	Yelverton

RFA_VEG_COMP_CODE_2008	RFA_VEG_CLASS_2008	RFA_ZONE_2008	RFA_UNIT_2008	RFA_VEG_DESC_2008	RFA_VEG_NAME_2008
Yelverton (Yd)	Yd	Blackwood Plateau and Plain	Uplands	Woodland of Allocasuarina fraseriana-Eucalyptus marginata subsp. marginata-Xylomelum occidentale-Banksia attenuata on sandy slopes in the humid zone.	Yelverton
Yelverton (Yw)	Yw	Blackwood Plateau and Plain	Valleys	Woodland of Allocasuarina fraseriana-Nuytsia floribunda-Agonis flexuosa-Banksia attenuata on slopes and open forest of Corymbia calophylla-Eucalyptus patens-Eucalyptus marginata subsp. marginata on the lower slopes and Eucalyptus rudis-Melaleuca rhaphiophylla on the valley floors in the humid zone.	Yelverton

Table B26. Heddle vegetation complex types and geomorphology.

Not all attributes are shown (this is a subset only) and not all attributes shown here are necessarily used in this dataset. The table is created from DCE (1990), as reported in BJ Keighery *et al.* (2008).

HEDDLE_VEG_TYPE_ORIG	HEDDLE_VEG_TYPE_STRUCTURE	HEDDLE_VEG_TYPE_ZONE	HEDDLE_VEG_TYPE_UNIT
Abba Complex	OPEN FOREST AND WOODLAND	SWAN COASTAL PLAIN	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Bassendean Complex-Central And\South	WOODLAND TO LOW WOODLAND AND SEDGELANDS	SWAN COASTAL PLAIN	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Cartis Complex	LOW OPEN FOREST TO OPEN FOREST	BLACKWOOD PLATEAU	BLACKWOOD PLATEAU - SCARPS
Dardanup Complex	MOSAIC OF VEGETATION TYPES FROM ADJACENT COMPLEXES	SWAN COASTAL PLAIN	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Darling Scarp Complex	LOW OPEN WOODLAND TO LICHENS	DARLING PLATEAU	DARLING PLATEAU - MAJOR VALLEYS FLOORS AND SCARPS
Forrestfield Complex	OPEN FOREST AND FRINGING WOODLAND	SWAN COASTAL PLAIN	SWAN COASTAL PLAIN - RIDGE HILL SHELF
Guildford Complex	OPEN FOREST TO TALL OPEN FOREST AND WOODLAND	SWAN COASTAL PLAIN	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Jarrahwood Complex	OPEN FOREST AND WOODLAND	BLACKWOOD PLATEAU	BLACKWOOD PLATEAU - VALLEYS
Karrakatta Complex-Central And\South	OPEN FOREST AND WOODLAND	SWAN COASTAL PLAIN	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Kingia Complex	OPEN FOREST	BLACKWOOD PLATEAU	BLACKWOOD PLATEAU - LATERITIC UPLANDS
Preston Complex	FRINGING WOODLAND	BLACKWOOD PLATEAU	BLACKWOOD PLATEAU - VALLEYS
Southern River Complex	OPEN WOODLAND	SWAN COASTAL PLAIN	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS

Table B27. Vegetation complexes, structure and unit names.

Not all vegetation complexes shown here are necessarily used in this dataset. Created from DBCA (2016d).

VEG_COMP_SCP_VEG_TYPE_2019	VEG_COMP_SCP_VEG_STRUCTURE_2019	VEG_COMP_SCP_VEG_UNIT_2019
Abba Complex	OPEN FOREST AND WOODLAND	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Bassendean Complex-Central and South	WOODLAND TO LOW WOODLAND AND SEDGELANDS	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Bassendean Complex-Central and South Transition	WOODLAND AND CLOSED SCRUB	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Bassendean Complex-North	LOW OPEN FOREST AND LOW WOODLAND AND SEDGELANDS	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Bassendean Complex-North Transition	LOW OPEN FOREST AND LOW WOODLAND	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Beermullah Complex	LOW OPEN FOREST AND OPEN WOODLAND	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Bootine Complex	LOW OPEN FOREST	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Caladenia Complex	MOSAIC OF VEGETATION FROM ADJACENT VEGETATION COMPLEXES	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Cannington Complex	MOSAIC OF VEGETATION FROM ADJACENT COMPLEXES	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Cartis Complex	LOW OPEN FOREST TO OPEN FOREST	SWAN COASTAL PLAIN - UPLAND
Coonambidgee Complex	LOW OPEN FOREST AND LOW WOODLAND TO OPEN WOODLAND	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Cottesloe Complex-Central and South	WOODLAND AND OPEN FOREST AND CLOSED HEATH	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Cottesloe Complex-North	LOW OPEN FOREST AND LOW WOODLAND AND CLOSED HEATH	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Cullula Complex	LOW OPEN FOREST AND OPEN WOODLAND	DANDARAGAN PLATEAU - LATERITIC UPLANDS
Dardanup Complex	MOSAIC OF VEGETATION TYPES FROM ADJACENT COMPLEXES	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Forrestfield Complex	OPEN FOREST AND FRINGING WOODLAND	SWAN COASTAL PLAIN - RIDGE HILL SHELF
Gingin Complex	OPEN WOODLAND	DANDARAGAN PLATEAU - SCARPS
Guildford Complex	OPEN FOREST TO TALL OPEN FOREST AND WOODLAND	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Herdsman Complex	SEDGELANDS AND FRINGING WOODLAND	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Karamal Complex-North	OPEN WOODLAND	DANDARAGAN PLATEAU - LATERITIC UPLANDS
Karamal Complex-South	OPEN FOREST	DANDARAGAN PLATEAU - LATERITIC UPLANDS
Karrakatta Complex-Central and South	OPEN FOREST AND WOODLAND	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Karrakatta Complex-North	LOW OPEN FOREST AND LOW WOODLAND	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Karrakatta Complex-North Transition	LOW OPEN FOREST AND LOW WOODLAND	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Mogumber Complex-North	OPEN TO CLOSED HEATH	DANDARAGAN PLATEAU - LATERITIC UPLANDS
Mogumber Complex-South	OPEN WOODLAND	DANDARAGAN PLATEAU - LATERITIC UPLANDS
Moondah Complex	LOW CLOSED FOREST AND LOW OPEN FOREST	DANDARAGAN PLATEAU - VALLEYS
Moore River	FRINGING WOODLAND	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Mungala Complex	OPEN WOODLAND TO CLOSED SCRUB	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Pinjar Complex	WOODLAND TO FRINGING WOODLAND	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Quindalup Complex	COASTAL DUNE COMPLEX - LOW CLOSED FOREST AND CLOSED	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS

VEG_COMP_SCP_VEG_TYPE_2019	VEG_COMP_SCP_VEG_STRUCTURE_2019	VEG_COMP_SCP_VEG_UNIT_2019
	SCRUB	
Reagan Complex	LOW OPEN WOODLAND TO CLOSED HEATH	DANDARAGAN PLATEAU - SCARPS
Serpentine River Complex	CLOSED SCRUB AND FRINGING WOODLAND	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Southern River Complex	OPEN WOODLAND	SWAN COASTAL PLAIN - AEOLIAN DEPOSITS
Swan Complex	FRINGING WOODLAND WITH LOCALIZED OCCURRENCE OF LOW OPEN FOREST	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Vasse Complex	CLOSED SCRUB FRINGING WOODLAND AND OPEN FOREST	SWAN COASTAL PLAIN - MARINE DEPOSITS
Wannamal Complex	LOW SHRUBLAND AND OPEN WOODLAND	DANDARAGAN PLATEAU - LATERITIC UPLANDS
Yanga Complex	CLOSED SCRUB AND LOW OPEN FOREST	SWAN COASTAL PLAIN - FLUVIATILE DEPOSITS
Yoongarillup Complex	WOODLAND TO TALL WOODLAND AND OPEN FOREST	SWAN COASTAL PLAIN - MARINE DEPOSITS

Table B28. South west forest region of Western Australia vegetation complex vegetation types, zones and subcategories.

Created from DBCA (2016d). This table is not the complete set of vegetation complex mapping attributes available and covers more than the range in this dataset.

VEG_COMP_SW_FOREST_VEG_TYPE_2019	VEG_COMP_SW_FOREST_ZONE_2019	VEG_COMP_SW_FOREST_SUBCAT_2019
Coolakin	Darling Plateau	Valleys
Darling Scarp	Darling Plateau	Uplands
Jalbaragup	Blackwood Plateau and Plain	Valleys
Kingia	Blackwood Plateau and Plain	Uplands
Michibin	Darling Plateau	Valleys
Murray 1	Darling Plateau	Valleys
Nooning	Darling Plateau	Valley Floors and Swamps
Rosa	Blackwood Plateau and Plain	Valleys
Treeton	Blackwood Plateau and Plain	Uplands
Treeton	Blackwood Plateau and Plain	Valleys
Whicher Scarp	Whicher Scarp	Uplands
Williams	Darling Plateau	Valley Floors and Swamps
Wilyabrup	Margaret River Plateau	Valleys
Yalanbee	Darling Plateau	Uplands
Yelverton	Whicher Scarp	Uplands
Yelverton	Whicher Scarp	Valleys

Table B29. Codes and descriptions of the datasets and dataset subgroups.

Data previously submitted to NatureMap and data to be submitted in 2020 are indicated. Previously submitted data includes BJ Keighery *et al.* (2012) and BJ Keighery *et al.* (2008).

2020_DATASET and reference	Dataset subgroup 2020_TO_GIVE_TO_NATUREMAP codes	Lodged with previous datasets (2008, 2012)	Notes	No. of quadrats	Analysed SWAFCT Gibson *et al.* (1994)	Analysed WHSFCT BJ Keighery *et al.* (2008)	To be lodged in 2020
SouthernSCP BJ Keighery *et al.* (2020a)	2012	BJ Keighery *et al.* 2012		1060	Y	N	Y
SouthernSCP, WhicherScarp BJ Keighery *et al.* (2020a), BJ Keighery *et al.* (2020b)	2012, WHS	BJ Keighery *et al.* 2012, BJ Keighery *et al.* 2008		38	Y	Y	Y
SouthernSCP BJ Keighery *et al.* (2020a)	2012-Add-NSFA	no	Quadrats not in 2012 dataset as not suitable for analysis.	7	N	N	Y
SouthernSCP BJ Keighery *et al.* (2020a)	2012-Add-Perm	no	Quadrats not in 2012 dataset as permission was needed before publication.	6	Y	N	Y
SouthernSCP BJ Keighery *et al.* (2020a)	2012-Add-Revisit	no	These are the results of revisits 14-18 years after the original visits.	13	N	N	Y
SouthernSCP BJ Keighery *et al.* (2020a)	2012-Add-Unk	no	Quadrats not in 2012 dataset for unknown reasons.	16	N	N	Y
SouthernSCP BJ Keighery *et al.* (2020a)	2012-Private	BJ Keighery *et al.* 2012 but locations not published on NatureMap	Quadrat locations not in 2012 dataset as on private property (the data itself was in 2012 dataset but not the X, Y coordinates).	17	Y	N	Y
SouthernSCP, WhicherScarp BJ Keighery *et al.* (2020a), BJ Keighery *et al.* (2020b)	2012-Private, WHS-Private	BJ Keighery *et al.* 2012, BJ Keighery *et al.* 2008 but locations not published on NatureMap	Quadrat locations not in 2008/2012 dataset as on private property (the data itself was in 2008/2012 dataset but not the X, Y coordinates).	6	Y	Y	Y
SwanBioplan BJ Keighery *et al.* (2020c)	SB	no		172	N	N	Y
WhicherScarp BJ Keighery *et al.* (2020b)	WHS	BJ Keighery *et al.* 2008		72	N	Y	Y
WhicherScarp BJ Keighery *et al.* (2020b)	WHS-Private	BJ Keighery *et al.* 2008 but locations not published on NatureMap	Quadrat locations not in 2008 dataset as on private property (the data itself was in the 2008 dataset but not the X, Y coordinates).	14	N	Y	Y
WSWASCP BJ Keighery *et al.* (2020d)	WSBPS_Misc	no		45	N	N	Y
WSWAWheatbelt BJ Keighery *et al.* (2020e)	WSBPS_Wheatbelt	no		100	N	N	Y

APPENDIX C: Metadata for the database and the shapefile

Part 1: Database metadata

GENERAL OVERVIEW	
Database title:	A floristic survey of the Whicher Scarp dataset: 2020 version
Database name:	WhicherScarp.accdb
Custodian:	Karen Clarke, Department of Biodiversity, Conservation and Attractions
Creator:	Vanda Longman, Wildflower Society of Western Australia
Date created:	23-05-2020
CONTENT DESCRIPTION	
Abstract:	Flora and other attributes for a series of floristic studies conducted between 1992 and 2006 on the Whicher Scarp, Western Australia.
Subjects:	Floristic surveys of the Whicher Scarp; flora and other attributes of 124 quadrats surveyed as part of floristic studies on and near the Whicher Scarp; floristic community type analysis of Whicher Scarp plant communities
Search word:	CALM, DBCA, Department of Biodiversity, Conservation and Attractions, Department of Conservation and Land Management, DEP, Department of Environmental Protection, flora, floristics, IBRA SWA Bioregion, plant, plant communities, plant survey, plot, quadrat, south-west, South West, Swan Bioplan, Swan Coastal Plain, Western Australia, WHSFCT, Whicher Scarp, Whicher Scarp floristic community types, Wildflower Society of Western Australia.
Location:	Mainly Interim Biogeographic Regionalisation for Australia (IBRA) Swan Coastal Plain (SWA) bioregion (IBRA SWA02 subregion) on and near the Whicher Scarp
Method:	This database is derived from the one accompanying the report A Floristic Survey of the Whicher Scarp (BJ Keighery *et al*. 2008) and presents the results of more than ten years survey by the Departments of Environmental Protection (DEP) and Conservation and Land Management (CALM) and their superseding nature conservation agencies, and the Wildflower Society of Western Australia (Inc.). It combines the results of a number of floristic studies (see Table 1) conducted on plant communities on and near the Whicher Scarp on the Interim Biogeographic Regionalisation for Australia (IBRA) Swan Coastal Plain Bioregion and on the Darling and Whicher Scarp portions of the Jarrah Forest Bioregion (DAWE 2020). The main studies included are A Floristic Survey of the southern Swan Coastal Plain (Gibson *et al.* 1994), the System 6 and Part System 1 Update Program (DEP 1996) and the Swan Bioplan Project. Many of the surveys that were undertaken in these studies involved the participation of the Wildflower Society of Western Australia Bushland Plant Survey Program team. Analysis and reporting was completed as part of the Swan Bioplan Project and resulted in a detailed reference outlining 20 Whicher Scarp floristic community types and the conservation status of species and communities that occur in the area. An update of the 2008 dataset has been created in 2020, with the listing of many more attributes for each of the 124 quadrats and a shapefile of quadrat positions. The dataset includes information about the sites' geology, geography, vegetation, tenure and vesting, the flora recorded and the Whicher Scarp floristic community types. Some of this information was collected in the field and some is the result of geoprocessing. The flora recorded at each quadrat is listed with attributes including growth and life forms and conservation status. Locations of quadrats were normally recorded in the field using hand-held GPS devices. For about one third of the quadrats (the older studies), positions were checked and refined when necessary in

	consultation with field datasheets, field knowledge and reports. For the newer study, it is not known what degree of checking was done. The positions of 14 quadrats that were previously on private land are now being made public in this update. Flora records from some/all of the quadrats in this dataset have been cited in reports as being in various precursors to this database including: **DEC** 2006 Database *Data for 22 quadrats established and sampled in Busselton Area from 2002 to 2006, used in the Swan Bioplan Study*. Department of Environment and Conservation. **DEP** 1996 Database *System 6 and Part System 1 Update Programme. Unpublished bushland plot and area records and analysis.* Department of Environmental Protection, Perth, Western Australia. **Keighery BJ, Keighery GJ, Longman VM and Clarke KA** 2009 Database *Native and Weed Flora of the Southern Swan Coastal Plain*. Database and associated notes in preparation for publication. **Keighery BJ, Keighery GJ, Longman VM and Clarke KA** 2012 *Weed and Native Flora of the Southern Swan Coastal Plain: 2005 Dataset.* Department of Environment and Conservation, Kensington, Western Australia. **Keighery BJ, Keighery GJ, Webb A, Longman VM and Griffin EA** 2008 *A Floristic Survey of the Whicher Scarp.* A report for the Department of Environment and Conservation (Western Australia) as part of the Swan Bioplan Project. **Longman V** 2008 Report/Database *Database used for creation of the species list for each FCT showing species presence by plot for each FCT and plot percentage occurrence of each species for each FCT (Jun 29th 2005).* Department of Environment and Conservation, Perth, Western Australia. **WSWA, CALM and DoE** 2005 Database *Data for 58 quadrats established for the Swan Coastal Plain/Whicher Scarp/Blackwood Plateau Interface Project (Whicher Scarp Project)*. A partnership project with the Wildflower Society of Western Australia (Inc.) Bushland Plant Survey Programme, the Department of Conservation and Land Management (CALM) and the Department of Environment (DoE).
Survey beginning date:	1992
Survey ending date:	2006
Processing:	The taxonomy of the flora is as it was in the database in 2008 when this dataset was compiled, although previous and updated names are also provided for many taxa.
Field list:	See Appendix B
Code list:	See Appendix B
Attribute accuracy:	There may be some gaps, errors and inconsistencies in some fields of the data. See limitations of the data and warnings in Appendix B. Content is verified, to the best of the custodian's and creator's knowledge, taking into consideration time restraints preventing further checking.
Notes:	'Attributes' and 'fields' are here often used interchangeably. The data in this dataset is not exactly the data that was analysed for the identification of Whicher floristic community types since there was further amalgamation, rationalisation and splitting of species done on the dataset before analysis (see App3aSpeciesReconciliation.doc in BJ Keighery *et al.* 2008).
TECHNICAL DESCRIPTION	
File inventory:	WhicherScarp.accdb with five tables (see Appendix A)
File formats:	Microsoft Access .accdb file format

File structure:	WhicherScarp.accdb with five tables (see Appendix A)
Version:	2007
Software:	Microsoft Access
ACCESS	
Rights:	
Access information:	Government and non-government access granted with no charge
Citation:	Keighery BJ, Keighery GJ, Webb A, Longman VM and Griffin EA 2020 *A floristic survey of the Whicher Scarp dataset.* A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.) and Department of Biodiversity, Conservation and Attractions using survey data originally from the Swan Bioplan Project at the Department of Environment and Conservation.
REFERENCES	See REFERENCES in body of report

Part 2: Shapefile metadata

GENERAL OVERVIEW	
Shapefile title:	A floristic survey of the Whicher Scarp shapefile: 2020 version
Shapefile name:	WhicherScarp.geojson
Custodian:	Karen Clarke, Department of Biodiversity, Conservation and Attractions
Creator:	Vanda Longman, Wildflower Society of Western Australia
Date created:	28-05-2020
Jurisdiction:	Western Australia.
CONTENT DESCRIPTION	
Abstract:	Quadrat positions and selected attributes for a series of floristic studies conducted between 1992 and 2006 on the Whicher Scarp, Western Australia.
Subjects:	Floristic surveys of the Whicher Scarp; flora and other attributes of 124 quadrats surveyed as part of floristic studies on and near the Whicher Scarp; floristic community type analysis of Whicher Scarp plant communities
Search word:	CALM, DBCA, Department of Biodiversity, Conservation and Attractions, Department of Conservation and Land Management, DEP, Department of Environmental Protection, flora, floristics, IBRA SWA Bioregion, plant, plant communities, plant survey, plot, quadrat, south-west, South West, Swan Bioplan, Swan Coastal Plain, Western Australia, WHSFCT, Whicher Scarp, Whicher Scarp floristic community types, Wildflower Society of Western Australia.
Location:	Mainly Interim Biogeographic Regionalisation for Australia (IBRA) Swan Coastal Plain (SWA) bioregion (IBRA SWA02 subregion) on and near the Whicher Scarp
Method:	This dataset is derived from the database accompanying the report A Floristic Survey of the Whicher Scarp (BJ Keighery *et al.* 2008) and presents the results of more than ten years survey by the Departments of Environmental Protection (DEP) and Conservation and Land Management (CALM) and their superseding nature conservation agencies, and the Wildflower Society of Western Australia (Inc.). It combines the results of a number of floristic studies (see Table 1) conducted on plant communities on and near the Whicher Scarp on the Interim Biogeographic Regionalisation for Australia (IBRA) Swan Coastal Plain Bioregion and on the Darling and Whicher Scarp portions of the Jarrah Forest Bioregion (DAWE 2020). The main studies included are A Floristic Survey of the southern Swan Coastal Plain (Gibson *et al.* 1994), the System 6 and Part System 1 Update Program (DEP 1996) and the Swan Bioplan Project. Many of the surveys that were undertaken in these studies involved the participation of the Wildflower Society of Western Australia Bushland Plant Survey Program team. Analysis and reporting was completed as part of the Swan Bioplan Project and resulted in a detailed reference outlining 20 Whicher Scarp floristic community types and the conservation status of species and communities that occur in the area. An update of the 2008 dataset has been created in 2020, with the listing of many more attributes for each of the 124 quadrats and a shapefile of quadrat positions. The dataset includes information about the sites' geology, geography, vegetation, tenure and vesting, the flora recorded and the Whicher Scarp floristic community types. Some of this information was collected in the field and some is the result of geoprocessing. The flora recorded at each quadrat is listed with attributes including growth and life forms and conservation status. Locations of quadrats were normally recorded in the field using hand-held GPS devices. For about one third of the quadrats (the older studies), positions were checked and refined when necessary in

	consultation with field datasheets, field knowledge and reports (see Positional Accuracy). For the newer study, it is not known what degree of checking was done. The positions of 14 quadrats that were previously on private land are now being made public in this update. A subset of all the attributes in the updated database is provided in the shapefile (fields are listed in Table C1). Table 4 describes the Whicher Scarp floristic community types (WHSFCT).
FIELDS	Fields that are in the shapefile are in Table C1. There are further descriptions for these fields in Appendix B. There are also further fields available for these quadrats in the database WhicherScarp.accdb.
TECHNICAL DESCRIPTION	
Storage:	GeoJSON
Encoding:	UTF-8
Geometry:	Point (Point)
CRS:	EPSG:4326 – WGS 84 - Geographic
North bounding latitude:	-32.2700633600000018
South bounding latitude:	-33.8134598899999972
East bounding longitude:	116.0128671899999944
West bounding longitude:	115.1368156999999997
Unit:	degrees
Feature count:	124
Progress:	Complete
Update frequency:	Not expected
Available format types:	ESRI, GeoJSON
Positional accuracy:	A positional accuracy of 100 m has been assigned to the quadrat positions. The methodology of checking the locations is provided in Table 7. See fields GEOREF_SOURCES and GEOREF_VERIF_STATUS for methodology specific to each quadrat.
Attribute accuracy:	Good - populated content is known and verified by the custodian, to the best of the custodian's and creator's knowledge, taking into consideration time restraints preventing further checking. See limitations of the data and warnings in Appendix B.
Logical consistency:	All points complete
Completeness:	Complete
Contact	Department of Biodiversity, Conservation and Attractions

organization:	
Contact position:	Swan Region, Parks and Wildlife Service
Scientific custodian contact position:	Ecologist
Technical custodian contact position:	
Mail address:	P.O. Box 104
Locality:	Bentley Delivery Centre
State:	Western Australia
Country:	Australia
Postcode:	6983
Electronic mail address:	karen.clarke@dbca.wa.gov.au
Metadata date:	28-05-2020
Notes:	‘Attributes’ and ‘fields’ are here often used interchangeably
ACCESS	
Access constraint:	Government and non-government access granted with no charge
Citation:	Keighery BJ, Keighery GJ, Webb A, Longman VM and Griffin EA 2020 *A floristic survey of the Whicher Scarp dataset.* A report, database and shapefile produced by the Wildflower Society of Western Australia (Inc.) and Department of Biodiversity, Conservation and Attractions using survey data originally from the Swan Bioplan Project at the Department of Environment and Conservation.
REFERENCES	See REFERENCES in body of report

APPENDIX C TABLES

Table C1. Fields in the shapefile.

Sources and more detailed field descriptions for the shapefile **WhicherScarp** are in Appendix B Part 2. CALM = Department of Conservation and Land Management. DBCA = Department of Biodiversity, Conservation and Attractions. DEP = Department of Environmental Protection.

Shapefile field name	Field description	Equivalent field name in Appendix B	Field type
id	Unique number for the record (quadrat) in the dataset	ID	Integer
quad	Unique quadrat or relevé name	QUAD	String
descriptio	Longitude and latitude (autogenerated by GIS program)		String
study_code	Floristic study code	STUDY_CODE	String
sub_study_	Subset of quadrats within a study	SUB_STUDY_CODE	String
study_cust	Custodian of the dataset	STUDY_CUSTODIAN	String
longitude	Quadrat's X coordinate in decimal degrees	LONGITUDE	String
latitude	Quadrat's Y coordinate in decimal degrees	LATITUDE	String
x	Quadrat's X coordinate in UTM (mE)	X	Real
y	Quadrat's X coordinate in UTM (mN)	Y	Real
zone	World UTM grid zone	ZONE	Integer
gps_datum	Model of the earth used in the mapping of the quadrat locations	GPS_DATUM	String
accuracy_m	Inferred accuracy of the position of the quadrat	ACCURACY_M_INFERRED	Integer
georef_sou	Sources used, and procedures done, to check and correct quadrat locations	GEOREF_SOURCES	String
georef_ver	Notes on whether the quadrat location as presented here has been verified, with verifier name when available	GEOREF_VERIF_STATUS	String
ibra_sub_c	Interim Biogeographical Regionalisation for Australia IBRA subregion 7.0 code	IBRA_SUBREG_7_CODE	String
ibra_sub_n	Interim Biogeographical Regionalisation for Australia IBRA subregion 7.0 name	IBRA_SUBREG_7_NAME	String
bfs_no_db	Bush Forever Site (BFS) number as it appears on the database maintained by CALM and DEP. It is thought this information is current as at the year 2000, at the time of publishing of Bush Forever	BFS_NO_DB	String
bfs_name_d	Bush Forever Site (BFS) name as it appears on the database maintained by CALM and DEP. It is thought this information is current as at the year 2000, at the time of publishing of Bush Forever	BFS_NAME_DB	String
dbca_ident	Reserve number, lease number or volume and folio number to identify land parcels according to the DBCA Legislated Lands and Waters dataset (lands and waters defined under acts which are applicable to DBCA)	DBCA_LEGISLATED_LANDS_AND_WATERS_IDENTIFIER	String
dbca_name	Name of tenure parcel according to the DBCA Legislated Lands and Waters dataset (lands and waters defined under acts which are applicable to DBCA)	DBCA_LEGISLATED_LANDS_AND_WATERS_NAME	String
bush_area	Location description	BUSH_AREA_WHS_REPORT	String
forest_are	Forest area, often the forest block name. Adjacent forest areas are also listed.	FOREST_AREA_2008	String
suburb_or_	Suburb or locality name	SUBURB_OR_LOCALITY_2019	String
lga_2019	Local government authority name	LGA_2019	String
sampling_p	Method used to sample the plant community	SAMPLING_PROTOCOL	String
sample_val	A numeric value for a measure of the size of the sample	SAMPLE_SIZE_VALUE	String
sample_uni	Unit of measurement of the size of the sample	SAMPLE_SIZE_UNIT	String
date01	Date of the first main survey	DATE01	String
date02	Date of the second main survey	DATE02	String
date03	Date of the third main survey	DATE03	String
suitable_f	Quadrat's suitability for analysis	SUITABLE_FOR_ANALYSIS	String
analysed	The quadrat has been analysed using multivariate analysis in a major study	ANALYSED	String
swafct	Swan Coastal Plain floristic community type code	SWAFCT	String
whsfct	Whicher Scarp floristic community type code	WHSFCT	String

2020_datas	Code indicates to which dataset and subgroup the record belongs	2020_DATASET	String