



Healthy native grasslands in western Victoria

Beyond Bolac CAG recognises that there are a number of factors that will influence the natural environment in the H11 H12 sub-catchment. Changes in land use, weather patterns, and an increased demand for natural resources will help shape the local environment, community and economy, presenting challenges and opportunities for the sub-catchment's future management.

Within the catchment, there has been a shift away from grazing sheep and cattle to more intensive agriculture, broad acre cropping and horticulture. This shift, in land use, will impact on the natural assets within the catchment, such as waterways and wetlands, however, it will also provide greater diversity in agricultural business which could provide a boost to the local economy and provide opportunities for Beyond Bolac CAG to form partnerships and seek support for unique projects. Beyond Bolac CAG will need to stay abreast of the various land uses within the catchment and continue to support and work with all stakeholders to ensure the health of the catchment isn't compromised.

Climate variability, across the catchment, will also pose challenges to land managers; climate projections for

the Glenelg Hopkins Regions suggest that the weather will be hotter and drier in the coming years which will impact on land use, natural resources, the community and the biodiversity of the H11 H12 sub catchment. Despite the overall trend of a hotter and drier climate being clear there are uncertainties in climate change projections and their application at a regional level. These uncertainties are compounded when identifying impacts at local scales because of complexities in ecological interactions and interdependencies (GHCMA, 2015). Beyond Bolac CAG will need to understand how the variability in the climate will impact on terrestrial and aquatic habitats across the catchment and seek to undertake projects to assist the catchment and land managers adapt to the changing climate.

Community involvement will remain an ongoing challenge for the Beyond Bolac CAG. To ensure the ongoing success of the group, the committee will need to look at ways of attracting new members to the committee, as well as maintaining the interest of existing Landcare members and enticing other farmers to become Landcare members to participate in future programs

and projects. A survey, undertaken by the ABS, called the General Social Survey suggest that there has been a decline in Australians volunteering. In 2014, people were less likely to be involved with an environment group than they were in 2010 (14% compared to 19%). While some forms of social participation measured in the GSS show a general decline, traditional forms of social and civic participation continue to play an important role in Australian society.

It is important to recognise societal shifts in the ways in which people meet and interact. Digital forms of communication and social networking have provided new opportunities for some people to connect with others, including those who are less mobile or geographically isolated. Some have suggested that younger people, in particular, prefer using social media to collect and disseminate information. This preference for online networking could be linked to Australian's in particular feeling time poor and being able to connect with others online during a time that suits the individual best is highly desirable (ABS, 2015).

Australian farmers are intimately connected to the land and depend on healthy ecosystems to provide soil health, nutrient and waste recycling, pollination from insects, sediment control and clean water.

Australian farmers are intimately connected to the land and depend on healthy ecosystems to provide soil health, nutrient and waste recycling, pollination from insects, sediment control and clean water.

To secure an environmentally sustainable and profitable future, farmers need to continue to employ a range of strategies (ABS, 2015). A national Landcare survey undertaken in 2013 identified that 73% of farmers were part of an agricultural related group, and of these the largest grouping was the local Landcare and Farming Systems groups at 32% with CMA/NRM groups being one of the smallest at 8%.

Nearly one third of farmers who were part of local Landcare and Farming Systems groups, cited information that is tailored to local conditions and issues (29%); hands on field days that are locally relevant (22%); Social networking (12%) and opportunity to see what other farmers are doing (11%) as their main reasons for being part of these groups (Hayr, 2013). Australian farmers feel that Landcare is still relevant to the future, but also feel that Landcare needs to continue to innovate and evolve (Hayr, 2012). How Beyond Bolac CAG is structured and managed into the future will be essential to gaining continued support and involvement from the community.

A list of potential projects has been developed by Beyond Bolac CAG to assist the group meet its vision over the next 10 years. The below maps indicate visually where these projects will take place within the catchment, and provides a brief summary of what the project aims to achieve. It's important to note that these projects are provided for discussion purposes only and detailed local planning and on-ground works for such projects will require consultation with all relevant land managers and stakeholders. These project ideas are not set in stone and will most likely change as the projects evolve over the coming years.

Completed Projects
 Beyond Bolac CAG Area
 Park or Reserve

Mininera Wetlands Cluster Restoration

Large scale restoration of high priority wetlands throughout the Mininera area. Wetlands will be fenced and revegetated to improve condition and biodiversity value.

Salt Lakes Restoration

Revegetation of shore to improve salinity and reduce erosion.

Purupa Wetlands Restoration

Fencing of wetlands and revegetation to improve condition and habitat quality.

Salt Creek Protection and Enhancement

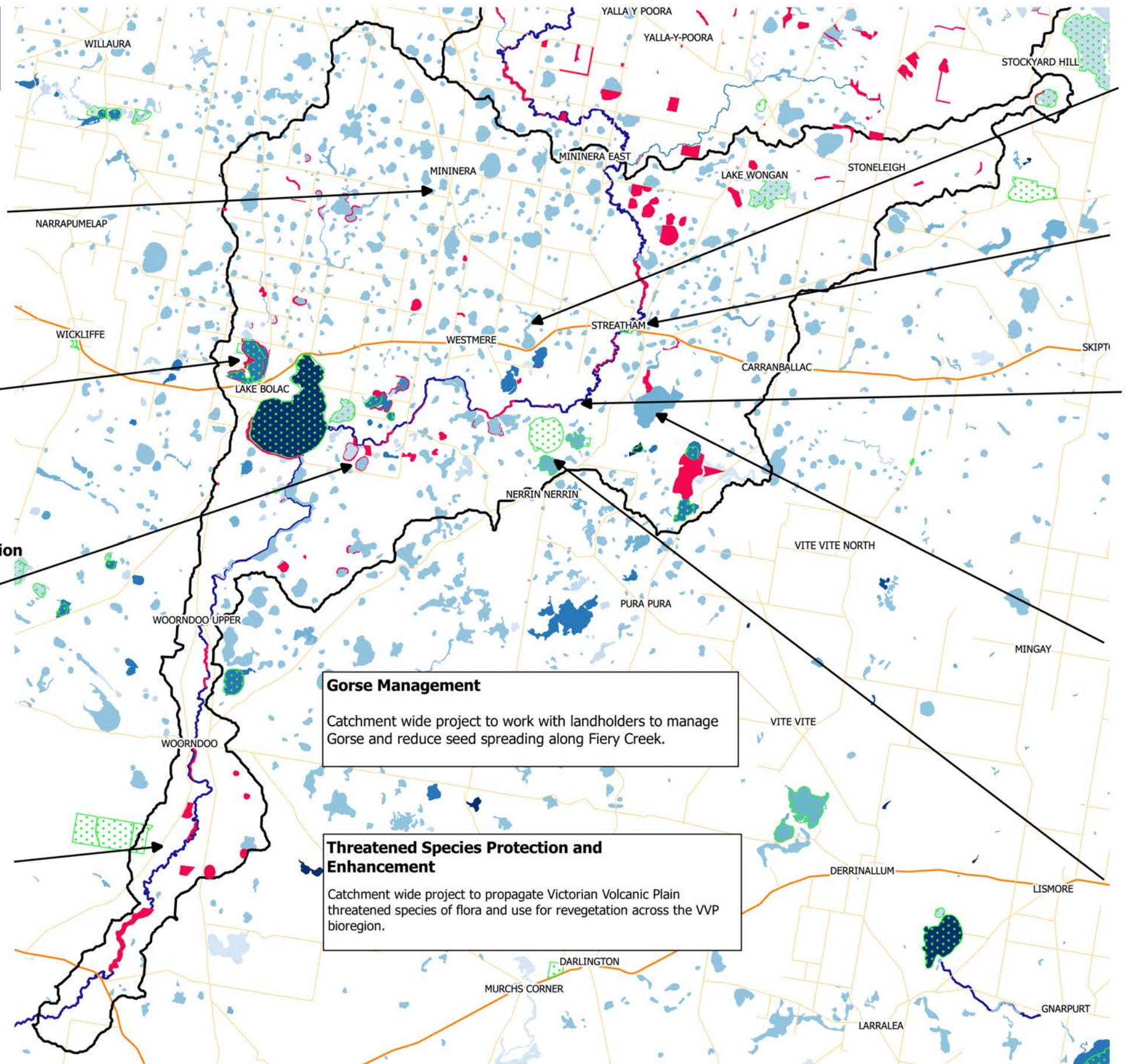
Fencing and revegetation of riparian zones to create a continuous corridor to improve stream condition and riparian habitat quality. Retoration of key wetlands will also be included in this area.

Gorse Management

Catchment wide project to work with landholders to manage Gorse and reduce seed spreading along Fiery Creek.

Threatened Species Protection and Enhancement

Catchment wide project to propagate Victorian Volcanic Plain threatened species of flora and use for revegetation across the VVP bioregion.



█ Completed Projects
 Beyond Bolac CAG Area
 Park or Reserve

Charleycomb Creek Protection and Enhancement

Fencing and revegetation of riparian zones to improve stream condition & habitat quality and reduce erosion.

Fiery Creek Protection and Enhancement (above Mt William Rd)

Fencing and revegetation of riparian zones to create continuous corridor to improve stream condition and riparian habitat quality.

Challicum Creek Protection and Enhancement

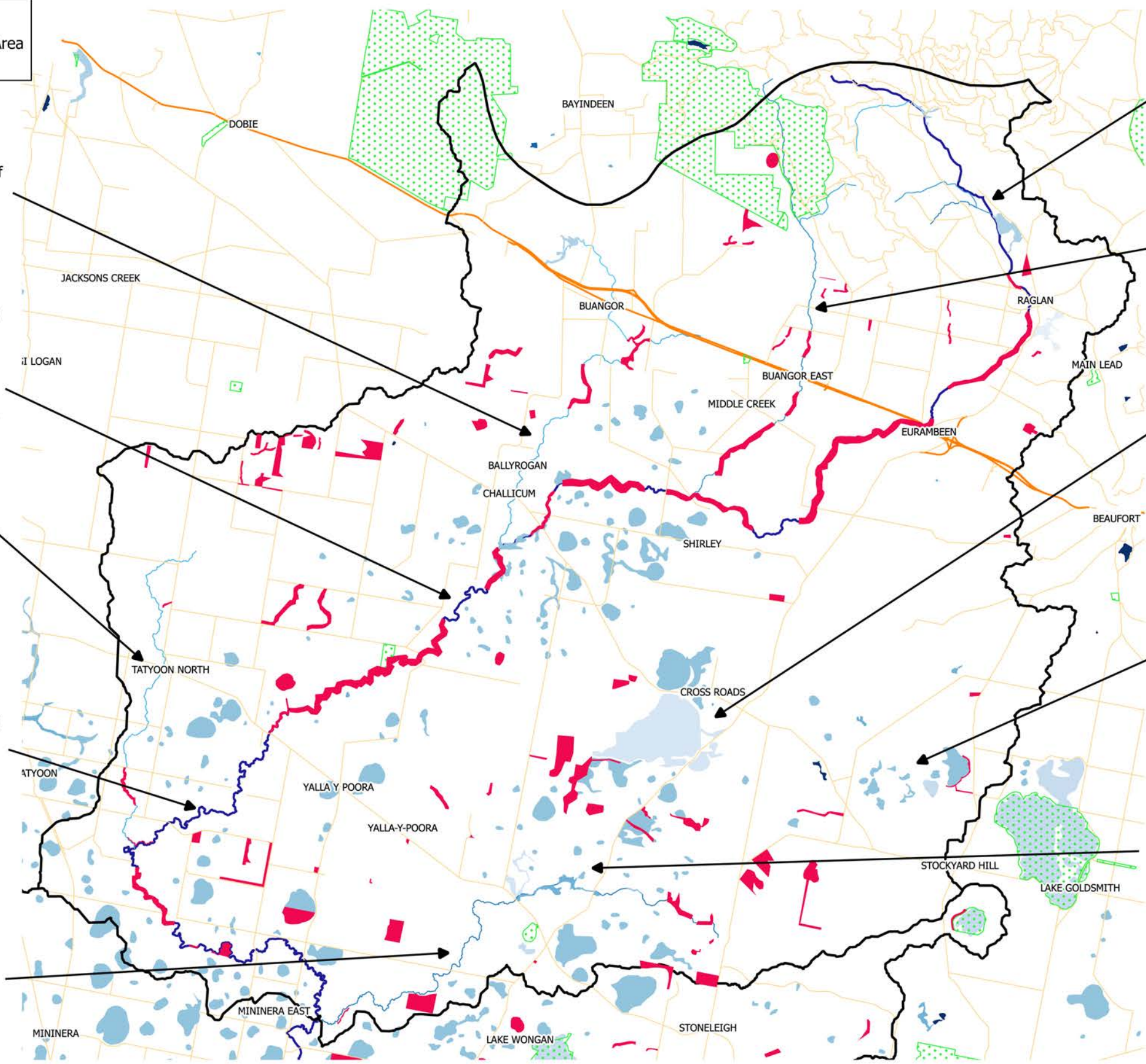
Fencing and revegetation of riparian zones to improve stream condition, habitat and reduce erosion.

Fiery Creek Protection and Enhancement (below Mt William Rd)

Fencing and revegetation of riparian zones to create continuous corridor to improve stream condition and riparian habitat quality.

Lower Wongan Creek Protection and Enhancement

Fencing and revegetation of riparian zones to improve stream condition and habitat quality.



Upper Fiery Creek Protection and Enhancement

Fencing and revegetation of riparian zones to create continuous corridor to improve stream condition and biodiversity value

Middle Creek Protection and Enhancement

Fencing and revegetation of riparian zones to improve stream condition, habitat quality and reduce erosion.

Northern Crossroads (St Marnocks) Wetlands Cluster Restoration

Fencing and revegetation of wetlands to improve condition and habitat quality for the protection of threatened and endangered species.

Mawallock Wetland Restoration and wildlife corridor

Fencing and revegetation of wetlands to improve condition & habitat quality & linking remnant patches to improve habitat connectivity through landscape

Wongan Creek (west sub-catchment) Protection and Enhancement

Fencing and revegetation of riparian zones to improve stream condition, salinity & habitat quality and protect threatened species.

Monitoring and evaluating the success of projects helps to improve current and future outputs, outcomes and impacts. Beyond Bolac CAG will evaluate projects undertaken to identify weaknesses and apply successful strengths to future projects. The group will also undertake a continuous assessment to monitor the implementation of projects to provide all stakeholders with early detailed information, such as whether the outputs are being met or that the schedules planned are being reached. This will enable the group to take action to correct the weaknesses as quickly as possible.

This Biodiversity Blueprint provides the baseline data for Beyond Bolac CAG to use to evaluate its performance over time. The Beyond Bolac Catchment Action Group Strategic Plan 2016–2021 provides targets for each strategy as well as a timeframe to achieve the target. The group will review the strategic plan annually, to see if its meeting the targets set, make any changes required to improve its project implementation and set its program for the following year.

Gervasi D. and P & P Design (2006) *H11 & H12 Catchment Health Report- Lake Bolac, Fiery & Salt Creeks*, GHCMA, Hamilton.

Bureau of Meteorology (2015) *Daily rainfall Buangor (Craigie)* retrieved November 30 2015 from http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_stn_num=089109&p_startYear=2014&p_c=-1588279864

Bureau of Meteorology (2015) *Daily rainfall Lake Bolac (Post Office)* retrieved November 30 2015 from http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_stn_num=089016&p_startYear=2014&p_c=-1584966739

Department of Environment Water Land and Planning (2015) EVC Benchmark- Bioregions retrieved December 1 2015 from <http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/evc-benchmarks#dunt>

Department of Sustainability, Environment, Water, Population and Communities (2011) *Nationally Threatened Ecological Communities of the Victorian Volcanic Plain: Natural Temperate Grassland & Grassy Eucalypt Woodland*, Commonwealth of Australia, Canberra.

Planisphere (2014) *Ararat Sustainable Future Growth Final Report*, Ararat Rural City Council, Ararat.

Ararat Rural City Council (2010) *Ararat Rural City Council Environmental Sustainability Strategy 2010-2020*, Ararat Rural City Council, Ararat.

Glenelg Hopkins Catchment Management Authority (2015) *Glenelg Hopkins CMA Climate Change Strategy Responding to climate change in the Glenelg Hopkins Region*, GHCMA, Hamilton

Clifton C. and Daamen C. and Horne A. (2005) *Water and Land use change study- Changes in hydrology and flow stress with land use change in south-west Victoria Final Technical Report*, Glenelg Hopkins CMA, Hamilton.

Mortlake Historical Society Book Committee (1985) *Pastures of Peace: A Tapestry of Mortlake Shire*, Shire of Mortlake, Mortlake

Wettenhall G and Gunditjmara people (2010) *The people of Budj Bim: engineers of aquaculture, builders of stone house settlements and warriors defending country*, em Press publishing, Mollongghip VIC

Dawson J. (1881) *Australian Aborigines- The languages and costumes of several tribes of aborigines in the Western District of Victoria, Australia*, Cambridge University Press, USA, 2009

Clark, Ian D. (1995) *Scares in the landscape: a register of massacre sites in Western Victoria 1803-1959*, Aboriginal Studies Press for the Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra.

Peterson, G. and Robertson, P. (2011) *Recovery Plan for Corangamite Water Skink *Eulamprus tympanum marnieae**, Department of Sustainability and Environment, Melbourne.

Weir J.K (2009) *The Gunditjmara land justice story*, Native Title Research Unit, the Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra.

Wikipedia (2015) *Lake Bolac Stone arrangement* retrieved on 3 March 2015 from https://en.wikipedia.org/wiki/Lake_Bolac_stone_arrangement

Native Fish Victoria, *Short Finned Eel* retrieved 1 March 2016 from <http://www.nativefish.asn.au/sfeel.html>

Smith, W.J.S. & P. Robertson (1999) *National Recovery Plan for the Striped Legless Lizard (Delma impar): 1999-2003*. Unpublished report to Environment Australia, Canberra.

Department of the Environment (2016) *Litoria raniformis in Species Profile and Threats Database*, retrieved 1 Mar 2016 at http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1828 Department of the Environment, Canberra

Australian Bureau of Statistic (2015) *4159.0 - General Social Survey: Summary Results, Australia, 2014* retrieved 7 March 2015 from <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4159.0>

Australian Bureau of Statistics (2015) *1301.0 - Year Book Australia, 2009-10*, retrieved 7 March 2015 from <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1301.0Chapter16052009%E2%80%9310>

Hayr B (2013) 2013 National Landcare Survey Results- full survey, Department of Agriculture, Australian Government, Canberra.

Hayr B (2012) *Health of the Landcare Movement Survey Results- summary*, Department of Agriculture, Australian Government, Canberra.

Glenelg Hopkins Catchment Management Authority (2007) *Glenelg Hopkins CMA Habitat Network Action Plan: facilitating floral and faunal movement and reducing isolation*, GHCMA, Hamilton

Department of Environment & Primary Industries (2010) *Index of Stream Condition: The Third Benchmark of Victorian River Condition ISC3*, The State Government of Victoria, Melbourne.

Sinclair Knight Merz (2005) *Water and Land Use Change Study- Stage 2 Community Report*, GHCMA, Hamilton

Glenelg Hopkins Catchment Management Authority (2016) *Wetlands*, retrieved 23 May 2016 from <http://www.ghcma.vic.gov.au/water/wetlands/>

Brolga Recovery Group (2016) *About Brolgas*, retrieved May 23 2016 from <http://www.brolgarecoverygroup.org/about-brolgas>

Department of Sustainability and Environment (2010) *Our Wildlife Factsheet-Brolga*, Victorian Government Department of Sustainability and Environment, Melbourne.

Department of the Environment (2016). *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains in Community and Species Profile and Threats Database*, retrieved 27 May 2016 from http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=97#profile_dist_maps

Glenelg Hopkins Catchment Management Authority (2016) *Shallow Freshwater Marsh Fact Sheet*, retrieved 27 May 2016 from <http://www.ghcma.vic.gov.au/media/uploads/ShallowFreshwaterMarsh.pdf>

Glenelg Hopkins Catchment Management Authority (2016) *Freshwater Meadow Fact Sheet*, retrieved 27 May 2016 from <http://www.ghcma.vic.gov.au/media/uploads/FreshwaterMeadow.pdf>

Victorian Agriculture (2016) *Legislation*, Department Economic Development, Jobs, Transport and Resources, Melbourne, retrieved 27 May 2016 from <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/protecting-victoria-from-pest-animals-and-weeds/legislation-policy-and-permits/legislation>

Agriculture Victoria (2014) *Noxious Weed List ordered by common name*, Department Economic Development, Jobs, Transport and Resources, Melbourne, retrieved 27 May 2016 from http://agriculture.vic.gov.au/_data/assets/pdf

<file/0005/283064/Noxious-weeds-list-ordered-by-common-name.pdf>

Agriculture Victoria (2014) *Declared Pest Animals*, Department Economic Development, Jobs, Transport and Resources, Melbourne, retrieved 27 May 2016 from http://agriculture.vic.gov.au/_data/assets/pdf_file/0007/283435/Declared-pest-animals_4Dec2014.pdf

Victorian Gorse Taskforce (2016) *who is the VGT?*, retrieved 27 May 2016 from http://www.vicgorsetaskforce.com.au/who_is_the_vgt

Australian Weeds Committee (2016) *Weeds of national significant Gorse Ulex europaeus*, John Thorp Australia, Newstead, Tasmania, retrieved 27 May 2016 <http://www.weeds.org.au/WoNS/gorse/>

National Gorse Taskforce (2006) *Gorse National Best Practice Manual*, Department of Primary Industries and Water, Hobart, retrieved 27 May 2016 from <http://www.weeds.org.au/WoNS/gorse/docs/GNBPM-intro.pdf>

Department of Sustainability, Environment, Water, Population and Communities (2011) *Feral European Rabbit (Oryctolagus Cuniculus)*, Commonwealth of Australia, Canberra, retrieved 27 May 2016 from <https://www.environment.gov.au/system/files/resources/7ba1c152-7eba-4dc0-a635-2a2c17bcd794/files/rabbit.pdf>

Wetland Care Australia (2016) *Information Bulletin - Agriculture and wetlands*, Ballina NSW, retrieved May 31 2016 from <http://www.wetlandcare.com.au/docs/education/IB%20Agriculture%20and%20Wetlands.pdf>

Allender, U (2016) *Upper hopkins_surfacewater_run record sheet*, Upper Hopkins Land Management Group.

Andrews, D (2016) *Pest plant species list*, Ararat Rural City Council, (email)

Birdlife Ballarat (2016) *Projects and Initiatives*, retrieved 7 June 2016 from <http://www.birdlife.org.au/locations/birdlife-ballarat/projects-initiatives-bal>

Ararat Rural City Council (2016) *Weed Identification Booklet*, State Government of Victoria

Map Data Resources

Map #	Resource Name & Title	Data Custodian	Attribution	Abstract	Currency Date	Web URL
2	NV2005_EXTENT Native Vegetation - Modelled Extent 2005	Department of Environment, Land, Water & Planning- Biodiversity and Ecosystem Services (DEPI)	Copyright © The State of Victoria, Department of Environment, Land, Water & Planning 2016	Modelled dataset of Native Vegetation and major water-based habitats, created by the Arthur Rylah Institute, and completed July 15th, 2007	24 August 2009	https://www.data.vic.gov.au/data/dataset/native-vegetation-modelled-extent-2005
3	NV1750_EVCBCS/EVC1750 Native Vegetation - Modelled 1750 Ecological Vegetation Classes (with Bioregional Conservation Status)	Department of Environment, Land, Water & Planning- Biodiversity and Ecosystem Services (DEPI)	Copyright © The State of Victoria, Department of Environment, Land, Water & Planning 2016	This is a derived dataset that delineates the current Bioregional Conservation Status of EVCs within the modelled 1750 EVC dataset.	20 March 2008	https://www.data.vic.gov.au/data/dataset/native-vegetation-modelled-1750-ecological-vegetation-classes-with-bioregional-conservation-status
4 & 5	NV2005_EVCBCS Native Vegetation - Modelled 2005 Ecological Vegetation Classes (with Bioregional Conservation Status)	Department of Environment, Land, Water & Planning- Biodiversity and Ecosystem Services (DEPI)	Copyright © The State of Victoria, Department of Environment, Land, Water & Planning 2016	This is a derived dataset that delineates the Bioregional Conservation Status of EVCs. The dataset is derived from a combination of Victorian bioregions (VBIOREG100), Pre 1750 EVCs (NV1750_EVC) and the current version of Native Vegetation Extent (NV2005_EXTENT). Bioregional conservation status and geographic occurrence are applied to unique Bioregion-EVC units.	20 March 2008	https://www.data.vic.gov.au/data/dataset/native-vegetation-modelled-2005-ecological-vegetation-classes-with-bioregional-conservation-status
6	VBA_FAUNA25 Victorian Biodiversity Atlas fauna records (unrestricted) for sites with high spatial accuracy	Department of Environment, Land, Water & Planning- Biodiversity and Ecosystem Services (DEPI)	Copyright © The State of Victoria, Department of Environment, Land, Water & Planning 2016	This layer contains a snapshot of fauna taxa records from the Victorian Biodiversity Atlas (VBA) (including most threatened taxa and marine protists). The main attributes in this layer are survey id, survey location, date, time, locational accuracy, taxa recorded, counts, observation type, survey type, collector, and reliability of the record. The VERS_DATE column identifies the currency of the data. This layer excludes restricted taxa records. These records are contained in the related (but restricted) dataset VBA_FAUNA_RESTRICTED.	28 July 2015	https://www.data.vic.gov.au/data/dataset/victorian-biodiversity-atlas-fauna-records-unrestricted-for-sites-with-high-spatial-accuracy
6	VBA_FLORA25 Victorian Biodiversity Atlas flora records (unrestricted) for sites with high spatial accuracy	Department of Environment, Land, Water & Planning- Biodiversity and Ecosystem Services (DEPI)	Copyright © The State of Victoria, Department of Environment, Land, Water & Planning 2016	This layer contains a snapshot of flora taxa records from the Victorian Biodiversity Atlas (VBA) (including most threatened taxa). The main attributes in this layer are survey id, survey location, date, time, locational accuracy, taxa recorded, counts, observation type, survey type, collector, and reliability of the record. The VERS_DATE column identifies the currency of the data. This layer excludes restricted taxa records. These records are contained in the related (but restricted) dataset VBA_FLORA_RESTRICTED.	29 July 2015	https://www.data.vic.gov.au/data/dataset/victorian-biodiversity-atlas-flora-records-unrestricted-for-sites-with-high-spatial-accuracy

Map #	Resource Name & Title	Data Custodian	Attribution	Abstract	Currency Date	Web URL
7	HY_WATERCOURSE Watercourse Network 1:25,000 - Vicmap Hydro	Department of Environment, Land, Water & Planning - Information Services Division	Copyright © The State of Victoria, Department of Environment, Land, Water & Planning 2016	This layer is part of Vicmap Hydro and contains line features delineating hydrological features. Includes; Watercourses (ie channels, rivers & streams) & Connectors.	22 April 2016	https://www.data.vic.gov.au/data/dataset/watercourse-network-1-25-000-vicmap-hydro
7	WETLAND_CURRENT Victorian Wetland Environments and Extent - up to 2013	Department of Environment, Land, Water & Planning- Water Division	Copyright © The State of Victoria, Department of Environment, Land, Water & Planning 2016	Polygons showing the extent and types of wetlands in Victoria. This layer is an update of the Wetland 1994 layer, it incorporates new regional mapping, some supplementary mapping and repositioning of planimetrically inaccurate wetlands. Supplementary mapping involved identifying and delineating wetlands which had not previously been mapped, but did not modify the extent of existing wetlands. It was undertaken primarily using aerial photograph interpretation (photos from 2007 to 2011) supplemented with existing geospatial datasets that provided context and informed the identification of wetland boundaries (e.g. vegetation mapping, topography). Wetlands were classified (according to the new classification framework) into primary categories based on wetland system type, salinity regime, water regime, water source, dominant vegetation and wetland origin.	15 June 2015	https://www.data.vic.gov.au/data/dataset/victorian-wetland-environments-and-extent-up-to-2013
9	LANDUSE_2014 Victorian Land Use Information System 2014/2015	Department of Economic Development, Jobs, Transport and Resources - Agriculture Research and Development	Copyright © The State of Victoria, Department of Economic Development, Jobs, Transport and Resources 2016	The Victorian Land Use Information System (VLUIS) dataset has been created by the Spatial Information Sciences Group of the Agriculture Research Division in the Department of Economic Development, Jobs, Transport, and Resources. The method used to create VLUIS is significantly different to traditional methods used to create land use information and has been designed to create regular and consistent data over time. It covers the entire landmass of Victoria and separately describes the land tenure, land use and land cover for each cadastral parcel across the state, biennially for land tenure and use and annually for land cover; for each year from 2006 to 2015.	28 May 2015	https://www.data.vic.gov.au/data/dataset/victorian-land-use-information-system-2014-2015
10	SENSITIVITY Areas of Cultural Heritage Sensitivity	Department of Premier and Cabinet- Office of Aboriginal Affairs Victoria (DPC)	Copyright © The State of Victoria, Department of Premier and Cabinet 2016	This dataset contains a spatial representation of "Areas of Cultural Heritage Sensitivity" as specified in Division 3, Part 2 of the Aboriginal Heritage Regulations 2007 (the Regs). Areas of cultural heritage sensitivity are areas that are either known to contain, or are likely to contain Aboriginal cultural heritage places and objects. These areas, which include various landforms within Victoria, are defined in the Aboriginal Heritage Regulations 2007. This polygon dataset is a representation of those areas as defined in the Regs	05 April 2016	https://www.data.vic.gov.au/data/dataset/areas-of-cultural-heritage-sensitivity

Map 8 Index of stream Condition

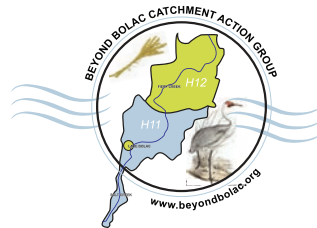
The Index of Stream condition map was produced by creating a GIS data layer using information provided in the Department of Environment & Primary Industries, 2010 Index of Stream Condition- The Third Benchmark of Victorian River Condition ISC3. The lines have been drawn into the map and do not have any GPS coordinates attached to them.

Map 10 Cultural heritage sites

The cultural heritage sites layer was produced by creating a GIS data layer using the map of the approximate location of the two sites as shown in Glenelg Hopkins CMA's H11 & H12 Catchment Health Report- Lake Bolac, Fiery & Salt Creeks, pg 12. These site have been drawn into the map and do not have accurate GIS coordinates attached to them.



BBCAG members at catchment field trip August 2016



This document and associated GIS mapping was composed by Jileena Cole under the guidance of the Beyond Bolac Catchment Action Group. Funded by The Norman Wettenhall Foundation under their Landscape Restoration Program.

