



Lake Buffalo

Land and On-Water Management Plan



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EXECUTIVE SUMMARY

Lake Buffalo is a water supply storage created by the damming of the Buffalo River within the Ovens River catchment. The storage is an important tourism and recreation asset in north-eastern Victoria, being a popular recreational asset used by locals and tourists for a diverse range of activities including power boating, fishing, canoeing, swimming, bushwalking, and picnicking.

Lake Buffalo was completed in 1965 with a storage capacity of almost 24,000 ML. The water stored in Lake Buffalo is used to supplement flows in the Ovens River for irrigation and urban water supply for the Rural City of Wangaratta. The primary role of the Lake Buffalo water storage is for irrigation water supply storage, and this factor needs to be managed and balanced against the recreational values of the waterways.

Community interaction is a prominent element associated with the management of water storages, and the management of public recreational use of irrigation storages is a challenge for Goulburn-Murray Water. Planning, management and resourcing of land and on-water issues has in the past tended to be reactive rather than proactive, with no integrated overarching plans for the management of land and on-water issues. This is currently being addressed through the development of Land and On-Water Management Plans for all of the Goulburn-Murray Water storages. Each Plan is being developed through an extensive process of engagement with communities to ensure the Plans have strong community support for their implementation.

This Lake Buffalo Land and On-Water Management Plan aims to identify and protect important values associated with the waterways by outlining priority land and on-water management issues and identifying key actions to be implemented over the next five years. Most importantly, this Plan aims to increase communication, consistency, coordination and cooperation between agencies, stakeholder groups and the community to protect the values and attributes of the Lake Buffalo storage.

The development of this Plan has been supported and informed by an extensive community and stakeholder consultation process, which included community forums, surveys, focus groups and interviews. Ongoing stakeholder engagement for the implementation of this Plan will be facilitated through the involvement of the Lake Buffalo Plan Implementation Group.

This Plan is a dynamic document and will continue to evolve as the various actions and strategies that it identifies are developed and implemented.

It is proposed that this Plan will be reviewed every five years.



1. A PLAN FOR THE MANAGEMENT OF LAKE BUFFALO

Lake Buffalo is a water supply storage created by the damming of the Buffalo River within the Ovens River catchment. The storage is an important tourism and recreation asset in north-eastern Victoria, being a popular recreational asset used by locals and tourists for a diverse range of activities including power boating, fishing, canoeing, swimming, bushwalking, and picnicking.

The water stored in Lake Buffalo is used to supplement flows in the Ovens River for irrigation and urban water supply for the Rural City of Wangaratta.

Community interaction is a prominent element associated with the management of water storages. The management of public recreational use of these storages presents a challenge for Goulburn-Murray Water. In the past, planning, management and resourcing of land and on-water issues has tended to be reactive and without integrated overarching plans for land and on-water issues. This is currently being addressed through the development of Land and On-Water Management Plans for all of the Goulburn-Murray Water storages. Each Plan is being developed through an extensive process of engagement with communities to maximise community support in their implementation.

This Lake Buffalo Land and On-Water Management Plan (the 'Plan') aims to identify and protect important values associated with the waterbody by outlining priority land and on-water management issues. It will establish key actions to be implemented over the next five years. Most importantly, this Plan aims to increase communication, consistency, coordination and cooperation between agencies, stakeholder groups and the community to protect the values and attributes of Lake Buffalo.

The development of this Plan has been supported and informed by an extensive community and stakeholder consultation process, which included community forums, surveys, focus groups and interviews. This Plan is intended to be a dynamic document which will continue to evolve as its actions and strategies are developed and implemented.

It is proposed that this Plan will be reviewed every five years.

1.1 Objectives of this Plan

The main objectives of this Plan are to:

- Recognise the diverse range of values and uses associated with the storage.
- Provide a strategic framework for management of the storage.
- Identify important social, economic and environmental issues, and develop a series of actions to address these issues to be implemented over the next five years.
- Positively influence the management of development pressures around the storage to protect natural and cultural values, through agreement with other Government departments and agencies.
- Protect the long-term quality of the water resource for local and downstream users.

An additional objective is to achieve general acceptance of the management recommendations and responsibilities by key stakeholder and community interest groups. This will be achieved through a comprehensive stakeholder and community consultation program and the technically robust and defensible processes used in the preparation of this Plan.

1.2. Plan Context

Vision for Lake Buffalo

Lake Buffalo is an effective operating water storage and is an attractive and safe place for visitors and tourists to engage in recreational activities on and around the water.

Storage Operations

The primary purpose of Lake Buffalo is to provide water to downstream communities and consumptive users. The storage's operational and maintenance costs are funded by the tariffs charged to Goulburn-Murray Water's wholesale and retail customers. Operational decisions, including water levels and release patterns, consider the potential effects on downstream users.

This Plan cannot make any specific decisions regarding the management of water levels in the storage. Operational issues, including storage levels and the long-proposed expansion of the existing storage, are 'bigger picture' questions beyond the scope of this Plan. For reference, a brief overview of storage operations is included as Appendix A.



Legal Status

This Plan has no legal status. It will not impose any new legal or statutory requirements. However, through influencing policy, it may lead to future changes in legislation that will assist in meeting the objectives of this Plan.

Land Status

Goulburn-Murray Water manages the lake bed and immediate foreshore land around Lake Buffalo. This land is a mixture of freehold land held in title and Crown Land with vested management.

A small amount of Goulburn-Murray Water managed land is bounded by private freehold land.

Goulburn-Murray Water leases some land on the perimeter of the storage to commercial operators and issues licenses for agricultural activities.

Plan Area

The geographic scope of this project is limited to the waterbody, the foreshore and the surrounding areas. Appendix B illustrates Lake Buffalo and the catchment to the storage.

Direct management control of water authorities is limited to areas of the lake bed and foreshore public land. While this Plan focuses on the waterbody and foreshore areas, it also aims to positively influence activities that could impact on the waterbody, the adjacent land areas surrounding the storage, and the broader catchment.

Management Roles and Responsibilities

A number of agencies play a role in the management of land and water issues for Lake Buffalo. Current management roles and responsibilities are summarised in Appendix C. A quick reference guide for the lead agencies responsible for managing land and on-water management issues is provided in Appendix D.

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Lake Buffalo is an effective operating water storage and is an attractive and safe place for visitors and tourists to engage in recreational activities on and around the water.

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2. PLAN IMPLEMENTATION AND RAISING AWARENESS

Lake Buffalo is located in a relatively isolated valley without any villages or towns located close by. This raises issues for community involvement in an ongoing implementation group.

Stakeholders and community consulted during the development of this Plan expressed support of an implementation group but no obvious model for community representation emerged during consultations.

Lake Buffalo services the community in two primary ways:

- By regulating the flow of water in the Buffalo and Ovens River, downstream users derive economic benefit from irrigation and provision of water for urban use. Goulburn-Murray Water has responsibility for maintaining the storage to deliver this benefit.
- By providing a variety of recreational opportunities Lake Buffalo benefits the community by contributing to community health and wellbeing through recreational activity, and economic activity derived from visitors spending to participate in recreation. Alpine Shire Council has a responsibility to promote community health and wellbeing and economic activity in the municipality.

For this Plan, it is suggested that Goulburn-Murray Water should form an implementation committee with representatives of Goulburn-Murray Water and Alpine Shire Council. Expressions of Interest should be sought to identify a suitable independent chairperson to provide community leadership for the group.

It is anticipated that as implementation of the Plan progresses, sufficient community interest may develop to have other formal community representation on the committee.

2.1 Lake Buffalo Plan Implementation Group

The Lake Buffalo Plan Implementation Group will play an important role in enabling the Lake Buffalo community and various user groups to have ongoing input into the implementation of identified actions. The Group will also act as a vehicle to encourage the identification and management of new issues should they arise.

The Implementation Group will:

- Assist with the implementation and monitoring of actions in the Plan.
- Work with community groups to implement actions.
- Provide a forum for agency representatives and the community to exchange ideas and discuss policy and regulatory changes in relation to lake management.
- Discuss infrastructure planning, media issues and management.

The Lake Buffalo Plan Implementation Group should include, but not be limited to:

- An independent chairperson.
- A Goulburn-Murray Water General Manager or their nominee.
- Economic Development representatives from Alpine Shire Council.
- Department of Environment and Primary Industries representative.

2.1.1 Key Issues

- The need for a Lake Buffalo Plan Implementation Group to enable the Lake Buffalo community and user groups to contribute to the implementation of the Plan.

2.1.2 Objectives

To establish a Lake Buffalo Plan Implementation Group to advise on the implementation of this Plan, and to ensure that activities on and around the storage are consistent with other strategies, policies and plans.

2.1.3 Actions

1. Establish a Lake Buffalo Plan Implementation Group to guide the implementation of the Plan and communicate the priorities in the Plan.

2.1.4 Stakeholders

Goulburn-Murray Water, Alpine Shire Council and community representatives.

2.2 Community Education and Awareness

Locals and visitors play an important role in the sustainable management of Lake Buffalo. The community engagement process used in the development of this Plan highlighted that community members have a close association with the values provided by Lake Buffalo. The community consultation process is summarised in Appendix E.

Key issues raised during the consultation process included:

- Improving communication with the local and user community.
- Raising awareness of all stakeholder roles and management responsibilities.
- Improved communication around how the storage operates.

Also identified through the consultation process was interest in a more collaborative approach for management of the Lake.



Improved education and awareness programs are important to help protect water quality and the surrounding environment. The programs also raise awareness of how different activities can impact on the storage. They are required to help the community understand how the storage operates, disseminate information on forecast water levels and demands as well as the destination (use) of water discharged from the storage. With a better appreciation of the operating constraints, impacts of activities and the role of the storage, communities will be better informed and prepared for changing water levels in the storage.

Various mechanisms can be used to increase education and awareness. These include interpretive signage, websites and fact sheets. Enhancing the Goulburn-Murray Water website and encouraging greater use will assist with improving awareness and understanding of storage operation and the impacts of activities on the storage and its surrounds.

2.2.1 Key Issues

- Limited information regarding the operation of the storage.
- Lack of understanding of the roles and responsibilities of stakeholders involved directly or indirectly in the management of Lake Buffalo.
- Lack of awareness and understanding of Lake Buffalo values as perceived by the various user groups.

2.2.2 Objectives

An informed and involved community and user group working cooperatively with agencies to develop a shared understanding of, and solutions to, the management challenges relevant to Lake Buffalo.

2.2.3 Actions

2. Develop a proactive communication and awareness campaign to provide up to date information to recreational users on the status of water levels in the storage. Information should include planned maintenance activities that may impact on recreational user groups.

3. Work with user groups to understand their information requirements.
4. Encourage and support processes that involve community and users in the recreational amenity of the Lake Buffalo.
5. Provide clear descriptions of agency roles and responsibilities (refer to Appendix C) and communicate this to the community.
6. Develop a single Code of Conduct for the storage which includes information about user and agency responsibilities relating to boating and boating safety, camping, hunting, solid waste, and emergency management. The Code of Conduct should also include information about the importance of designated public access in minimising impacts on the environment including the impacts of illegal vehicle access on the lake bed.
7. Implement communication actions (e.g. brochures and signage) to promote knowledge of boating rules and to highlight acceptable boating behavior.
8. Update the Goulburn-Murray Water website to provide details of development controls and permit, licence and lease procedures.

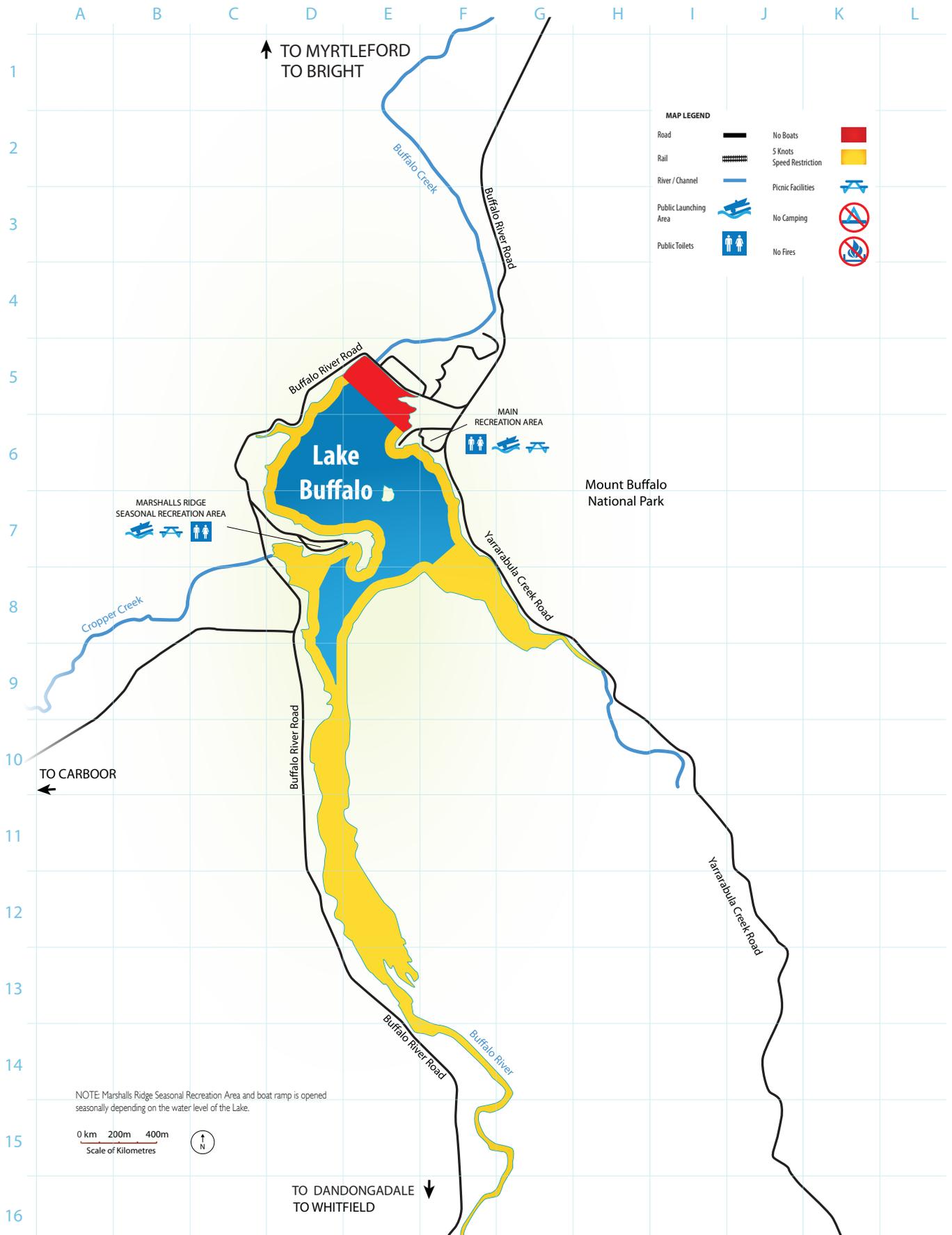
2.2.4 Stakeholders

Goulburn-Murray Water, Country Fire Authority, Victoria Police, Transport Safety Victoria, Parks Victoria, Alpine Shire Council.

2.3 References

Regional Development Company (2012), Lake Buffalo Community and Stakeholder Consultation – Round 1 Outcomes Report, June 2012.

LAKE BUFFALO BOATING AND FACILITIES MAP



3. RECREATION AND TOURISM

Lake Buffalo is an important recreational and tourism asset for North East Victoria. The Lake attracts tourists from Victoria and interstate and supports a wide range of recreational activities including fishing, swimming, boating, water skiing, walking, cycling and picnicking.

Recreational activities at Lake Buffalo need to be carefully balanced against its primary role as a water supply storage for irrigation and downstream potable water supply, and to ensure impact on the environment are minimised.

Goulburn-Murray Water's role as manager of public recreational facilities is a legacy of the past when State Authorities provided these services, which were then funded by government. Currently, there is no sustainable revenue stream to provide ongoing or enhanced recreational experiences at Goulburn-Murray Water storages. As a State Water Corporation, operating costs are recovered through irrigation water charges, which do not include management of public recreation facilities. Limited funding is obtained from urban water charges and commercial leases and licences to help offset the cost of public recreational management. Work is continuing with state agencies to develop appropriate funding mechanisms to cover ongoing costs of recreation and public access management at the storages.

This Plan aims to recognise the current funding constraints and identify opportunities for shared management responsibility between stakeholder agencies. This Plan will help prioritise works and services and identify improvement opportunities to enable the most effective and appropriate application of resources.

3.1 Boating

Boating at Lake Buffalo includes the following user groups: speedboats, personal watercraft, sailing, canoeing and kayaking. The consultation process indicated that recreational boating had increased in recent years.

The Myrtleford Boat Club leases a section of the Main Recreation Area on the eastern side of the storage, adjacent to the boat ramp.

Goulburn-Murray Water is the designated waterway manager under the *Marine Safety Act 2010*. This role includes compliance activities associated with waterway use and the power to make recommendations to the Director of Transport Safety Victoria to support the efficient and safe operation of vessels. Resources to monitor and enforce boating rules are currently limited. The Water Police undertake regular patrols for compliance with boating safety regulations and vessel zoning rules.

Public boat ramps at the Main Recreation Area and Marshalls Ridge provide access to the storage at varying water levels. The Marshalls Ridge boat ramp is not available for use when storage levels fall below 50 per cent.

The potential for conflict between user groups is greatest during peak use periods such as Easter and Christmas holidays when congestion may arise in some areas of the Lake. For example, the location of Myrtleford Boat Club being in close proximity to the main public boat ramp was identified as an issue in peak use periods as the launch area crowds the foreshore area used by the public. The consultation process for Plan development also identified concerns regarding safety risks associated with irresponsible use of powered watercraft, particularly personal watercraft. Power watercraft can also cause environmental concerns such as erosion and noise.

All waters of Lake Buffalo are subject to State inland waters boat operating and zoning rules. Boats must not exceed 5 knots within 50 metres of the shore, another vessel or swimmers. At Lake Buffalo access lanes at both the Main Recreation Area and Marshalls Ridge allow for boats involved in skiing to approach and depart the shore.



No swimming is allowed within 50 metres of a boat ramp that is being used or about to be used.

It has been identified that the current zoning rules for Lake Buffalo need to be reviewed to support safe boating at the storage. Stakeholders suggested that increased compliance activities during peak use periods are required to ensure greater adherence of powerboat users to current speed limits. Stakeholders highlighted improved signage with regard to speed limits and safety risks as a strategy for improving on-water safety during the consultation process.

3.1.1 Key Issues

- Congestion of the storage at some locations during peak use periods (e.g. Main Recreation Area boat ramp and Myrtleford Boat Club).
- Lack of awareness of boating rules by waterway users.
- Potential environment impacts associated with powered watercraft.
- Perception of limited monitoring and compliance of boating rules on the waterways.
- Safety concerns for impacts of power boating activities on passive recreational users e.g. kayakers.
- Current zoning rules may not be complementary to safe boating in some areas of the storage.
- Failure to adhere to the 5 knot zone around the lake edge and boat ramps.

3.1.2 Objectives

To provide a safe and equitable access for all boat users.

3.1.3 Actions

9. Continue to work with Transport Safety Victoria to review and amend the current zoning rules around the storage.
10. Establish consistent signage at all boating access points to improve awareness of boating safety issues.

11. Consider feasibility for relocation of Main Recreation Area boat ramp away from Myrtleford Boat Club to avoid overcrowding. Alternatively, consider options for increasing supporting infrastructure such as access tracks and trailer parking to disperse impacts.

12. Establish improved resourcing and monitoring and enforcement of boating activities.

3.1.4 Stakeholders

Goulburn-Murray Water, Transport Safety Victoria, Victoria Police, Alpine Shire Council, Myrtleford Boat Club.

3.2 Fishing

Fishing is regulated by Fisheries Victoria (Department of Environment and Primary Industries) under the *Fisheries Act 1995* and *Fisheries Regulations 2009* in conjunction with Specific Management Plans such as the *North East Fisheries Management Plan*. The goal of the Plan is to “manage recreational fisheries resources in the North East Region in accordance with ESD [Environmentally Sustainable Development] principles” (Department of Primary Industries, 2007).

Lake Buffalo is a popular destination for recreational fishing. The storage provides habitat for a number of fish species targeted by recreational anglers. These include Golden Perch, Redfin and Trout. The Department of Environment and Primary Industries currently stocks Lake Buffalo with Murray Cod and Golden Perch. Stakeholders highlighted the long-term continuation of these stocking programs as a key concern during the consultation process. The Myrtleford Angling Club is located on leased land on the western perimeter of the storage at the Marshalls Ridge.

Some Lake users have reported concerns regarding European Carp populations. Carp not only compete with native fish species, but can also have adverse impacts on water quality. Carp control is further discussed in Section 4.2: Invasive Species. Potential for fish deaths was raised as an issue, particularly during periods of very low water levels.

Management agencies need to collaborate to manage fish stocking and fish mortality when water levels are low. Clean up management practices also need to be considered should fish deaths occur.

3.2.1 Key Issues

- Maintenance of fish stocks for recreational angling.
- Potential for fish deaths, particularly during periods of very low water levels.

3.2.2 Objectives

To maintain and enhance a sustainable mixed species recreational fishery within Lake Buffalo.

3.2.3 Actions

13. Implementation of recommendations in the *North East Fisheries Management Plan (2007)* that relate to sustainable recreational fishing in Lake Buffalo.

3.2.4 Stakeholders

Fisheries Victoria, Goulburn-Murray Water, Myrtleford Angling Club.

3.3 Hunting

Deer hunting is permitted and is a popular activity along the Buffalo River within the Mount Buffalo National Park. Samba Deer is the primary target species for hunters in the Lake Buffalo catchment. Deer hunting is not permitted on storage perimeter land outside the National Park.

There has also been a long history of wild duck hunting on Lake Buffalo. Duck hunting is permitted on a seasonal basis, generally from mid March to early June. Hunting from powerboats is not permitted when the motor is running, whether the vessel is in motion or not. Firearm regulations apply to shooting near dwellings and restrictions apply within one kilometre of any storage structure.



Shooters should make themselves familiar with Country Fire Authority regulations and restrictions, particularly during hot and dry weather. Hunters must also be aware of the proximity of hunting to recreational users of the storage, as well as the requirement that there is no camping at the site and to take rubbish home with them.

3.3.1 Key Issues

- Hunters crossing into areas where hunting is not permitted.
- Impact of hunting on the environment.
- Hunters not complying with shooting and hunting regulations.
- Rubbish left by hunters.

3.3.2 Objectives

Increased education and awareness to improve hunting behaviour and provide clarity regarding the management roles and responsibilities between agencies.

3.3.3 Actions

14. Develop agency management agreements that provide hunters with clear and concise information about areas where hunting is permitted.
15. Improve education and awareness to encourage protection of the environment and compliance with shooting and hunting regulations.

3.3.4 Stakeholders

Department of Environment and Primary Industries, Goulburn-Murray Water and Field and Game Victoria.

3.4 Public Facilities and Infrastructure

Most infrastructure around Lake Buffalo is related to recreational activities, such as boating and picnicking. Infrastructure is located within the two reserves located at the Marshalls Ridge and the Main Recreation Area. The reserves contain shelters, playgrounds, public toilet blocks (including supporting infrastructure such as effluent evaporation ponds and treatment systems), picnic tables and chairs, roads, car parks, viewing areas and boat ramps.

Stakeholders highlighted concerns about the recent removal of the wood barbeque facility at Marshalls Ridge and a consequent increase in illegally lit fires at this location. Options are being considered for a new barbeque facility within the recreation area.

Given most infrastructure was built around the time the Lake was constructed, it is relatively old and in need of upgrade and maintenance. Limited grant funding is available to construct new facilities around the storage and there is no direct funding source for ongoing maintenance.

The consultation process for Plan development highlighted a number of opportunities for improving or developing new infrastructure. This includes construction of walking and cycling trails around the Lake foreshore, playground upgrades, planting of shade trees and construction of boardwalks and rest areas around the Main Recreation Area.

A new toilet block has been constructed at the Main Recreation Area. The toilet block and associated effluent management system at Marshalls Ridge does not currently meet wastewater requirements due to its close proximity to full storage water level. Options are being considered to address this issue, including replacement of the toilet block and upgrading of the effluent system to meet current best practice.

A more detailed assessment of facilities is required to determine priorities for investment. This should be closely aligned with population and visitor forecasts and demand. Costs for maintaining and upgrading reserves and associated public infrastructure are significant. Potential partnerships with other organisations and agencies should be considered for upgrade or development of reserve infrastructure.

3.4.1 Key Issues

- Aging infrastructure in need of upgrade and maintenance.
- Need for more toilets, seating and shelters around the foreshore.
- Funding for upkeep and upgrade of infrastructure.
- Lack of walking and cycling trails around the storage.

- Removal of wood barbeque at Marshalls Ridge resulting in increase in illegal fires in the area.
- Wastewater setbacks at Marshalls Ridge are non-compliant.

3.4.2 Objectives

To improve public infrastructure and work with other agencies to obtain funding for upgrades and maintenance.

3.4.3 Actions

16. Identify the scale and type of infrastructure upgrades, additional infrastructure and services required.
17. Estimate the long term resident and visitor demand on and around the Lake and ensure that infrastructure provision is aligned with demand.
18. Work with other agencies to identify funding opportunities for the upkeep and maintenance of infrastructure around the Lake.

3.4.4 Stakeholders

Goulburn-Murray Water, Alpine Shire Council, Transport Safety Victoria, Department of Environment and Primary Industries (Crown Land).

3.5 Camping

Camping is not currently permitted around the foreshore of Lake Buffalo. However, there are a number of sites in the broader catchment where illegal camping is known to occur. These include those on the Buffalo Arm, located on land managed by the Department of Environment and Primary Industries and a site on the Yarrarabula Arm located on Goulburn-Murray Water managed land.

The Myrtleford Boat Club and Angling Club also hold events once or twice per year at Lake Buffalo that allows camping on the Club lease site.

Camping on the Club managed land is permitted as part of the permit conditions for Club site and subject to adequate facilities being provided by the Club.

The consultation process for Plan development recommended the introduction of minimum impact camping sites within the Lake Buffalo catchment area. The issues are managing impact of camping, including human waste and the potential impact on water quality. This could be managed by developing appropriate management and controls to ensure protection of the natural environment. Public / private partnerships were suggested as a potential opportunity for campground management. The Nug Nug Reserve was cited as a working example of a public campground managed by a volunteer committee within the area.

During the consultation, stakeholders also suggested consideration of opportunities for opening up the waters edge at select locations for caravans and campervans.

3.5.1 Key Issues

- No official designated camping areas around the foreshore of Lake Buffalo.
- Illegal camping.

3.5.2 Objectives

To manage impacts of camping on water quality, public safety and the foreshore environment.

3.5.3 Actions

19. Determine the feasibility of low impact camping sites in the Lake Buffalo catchment.
20. Undertake compliance activities to prevent illegal camping activities.

3.5.4 Stakeholders

Goulburn Murray Water, Alpine Shire Council and Department of Environment and Primary Industries.

3.6 Emergency Management and Safety

In addition to safety issues relevant to boating, as discussed in Section 3.1: Boating, a number of other safety issues are relevant to Lake Buffalo.

Examples include the safe maintenance of facilities and infrastructure, and safety concerns relating to the isthmus of land between the boat ramp and the "island" during periods of low water. Stakeholders also highlighted lack of mobile phone coverage over parts of the storage area as an important safety issue.

Goulburn-Murray Water maintains a risk register of public facilities on its land. This incorporates a prioritised list of management actions required to manage public safety. A high priority for Goulburn-Murray Water is the implementation of a best practice risk management approach for the management of public safety in all publicly accessible areas of the storage.

The consultation process for Plan development highlighted the importance of Lake Buffalo in provision of water for fire fighting. Fire trucks use boat ramps wherever possible to avoid impacts to the foreshore. Country Fire Authority requirements need to be considered as part of any proposed upgrade to boat ramps.

The large number of submerged trees within the 5 knot zones around the edge of the storage and along the Buffalo, Yarrarabula and Cropper Arms can present a boating safety issue. Furthermore, submerged areas within these zones become a safety issue when the storage drops to certain levels.

In the floods during the summer of 2010/11, a large amount of debris and timber washed into the storage causing dam safety and boating issues. In 2011 grant funding from Department of Transport was made available to restore facilities at Lake Buffalo damaged during the 2010 floods.

Historical flood events at the storage have highlighted the need to plan and coordinate emergency responses and clarify roles. This issue was highlighted in the recent report *Review of the 2010–11 Flood Warnings and Response* (Comrie, 2011). The report took into account extensive community consultation with flood-affected towns across Victoria and outlines the need for reform in four key areas:



- The need for clarification of roles and responsibilities with respect to flood planning, modeling, warnings and clean up.
- Improvement and auditing of emergency management planning at State, regional and local levels.
- For operational purposes, to adopt an 'all hazards, all agencies approach to emergency management'.
- Greater community involvement in managing risks and planning for emergencies.

Victoria Police coordinates the response to emergency incidents on Lake Buffalo. The Country Fire Authority, Victorian State Emergency Services and Ambulance Victoria all have a support role in response to emergency incidents.

3.6.1 Key Issues

- Impacts of flood events resulting in flood debris and impacts to standing timber.
- A requirement for improved interagency cooperation around emergency management.

3.6.2 Objectives

The establishment and implementation of effective emergency management arrangements to improve the safety of recreational lake users.

3.6.3 Actions

21. Ensure emergency services and relevant agencies meet regularly to improve and coordinate emergency management / response.
22. Enhance existing information materials for Lake Buffalo to increase awareness of issues relating to emergency management and safety.
23. Engage media / communication resources to communicate safety and compliance messages to recreational storage users.
24. Seek input from emergency services regarding methods for locating Lake users in case of emergency.

3.6.4 Stakeholders

Victoria Police, Transport Safety Victoria, State Emergency Service, Ambulance Victoria, Country Fire Authority and Goulburn-Murray Water.

3.7 Tourism and Economic Development

Although the storage was built primarily to supply water for irrigation, a recreation and tourism industry has evolved. This has generated significant economic and social benefits to the local region. The economic value of recreation at Lake Buffalo has been estimated at \$114,000 per year (Goulburn-Murray Water, 2007).

The consultation process for Plan development highlighted concerns regarding the impacts of increased visitation numbers on safety and the environment. Recreational and tourism ventures such as sustainable 'eco lodges' that do not adversely impact on Lake operations, water quality, environmental values or public safety and access are encouraged. Preference was given to recreational and tourism developments that can adapt to fluctuating water levels. Private investment in tourism ventures needs to be supported by detailed feasibility studies and integrated Council planning for recreation and tourism development.

Currently, no tourism strategy has been specifically developed for Lake Buffalo. A tourism strategy is required that includes information and strategic direction relating to storage operation. It should guide businesses and commercial operators on operating within the constraints imposed by fluctuating water levels. The strategy should include guidelines relating to preferred and appropriate commercial ventures. Studies are required to estimate the long term resident and visitor demand on and around the Lake prior to strategy development.

3.7.1 Key Issues

- Potential for increased visitation numbers to pose environmental and economic impacts.
- Lack of infrastructure to support tourism activities.

3.7.2 Objectives

Encourage recreation and tourism ventures that will not adversely impact on Lake operations, water quality, environmental values or public safety and access.

3.7.3 Actions

25. Commission a study to estimate the long term resident and visitor demand on and around the storage in order to inform decisions about future tourism opportunities and developments.
26. Determine actions to support tourism at Lake Buffalo (e.g. picnic areas that includes parking suitable for buses).

3.7.4 Stakeholders

Goulburn-Murray Water, Alpine Shire Council and commercial operators.

3.8 References

DPI, 2007, North East Fisheries Management Plan, August 2007, Management Report Series No. 48.

Goulburn-Murray Water, 2007, Lake Buffalo Water Quality and Biodiversity Management Plan (Draft).

Goulburn-Murray Water, 2012, website, <http://www.g-mwater.com.au>





4. ENVIRONMENT AND CULTURAL HERITAGE

Although most significantly altered by the damming of the Buffalo River, the Lake Buffalo catchment has changed since European settlement. Nevertheless, Lake Buffalo and its surrounding catchment area support a diverse range of environmental and aesthetic values. Terrestrial vegetation around the foreshore provides important habitat for native species and protects water quality by filtering nutrients, reducing the inflow of sediments and stabilising the foreshore and banks of connecting tributaries. The Lake itself provides habitat for a diverse range of aquatic species including fish, macro invertebrates and plants.

This Plan should be read in conjunction with other relevant regional strategies including, but not limited to the *North East Regional Catchment Strategy* (2012), *North East Regional River Health Strategy* (2005), *North East Native Vegetation Plan* (2005) and the *Ovens Basin Water Quality Strategy* (2000).

4.1 Flora and Fauna

A significant proportion of the Lake Buffalo catchment comprises the Mount Buffalo National Park and State Forest. Relatively intact undisturbed forest adjoins approximately 50 per cent of the storage.

The northern, eastern and western catchment areas support intact stands of native forest. High value stands of native forest are located toward the west of the catchment in the Cropper Creek production area. Vegetation consists predominantly of broad-leaf peppermint occurring at lower elevations and on drier aspects. Pockets of narrow-leaf peppermint also occur in sheltered basins and on moister aspects. Although there is some awareness of flora species endemic to the Lake and immediate surrounds, further detailed flora surveys undertaken by local environment groups would be beneficial (Soil Conservation Authority, 1984).

Re-establishment of native vegetation around the Lake has had a positive influence on water quality. Goulburn-Murray Water in partnership with Greening Australia has recently undertaken 180 hectares of revegetation works along the Yarrarabula Arm. Revegetation works on the Lake perimeter land should be encouraged and supported where appropriate. Other options include working with the North East Catchment Management Authority, local Landcare groups and other relevant agencies to investigate the funding of incentive schemes for revegetation works.

Invasive weed species can have a significant impact on terrestrial flora values (refer to Section 4.2: Invasive Species).

Native resident fish species in Lake Buffalo listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act)* 1999 and the *Victorian Flora Fauna Guarantee Act (FFG Act)* 1988 include Golden Perch, Trout Cod and Murray Cod.

Lake Buffalo contains small pockets of standing dead timber that are likely to provide important habitat for aquatic fauna. However, the standing dead timber has also been identified as a safety hazard by recreational users, particularly in locations where there are high levels of boating activity (refer to Section 3.1: Boating).

Generally, relocating dead trees (standing or fallen) should only be permitted in clearly justified circumstances. In the event that any timber or large woody debris is removed, it should be relocated safely to an alternative area in the waterbody. An important criterion for approval of such proposals is the demonstration of a net habitat enhancement. In some parts of the Lake an increase in dead trees may create potential conflict with recreational interests due to safety issues.

4.1.1 Key Issues

- Impacts of invasive species of terrestrial flora.
- Conflict between aquatic habitat conservation and recreational boating safety (e.g. dead trees).

4.1.2 Objectives

Improved protection and enhancement of native flora and fauna.

4.1.3 Actions

27. Support foreshore vegetation works in riparian areas to protect biodiversity values and enhance visual amenity.
28. Continue to support existing foreshore revegetation programs, mutually agreed with neighbouring landholders and investigate potential for establishment of a revegetation incentive program for landholders.
29. Promote and implement management strategies to monitor, protect and enhance aquatic habitat for native fish species as identified in the *North East Fisheries Management Plan (2007)*.

4.1.4 Stakeholders

Goulburn-Murray Water, North East Catchment Management Authority and Department of Environment and Primary Industries.

4.2 Invasive Species

Invasive species, including pest plants and animals, are a major concern to public and private land and water managers. They represent a significant threat to economic productivity and to environmental values.

The consultation process for Plan development highlighted blackberry infestations as a significant concern, particularly in Goulburn-Murray Water owned land. The Yarrarabula Arm is characterised by significant blackberry outbreaks, which have become an increasing concern since the cessation of pine plantation leases following the 2006 bushfires. Other significant weed

species present in the Lake Buffalo catchment include English Broome and Gorse. Aquatic weed species such as Water Lily have also been identified in the Yarrarabula Arm.

Weed management activities on the public foreshore and lake bed areas of Lake Buffalo are generally undertaken by Goulburn-Murray Water and grazing licence holders. The *North East Regional Catchment Strategy (2011)* identifies priority areas for weed control works on waterways. The North East Catchment Management Authority may provide financial assistance for the removal / control of weeds or overgrown vegetation in these areas.

Pest animal species currently impacting on the Lake Buffalo include rabbits, foxes, hares, pigs, deer, cats and goats. Carp also pose a serious threat to the health of the storage and surrounding tributaries and streams. Carp reproduce quickly and can tolerate a broad range of environmental conditions. Their adaptability enables them to displace native species. Currently, there are no programs to manage Carp in the storage. Stakeholders suggested that there may be opportunities to better understand and monitor Carp populations in Lake Buffalo as a part of wider studies, research and control programs.

4.2.1 Key Issues

- Aquatic and terrestrial weed species impacting on biodiversity values.
- Pest animal species impacting on biodiversity values.
- Lack of funding and resources for control of priority pest and plant animal species.

4.2.2 Objectives

To effectively manage invasive species in Lake Buffalo, the foreshore and surrounding environment.

4.2.3 Actions

30. Develop a prioritised weed control program coordinated with agencies and landholders, including the discussion of funding and responsibilities.

31. Investigate the application of Carp control for Lake Buffalo.

32. Support Department of Environment and Primary Industries and other agencies to minimise the impacts of pest animals on the surrounding communities to the Lake and environment.

4.2.4 Stakeholders

Goulburn-Murray Water, North East Catchment Management Authority and Department of Environment and Primary Industries.

4.3 Water Quality

Good water quality is critical in supporting a range of values that are derived either directly or indirectly from Lake Buffalo. This includes water for irrigation, stock and recreation. Goulburn-Murray Water provides urban water authorities with raw water for a number of small towns. Lake Buffalo also provides raw water to North East Water for urban water supply for the Rural City of Wangaratta.

Water authorities have a responsibility under the *Safe Drinking Water Act 2003* to identify and, where possible, mitigate risks to water quality. This Act is aimed at protecting water quality intended for human consumption.

Water quality within Lake Buffalo can be influenced by a number of factors including adjacent land use, storage activities, in-storage processes and the quality of inflows into the storage. Recreational users of the waterway also have the potential to impact water quality, and can in turn be affected by poor water quality. Good water quality is also important for the preservation and health of aquatic habitat and ecosystems. Public awareness of water quality issues can be enhanced through education programs focused on communicating the importance of water quality. Catchment activities that can impact upon water are discussed in Sections 3 and 5 of this Plan. A full assessment and identification of risks to water quality will be undertaken under Goulburn-Murray Water's Lake Buffalo Water Quality Risk Assessment.



Accurate water quality monitoring is important to improve our understanding of the trends in biophysical and chemical parameters in inland rivers, water storages and streams. Understanding these trends allows land and water resource managers to develop strategies, actions and frameworks to address water quality decline and any threatening processes impacting on the water resource. The quality of water is a reflection of the state, use and management of the catchment feeding Lake Buffalo.

Water quality in Lake Buffalo has been regularly monitored as part of the Major Storages Operation Monitoring Program that commenced in 1992. Basic physico-chemical factors and blue-green algae are monitored monthly; major ions are monitored every six months. Results are summarised and analysed yearly (GMW, 2012).

Water quality in Lake Buffalo is considered to be relatively good, particularly when compared to other water storages. This is likely to be attributable to less intensive farming in the catchment, combined with the presence of large forested areas and its position in the upper catchment. Bushfires in the Lake Buffalo catchment in 2003, 2006 and 2007 burned a significant proportion of the catchment and are likely to be the cause of higher turbidity levels. This is due to large post-fire inputs of sediment and ash to streams flowing into Lake Buffalo (Smith et al, 2011 and GMW, 2012). The relevant water quality guideline value for turbidity at Lake Buffalo is low (5 NTU) and there have been a number of years since the fires when this value has been exceeded.

Blue-green algae are naturally occurring cyanobacteria that have the potential to be harmful as they can make people and animals sick. Low levels of blue-green algae are present in Lake Buffalo. Blue green algae is monitored routinely by Goulburn-Murray Water to meet its obligations as a local water manager, as directed by the Department of Environment and Primary Industries and the Department of Health.

The Department of Environment and Primary Industries and the Department of Health set a maximum algae level considered safe (GMW, 2009). Goulburn-Murray Water issues warnings when the level of blue-green algae exceeds the safe level. Goulburn-Murray Water has developed incident response plans for all water major storages including Lake Buffalo. A large number of factors can influence the growth of blue-green algae including weather, light availability, flow / turbulence and algae food (nutrient) levels. There has never been a warning issued for blue-green algae at Lake Buffalo and it is unlikely that blue-green algae will become a major issue.

The North East Catchment Management Authority has a number of strategies in place for targeting water quality issues including its forthcoming *Regional Catchment Strategy* (2013) and *North East Catchment Management Authority River Health Strategy* (2005).

4.3.1 Key Issues

- Impacts of natural events and human activities on water quality and aquatic ecosystem health.
- Assurance that effective monitoring of water quality is being implemented.

4.3.2 Objectives

Undertake targeted and effective water quality monitoring and management to improve our understanding of biophysical and chemical parameters and to develop effective management strategies and frameworks to identify and where applicable address water quality issues.

4.3.3 Actions

33. Support the implementation of relevant actions included in the *North East Catchment Management Authority Regional Catchment Strategy* (2013) and *River Health Strategy* (2005).
34. Review existing water quality monitoring programs to ensure they are aligned with the hazards stipulated in the *Safe Drinking Water Act* 2003 and Regulations, Regional Catchment Strategies and related NRM objectives.

35. Actively support partner agencies in the protection and enhancement of water quality within the catchment.

4.3.4 Stakeholders

Goulburn-Murray Water, Environment Protection Authority, Department of Environment and Primary Industries, North East Catchment Management Authority and North East Water.

4.4 Cultural Heritage

The management and protection of Aboriginal and European heritage located within the Lake Buffalo catchment is the responsibility of all government agencies in control of land management activities and private landowners.

State and Commonwealth legislation provides specific protection for Aboriginal and non-Aboriginal heritage. In particular, the *Aboriginal Heritage Act 2006* and associated *Aboriginal Heritage Regulations (2007)* protect Aboriginal heritage and provide a consistent approach to managing Aboriginal cultural heritage land use and development proposals. There are also other guidelines and regulations that set standards for identification, listing and conservation of heritage places.

The current status of Aboriginal and European heritage at Lake Buffalo has not been specifically investigated and is not well understood or documented. Goulburn-Murray Water will seek to work collaboratively with key stakeholders including the Taungurung Clans Aboriginal Corporation and other relevant agencies and stakeholders to improve understanding and protection of heritage items at Lake Buffalo.

4.4.1 Key Issues

- Lack of understanding of the current status of Aboriginal and European heritage within the Lake Buffalo catchment.

4.4.2 Objectives

Protect important Aboriginal and European cultural heritage sites at Lake Buffalo.

4.4.3 Actions

36. Support initiatives to enhance identification and protection of Aboriginal and European cultural heritage.

4.4.4 Stakeholders

Goulburn-Murray Water, Aboriginal Affairs Victoria, North East Catchment Management Authority and the local Registered Aboriginal Party (RAP) if one is appointed.

4.5 References

GMW (2012), Goulburn-Murray Water Major Storages 2011 Water Quality Report.

National Parks Service (1996), Mount Buffalo National Park Management Plan. National Parks Services – Department of Natural Resources and Environment, Victoria. June 1996.

North East CMA (2005), North East Native Vegetation Plan ISBN 0 9578204 3 7.

Soil Conservation Authority (1984), A proposal for Proclamation Prepared for consideration by the Land Conservation Council.

Smith H, Cawson J, Sheridan G and Lane P (2011), Desktop review – Impact of bushfires on water quality. For the Australian Government Department of Sustainability, Environment, Water, Population and Communities, 18th March 2011.

North East CMA (2012), North East Regional Catchment Strategy – pending Ministerial Approval.

North East CMA (2005), North East Regional River Health Strategy 2005.

North East CMA (2005), North East Native Vegetation Strategy 2005.

North East CMA (2000), Ovens Water Quality Strategy 2000.

GMW (2012a), Blue Green Algae Incident Response Plan Lake Buffalo: Site Specific Information.



5. PUBLIC LAND MANAGEMENT

Goulburn-Murray Water owns and manages the lake bed and a substantial amount of land around Lake Buffalo. The land is public land, existing as either freehold title vested Crown Land or Crown Land reserved for water supply purposes. Along with other nearby public land managed by other authorities, this land is considered a valuable community asset. Effective land management is critical for protection of environmental, social, cultural and economic values at Lake Buffalo.

Examples of land management issues include historical land tenure issues, potential impacts of grazing and commercial forestry on water quality and management of fire risk. Land use and development planning issues are not significant at Lake Buffalo given the small proportion of freehold land which makes up the storage catchment area.

5.1 Land Tenure

Goulburn-Murray Water owns and manages a significant proportion of land immediately surrounding the Lake. It holds freehold title to in excess of 5,000 hectares of land around the perimeter of Lake Buffalo that was acquired for the proposed Stage II enlargement of the storage known as "Big Buffalo". The land around the storage varies from cleared to heavily timbered native forest. Pine plantations were established in the 1980s and are currently owned by Hancock Victorian Plantations Pty Ltd, a major commercial forestry company, under a lease from Goulburn-Murray Water. The lease area is in excess of 4,000 hectares although the net plantation area comprises about 1,000 hectares. A small number of grazing sub-leases exist within the lease area. The river and creek Crown Land Reserves through the area are also currently not actively managed.

Significant areas of the plantation were destroyed by fire and storm in 2003 and 2006. These areas of plantation have not been replanted due to the short period of time to

lease expiry hence the areas have been neglected and not actively managed. Negotiations are currently in progress for the grant of a new long term commercial forestry lease. The Yarrarabula Creek Arm of the lease however was surrendered and attempts at rehabilitating this area through native revegetation programs and weed control have been implemented, although with mixed success.

Goulburn-Murray Water lacks sufficient funding to ensure effective management of its freehold title lands at Lake Buffalo and hence long term leasing preferably for commercial forestry is necessary. Stakeholders highlighted this as a key concern during the consultation process for Plan development. Issues associated with limited resources for catchment management activities have been further exacerbated by Hancock Victorian Plantations reducing its leasehold area for pine plantations in the Yarrarabula Creek Arm area due to fire risk and access difficulties for forestry operations.

5.1.1 Key Issues

- Limited resources to manage large tracts of Goulburn-Murray Water freehold title land and Crown Land at Lake Buffalo.

5.1.2 Objectives

Lease all suitable land for long term commercial forestry and consider suitable land management options for the Yarrarabula Creek Arm, areas of native forest and the Crown Land river and creek reserves.

5.1.3 Actions

37. Investigate suitable land management options for Goulburn-Murray Water freehold land located on the Yarrarabula Creek Arm, areas of native forest and the Crown Land river and creek reserves.
38. Proceed with negotiations for a long term lease.

5.1.4 Stakeholders

Goulburn-Murray Water, North East Catchment Management Authority, Hancock Victorian Plantations, Department of Environment and Primary Industries, Parks Victoria and Alpine Shire Council.

5.2 Agriculture Land Use and Grazing

Only a small proportion of the Lake Buffalo catchment is used for agriculture, but the value of production is high. Most of the cleared land is under pasture, consisting mainly of sown introduced species grazed by beef and dairy cattle. Some sheep are grazed mainly for meat production. Tobacco was traditionally the major crop of the area, but in the Buffalo Valley downstream of the Lake has now been replaced by vegetables and viticulture.

Goulburn-Murray Water does not currently issue grazing licences. However currently there are two grazing sub-leases for grazing on Hancock Victorian Plantations lease areas in the Lake Buffalo catchment. To date, there has been limited monitoring of compliance with the sub-lease conditions, or assessment of the adequacy of conditions. Some areas that are not under lease are also being grazed illegally. It is proposed to terminate all grazing in the future as part of the lease negotiations with Hancocks.

In recent years approximately 200 hectares of agricultural land outside of the plantation lease was licensed by Goulburn-Murray Water for copping purposes only however these areas are currently vacant and negotiations are in progress for these to be occupied for the purpose of commercial forestry.

Land currently grazed under sub-lease arrangement at Lake Buffalo is known to have been contaminated with biocides due to the application of DDT and Dieldrin when the land was used for tobacco growing. There are concerns that potential contamination 'hotspots' still exist (GMW, 2007). Cattle grazing land previously used for tobacco growing has retained the biocides and there is evidence to suggest detectable

levels in the animals' flesh. There is limited potential for the expansion of grazing leases due to the presence of these contaminants at Lake Buffalo.

There is currently a small number of stock trapped on an island and between the Buffalo Arm and Yarrarabula Arm. Stock are likely to have accessed this area during periods of lower water levels. Goulburn-Murray Water is currently considering options for removal of stock from this area of land.

Well managed grazing lands can be beneficial in controlling weeds and vegetation growth in foreshore areas, particularly where it creates a fire hazard. However, poorly managed grazing can result in public health risks. This is due to faecal matter inputs and other water quality issues such as increased nutrients contributing to nuisance, potentially toxic algal blooms, erosion and increased turbidity. Unrestricted grazing in foreshore areas can also result in damage to native riparian vegetation, including spread of pest plant species and destruction of habitat of native animals (GMW, 2011).

Public ownership has effectively prevented private development in the immediate environment and catchment of Lake Buffalo. As a consequence, issues commonly associated with catchment water quality protection, such as the effects of agricultural production and grazing, have not arisen.

5.2.1 Key Issues

- Potential impacts on stock in historical tobacco growing areas due to biocide accumulation.
- Poorly managed grazing land resulting in water quality decline, public health risks and damage to native riparian vegetation.
- Limited monitoring of compliance with grazing sub-lease conditions.
- Cattle trapped on island between Buffalo and Yarrarabula Arms.
- Termination of grazing with long term occupants.

5.2.2 Objectives

Well managed, best practice grazing and agricultural programs to manage and minimise the impacts to stock on public land.

Eliminate stock grazing as a management tool.

5.2.3 Actions

39. Terminate all grazing in the future as part of the lease negotiations with Hancocks.
40. In the interim, reinforce compliance with sub-lease conditions through adequate monitoring.
41. Investigate strategies for removal of stock from island between Buffalo and Yarrarabula Arms.

5.2.4 Stakeholders

Goulburn-Murray Water, Hancock Victorian Plantations, Department of Environment and Primary Industries, Alpine Shire Council and North East Catchment Management Authority.

5.3 Permits, Licences and Lease Arrangements

There are only two leases in place at Lake Buffalo; the Myrtleford Angling Club at Marshalls Ridge, and the Myrtleford Boat Club located adjacent to the boat ramp in the Main Recreation Area.

Event permits are also issued for various recreational activities.

Issues raised in relation to leases and permits include the lack of clarity regarding conditions, overly onerous conditions, lack of compliance with conditions and excessive cost.

5.3.1 Key Issues

- The need for further information to assist occupiers in making decisions about lease agreements.

5.3.2 Objectives

To establish a cooperative partnership between lease and permit holders, to provide an appropriate, well maintained perimeter land around Lake Buffalo.



5.3.3 Actions

42. Proactively consult with occupiers regarding the conditions of their lease agreements lease / licences, and deal with cases of repeated non-compliance.

5.3.4 Stakeholders

Goulburn-Murray Water, permit and lease holders.

5.4 Fire Management

Vegetation around storages can pose a significant fire risk to neighbouring properties and recreational users. Public land managers are obliged to responsibly manage fire risk on land around Lake Buffalo. The lighting of illegal fires around the storage is also a potential problem identified during the consultation process for Plan development.

Fire hazards tend to increase during periods of low storage levels. This is because vegetation areas effectively increase in parallel with the drying lake bed. However, this is not a significant issue at Lake Buffalo.

The consultation process for Plan development also highlighted the importance of Lake Buffalo in providing water for fire suppression activities. Trucks, planes and helicopters all access the storage for re-filling during wild fire events.

Goulburn-Murray Water implements annual Fire Protection Plans to address potential fire risks on and around storages and along the delivery network. Goulburn-Murray Water has also implemented a range of programs in partnership with local Councils, the Country Fire Authority and Department of Environment and Primary Industries to identify and address potential fire risks on and around its storages and along the delivery network to reduce fire risk. This cooperative approach with the Country Fire Authority and other relevant agencies will continue into the future.

The Alpine Shire Council is currently preparing a Municipal Fire Management Plan. Club sites are required to have updated Fire Management Plans in place as part of their lease agreement. These plans have been developed in partnership

with the Country Fire Authority, Department of Environment and Primary Industries, Victoria Police and other agencies and community groups.

Hancock Victorian Plantations is a significant stakeholder in fire management at Lake Buffalo and has its own fire fighting equipment and appropriately trained staff. The company declares “black” days when staff do not attend work as the conditions are deemed unsafe, even if a total fire ban has not been declared.

Following the events of Black Saturday on 7 February 2009, the State Government has taken a number of steps to address and reduce bushfire risk to the Victorian population. One of these steps is the capacity of the Government to declare certain days as ‘Code Red’ days. On ‘Code Red’ days, any activity on and around Lake Buffalo, including use by the public will be guided by the recommendations of Goulburn-Murray Water, Department of Environment and Primary Industries, and the Country Fire Authority.

5.4.1 Key issues

- Illegally lit fires around storage.
- Vegetation around the storage can pose a significant fire risk to neighbouring properties and recreational users.

5.4.2 Objectives

To ensure responsible management of fire risks at Lake Buffalo.

5.4.3 Actions

43. Manage fire risks around Lake Buffalo through annual Fire Protection Plans prepared by Goulburn-Murray Water. Ensure Fire Protection Plans take account of supply levels within Lake Buffalo and include a strategy for managing ‘Code Red’ days.
44. Identify areas of public land suitable for use as Neighbourhood Safer Places in consultation with relevant agencies.
45. Integrate and link Fire Protection Plans with the Alpine Shire Council’s Municipal Fire Management Plans.

5.4.4 Stakeholders

Department of Environment and Primary Industries, Country Fire Authority, Goulburn-Murray Water and Alpine Municipal Fire Management Planning Committee.

5.5 References

EPA, 2008, Code of Practice – Onsite Wastewater Management.

Goulburn-Murray Water (2007), Lake Buffalo Water Quality and Biodiversity Management Plan (Draft).

Goulburn-Murray Water (2011), Managing Stock Access to Goulburn-Murray Water Storages and Channels to Manage Water Quality Risks, Meeting Minutes, Thursday 10 November 2011.

DPCD (2009), Planning permit applications in open, potable water supply catchment areas.



APPENDIX A – OVERVIEW OF STORAGE OPERATIONS



At full supply level Lake Buffalo has a total area of 340 hectares and a volume of approximately 23,504 megalitres. The area of the Lake is considered relatively small, compared to its catchment capabilities. As a result the storage is capable of filling several times in a single year.

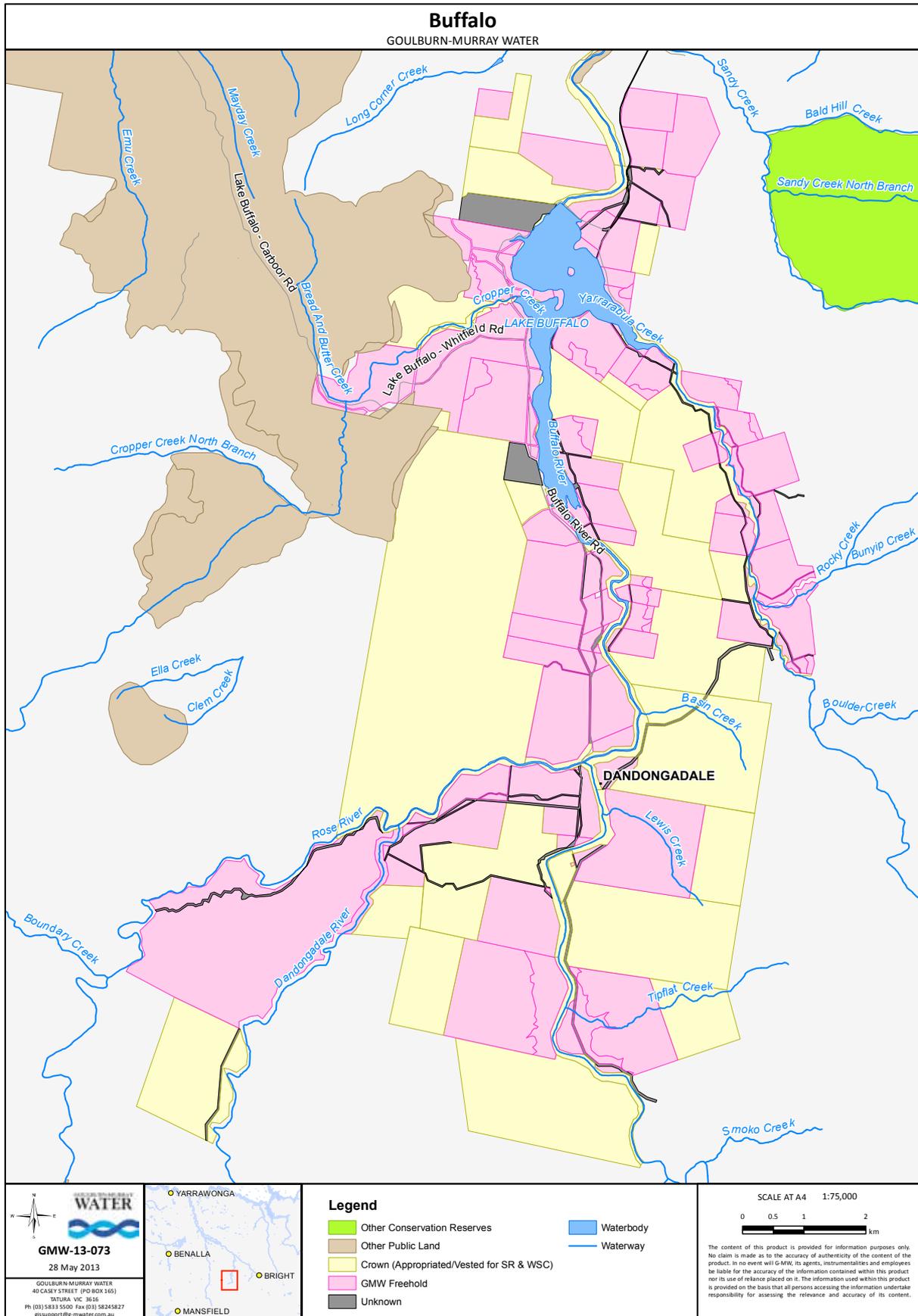
The upstream catchment area is approximately 1,062 square kilometres of mountainous, heavily timbered country drained by the Buffalo River and its major tributaries, the Catherine, Dandongadale and Rose Rivers and the Yarrarabula Creek (known also as the Little River).

Lake Buffalo dam was constructed as the first stage of a proposed much larger dam referred to as “Big Buffalo”. Big Buffalo did not proceed and the current dam was designed to enhance supply to Victorian areas served by the Murray River as well as meeting requirements within the Ovens Valley.

Lake Buffalo ensures that adequate reserves of water are available to water consumers in the Buffalo-Lower Ovens Valleys and on becoming operational it allowed an immediate expansion of irrigation beginning in the 1960s. It also provided greater security of supply and an increase in development. The original purpose of Lake Buffalo was to maintain summer flows for irrigation, stock and domestic requirement especially during drought.

The towns of Wangaratta, Myrtleford, Bright and Porepunkah depend on water from the catchment for domestic and industrial supplies, while agricultural ventures rely on the catchment water for the irrigation of crops and pasture.

APPENDIX B – MAP OF LAKE BUFFALO





APPENDIX C – AGENCY ROLES AND RESPONSIBILITIES

Aboriginal Affairs Victoria

www.aboriginalaffairs.vic.gov.au

Aboriginal Affairs Victoria (AAV) is the Victorian Government's central point of advice on all aspects of Aboriginal affairs in Victoria. Currently there is no Registered Aboriginal Party (RAP) for the Lake Buffalo catchment.

The *Victorian Aboriginal Heritage Act 2006* recognises Aboriginal people 'as primary guardians, keepers and knowledge holders of Aboriginal cultural heritage'. Registered Aboriginal Parties play a leading role in administering the new Act and have well defined responsibilities at a local level.

Alpine Shire Council

www.alpineshire.vic.gov.au

Under the *Planning and Environment Act 1987*, local government is responsible for ensuring that land is used and developed in an environmentally, economically and socially responsible manner, to provide a sustainable future for the community.

Alpine Shire Council is the authority with responsibility for statutory planning matters, urban water supply, wastewater management, stormwater management, waste management services, onsite wastewater management tanks, management of public facilities and reserves, management of animals and local law enforcement.

Bureau of Meteorology

www.bom.vic.gov.au

Bureau of Meteorology (BoM) is the main provider of weather forecasts, warnings and observations to the Australian public and is responsible for issuing flood alerts in Australia.

North East Water

www.nerwa.vic.gov.au

North East Water provides water and sewerage services to 38 towns, villages and cities in North East Victoria, serving an estimated population of 117,100 people in an area of approximately 20,000 square kilometres. The region extends from Corryong in the east, along the Murray River to Yarrawonga, then south to Benalla and the alpine towns of Bright, Mount Beauty and Dartmouth.

Country Fire Authority

www.cfa.vic.gov.au

Country Fire Authority (CFA) is a volunteer and community based fire and emergency services organisation and is responsible for fire and related emergency coordination in rural and regional areas.

Department of Health

www.health.vic.gov.au

The Drinking Water Regulatory Section within the Department of Health (DoH) has responsibility for the implementation and oversight of the *Safe Drinking Water Act 2003* and the *Safe Drinking Water Regulations (2005)* on behalf of the Secretary to the Department of Human Services. The primary functions of this section are to oversee the implementation of, and monitor compliance with, the Act and Regulations. The functions of the Department of Human Services are to:

- Protect public health in relation to the supply of drinking water. Monitor and enforce compliance with this Act and the Regulations.
- Report on the performance of water suppliers and water storage managers in relation to the requirements imposed on them under this Act.

- Investigate and report on any aspect of drinking water quality in Victoria. Make recommendations to the Minister for Health on any matter relating to drinking water or regulated water.
- Promote industry and public awareness and understanding of drinking water quality issues.

The Drinking Water Regulatory Section works with the Victorian water industry, other units within the Department of Health, key stakeholders and other government departments to deliver the regulatory objectives of the Act.

Department of Planning and Community Development

www.dpcd.vic.gov.au

The Department of Planning and Community Development (DPCD) has a central role in managing Victoria's growth and development and building stronger communities. DPCD works collaboratively with local government and other key public and private stakeholders to lead State and metropolitan development, strategic and statutory planning, development regulation, and environmental assessment. The municipal Council is usually the responsible authority for issuing planning permits and administering the planning scheme and should be contacted for local and property specific planning advice. DPCD regional offices work in partnership with councils and stakeholders to deliver State Government policies and programs. They assess planning scheme amendments and provide planning advice and guidance. The regional offices are the local 'shop front' for a wide range of the Department's services including statutory and strategic planning information.

Department of Environment and Primary Industries

www.dpi.vic.gov.au

The Department of Environment and Primary Industries (DEPI)

focuses on boosting productivity in Victoria's world-class food and fibre sector, managing natural resources, protecting the environment and responding to fire, flood and biosecurity emergencies.

The Department leads the Victorian Government's efforts to sustainably manage water resources and catchments, climate change, bushfires, parks and other public land, forests, biodiversity and ecosystem conservation. The Department provides leadership in conservation, water management, statewide planning, urban development and public land management including forests, coasts, alpine resorts, Crown Land reserves and parks.

Fisheries Victoria is part of the Department of Environment and Primary Industries and regulates the taking of fish species and advocacy across all natural resource management agencies.

DEPI has been formed from the Department of Sustainability and Environment and the Department of Primary Industries.

Environment Protection Authority

www.epa.vic.gov.au

Environment Protection Authority (EPA) is a statutory authority established under the *Environment Protection Act 1970*. It exists to ensure the protection of beneficial uses of air, water and land from the adverse impacts of waste and unwanted noise. The EPA also jointly administers the *Pollution of Waters by Oils and Noxious Substances Act (POWBONS Act) 1986* and the *Pollution of Waters by Oil and Noxious Substances Regulations (2002)* with the Department of Transport. The EPA also oversees the State Environment Protection Policy (Waters of Victoria). State environment protection policies (SEPPs) are subordinate legislation made under the provisions of the *Environment Protection Act 1970*. Under the Act the requirements in environmental regulations, works approvals, licences and other regulatory tools, must

be consistent with SEPPs. The SEPP (Waters of Victoria) applies to all surface waters of Victoria and aims to provide a coordinated approach for the protection and, where necessary, rehabilitation of the health of Victoria's water environments. This policy protects the environmental values, beneficial uses and associated social and economic values of the water environment to ensure that the needs of current and future generations are met. Specific schedules to SEPP (Waters of Victoria) deal with specific individual catchments.

Goulburn-Murray Water

www.g-mwater.com.au

Goulburn-Murray Water (GMW) maintains and manages the water supply operations, maintenance and safety of Lake Buffalo. Goulburn-Murray Water manages lake bed and public foreshore land, and is responsible for licensing and approving structures on the Lake Buffalo foreshore.

Goulburn-Murray Water also has statutory responsibilities in coordination of the blue-green algae monitoring and response program, and as a storage manager under the *Safe Drinking Water Act 2003*.

North East Catchment Management Authority

www.necma.vic.gov.au

The North East Catchment Management Authority (NECMA) is a statutory authority responsible for coordinating integrated catchment management and sustainable land and water use in north eastern Victoria. The region's main river catchments include the Ovens, King, Kiewa, Mitta Mitta and Upper Murray which form part of the Murray-Darling Basin. The Catchment Management Authority fulfils its charter through the preparation, coordination and implementation of the *North East Regional Catchment Strategy*, where the Catchment Management Authority has operational responsibility for waterway and floodplain management in priority areas.



Transport Safety Victoria

www.transportsafety.vic.gov.au

Transport Safety Victoria (TSV) is the integrated safety regulator for bus, maritime and rail transport. This regulatory function is exercised through the establishment of the independent statutory office of the Director, Transport Safety (Safety Director) under the *Transport Integration Act (TI Act) 2010*. TSV exists to support the statutory object and functions of the Safety Director.

Transport Safety Victoria is responsible for determining standards and procedures for navigation and maritime safety on state waters, including all inland waters such as rivers, creeks, canals, lakes and reservoirs. Responsibilities also include qualification, crewing and construction standards for commercial vessels and boating safety, licensing and registration for recreational vessels.

Victoria Police

www.police.vic.gov.au

Victoria Police is the primary law enforcement agency of Victoria. Victoria Police is responsible for the enforcement of Victorian laws in relation to land and on-water uses of Lake Buffalo.

VicRoads

www.vicroads.vic.gov.au

VicRoads supports Victoria's liveability and economic prosperity by planning, developing and managing the arterial road network and delivering registration and licensing services.

Victorian State Emergency Service

www.ses.vic.gov.au

Victorian State Emergency Service (SES) works to ensure the safety of Victorian communities by responding to emergency disasters across the state. The Victorian State Emergency Service is the control agency during emergency responses to floods, storms, earthquakes and tsunamis in Victoria, and is the largest provider of road crash rescue in the state.

WorkSafe

www.worksafe.vic.gov.au

WorkSafe is responsible for enforcing Victoria's work place safety laws and helping to prevent work place injuries.

APPENDIX D – AGENCY QUICK REFERENCE GUIDE

| Issue | Agency* |
|--|--|
| Aboriginal cultural heritage | AAV |
| Animal management (e.g. dogs) | Council |
| Aquatic vegetation and weeds | DEPI , GMW |
| Boating management – zones, buoys, signage | GMW , TSV |
| Boating management – policing and enforcement | Victoria Police , GMW, TSV |
| Blue-green algae | GMW , DEPI |
| Camping | GMW , Council |
| Commercial operations, developments and events | GMW , Council |
| Dam operations (lake level and storage releases) | GMW |
| Duck hunting | DEPI , Victoria Police, GMW |
| Emergency management | Victoria Police , CFA, SES |
| Environmental incident (pollution, spills, noise, reportable incidents, etc.) | EPA |
| Erosion (public foreshore land) | GMW |
| Event licensing – on water | GMW |
| Event licensing – foreshore land | GMW |
| Event planning approval | GMW |
| Fishing information (stocking, licensing and enforcement) | DEPI |
| Fish habitat management | DEPI , NECMA |
| Fish deaths | EPA , DEPI, GMW |
| Flood warnings | BoM |
| Foreshore works approval and licensing (jetties, moorings, etc.) | GMW |
| Agricultural licensing | GMW |
| Illegal activity and anti social behaviour | Victoria Police |
| Pest plant and animals (public foreshore) | GMW , DEPI |
| Planning and development | GMW , Council, DPCD |
| Public reserves and facilities (e.g. boat ramps, toilets, playground equipment, BBQs, roads, etc.) | GMW , DEPI, PV |
| Rubbish and litter | GMW , DEPI, EPA |
| Trees and foreshore (riparian) vegetation | GMW , DEPI, NECMA |
| Timber (lake bed standing and remnants) | GMW , DEPI |
| Tourist information (general) | Council Tourist Information Centres |
| Water quality (blue-green algae) | GMW , DEPI |
| Water supply (non-reticulated stock and domestic licensing) | GMW |
| Water supply (downstream storage releases) | GMW |

* Primary contact in **bold** font



APPENDIX E – COMMUNITY CONSULTATION SUMMARY

The consultation activities for this project consist of two rounds of consultation:

- Round One aimed to identify key issues, suggestions for tackling those issues, and ideas for the development of a vision.
- Round Two to test the Draft Plan.

A variety of consultation activities were undertaken throughout Round One of the project. Activities have included:

- A 'Have a Say Day' on site at Lake Buffalo (39 people interviewed).
- Government agencies workshop (12 attendees representing 7 agencies).
- Community 'Have a Say' meeting in Myrtleford (5 present).
- One-on-one focused interviews conducted with targeted stakeholders / community representatives and landholders either in person or via telephone (6 interviews).
- An online questionnaire for people unable to attend the consultation activities. The survey link was distributed by Goulburn-Murray Water's e-newsletter, media releases, Goulburn-Murray Water website and to people who indicated they were unable to attend meetings and interviews (5 respondents).

Qualitative data was collected by a range of methods including:

- Facilitator/interviewer notes.
- "Six Thinking Hats" exercise (used to explore the topic from a range of perspectives).
- "Flags on Map" exercise (used to identify issues and solutions).
- Information gathered throughout these consultation activities has informed the development of this Draft Plan.

A second round of consultations will test the Draft Plan. The second round of consultations will be developed with the Project Guidance Group and as a minimum will provide participants in the first round of consultations the opportunity to make comment on the draft. Feedback on the community's impressions of the Draft Plan will inform the finalisation of the Plan.

APPENDIX F – SUMMARY OF ACTIONS

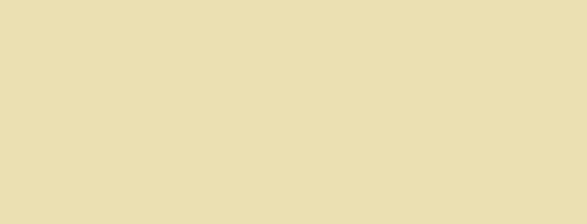
Note: The lead agency principally responsible for each action is highlighted in bold text in the table below alongside key supporting agencies. The lead agency does not have a statutory or legal obligation to carry out the action. The lead agency is responsible for initiating and coordinating the action in collaboration with other agencies.

| Action No. | Action | Lead Agency |
|------------|---|---|
| | Plan implementation | |
| 1 | Establish a Lake Buffalo Plan Implementation Group to guide the implementation of the Plan and communicate the priorities in the Plan. | GMW , NE CMA, Alpine Shire Council, Parks Victoria |
| | Education and awareness | |
| 2 | Develop a proactive communication and awareness campaign to provide up to date information to recreational users on the status of water levels in the storage. Information should include planned maintenance activities that may impact on recreational user groups. | GMW , DEPI, CFA, Victoria Police, Department of Transport, Planning and Local Infrastructure |
| 3 | Work with user groups to understand their information requirements. | GMW |
| 4 | Encourage and support processes that involve community and users in the recreational amenity of the Lake Buffalo. | GMW |
| 5 | Provide clear descriptions of agency roles and responsibilities (refer to Appendix C) and communicate this to the community. | GMW |
| 6 | Develop a single Code of Conduct for the storage which includes information about user and agency responsibilities relating to boating and boating safety, camping, hunting, solid waste, and emergency management. The Code of Conduct should include information about the importance of designated public access in minimising impacts on the environment including the impacts of illegal vehicle access on the lake bed. | GMW , CFA, Victoria Police, Department of Transport, Planning and Local Infrastructure, DEPI |
| 7 | Implement communication actions (e.g. brochures and signage) to promote knowledge of boating rules and to highlight acceptable boating behaviour. | GMW |
| 8 | Update the Goulburn-Murray Water website to provide details of development controls and permit, licence and lease procedures. | GMW |
| | Recreation and Tourism | |
| 9 | Continue to work with Transport Safety Victoria to review and amend the current zoning rules around the storage. | GMW , TSV |
| 10. | Establish consistent signage at all boating access points to improve awareness of boating safety issues. | GMW , Department of Transport, Planning and Local Infrastructure |
| 11. | Consider feasibility for relocation of Main Recreation Area boat ramp away from Myrtleford Boat Club to avoid overcrowding. Alternatively, consider options for increasing supporting infrastructure such as access tracks and trailer parking to disperse impacts. | GMW , Myrtleford Boat Club, Alpine Shire Council |
| 12. | Establish improved resourcing and monitoring and enforcement of boating activities. | GMW , Victoria Police |
| 13. | Implementation of recommendations in the <i>North East Fisheries Management Plan (2007)</i> that relate to sustainable recreational fishing in Lake Buffalo. | DEPI |
| 14. | Develop agency management agreements that provide hunters with clear and concise information about areas where hunting is permitted. | DEPI , GMW |

| Action No. | Action | Lead Agency |
|--|--|--------------------------------------|
| 15. | Improve education and awareness to encourage protection of the environment and compliance with shooting and hunting regulations. | DEPI, GMW |
| 16. | Identify the scale and type of infrastructure upgrades, additional infrastructure and services required. | GMW |
| 17. | Estimate the long term resident and visitor demand on and around the Lake and ensure that infrastructure provision is aligned with demand. | GMW, Alpine Shire Council |
| 18. | Work with other agencies to identify funding opportunities for the upkeep and maintenance of infrastructure around the Lake. | GMW, Alpine Shire Council, DOT, DEPI |
| 19. | Determine the feasibility of low impact camping sites in the Lake Buffalo catchment. | GMW, Alpine Shire Council |
| 20. | Undertake compliance activities with regard to illegal camping activities. | GMW, Victoria Police |
| 21. | Ensure emergency services and relevant agencies meet regularly to improve and coordinate emergency management / response. | GMW |
| 22. | Enhance existing information materials for Lake Buffalo to increase awareness of issues relating to emergency management and safety. | GMW, TSV, CFA |
| 23. | Engage media / communication resources to communicate safety and compliance messages to recreational storage users. | GMW, TSV |
| 24. | Seek input from emergency services regarding methods for locating Lake users in case of emergency. | Victoria Police, GMW |
| 25. | Commission a study to estimate the long term resident and visitor demand on and around the storage in order to inform decisions about future tourism opportunities and developments. | Alpine Shire Council, GMW |
| 26. | Determine actions to support tourism at Lake Buffalo (e.g. picnic areas that includes parking suitable for buses). | GMW, Alpine Shire Council |
| Environment and Cultural Heritage | | |
| 27. | Support foreshore vegetation works in riparian areas to protect biodiversity values and enhance visual amenity. | GMW, NECMA |
| 28. | Continue to support existing foreshore revegetation programs, mutually agreed with neighbouring landholders and investigate potential for establishment of a revegetation incentive program for landholders. | GMW, NECMA |
| 29. | Promote and implement management strategies to monitor, protect and enhance habitat for native species as identified in the <i>North East Fisheries Management Plan (2007)</i> . | DEPI |
| 30. | Develop a prioritised weed control program coordinated with agencies and landholders, including the discussion of funding and responsibilities. | GMW, NECMA, DEPI |
| 31. | Investigate the application of Carp control for Lake Buffalo. | DEPI |
| 32. | Support Department of Environment and Primary Industries and other agencies to minimise the impacts of pest animals on the surrounding communities to the Lake and environment. | DEPI, NECMA, GMW |
| 33. | Support the implementation of relevant actions included in the <i>North East Catchment Management Authority Regional Catchment Strategy (2013)</i> and <i>River Health Strategy (2005)</i> . | GMW, NECMA |
| 34. | Review existing water quality monitoring programs to ensure they are aligned with the hazards stipulated in the <i>Safe Drinking Water Act 2003</i> and Regulations, Regional Catchment Strategies and related NRM objectives. | GMW, EPA, DEPI, NECMA |
| 35. | Actively support partner agencies in the protection and enhancement of water quality within the catchment. | GMW, NECMA, North East Water, EPA |

APPENDIX F – SUMMARY OF ACTIONS (CONTINUED)

| Action No. | Action | Lead Agency |
|------------|---|--|
| 36. | Support initiatives to enhance identification and protection of Aboriginal and European cultural heritage. | GMW , AAV, local Aboriginal representatives and groups |
| | Land Management | |
| 37. | Investigate suitable land management options for Goulburn-Murray Water freehold land located on the Yarrarabula Creek Arm, areas of native forest and the Crown Land river and creek reserves. | GMW |
| 38. | Proceed with negotiations for a long-term lease. | GMW |
| 39. | Terminate all grazing in the future as part of the lease negotiations with Hancocks. | GMW |
| 40. | In the interim, reinforce compliance with sub-lease conditions through adequate monitoring. | GMW |
| 41. | Investigate strategies for removal of stock from island between Buffalo and Yarrarabula Arms. | GMW |
| 42. | Proactively consult with occupiers regarding the conditions of their lease agreements lease / licences, and deal with cases of repeated non-compliance. | GMW |
| 43. | Manage fire risks around Lake Buffalo through annual Fire Protection Plans prepared by Goulburn-Murray Water. Ensure Fire Protection Plans take account of supply levels within Lake Buffalo and include a strategy for managing 'Code Red' days. | GMW , Alpine Municipal Fire Management Planning Committee, CFA |
| 44. | Identify areas of public land suitable for use as Neighbourhood Safer Places in consultation with relevant agencies. | CFA , Alpine Municipal Fire Management Planning Committee, GMW |
| 45. | Integrate and link Fire Protection Plans with the Alpine Shire Council's Municipal Fire Management Plans. | GMW , Alpine Municipal Fire Management Planning Committee, Alpine Shire Council |





Goulburn-Murray Water
PO Box 165
Tatura Vic 3616
Tel 1800 013 357
www.g-mwater.com.au