



VICTORIAN BAYS AND INLETS FISHERIES ASSOCIATION (VBIFA)

Environmental Management System (EMS)

2013

"A voluntary, industry-driven initiative"

The VBIFA Vision

“VBIFA members recognize and will at all times accept their role as custodians of marine resources and the environment.

VBIFA members will promote and demonstrate united, ecologically sustainable and thriving bay and inlet Fisheries.

VBIFA members will ensure the continued supply of high quality, locally caught fresh seafood, which is valued by the Victorian community.”

This EMS was originally developed in 2005 by the Victorian Bays and Inlets Fisheries Association Inc. (VBIFA) with assistance from Dr. Pascale Baelde, Seafood Services Australia, Natural Heritage Trust PIRVic, Seafood Industry Victoria and Phillip Island Nature Park. Thanks to John Ford at the University of Melbourne for his comments on this revised edition.

Revised by VBIFA in 2012/13

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Sustainable Fishing - Healthy Seafood
Seafood Industry Victoria Inc.



**CARING
FOR
OUR
COUNTRY**



PREFACE

Victoria's bays and inlets are a shared resource. As with most share arrangements there are occasionally pressures between users of the resource which sometimes result in an appeal for a larger share allocation by one user group. When these pressures do arise, misconceptions about the commercial fishing sector and generalisations which are unfounded and wrong can lead to undue criticism of the commercial sector and impact the industry's social licence to operate. VBIFA members believe that these misconceptions need to be addressed to help broker a harmonious relationship with all stakeholders.

Victorian bay and inlet commercial fishers maintain that much of the criticism levelled at their fishing activities has been based on misconception rather than facts. Scientific research has generally found that commercial fishing activities in Victorian bays and inlets have no adverse impact on fish stocks or the environment.

When defending their practices commercial fishers often suggest to their critics that they should have a trip out on a commercial boat and observe a fishing operation before they pass judgment. On the odd occasion that this offer has been taken up the response has invariably been one of pleasant surprise at the obvious environmental approach commercial fishers take to their day-to-day activities.

As it is not often practical to take people out fishing, VBIFA members feel that one way to help the broader community understand their practices and their relationship with the environment is through the development of an Environmental Management System.

VBIFA members believe that as we harvest fish on the community's behalf, the community is entitled to feel confident that their fish are being harvested in an environmentally conscious and sustainable manner.

This EMS is an initiative of VBIFA members, as custodians we believe that it represents a genuine partnership approach to the management of Victorian bay and inlet fish resources.



Gary Leonard

Chairman Victorian Bay and Inlet Fisheries Association (VBIFA)

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The EMS is available by phoning VBIFA (0412 754 977) or Seafood Industry Victoria (03 9687 0673). It is also available on the Seafood Industry Victoria website (www.siv.com.au).

EMS: A voluntary, industry-driven environmental initiative

Purpose and scope of the EMS

Victorian bay and inlet commercial fisheries are amongst the oldest fisheries in Australia, having existed for over 170 years. Many are third generation fishers¹. They offer a unique service to the community by providing healthy, high quality and fresh seafood on a daily basis.

In recent years, concerns about over-fishing and environmental damage have turned the media spotlight onto commercial fisheries across the globe. In some areas, this has led to political or social pressure to restrict commercial fishing in the name of conservation. The members of VBIFA feel strongly that their fishery is environmentally responsible and wish to communicate their good environmental practice to policy-makers, regulators, the community and the media to ensure continued access to the marine resource they depend upon.

Rapid population growth in Victoria and extreme weather events such as drought and flood have in the past and will continue to impact the ecological balance of the bays and inlets. This presents further risks to the commercial fishery. A systematic approach to environmental management, through the development of an Environmental Management System (EMS) can help fishers navigate ecological, social, political and economic challenges and manage the risks that they present. EMS provides a robust framework, enabling the bay and inlet fishers to identify and assess environmental risks, develop management actions and protect the environment and their livelihood for the future.

The concept of EMS recognizes that primary producers, such as commercial fishers, have the knowledge and expertise to develop and implement best practice that meets both environmental needs and food production needs.

An EMS is based on the principle of continuous improvement and follows well-established steps, including;

1. Review of fishing practices and **identification of environmental risks** and impacts
2. Development of an **action plan** to minimize risks and impacts
3. **Regular review** of the performance of the EMS and implementation of corrective actions when necessary

¹ In 2002, the Lakes Entrance Family History Resource Centre published 'Casting the net', an historical review of early fishing families on the Gippsland coast (available from the Centre, PO Box 674, Lakes Entrance, 3909).

The EMS creates transparency within the industry, enabling the wider community to see clearly how the fishery operates. This helps to eliminate misconception and improve confidence in the industry. As a dynamic process based on information gathering, the EMS fosters communication between the fishing industry and researchers, Government and the community. This can help to develop effective co-management.

The VBIFA EMS covers the four major fishing methods (haul seine, mesh net, purse seine, demersal longline) allowed in the Victorian bays and inlets under the following fishing licences:

- Western Port-Port Phillip Bay Access Licence
- Purse Seine (Port Phillip Bay) Fishery Access Licence
- Corner Inlet Fishery Access Licence
- Gippsland Lakes Fishery Access Licence

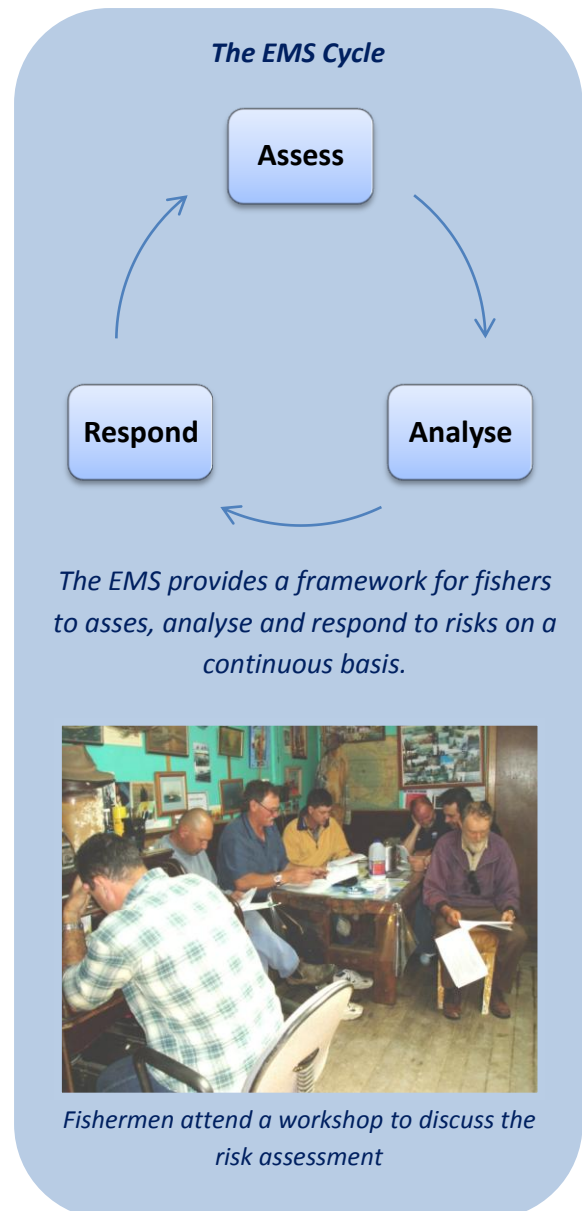
Development and Implementation

VBIFA first developed the EMS in 2005 with the assistance of an EMS facilitator, Dr. Pascale Baelde. An external review was commissioned in 2006, a year after its publication and it has since been reviewed on an annual basis by VBIFA members

During the 2012 internal review, efforts have been made to further develop the processes for data collection, stakeholder engagement and increasing VBIFA membership. This is in line with some of the recommendations of the 2006 review. The main developments to arise from the 2012 review are outlined below.

Verification of best practice and data collection

A new *Data Record Sheet* (Appendix I) has been implemented under the EMS Action Plan to collect data on interactions with wildlife and incidental catch. Data collected will be reviewed at the annual performance review. A second document, the *EMS Annual Review Checklist* (Appendix II), has been introduced to provide structure to the internal annual review. This documentation will improve the evidence base for demonstrable good practice and continuous improvement.



Expand the reach of the EMS within the fishing community

In 2005, VBIFA's founding members signed the EMS (see Appendix IV) and VBIFA have continued to promote Association membership to all bay and inlet licence holders to try to maximise the reach of the EMS. In Gippsland, 90% of licence holders have joined VBIFA which is a very positive outcome and the Board are working to increase numbers in the other commercial fishing areas of Corner Inlet and Port Phillip Bay. The 2012 review of the EMS provides an opportunity to continue to promote the benefits of VBIFA membership.

Increased engagement with stakeholders

VBIFA will work with Seafood Industry Victoria and SeaNet to raise awareness about the EMS at community events, within government and amongst other marine stakeholders. A simple Communications plan will be developed for the launch of the EMS. The Action Plan in Section Four clearly marks out stakeholders with whom ongoing relationships should be developed.

Updated references and data

The review provided an opportunity to update references throughout the document and incorporate new data and research.

Risk analysis of external risks

An analysis of the external risks has been added to help quantify how activities outside of VBIFA's direct control may be impacting the fishery. External risks are difficult for the fishers to manage alone but identifying those that present a significant risk is the first step towards working with other stakeholders to develop management actions.

Review

VBIFA will conduct an annual internal review, with an external review carried out by independent experts every fifth year.

VBIFA will use the *EMS Annual Review Checklist* (Appendix II) to carry out the internal review. This will provide documentation for measuring ongoing improvement.

ABOUT THE FISHERY

Characteristics of the bay and inlet fisheries

As is typical of coastal fisheries, commercial catches in the Victorian bays and inlets are made of a mix of several species, the abundance of which fluctuates with natural changes in the environment. Fishers harvest these species using a variety of fishing methods, adapting their fishing patterns to seasonal fluctuations in fish stock abundance. In this way they do not put excessive pressure on any particular species. This type of fishing also ensures a diversified supply of seafood products on the market.

Commercial fishing in the Victorian bays and inlets is conducted by small family businesses. Most operate on small 7-8 meter long aluminium boats with outboard motors; only a few wooden boats with diesel engines remain. Except for pilchards caught in Port Phillip Bay, which are mostly snap-frozen for the bait market, all seafood products are caught daily and sent fresh to the Melbourne market and local retailers. Some fishers have their own retail shop from which they sell their catch directly to customers.

Haul seining and mesh netting are the most widely used fishing methods, followed by purse seining and demersal longlining (also referred to as bottom-set longlining). Trawling and Danish seining are not permitted in the bays and inlets.

Haul seine The term haul seine is generic and refers to several seining techniques, including beach seine, estuary seine, garfish seine, and ring seine. These mostly differ in their mesh size and method of deployment. The design of haul seines varies between the bays and inlets, depending on the species targeted and the type of area fished, but, overall, is based on the same fishing principles.

A beach seine is set from the beach. After hauling, catch is sorted standing in the water.



Beach seining (setting)



Beach seining (hauling)

A haul seine works by herding the fish into a bag or bunt. The net is set in a U-shape and both ends, or wings, are drawn together to enclose and trap fish in the bag. The mesh size varies along the length of the net, with larger meshes used in the wings and smaller meshes in the middle sections (shoulders) and bag.

In Port Phillip Bay and Gippsland Lakes, seines are set from a tender (or dinghy) anchored in shallow water. Sorting the catch (bunting) is also done standing in the water.

Ring seines (only used in Corner Inlet) are set and hauled over deeper water. They have one short wing that is anchored, while the long wing is towed around in a circle. When the two ends meet, the bottom of the net is pursed by pulling a rope going through rings attached to the footline.

Garfish seines are floating seines with smaller mesh size used to catch garfish near the surface. Except for these specialized garfish seines, haul seines catch a mix of species of varying size and shape, with some species being retained (commercial species) and others being released alive (bycatch species).

Mesh Net A mesh net is a flat rectangular net, with a weighted footline and a floatline to maintain it in an upright or oblique position over the sea floor. Bay and inlet fishers use different nets, with different mesh sizes, to target different fish sizes or species in different seasons and on different fishing grounds.

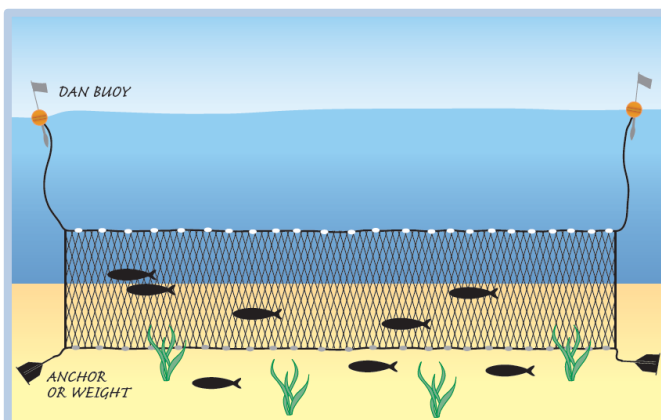


Diagram of a mesh net



Ring seine – start of hauling



Ring seine – end of hauling



Mesh netting

Overall, haul seines and mesh nets catch similar species, including King George whiting, black bream (mostly in Gippsland Lakes), flathead, tailor, silver trevally, yellow eye mullet and Australian salmon. Mesh nets tend to catch more demersal species such as flathead, flounder, mullet, etc and haul seines catch more pelagic species such as garfish and southern calamari.

Purse seine A purse seine is designed to catch schools of small pelagic species at or near the surface. The net is set in a circle around the fish school and kept suspended from the surface with floats. A purse line, threaded through rings attached to the leadline, is used to close the bottom of the net. The net is then brought alongside the vessel and the fish are scooped out. This fishing technique is only allowed in Port Phillip Bay. Today, species caught with purse seines include pilchards, anchovies and sandy sprats and are used both for bait and, increasingly, for human consumption.

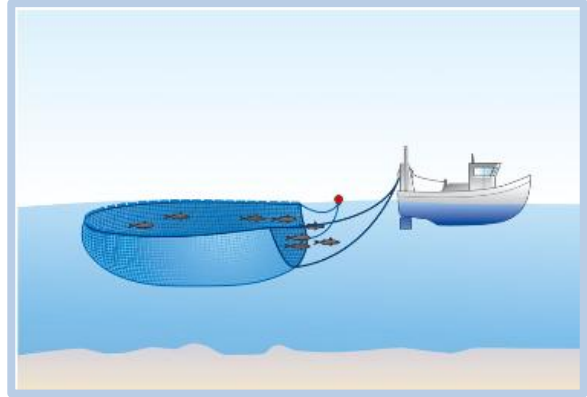


Diagram of a purse seine

Demersal longline In a demersal long line, short snoods with baited hooks are attached to a longline that is set near the sea floor using weights and anchors and marked at both ends with buoys and flags. Longlines are usually set before dawn and retrieved after a couple of hours. They are mostly used to target snapper and, occasionally, gummy shark.

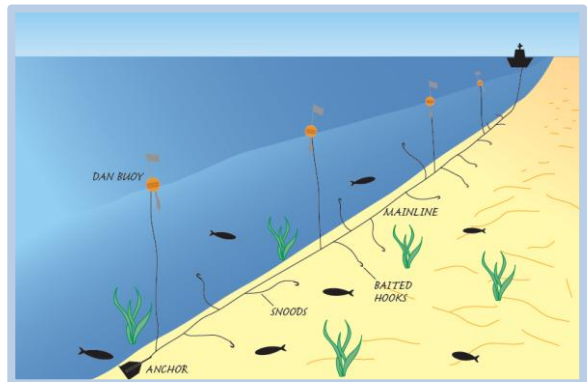


Diagram of demersal long-lining

Other fishing methods that are occasionally used, and their targeted species, are shown below:

- Stake net: eastern school prawn, eastern king prawn
- Hand line: snapper, King George whiting, southern calamari
- Dropline: snapper, gummy shark
- Pike net: pike
- Fish trap: leatherjacket, red mullet
- Crab pot/hoop net: sand crab, black crab
- Pot: octopus
- Hooker dive: mussels
- Other: sand worm pump, drag shrimp net, spider crab trap, pipi rake or pump, anchovy ring net

Management framework and governance

Legislation Commercial fishing is tightly controlled under the *Fisheries Act 1995* and *Fisheries Regulations 2009*². Fishing regulations in the bays and inlets have built up over the years and are complex. They are described in detail in the *Fisheries Regulations 2009* and include restrictions on:

- Types and configuration of fishing methods (restrictions on mesh size, length of nets, number of lines and hooks, etc)
- Restrictions on fishing areas (seasonal and permanent areas closures)
- Restrictions on fishing times (weekend closures in Western Port, Corner Inlet and Gippsland Lakes, seasonal closures in each bay and inlet)
- Restrictions on the size of fish caught

It is a condition of licence that fishers fill in fishing returns in which they record daily catch by species, including details of fishing grounds, fishing gear used and number of shots conducted per day. Fishing activities are also controlled by conservation legislation concerned with the protection of marine species, implementation of marine protected areas, pollution control etc (see Appendix VI).

Fisheries Victoria, within the Department of Primary Industries (DPI) manages all commercial and recreational fishing activities in Victoria. The Fisheries Research Branch (FRB) is the scientific agency responsible for assessing the status of fish resources and essential fish habitats.

Bay and inlet fisheries have undergone significant changes over the years. Entry to the bay and inlet fisheries was capped in 1968 and in 1987 two-to-one restrictions were imposed on the transfer of licences (creating consolidated licences that then become transferable on a one-to-one basis). This consolidation stopped in 2009, and led to a reduction in the number of Fishery Access Licences, from 244 in 1989 to 214 in 1998 (bait and mussel-dive licences not included). Then, between 1999 and 2000, a voluntary buy-back scheme was implemented, further reducing the number of licences from 214 to 104 (see Table 1).

A series of spatial closures was also declared in the early 2000s. Commercial fishing was closed in Anderson Inlet, Shallow Inlet and Tamboon Inlet in 2000, followed in 2003 by the closure of Lake Tyers and Mallacoota Inlet in order to create recreational only areas. In 2002, Marine National Parks and Sanctuaries where commercial fishing is prohibited were declared in areas within Port Phillip Bay, Western Port and Corner Inlet. In December 2007 Western Port was closed to commercial net fishing. Today commercial operations are restricted to Port Phillip Bay, Western Port (although no commercial net fishing is allowed) Corner Inlet and Gippsland Lakes, with 71 licences remaining (Table 1 and Figures 1 -4).

² Recreational fishing is also controlled under the *Fisheries Act 1995* and the *Fisheries Regulations 2009*.



Table1: Fishery access licences					
Fishery	No. of licences in 1989*	No. of licences before buy-out (before 1999)**	No. of licences after buy-out (after 2000)**	No. of licences in 2004***	No. of licences in 2011****
Anderson Inlet	4	4	0	Closed	Closed
Corner Inlet	39	30	20	20	18
Gippsland Lakes	37	32	19	18	10
Lake Tyers	13	10	3	Closed	Closed
Mallacoota Inlet	8	8	4	Closed	Closed
Shallow Inlet	5	5	0	Closed	Closed
Tamboon Inlet	4	4	1	Closed	Closed
Port Phillip/Western Port *****	134	121	57	55	43
TOTAL	244	214	104	93	71

Bait and mussel-dive licences (18 in 2011) not included.

** Natural Resources and Environment Committee Report (NREC 1991).*

*** Adapted from Morison (2001).*

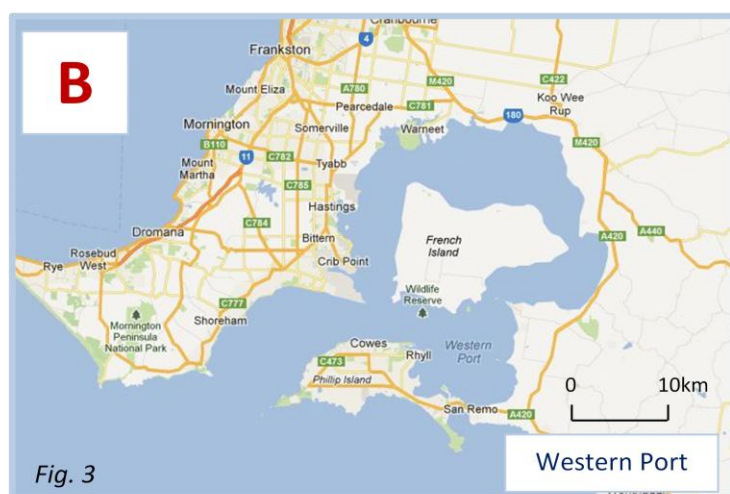
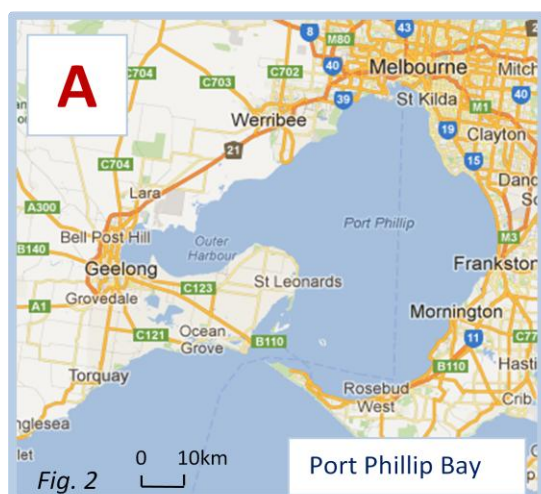
**** Data from Fisheries Victoria – Commercial Fish Production Information Bulletin.*

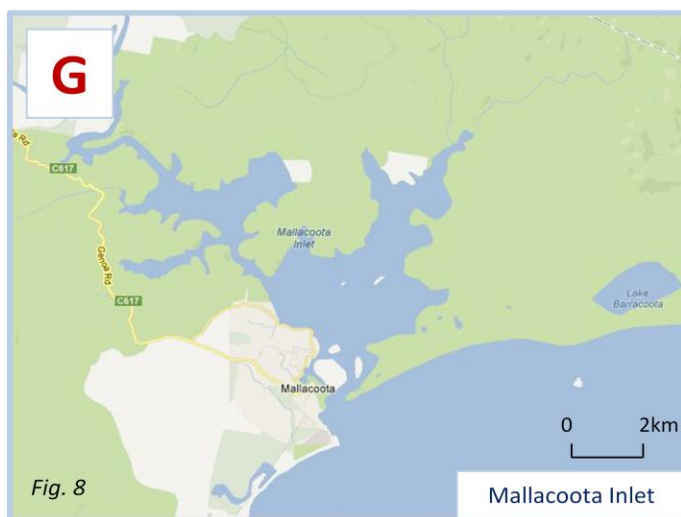
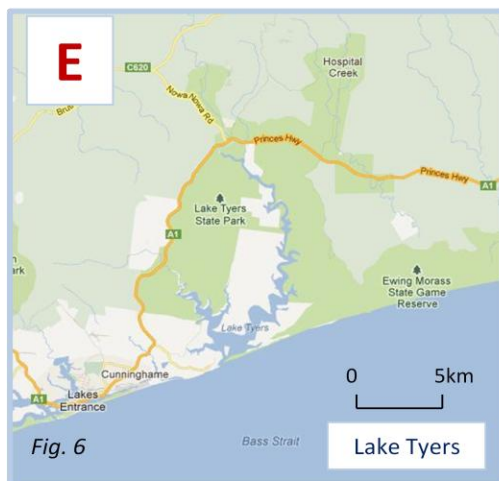
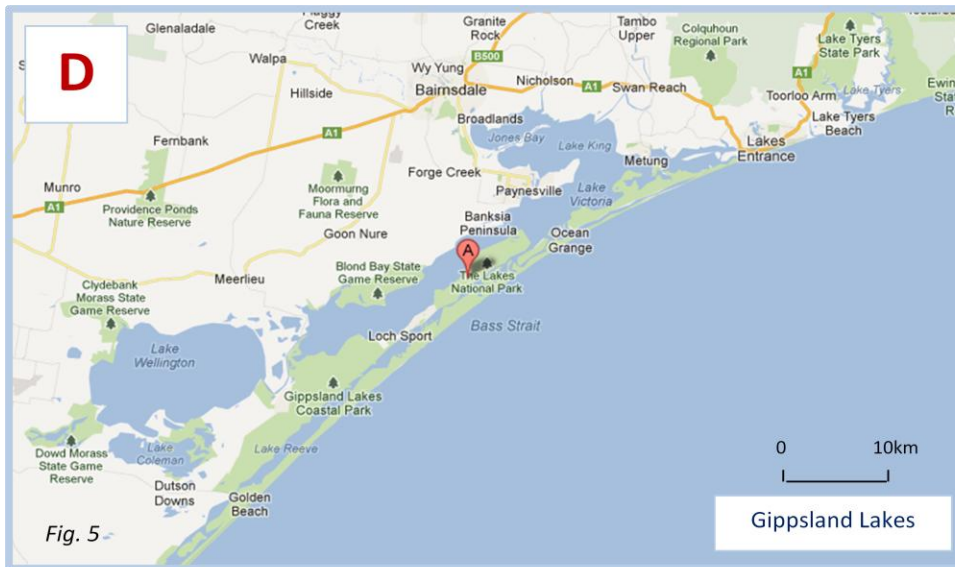
***** Data from Fisheries Victoria – Commercial Fish Production Information Bulletin.*

****** Western Port closed to commercial net fishing in 2007.*

Industry Representation Proposed amendments to fisheries legislation need to be accompanied by meaningful consultation with industry members before a decision is made. Fisheries Victoria utilise the services of the peak commercial fishing representative body to ensure all members are consulted and that their concerns and issues are heard. Seafood Industry Victoria (SIV) in its capacity as the peak body of the Victorian commercial fishing industry, represents members involved in the harvesting, processing, wholesaling, retailing and exporting of seafood. It was established in 1989 under the *Victorian Fishing Industry Council Act 1979* and is an incorporated body. SIV's role is to provide the conduit between industry and government, to ensure its member's best interests are represented. SIV also plays a role in advocating industry to other stakeholder groups.

Figures 1 – 8, Maps showing commercial fishing areas in Victoria (including historical fishing areas where restrictions now exist)





Industry Voluntary Codes of Practice

In addition to existing government regulations, bay and inlet fishers have developed voluntary Codes of Practice to address local issues with fish stocks, to control potential issues with fishing effort and to limit interactions with the growing recreational fishing sector.

Victorian Fishery Association into Resource Management (VFARM)

For this area, the Code of Practice includes:

1. Haul seining: conduct no more than two shots per night, bunt in depth greater than 90cm and use net material that minimize the meshing of fish
2. Mesh netting: set nets so that they catch fish near the sea floor and use the appropriate mesh size and hanging ratio for the target species
3. Demersal longlining: use the appropriate type of hooks and baits and fish at the appropriate time and location for the target species

Corner Inlet Fisheries Habitat Association (CIFHA)

For this area, the Code of Practice includes:

1. No more than two seine shots per day
2. Seining allowed only in one side of the 'Middle Ground' line in any one day

East Gippsland Estuarine Fisherman's Association Inc (EGEFA)

For this area, the Code of Practice includes:

1. No fishing in several specified places during holiday periods in order to minimize interactions with recreational fishers
2. Compliance with a haul seine design that allows the release of non target catch
3. Compliance with prescribed best prawn netting practices

More information on these Codes of Practice can be obtained from the Associations. An important function of the codes is to ensure that new and less experienced fishers rapidly adopt the best practice that have been developed by long-established and more experienced fishers. 'Gentlemen's Agreements' are also used in these areas. These agreements are informal and evolve over time; they are negotiated as needed following, for example, changes in fishing technology or environmental conditions. They are not formally enforced but there is high mutual expectation for fishers to comply.

The Australian Conservation Foundation's Sustainable Australian Seafood Assessment Programme (SASAP)

The Australian Conservation Foundation (ACF) and the University of Technology Sydney (UTS) have developed the Sustainable Australian Seafood Assessment Programme (SASAP). The programme aims to provide an independent, transparent and scientifically rigorous assessment of the sustainability of Australian fisheries, offering guidance to consumers who wish to make sustainable seafood choices. Several of the species caught by bay and inlet fishers have been assessed and certified as sustainable by the SASAP programme and others are set to follow. Species currently certified by the SASAP programme include:

Port Phillip Bay - southern calamari, King George whiting, silver trevally, snapper

Corner Inlet – southern calamari, King George whiting, silver trevally, rock flathead

Gippsland Lakes – black bream

The assessment is carried out by an independent science reference panel and the certification of these species provides independent recognition of the low-impact and responsible operations of the bay and inlet fisheries. More information can be found at www.acfonline.org.au



A selection of Victorian seafood

Seafood Production

Over the last 20 years, fishing effort in the bays and inlets has decreased owing to the reduced number of fishing licences, although the rate of decline has slowed considerably in the last ten years (see figure 9). The same pattern can be seen with total annual catch in Figure 10. The catch rate across all licence holders (in kilos per day) has remained fairly steady since 1990, fluctuating around the average of 185kg per day (figure 11).

Figure 12 illustrates how the value of fish per tonne landed has risen since 1990, although it is worth noting that there is a slight decrease in value per tonne between 2008 and 2010 and no data is available for 2010/11. The red line on Figure 12 shows the figure adjusted for inflation and illustrates an increase in the *real price* of fish landed of 2.6% per year since 1990. The general trend of increasing value per tonne means that despite reduced effort and consequent reduced catch volumes, the value of the bay and inlet fishing industry remains fairly constant at about \$6.5 - 7 million (see figure 13).

Figure 11 shows a steady catch rate of around 185kg per day for all bay and inlets licence holders combined. However, as the number of licence holders has reduced over time, the catch rate per licence holder must have increased. The efficiency of individual licence holders i.e. tonnes landed per days at sea per licence holder, has increased. Higher yields per hour at sea points towards a reduced environmental cost of the fishery i.e. less fuel burnt, shorter soak times for nets means less interactions with wildlife and opportunities for bycatch etc. Using post-2000 data only to reduce the chance of including any latent licences that would have been eliminated by the consolidation and buy-back programmes of 1989 and 1999, efficiency i.e. tonnes landed per days at sea per licence holder per year have increased by an estimated 9%. This is a positive message for sustainability.

Fig. 9 Fishing effort (days)

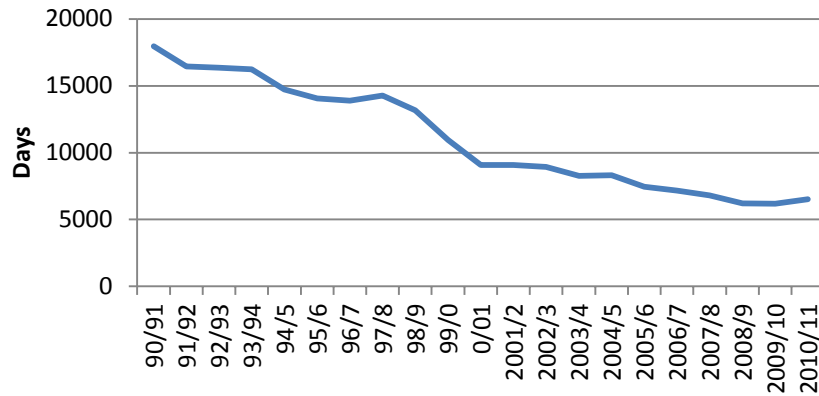


Fig. 10 Total B&I catch (tonnes)

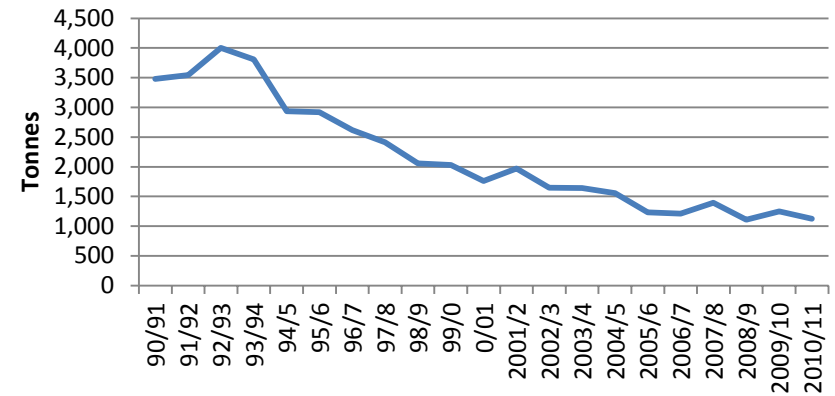


Fig. 11 kg per day landed

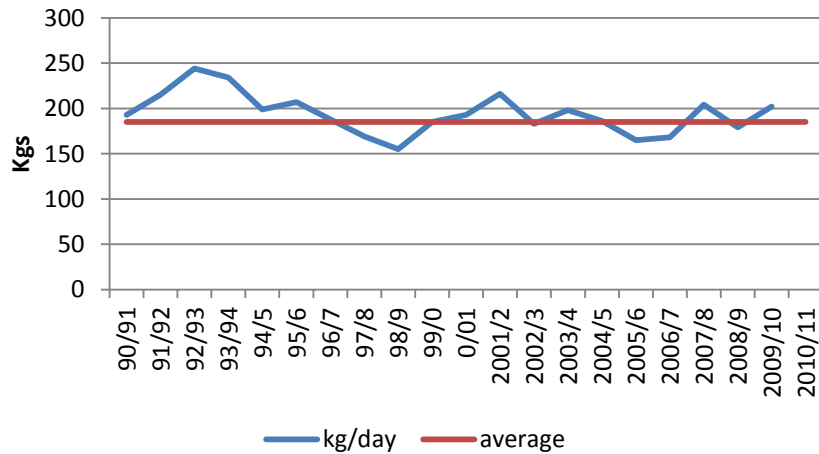
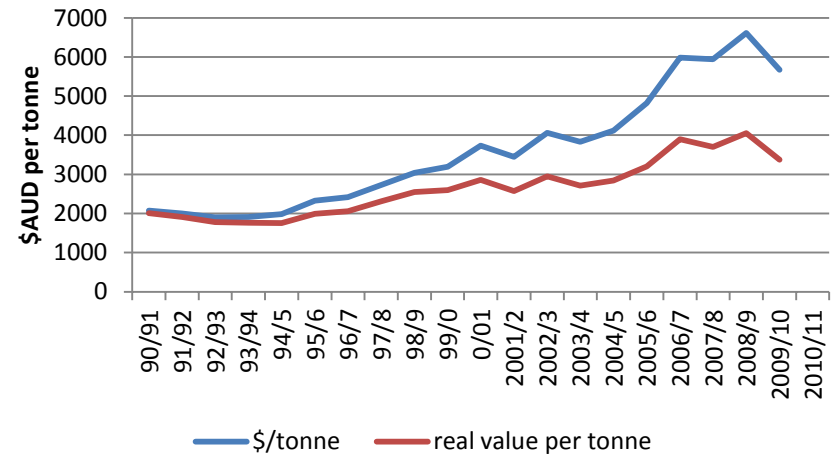
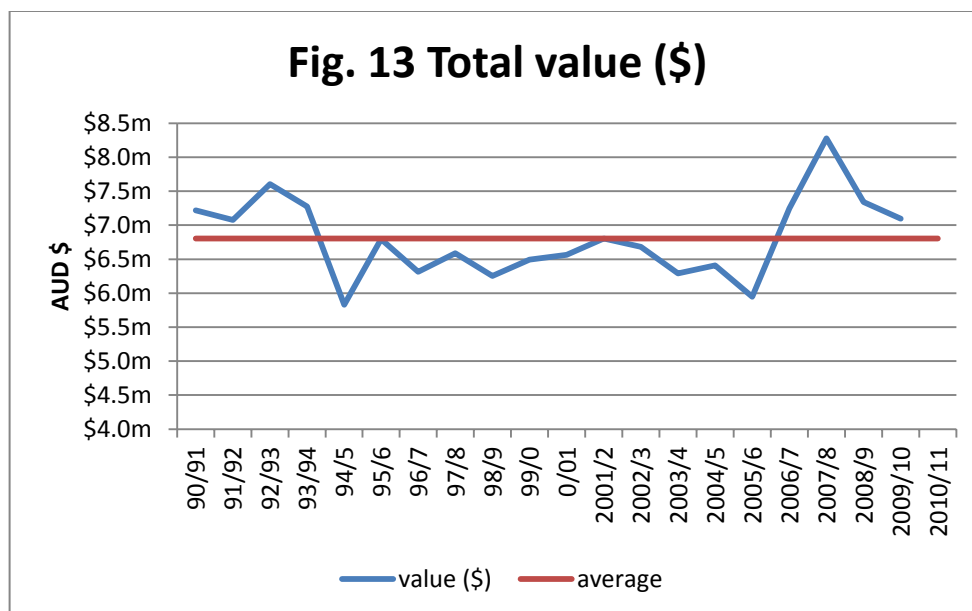


Fig. 12 value per tonne





Since 2007, bay and inlet fisheries have produced an average of 1,211 tonnes of seafood per year. Bay and inlet catches are typically made of some of the most highly valued species in Victoria. For example, between 2007/8 and 2010/11, the majority of King George whiting (95%), rock flathead (100%), sea garfish (98%), southern calamari (99%), black bream (84%), snapper (88%), and silver trevally (79%) landed in Victoria were caught in the bays and inlets. (Data from Commercial Fish Production Bulletin, DPI).

Environmental factors and human activity greatly influence seafood production. Fisheries Victoria states that:

Variations in total catch and species composition of the catch between each bay or inlet, or over time within a bay or inlet, are thought to be more a reflection of variable habitat and environmental conditions affecting fish reproduction and survival, rather than the impact of commercial (or recreational) fishing itself. Fish habitat and environmental conditions in Victorian bays and inlets are influenced by natural climatic factors and also by a range of human 'development' activities other than fishing.

(Fishery Status Report, Commercial Bay and Inlet Fisheries, DPI)

The influence of these factors will be assessed as external risks in section three.

Contribution to research

Bay and inlet fishers gladly contribute to research in the bays and inlets, taking scientists onboard vessels and sharing their knowledge and experience. Examples include:

- Assisting scientists at sea during annual surveys of juvenile fish abundance (e.g. black bream, snapper)
- Assisting scientists at sea during tagging survey (e.g. snapper)
- Collecting and measuring fish during normal fishing operations on an ongoing basis (e.g. snapper, King George whiting, rock flathead, gummy shark)
- Collecting samples for water and fish quality analysis

Recreational catch

The National Recreational and Indigenous Fishing Survey conducted in 2000/01 showed that, in Victoria, recreational fishers caught more black bream, King George whiting, snapper and southern calamari than commercial fishers.

Table 2: Commercial & recreational catch comparison for some major species 2000/1 (live weight)		
Species	Commercial catch (tonnes)	Recreational catch (tonnes)
Black bream	187	203
King George whiting	171	215
Snapper	64	332
Southern calamari	84	90

(Source: Fisheries Co-Management Council (FCC) 2005 Annual Report in Hundloe, T., Blamey, R., McPhee, D., Hand, T. & Bartlett, N, 2006)

Environments, habitats and wildlife

The Victorian bays and inlets are characterised by distinct physical environments which provide habitat for a wealth of wildlife, much of which can only be found in Victorian waters. Habitats include:

Inter-tidal rocky shores - A characteristic rocky shore community is present where rock is exposed at the shoreline, typically home to seaweeds and herbivorous molluscs. Filter-feeding organisms are also common, including tube-building worms, sea squirts, mussels and barnacles. Crabs and seastars, hermit crabs and shrimps scavenge in rock pools.

Sub-tidal rocky reefs - Victoria's subtidal reefs can be the underwater extensions of intertidal rocky shores or isolated offshore reefs. They can take the form of banks of stones or cobbles, large underwater boulders, cascading shelves of rock, or as canyons, caves and arches carved out of the seafloor. They are scattered throughout Victorian waters from the low-water mark to a depth of 100 metres. Kelps and other types of large brown seaweeds are found here along with 1,400 species of algae, 70% of which are endemic. Sponges, corals, sea-whips and sea squirts are common, which in turn shelter a multitude of smaller invertebrates. Sub-tidal reefs support a diverse fish fauna, ranging from wrasse, sweep, old wives and leatherjackets to Port Jackson Sharks.

Seagrass beds - Seagrass meadows cover the seafloor in many of Victoria's bays and inlets and also occur in sheltered patches along the open coast. Seagrasses are true flowering plants. Seagrass beds bind together unstable sediments and provide substrate, habitat, and food sources for many other organisms. Numerous small seaweeds and lace corals (bryozoans) grow on the stems and leaves. Abundant smaller invertebrates shelter in the leafy canopy or in the sediment amongst the roots including marine worms, small crustaceans, snails and molluscs. Shrimps, crabs and seastars can also be found. Few organisms eat living seagrasses, instead feeding on seagrass detritus, epiphytic seaweeds (seaweeds that grow on the seagrass) or the smaller animals. Fish are abundant, including gobies, seahorses and seadragons. Seagrass beds act as nursery grounds for many fish such as King George whiting, greenback flounder and mullet. Seagrass meadows can be seen as 'global hotspots' for organic carbon storage, storing about twice the amount of carbon per hectare as terrestrial soils which makes them valuable assets for the mitigation of climate change (Fourqurean et al, 2012)



Seagrass is essential fish habitat

Pelagic - A distinct marine community inhabits the open water column above the seafloor. Surface waters teem with tiny plants (phytoplankton) and animals (zooplankton) which form the basis of the marine food web. In addition to the tiny plankton, the sea is populated with larger swimming animals, from shrimps and jellyfish to whales. Many of these animals migrate large distances. Whales arrive in Victoria from deep in the Southern Ocean. Eels migrate from Victoria's rivers all the way to Torres Strait to spawn. Vertical migration is also common in the ocean, with animals ascending and descending during the day to feed or shelter.

Areas of Corner Inlet, Port Phillip Bay, Western Port and Gippsland Lakes are designated RAMSAR sites, recognised for their wetlands and the diversity of bird life that this supports.

(Adapted from Department of Sustainability and Environment, 'Our Living Wealth')

ENVIRONMENTAL RISK IDENTIFICATION AND ASSESSMENT

The Risk Assessment Matrix

Individual environmental risks have been identified and assigned a score between 1 and 5 for both the likelihood of the risk occurring and the predicted consequence if it were to occur (see table 3). These two scores are then used to rate each risk as either low, medium or high on the risk matrix (see tables 4 and 5). Understanding the severity of each risk through this rating system allows for the development of appropriate control measures, which are detailed in the Action Plan in section four. The EMS includes internal risks (those which commercial fishermen can directly influence) and external risks (those which sit outside of their direct control).

For the 2012 review, VBIFA members revisited the original risk assessment to see if any additions or changes were required. The risk matrix was amended slightly from the 2005 version. A 5x5 matrix was adopted to reflect common practice in food safety and other environmental management systems.

It is important to note that this risk assessment does not include an analysis of the impact of the commercial fishery on fish stocks. The sustainable harvest of fish populations is managed by Fisheries Victoria who use a variety of effort controls including, licensing, area/seasonal closures, gear restrictions and minimum landing sizes to manage fish populations. The Fisheries Victoria stock status report for bay and inlet fisheries can be found here: www.dpi.vic.gov.au/fisheries/commercial-fishing/fishery-status-report/commercial-bay-and-inlet-fisheries

The assessment is largely qualitative, based on the assessment of the identified risks by VBIFA members. Any available data collected by industry was utilised and a desktop survey of scientific research was carried out to provide, where possible, supporting evidence for the risk assessment scores. The risk assessment process highlighted the fact that data collected directly from the fishery would help to inform future risk analysis and provide a framework for ongoing improvement. This is addressed in the Action Plan for the coming five year period (see section four).

Table 3 describes the scale used to score the risks. Note that both *actual* risk and *perceived* risk are assessed in the EMS. Perceived risk is where an action by the fishers is perceived by the public or the media to cause considerable ecological damage although in reality the actual impact may be small. This can also be called public perception or 'social risk'. Environmental factors can also carry economic risk to the fishery and so this has also been assessed in the EMS which strengthens the document as a tool to underpin a strong and sustainable business.

Table 3: Scoring the risks

SCORE	LIKELIHOOD	SCORE	CONSEQUENCE
1	Rare but not impossible	1	Negligible, very insignificant impact. Unlikely to be measurable
2	Unlikely, but has been known to occur	2	Minor, possibly detectable but minimal impact
3	Possible, it may occur	3	Moderate, ecological recovery measured in months or years, significant impact on public perception of the fishery or moderate economic impact
4	Occasional, it may occur	4	Serious, ecological recovery measured in years to decades, highly significant impact on public perception of the fishery or serious economic impact
5	Likely, expected to occur	5	Catastrophic, widespread and permanent ecological damage, recovery unlikely. Economic failure of the fishery or irreversible damage to public opinion

Table 4 illustrates how the scores are used to colour grade each risk e.g. a risk with a likelihood of '2' and a consequence of '3' will have a pale blue colour.

Table 4: RISK MATRIX					
	CONSEQUENCE				
LIKELIHOOD	1	2	3	4	5
1					
2					
3					
4					
5					

Table 5 shows how each colour is assigned a risk level – low, medium or high. The previous example is ranked as low risk.

Table 5: RISK SCORING	
	LOW RISK
	MEDIUM RISK
	HIGH RISK

Internal Risk Assessment

This section presents background information and risk analysis scores for each of the environmental risks identified through the EMS process.

RISK 1 Non-compliance with fisheries conservation and legislation

Commercial fishing is a highly regulated industry and for VBIFA members, complying with regulations is essential to running their fishing businesses effectively. Non-compliance could lead to financial penalties, area closures and reputational harm but more importantly, VBIFA members support regulations that are designed to ensure the sustainability of their fisheries.

Commercial fishers are well-informed of fisheries regulations and any subsequent amendments through regular communication with their peak body (Seafood Industry Victoria), local Fisheries Officers and/or by checking the DPI website. Most members have their own copies of the *Fisheries Act 1995* and *Fisheries Regulations 2009*.

Fishers comply with the various conservation laws that affect their fishing activity, for example, no-take zones in marine protected areas (MPAs).

Risk assessment for non-compliance			
Likelihood	Consequence	Overall rating	Justification
1	3	LOW	Excellent knowledge of the regulations amongst VBIFA members makes the likelihood of non-compliance low. Consequence is moderate due to the potential for negative publicity for a fishery that was found not to comply with legislation.

RISK 2 Wasting commercial catch or landing poor quality, unsaleable catch due to unfavourable conditions at sea or the landing of exceptionally large catches

Unfavourable conditions at sea

There is a risk that un-forecast bad weather, problems with the engine, fishing gear or personal injury could make handling the catch too dangerous and fish would have to be abandoned at sea which is wasteful and therefore undesirable.

Professional experience means that bay and inlet fishers' are rarely caught in conditions so bad that they risk losing their catch. Spending most of their working life at sea, fishers avoid potentially hazardous weather conditions by checking the forecast before leaving the shore and while at sea and by maintaining fishing equipment in good working condition. Should un-forecast bad weather occur, their small-scale operations and the fact that they do not travel far

out to sea means fishers can cut short the trip and swiftly return to shore. Formal training as skippers and practical experience at sea means that fishers are aware of potential sources of physical injury and understand their professional responsibility to ensure the safety of everyone onboard.

To operate a commercial vessel, fishers must hold a Coxwains Certificate of Competency. To be eligible for this Certificate, applicants must have logged at least 12 months (240 days) at sea.

Exceptionally large and/or unmanageable catches make sorting fish too difficult and slow and fish loses quality and is un-marketable

Haul seines do not commonly exceed the carrying capacity of their small boats but it may occur under unfavourable circumstances, for example at certain times of the year, species such as Australian salmon, mullet, trout, silver trevally, etc can form unexpected large schools.

Purse seining may have similar issues when schools of pelagic species are targeted. The handling and sorting of catches that are too big could be lengthy and stressful for the fish. It would be possible to bring onboard only a portion of the catch, while the rest could die of asphyxia in the net and be wasted at sea.

In the case of mesh netting, normal size catches can at times be difficult to process if they comprise too many fish with appendages, such as elephant fish or leatherjacket, because of the time required to unmesh these fish.

It is not in the fisher's interest to end up with catches that cannot be managed efficiently because of the potential loss of fish resources, fishing time and revenue. Again, fishing experience is the key to minimizing this risk. Most fishers are well established fishers with long-term experience of the fishery. They know the movement of species and know where and when to set nets in order to avoid unmanageable or unwanted catches. Problematic catches may happen with less experienced fishers or at the transition between fishing seasons when new species arrive on fishing grounds. However, within a few days, information is shared between fishers who quickly learn from each other's mistakes and avoid risky areas. In Gippsland Lakes, a PhD student created a map showing all licence holder's fishing areas. All fishers have a copy of this which means that information about areas to avoid can be easily communicated by referring to the map.

Risk assessment for wasting a large catch due to adverse conditions at sea, engine problems, fishing gear problems or personal injury: all gear types			
Likelihood	Consequence	Overall rating	Justification
1	2	LOW	Likelihood is rare because professional fishers have gained essential skills through training and experience which cover personal safety, avoiding mechanical problems and understanding weather conditions. Consequence is minor as catches are small and it is unlikely to happen.

Risk assessment for unmanageable catches due to exceptionally large quantity of fish caught: Haul seine, mesh net and purse seine			
Likelihood	Consequence	Overall rating	Justification
2	2	LOW	Rated as unlikely because extensive fishing experience minimizes the risk of ending up with unmanageable, large catches. Consequence is minor as catches are small and it is unlikely to happen.

Risk assessment for unmanageable catches due to exceptionally large quantity of fish caught: Demersal long-line			
Likelihood	Consequence	Overall rating	Justification
1	2	LOW	Likelihood is rare because the number of fish caught is limited by number of hooks set and therefore never surprisingly large. Consequence is minor as catches are small and it is unlikely to happen.

RISK 3 Death of fish bycatch before or after release

The term 'bycatch' is used to refer to undersized commercial species and non-commercial species that cannot be landed by fishermen. By regulation, any fish that cannot be landed (other than noxious species) must be immediately returned to the water with the least possible injury or damage. High bycatch survival minimises the ecological impact of the fishery. This risk mostly applies to haul seine and mesh net fishing methods although it is important to note that overall in the bays and inlets, bycatch is very low. As a mixed-species fishery, most of what is caught can be sold and only a very small number of non-commercial species are captured. Non-commercial bycatch species include porcupine fish, toad fish, cobblers, black stingray, banjo shark, Pork Jackson shark, sandy crab etc. The information below documents established practices designed

to improve selectivity of gear and return incidental catch to the sea alive. It is recognised that data on incidental catch which could help to illustrate the good practices outlined below is limited and this will be addressed in the EMS Action Plan.

Haul seine Haul seines are designed to catch a variety of species of different size and shape. Haul seine modifications have previously been developed following problems with the meshing of undersized King George whiting in the wings of haul seines in Port Phillip Bay and Corner inlet. The modifications successfully minimised meshing of this and most other species. The modifications include adjusting mesh size so that juvenile fish (i) either escape through the nets (larger mesh on the wings of the net) or (ii) are trapped in the bag and later released alive (smaller mesh on the shoulder and bag). Haul seiners have also adopted thicker material (either by using conventional nylon nets with high 24-ply, or by using polyethylene nets), which further limits the meshing of fish. Even species with spikes and appendages, such as cobblers and porcupine fish, roll over the thick and small mesh nets without getting meshed.

Over the years, fishers have developed practices to bunt and sort fish in the water in order to maintain them in good condition and maximize the survival of bycatch. These practices include:

- Slow hauling speed
- Sorting fish in sufficiently deep water and not too tight in the bag
- Sorting fish using a deep-net and/or gloved hands
- Releasing bycatch species that may injure others (porcupine, jelly fish) and species that are most fragile first (undersize fish), before sorting commercial species of interest
- Minimizing sorting time and fish handling to limit stress and avoid loss of scale



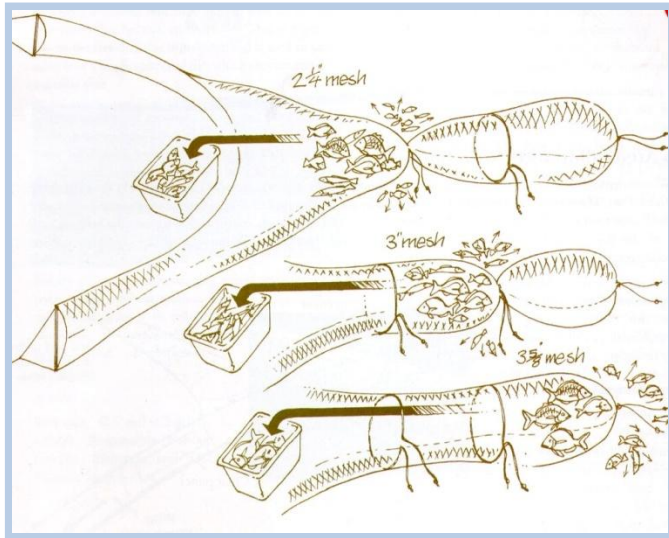
Sorting catch (bunting) in water



Bunting from the boat using a sorting pen and dip net

A 2002 study by Knuckey *et al.* showed that the chance of survival for caught and released fish was very good; the survival rate averaging 90% across all species. Short tow duration, slow hauling speed, sorting the catch in the water and using thicker net material, all contribute to maximizing the survival of bycatch. The study also found that up to 60% of small fish simply avoid capture by passing through the meshes.

In Gippsland Lakes black bream is the most commercially important species and it has a high body-shape. A haul seine has been developed that sorts fish while ensuring the survival of bycatch. Fishers have designed a three chamber haul seine that sorts species according to their overall size/shape. Each chamber is individually closed by a rope and the mesh size increases from the first chamber at the mouth of the bag to the third chamber at the end



Three chamber haul seine used in Gippsland Lakes

of the bag. All fish caught in the seine enter the first chamber and, standing in waist-deep water, adults of small-size species (e.g. yellow-eye mullet, tailor, bay trout) are removed, while juveniles of the same species escape. The second chamber is then opened to let the remaining larger species in: adults of luderick and silver trevally are removed while their juveniles escape. Similarly, the third chamber is opened to let largest/highest species (black bream) in and remove the adults while juveniles, and all remaining fish, are set free. The fish are constantly kept in the water and suffer minimum stress.



Checking that fish are over the size limit



A PVC 'fish chute'

Note on under-sized garfish Smaller garfish (below the minimum landing size) are delicate and there is a risk that individuals could perish before they can be released through the sorting process – especially when sharing the bunt with other species such as toadfish. Although small garfish are able to pass through the mesh of the shoulders and bag, they tend not to and it is up to the fishers to sort them and return them to the sea. Fishers take care to sort small garfish as quickly as possible and to return them in a manner that avoids predation by birds (e.g. in the shade of the boat or by using a ‘fishchute’). They feel that current net designs are the best fit for the multi-species fishery and that modifications to try to limit the catching of small garfish could lead to far worse issues with the meshing of other species, for example juvenile King George Whiting. Special attention will be paid to garfish in the Action Plan to promote maximum survival rates.

Mesh Nets By varying the size and shape (hanging ratio) of meshes fishers can design nets to catch fish of certain size/shape. Avoiding bycatch is very important for the fishermen as a lot of fishing time can be wasted un-meshing unwanted fish.

Fish caught are still alive as nets are hauled and the few fish occasionally caught as bycatch are carefully removed and released. In some areas, when birds become seasonally more abundant (e.g. pelicans in winter), a ‘release chute’ is used to protect released fish from predation.

It is well recognized in Victoria, and elsewhere, that mesh nets catch little bycatch (Halliday *et al.* 2001). A 2002 study in NSW (Gray 2002) reported high survival rates for released bycatch in the inshore mesh net fishery. In 2006, Fisheries Victoria funded research to look at the survival rates of small black bream after release from commercial nets in the Gippsland Lakes. A number of the under-sized released fish were collected and placed in holding tanks for three days of monitoring before they were returned to the Lakes. Results showed that 70 percent of the catch was legal size and 30 percent were under-sized and therefore released. Of those that were released, only 3 percent did not survive. (DPI, Fish-e-fax 2006)

Risk assessment for death of bycatch before release: Haul seine and mesh net			
Likelihood	Consequence	Overall rating	Justification
2	2	LOW	Likelihood low because haul seine nets and practices are designed to keep fish alive in water while sorting catches. See Knuckey et al. 2002. Size and design of mesh nets used promotes selectivity and therefore catch little bycatch; if bycatch is caught, it is carefully un-meshed and released alive. Consequence also minor as low numbers concerned.

Death of Bycatch after release: Haul seine and mesh net			
Likelihood	Consequence	Overall rating	Justification
2	2	LOW	Likelihood low as professional fishers have developed best handling practices to maximise the survival of released bycatch species. They carefully avoid injury to fish during bunting (haul seine), un-meshing (mesh net), and measuring; carefully avoid predation by birds during release. Consequence minor as very low numbers concerned

Purse seine In the bays and inlets, purse seining also catches very little bycatch as fishers are able to target single-species schools of fish. Today, purse seine fishers in Port Phillip Bay target species like anchovies and sandy sprat. Because of the small size of these species they have also adopted smaller meshes and thicker net material to avoid meshing them.

Demersal longline This method catches very little bycatch as species caught can usually be landed and sold.

Death of bycatch before release: Purse seine and demersal long line			
Likelihood	Consequence	Overall rating	Justification
1	1	LOW	Likelihood low as purse seines rarely have any bycatch. Longlines are selective and catch very little bycatch. If bycatch is caught, it is carefully freed and released alive. Consequence negligible as low numbers concerned.

Death of bycatch after release: purse seine and demersal long line			
Likelihood	Consequence	Overall rating	Justification
1	1	LOW	Likelihood is rare as bycatch is minimal. Consequence is negligible as the concern is for very low numbers.

RISK 4 Interactions with birds, seals, dolphins, whales, great white sharks, seahorses, pipefish and seadragons

Birds Each Victorian bay and inlet is inhabited by different species of birds because of their different environmental characteristics. Whilst seagulls and Australian pelicans are frequently observed in all three bays and inlets, cormorants (black cormorants and pied cormorants in particular), Eurasian coots and some duck species (like chestnut teal and musk duck) are mostly observed in the more brackish waters of the Gippsland Lakes. Short-tailed shearwaters and fluttering shearwaters, Australasian gannets, little penguins, and crested terns prefer the more marine waters of Port Phillip Bay. All marine birds are listed under the *Environmental Protection and Biodiversity Conservation Act (EPBC Act), 1999* and therefore protected by law. Of the birds, only the Fairy Tern is listed as vulnerable (Department of Sustainability and Environment, Water, Population and Communities (SEWPAC)) but these are rarely seen in the areas where VBIFA members work.

Professional fishers mostly fish at night time when birds are less active, thus avoiding interaction with them. Some species, like coots, tend to form large temporary flocks that remain in one area and so nets can be set away from them. Birds, usually seagulls, cannot get to long-line baited hooks as they sink rapidly in the water.

A study in NSW found a low level of fatal interactions with seabirds in the estuarine mesh net fishery (Gray *et al.* 2003).

Seals Australian fur seals are the dominant seal species in Victorian bays and inlets, with New Zealand fur seals, leopard seals and elephant seals only rarely seen. All seals and sea lions occurring within Australian waters are protected under the EPBC Act. Scientists use pup production to estimate the fur seal population. The number of pups born per year has doubled between 1986 and 2007 and the total fur seal population in Victoria in 2007 was estimated to be 120,000 (Kirkwood *et al.* 2010). Kirkwood also notes the colonisation of new haul-out and breeding sites, further suggesting the species' vulnerability is reducing. (Kirkwood *et al.* 2010).

Interactions between bay and inlet fishers and seals are low, between July 1997 and October 1998 observers monitored 80 haul seine shots in Port Phillip Bay and Corner Inlet. No catches or interactions with seals were recorded. (Department of Agriculture, Fisheries and Forestry (DAFF), 2005)

However, interactions do occur, one fisher in Corner Inlet kept a record of interactions with seals between July 2005 and May 2006. There were 26 interactions over this 10 month period where the seal took fish from the nets and left the site unharmed. The frequency of interactions may be quite high for this particular fisherman at this time because he was fishing towards the mouth of the inlet where seals are more common.

Dolphins and whales Under the EPBC Act, all cetaceans (whales, dolphins and porpoises) are protected in Australian waters. Twenty-five species of whales and two species of dolphin live or migrate through Victorian waters (SEWPAC). These include Southern Right Whales, Humpback Whales, Blue Whales, Bottlenose Dolphins and Common Dolphins. In fisher's experience, of these animals, dolphins are most likely to frequent the waters of the bays and inlets and therefore present the most tangible risk. Port Phillip Bay has a resident population of bottlenose dolphins, *Tursiops australis*, isolated as a separate species in 2011 (Charlton-Robb *et al*, 2011)). Common dolphins are only occasionally seen in the bays and inlets. Southern right whales occasionally enter Port Phillip Bay but have never interacted with commercial fishing.

The Dolphin Research Institute does not consider commercial fishing vessels a significant risk to dolphins in Port Phillip Bay, Western Port, Corner inlet or Gippsland Lakes. Entanglement in commercial gear is not considered as a high priority threat although it is important for fishers to be conscious of the possibility. Issues such as marine debris and fisheries stock management are considered to be integral to the health of the dolphin population. (Dolphin Research Institute, pers. comm. 2012)

Sharks The Great white shark, *Carcharodon carcharias*, is listed under the EPBC Act and is known to frequent Victorian waters. The area outside Corner Inlet has been shown, through tagging research, to be an important location for juveniles of the species (Bruce & Bradford, 2008). Great whites are not known to have interacted with commercial fishing in Victoria and it is very rare to find them in the inshore, sheltered environments frequented by the VBIFA fishers.

Seahorses, seadragons and pipefish Seahorses, seadragons and pipefish may, on occasion, get caught in mesh nets and haul seines and are carefully freed and released without injury.

Various pieces of research acknowledge that, in the Victorian bays and inlets, there are few interactions with commercial fishing that lead to injury of protected species (Norman 2000, Commonwealth of Australia 2003, TQCSI - MSC 2004).

Summary Overall, interactions are scarce and when they do occur, the animal (most commonly seals) gets an easy meal from the nets and leaves the site unharmed. However, there is a lack of awareness amongst the public about commercial fishing methods in the bays and inlets and the care that fishers take to co-exist with the local wildlife. This creates a significant risk to the public perception of the fishery that animals will be injured by commercial fishing activities. Consequently, the risk assessment for interactions with wildlife has been separated into two parts to assess (i) ecological risk and (ii) public perception risk. The economic risk from interactions with wildlife e.g. seals causing damage to fishing gear, is considered in the external risks section as often it is beyond the fisher's control.

Ecological risk			
Likelihood	Consequence	Overall rating	Justification
Birds			The likelihood of interactions with most protected species is low because the fishing fleet is small and fishing practices used are not prone to interactions. Seals are scored a 4 as fishers do interact with them occasionally.
1	2	LOW	
Seals			The consequence scores for interactions on wildlife populations range from minor to moderate, depending on the species. Overall ecological risk is low because the majority of wildlife species that occupy the areas where fishers work are abundant and neither threatened nor endangered and interactions are scarce, except for occasional interactions with seals who are not harmed through such occurrences.
4	1	LOW	
Dolphins & whales			
1	3	LOW	
Great White sharks			
1	3	LOW	
Pipefish, seahorses and sea dragons			
1	2	LOW	

Public perception risk			
Likelihood	Consequence	Overall rating	Justification
Birds			The likelihood of interactions with most protected species is low because the fishing fleet is small and fishing practices used are not prone to interactions. Seals are scored a 4 as fishers do interact with them occasionally. There is a significant risk of damaging public perception through interactions with iconic wildlife such as seals. Therefore scores of moderate have been used for some species – seals, dolphins, whales and great white sharks.
1	2	LOW	
Seals			
4	3	HIGH	
Dolphins & whales			
1	3	LOW	
Great White sharks			
1	3	LOW	
Pipefish, seahorses and sea dragons			
1	2	LOW	

RISK 5 Damage to seagrass from propeller, dragging anchor or during fishing

VBIFA members are well aware of the ecological importance of seagrass for fish stocks and that the sustainability of their fishing and livelihood depend on a healthy marine environment and healthy seagrass beds in particular.

Bay and Inlet fishers have designed their haul seines to have minimum contact with seagrass. The design differs slightly between the bays according to different physical characteristics, but the objective is the same. Footlines are about 15-20% longer than the headline, and thus slacker and towed behind the headline. As a result, the footline glides over seagrass leaves without damaging them. The net just lays the seagrass leaves down as it goes over, and the leaves stand straight back up afterward. This has been well illustrated in underwater footages taken by DPI staff (Bycatch video No.10, DPI). Further, haul seines would not fish effectively if they were too heavily weighted or 'bogged' in the seabed. Several studies and reviews have showed that our haul seining also has little impact on seagrass in the bays and inlets (See WBM Oceanics Australia 1997 and Knuckey *et al.* 2002).

It is generally recognized that mesh netting and longlining have little physical impact on habitats or the marine environment (NREC 1991). Seagrass environments are not the right areas for demersal long lines being too shallow and not home to the target species, and therefore are not used.

When travelling at sea, fishers carefully avoid scarring seagrass with their propellers. From experience they know the type of substrate underneath the boat at any time, the water depth and, most importantly, how tide cycles affect water depth. They avoid anchoring and bunting on seagrass because anchors tend to hold better on sand and fish tend to escape under the net when bunting over seagrass.

Damage to seagrass from propeller: all gear types			
Likelihood	Consequence	Overall rating	Justification
1	2	LOW	Likelihood is rare as professional fishers know the value of seagrass for fish stocks and possess the local knowledge needed to avoid physical damage to seagrass. Consequence scored as minor because it would be highly localised, small scale damage if it did occur.

Damage to seagrass from dragging anchor: all gear types			
Likelihood	Consequence	Overall rating	Justification
1	2	LOW	Likelihood is rare because professional fishers generally prefer to anchor on sand patches where anchors hold best. Consequence scored as minor because it would be highly localised, small scale damage if it did occur.

Damage to seagrass during fishing: mesh net & purse seine			
Likelihood	Consequence	Overall rating	Justification
1	1	LOW	Likelihood is rare because mesh nest have very light contact with seagrass and purse seines no contact. Consequence also negligible because it would be a minimal impact if it did occur.

Damage to seagrass during fishing: haul seine			
Likelihood	Consequence	Overall rating	Justification
1	2	LOW	Haul seines are designed to work just above the seabed 'feathering' seagrass leaves without damaging them. Consequence scored a 2 because it would be highly localised, small scale damage if it did occur.

Risk 6 Damage to water quality from fuel spills, pollution from outboards and chemical spills

The small size of the fishing fleet, small travelling range and limited fuel consumption means that the bay and inlet fishing operations generate limited pollution. Spending so many days at sea, fishers need to maintain outboard motors in top condition and tend to replace them every two years, in line with the duration of the manufacturer's warranty. Thus the latest and most environmentally friendly models are in use.

Most fishers carry two PVC 30 litre tanks (a main and a spare), which is well above the average daily use. Thus they never run out of fuel and do not need to refuel while at sea. Fuel tanks are normally filled on land at service stations. Transport Safety Victoria checks fuel tanks and connecting hoses annually to ensure that they are in good working condition. No chemical

detergents are carried at sea and boats and fishing gear are cleaned with sea water immediately after fishing. Fish bins are thoroughly cleaned, on land, by wholesalers.

There are waste oil disposal facilities back at port.

Risk assessment for chemical spill			
Likelihood	Consequence	Overall rating	Justification
1	2	LOW	Likelihood and consequence low as professional fishers do not carry chemicals onboard

Risk assessment for pollution from outboards			
Likelihood	Consequence	Overall rating	Justification
2	2	LOW	Likelihood and consequence low as licence holders use outboard motors which comply with required environmental standards. They are maintained in good working condition and generally replaced every two years. If an incident did occur it would be very small-scale.

Risk assessment for fuel spill			
Likelihood	Consequence	Overall rating	Justification
1	2	LOW	Likelihood is low because the good working condition of boats and equipment is checked by Transport Safety Victoria each year. Consequence is minor because given the small quantities of fuel carried onboard; any fuel spill would be very small.

RISK 7 Spread of marine pests which threaten native species and can destroy habitat and fishing gear

The Northern Pacific seastar which is established in Port Phillip Bay and the European carp in Gippsland Lakes are the marine pest species that impact most of the fishing in the bays and inlets. Other pests include European shore crab, black striped mussel, European fan worm and the Japanese wakame. High traffic by domestic vessels and fouling on their hull can potentially contribute to the spread of marine pests.

The small size of the fishing fleet and the limited travelling range minimize the risk of spreading marine pests. Most fishers use trailer aluminium boats that attract little fouling. The few remaining wooden boats that stay on the water are regularly cleaned on approved slipways. These slipways have to comply with strict regulations regarding water pollution and spread of marine pests. Fishing activities are also usually limited to a few areas within one bay or inlet, launching and retrieving our boats at the same ramp. When occasionally fishing in another bay, fishers travel by road with trailer boats. This means that they would clean the boat on land before driving to launch it at a new location.

After every fishing trip, particularly in Port Phillip Bay, and before going back to the boat ramp and trailers, fishers clean and inspect their boats, fishing equipment and anchors for the presence of marine pests. They carefully remove any seastars and other biofouling that might be attached to the mesh nets or longlines and dispose of them in rubbish bins on land.

Note: marine pests are also covered as an external risk as their spread is not solely influenced by bay and inlet fisher's behaviour.

Risk assessment for marine pests			
Likelihood	Consequence	Overall rating	Justification
1	3	LOW	Likelihood is low because professional fishers experience first-hand the impact of marine pests on the environment and fish stocks and have learnt and adopted recommended best practices to avoid spreading them. Consequences moderate as pests can impact commercial fishing practices and commercial viability.

External Risks

RISK 8 Climate change and weather extremes negatively impact the fishery

Marine biodiversity is changing in South East Australia in response to warming ocean temperatures and a stronger Eastern Australian current (Marine Report Card, 2009). It is also predicted that there will be up to 20% more months of drought and an increased occurrence of extreme weather events such as storms with heavy rainfall as a result of the changing climate. (Department of Climate Change and Energy Efficiency).

It is difficult to say with certainty the environmental impact from climate change in the bays and inlets but possibilities include:

- Increased salinity in Gippsland lakes from reduced rainfall
- Tropical species become established in Victorian waters
- Increased frequency of mass fish deaths from storm water entering Port Phillip Bay
- Heavy rains bring more silt from rivers into coastal waters and smother seagrass in Corner Inlet
- Sea-level rise and increased turbidity of water from extreme weather events causes seagrass die off
- 'Coastal squeeze' of saltmarsh and mangroves as coastal areas are squeezed between rising sea levels and man-made structures such as sea walls and roads
- Reduction in the abundance of estuarine species as rainfall and consequently river flow is reduced

These factors, and others, could have considerable impact on the bay and inlets fishery.

Gippsland Lakes is particularly affected by changes in environmental conditions. Recruitment of black bream is notoriously variable, among the most variable of all harvested fish species in Australia (FCC 2004), and driven by environmental factors (i.e. recruitment depends on high water temperature around spawning time and high rainfall after spawning). Catches of black bream were fairly stable throughout the 1990s (between 120 and 185 tonnes per year) before declining sharply to 24 tonnes in 2002-03 and to 35 tonnes in 2003-04. Fishers and scientists agree that this decline mostly results from the sustained eight year drought conditions in the Gippsland Lakes.

Risk assessment for climate change			
Likelihood	Consequence	Overall rating	Justification
5	2	HIGH	Climate change is likely and expected to occur and therefore likelihood is scored a 5. Consequence is rated as minor. Fishers feel that as multi-species fisheries that adapt to seasonal and year on year changes in species distribution and availability, they are well-placed to adapt to changing conditions and potentially different species in the bays and inlets.

RISK 9 Water pollution and habitat degradation from land-based activities

Victoria's resident population grew by an estimated 75,400 people in 2011 to a total of 5,574,500 as of December 2011. This represents a growth rate of 1.4%. (Australian Bureau of Statistics (ABS), 2012) Population growth is accompanied by commercial, residential, industrial and agricultural development. Human activity such as dredging for coastal development, increased tourist traffic, nutrient runoff from agricultural activities and residential gardens are all environmental risks to the bay and inlet fishery. By-products of development and human activity can enter the water system and will eventually flow into one of the bays and inlets, affecting their physical characteristics. Changes can then occur to the diversity, composition and abundance of species in the area.

An example of water pollution occurred in December 2011 when the Gippsland Lakes Estuarine Fishery was closed due to high concentrations (exceeding established health guideline values) of nodularin toxin caused from a regional blue green algae bloom. After the initial closure, harvesting of finfish from the region was permitted; providing it was gilled and gutted before sale. This requirement lasted for four months and was lifted in April 2012 so that commercial harvesting could commence normally. The requirement of this extra processing had severe financial and time implications for the fishermen affecting the viability of their business.

The algal blooms can have knock-on effects too, for example huge numbers of jellyfish start to flourish which interact with fishing operations and require management actions.

In June 2012, heavy rains caused the Morwell River to breach and flood the Yallourn open cut mine in Gippsland. Water from the flooded mine was fed back into the Latrobe River which supplies the Gippsland Lakes. The Environmental Protection Agency (EPA) reported that levels of heavy metals were not of a concern (Channel Nine news report, June 2012) but fishers remain concerned about the impacts on the Lakes fishery.

Port Phillip Bay is almost land-locked and only about 4% of the water is replaced with each tide. This means flushing out of nutrients etc is a slow process. (DPI Port Phillip Bay: Fish in our Waters Report, 2010)

A significant decline in seagrass beds in recent decades has occurred throughout the world. In Victoria the most affected areas are Western Port and Corner Inlet. No single cause has been identified. Some of the decline may be due to natural changes in populations, but other factors appear to be sediment and nutrients from urban and agricultural run-off, dredging, and small boat activity. (DSE, Our Living Wealth, 1997).

Risk assessment for water pollution and habitat degradation from land-based activities			
Likelihood	Consequence	Overall rating	Justification
5	4	HIGH	Urban and agricultural development currently occurs and is expected to continue resulting in a likelihood score of 5 (likely). Consequence rated as serious because the impacts have already been experienced and are wide-reaching with considerable economic and ecological implications.

RISK 10 Introduced species damage local environment and threaten native species, impacting fishing activity

The bay and inlet fishermen conduct thorough pest management actions of their own to prevent the spread of invasive species but other marine activities can cause their spread such as the release of contaminated ballast water and bio-fouling from industrial shipping and recreational fishing. Recreational vessels from Tasmania often refuel in Victorian ports.

Introduced species can have a number of impacts on native populations such as causing damage to habitat and fishing gear and threatening populations of native species by competing for resources. This can affect the livelihood of the bay and inlet fishermen. Examples of invasive species include the European carp which causes habitat degradation by stirring up the mud floor of the Gippsland Lakes as well as causing extensive damage to fishing gear. There is also the Northern Pacific seastar which is a voracious predator of native shellfish, an important part of the food web which provides food to commercially important species such as snapper.

Under Victorian Ballast Water Regulations ships that intend to enter a Victorian port are required to report on the status and risk of any ballast water contained on their ships. Domestic ballast water may only be discharged in Victorian waters with the written approval of the EPA and no ballast water determined to be high risk may be discharged in Victorian state waters.

Risk assessment for introduced species			
Likelihood	Consequence	Overall rating	Justification
4	4	HIGH	Likelihood and consequence both scored a '4' – 'occasional but serious'. Likelihood is 'occasional' as fishers hoped that Victorian Regulations would prevent the spread of pests. Fisher's noted that despite the serious impact score awarded, introduced species could potentially be an opportunity if new markets can be established such as has been seen with the European shore crab in Gippsland Lakes.

RISK 11 Illegal fishing and the black market can lead to environmental, reputational and economic damage

Instances of illegal fishing reported in the media may negatively impact the whole fishery, damaging the reputation of those fishers operating legally. Illegal taking of catch could also affect the stock management of different species currently fished by VBIFA members by removing an unknown quantity of fish. Illegal fishing could include bad fishing practices which damage the environment. The selling of illegally caught fish also reduces the price and market opportunities for legally caught and sold fish. Illegal fish may not be handled in line with food standards and therefore carries a risk of sickness to the general public. Any outbreak of illness from seafood will be a slur on the whole Victorian seafood industry and therefore further impact legal fishers.

As a snapshot of illegal fishing activity, in May 2012, Fisheries Victoria issued media releases for three illegal fishing incidents over the course of the month. Two involved under-sized snapper - one in Mordialloc where two recreational fishers had landed 61 snapper over their bag limit, all of which were under-sized and one in Mornington where a recreational fisher was caught tipping under-sized snapper into the water on seeing the fisheries officers. There was also an incident with abalone at Kirks Point with an illegal haul of abalone, many of which were undersized (DPI (2012) Media releases).

Risk assessment for illegal fishing			
Likelihood	Consequence	Overall rating	Justification
5	4	HIGH	Illegal fishing is considered likely and so scored a 5. Economic consequence is serious and environmental consequence is likely to be serious but un-quantified so a score of 4 is given.

RISK 12 Predatory bird and seal populations

Native seal and bird populations often target fish caught by bay and inlet fishers. Frequently this results in damage to fisher's equipment and loss of catch. This has a financial impact on fishing operations for VBIFA members. Fisher's try their best to reduce interactions with birds and seals and, if interactions do occur, they are managed appropriately under the EMS action plan. However, interactions are a sensitive issue and can result in poor public perceptions even though they may not be the fault of the fisherman.

Between July 2005 and May 2006, one fisher in Corner Inlet recorded interactions with Australian fur seals. This fisher had 26 interactions with Australian fur seals over this 10 month period. In over 90% of these interactions the seals took fish which had been caught in the nets and in 100% of the interactions there was damage to fishing gear. In nearly half of the interactions the fisher was forced to abandon fishing for the day.

An average of 5.5 hours was spent mending the net after each interaction with an Australian fur seal. This information demonstrates the economic impact of interactions with seals.

Historically the stock of black bream has also been affected by predation by cormorants in the Gippsland Lakes (Coutin 2002). From a study in the 1990's, predation by cormorants was estimated to be equivalent to the combined effect of commercial and recreational fisheries (Reside and Coutin 2001).

Risk assessment for predatory bird and seal populations			
Likelihood	Consequence	Overall rating	Justification
4	3	HIGH	Interactions are expected and therefore scored a '4'. Financial consequence is 'moderate'.

RISK 13 Area closures and other restrictions can impact the financial viability of fishery

Bay and inlet fisheries have worked collaboratively with Government on some examples of area closures. Sometimes these are voluntary closures which gradually become part of the law and sometimes they are a result of ongoing discussion and engagement which results in amended boundaries for closed areas e.g. with the marine protected area in Corner Inlet. However, in the past some closures appear to have been politically motivated such as the closure of Western Port Bay in 2006 where no engagement with the commercial fishing industry occurred. Closures such as this can displace effort, reduce the economic value of the Victorian fishing industry, constrain the supply of fresh local seafood for Victorians and affect employment opportunities for the sector. Smaller-scale closed areas within individual bays can displace effort and restrict

the flexibility that is necessary for a multi-species fishery to work, where fishers can adapt to changing seasons, weather and conditions to target different species within their bay or inlet.

Risk assessment for area closures and other restrictions			
Likelihood	Consequence	Overall rating	Justification
3	4	HIGH	Likelihood is rated as 'possible' and consequence serious due to the significant economic and social consequences of some closures.

RISK 14 Recreational sector causes overfishing and habitat degradation

Recreational harvest is controlled by bag limits, size limits and the issuing of recreational fishing licences. Precise information on how much of each species is taken annually is scarce; the impact on stock levels is not fully known and effort is managed on a 'best guess' basis. Fisheries Victoria sells 290,000 licences each year although the total number of active licences is not clearly known. On their website, the Victorian Recreational Fishing body, VRFish, state that the recreational fishing community includes over 721,000 Victorians. (www.vrfish.com.au)

Increased traffic to the coast and out into the bays and inlets from recreational fishers could impact the marine and coastal habitat.

The DPI report *Port Phillip Bay: Fish in our Waters* states that approx 2.5million fish are caught from Port Phillip Bay every year which represents 20-25% of recreational fishing effort. Therefore we can approximate that somewhere between 10 and 12.5 million fish are removed by recreational fishers every year (note this will not all be from the bay and inlets, some will be offshore and some inland).

Risk assessment for recreational fishing			
Likelihood	Consequence	Overall rating	Justification
3	3	MEDIUM	Negative impacts are possible and the lack of certainty around volumes taken through recreational fishing leads to a 'moderate' consequence score

Summary of risk analysis

TABLE 6: LOW RISK
Non-compliance with legislation
Waste of commercial catch
Death of bycatch before release
Death of fish bycatch after release
The ecological risk of interactions with wildlife
Marine habitat damage
Damage to water quality - pollution
Spread of marine pests by bay and inlet fishers

TABLE 7: MEDIUM RISK
Recreational sector over-fishing

TABLE 8: HIGH RISK
Illegal fishing and the black market
Climate change & weather extremes
Economic impact of interactions with birds and seals
Public perception risk of interactions with seals
Area closures & restrictions
Water pollution & habitat degradation from land based activities
Introduced species damage local environment and threaten native species

Tables 6, 7 and 8 illustrate how a majority of the internal risks which can be controlled by the fishers themselves are rated low-risk. Only one was rated high, the public perception risk of negative interactions with seals. All of the external risks, where fishermen have limited control, were rated either moderate (recreational sector overfishing) or high risk. This demonstrates the complex nature of fishery management. The fishers alone cannot ensure the environmental health of the fishery, external factors such as changing climate, urban development and wider shipping and fishing interests all influence the ongoing environmental, economic and social health of the bay and inlets fishery. The following section lays out the management actions designed by the bay and inlet fishers to manage these risks – both to ensure the low risks remain marginal and to attempt to ‘manage down’ some of the higher risks.

4 RISK MANAGEMENT ACTION PLAN

This Action Plan identifies a series of actions to manage each risk, details of who is responsible to carry out the action and an overview of the implementation and review process.

Table 9: Risk Management Action Plan

1.0	Actions around legislation	Responsibility of:	Implementation/review process
1.1	Every licence holder will be notified of changes to legislation by DPI and SIV	Department for Primary Industries (DPI) Seafood Industry Victoria (SIV)	DPI to communicate to bay and inlet licence holders any relevant changes to legislation SIV to pass on information about legislation to bay and inlet licence holders
1.2	VBIFA Committee to apply the Association's rules in cases of serious offences by its members, namely: - Rule 8: Mediate with fishers involved to check their continued commitment to VBIFA EMS - Rule 7: Discipline, suspension and expulsion for repeat offenders VBIFA Committee will report any actions taken to Fisheries Victoria	VBIFA Committee	Continuous monitoring of member's compliance to EMS and an annual review of any offences at the VBIFA AGM
1.3	VBIFA Committee to check the compliance rate recorded by Fisheries Victoria for bay and inlet fishers	VBIFA committee	Annually, in advance of VBIFA AGM. Any non-compliance to be discussed at AGM and if necessary Association rules applied (see 1.2).
1.4	VBIFA members to familiarize themselves with the regulation reference list (Appendix VI) and contact VBIFA Committee whenever in doubt	VBIFA members	At all times , with a review of any changes to the regulations at the AGM

2.0	Actions around wasting commercial catch	Responsibility of:	Implementation/review process
2.1	All boats: • Give induction on sea safety rules to new crew and occasional visitors e.g. scientists, observers (check VBIFA water-proof reference booklet) • Check weather conditions before going out and while at sea • Ensure fuel tanks are full prior to each fishing trip • Maintain fishing gear in good working condition • Avoid areas and times where problematic catches are likely (e.g. catch too big or containing too much bycatch) • Have emergency numbers accessible onboard (carry VBIFA reference booklet) • Respond to calls for assistance from other fishers in handling difficult catches, wherever possible	VBIFA members	At all times
2.2	Additional actions for haul seine and purse seine: <i>NOTE: the following mitigation actions only apply to situations where no personal injury has occurred. In case of injury, the safety of people onboard takes precedence over rescuing catches</i> • If working conditions become too difficult, release the entire catch alive, or reduce the catch to manageable size • Seek another fisher's assistance to bring more fish bins and/or handle the catch, as required • If fish have died accidentally and have spilled out of the net: • Inform local Fisheries Officers immediately • Seek other fishers' assistance to collect dead fish, as required	VBIFA members	If incident occurs and with an annual review of any incidents at AGM
2.3	Additional actions for mesh net: <i>NOTE: the following mitigation actions only apply to situations where no</i>	VBIFA members	If incident occurs and with an annual review of any incidents at AGM

	<i>personal injury has occurred. In case of injury, the safety of people onboard takes precedence over rescuing catches</i> • Retrieve one net, or fleet of nets, at a time and un-mesh fish in a sheltered area; successively retrieve remaining nets in similar way; • Seek another fisher's assistance to un-mesh fish, as required • If the situation is too dangerous: ○ Give up fishing and come back as soon as it is safe to do so • If nets had to be left in the water, inform local Fisheries Officers		
3.0	Actions around bycatch	Responsibility of:	Implementation/review process
3.1	All boats: • At times when bycatch species abound on fishing grounds, share or seek information on their movements with other fishers • Handle fish carefully at all times e.g. unmeshing (mesh nets) sorting and releasing* • Release fish away from birds and/or use a release chute, as required* • Release fish in shady areas between/under boats whenever possible* • Keep measuring board on the boat easily accessible • If you have a problem with bycatch management whilst at sea: - Contact another fisher in your area to ask for assistance - Report the incident to Fisheries Victoria as soon as possible • Dispose of any waste responsibly <i>*With particular attention to delicate under-sized garfish</i>	VBIFA members	At all times

3.2	Additional actions for haul seine: • Use the largest mesh size possible for the targeted species • Bunt in sufficient water depth to minimize crowding (at, or over, regulated depth) • Use shallow dip nets, or gloved hands, when sorting catch to minimize scale damage • Release bycatch species as quickly as possible and before sorting commercial catch • Do not bunt the fish too tightly in the bag • Bunt on sandy bottom whenever possible (fish tend to suffocate when bunting on mud) • If beach seining - check beach for debris 50 metres on either side of fishing activity and make sure nothing is left behind	VBIFA members	At all times
3.3	Additional actions for mesh netting: • Share information with other fishers on optimal net design (e.g. hanging ratios) to increase selectivity of mesh nets • Handle fish carefully during un-meshing, measuring, and releasing; • Un-mesh fish as the net comes onboard and immediately: ○ Release bycatch ○ Measure commercial species, as required	VBIFA members	At all times
3.4	Instigate data collection for incidental catch (see Data Record Sheet – Appendix I)	VBIFA Committee and nominated VBIFA members	Snapshots of incidental catch to be kept by a small number of volunteer fishers and collated by VBIFA committee. To be collected on the first trip of every month Data collected will be reviewed at the annual EMS review.
3.5	Look into research being done in South Australia about survival rates for	SeaNet & VBIFA	Before 2013 review

	under-sized garfish to see if any lessons can apply.		
4.0	Actions around interactions with wildlife	Responsibility of:	Implementation/review process
4.1	All boats: • Fish at night time whenever appropriate to minimize interaction with birds (especially during summer months) • Avoid areas/times when birds and seals are in the area • Share/seek information with other fishers on whereabouts of interacting birds and seals • Carefully free and release any wildlife species that may be caught in fishing gear • Comply with regulatory minimum distance (150m) and maximum speed (5 knots) allowed near dolphins and whales • VBIFA members to familiarize themselves with the correct identification of protected wildlife species (check VBIFA water-proof reference booklet) • Report injured or dead wildlife species to DSE or Parks Victoria • Take pictures when in doubt about species identification • VBIFA members to report (and take pictures when possible) or unusual sightings of wildlife species and recovered bird bands	VBIFA members	At all times and with an annual review of effectiveness at the VBIFA AGM
4.2	Additional actions for mesh-netting • Avoid setting nets in shallow waters near bird rookeries or colonies • Retrieve mesh nets as soon as seals are spotted around • Avoid excessive slack in buoy line	VBIFA members	At all times and with an annual review of effectiveness at the EMS review
4.3	Instigate data collection for interactions with wildlife (see Data Record Sheet – appendix I)	VBIFA Committee and a nominated	Records of interactions with marine life to be kept by a small number of volunteer

		VBIFA members	fishers and collated by VBIFA committee. To be collected on the first trip of every month. Data collected will be reviewed as part of the annual EMS review (most likely at the VBIFA AGM)
5.0	Actions around marine habitat	Responsibility of:	Implementation/review process
5.1	All boats: • Avoid motoring through seagrass • Avoid anchoring over seagrass when possible • When anchoring over seagrass is necessary, prevent anchor from dragging over seagrass	VBIFA members	At all times and with an annual review of the effectiveness of control measures and the condition of the seagrass in the bays and inlets at the EMS review meeting
6.0	Actions around water quality	Responsibility of:	Implementation/review process
6.1	All boats: • Keep engines in best possible condition (at, and above, the performance checks required by Transport Safety Victoria) • Only use outboard motors that meet required environmental standards • If re-fuelling at sea is necessary, use a funnel or siphon hose when pouring fuel into drums or tanks • Carry absorbent rags in case of spillage (contain any spilled fuel onboard for disposal on land)	VBIFA members	At all times and with an annual review of the effectiveness of the control measures at the EMS review meeting (VBIFA AGM)
7.0	Actions around marine debris	Responsibility of:	Implementation/review process
7.1	Preventing loss of equipment at sea • Check fishing gear regularly for defects and recondition or dispose of appropriately on land • When disposing of derelict nets on land, strip the nets off the lines to stop anyone re-using them	VBIFA members	At all times and with an annual review of the effectiveness of the control measures at the EMS review meeting (VBIFA AGM)

	Share information on hook-ups with other fishers.		
7.2	Prevention of discarding marine debris - Not discarding at sea any plastic bags and bottles, confectionery wrappers, strapping bands, synthetic ropes, floats, rubber gloves, cigarette butts, etc - Carry a rubbish container or bag on the boat - Carry an adequate ashtray onboard, as required	VBIFA members	At all times and with an annual review of the effectiveness of the control measures at the EMS review meeting (VBIFA AGM)
7.3	Mitigation – retrieving any equipment lost at sea - Recover all fishing gear accidentally lost at sea, whenever possible and safe - Seek another fisher’s assistance when necessary - Inform local Fisheries Officers when lost fishing gear cannot be retrieved immediately - Inform local Fisheries Officers when nets have been stolen or tampered with	VBIFA members	As and when found and with annual review of the effectiveness of the control measures at the EMS review meeting (VBIFA AGM)
7.4	Mitigation – retrieving marine debris found at sea - Whenever practical and safe, retrieve marine debris found at sea (particularly floating pieces of wood – for boating safety) and dispose of at an appropriate onshore disposal facility - If the marine debris is too big to be carried onboard, report to Parks Victoria or Transport Safety Victoria	VBIFA members	As and when found and with annual review of the effectiveness of the control measures at the EMS review meeting (VBIFA AGM)

8.0	Actions around spread of marine pests	Responsibility of:	Implementation/review process
8.1	- VBIFA members to familiarize themselves with correct identification of marine pests (check VBIFA water-proof reference booklet) - VBIFA members to familiarize themselves and comply with the recommendations from the National System for the Prevention and Management of Marine Pest Incursions to avoid spreading of marine pests (check VBIFA water-proof reference booklet) - Immediately report new sightings of marine pests to DSE (take pictures when in doubt)	VBIFA members	At all times when sightings occur and with annual review of any incidents at the VBIFA AGM
8.2	Explore opportunities to establish new markets for introduced species as has been done with the European shore crab	VBIFA committee	Engagement with DPI and SIV. Annual review at AGM
8.3	Engage with management authorities e.g. DSE , to manage suspected pest incursions and containment for existing species	VBIFA members	Engagement with DSE, SIV and SeaNet. Annual review at AGM
9.0	Climate change and weather extremes	Responsibility of:	Implementation/review process
9.1	Support monitoring or rehabilitation programmes of key habitats e.g. breeding areas, areas of high productivity, seagrass etc	VBIFA committee	Proactively engage with relevant organisations e.g. Parks Victoria.
9.2	Monitor and record in the comments section of your logbook any changes such as significant ecological changes or unusual species that could be down to climate change.	VBIFA committee and members	At all times in logbook. Explore opportunities to engage with monitoring projects such as Redmap (SeaNet can help with this). Annual review at the AGM
9.3	Report unusual species to your local fisheries officer	VBIFA members	As and when sightings occur
10.0	Water pollution and habitat degradation from land-based activities	Responsibility of:	Implementation/review process
10.1	Work with the steering committee for blue-green algal bloom events to develop satisfactory management protocols	VBIFA members & Committee	Aim to improve the Incident management procedure for algal blooms within the next 12 months i.e. before 2013 review and then ongoing monitoring and input to the process

10.2	Engage with land-users to raise awareness of the impact of their activities on the marine environment	VBIFA Committee	Engage with Landcare, Parks Victoria and any other relevant organisations. Raise awareness about the issues and the EMS document as a management tool. (SeaNet can provide assistance here). Annual review at AGM
11.0	Illegal fishing and the black market	Responsibility of:	Implementation/review process
11.1	Take down details of suspected illegal fishing and report to DPI (number on VBIFA reference booklet)	VBIFA members	As and when illegal fishing witnessed call 13 FISH. Annual review of effectiveness at the VBIFA AGM
11.2	Support research into methods for identifying the source of seafood products to enable the identification of black market product.	VBIFA members	As and when engagement opportunities arise
12.0	Predatory bird and seal populations	Responsibility of:	Implementation/review process
12.1	Collect data on interactions to help to demonstrate the impact that these species can have on fishing gear etc.	Nominated VBIFA members	Fishermen who volunteer to record interactions with wildlife will record the nature of the interaction and the impact on the fishing activity. Review at VBIFA AGM.
13.0	Area closures and other restrictions	Responsibility of:	Implementation/review process
13.1	Ensure that fishing activities are carried out in line with both regulations and the voluntary EMS and avoid negative interactions with stakeholders	VBIFA members	At all times
13.2	Improve the profile of the commercial fishing industry within the wider community by initiating or participating in programmes to manage the public perception of the industry	VBIFA committee	Working with SIV and SeaNet on potential events/projects/communications
13.3	Investigate the feasibility of carrying out projects in Port Phillip Bay and Corner Inlet to map the fishing areas of individual licence holders. This can be used as an engagement tool with planning authorities (and has been done in Gippsland Lakes)	VBIFA / VFARM / CIFHA / SeaNet	To feedback at 2013 VBIFA review

14.0	Recreational sector over-fishing	Responsibility of:	Implementation/review process
14.1	Support the engagement of more resources for data collection, management and enforcement of the recreational fishing sector	VBIFA committee	Ongoing communication with DPI
15.0	General action points	Responsibility of:	Implementation/review process
15.1	Fishers will carry the necessary equipment at sea including: • Radio or mobile phone (<i>conditional agreement – Arthur Allen not required to carry a mobile phone</i>) • Phone numbers of others fishers working in the same area • VBIFA waterproof reference booklet with phone numbers, information about sea safety, marine pests and key bird, seal, dolphin and whale species • Disposable camera	VBIFA members	On every trip
15.2	Keep a log of all reports made to government agencies and NGO's	VBIFA members	Continuously
15.3	Continue to look for new ways to further improve the environmental performance of their fishing methods	VBIFA members	Continuously
15.4	The VBIFA committee will: • Administrate VBIFA and collect information from members • Update information in the reference booklet • Coordinate the annual EMS review and 5-yearly external review (see review template) • Keep up to date with changes in regulations and new fishing technology • Maintain regular communications with VBIFA members	VBIFA Committee	Continuously
15.5	Nominated VBIFA members will visit – at least annually – local councillors to discuss commercial fishing operations and raise any pertinent issues	Nominated VBIFA members	Annually
15.6	Develop a Communications Plan for the EMS to raise awareness amongst stakeholders about the bay and inlet fisheries risk management processes and to help seek solutions on complex issues beyond fishers direct control	VBIFA Committee	Before 2013 review of the EMS

5 Useful contacts

Organisation	Contact name	Phone	Website
VBIFA	Gary Leonard	04 1275 4977	
East Gippsland Fishermen's Association (EGEFA)	Arthur Allen	03 5155 2475	
Corner Inlet Fisheries Habitat Association (CIFHA)	Donald Henderson	5686 2025	
Victorian Fisheries Association into Research Management (VFARM)	Maria Manias	03 9408 4384	
Port Franklin Fishermen's Association	Ray Dunstone	03 5686 2780	
Lakes Entrance Fishermen's Co-op Society Ltd	Dale Sumner	03 5155 1688	www.lefrtrade.com.au
Seafood Industry Victoria (SIV)	Executive Director Renee Vajtauer	03 9687 0673	www.siv.com.au
SIV Board Director (Bays and Inlets)	Grant Leeworthy	04 0835 5012	grl@deakin.edu.au
SeaNet	Hannah Arcaro	03 9687 0673	www.oceanwatch.org.au
Fisheries Victoria (DPI)	Bairnsdale Office	03 5152 0400	www.dpi.vic.gov.au
	Queenscliff Office	03 5258 0111	
	Mornington Office	03 5975 4779	
	Yarram Office	03 5183 9100	
	Geelong Office	03 5226 4667	
	Lakes Entrance	03 5155 1539	
Parks Victoria (DSE)	Information service	131 963	www.parkweb.vic.gov.au
Gippsland Coastal Board	General information	03 5152 0451	www.gcb.vic.gov.au
Central Coastal Board	General information	03 8627 4724	www.ccb.vic.gov.au
Victorian Coastal Council	General information	03 9637 8893	www.vcc.vic.gov.au
East Gippsland Shire Council	General information	03 5153 9500	www.eastgippsland.vic.gov.au
South Gippsland Shire Council	General information	03 5662 9200	www.southgippsland.vic.gov.au
La Trobe City Council	General information	1300 367 700	www.latrobe.vic.gov.au
Wellington Shire Council	General information	1300 366 244	www.wellington.vic.gov.au
Greater Geelong City council	General information	03 5272 5272	www.geelongaustralia.com.au
Borough of Queenscliffe Council	General information	03 5258 1377	www.queenscliffe.vic.gov.au
Mornington Peninsula Shire Council	General information	1300 850 600	www.mornpen.vic.gov.au
Melbourne City Council	General information	03 9658 9658	www.melbourne.vic.gov.au
Catchment Management Authorities	Port Phillip and Western Port	03 9785 0187	www.ppwcm.vic.gov.au
	West Gippsland	03-5175 7800	www.wgcma.vic.gov.au

	East Gippsland	03 5153 0462	www.egcma.vic.gov.au
Department of Planning and Community Development	Switchboard	03 9208 3333	www.dpcd.vic.gov.au
Port of Melbourne Corporation	Melbourne office	1300 857 662	www.portofmelbourne.com
Gippsland Port Authority	Head office	03 5150 0500	www.gippslandports.vic.gov.au
	Lakes Entrance	03 5155 6900	
	Port Welshpool	03 5688 1658	
Transport Safety Victoria	Marine Safety	1800 223 022	www.transportsafety.vic.gov.au
Environmental Protection Agency (EPA)	General information	1300 372 842	www.epa.vic.gov.au
VRFish (Recreational fishing peak body)	Switchboard	03 9686 7077	www.vrfish.com.au

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APPENDIX I



VBIFA DATA RECORD SHEET

Date of trip: Time of trip:.....

Location: Port Phillip Bay / Corner Inlet / Gippsland Lakes / Western Port Area.....

Gear: Mesh net / Seine net / Purse seine / Demersal long line / Other.....

Did you catch any non-commercial species during this trip? Yes / No

If yes, please fill out further details below

Species	Number	Released alive	Dead	Other
Porcupine fish				
Toad fish				
Cobbler				
Weed fish				
Black stingray				
Banjo shark				
Port Jackson shark				
Sandy crab				
Seahorse				
Pipefish				
Seadragon				
N. Pacific Seastar				
Other				
Other				
Other				

Did you have any interactions with seals, birds or other wildlife? Yes / No

Please fill out details below of your interactions

Bird species	Approx Number
Great cormorant	
Little black cormorant	
Little pied cormorant	
Pied cormorant	
Black-faced shag	
Pelican	
Other (specify)	
Other (non-identified)	

Other species	Approx Number

Seal species	Approx Number
Australian fur seal	
New Zealand Fur seal	
Elephant seal	
Leopard seal	
Species non-identified	

Further comments

How did the species impact your work?

No impact	
Scared fish away from the area?	
Forced you to fish elsewhere?	
Forced you to abandon fishing trip?	
Damaged/took fish you had caught?	
Estimated loss of catch	kg
Damaged fishing gear?	
Extent of damage	small / moderate / major

THANK YOU FOR FILLING THIS OUT. IT WILL BE COLLECTED BY THE CHAIR OF YOUR FISHING ASSOCIATION

This information is for the ongoing management of the VBIFA Environmental Management System (EMS). Please note that the information collected here is owned by VBIFA and will not be made publically available without consultation with VBIFA members.



EMS ANNUAL REVIEW CHECKLIST

YEAR:

How to use this checklist:

This checklist will help VBIFA members to review the performance of the fishery against the action plan in the EMS. It should be completed once a year with the involvement of as many VBIFA members as possible – the VBIFA AGM may be a suitable event.

Before the review meeting

The VBIFA committee member(s) in charge of the EMS process should collate and fill out as much data as possible before the meeting. For example, this may include finding out the number of non-compliances issued for bay and inlet fishers by Fisheries Victoria or noting down any incidental catch figures from the data collection programme maintained by VBIFA members. The review sheets from previous years should also be brought to the meeting for reference.

At the review meeting

At the meeting each item listed on the sheet should be briefly discussed and all fishers invited to raise their experiences from the year. Any data, maps or information relevant to the EMS review should also be brought to the attention of all members. Findings can be compared to the previous year to assess year on year progress and any follow up actions to be taken should be noted down in the 'Actions' column.

After the meeting

The VBIFA committee member in charge of the EMS process should follow up on any actions, sign and date the sheet and file it for the next year.

Item	Comments/information for this year	Different to previous year(s)?	Actions to be taken
Number of non-compliances recorded by Fisheries Victoria this year			

EMS ANNUAL REVIEW CHECKLIST Continued

Item	Comments/information for this year	Different to previous year(s)?	Actions to be taken
Interactions with seals, birds, whales and dolphins & other wildlife?			
Incidental catch (bycatch) data from completed Data Record Sheets?			
Marine pests			
Marine debris and pollution			

EMS ANNUAL REVIEW CHECKLIST Continued

Item	Comments/information for this year	Different to previous year(s)?	Actions to be taken
Any incidents of unmanageable catches			
Species distribution in bays and inlets			
Algal blooms			
Any stakeholder engagement to help manage external risks carried out? What was the outcome?			

EMS ANNUAL REVIEW CHECKLIST Continued

Are there any new issues/risks that need consideration?	
Any other notes?	
Do you feel that any comments made here require any scores in the EMS risk assessment to be amended? YES / NO Which risks need amending? If you answered yes to the above, amend EMS document to reflect proposed changes	
Date completed: Completed by Signature:	

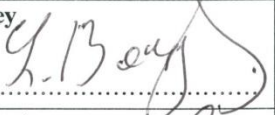
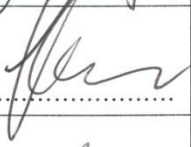
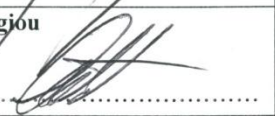
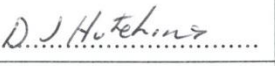
APPENDIX III

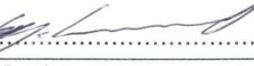
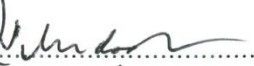
EMS DEVELOPMENT TIMELINE

Date	Action
2004	Initial EMS process begun
2005	EMS published
2006	External review conducted by Ian Cartwright, Daryl McPhee and Karen Weaver
2007	Internal review
2008	Internal review
2009	Internal review
2010	Internal review
2011	Internal review
2012	Internal review: • June/July: engagement with fishing associations and VBIFA Board members • August: document amended and new draft circulated for comment • September: Further amendments • Nov/Dec: VBIFA AGM – final review of proposed document by all members and development of a Communications plan for the re-launch of the reviewed document • Jan/Feb: Launch of reviewed EMS including launch of the new Data Record Sheet (Appendix I)
2013	External Review to take place

APPENDIX IV

SIGNATORIES TO THE EMS

Name	Address	Date
Arthur Allen Signature: 	30 Lakeview Drive, Lakes Entrance, 3194	21/2/5
Dave Allitt Signature: 	PO Box 529, Lakes Entrance, 3909	29/01/05
Len Beazley Signature: 	60 Dow Street, Port Melbourne, 3207	3.2.05
Robert Carabott Signature: 	4 Taegtow Way, Altona Meadows, 3028	23/01/05
Neville Clarke¹ Signature: 	PO Box 1067, Port Franklin, 3964	30/1/05
Wayne Cripps Signature: 	PO Box 1066, Port Franklin, 3964	30/01/05
John Gazan Signature: 	52 Beach Road, Rhyll, 3923	10/02/05
Sam Georgiou Signature: 	13 Sharam Avenue, Mentone, 3194	23/08/05
Dalton Hutchins Signature: 	6 King George Avenue, Mornington, 3931	8/02/05
Neville Hutchins Signature: 	6 King George Avenue, Mornington, 3931	8/02/05

Name	Address	Date
Matt Jenkins Signature: 	PO Box 297, Lakes Entrance, 3909	29-1-05
Max Laub Signature: 	1 Nelson Street, Port Albert, 3971	30-1-05
Gary Leonard² Signature: 	PO Box 666, Lakes Entrance, 3909	29/1/05
Pasquale Mateira Signature: 	50 Margaret Street, Werribee, 3030	26/2/05
Phillip McAdam Signature: 	71 Gordon Street, Newport, 3015	23/1/05
Name: Tim Mirabella³ Signature: 	PO Box 402, Hastings, 3915	8/2/05
Robert Morecroft Signature: 	1 Bay Road, Eagle Point, 3878	29/1/05
John Murdoch⁴ Signature: 	PO Box 545, Geelong, 3220	23/1/05
Angelo Xenos Signature: 	8 Lester Avenue, St Albans, 3021	23/1/05

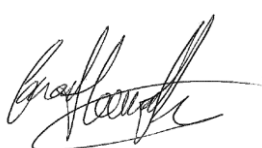
1: VBIFA Secretary and Corner Inlet Committee member

2: VBIFA Treasurer and Gippsland Lake Committee member

3: VBIFA President

4: Port Phillip/Western Port Bay Committee member

APPENDIX IV Continued

East Gippsland Estuarine Fishermans Association (EGEFA) members who joined VBIFA in 2012	
Name	Date
James Casement	9.1.13
Andrew Twigg	9.1.13
Michah Davy	9.1.13
Robert Jenkins	9.1.13
Matthew Allen	9.1.13
Harold Leonard	9.1.13
Malisa Leonard	9.1.13
Signed on behalf of the above by Gary Leonard (EGEFA President)	9.1.13
Signature 	
Other new members (2012/3)	
Grant Leeworthy	9.1.13
Signature 	
Michael Vawdrey	March 2013
Anthony Molinia	March 2013
Eugene Garland	March 2013
Steven Kartsakus	March 2013
Steve Javni	March 2013

APPENDIX V

AVERAGE ANNUAL COMMERCIAL CATCH BY SPECIES IN THE BAYS AND INLETS

Common name	Scientific name	Average annual catch (tonnes) 2007/8-2010/11
King George whiting	<i>Sillaginodes punctata</i>	156
Black Bream	<i>Acanthoparus butcheri</i>	67.5
Southern anchovy	<i>Engraulis australis</i>	51
Southern sea garfish	<i>Hyporhamphus melanochir</i>	65.5
Yellow-eye mullet	<i>Aldrichetta forsteri</i>	50.5
Southern calamari	<i>Sepioteuthis australis</i>	62.5
Australian salmon	<i>Arripis spp</i>	49.75
Rock flathead	<i>Platycephalus laevigatus</i>	95.25
Snapper	<i>Pagrus auratus</i>	93.5
Silver trevally	<i>Psuedocaranx dentrex</i>	44.5
Tailor	<i>Pomatomus saltatrix</i>	24.25
Gummy shark	<i>Mustelus antarcticus</i>	17.25
Greenback flounder	<i>Rhombosolea tapirina</i>	14
Luderick	<i>Girella tricuspidata</i>	18.25
Sand flathead	<i>Platycephalus bassensis</i>	7.5
Sea mullet	<i>Mugil cephalus</i>	5
Leatherjacket	<i>Monacanthidae</i>	5
Yank flathead	<i>Platycephalus speculator</i>	12
Dusky flathead	<i>Platycephalus fuscus</i>	21.25
Short-fin pike	<i>Sphyranea novaehollandiae</i>	7.25
European carp	<i>Cyprinus carpio</i>	63.75
Estuary Perch	<i>Macquaria colonorum</i>	1
Blue weed whiting	<i>Haletta semifaciata</i>	2.25
Other species		276.50
Total		1211.25

APPENDIX VI

REGULATIONS REFERENCE LIST

Regulations	Type of Restrictions	Acts & regulations	Authority
Commercial fishing restrictions			
Fisheries Regulations	Legal size for fish species; fishing gear restrictions; closed areas; closed seasons; artificial reef exclusion zones	<i>Fisheries Act 1995</i> <i>Fisheries Regulations 2009</i>	Fisheries Victoria
Marine National Parks and Sanctuaries (no-take zones)	Boundaries for parks and sanctuaries are shown on the Parks Victoria website.	<i>Parks Victoria Act 1998</i> <i>National Parks Act 1975</i> <i>Environment Protection and Biodiversity Conservation Act 1999</i>	Parks Victoria Fisheries Victoria Department of Sustainability, Water, Population and Communities (SEWPAC)
Heritage Areas	It is an offence to enter protected zones around shipwrecks (7 protected zones in Port Phillip Bay)	<i>Heritage Act 1975 (State Waters)</i>	Heritage Victoria (DSE)
Boating activity exemptions and exclusion zones	It is an offence to travel through No Boating Zones	<i>Marine Safety Act 2010</i>	Water Police, Parks Victoria and Port of Melbourne
Protected species			
All marine reptiles, turtles, birds and mammals protected under wildlife legislation. All seahorses, seadragons, pipefish protected under fisheries	It is an offence to intentionally cause injury or death to a protected species.	Wildlife Act 1975 Flora and Fauna Guarantee Act 1988 Fisheries Act 1995	Department of Sustainability and Environment Fisheries Victoria SEWPAC

legislation.		Environment Protection and Biodiversity Conservation Act 1999	
Whales and dolphins	Exclusion zone around marine mammals (minimum 150 m distance and maximum 5 knots speed).	Wildlife Act 1975; Wildlife (Whale) Regulations 1988.	Parks Victoria
Waste			
Pollution control	The discharge of oil residues, chemicals, garbage, sewage, litter or any other waste is prohibited in any waters of Victoria.	<i>Environment Protection Act 1970</i> <i>Pollution of Waters by Oil and Noxious Substances Act 1986</i> <i>Marine Safety Act 2010</i>	EPA (Environment Protection Authority) Transport Safety Victoria (oil spill coordination and response)
Marine debris	Total prohibition on the disposal of plastics into the sea.	<i>International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)</i>	Intergovernmental responsibilities
	Marine debris ³ is listed as a threatening process; it includes plastic garbage, recreational and commercial fishing gear and solid non biodegradable floating materials. Risks to wildlife include entanglement in nets and ropes and ingestion of pieces of filament and hooks.	<i>EPBC Act 1999</i>	SEWPAC

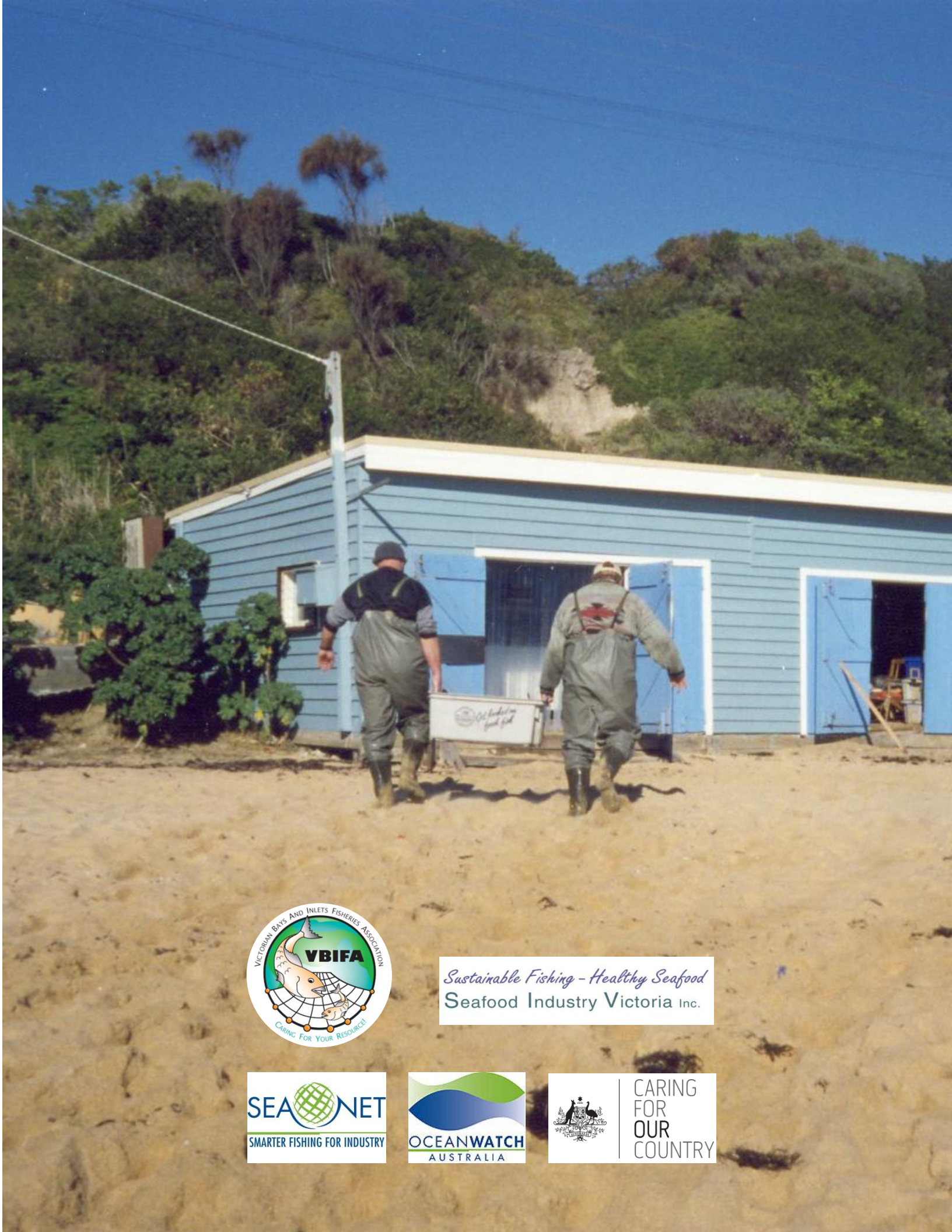
³ The exact nomination title is "Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris" (see www.deh.gov.au/biodiversity/threatened/kt/marine-debris.html).

THE VICTORIAN BAY AND INLETS FISHERIES ASSOCIATION INC.

STATEMENT OF PURPOSE

The purposes of the Victorian Bays and Inlets Fisheries Association are:

1. To provide a representative body for eligible members regarding bay and inlet fishing in Victorian waters.
2. To promote and develop ecologically sustainable development of fisheries in Victorian bay and inlet waters.
3. To promote community awareness of the economic value of fishing in Victorian bay and inlet waters and the importance of fish as food.
4. To promote security of access to Victorian waters and fishery resources for commercially licensed bay and inlet fishers.
5. To promote security of licence rights and entitlements under the *Fisheries Act 1995* (Victoria) and/or its successor in legislation for the benefit of commercial fishers in the Victorian bay and inlet fisheries.
6. To promote consistent, objective, and efficient management of fisheries in Victorian bay and inlet waters in accordance with the principles of ecological sustainable development.
7. To undertake and promote research and development in bay and inlet fisheries in Victorian waters.
8. To promote environment certification as to fishing methods in Victorian bay and inlet fisheries.
9. To promote quality certification of fish taken from Victorian waters in bay and inlet fisheries.
10. To work collaboratively with other entities in identifying options and opportunities for maximising of profits for commercial fishers in Victorian bay and inlet waters at all times having regard to the principles of sustainable development.
11. To provide information and education to licensed fishers in the bay and inlet fisheries in Victorian waters.
12. To take out membership of such bodies as the Association feels will assist and enhance commercial fishers in the Victorian bay and inlet fisheries.
13. To document and review fishing practices in the bays and inlets of Victorian waters.
14. To develop codes of conduct for use by commercial fishers in Victorian bay and inlet waters.
15. To promote and develop an environmental management plan for commercial fishing in bay and inlet fisheries in Victorian waters



Sustainable Fishing - Healthy Seafood
Seafood Industry Victoria Inc.

