Development of risk assessment procedures in national fisheries compliance programs

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Development of risk assessment procedures in national fisheries compliance programs

Final Report to the

Fisheries Research and Development Corporation

by

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ABBREVIATIONS

Abbreviation	Explanation
AFLEC	Australasian Fisheries Law Enforcement Conference
ESD	Ecologically sustainable development
FRDC	Fisheries Research and Development Corporation
NFCC	National Fisheries Compliance Committee
SWOT	Strength, weakness, opportunity and threat analysis

NON TECHNICAL SUMMARY

2002/085 Development of risk assessment procedures in national fisheries compliance programs

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OBJECTIVES:

1. To identify criteria and measures for assessing compliance risks in nationally indicative fisheries.
2. To identify which fisheries compliance risk assessment criteria, measures and processes are practical and useful.
3. To develop a user-friendly resource package for use by fisheries compliance practitioners to assess compliance risks in a consistent and nationally agreed fashion.
4. To communicate and extend the risk assessment resource package nationally.

NON TECHNICAL SUMMARY:

Motivation for this project arose from the perceived need to develop a consistent and nationally agreed risk assessment framework for application in the management of fisheries compliance.

This project resulted in the production of a risk assessment resource package comprising a framework document, an electronic database application and associated user guide. The resource package has been specifically designed for use by fisheries compliance managers and enforcement staff within government.

OUTCOMES

The project synthesised and reviewed current and past literature relating to fisheries compliance risk assessment and developed risk assessment criteria through workshops with fisheries compliance managers. A generic fisheries compliance risk assessment framework was produced drawing on the literature and the collective knowledge of the fisheries compliance managers.

In addition, a simple 'standardised' risk management and reporting tool known as *FISHRISK* was developed using the Microsoft® Access 2000 database software to meet specific risk management needs in fisheries compliance. Its primary purpose is to assist fisheries management organisations in Australia to manage compliance risks within their respective jurisdictions in a consistent and nationally agreed fashion. A comprehensive User Guide was produced to assist compliance practitioners in the use of the application.

FISHRISK provides a step-by-step risk assessment guide for officers and allows them to capture risk data and decisions as they proceed through the risk assessment process. Use of the application enables consistent structure and user interface across fisheries compliance in Australia and allows for tailoring of the data to an organization's specific requirement. Criteria against which risks can be measured and prioritized were adapted from AS/NZS 4360:1999.

FISHRISK also produces a range of reports that can provide decision makers, policy makers, program planners and stakeholders with accurate, up to date information on fisheries compliance risks. The reports can then be used to monitor the progress of treatments carried out to mitigate the risks and for review purposes.

Overall the project has been of benefit to fisheries compliance practitioners by educating them about the methodology and value of risk assessment in fisheries compliance. It is expected that the use of *FISHRISK* and a risk assessment approach will produce a more strategic outcome to the management of fisheries compliance and result in improved cost-effectiveness in compliance delivery. Cost savings will be of benefit to stakeholder-funders, fisheries management organisations and the general community through the delivery of more effective compliance services.

The future development of the *FISHRISK* application rests largely with the various Australian fisheries compliance organisations. Jurisdictions may customise the database to their own needs based on a national standard. *FISHRISK* can already be adapted to meet particular jurisdictional requirements including the ability to turn on / off fisheries in the database, incorporate more quantitative data and stylise the look of generated reports and the components of those reports. For instance, the function of quantitative data is limited to a number of commentary fields within the present database. Depending on need, additional quantitative data fields can be activated that can track data that has not yet been scoped into the existing database.

Further developments could include the nationalisation of activities related to risk assessment and management, the use of internet based technologies to improve the sharing of knowledge about compliance impacts on stock sustainability across jurisdictions, and the continuing advancement of the science of risk analysis.

KEYWORDS: **Risk assessment, fisheries, compliance, enforcement.**

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Special thanks are extended to those national compliance managers who attended the workshop sessions conducted at the Australasian Fisheries Law Enforcement Conference (AFLEC) meetings and provided valuable comment on the development of fisheries compliance risk assessment criteria and measures and the *FISHRISK* application.

Finally, sincere thanks are extended to my co-workers and colleagues, Anita Ward, Tara Baharthah and Shona James. Their support and patience while I completed this report is greatly appreciated.

1. BACKGROUND

1.1 Overview

Fisheries and related activities are important throughout Australia, generating in excess of $2 billion in revenue each year (ABARE, 2001). The sustainable management of these resources is vital, and fisheries organisations rely on the support of compliance programs to ensure the effectiveness of management programs. Fisheries compliance programs involve maximising voluntary compliance through stakeholder engagement and education, and creating effective deterrence through monitoring, surveillance and enforcement (National Fisheries Compliance Committee, 1999).

Services delivered within compliance programs may involve routine monitoring and surveillance, intelligence gathering, inspection, investigation, prosecution and education activities. These activities are aimed at ensuring that commercial and recreational fishing sectors abide by fisheries legislation. Enforcement-related resources are invariably limited, and an appropriate level of compliance is normally determined by examining the trade-offs between the cost of enforcement, requirements imposed by the management plan and the effect particular levels of non-compliance may have on stock sustainability.

Many compliance programs are complex, leading to significant costs depending on the jurisdiction and the fishery being managed. Costs are either recovered directly from an industry group and/or by way of government contribution. Under the industry cost recovery process, compliance programs have come under increasing scrutiny by industry groups in terms of cost and detail. Contemporary legal opinion (Crown Solicitor of South Australia, 2000) emphasised the importance of maintaining a level of independence between fisheries agencies and industry when determining the level of funding for compliance.

Notwithstanding, there is a legitimate claim that fishery interest groups can play an important role in helping to shape the direction of compliance programs. Fishers not only actively contribute toward compliance programs through the payment of license fees, but they are often the first to become aware of compliance risks when they arise and hence their cooperation is a vital component of the enforcement strategy. Forced compliance within fisheries, like most other sectors, is not practical and the value of voluntary compliance should not be under-estimated.

Risk assessment describes the formal process of determining threats and opportunities to achieve desired outcomes from a given process. The idea is to establish the desired outcome (optimal compliance), the processes that lead to the achievement of optimal compliance (by systematically describing them), and the impacts (risks) upon the process that may affect outcomes. If possible, it is desirable to quantify risks at each stage of the process. Risk assessment historically arose from the business community, but the practice has since been adopted in many disciplines as a way of methodically describing processes and impacts. The main objective is to minimise (through affirmative action or enforcement) those risks that may threaten preferred outcomes, thereby allowing

optimal allocation of resources between “competing” risks. Risk assessment is used widely in the environmental monitoring sector and is now being used in the natural resource management sector. It’s use within the fisheries management sector is relatively new and its application to fisheries compliance more so.

Ecologically sustainable development (ESD) has become a major objective of the fisheries legislation of most jurisdictions (Fletcher *et al* 2002). A key component is the need to measure and report on performance against ESD objectives. The concept of ESD is broader than traditional fisheries management in that it not only considers the effects of the fishery on the target species, but also what effects there may be on the rest of the ecosystem and poses some difficulties for fisheries managers because of its complexity. In order to meet reporting objectives fully, fisheries compliance practitioners need to demonstrate that services are delivered in accordance with the governance requirements of ESD. The use of risk assessment can assist this process by determining the relative priority of issues, justifying those levels and specifying an appropriate level of management response.

Fisheries management agencies in Australasia are becoming increasingly aware of the benefits to be gained from adoption of a compliance risk assessment framework. Western Australia, South Australia, the Commonwealth and New Zealand have adopted risk management approaches for compliance programs in specific fisheries. The experience in Western Australia and the Commonwealth is that risk assessment can be greatly enhanced through the involvement of fishery stakeholders. Such assessments can be used as the basis for determining the direction and priorities for compliance programs within a fishery without compromising the program through undue budgetary influence.

Approaches to the risk assessment process, however, have tended to differ between jurisdictions. The development of a common risk assessment framework, including a generic system of risk quantification and documentation is seen as a desirable outcome. This will allow valid comparisons to be made for similar fisheries between jurisdictions, particularly those where species are common across jurisdictions, and across years. In addition, it will allow for consistency in national reporting.

1.2 Compliance Theory

Regulation of fishing involves mechanisms and processes that direct or control fishing activity according to particular rules. Non-compliance with these rules can occur through accident, ignorance, omission or deliberate acts. Deliberate or omissive acts involving gain or benefit are generally viewed as criminal activity. The application of the term ‘crime’ to this deviant behaviour in Australia is relatively new. Such activity was previously referred to simply as ‘illegal’. However, this lesser term did not convey the significance or impact that the activity may have been having on the fisheries resource leading some within the community to take the view that such activity ‘wasn’t all that bad’. That is not the case anymore, and the wider community now appears to recognise fisheries crime for what it is.

The literature contains a considerable number of theories published about why people choose to commit crime (Feldman 1993). In the fisheries literature, most of these theories focus on the role of monetary factors in explaining non-compliant behaviour (Hatcher *et al.* 1998) and are focused on theoretical, rather than empirical, analysis (Sutinen and Anderson 1985, Milliman 1986). More recent studies have recognised the importance of non-monetary factors in determining fisher behaviour with respect to fisheries regulations (Sutinen and Gauvin 1989, Furlong 1991, Hatcher *et al.* 1998, Kuperan and Sutinen 1998). The reality is that fishers may be influenced by multiple factors in their decision to commit crime.

There are three theories that may have relevance in explaining criminal behaviour among fishers, the theories of differential association, neutralisation and rational choice (reviewed by McKinlay, 2002). Differential association (Sutherland and Cressey 1970) is a theory that focuses on individual criminality, and proposes that criminal behaviour is learnt through association with others engaged in deviant activity. The theory suggests that a person becomes delinquent through exposure to delinquent patterns, and isolation from anti-delinquent patterns. People tend to assimilate their surrounding culture, so that exposure to criminal activity helps to establish patterns that lead to criminal behaviour. Neutralisation theory (Sykes and Matza 1957) proposes that deviance is a learnt behaviour, but focuses on the rationalisation people require in order for them to excuse illegal behaviour. Neutralisation is a cognitive technique that allows people to engage in deviant activity, yet still maintain a positive self-image. Rational choice theory (Cornish and Clarke 1986) on the other hand, proposes that people engage in deviant behaviour through personal choice and rational calculation similar to a cost-benefit analysis. Actions that result in benefits, with little or no cost, are favoured over those that do incur costs. In a contemporary sense, many of the tenets of rational choice theory have a strong body of support (Feldman 1993).

When faced with a decision to comply or otherwise with a law or regulation the cost-benefit analysis involves consideration of four factors – the amount of illegal gain or benefit, the expected penalty, moral obligation, and social influence (Sutinen, 1996). The benefit in a commercial fishery is the amount of added income that can be earned through the illegal activity. In a recreational fishery, the benefit is the added value of the fish taken illegally. In terms of expected penalty arising from prosecution, if large enough, can offset the illegal benefit. If an individual believes that compliance is the 'right thing to do', there will be a moral obligation to comply. Peer pressure and social influence can play a significant role in influencing an individual's attitude toward compliance.

McKinlay, 2002 proposed that some aspects of economic and white-collar crime were present in fisheries crime. He classified fishers who engaged in economic crime into two types – those who did so only occasionally, and those who did so habitually. Although he identified the latter as being in the minority, their impact was usually much greater because of their high motivation and their neutralisation attitude of a positive self-image. For those that only engaged in occasional economic crime, he likened their activity to employee pilferage. In this scenario the fisher was the "employee", the fishery (or by proxy, the fisheries management organisation) was the "employer" and the fish was the item that was pilfered.

Employee pilferage is generally viewed as more respectable than other types of economic crime in the community, usually because it is difficult to identify the victim. In the case of a fishery the victim is obscure – is it the fish, the ecological sustainability of the fishery, other fishers or the government? In committing economic crime the moral obligation to 'do the right thing' has been neutralised.

White-collar crime, as a subset of economic crime, refers to illegal acts committed for monetary gain by the affluent in the course of their normal business activities. It usually involves legitimate businesses carrying out deviant activity motivated by profit. McKinlay, 2002 noted that it was particularly difficult to effectively police white-collar crime. Activities were generally hidden in normal business routines, making illegal acts difficult to detect or trace. This was especially so when the major recipient of the benefit (e.g. the owner of a processing factory or fishing boat) is spatially removed from the employee or fisher that physically carries out the criminal act. Successful prosecutions were generally difficult to obtain, and penalties were often small compared with the potential gains from illegal activity.

McKinlay argued that at least some fishers who habitually engaged in illegal fishing activities shared many of the characteristics associated with white-collar crime. Illegal activity was often hidden among legitimate fishing, processing, transporting and fish selling activities conducted in the course of their normal business.

Understanding the motivation behind the criminal activity can influence what type of control should be used to mitigate that activity, e.g. education, strong enforcement, heavy penalties etc.

In some fisheries, especially those involving high value products, there are considerable opportunities to benefit from illegal activity. Often the possibility of detection is low and the expected penalty is minor relative to the benefit. Combined with a white-collar approach to illegal activity and luke-warm social influence, the challenge for compliance managers is to develop programs that not only increase deterrence but also increase moral obligation to comply and shift social influence to the side of supporting compliance with the regulations.

1.3 Managing Compliance

Achieving an optimal level of compliance (National Fisheries Compliance Committee, 2003) as an outcome has a number of components, that of holding non-compliance at an acceptable level; the development of compliance activities in conjunction with an appropriate management plan to maintain that level; and protection of the long-term integrity and sustainability of the fishery at a reasonable cost for enforcement services.

An acceptable level of non-compliance is somewhere around a high level of voluntary compliance most of the time. Some measure of enforcement, comprising a reasonable threat of detection, successful prosecution, and significant penalties for those who do not, is necessary to maximise voluntary compliance within a fishery. This can be achieved by comprehensive and timely

intelligence management, effective monitoring and surveillance, appropriately trained enforcement staff, and suitable deterrents in the form of punitive and administrative penalties.

The enforcement techniques employed by fisheries compliance organisations are generally stylised to the particular fishery or compliance threat. The techniques include, but are not restricted to:

- overt presence by openly patrolling areas to deter illegal activity;
- covert patrolling, monitoring and carrying out surveillance using deception and mimicking behaviour to avoid detection;
- saturation and pulse operations designed to concentrate on specific compliance issues;
- patrol vessels to carry out at-sea inspections of licences, catch and fishing gear;
- aerial patrols to detect activity in large or remote fishing areas;
- in-port inspections of vessels, catch and equipment;
- land inspections of catch and fish processing factories, aquaculture facilities, retail outlets, delivery routes;
- use of mobile patrols to increase the element of surprise and to obviate the advantage offenders may have through knowledge of the movement patterns of local officers;
- specialized officers with the task of conducting complex investigations into serious fisheries offences;
- a free-call telephone hotline for public reporting of instances of observed illegal activity;
- well thought out fishery management plans which strengthen industry support and facilitate enforcement;
- regulations and restrictions limiting catches, sizes, fish types, fishing gear, equipment, sales, fishers, seasons, times and areas;
- comprehensive biological research leading to management based on accurate information supports enforcement effort;
- penalties for illegal activity that are commensurate with the value of the illegal fish involved, and the type of illegal activity to create an effective deterrent;
- seizure and confiscation of fish and fishing equipment;
- licence suspension or cancellation for offences involving for high value species;
- educational initiatives aimed at promoting awareness of fisheries and reporting prosecution action outcomes; and
- volunteer liaison officers to assist educating fishers about fishing rules and regulations.

In contemporary Australia, the level of enforcement required to maintain an acceptable level of compliance at different stages of the fishing process is generally developed through regional compliance meetings involving program managers and field staff. Although there is generally a commitment by managers to collaborate with fisheries stakeholders in the development and implementation of fisheries policies and laws, this component is inconsistent across all jurisdictions. Stakeholders do however have input to the compliance program

through management advisory committee (MAC) groups that represent their views in the management negotiation process. In cost recovery fisheries stakeholder participation, and in particular their responsible attitude toward compliance, play an important role in ensuring that limited compliance resources are targeted to best effect among competing compliance activities.

Although non-compliance has been cited as a principal cause of the failure of fishery management and conservation programs in the United States, policy responses have been typically naïve due to an inadequate understanding of the true nature, extent and causes of the non-compliance (Sutinen, Rieser and Gauvin 1990).

McKinlay, 2002 proposed that there were six main reasons why fishers engaged in non-compliant activity in many nationally managed fisheries in Australia; they did not know the fisheries regulations, they did not believe in the fisheries regulations, they did so for personal gain, there was an existing culture of non-compliance, they were suffering financial hardship and competition among fishers.

Identifying compliance risks and developing ways to minimise those risks through the allocation of limited enforcement resources in a cost-effective manner can encourage positive compliance outcomes. Allocation of enforcement effort requires balancing the risks of infringement against the associated enforcement costs (Anderson 1989). Understanding why an individual fisher may decide to engage in crime is important in the risk assessment process if not only from the point of view of identifying risks.

1.4 Risk Assessment Standards

Australia's fisheries are a valuable natural resource and from a general community perspective, there is a high expectation that the integrity of fisheries management regulations is properly observed and enforced (National Fisheries Compliance Committee, 1999).

With the advent of cost recovery and heightened accountability requirements, those responsible for compliance programs are increasingly required to justify expenditure and quantify achievements. Fisheries Officers in the field are expected to be aware of and deliver best practice enforcement services. In addition, as some fishery management arrangements become more complex, compliance practitioners are being increasingly challenged to plan and execute fisheries compliance programs that support these complicated arrangements and to deliver those services in a cost effective manner.

In some commercial fisheries in Australia, factors such as over-capitalisation and overcapacity have led to economic inefficiency and reduced profitability resulting in increased fishing effort and a depletion of fish stocks so that the incentive for some fishers to break fisheries laws is high. In others, such as rock lobster and abalone fisheries, there is a strong financial attraction for illegal activity because of the high value of the product. Illegal poaching and black-market sales can quickly put the sustainability of a fishery under threat (Hauck and Sweijd 1999).

Similarly, recreational and other users of fisheries resources are known to breach regulations, more usually motivated by greed and laziness.

Achieving a high level of compliance presents a significant challenge to fisheries compliance organizations but ultimately, the success of any fisheries management system depends on this being achieved. What then can be done to maximize compliance in a fishery?

Having recognized the importance of maximizing compliance in fisheries management, the National Fisheries Compliance Committee (NFCC) developed a strategy for setting the direction for the planning and delivery of cost effective and efficient fisheries compliance programs. The Australian Fisheries Compliance Strategy (National Fisheries Compliance Committee, 2003) outlined opportunities to achieve optimal levels of compliance which it defined as "that which holds the level of non-compliance within acceptable levels which can be achieved at a reasonable cost for enforcement services, while not compromising the integrity and sustainability of the resource or the rights or reasonable expectations of those utilising the resource".

One of the elements identified in the Strategy as being critical to achieving optimal compliance was working with fisheries stakeholders to identify compliance risks and develop compliance strategies, systems and service specifications to lessen those risks.

The Strategy set out two compliance goals to be achieved; maximizing voluntary compliance and creating effective deterrence. It also identified a number of operational strategies to achieve those goals. The adoption and use of risk management principles and techniques in fisheries compliance provides the support base for many of the operational strategies identified, in particular;

Involving stakeholders in compliance planning – through the involvement of stakeholders, either directly or indirectly, in identifying compliance risks and devising treatments so that these are incorporated into compliance plans. A two step process involving initial consultation with stakeholders but final decision making without stakeholders, may be required where compliance planning is compromised by the direct involvement of stakeholders,

Co-management of fisheries – involvement of stakeholders in risk management processes to promote shared responsibility for management,

Lower compliance costs – the utilization of risk management to increase effectiveness and thereby reduce cost,

Measuring effectiveness – a methodical approach to risk management provides for recording and review and can be used to determine the effectiveness of compliance programs,

Effective monitoring and surveillance – a risk-based approach to enforcement will identify monitoring and surveillance activities that will limit non-compliance, e.g. target offenders and increase the probability that they will be caught,

Risk Management – achieved through the adoption of risk management principles,

Targeting high-risk offenders – a risk-based approach can identify offenders, who pose a high risk to fisheries systems and target them through compliance planning,

Improving the legal enforcement framework - a risk-based approach can identify gaps or inefficiencies in existing legal enforcement frameworks, and

Evaluate and review – a risk-based approach includes a requirement to evaluate and review the effectiveness of compliance activities.

Sutinen, Rieser and Gauvin 1990 proposed as a first step, the definition of the extent and patterns of non-compliance in a fishery. The forces responsible for the observed non-compliance could then be identified and a strategy designed for improving compliance. Risk management can be used as a tool to achieve these outcomes by identifying and quantifying (in terms of the number of threats) areas of non-compliance. It can then provide the basis for designing a compliance strategy that will deal with the non-compliant activity.

Although recognized as an important component of good management practice, the term risk management means many things to many people. In a general sense, it can be broadly defined as the management of uncertainty that has the potential for loss (both financial and non-financial) or opportunity. In the fisheries compliance context, risk management is concerned with what can go wrong in a compliance program, how to treat (mitigate, prevent and control) it and how to finance it. At the same time, risk management can also identify opportunities and threats that may not have been apparent by other means.

Risk has always been a problem. However, in a more simpler and structured world, risk could be easily controlled, contained, transferred, ignored or avoided. That is no longer the case. Along with an increasing population have come the effects of a modern world – increased complexity, competitiveness, efficiency and productivity, and an ever-changing environment. When applied to fish stocks, these increased pressures can increase the risk to sustainability. In the face of these pressures, fisheries compliance organizations need to change and adapt to keep their compliance advantage. The need to understand and apply the principles of risk management is greater than ever. In addition, risk is a dynamic concept that requires identification and understanding. It won't identify itself and ignoring a risk until it eventuates can be extremely costly.

The assessment of risk requires a combination of professionalism, analytical ability, imagination and innovation. Although fisheries compliance managers and practitioners have a good understanding of what is required in a compliance program at an operational level, they may lack a strategic view and miss the "big picture". Invariably, some threats and opportunities are missed and the resultant decision-making is not as robust as it could be. Managers and practitioners need to consider how all the compliance risks can be identified (stakeholder involvement, industry reports), whether the risks are good (creation of opportunities) or bad, whether they should be retained, avoided or transferred and how to manage them.

If a fisheries compliance organization is able to control compliance risks through treatment and in an efficient manner, then it is likely that it will suffer fewer (potential) losses, which will increase the benefits gained from its operations. Generally, financing the management of risk can be derived from existing operational budgets but may require additional funds from time-to-time. In the difficult "user pay" business environment, it is useful for a fisheries compliance organization to think of itself as an insurer and argue that funding set aside to deal with a problem today will save a greater loss (to stakeholders) at a future time.

To the extent possible, fisheries compliance organizations should practice risk management in accord with the Australian / New Zealand Standard on Risk Management AS/NZS 4360:1999 (or later version). The Standard provides a generic framework for establishing the context, identification, analysis, evaluation, treatment, monitoring and communication of risk. It can be used to guide the practitioner through a process consisting of well-defined steps which, taken in sequence, support better decision-making by providing greater insight into risks and their impacts. It should be read and applied in conjunction with other applicable Standards such as the Australian Standard on Compliance Programs AS 3806:1998 (or later version) and risk management tools.

1.5 Managing Risk

In order for risk management to be successful the process must integrate, impact, inform, interpret and influence practices within the organisation. A proactive approach to risk management is not just a reliance on good practice, or the creation of systems. It is a process of managing risk.

The risk management process can be applied at any stage in the life of a compliance program, project or activity. It should be applied, where possible, at the beginning of any major new project or change in operational environment (e.g. new legislation or changed service delivery program). The risk management process can be applied at all levels of an organisation - strategic, operational and tactical however it should begin at the strategic management level. By completion of the strategic aspect first it is possible to ensure that operational activities are accurately placed within the strategic context. The assessment of particular or significant compliance risks can be incorporated into the planning and review cycle of the organisation.

The main strategies for ensuring sound and appropriate risk management are:

- develop and document organisational risk management policies and procedures. Generally this entails the development of a framework which should define the basic steps to be followed if a risk event is to be managed;
- provide administrative support for the risk management process – the process cannot operate without adequate resources;
- establish training in risk management as a core competency for compliance managers;
- ensure that where significant risks events are involved that relevant officers have, and maintain appropriate levels of training and qualifications;
- promote awareness of appropriate risk management;

- promote ownership of risks by compliance officers;
- encourage lateral thinking about the management of risk events;
- promote a risk management culture;
- establish risk criteria indicating what level of risk is acceptable according to risk category;
- conduct compliance risk analyses and assessments for all significant operations programs and fisheries;
- ensure appropriate documentation of risk analyses supporting significant compliance program decisions;
- monitor and report on significant risk related events and risk management failures;
- maintain a risk management register to record formal risk assessments and associated risk treatments; and
- disseminate information on risk events effectively.

An overview of the risk management process detailed by AS / NZS 4360:1999 is shown in Figure 1.

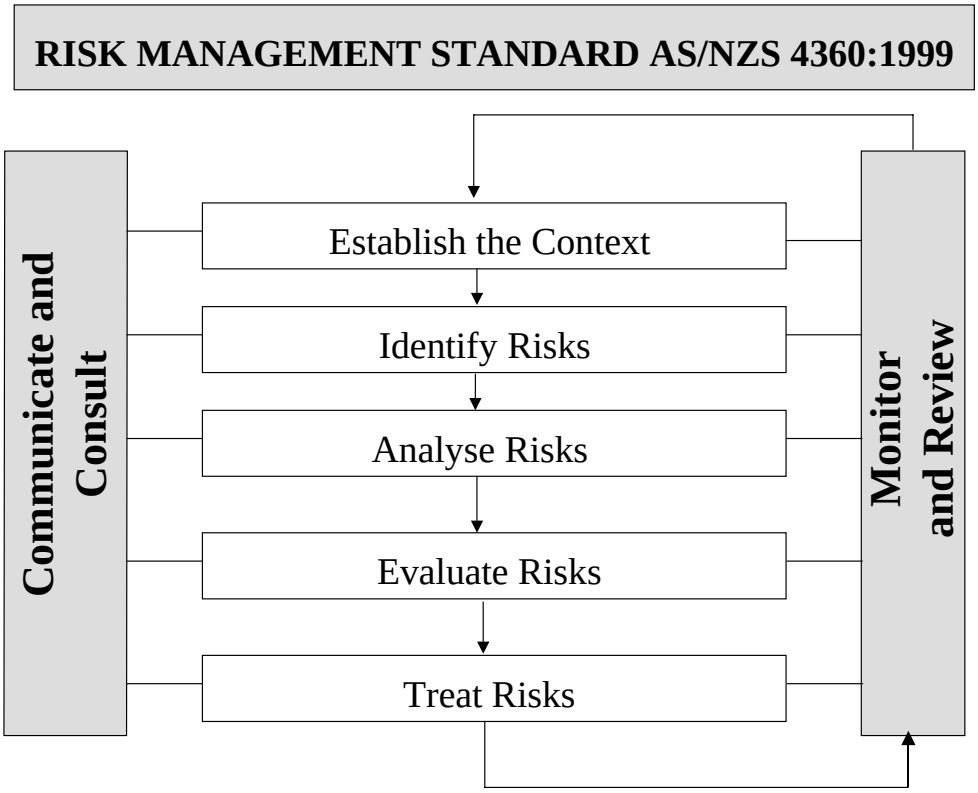

Figure 1. Risk management overview

Steps in the risk management process are:

Establish the context - Decisions about managing risks need to be consistent with the internal and external environment of the organisation. It is important to start the risk management process with a clear understanding of the operating environment. The risk management process should be defined and identified from

a strategic, organisational and operational perspective so that the goals, strategies, scope and parameters of the activity are clear. Establish the objectives for the risk management process.

It is very important to identify whether the risk management process is to be done in the context of existing controls or without controls, or whether both conditions are to be considered.

In establishing the context it is essential to identify and scope all influences (internal and external) that may reasonably impact on the area of review. The context includes financial, operational, environmental, political, cultural and legislative considerations to name a few. Carrying out an environmental scan using a strengths / weaknesses / opportunities / threat (SWOT) analysis can be helpful. Risk is about bad things that do happen and good things that do not happen. It is important to manage both for the downside and for the upside to enhance the possibility that good things will occur. Therefore risk should also be seen as an opportunity.

At the earliest opportunity, it is essential to identify the stakeholders and participants involved in a proposed risk management study. Stakeholders can include decision / policy makers (e.g. Fisheries Management Policy Officer); individuals who are affected by a decision or activity (e.g. fishermen); individuals, such as employees, management and volunteers (e.g. Fisheries Officers); other government organizations and politicians (e.g. Police); non-government organizations (e.g. Fishing Industry groups); or other individuals (e.g. tourists). Where possible, stakeholders should be actively involved in the risk assessment process.

An important component of this step is the development of risk evaluation and risk rating criteria. Consideration must be given to the level of risk the organisation is prepared to accept. Risk criteria are used to rank risks and decide whether they are acceptable or not in the risk evaluation step. It is not essential that all facets of risk acceptability be defined at this point. It is, however, appropriate for the major issues to be acknowledged.

Finally, develop risk headings or categories for risk identification (based on strategic goals, objectives, strategies or specific requirements). Examples of possible categories of risk are sustainability, strategic, operational, financial, compliance, reputation and legislation to name a few.

Communicate and consult - Risk communication and consultation can be defined as any two-way dialogue between stakeholders about the existence, nature, form, severity, or acceptability of risks. At the earliest stages in the risk management process, it is important to develop a risk communication strategy with both internal and external stakeholders. Communication efforts should be focused on consultation, rather than a one-way flow of information from decision-makers to stakeholders.

Identify risks – this step involves the identification of the what, how, when, where, why and who of all the risks to be managed. It requires rigour and needs to be

comprehensive - a potential risk not identified at this stage is excluded from further analysis. Valid information is important in identifying risks and in understanding the likelihood and the consequences of the risk. Although it is not always possible to have the best, or all information, it should be as relevant, comprehensive, accurate and timely as resources will permit. Existing information sources need to be accessed and where necessary, new data sources developed. Be aware that some risks will not lend themselves to objective analysis or observation, and the cost of collecting all data might be too great for the benefits provided.

Techniques used to identify risks will depend on the nature of the activities under review and the types of risk involved. Possible techniques that can be used to identify fisheries compliance risks include, but are not limited to workshops / brainstorming sessions; interviews / focus group discussions; scenario analysis; SWOT analysis; personal experience or past organisational experience; history, failure analysis; examination of extra-jurisdictional experience; expert judgment; operational modelling; work breakdown structure analysis; and audits or physical inspections.

Sources of risk can include, but are not restricted to commercial and legal relationships; socio-economic drivers; political and legal; personnel and human behaviour; cultural; financial / markets; management activities and controls; technology shifts; natural events; property / assets; security; the activity itself / operations; and occupational health and safety.

Risk has two components, uncertainty and exposure. If both are not present, there is no risk. For example, if a man jumps from an aircraft with a parachute on his back, he may be uncertain as to whether or not the chute will open. He is taking a risk because he is exposed to that uncertainty – if the chute fails to open, he will suffer personally. A typical spectator on the ground watching him jump would not be taking a risk. The spectator may be equally uncertain as to whether the chute will open, but they are not personally exposed to that uncertainty. Exceptions might include a spectator that is owed money by the man jumping from the plane or a spectator who is a member of the man’s family. These spectators do face risk because they may suffer financially and/or emotionally should the man’s chute fail to open. They are exposed and uncertain.

Just as a risk event with a zero percent likelihood of occurring is not a risk (it has no uncertainty), if an event is 100% certain to occur, then it is also not a risk. It is not even a high risk. It is a fact.

Having identified the risk events, it is necessary to consider possible causes and effects. There is a cause for every risk and an effect if the risk occurs. When a risk is identified, make sure that the risk is recorded, and not the cause or effect of the risk. The cause is a situation that exists and sets up a potential risk. In general, the cause is a fact or a certainty. On the other hand, the effect is the likely outcome if the risk occurs. Look at the following example and define the risk.

A compliance database solution needs to be implemented in all of an organisation’s offices including those in regional areas. If the database software

is not upgraded on time where necessary, the solution will not be viable in those regional locations.

- Is the risk that we have to implement the solution in the regional locations? No, that is the cause. It is a fact, or a requirement.
- Is the risk that the solution will not be used in certain regions? No, that is the potential effect of what might occur in this scenario.
- Is the risk that the necessary software upgrades are not performed on time? Yes, this is where the uncertainty exists.

Perceptions of risk can vary significantly between compliance practitioners, policy-makers and stakeholders. It is therefore extremely important that the risk scenario is accurately described and documented so that all stakeholders are of the same understanding. It is also important to identify each source so that the analysis can consider the contribution each makes to the likelihood and the consequences of the risk later in the process.

Analyse risks - experience has shown that there is not a single view of what is a tolerable level of risk from all hazards. Rather people tolerate different levels of risk according to the form and extent of loss, corresponding benefits and other factors. For example, people tend to tolerate lower levels of risk from hazards under the control of other people than from hazards under their own control. Accordingly it can be erroneous to assume that risk criteria developed in one context for one hazard can be transposed to another context or another hazard.

Analysis involves three steps - (1) assessment of the risk rating for an individual risk, based on the *likelihood* (of something happening) and *consequence* (if it does happen) of the risk event occurring in normal circumstances, (2) assessment of the adequacy of existing systems and controls which may have impact on the risk, and (3) assessment of the residual risk (the risk which remains after considering the relevant systems and controls).

Evaluate risks - Risk evaluation involves a decision as to whether a particular risk is acceptable or not, taking into account: existing controls; the loss consequences of managing the relevant risk or leaving it untreated; benefits and opportunities presented by the risks; and the risks borne by other stakeholders.

The outcome of this process is a list of risks with agreed priority ratings from which decisions can be made about acceptable levels of tolerance for particular risks and where greatest effort should be focused.

If the risks fall into the low or acceptable risk categories they may be accepted without any further treatment (although, such risks should still be monitored to ensure they remain acceptable). Risks that do not fall into the low or acceptable risk category should be treated using the process outlined below.

Treat risks - the objective of this step is to identify and implement options to manage and mitigate the unacceptable residual risks. Recommended treatments and strategies (including costs and estimates of success) to deal with the risk events should detail recommendations on risk financing recommendations and

assign responsibility (including timelines) for implementation of the treatment. A number of methods can be employed to treat a risk:

- avoid the risk by deciding either to not proceed with the activity that contains an unacceptable risk, or choose a more acceptable alternative activity that meets the objectives and goals of the organisation, or choose a more acceptable alternative methodology or process within the activity, which presents less risk. The option of adopting an alternative work practice of lower risk reduces the consequences and/or likelihood of harm or loss and therefore, is a treatment and not necessarily avoidance of risk. This method can result in opportunity loss. Avoiding the risk is equivalent to refusing to accept the risk.
- reduce the likelihood or the consequences of the risk, or both do this. Note that there is a trade-off between the level of risk and the cost of reducing those risks to an acceptable level. Any one of several decision points may be chosen including a satisfactory (but not optimum) solution, the most cost-effective solution, the accepted practice (good business practice), the best achievable result (given current technology), and the absolute minimum. Which criterion is considered to be most acceptable depends on the circumstances and the established risk context within which the decision has been made. With the right scenario, a valid argument can be made for any of the above options. Where risk reduction is considered both feasible and cost effective, the required funding will need to be budgeted, with the responsible person ensuring that the risk reduction measures are carried out to the level determined.
- transfer the risk, in full or part, to another party. From a public sector perspective, this may mean transferring it to the public at large and, in many instances; this may be acceptable for political, statutory or constitutional reasons. Again, the risk criteria should establish the level of acceptability of risk transfer in each instance. For example, where goods and/or services are being acquired from a contractor, and the contractor is in the best position to manage that particular risk, risk transfer would be acceptable. Legislation and administrative processes may also transfer risk. Risks should be allocated to the party, which can exercise the most effective control over these risks.
- retain residual risks, following completion of risk reduction measures, or of those risks that for political, statutory or constitutional reasons are required to be retained by the organisation.

Monitor and review – Monitoring and review is an essential and integral step in the risk management process. Few risks remain static over time. Programs and processes can change, as can the political, social and legal environments and the goals and objectives of the organisation. Risks and the effectiveness of control measures need to be monitored periodically to ensure changing circumstances do not alter the risk priorities.

It is important that an appropriate level and standard of documentation be maintained as part of the process to demonstrate that the process has been done correctly; enable decisions or processes to be reviewed; and demonstrate accountability. Risk management should not impose another layer of paperwork so long as a sensible approach is taken. Only a brief record on file may document a process that is of low consequence. On the other hand, a major change in

operational circumstances would require a detailed explanation of the process for audit and review. There is a range between these extremes, and prudent practical judgment is needed to decide the appropriate level of documentation in varying circumstances

In summary, risk assessments need not be particularly complicated, formal or time consuming. A common sense approach must be adopted. Assessments should be tailored to the particular circumstance, fishery or issue. However, risk assessments should, at a minimum, include:

- a workshop or focus-group comprising compliance and policy managers, compliance practitioners, stakeholders and other objective expertise to brain storm and identify risk events,
- a basic understanding by the workshop participants of risk assessment, and at a minimum reference to the Australian / New Zealand Standard on Risk Management (AS/NZS 4360:1999),
- the establishment of a communication and consultation strategy with stakeholders,
- identification of all likely compliance risks and possible risk events,
- identification of opportunities associated with the risk events (including those that may be lost or reduced in value through risk management),
- the estimated likelihood (qualitative probability or frequency) of the identified risk events,
- the estimated consequence (qualitative or quantitative impacts, losses, gains, costs) of the identified risk events,
- the basis of all estimates (including “guessed” where appropriate),
- recommended treatments and strategies (including costs and estimates of success) to deal with the risk events,
- risk financing recommendations,
- assignment of responsibility (including timelines) for implementation of the treatment,
- a robust system of recording all risk assessment information, and
- a formal monitoring and review process.

2. NEED

Fisheries compliance and enforcement activities form the basis for ensuring that fishers comply with management plans, and for the continued sustainability of fisheries. Ensuring adequate levels of fisher compliance in fisheries is expensive, and the cost of enforcement activities in most fisheries can be substantial when compared with other management costs.

State and Commonwealth fisheries management agencies are accountable for achieving efficient and effective compliance outcomes. In 1999 the NFCC identified risk assessment as a vital component of fisheries compliance programs through the publication of the Strategic Direction for Australian Fisheries Compliance and Framework for Fisheries Agencies paper. This was reiterated in a later paper, The Australian Fisheries Compliance Strategy in 2003.

The need to develop comprehensive and practical assessment procedures has increased in recent years to meet auditing requirements and reporting needs to stakeholders. The Governance component of ESD principles when applied to fisheries will necessitate demonstration of the ability to achieve best practice compliance to achieve the requirements of management plans.

Some fisheries management organisations in Australia have adopted compliance risk assessment procedures; however they have not been developed uniformly. Other agencies are yet to develop procedures or are having difficulties in doing so. The development and national application of a common risk assessment framework and uniform procedures will assist the achievement of best practice and provide fisheries compliance practitioners with the data to answer stakeholder queries regarding risks associated with key issues such as cost, efficiency, effectiveness, changes in practice, emerging trends, technology influences and cross jurisdictional impacts.

Patterns in non-compliance can be identified in conjunction with the comprehensive identification of fisheries compliance risks. This knowledge can assist fisheries compliance managers to direct enforcement staff to where they are most needed and can be most effective. Recording, monitoring and reviewing risk data provides compliance managers with an opportunity to plan the allocation of enforcement effort based on a detailed assessment of previous fishing seasons, and to modify strategies in response to changing conditions within and between seasons.

The production of an electronic risk register that would guide compliance practitioners through the risk assessment process was assessed as being the most practical and cost-effective way of distributing uniformity, or at least the opportunity for uniformity, across all fisheries jurisdictions in Australasia.

3. OBJECTIVES

The original objectives of this project were defined as:

1. To identify criteria and measures for assessing compliance risks in nationally indicative fisheries.

2. To identify which fisheries compliance risk assessment criteria, measures and processes are practical and useful.

3. To develop a user-friendly resource package for use by fisheries compliance practitioners to assess compliance risks in a consistent and nationally agreed fashion.

4. To communicate and extend the risk assessment resource package nationally.

Although the original objectives have been largely satisfied, some qualifying remarks are required.

With respect to objectives 1 and 2, I focused on obtaining data that would represent all fisheries, species, risks, treatments and risk criteria in Australia. These data would be collated into a comprehensive generic library with the plan that it forms the centrepiece of a compliance database. Ultimately, the database would form the foundation of an electronic software application as a key component of objective 3.

This ambitious plan was discovered to be ill conceived once the practicality of trying to incorporate the elements of the database into the software application was examined. Difficulty was experienced in generically changing the information and this would have resulted in loss of key risk information. It became clear that a better approach would be to incorporate the capability within the software application, allowing the user the ability to turn on and off certain elements and features, and for the user to build the risk register (database) in a contemporary and specific fashion.

4. METHODS

This study focused on three methodologies for examining fisheries compliance programs and developing risk assessment procedures in fisheries compliance programs in Australasia:

- research of fisheries compliance and risk assessment literature;
- workshops with fisheries compliance practitioners to develop appropriate risk assessment criteria and measures; and,
- the development of an electronic risk assessment application.

A literature search of keywords associated with 'fisheries compliance risk assessment' was conducted using the library cataloguing service, search engines on the world wide web, reviews of reference lists in relevant publications, enquiry through the Association of Risk Insurance Managers of Australasia and personal enquiry with selected fisheries compliance managers and researchers.

Through liaison with the NFCC it was decided that the AFLEC would provide the most appropriate forum for determining fisheries compliance risks. Two workshops were conducted with AFLEC delegates, one in 2002 and the other in 2004. The former workshop was designed to engage AFLEC delegates in the risk assessment process and to draw on the collective knowledge of these experienced compliance practitioners to identify key risk assessment criteria, measures and processes. The latter provided the opportunity to refine the risk assessment resource package and provide initial training in how it could be applied.

A number of commercially available risk management software applications were trialed to determine their suitability as the platform for the fisheries compliance risk assessment resource package. Those trialed included Operational Risk Builder by Methodware, Risk Wizard by Risk Wizard Pty Ltd, Tickit by SoftGen Australia and PHA-Pro by Dyadem International Ltd. All of the above products were compliant with AS/NZS 4360:1999 and offered a range of features. Some of the features provided by these products included Internet accessibility, access by mobile units synchronised with a central database, the ability to upgrade from a single user to multiple users, and the capability of migrating data from existing systems. Assessments were also made of the cost of multiple licences for these products.

Coincidentally, the Western Australian Department of Fisheries was in the process of implementing a simple risk management application within the organisation to manage corporate risks. The application was an internally modified version of RiskBase, a product owned by the State Government Insurance Commission (SGIC) of Western Australia. Early enquiries indicated that RiskBase was freeware and that it could be modified for the purposes of the Project. A discussion with Information Technology personnel from the Department of Fisheries identified the required standard of skill to develop the software application to meet the needs of the Project and the likely cost. The cost of this option would produce a significant saving for the Project.

As a consequence, it was decided to review RiskBase and determine whether it might be suitable for the Project. It was decided that if it were deemed suitable, a

formal approach would be made to the SGIC for a licence to cover all Australasian jurisdictions. Intellectual property rights for the resultant product would also be canvassed.

Within Western Australia, the Principal Investigator assisted regional fisheries compliance personnel to develop and enhance their skills in relation to carrying out compliance risk assessments. This had the advantage of providing data for the Principal Investigator and at the same time providing a greater number of compliance practitioners that are skilled in conducting fisheries compliance risk assessments. Risk assessments were conducted on abalone, rock lobster, pearling, shark and recreational fisheries. Most of the costs associated with the involvement of the Principal Investigator in the above assessments were met external to the Project.

The combined collection of risk assessment framework, electronic software application, user guide and report form a fisheries compliance risk assessment resource package. The package will be suitable for use by lower middle managers involved in the delivery of fisheries compliance programs and enable fisheries compliance practitioners to carry out risk assessment workshops on the fisheries within their jurisdictions.

5. RESULTS / DISCUSSION

5.1 Fisheries Compliance Risk Management Framework

Results of the literature search were used to develop the compliance and risk management sections of the background to this report and to identify key components required in a risk assessment framework. Particular note was made of the fisheries compliance and management research undertaken by John Sutinen from the University of Rhode Island as a special requirement in the project study.

The resultant Fisheries Compliance Risk Management Framework (see Appendix 3) comprises policy and procedural guidance to assist managers in the risk management process. The purpose of the framework is not to make compliance practitioners risk averse but to pro-actively manage compliance risks and to optimise opportunities and achieve stated objectives.

Outlined in Table 1. below is a summary of the steps and documentation required to complete the risk management process detailed in the Fisheries Compliance Risk Management Framework.

Steps: Risk Management Process	**Documentation to be completed**
Establish Context • Establish the level to which the risk management process should be applied (corporate, program / fishery or project) • Establish whether to be done in the context of existing controls or without controls • Assess external and internal environment including stakeholders • Confirm objectives and strategies	Depends on the level the risk management process is being applied to. Examples include strategic plans, business plans and project plans.
Communicate and consult • Develop a risk communication strategy with both internal and external stakeholders	Depends on strategy. Must be consultative, not one-way flow of information. Promotes ownership of the process.
Identify Risks • Determine method to identify risks (? generic risk assessment process) • Identify all sources of risk • Identify areas of opportunities	Document in Risk Assessment Worksheet.
Analyse Risk • Determine criteria • Assess how the risk affects the objectives and what can happen • Rate the likelihood and consequence of the risk, • Combine the ratings to determine risk level without existing controls, • Assess adequacy and effectiveness of existing controls • Evaluate the risk level with controls i.e. the residual risk	For each risk identified document in Risk Assessment Worksheet.
Evaluate Risks • Determine acceptability or otherwise of residual risk • Assign a risk priority (Accept, Accept and monitor, Accept with adequate controls, Urgent management required, Unacceptable)	If residual risk is acceptable, document in Risk Assessment Worksheet. If unacceptable, assign a priority and complete the treatment below.

Treat Risks • Determine appropriate options to be used to treat the unacceptable risks (Avoid, Reduce, Transfer and Retain) • Detail the treatment identifying risk financing, resources, timelines and officer responsible	Include in Risk Assessment Worksheet
Monitor and Review • On a regular basis monitor the risks and assess the effectiveness of the treatment strategies. • Risks of extreme or high rating having a pervasive effect on compliance operations should be reported to senior management.	Document in *FISHRISK*, risk register, program / fishery meeting minutes, project steering committees or other retrievable permanent record.

Table 1. Steps involved in the Fisheries Compliance Risk Management Framework

5.2 Workshops

A workshop to examine Fisheries Research and Development Corporation (FRDC) Project 2002/085 was conducted with delegates at the year 2002 meeting of AFLEC in Cairns, Queensland. Prior to the conference, all delegates received a letter detailing the purpose of the workshop and that they come prepared with an understanding of the status of fisheries compliance risk assessment within their respective jurisdictions.

The workshop comprised the delivery of a presentation about the Project and another on fisheries compliance risk assessment from the Principal Investigator.

The objectives and outcomes of the workshop were:

- *Identify Australian fisheries by means of either gear or species*

Delegates were presented with a range of gear and species identifiers for the full range of fisheries within Australia and asked to decide whether to base the fisheries descriptions to be used in FRDC 2002/085 by gear or species. Delegates agreed that because fisheries management throughout jurisdictions was generally species-based it would be easier if the Project followed suite. This issue was important when trying to make comparisons across jurisdictions and took account of the fact that most fishery stakeholder groups were species-based. This would be important in future interaction with stakeholders.

- *Identify a suite of nationally indicative fisheries which would best represent examples of the range of fisheries throughout Australia*

Delegates were provided with a comprehensive listing of fisheries within Australia and asked to decide which ten fisheries would provide as broad as possible representation of those fisheries. The Principal Investigator emphasized that it would not be possible to incorporate all fisheries into the fisheries data library, nor was it desirable. The aim of the Project was to produce a tool that would encourage practitioner participation in developing and enhancing the library. The library could provide templates, examples and guidance for

practitioners but not be a substitute for the task of conducting their own compliance risk assessments.

The first cut produced a list of 25 "species" based fisheries, which included well-defined species and broad groupings. This list was whittled down to 15 species groupings through negotiation and discussion, and then further reduced to achieve the desired 10 species. The final list of fisheries is set out in Table 2 below.

Initial AFLEC list	Congregated AFLEC list	Proposed list for library
Abalone	Abalone	Abalone
Rock Lobster	Rock Lobster	Rock Lobster and Crabs
Prawns	Prawns & Bay Bugs	Prawns and Scallops
Crabs	Crabs	
Shark	Shark	Shark and Tuna
Tuna	Tuna (Pelagics)	
Scallops	Scallops	
Fin Fish	Fin Fish	Fin Fish and Baitfish
Bait Fish	Bait Fish inc Pilchards	
Live Fish	Live Fish & Aquarium spp	Live Fish & Aquarium
Exotic Fish	Exotic Fish	Exotics
Freshwater Fish	Freshwater / Natives / Endangered inc GWS	Freshwater / Natives / Endangered
Endangered Fish		
Pearls	Pearls/Trochus/BDM/Oysters	Pearls and Aquaculture
Native Fish		
Trochus		Trochus / BDM / Oysters
Beche de Mer		
Great White Shark(GWS)		
Aquaculture Broodstock	Aquaculture Broodstock	
Bay Bugs		
Pelagic Fish		
Pilchards		
Aquarium Fish		
Eels	Eels	
Edible Oysters		

Table 2. List of nationally indicative species based fisheries discussed at AFLEC 2002.

- *Identify fisheries compliance risk assessment criteria, measure and processes currently in use*

Delegates were asked to report on the status of fisheries compliance risk assessment within each jurisdiction and detail the criteria, measures and processes currently in use. Delegates reported that the interpretation of fisheries compliance risk assessment differed across jurisdictions and the degree of sophistication and application varied widely.

Where practiced, Australian jurisdictions mainly applied risk assessments to operational and safety matters. Assessment of compliance within fisheries was only applied in Commonwealth fisheries and those managed by South Australia and Western Australia.

The status of fisheries risk compliance risk assessments is summarised in Table 3.

Victoria	Assess investigations and safety issues
New South Wales	Assess compliance operations mainly from a safety perspective
Commonwealth	Assess all managed fisheries - includes compliance operational plans and budgets
Queensland	Not used in State fisheries however some experience through Commonwealth managed Northern Prawn Fishery
Northern Territory	Assess compliance operations mainly from a safety perspective
South Australia	Assess managed fisheries - includes compliance operational plans and training needs
Tasmania	Information not available
Western Australia	Assess major managed fisheries. Also used to assess investigations and operational safety issues.
New Zealand	Assess major deepwater fisheries and aquaculture. Major inshore fisheries to be assessed next.
Papua New Guinea	Not used

Table 3. Status of formal fisheries compliance risk assessment practiced in Australasian jurisdictions

In relation to risk criteria, it was reported that their development provided the framework against which risk could be evaluated. Criteria could be expressed quantitatively or qualitatively and possess an operational, technical, financial, legal, social or other basis. Criteria provided guidelines for identifying operational priorities and what was / was not an acceptable level of risk. Although they did not play a role in operational decisions, they provided a guide for decisions at the planning stage of operations regarding the types of resources and procedures which could be provided in advance of events, given the anticipated level of risk and cost-effectiveness of services or regulations. In carrying out risk assessments, it was considered most important that the criteria developed included tangible, measurable criteria which included quantities or qualities, e.g. detected breaches, service levels etc.

Risk measures were identified as the components in a given risk. The two measures in use, likelihood and consequence, were based on AS/NZS 4360:1999.

The risk management process employed within the various jurisdictions generally followed the systematic approach set out in AS/NZS 4360:1999, e.g. applying management policies, procedures and practices to the tasks of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risk.

A number of risk criteria and ratings were accepted. These are documented in Tables 4-6 below.

	Consequence	***Description***
5	Catastrophic	non-achievement of operations, permanent long term damage to fish stocks, death, huge financial loss, very high impact on reputation - the consequences would threaten the survival of not only the program, but also the organisation, possibly causing major problems for clients and the administration of the program
4	Major	significant delay in achievement of operations, long term significant impact on fish stocks, extensive injuries, major financial loss, high impact on reputation - the consequences would threaten the survival or continued effective function of the program
3	Moderate	moderate but manageable impact on operations, temporary significant impact on fish stocks, medical attention required, high financial loss, publicly embarrassed / moderate impact on reputation – the consequences would not threaten the program, but would mean that the administration of the program could be subject to significant review or changed way of operating
2	Minor	inconvenient delay in operations, temporary minor stock impact, first aid only, medium financial loss, low impact on reputation - the consequences would threaten the efficiency or effectiveness of some aspects of the activity but would be dealt with internally
1	Insignificant	little impact on operations, little impact on fish stocks, no injuries, low financial loss, no reputation impact - consequences are dealt with by routine operations

Table 4. Example rating definitions for Consequence

	Likelihood	***Description***
5	Almost Certain	the event is expected to occur in most similar circumstances and / or will occur more than 10 times per year
4	Likely	the event will probably occur in most similar circumstances and / or will occur at least once per year
3	Moderate	the event should occur at sometime in similar circumstances and / or will occur once every 2-5 years
2	Unlikely	the event could occur at sometime and / or will occur once every 5-20 years
1	Rare	the event may occur only in exceptional circumstances and / or

		will not occur less than every 20 years or more

Table 5. Example rating definitions for Likelihood

Rated risks can be plotted to a table and compared with established criteria and / or prior assessments. Placement on the table identifies risk acceptability and guidance for treatment using various categories, e.g.:

Rating	***Description***
A	ACCEPTABLE level of risk with current Program
B	MONITORING required but no additional management control
C	ADDITIONAL MANAGEMENT control required
D	URGENT MANAGEMENT control required
E	UNACCEPTABLE level of risk to the Program

Table 6. Example ratings for Risk Acceptability

- *Make qualitative assessments about the criteria, measures and processes and document them*

Delegates were asked to make qualitative assessments about the criteria, measures and processes applying to fisheries compliance risk assessment in each of their jurisdictions. Some of the risk criteria that had been used were inadequate and contained a high degree of subjectivity among stakeholders. Experience has shown that there is not a single view of what is an acceptable level of risk from all hazards. Rather stakeholders accept different levels of risk according to the form of loss, corresponding benefits and other factors. For example, stakeholders tend to tolerate lower levels of risk from hazards under the control of others rather than from hazards under their own control. Accordingly it can be erroneous to assume that risk criteria developed in one context for one hazard can be transposed to another context or another hazard. Rather, it is necessary to examine how stakeholders view a particular type of hazard in a particular circumstance to derive a valid impression of their perception of the acceptability of the associated risk. For this reason, it was considered vital that enough time was spent on deciding appropriate criteria at the outset.

The measures used had a strong basis in AS/NZS 4360:1999, however some concern was expressed that the generic determination of likelihood and consequence left a number of subsequent risk ratings open to interpretation. A suggested alternative methodology was to determine, where possible, individual levels of likelihood and consequence for each risk. It was recognised that this would require considerable resources and may be prohibitively expensive. In any case, it was important to fully document the reasons for assignment of those levels to the risk.

The processes followed by each of the jurisdictions employing fisheries compliance risk assessments were considered appropriate and within standard. The degree of sophistication in delivery would improve with further practice.

Most jurisdictions noted that it was important to include all stakeholders in the process.

A further workshop was conducted with AFLEC delegates in Darwin, Northern Territory in 2004. This workshop comprised the delivery of a further presentation about the Project and another on the software application that had been developed through the Project. This second component also constituted initial training in the use of the application.

The objectives and outcomes of the workshop were:

- *Identify elements that may be able to be incorporated into the software application being developed through the Project*

Delegates were generally happy with the layout of the application and made a number of recommendations which were thought could enhance the product. These were; allow the cause of a risk to be fully explained so that as much information regarding the scenario could be captured. This was considered important when conducting later reviews and determining the effectiveness of treatments applied to mitigate a particular risk; maintain a risk and treatment history tracking capability; maintain a sensitivity differential with identified risks, i.e. allow the ability to tag some risks as being highly sensitive; consider aligning regional coding with that operating in other compliance information databases so that they could be linked; and to note that jurisdictions should stylise the regional components if they so chose before they released the application in to their jurisdiction.

Where possible, modifications were made to the application to achieve the above outcomes, i.e.:

a. increasing the size of the "cause" field to allow for detailed information;
b. incorporatation of history tracking fields;
c. incorporation of a high sensitivity field (not activated but can be turned on); and
d. alignment of regional coding possible depending on use by particular jurisdiction.

In addition, because of database design restrictions, the original generic fisheries library was abandoned in favour of more descriptive labels. Jurisdictions would have the capability of "locking in" generic fisheries labels before the application was released.

- *Provide initial training in the use of the software application*

Delegates were taken through each step of the application so that they were able to provide initial comment on layout and to get a feel for how it worked.

Delegates endorsed the value of the Project and its continued development.

5.3 FISHRISK application

Many of the commercially available risk management software applications that were trialed for suitability as the platform for the fisheries compliance risk assessment resource package were quite comprehensive and had good features associated with them. None however, in the view of the author, offered a solution that best suited the task of fisheries compliance risk assessment. Most were designed for the general business community or the environmental sector and although they could be adapted, the cost would have been beyond the extent of the Project budget. Similarly, the cost of multiple licences across all jurisdictions in Australia was considered prohibitive.

The SGIC owned risk management application, RiskBase was reviewed for applicability to the Project. Although it was less complicated than the commercially available applications, it required substantial modification to adapt it to the fisheries compliance context. Given the knowledge gained through examination and review of all of the risk management software applications and the advice received from compliance managers, it was decided that the best approach was to develop a new application.

Microsoft® Access 2000 database software was chosen in which to build the application. Microsoft® Access was chosen because of its ready availability, relatively uncomplicated method of database development and ease of use. Accordingly, a relational database was developed utilising jurisdiction, region and fishery as primary fields. The resultant application, named *FISHRISK* is at Appendix 4.

Abridged versions of the fisheries compliance and risk assessment documentation developed earlier were embedded within the *FISHRISK* application to provide compliance practitioners with some background and guidance in relation to the application of risk assessment.

FISHRISK is cognizant of both the above Standards and has been developed using criteria that have been adapted from AS/NZS 4360:1999. It provides a step-by-step risk assessment guide for compliance practitioners and allows them to capture risk data and decisions as they proceed through the risk assessment process. Use of the application enables consistent structure and user interface across fisheries compliance in Australia.

FISHRISK also produces a range of reports that can provide decision makers, policy makers, program planners and stakeholders with accurate, up to date information on fisheries compliance risks. The reports can then be used to monitor the progress of treatments carried out to mitigate the risks and for review purposes.

Some promotion and training in fisheries compliance risk assessment has been delivered through the AFLEC workshops and participation in regional risk assessment workshops.

The risk assessment resource package that has been developed through this project is self-explanatory and self-contained. The use of the Fisheries Compliance Risk Assessment Framework will continue to be promoted through NFCC and AFLEC.

A high degree of interest has been expressed in utilising the resource package and the success of the communication and extension plan will be evaluated by the extent to which the risk assessment resource package is adopted nationally.

6. BENEFITS AND ADOPTION

The risk assessment resource package developed in this study is relevant to all fisheries compliance jurisdictions in Australia. Workshops and reports demonstrating results have been provided several times during the life of the Project to national compliance groups, such as the AFLEC and the NFCC. The study has been well received and many fisheries compliance organisations have expressed strong interest in applying risk assessment procedures in their fisheries.

The resource package is complete in that all that is required is implementation. The cost to an individual jurisdiction to stylise or further enhance the resource package is low.

Overall the project has been of benefit to fisheries compliance practitioners by educating them about the methodology and value of risk assessment in fisheries compliance. It is expected that the use of *FISHRISK* and a risk assessment approach will produce a more strategic outcome to the management of fisheries compliance and result in improved cost-effectiveness in compliance delivery. Cost savings will be of benefit to stakeholder-funders, fisheries management organisations and the general community through the delivery of more effective compliance services.

It is expected that the up-take of the resource package will be high.

7. FURTHER DEVELOPMENT

The preceding information represents the contemporary state of risk assessment and analysis in respect to fisheries compliance.

The key element of risk analysis remains the linking of individual stakeholders, be they government organisations, fishers or other members of the community, to a science based assessment of the impacts of identified risks on stock sustainability.

The future development of the *FISHRISK* application rests largely with the various Australian fisheries compliance organisations. *FISHRISK* can already be adapted to meet particular jurisdictional requirements including the ability to turn on / off fisheries in the database, incorporate more quantitative data and stylise the look of generated reports and the components of those reports.

Further developments are likely to include the nationalisation of activities related to risk assessment and management, the use of internet based technologies to improve the sharing of knowledge about compliance impacts on stock sustainability across jurisdictions, and the continuing advancement of the science of risk analysis.

8. PLANNED OUTCOMES

The overall outcome was for nationally agreed assessment procedures to identify risks within compliance programs. This was considered useful within fisheries compliance organisations from a business performance aspect and for demonstrating to stakeholders that fisheries management agencies were achieving efficient and effective compliance at best practice levels.

The development of the Fisheries Compliance Risk Assessment Framework has achieved this outcome.

Another planned outcome of the process was expected to be the comprehensive identification of risks associated with fisheries compliance and provision of a foundation for compliance practitioners to report achievements under their respective program objectives and national ESD governance requirements. Measures to reduce the risks using practical, cost-effective treatments were also to be developed with which fisheries management agencies can measure and report on fisheries compliance efficiency and effectiveness.

The development of the *FISHRISK* database application has achieved this outcome.

A third outcome was the provision of written resource material, computer software and training to all Australian fisheries compliance groups. Fisheries compliance organisations were to be encouraged to incorporate the involvement of stakeholder groups into future risk assessments.

The development of the complete fisheries compliance risk assessment resource package has achieved this outcome.

All fishing industry sectors and the general community will accrue direct benefits as a result of the adoption of a uniform process.

9. CONCLUSION

Motivation for this project arose from the perceived need to develop a consistent and nationally agreed risk assessment framework for application in the management of fisheries compliance.

In assessing both the literature and available risk assessment software applications it became clear that much of what was out there was more applicable to the general business, finance and insurance sectors. Although these information sources and risk assessment tools could be adapted to the fisheries management context, it was better if these were developed specifically for this area.

Although I have attempted to review as much of the literature relating to fisheries compliance and risk assessment as possible, the need is more practical than theory. In the end this project was more about creating tools than conducting research.

The tools contained within the resource package are self-explanatory and require commitment and application for them to work. Acceptance and implementation of risk assessment procedures within fisheries compliance now relies on breaking through some cultural barriers and encouraging the use of the resource package as a regular component of fisheries compliance management. No amount of further research is required to achieve that aim.

Uptake and application of the risk assessment framework and tools provided through this Project remains largely with individual jurisdictions. Acceptance and encouragement can be assisted through the ongoing support of NFCC and AFLEC.

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APPENDIX 1: INTELLECTUAL PROPERTY

Although the information provided in this report is not of a commercially sensitive nature, the *FISHRISK* application retains commercial value. As such, the intellectual property contained within the *FISHRISK* application remains the property of the FRDC and the Government of Western Australia Department of Fisheries.

Although the *FISHRISK* application has been provided to all fisheries jurisdictions in Australia it has been done so under licence so as to protect original intellectual property.

APPENDIX 2: STAFF

Mr N.L. Sarti	Compliance Manager	100% *
Mr J.P. McKinlay	Research Scientist	5%
Mr J.G. Looby	Compliance Manager	5% *
Mr R Humphreys	Database Programmer	5%
Various	Compliance Managers	5% **

* Staff employed for parts of the project under FRDC funding

** Staff employed for parts of the project under non-FRDC funding

APPENDIX 3

Risk Management Framework

For fisheries compliance risk assessment

N.L. Sarti

August 2006

Department of Fisheries
Government of Western Australia

Australian Government

Fisheries Research and Development Corporation

Project No. 2002/085

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EXECUTIVE SUMMARY

The Fisheries Compliance Risk Management Framework comprises policy and procedural guidance to assist managers in the risk management process. The purpose of the framework is not to make compliance practitioners risk averse but to pro-actively manage compliance risks and to optimise opportunities and achieve stated objectives. The intent of the framework is not to create bureaucracy but to educate managers and encourage risk management into day-to-day activities in a cost beneficial manner.

Outlined below is a summary of the steps and documentation required to complete the risk management process detailed in this procedural guide.

Steps: Risk Management Process	Documentation to be completed
Establish Context (section 1) • Establish the level to which the risk management process should be applied (corporate, program / fishery or project) • Establish whether to be done in the context of existing controls or without controls • Assess external and internal environment including stakeholders • Confirm objectives and strategies	Depends on the level the risk management process is being applied to. Examples include strategic plans, business plans and project plans.
Communicate and consult (section 2) • Develop a risk communication strategy with both internal and external stakeholders	Depends on strategy. Must be consultative, not one-way flow of information.
Identify Risks (section 3) • Determine method to identify risks • Identify all sources of risk • Identify areas of opportunities	Complete column A of the Risk Assessment Worksheet at Appendix 1.
Analyse Risk (section 4) • Assess how the risk affects the objectives and what can happen • Rate the likelihood and consequence of the risk, referring to the tables at sections 4.1 and 4.2 • Combine the ratings to determine risk level without existing controls, using the risk rating table at section 4.3 • Assess adequacy and effectiveness of existing controls • Evaluate the risk level with controls i.e. the residual risk	For each risk identified complete columns B, C, D, E and F of the Risk Assessment Worksheet at Appendix 1.
Evaluate Risks (section 5) • Determine acceptability or otherwise of residual risk • Assign a risk priority using the table at section 4.3 (Accept, Accept and monitor, Accept with adequate controls, Urgent management required, Unacceptable)	If residual risk is acceptable, document in column G of the Risk Assessment Worksheet at Appendix 1. If unacceptable, assign a priority and complete the treatment below.
Treat Risks (section 6) • Determine appropriate options to be used to treat the unacceptable risks (Avoid, Reduce, Transfer and Retain) • Detail the treatment identifying risk financing, resources, timelines and officer responsible	Complete column G of the Risk Assessment Worksheet at Appendix 1.
Monitor and Review (section 7) • On a regular basis monitor the risks and assess the effectiveness of the treatment strategies. • Risks of extreme or high rating having a pervasive effect on compliance operations should be reported to senior management.	Document in FISHRISK, risk register, program / fishery meeting minutes, project steering committees or other retrievable permanent record.

1. INTRODUCTION

Risk management is nothing new. Each of us manages risk on a daily basis - driving, working, shopping, investing, etc. Most decisions are automatic, guided by prior experience or learned information. In a sense, we are all experienced with risk management.

It is not possible, nor necessarily desirable, to operate in an entirely risk free environment but, by avoiding, reducing or transferring risks, it may be possible to manage them within acceptable levels. As General George S. Patton said in 1944, "take calculated risks – that is quite different from being rash".

Risks to be managed in a fisheries compliance context include activities, which affect fishery stock sustainability and the associated marine habitat, and overall returns to fishers and the general community. Managing risk provides a foundation for better decision-making throughout all aspects of the fisheries compliance management process. Risk management is a means of applying an objective process to subjective information as a decision-making tool.

2. BACKGROUND

Fisheries compliance organisations in Australia are becoming increasingly aware of the benefits to be gained from adoption of a compliance risk assessment framework. Some fisheries jurisdictions have already adopted risk management approaches for compliance programs in specific fisheries.

Approaches to the process, however, have tended to differ between jurisdictions. It is desirable to develop a common framework for the process, including a generic system of risk quantification and documentation. This would allow valid comparisons to be made between years, and between jurisdictions, for similar fisheries.

Utilising funding from the Australian Government Fisheries Research and Development Corporation and supported by members of the National Fisheries Compliance Committee and the Australasian Fisheries Law Enforcement Conference, the Government of Western Australia Department of Fisheries has developed the Fisheries Compliance Risk Management Framework.

The intent of this framework is to capitalise on risk management processes that may already be in place and further improve and formalise risk management activities to bring them in line with the Risk Management Standard.

3. FISHERIES COMPLIANCE RISK MANAGEMENT POLICY

Having recognized the importance of maximizing compliance in fisheries management, the National Fisheries Compliance Committee (NFCC) developed the Australian Fisheries Compliance Strategy (NFCC, 2003) for setting the direction for the planning

and delivery of cost effective and efficient fisheries compliance programs. It outlined an agreed and consistent national approach to achieving best practice compliance through the actions of relevant jurisdictions cooperating through the NFCC.

One of the elements identified in the Strategy as being critical to achieving optimal compliance was working with fisheries stakeholders to identify compliance risks and develop compliance strategies, systems and service specifications to lessen those risks.

The Strategy set out two compliance goals to be achieved; maximizing voluntary compliance and creating effective deterrence. It also identified a number of operational strategies to achieve those goals. The adoption and use of risk management principles and techniques in fisheries compliance provides the support base for many of the operational strategies identified.

The Strategy supports a policy that NFCC is committed to establishing a philosophy and culture that ensures effective risk management is an integral part of all fisheries compliance activities and a core management capability.

An inherent policy objective of undertaking a risk management approach is to act on legal advice to ensure that stakeholders that part fund compliance programs are kept at "arms length" from determining core compliance activities and funding, and at the same time ensure that industry and key stakeholders have the opportunity to take ownership of profiling key compliance related risks to fisheries.

4. RISK MANAGEMENT APPROACH

The main objective of the risk management framework is to ensure a common and consistent approach to the management of fisheries compliance risks.

To the extent possible, fisheries compliance organizations should practice risk management in accord with the Australian / New Zealand Standard on Risk Management AS/NZS 4360:1999 (or later version). The Standard provides a generic framework for establishing the context, identification, analysis, evaluation, treatment, monitoring and communication of risk. It defines risk management as "the culture, processes and structures that are directed towards the effective management of potential opportunities and adverse effects". The Standard also describes risk management as "an iterative process consisting of well-defined steps which, taken in sequence, support better decision-making by contributing a greater insight into risks and their impacts. Risk management is recognized as an integral part of good management practice". This risk management framework is in line with the Risk Management Standard (AS/NZS 4360:1999).

An overview of the risk management process detailed by AS / NZS 4360:1999 is shown in Figure 1.

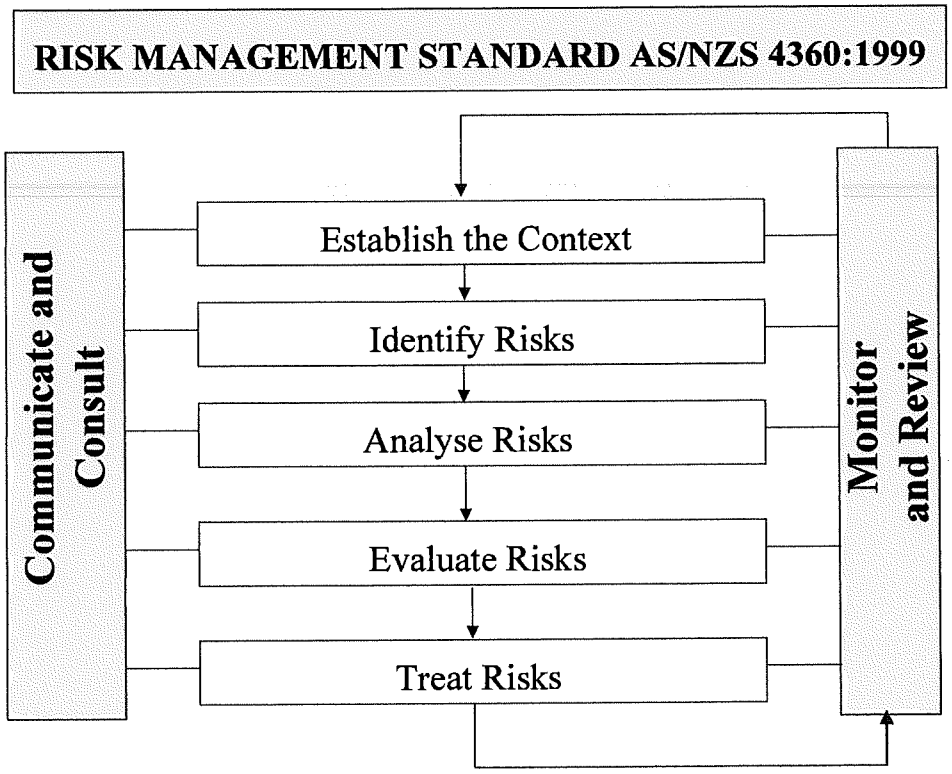


Figure 1. Risk management overview

5. DETAILED OUTLINE OF THE SPECIFIC ELEMENTS OF THE PROCESS

5.1 Establish the Context

Decisions about managing risks need to be consistent with the internal and external environment of the organisation. It is important to start the risk management process with a clear understanding of the operating environment. The risk management process should be defined and identified from a strategic, organisational and/or operational perspective so that the goals, objectives, strategies, scope and parameters of the activity are clear.

In establishing the context it is essential to identify and scope all influences (internal and external) that may reasonably impact on the area of review. The context includes financial, operational, environmental, political, cultural and legislative considerations to name a few. Risk is about bad things that do happen and good things that do not happen. It is important to manage both for the downside and for the upside to enhance the possibility that good things will occur. Therefore risk should also be seen as an opportunity. A balanced view of risk tries to minimise hazards, influence and control uncertainties and manage opportunities in a cost beneficial manner.

At the earliest opportunity, it is essential to identify the stakeholders involved in a proposed risk management study. Stakeholders can include decision / policy makers (e.g. Fisheries Management Policy Officer); individuals who are affected by a decision or activity (e.g. fishermen); individuals, such as employees, management and volunteers (e.g. Fisheries Officers); other government organizations and politicians (e.g. Police); non-government organizations (e.g. Fishing Industry groups); or other individuals (e.g. tourists). Where possible, stakeholders should be actively involved in the risk assessment process.

An important component of this step is the development of risk criteria and constraints. Consideration must be given to the level of risk the organisation is prepared to accept. Risk criteria are used to rank risks and decide whether they are acceptable or not in the risk evaluation step. It is not essential that all facets of risk acceptability be defined at this point. It is, however, appropriate for the major issues to be acknowledged.

It is also very important to identify whether the risk management process is to be done in the context of existing controls or without controls, or whether both conditions are to be considered.

5.1.1 Multi-level approach

Since risk management is undertaken at various levels, the final goal is always to achieve effective risk management throughout the whole organisation. This can be achieved through a multi-level approach within the organisation.

Corporate Level – most often, strategic risks at the corporate level are determined by executive advisory committees and are generally published within the Strategic Plan for the organisation. There should be close links between the organisation's goals; its plans and the risks that may impact on the achievement of fisheries management goals.

Program / Fishery Level – as part of normal strategic planning processes, fisheries management and compliance programs develop their own objectives, context statements and strategic plans. During the process, managers would generally identify a range of issues, challenges and risk factors in the internal and external environments that may affect or enhance the achievement of objectives. Consequently, the risk management process should be closely aligned to program and fishery management plans, and provides a process for analysis of risks that may affect the achievement of strategic plans.

Project Level – project is defined broadly in this context to incorporate major operational undertakings and compliance business ventures such as patrol vessel operations, serious offences investigation groups, compliance research projects, training programs, and capital works projects.

The risk management approach outlined in this framework is generic and applicable to all of the three levels identified above, however at project level, specific risk management procedures may apply.

5.1.2 Risk Categories

Develop risk categories or headings for risk identification based on goals, objectives, strategies or specific requirements.

Examples of possible categories of risk are:

Sustainability – risks that affect the sustainability of a fishery breeding stock, e.g. poor management, disease.
Strategic – risks that affect an organisation's ability to achieve its goals, e.g. risks of a corporate nature which have an impact on the achievement of strategic plans, and risks which have impact on the achievement of organisational area objectives/strategies.
Operational – risks that affect ongoing management processes, e.g. health and safety, physical infrastructure, equipment breakdown and inadequacy, operational systems and processes, and human resources.
Human Behaviour – e.g. regulatory avoidance, illegal activity.
Financial - risk that may result in a loss of assets and failure to maximise access to funding, e.g. on the downside reduced government funding and on the upside increased opportunities to diversify sources of income, internal funding models, and costing.
Compliance - risk that affects compliance with externally imposed laws, regulations and other requirements, as well as with internally imposed policies and procedures, e.g. non-compliance with Surveillance Devices Act or Corporations Act resulting in breaches and penalties, non-compliance with published Policies and Procedures, and on the other hand, an opportunity identified as a result of managing non-compliance with the Corporations Act.
Reputation - risk that affects an organisation's reputation (note that this risk may result from the organisation's failure to effectively manage any or all of the other risk types as it involves external perception), e.g. quality of service delivery, risks associated with an event that may generate adverse publicity, and opportunities associated with any events that may generate positive publicity.
Natural Events – e.g. drought, red tide, deoxygenation.
Political – e.g. change of sentiment, loss of support.
Technology – e.g. superceding of equipment, technology creep.
Market-based – e.g. loss or creation of new markets, price and quality movements.
Stakeholder – e.g. loss of support, changing values, conflicting expectations.
Project management – e.g. cost over-runs, missed deadlines, changing scope.
Staff – e.g. skill, experience, qualifications, resignations, retirements, loss of morale.
Information – e.g. insufficient or misleading intelligence or data, provision of inappropriate, inadequate or wrong advice.
Communication – e.g. ineffective communication, opportunity to communicate better through different media.
Legislation – ambiguous drafting, unenforceable provisions.

5.1.3 Risk Criteria

Risk criteria can be both qualitative and quantitative. The current focus of this framework is on qualitative criteria as outlined in section 4 of this document. However, when establishing the context and assessing risks, the quantitative criteria should be considered.

5.1.4 Key questions in establishing context

- Determine to what level (Corporate, Program/Fishery or Project) is the risk management process being applied?
- What are the goals and objectives that need to be accomplished?
- What are the performance measures that will indicate achievement of these objectives?
- Have the financial, operational, environmental, political, cultural and legislative environments been considered?
- Have all the stakeholders been identified and their interests considered?

5.1.5 Procedure

(1) Obtain an understanding of the organisation's risk management framework.
(2) Identify the strengths, weaknesses, opportunities and threats. For example, if at Program /Fishery level, define the environment (financial, operational, environmental, political, cultural or legislative etc) and identify strengths, weaknesses, opportunities and threats for the Program.
(3) Establish the objectives and strategies to which the risk management process is being applied.

5.2 Communicate and Consult

Risk communication and consultation can be defined as any two-way dialogue between stakeholders about the existence, nature, form, severity, or acceptability of risks. At the earliest stages in the risk management process, it is important to develop a risk communication strategy with both internal and external stakeholders. Communication efforts should be focused on consultation, rather than a one-way flow of information from decision-makers to stakeholders.

5.3 Identify Risks

This step involves the identification of the what, how, when, where, why and who of all the risks to be managed. It requires rigour and needs to be comprehensive - a potential risk not identified at this stage is excluded from further analysis. Valid information is important in identifying risks and in understanding the likelihood and the consequences of the risk. Although it is not always possible to have the best, or all information, it should be as relevant, comprehensive, accurate and timely as resources will permit. Existing information sources need to be accessed and where necessary, new data sources developed. Be aware that some risks will not lend themselves to objective analysis or

observation, and the cost of collecting all data might be too great for the benefits provided.

Risk has two components, uncertainty and exposure. If both are not present, there is no risk. For example, if a man jumps from an aircraft with a parachute on his back, he may be uncertain as to whether or not the chute will open. He is taking a risk because he is exposed to that uncertainty – if the chute fails to open, he will suffer personally. A typical spectator on the ground watching him jump would not be taking a risk. The spectator may be equally uncertain as to whether the chute will open, but they are not personally exposed to that uncertainty. Exceptions might include a spectator that is owed money by the man jumping from the plane or a spectator who is a member of the man's family. These spectators do face risk because they may suffer financially and/or emotionally should the man's chute fail to open. They are exposed and uncertain.

Just as a risk event with a zero percent likelihood of occurring is not a risk (it has no uncertainty), if an event is 100% certain to occur, then it is also not a risk. It is not even a high risk. It is a fact.

Having identified the risk events, it is necessary to consider possible causes and effects. There is a cause for every risk and an effect if the risk occurs. When a risk is identified, make sure that the risk is recorded, and not the cause or effect of the risk. The cause is a situation that exists and sets up a potential risk. In general, the cause is a fact or a certainty. On the other hand, the effect is the likely outcome if the risk occurs. Look at the following example and define the risk.

A compliance database solution needs to be implemented in all of an organisation's offices including those in regional areas. If the database software is not upgraded on time where necessary, the solution will not be viable in those regional locations.

- Is the risk that we have to implement the solution in the regional locations? No, that is the cause. It is a fact, or a requirement.
- Is the risk that the solution will not be used in certain regions? No, that is the potential effect of what might occur in this scenario.
- Is the risk that the necessary software upgrades are not performed on time? Yes, this is where the uncertainty exists.

Perceptions of risk can vary significantly between compliance practitioners, policy-makers and stakeholders. It is therefore extremely important that the risk scenario is accurately described and documented so that all stakeholders are of the same understanding. It is also important to identify each source so that the analysis can consider the contribution each makes to the likelihood and the consequences of the risk later in the process.

5.3.1 Possible methods for identifying risks

Techniques used to identify risks will depend on the nature of the activities under review and the types of risk involved. Potential methods for identifying risk include:

- workshop / brainstorming sessions eg: why does this event or situation represent a risk? Why would it impact on achieving objectives? How can it happen? What is the trigger which results in the occurrence or non occurrence of the particular event? What is the nature of the risk? What are the circumstances surrounding the event when it is likely to occur?;
- audit or physical inspection;
- examination of extra-jurisdictional experience;
- expert judgment;
- history, failure analysis;
- interview/focus group discussion;
- operational modelling;
- personal experience or past organisational experience;
- scenario analysis;
- strengths, weaknesses, opportunities and threats (SWOT) analysis;
- survey, questionnaire; and
- work breakdown structure analysis.

5.3.2 Possible sources of risk

Sources of risk can include, but are not restricted to commercial and legal relationships; socio-economic drivers; political and legal; personnel and human behaviour; cultural; financial / markets; management activities and controls; technology shifts; natural events; property / assets; security; the activity itself / operations; occupational health and safety.

5.3.3 Key questions in identifying risks

- How, when, where and why are the risks likely to occur, and who might be involved?
- What is the source of each risk?
- What is the potential loss / cost of each risk?
- What are the accountability mechanisms – internal and external?
- What is the reliability of the information?
- What are the stakeholder's expectations of the organisation's performance?

5.3.4 Procedure

(1) Confirm corporate, fishery/program or project objectives.
(2) Based on 3.1 determine the most appropriate method of identifying risks.
(3) Based on 3.2 and 3.3 identify all sources of risks impacting on objectives.
(4) Identify areas of opportunities.
(5) Complete column A of the Risk Assessment Worksheet. (Refer Appendix 1 for the Risk Assessment Worksheet template.)

5.4 Analyse Risks

This approach to risk analysis involves three steps. It will help ensure that all key risks are recorded, and that judgments as to the appropriate management of those risks are substantiated:
(1) assessment of the risk rating for an individual risk, based on the *likelihood* (of something happening) and *consequence* (if it does happen) of the risk event occurring in normal circumstances;
(2) assessment of the adequacy of existing systems and controls which may have impact on the risk; and
(3) assessment of the residual risk (the risk which remains after considering the relevant systems and controls).

Note that it can be erroneous to assume that risk criteria developed in one context for one risk event can be transposed to another context or another risk event. It is therefore important that each risk be considered individually.

5.4.1 Likelihood

Likelihood is used as a description of probability or frequency. It is generally considered to have five rating points:

1 - Rare - may occur only in exceptional circumstances.
2 - Unlikely - could occur at some time.
3 - Moderate - should occur at some time.
4 - Likely - will probably occur in most circumstances.
5 - Almost Certain - is expected to occur in most circumstances.

5.4.2 Consequence

Consequence is the outcome of an event, being a loss, disadvantage or gain. In determining the consequences of a particular risk, managers should consider operational cost, the affect on fish stocks, injury or illness to personnel, the possible asset or financial cost to the organisation, and the affect on the reputation of the organisation.

Consequences are generally considered to have five rating points:

1 - Insignificant – little impact on operations, little impact on fish stocks, no injuries, low financial loss, no reputation impact - consequences are dealt with by routine operations.
2 - Minor – inconvenient delay in operations, temporary minor stock impact, first aid only, medium financial loss, low impact on reputation - the consequences would threaten the efficiency or effectiveness of some aspects of the activity but would be dealt with internally.
3 – Moderate – moderate but manageable impact on operations, temporary significant impact on fish stocks, medical attention required, high financial loss, publicly

embarrassed / moderate impact on reputation – the consequences would not threaten the program, but would mean that the administration of the program could be subject to significant review or changed way of operating.

4 - Major – significant delay in achievement of operations, long term significant impact on fish stocks, extensive injuries, major financial loss, high impact on reputation – the consequences would threaten the survival or continued effective function of the program.

5 – Catastrophic – non-achievement of operations, permanent long term damage to fish stocks, death, huge financial loss, very high impact on reputation - the consequences would threaten the survival of not only the program, but also the organisation, possibly causing major problems for clients and the administration of the program.

5.4.3 Determine level of risk

Having considered the likelihood and consequences of individual risks, the level of risks can be determined using the following table:

Likelihood ***Consequence***	**1**	**2**	**3**	**4**	**5**
Insignificant	Accept	Accept	Accept	Accept and monitor	Accept and monitor
Minor	Accept	Accept and monitor	Accept with adequate controls	Accept with adequate controls	Urgent management required
Moderate	Accept	Accept with adequate controls	Accept with adequate controls	Urgent management required	Unacceptable
Major	Accept and monitor	Accept with adequate controls	Urgent management required	Unacceptable	Unacceptable
Catastrophic	Accept and monitor	Urgent management required	Unacceptable	Unacceptable	Unacceptable

5.4.4 Assess adequacy of existing systems/controls

An organisation's existing systems and controls can be used to reduce the level of risk. The risk management process requires a consideration of what systems and controls are already in existence and the effectiveness of these systems and controls in relation to risks. Once the adequacy of these systems and controls has been assessed, further consideration can be given as to whether these systems or controls require modification, or whether other systems and controls are needed.

The adequacy of systems and controls can be assessed by a number of methods including the history or probability of failure of the systems/controls, the effectiveness of the systems/controls in prevention or reduction of risks, and the flexibility of systems/controls in dealing with slightly modified circumstances.

The effectiveness of existing controls can be rated as follows:
1 – Inadequate – control not fully in place, maintained, monitored or reviewed.
2 – Adequate – controls in place for specific circumstances, some room for improvement. Periodically reviewed.
3 – Excellent – controls fully in place, "best practice". Maintained, monitored, reviewed and tested regularly.

5.4.5 Residual risk

Residual risk is the level of risk, which remains after considering the adequacy of existing systems and controls. It is expected that various systems and controls can be used to reduce or moderate the consequences/likelihood of an individual risk. This may lead to the reduction of the original risk rating.

5.4.6 Key questions in analysing risks

- What is the potential likelihood of the risk happening?
- What are the potential consequences of the risks if they do occur?
- What factors might increase or decrease risk?
- Are there any opportunities?
- What are the current controls that may prevent, detect or lower the consequences of potential or undesirable risks/events?
- How confident are you in your judgment?

5.4.7 Procedure

(1) For each risk identified complete columns B, C, D, E and F of the Risk Assessment Worksheet at Appendix 1 based on the information above.
(2) The residual risk can be determined by applying the likelihood/consequence combinations outlined in 4.3.
(3) Include information for the basis of all estimates (including "guessed" where appropriate).

5.5 Evaluate Risks

This step is about deciding whether the *residual* risks are acceptable or unacceptable taking into account: existing controls; the loss consequences of managing the relevant risk or leaving it untreated; benefits and opportunities presented by the risks; and the risks borne by other stakeholders. A risk is called acceptable if it is not going to be treated. Defining a risk as acceptable does not imply that the risk is insignificant, but indicates that it needs to be monitored for changes by management. Risks that do not fall into the acceptable category should be treated using the process outlined below. These are prioritised for management action as a component of the treatment action plans. (Refer column G of the Risk Assessment Worksheet at Appendix 1)

5.5.1 Reasons why a risk may be accepted

- The level of the risk is so low that specific treatment is not appropriate within available resources i.e. not cost beneficial.
- The risk is such that there is no treatment available. For example, the risk that a project might be terminated following a change of government is not within the control of an organisation.
- The cost treatment, including insurance costs, is so manifestly excessive compared to the benefit that acceptance is the only option. This applies particularly to lower ranked risks.
- The opportunities presented outweigh the threats to such a degree that the risk is justified.

5.5.2 Key questions in assessing and ranking risks

- What is the acceptable level of risk?
- What is the priority of the risk?

5.5.3 Procedure

(1) For each risk, consider the residual risk rating. If the residual risk is low then it may be acceptable and no specific treatment may be required, however reasons why a risk is considered acceptable should be documented in column G.
(2) Risks that are unacceptable require treatment as outlined in section 6.

5.6 Treat Risks

The objective of this step is to identify and implement options to manage and mitigate the unacceptable residual risks. Recommended treatments and strategies (including costs and estimates of success) to deal with the risk events should detail recommendations on risk financing recommendations and assign responsibility (including timelines) for implementation of the treatment.

A number of methods can be employed to treat a risk:

Avoid - avoiding the risk by deciding either to not proceed with the activity that contains an unacceptable risk, or choose a more acceptable alternative activity that meets the objectives and goals of the organisation, or choose a more acceptable alternative methodology or process within the activity, which presents less risk. The option of adopting an alternative work practice of lower risk reduces the consequences and/or likelihood of harm or loss and therefore, is a treatment and not necessarily avoidance of risk. This method can result in opportunity loss. Avoiding the risk is equivalent to refusing to accept the risk.

Reduce - reducing the likelihood or the consequences of the risk, or both do this. Note that there is a trade-off between the level of risk and the cost of reducing those risks to an acceptable level. Any one of several decision points may be chosen including a satisfactory (but not optimum) solution, the most cost-effective solution, the accepted

practice (good business practice), the best achievable result (given current technology), and the absolute minimum. Which criterion is considered to be most acceptable depends on the circumstances and the established risk context within which the decision has been made. With the right scenario, a valid argument can be made for any of the above options. Where risk reduction is considered both feasible and cost effective, the required funding will need to be budgeted, with the responsible person ensuring that the risk reduction measures are carried out to the level determined.

Transfer - transferring the risk, in full or part, to another party. From a public sector perspective, this may mean transferring it to the public at large and, in many instances; this may be acceptable for political, statutory or constitutional reasons. Again, the risk criteria should establish the level of acceptability of risk transfer in each instance. For example, where goods and/or services are being acquired from a contractor, and the contractor is in the best position to manage that particular risk, risk transfer would be acceptable. Legislation and administrative processes may also transfer risk. Risks should be allocated to the party, which can exercise the most effective control over these risks.

Retain - retention of residual risks, following completion of risk reduction measures, or of those risks that for political, statutory or constitutional reasons are required to be retained by the organisation.

5.6.1 Procedure

(1) For each risk that is unacceptable identify treatment options based on above (Avoid, Reduce, Transfer or Retain).
(2) In assessing treatment options consider feasibility, costs and benefits.
(3) Determine the most appropriate treatment option for each risk. Recommend risk financing options.
(4) Determine and document how the treatment will be implemented i.e. through linkage to the strategic plan, or operational plan or through other processes.
(5) Based on the above complete column G of the Risk Assessment Worksheet at Appendix 1.

5.7 Monitor and Review

Monitoring and review is an essential and integral step in the risk management process. It is necessary to monitor risks, the effectiveness of the plan, strategies and management systems that have been set up to manage unacceptable risks.

Risks and the effectiveness of control measures need to be monitored periodically to ensure changing circumstances do not alter the risk priorities. Few risks remain static over time. Programs and processes can change, as can the political, social and legal environments and the goals and objectives of the organisation. The principles of risk management are quite general in nature, but their application depends upon the context and environment from time to time. The process of review and monitoring ensures that risk management strategies continue to be a vital part of a fisheries compliance

organisation's operational processes. The presence of regular performance information can assist with identifying likely trends, trouble spots and other changes that have arisen.

5.7.1 Methods of review and monitoring

The strategic planning process in the organisation, either at the corporate or fishery/program level can provide for the annual revision and updating of both the strategic plan for each organisational area and the accompanying risk assessment worksheet. This formal review provides the opportunity to:

- determine whether each risk previously identified is still relevant to the organizational area;
- review the assessments given to likelihood and consequences for each risk;
- review the risk rating;
- review the adequacy of existing systems and controls to manage risk;
- review the residual risk rating; and
- review the treatment strategies which previously have been considered.

The review process also provides the opportunity to determine if there are any new risks that should be included, and undertake the risk assessment process for these new risks.

At the project level, in most instances the risks are reviewed and monitored by the relevant project management group.

5.7.2 Documentation

It is important that an appropriate level and standard of documentation be maintained as part of the process to demonstrate that the process has been done correctly; enable decisions or processes to be reviewed; and demonstrate accountability. Risk Management should not impose another layer of paperwork so long as a sensible approach is taken. Only a brief record on file may document a process that is of low consequence. On the other hand, a major change in operational circumstances would require a detailed explanation of the process for audit and review. There is a range between these extremes, and prudent practical judgment is needed to decide the appropriate level of documentation in varying circumstances.

5.7.3 Key questions in monitoring and review

- Are the risk treatments effective in minimising the risks?
- Are risk treatments comparatively efficient/cost effective in minimising risks?
- Are the management and accounting controls adequate?
- Do the risk treatments comply with legal requirements, government and organizational policies?
- How can further improvements be made?

RISK ASSESSMENT WORKSHEET

Risk Category A	Description of risk / opportunity B	Likelihood C	Consequence D	Risk Rating E	Adequacy of existing controls / systems F	Residual risk rating G	Acceptability? Reasons why or Risk treatment action plan
Ratings		1 Rare 2 Unlikely 3 Moderate 4 Likely 5 Almost certain	1 Insignificant 2 Minor 3 Moderate 4 Major 5 Catastrophic		1 Inadequate 2 Adequate 3 Excellent		A Avoid Rd Reduce T Transfer Rt Retain

Assessed by _____ **Reviewed by** _____ **Date** / /

APPENDIX 4: *FISHRISK* APPLICATION

The attached CD contains the Microsoft® Access based *FishRisk* application. An automenu feature allows users to view the contents of the CD and install supporting software.

Contents of the CD:

AcroReader.exe	Adobe® Acrobat Reader application file
Agroshark.bmp	Shark clipart
Amenu.zip	Freeware autorun software by Desernet®Broadband Media, Inc
APPENDIX 1 Intellectual Property.doc	Microsoft® Word document (1 page)
APPENDIX 2 Staff.doc	Microsoft® Word document (1 page)
APPENDIX 3 Risk Management Framework.pdf	Adobe® Acrobat document (18 pages)
APPENDIX 4 FishRisk Application.doc	Microsoft® Word document (1 page)
APPENDIX 5 FISHRISK UserGuide.doc	Microsoft® Word document (1 page)
APPENDIX 5 FISHRISK UserGuide.pdf	Adobe® Acrobat document (25 pages)
Autorun.inf	Setup information file
Autorun.exe	Autorun application file
FinalReport 2002 085.pdf	Adobe® Acrobat document (39 pages)
FISHRISK notes.doc	Microsoft® Word document (1 page)
FishRisk v2.mdf	Microsoft® Access database file
FishRisk v2.zip	Compressed version of the FishRisk v2.mdf file
Installation notes.doc	Microsoft® Word document (1 page)
License.txt	Automenu licence agreement by Desernet® Broadband Media, Inc

APPENDIX 5: *FISHRISK* USER GUIDE

The enclosed *FISHRISK* User Guide has been compiled in order to assist fisheries compliance practitioners in the use of the *FISHRISK* application.

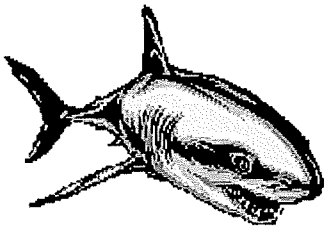
For that reason it has been prepared as a "stand alone" document.

FISHRISK

A Risk Assessment Tool for Fisheries Compliance Practitioners (Version 2.2)

User Guide

Principal Investigator: Neil Sarti
Government of Western Australia, Department of Fisheries



Department of Fisheries
Government of Western Australia

Australian Government
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ISBN: 1 877098 54 X

SYSTEM REQUIREMENTS:

- *FISHRISK* requires an IBM® compatible Personal Computer with a Microsoft® Windows operating system and Microsoft® Access 97 or later version installed
- Any Personal Computer that can run Microsoft® Windows should be able to run *FISHRISK* although performance may be affected
- As a general rule, the faster the clock speed of the central processing unit and the greater the amount of random access memory (RAM) available, the better the performance will be.
- Accompanying reports and the user guide require the use of Microsoft® Word and a pdf file reader.
- A copy of Adobe® Acrobat Reader is provided on the CD for reading pdf files and may be used without cost in accordance with the conditions of use.

NOTES:

Make sure your computer has the date format set correctly. *FISHRISK* uses the date format set in Windows, so if your system is using the US date format, the year and month will be reversed. You can check your date settings in the control panel.

FISHRISK was created in Microsoft® Access 2000 using a Personal Computer installed with Microsoft® Windows 98 Second Edition operating at 950 Mhz and with 128 Megabytes of RAM

INSTALLATION INSTRUCTIONS FOR *FISHRISK*

(1) Single click the Start icon in the bottom left hand corner of the screen and select Programs / Windows Explorer OR
(1) Select Windows Explorer from the application tray or the Desktop

(2) Select drive C: or any other hard drive or location where you want *FISHRISK* to be installed
(3) Select File \ New \ Folder from the upper Toolbar
(4) This will create a folder called New Folder
(5) Single right click on the New Folder and select Rename from the pop-up options box
(6) This action will allow you to rename the file by typing its new name on the keyboard. Choose *FishRisk* or any other meaningful name
(7) Now choose the appropriate drive letter for the CD Rom drive (generally D:) so that the file contents of the CD are visible.
(8) Single click on the file FishRisk v2.mdb
(9) Select Copy either from a right button click on the mouse, Edit \ Copy from the upper Toolbar or Ctrl + C from the keyboard
(10) Paste the FishRisk v2.mdb file to the C:\FishRisk folder created earlier at step 6 above
(11) Often Microsoft Access files assume a read-only property when they are copied to CD. It will be necessary to unlock that property in order for the application to be fully operational and capable of accepting new data
(12) Using Windows Explorer again, single right click on the FishRisk v2.mdb file in the C:\FishRisk folder
(13) Select Properties and the Properties box will open
(14) Uncheck the Read-Only property in the Attributes section
(15) Click Apply at the bottom right hand corner of the Properties box
(16) Click OK

FISHRISK can now be opened in the normal manner

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1. INTRODUCTION

FISHRISK is a simple risk management and reporting tool that has been developed using the Microsoft® Access 2000 database software to meet specific risk management needs in fisheries compliance. Its primary purpose is to assist fisheries management organisations in Australia to manage compliance risks within their respective jurisdictions.

FISHRISK was developed by the Government of Western Australia Department of Fisheries using funding from the Australian Government Fisheries Research and Development Corporation and supported by members of the National Fisheries Compliance Committee and the Australasian Fisheries Law Enforcement Conference. The contribution and support of these organizations is acknowledged.

FISHRISK provides a step-by-step risk assessment guide for officers and allows them to capture risk data and decisions as they proceed through the risk assessment process. Use of the application enables consistent structure and user interface across fisheries compliance in Australia and allows for tailoring of the data to an organizations specific requirement. Criteria against which risks can be measured and prioritized have been adapted from AS/NZS 4360:1999. It is important to note that *FISHRISK* aids the user in the decision-making process, but does not make the decision. Decisions will still need to be made by the user or appropriate organizational authority.

Not only does *FISHRISK* record information, it also produces a comprehensive range of reports. These reports can provide decision makers, policy makers, program planners and stakeholders with accurate, up to date information on fisheries compliance risks. The reports can then be used to monitor the progress of treatments carried out to mitigate the risks and for review purposes.

FISHRISK can be used by officers to identify and assess fisheries compliance risks either on a stand-alone basis or in a workshop-style setting.

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Intel® is the registered trademark of the Intel Corporation.

2. GUIDELINES / GENERAL INFORMATION

YOU SHOULD CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS PRIOR TO INSTALLING *FISHRISK* ("THE APPLICATION"). INSTALLATION OF THE APPLICATION MEANS YOU ACCEPT THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THEM YOU SHOULD TERMINATE THE INSTALLATION AND DELETE ANY APPLICATION FILES THAT MAY HAVE BEEN CREATED.

The Fisheries Research and Development Corporation and Government of Western Australia Department of Fisheries (the "Providers") are authorised to licence the *FISHRISK* application. By installing the Application you accept a non-exclusive licence to use the Application on the following terms and conditions.

2.1 Use rights and limitations

You may:
a) use the Application on multiple CPUs for the purposes of fisheries management;
b) copy the Application on to any machine – readable or printed form for back up purposes in support of your use of the Application;
c) modify the Application to meet the particular needs of your organisation.

You shall not:
a) use, copy, modify or sub licence the Application in whole or in part except as expressly provided for in this licence;
b) remove any product identification, copyright notices or other notices or proprietary restrictions from the Application;
c) commercialise or provide to any third party any product incorporating the whole or any part of *FISHRISK* without first obtaining the prior written approval of the Providers.

This Agreement does not entitle you to any training in relation to the use of *FISHRISK* or to any maintenance or support of the Application.

The Providers do not claim that *FISHRISK* is a completed product. Information provided by *FISHRISK* should not be relied upon as being error free and no representations or warranties are made by the Providers in respect to the appropriateness, timeliness, reliability, accuracy or completeness of material derived from *FISHRISK*.

As far as lawfully possible, *FISHRISK* excludes all liability for any loss, cost, damage or claim arising from the use of the Application or any of the information contained therein.

2.2 Duration

This licence is effective until terminated. You may terminate it at any time by destroying the Application together with all copies in any form. This licence will also terminate if you fail to comply with any term or condition of this licence.

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2.3 Minimum hardware

Intel® Pentium 90 CPU or equivalent with 10 Megabytes of hard disk space free and 64 Megabytes of available RAM

2.4 Software requirements

Microsoft® Windows 98 / Microsoft® Windows NT 4.0 or later operating system
Microsoft® Access 2000 or later for database management
Microsoft® Word 2000 or later for report generation

3. INSTALLATION

Prior to installing the *FISHRISK* application ensure that you have obtained a Login ID and password from your database administrator. You will not be able to open the database without a valid ID and password.

Load the *FISHRISK* CD into the drive of your PC and follow the instructions to copy the database file to your hard drive. Generally, the *FISHRISK* application needs no particular positioning within your hard drive but it is recommended that it be located at C:\FishRisk. There is no need to reboot the PC.

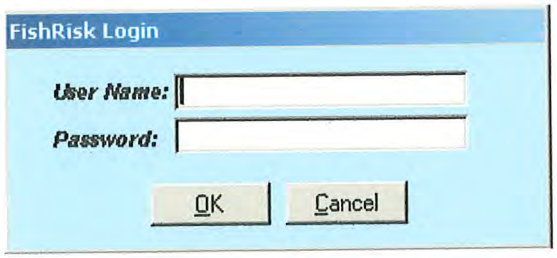
4. OPENING THE APPLICATION

QUICK TIP #1
GET A LOGIN AND PASSWORD FIRST

1. Make sure that you have obtained a login User Name and Password from your database administrator prior to opening the Application.
2. You will not be able to open the database without a valid ID and password.

Open Microsoft® Access through the Start / Programs selection process or by double clicking the Microsoft® Access icon on your desktop or system tray.

Select Open Existing File and click *OK*. Select the database file from wherever you have saved it on your hard drive, click *OK*. The following login box will appear:



Enter your pre-allocated login User Name and Password, and then click *OK*.

You will now be at the Main Switchboard

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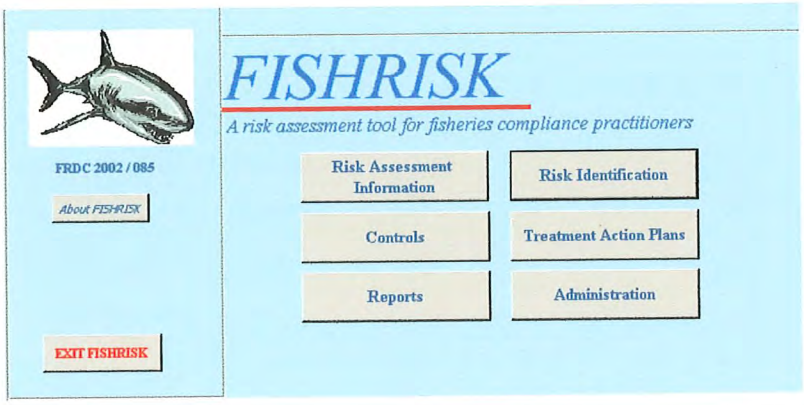
If an ID and password has not been allocated or there is a problem, contact your database administrator.

5. MAIN SWITCHBOARD

The Main Switchboard of *FISHRISK* consists of two buttons in the left hand frame and six application section buttons in the right hand frame.



To activate each button with the mouse, point the arrow to the button heading you wish to open and left click.

5.1 About *FISHRISK*

Activating the About FISHRISK button will open the following screen which provides copyright and version information.

Click *OK* to return to the Main Switchboard.

5.2 Exit *FISHRISK*

Activating the Exit FISHRISK button will close the *FISHRISK* application completely.

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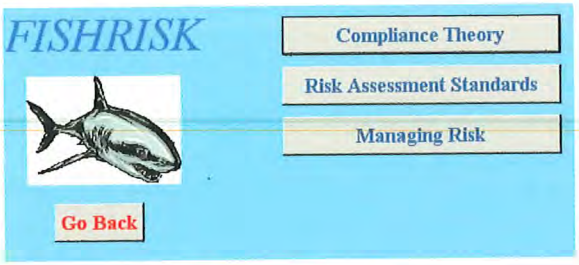
6. RISK ASSESSMENT INFORMATION

Activating the Risk Assessment Information button will open the following screen.



This section has three subsections and provides users with a range of information about risk assessment processes including Compliance Theory, Risk Assessment Standards and Managing Risk.

6.1 Compliance Theory

This section contains a narrative on Compliance Theory. Pages can be viewed in their entirety by using the scroll bars on the screen. Pages can be scrolled upwards or downwards by using the ▲ or ▼ button on the scroll bar at the right hand side of the screen or by using the PageUp and PageDown buttons on the keyboard. The Back button will return the user to the Risk Assessment section of the Switchboard.

6.2 Risk Assessment Standards

This section contains a narrative on Risk Assessment Standards. Pages can be viewed in their entirety by using the scroll bars on the screen. Pages can be scrolled upwards or downwards by using the ▲ or ▼ button on the scroll bar at the right hand side of the screen or by using the PageUp and PageDown buttons on the keyboard. The Back button will return the user to the Risk Assessment section of the Switchboard.

6.3 Managing Risk

This section contains a narrative on Managing Risk. Pages can be viewed in their entirety by using the scroll bars on the screen. Pages can be scrolled upwards or downwards by using the ▲ or ▼ button on the scroll bar at the right hand side of the screen or by using the PageUp and PageDown buttons on the keyboard. The Back button will return the user to the Risk Assessment section of the Switchboard.

6.4 Go Back

The Go Back button will return the user to the Main Switchboard.

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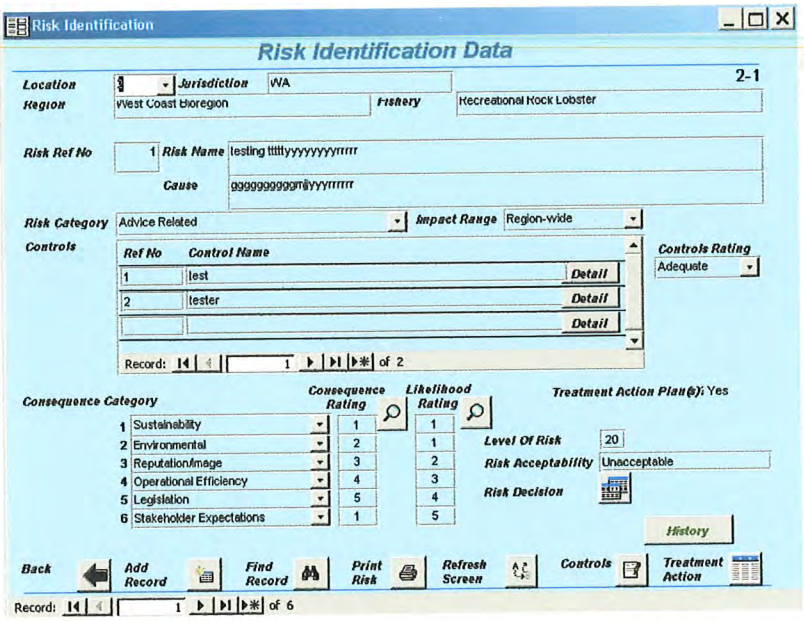
7. RISK IDENTIFICATION MENU

A single mouse click on the Risk Identification button takes you to the following screen. This screen form is used to enter a new risk, amend risks or as a review point for an existing risk

Risk Reference



QUICK TIP #2
HOW TO ADD OR AMEND RISKS

1. Click the **Risk Identification** button on the Main Switchboard.
2. Populate the **Risk Identification Data** screen form with data.
3. Click the **Risk Decision** button at the bottom of the Risk Identification Data screen form.
4. Populate the **Risk Decision** screen form.

3 Click the **Back** button at the bottom left hand corner of the Risk Decision screen form. This will return you to the **Risk Identification Data** screen form.

4 Click the **Add Record** button at the bottom left of the Risk Identification Data screen form to add a new risk. Populate the screen form as above for each new risk.

5 Click on the ◀ or ▶ button on the **Record** file tray at the bottom left hand corner of the screen to move between the risks that have already been entered. The file tray will indicate the total number of files and which one the screen is displaying at the time.

This section allows users to enter a range of information in relation to a particular risk. The data entry points include:

RI-1 **Location** – users should select a location identifier for the Jurisdiction / Region / Fishery combination from the dropdown box. This will then populate the individual Jurisdiction, Region and Fishery boxes and change the Risk Reference identifier at the top right hand corner of the screen. Location combinations can be entered through the Location Update component of the Administration section of the Main Switchboard. Although a Database Administrator can only update these, the database will generally be distributed

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with pre-loaded location combinations for your jurisdiction. The Database Administrator can amend or add location combinations.

RI-2 **Jurisdiction** – State, Commonwealth, Territory or Country. See Location above.

RI-3 **Region** – region or area name determined by Jurisdiction. See Location above.

RI-4 **Fishery** – fishery name determined by Jurisdiction. See Location above.

RI-5 **Risk Ref No** – data input is not required - a number will be assigned automatically when data on a risk is entered.

RI-6 **Risk Name** – users should describe in as much detail as possible the risk event that might occur or prevent the completion of the desired activity or event outcome.

RI-7 **Cause** – users should describe in as much detail as possible the reason for the risk event occurring.

RI-8 **Risk Category** – users should select a category from the drop down box.

RI-9 **Impact Range** – users should select an impact from the drop down box.

RI-10 **Control Ref No** – data is not required - a number will be assigned automatically when data on a control is entered.

RI-11 **Control Name** – users should describe in as much detail as possible the controls, which will treat (prevent or mitigate) the risk event occurring.

RI-12 **Detail** – clicking on this button takes the user to the Control Assessment Plan (see below at Section 8).

RI-13 **Controls Rating** – users should select a rating from the drop down box.

RI-14 **Consequence Category** – each risk must be evaluated in terms of consequences. Users should select the most significant categories from the drop down box to adequately describe the consequences of the risk.

RI-15 **Consequence Rating** – users need to assign a consequence rating (between 1 and 5) for each consequence category entered. The rating scale can be viewed by clicking on the Magnifying Glass button. See below:

Consequence Rating

Level	Description	Operations	Sustainability	Environment	Socio-Political	Economic	Stake Holder	Interruption	Reputation	Injury	Finance Loss
1	Insignificant	Little impact	Little impact	Little impact	Little impact	Little impact	Little impact	Less than 1 hour	No impact or negligible	Near miss	$5k or less
2	Minor	Inconvenient delay	Temp minor stock impact	Some temp confined impact	Temporary disruption & internal query	Tolerable reduction in income	Minor temp restrictions	1 hour to 1 day	Low impact, low news profile	First aid only	$5k to $30k
3	Moderate	Moderate but manageable impact	Temporary significant impact on fish stocks	Significant temp impact requiring suspension of fishing activities	Community complaints and ministerial query	Break-even returns, temporary loss of profit or market share	Important expectations suspended or restricted in the short term	1 day to 1 week	Publicly embarrassed moderate impact and news profile Ministerial involvement	Medical attention	$30k to $300k
4	Major	Significant delay in achievement	Long term significant impact on fish stocks	Long-term damage requiring denial of access to key stake holders	Significant disruption to business community & flow on effect including Upper House questions to Minister	Sustained stakeholder loss. Temporary closure or suspension of business activity. Loss of market share significant	Long term suspension or restriction of expectation in some areas	1 week to 1 month	Publicly embarrassed high impact and news profile. Third party action, public and Ministerial involvement	Extensive injury, disease or death	More than $300k Less than or equal to $1M
5	Catastrophic	Non-achievement	Permanent or widespread long term damage to fish stocks	Permanent or long-term damage to high value habitats affecting major stakeholders	Loss of community support and censure by Government	Permanent loss of economic viability, effective market share and termination of local industry activity.	Permanent loss of key viability expectation	More than 1 month	Publicly embarrassed, very high impact and widespread news profile 3rd party action, public and Ministerial involvement, Govt censure and enquiry.	Multiple, major injuries or deaths	More than $1M

Back Likelihood Rating

RI-16 **Likelihood Rating** – users need to assign a likelihood rating (between 1 and 5) for each consequence category entered. The rating scale can be viewed by clicking on the Magnifying Glass button. See below. Once both a Consequence Rating and a Likelihood Rating have been entered, the Level of Risk and the Risk Acceptability of the most severe consequence will be automatically calculated.

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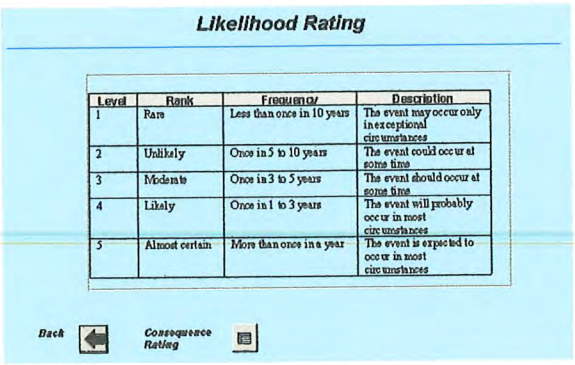
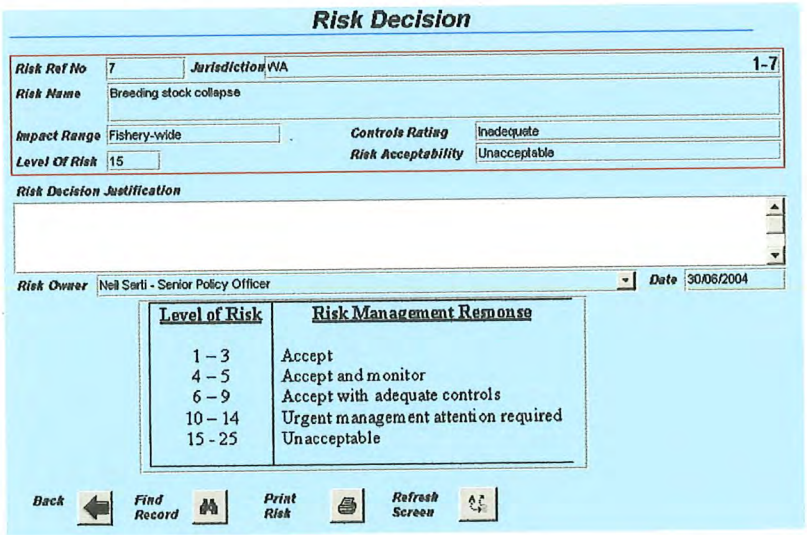


RI-17 **Treatment Action Plan(s)** – data input is not required. This field indicates whether Treatment Action Plan(s) have been developed by either a Yes or No indicator and is populated from responses entered elsewhere.

RI-18 **Level of Risk** – data input is not required - a number for the most severe consequence will be calculated automatically once both a Consequence Rating and a Likelihood Rating have been entered.

RI-19 **Risk Acceptability** – data input is not required - a classification for the most severe consequence based on the Level of Risk will be assigned automatically once both a Consequence Rating and a Likelihood Rating have been entered.

RI-20 **Risk Decision** – clicking on this button takes the user to the Risk Decision screen form. Some of the information has been populated from the Risk Identification Data screen form. See below.



RD-1 **Risk Decision Justification** – As a guide, risks with a Level of Risk below 9 are acceptable subject to management control. However risks with a Level of Risk rated 10 or above require consideration and users should describe whether the organisation is prepared to accept the risk and detail any further treatment action that might be required.

RD-2 **Risk Owner** – users should select the name of the officer / position responsible for managing the risk from the drop down box.

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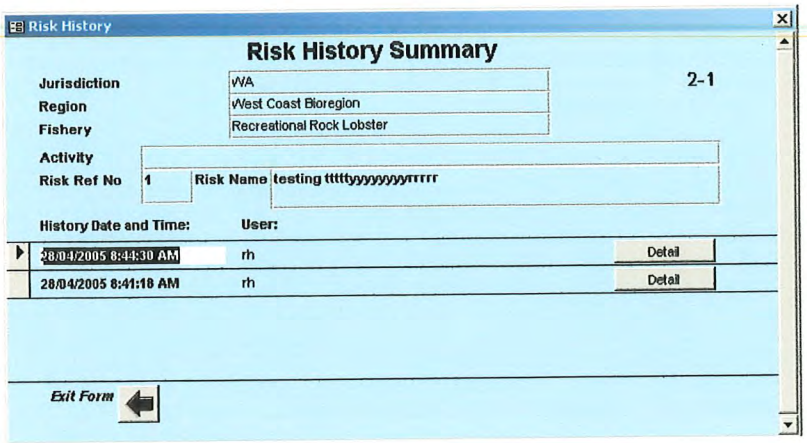
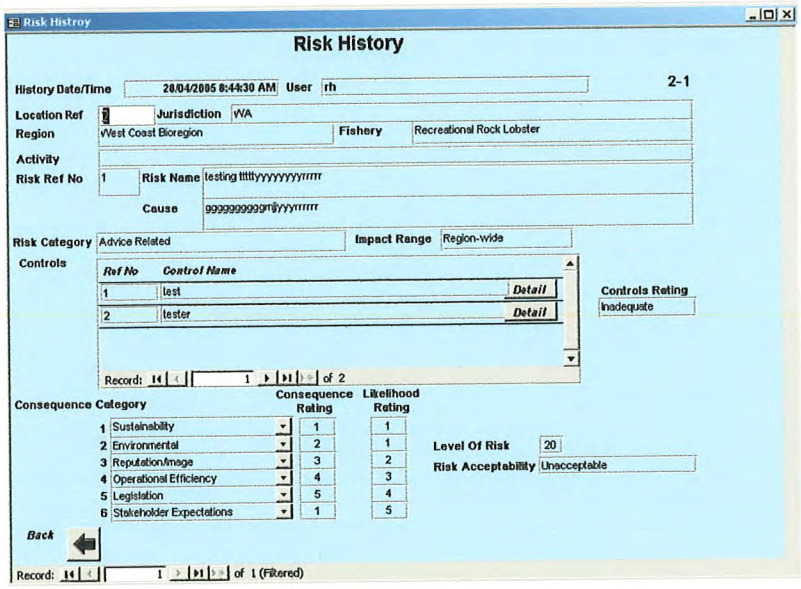
RD-3 **Date** – users should enter the date of the decision in the format dd/mm/yy.

RI-21 **History** – clicking on this button takes the user to the Risk History Summary screen form. All of the information has been populated from the Risk Identification Data screen form. See below.



RHS-1 **Detail** - clicking on this button takes the user to the Risk History screen form. The information has been populated from responses entered elsewhere. See below.



RH-1 **Detail** – clicking on this button takes the user to the Control Assessment Plan screen form. The information has been populated from responses entered elsewhere. See Section 8.

RI-22 **Back** – clicking on this button returns the user to the previous screen form or back to the Risk Identification Data screen.

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RI-23 Add Record – clicking on this button takes the user to a new Risk Identification screen form.

RI-24 Find Record – clicking on this button takes the user to the next record containing the search character. First, single click in the field that you wish to search then click the Find Record button. Enter the search character in to the 'Find What' box and click 'Find Next'. The screen form will display either the next entry with the desired character or a message that the item was not found.

RI-25 Print Risk – clicking on this button will print the Risk Identification Data screen from the default printer.

RI-26 Refresh Screen – clicking on this button refreshes the screen form and will update data that has been entered.

RI-27 Controls – clicking on this button takes the user to the Control Summary screen form (see below at Section 8).

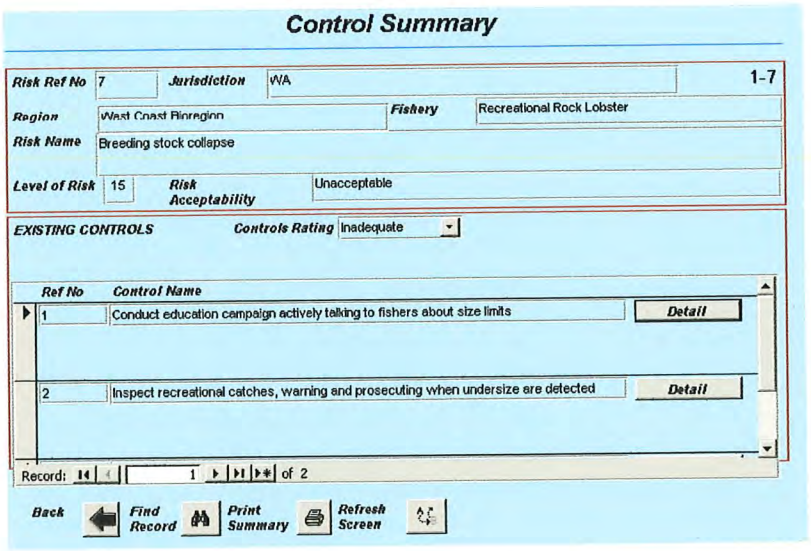
RI-28 Treatment Action – clicking on this button takes the user to the Risk Treatment Action Plan screen form (see below at Section 9).

QUICK TIP #3
SAVING DATA

1. Additions and amendments to data fields will only update once a user has clicked **Back** or tabbed to another field.
2. Using the ◀ or ▶ button on the **Record** file tray or the **Refresh Screen** button at the bottom of the screen form will ensure that details are saved.

8. CONTROLS MENU

A single mouse click on the **Controls** button takes you to the **Control Summary** screen.



QUICK TIP #4
HOW TO ADD OR AMEND CONTROLS

1. Click on **Controls** button at the bottom right of the **Risk Identification Data** screen form.
2. The **Controls Summary** screen form will appear.

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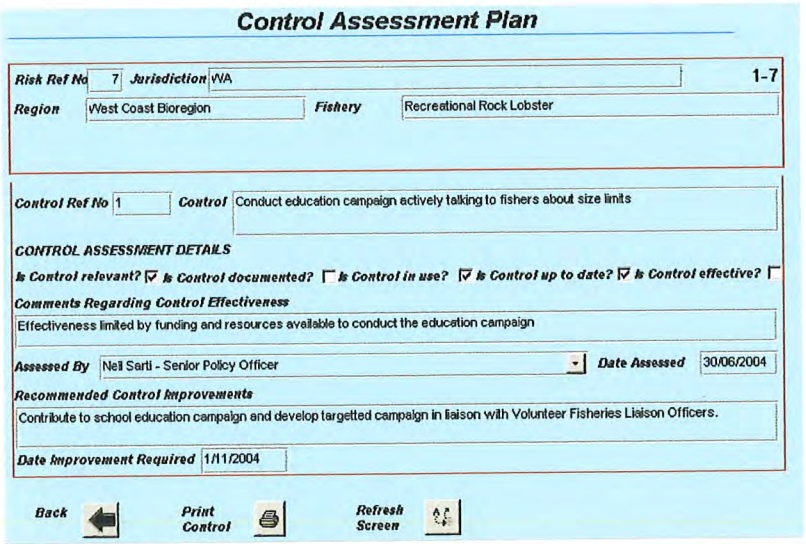
3. Click on the **Detail** button for the particular control you are interested in.
4. The **Control Assessment Plan** screen form will appear.
5. Where required, populate the **Control Assessment Plan** screen form.
6. Click on the ◀ or ▶ button on the **Record** file tray at the bottom left hand corner of the Existing Controls section of the screen form to move between controls. Alternatively, use the scroll bar on the right hand side.
7. Clicking on the **Back** button at the bottom left hand corner of the Control Assessment Plan and Control Summary screen forms will return you to the **Risk Identification Data** screen form.

The Control Summary screen form allows the user to select the individual controls associated with a risk and to perform an analysis of an existing control. Some of the information has been populated from the Risk Identification Data screen form. All the controls associated with that risk are displayed. See above. The remaining data entry points include:

CS-1 **Detail** – clicking on this button takes the user to the Control Assessment Plan screen form. See below.



The Control Assessment Plan screen form requires the user to assess existing controls. Some of the information has been populated from the Risk Identification Data screen form. See above. The remaining data entry points include:

CA-1 **Is Control relevant?** – tick if relevant at the time of assessment.
CA-2 **Is Control documented?** – tick if documented at the time of assessment.
CA-3 **Is Control in use?** – tick if in use at the time of assessment.
CA-4 **Is Control up to date?** – tick if up to date at the time of assessment.
CA-5 **Is Control effective?** – tick if effective at the time of assessment.
CA-6 **Comments Regarding Control Effectiveness** – users should describe in as much detail as possible the effectiveness of the controls in managing the risk.
CA-7 **Assessed By** – users should select the name of the officer / position assessing the control from the drop down box.
CA-8 **Date Assessed** – users should enter the date of the assessment in the format dd/mm/yy.

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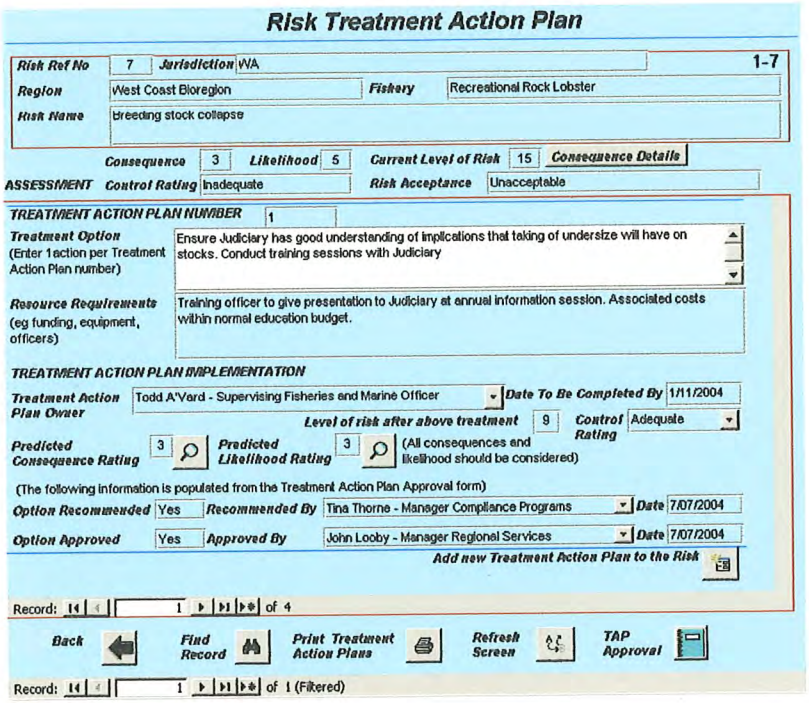
CA-9 Recommended Control Improvements – users should describe in as much detail as possible any recommendations for further improvements of the controls in managing the risk.

CA-10 Date Improvement Required – users should enter the date that the control improvement must be completed by in the format dd/mm/yy.

9. TREATMENT ACTION PLANS MENU

A single mouse click on the Treatment Action Plan button takes you to the Risk Treatment Action Plan screen form.



QUICK TIP #5
HOW TO ADD OR AMEND TREATMENTS

1. Click on the **Treatment Action** button at the bottom right of the **Risk Identification Data** screen form
2. Populate the **Risk Treatment Action Plan** screen form.
3. Click on the **Add New Treatment Action Plan** button at the bottom right of the form screen if required.
4. Click on the **TAP Approval** button at the bottom right hand of the screen form. Populate the Treatment Action Plan Approval screen form where required.
5. Clicking on the **Back** button at the bottom left hand corner of the Treatment Action Plan Approval and Risk Treatment Action Plan screen forms will return you to the **Risk Identification Data** screen form.

The Risk Treatment Action Plan screen form allows the user to detail the proposed treatments associated with a risk. Some of the information has been populated from the Risk Identification Data screen form. See above. The remaining data entry points include:

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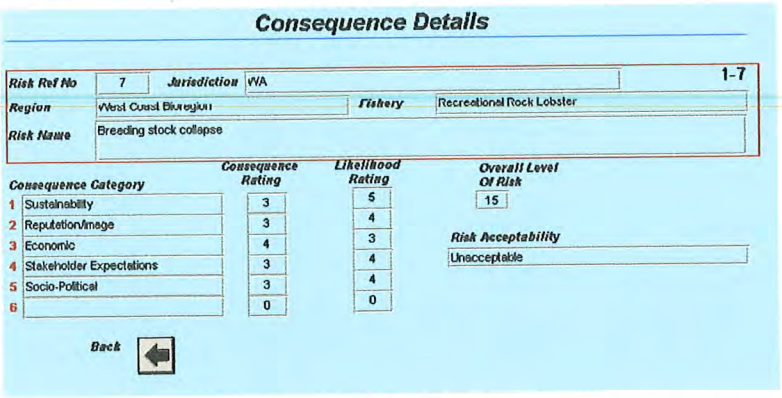
RT-1 Consequences Details – clicking on this button takes the user to the Consequence Details screen form. See below. This screen form details information on a particular risk, its associated consequence details and the level of risk associated with it.



RT-2 Treatment Action Plan Number – data input is not required - a number will be assigned automatically when data on a treatment option is entered.

RT-3 Treatment Option – users should describe in as much detail as possible the actions, which will treat (prevent or mitigate) the risk event.

RT-4 Resource Requirements – users should describe in as much detail as possible the resources (e.g. funding, equipment, officers etc) required to implement this above option

RT-5 Treatment Action Plan Owner – users should select the name of the officer / position responsible for the treatment action plan from the drop down box.

RT-6 Date To Be Completed By – users should enter the date by which the treatment is due to be completed in the format dd/mm/yy.

RT-7 Predicted Consequence Rating – users should re-evaluate the consequences of this risk taking into account the above treatment option and all consequences then assign a consequence rating (between 1 and 5) for each treatment action. The rating scale can be viewed by clicking on the Magnifying Glass button.

RT-8 Predicted Likelihood Rating – users should re-evaluate the likelihood of this risk taking into account the above treatment option and all likelihoods then assign a likelihood rating (between 1 and 5) for each treatment action. The rating scale can be viewed by clicking on the Magnifying Glass button.

RT-9 Level of Risk after above Treatment – data input is not required - a number will be calculated automatically once both a Predicted Consequence Rating and a Predicted Likelihood Rating have been entered.

RT-10 Predicted Control Rating – users need to consider whether the above treatment has changed the control by selecting a rating from the drop down box.

RT-11 Add new Treatment Action Plan to the Risk – clicking on this button clears the data in the current Risk Treatment Action Plan screen form and allows the user to enter a new Treatment Action Plan.

RT-12 TAP (Treatment Action Plan) Approval – this screen form (see below) provides a summary of the treatment options available for a particular risk and allows the user to recommend the most appropriate treatment. Some of the

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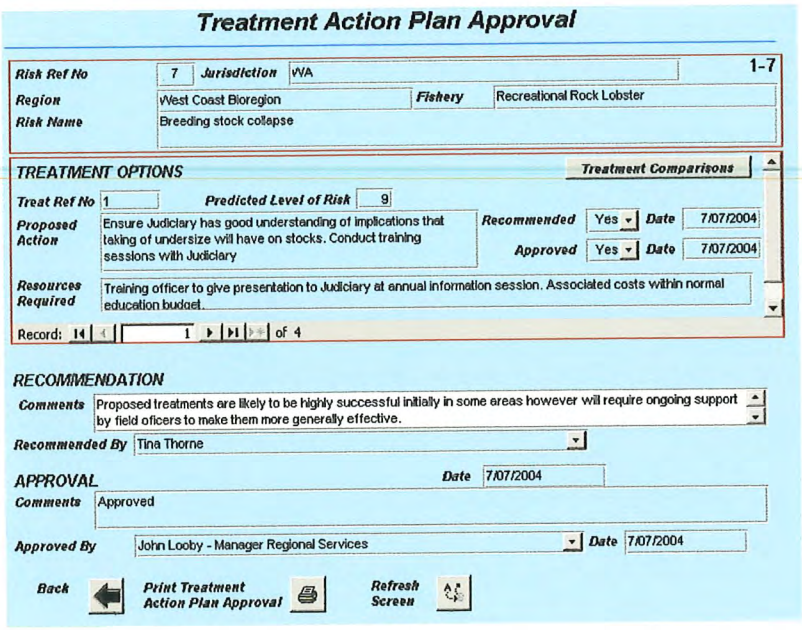
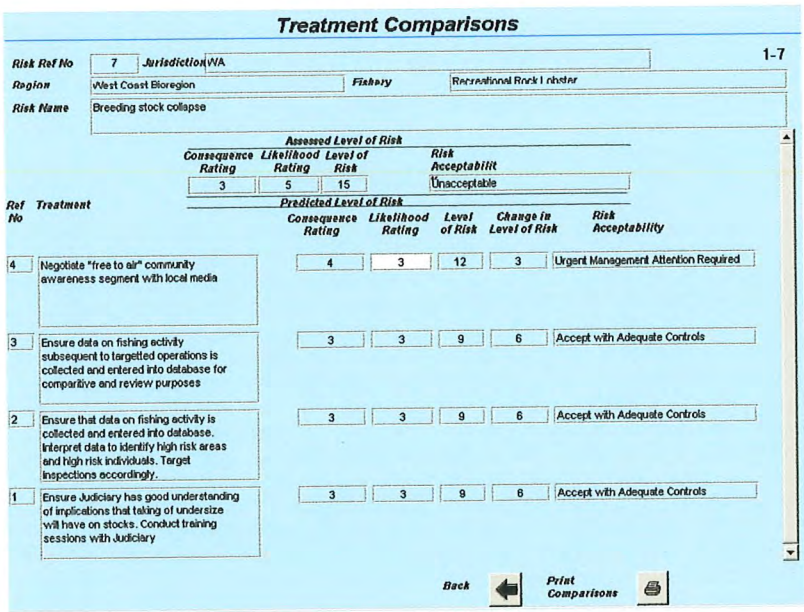
data is populated from the Risk Treatment Action Plan screen form and in turn, it populates data back.



TA-1 **Treatment Comparisons** – clicking on this form takes you to the Treatment Comparison screen form (see below). This provides a summary of the treatment options available for a particular risk and allows the user to compare treatment changes to the existing treatment strategy. No data entry is required - the data is populated from the Risk Treatment Action Plan screen form.



TC-1 **Recommendation comments** – the recommending officer should provide a brief explanation of which treatment action plan options are being recommended and why.

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TC-2 **Recommended by** – users should select the name of the officer / position recommending the treatment action plan from the drop down box.

TC-3 **Recommendation date** – users should enter the date on which the treatment is recommended in the format dd/mm/yy.

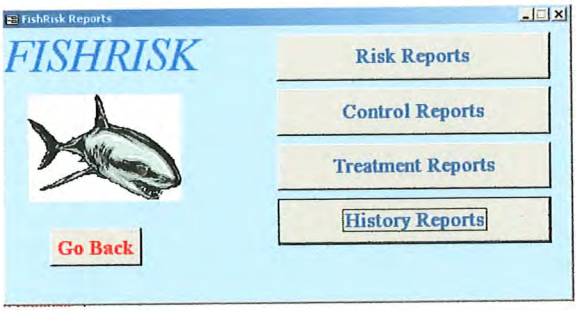
TC-4 **Approval comments** – the approving officer should provide any relevant comments in relation to approving the treatment action plan.

TC-5 **Approved by** – users should select the name of the officer / position responsible for approving the treatment action plan from the drop down box.

TC-6 **Approval date** – users should enter the date on which the treatment is approved in the format dd/mm/yy.

10. REPORTS MENU

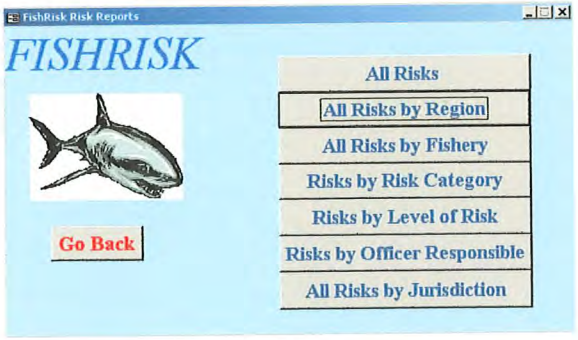
A single mouse click on the Reports button takes you to the following screen. This screen allows the user to choose a number of standardised reports that have been grouped as Risk Reports, Control Reports, Treatment Reports and History Reports. The reports may be viewed or printed.



Clicking on the Go Back button will return you to the Main Switchboard.

10.1 Risk Reports

A single click on the Risk Reports button will take the user to the following screen.



Click on a Report button to view details for that report. A pop-up box will appear for some reports requesting information for certain fields (see below). In order to obtain the report it will be necessary to enter the requested data into the pop-up box and then

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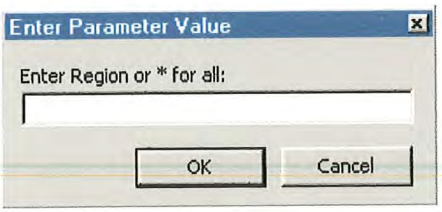
click OK. Alternatively, an asterisk (*) may be entered which will result in a report on all data for that field. Clicking Cancel will cancel the report request.



Once generated the Report may be printed by clicking the Print button on the toolbar in left hand top corner of the screen, selecting File / Print option from the toolbar or selecting the shortcut Ctrl + P.

- **All Risks** – this report details all of the risks within the database.
- **All Risks by Region** – this report details all of the risks within the database that are associated with a particular region.
- **All Risks by Fishery** – this report details all of the risks within the database that are associated with a particular fishery.
- **Risks by Risk Category** – this report details all of the risks within a specified Region and/or Fishery that are associated with a particular risk category.
- **Risks by Level of Risk** – this report details all of the risks within a specified Region and/or Fishery that are associated with a particular level of risk.
- **Risks by Officer Responsible** – this report details all of the risks within a specified Region and/or Fishery that are the responsibility of a particular officer.
- **All Risks by Jurisdiction** – this report is optional and only of use if multiple jurisdiction information is contained within the database. By default it will not be turned on but can be activated by a Database Administrator. It details all of the risks within the database that are associated with a particular jurisdiction.
- **Go Back** – clicking on the Go Back button will close the Risk Reports menu and return the user to the Reports screen.

10.2 Control Reports

A single click on the Control Reports button will take the user to the following screen.

Click on a Report button to view details for that report. A pop-up box will appear for some reports requesting information for certain fields (see below). In order to obtain the report it will be necessary to enter the requested data into the pop-up box and then click OK. Alternatively, an asterisk (*) may be entered which will result in a report on all data for that field. Clicking Cancel will cancel the report request.

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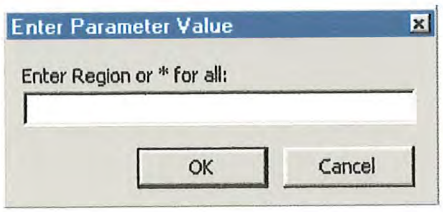
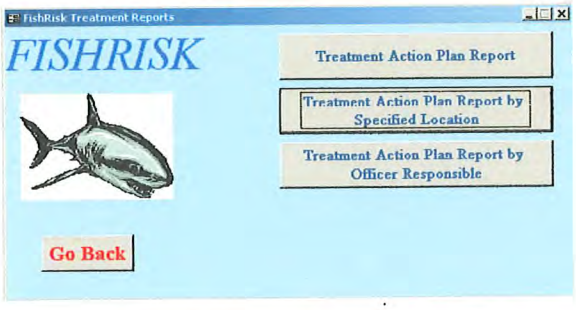


Once generated the Report may be printed by clicking the Print button on the toolbar in left hand top corner of the screen, selecting File / Print option from the toolbar or selecting the shortcut Ctrl + P.

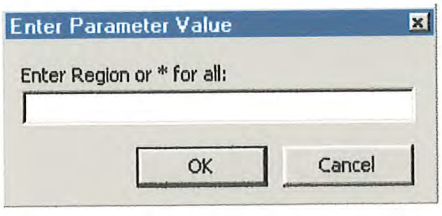
- **Inadequate Controls Report** – this report details all of the risks within a specified Region and/or Fishery with controls that have been rated as inadequate.
- **Controls by Risk** – this report details all the risk controls within a specified Region and/or Fishery.
- **Go Back** – clicking on the Go Back button will close the Control Reports menu and return the user to the Reports screen.

10.3 Treatment Reports

A single click on the Treatment Reports button will take the user to the following screen.



Click on a Report button to view details for that report. A pop-up box will appear for some reports requesting information for certain fields (see below). In order to obtain the report it will be necessary to enter the requested data into the pop-up box and then click OK. Alternatively, an asterisk (*) may be entered which will result in a report on all data for that field. Clicking Cancel will cancel the report request.



Once generated the Report may be printed by clicking the Print button on the toolbar in left hand top corner of the screen, selecting File / Print option from the toolbar or selecting the shortcut Ctrl + P.

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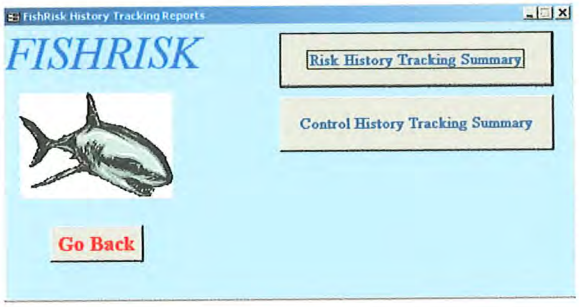
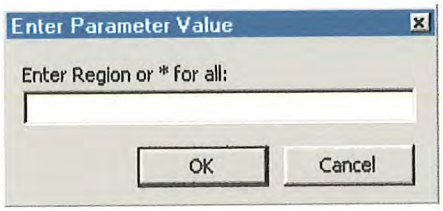
- **Treatment Action Plan Report** – this report details the treatment options that are associated with a particular risk within a specified Region and/or Fishery.
- **Treatment Action Plan Report by Specified Location** – this report details all of the treatment options associated with approved Treatment Action Plans within a specified Region and/or Fishery.
- **Treatment Action Plan Report by Officer Responsible** – this report details all of the approved Treatment Action Plans within a specified Region and/or Fishery and has been sorted on the basis of Responsible Officer.
- **Go Back** – clicking on the Go Back button will close the Treatment Reports menu and return the user to the Reports screen.

10.4 History Reports

A single click on the History Reports button will take the user to the following screen.



Click on a Report button to view details for that report. A pop-up box will appear for some reports requesting information for certain fields (see below). In order to obtain the report it will be necessary to enter the requested data into the pop-up box and then click OK. Alternatively, an asterisk (*) may be entered which will result in a report on all data for that field. Clicking Cancel will cancel the report request.



Once generated the Report may be printed by clicking the Print button on the toolbar in left hand top corner of the screen, selecting File / Print option from the toolbar or selecting the shortcut Ctrl + P.

- **Risk History Tracking Summary Report** – this report details the history of individual risks. Individual pages of the report may be moved to by clicking on the ◀ or ▶ buttons at the bottom left hand of the screen.
- **Control History Tracking Summary Report** – this report details the history of those risks where a control assessment plan has been developed.
- **Go Back** – clicking on the Go Back button will close the History Reports menu and return the user to the Reports screen.

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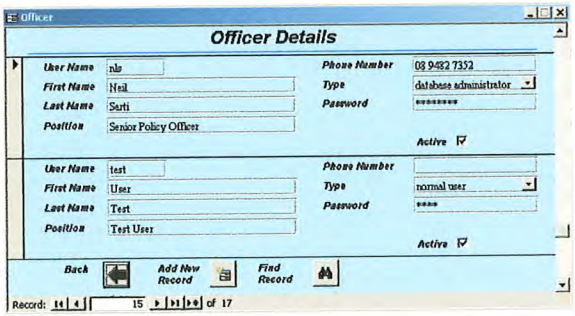
11. ADMINISTRATION MENU

A single mouse click on the Administration button takes you to the following screen. Only staff designated as Database Administrators can access this section. This section allows the Database Administrator to update the Officer and Location tables within the database.

Clicking on the Go Back button will return you to the Main Switchboard.

11.1 Edit Officers

A single click on the Officers button will open the Officer Details screen form (see below).



- **User Name** – insert login information that will uniquely identify the officer. Generally follow the initials of the officer name.
- **Phone number** – contact telephone number for the officer.
- **First Name** – first name of officer.
- **Last Name** – last name of officer.
- **Position** – the position within the organisation occupied by the officer.
- **Type** – select the type of access required by the officer (either Normal User or Database Administrator) from the drop down box.
- **Password** – insert a password for the officer to access *FishRisk*.
- **Active** – tick this box to activate the officer's access to the database.
- **Back** – clicking on this button returns the user to the Administration menu screen.
- **Find Record** – clicking on this button takes the user to the next record containing the search character. First, single click in the field that you wish to search then click the Find Record button. Enter the search character in to the 'Find What' box and click 'Find Next'. The screen form will display either the next entry with the desired character or a message that the item was not found.

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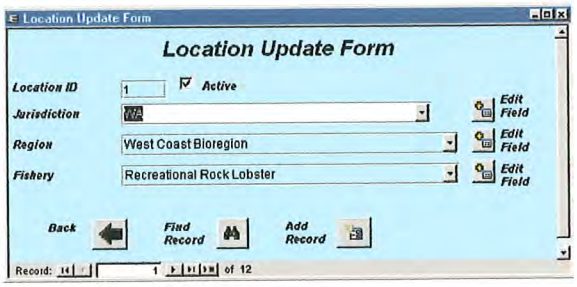
- **Add Record** – clicking on this button takes the user to a new Officer details entry screen form.

To view the list of Officers that have been entered, use the mouse to scroll downwards to view the list. The scrollbar is situated on the right hand side of the screen.

When you have finished editing the Officer Details, use the mouse to left click on the Back button.

11.2 Edit Location

A single click on the Location button will open the Location Update screen form (see below).



- **Location ID** – no information is required. This number is automatically assigned by the database.
- **Active** – tick this box to activate the location combination within the database.
- **Jurisdiction** – this field has been pre-populated with characters representing all the States / territories of Australia and New Zealand. Select a jurisdiction from the drop-down box.
- **Region** – this field has been pre-populated with some regional information depending on the jurisdiction. Select a region from the drop-down box.
- **Fishery** – this field has been pre-populated with some fishery information depending on the jurisdiction. Select a fishery from the drop-down box.
- **Edit Field** – clicking on the Jurisdiction, Region or Fishery Edit Field buttons will open a new record box which allows for the data in that field to be updated either by editing, adding or deleting a field. Note that these field changes may have consequential effects on interrogation of the database. An alternative to deleting a field is to make it inactive by unticking the Active button.
- **Back** – clicking on this button returns the user to the Administration menu screen.
- **Find Record** – clicking on this button takes the user to the next record containing the search character. First, single click in the field that you wish to search then click the Find Record button. Enter the search character in to the 'Find What' box and click 'Find Next'. The screen form will display either the next entry with the desired character or a message that the item was not found.
- **Add Record** – clicking on this button takes the user to a new Location Update entry screen form.

When you have finished editing the Location Update details, use the mouse to left click on the Back button.

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11.3 Setting up Reports

In order to stylise reports to your particular organisation it will be necessary to edit all of the report headers. This can be done by selecting a report, choosing Design View from the View drop-down list on the toolbar at the top left hand of the screen and editing the organisation details directly in the text box.

12. REFERENCES

Standards Association of Australia (1999) *Risk Management* AS/NZS 4360:1999. 45pp.

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APPENDIX

PARAMETERS USED IN *FISHRISK*

The exact spelling of a parameter is required when entering a report query. The following tables lists the parameters* pre-loaded with *FISHRISK*. The Database Administrator has the ability to activate or deactivate these parameters so that only those relevant to your jurisdiction are visible.

** Note that these may be changed / updated by your Database Administrator*

1. Location

Jurisdiction	Region	Fishery
WA (Western Australia)	South Coast Bioregion	Abalone
SA (South Australia)	West Coast Bioregion	Recreational Rock Lobster
VIC (Victoria)	Gascoyne Bioregion	West Coast Rock Lobster
TAS (Tasmania)	North Coast Bioregion	Crab
NSW (New South Wales)	Inland Bioregion	Exmouth Gulf Prawn
CW (Commonwealth)	North Queensland	Shark Bay Prawn
QLD (Queensland)	South Queensland	Shark Bay Scallop
NT (Northern Territory)	Northern Victoria	Trawl (Fish)
ACT (Aust Capital Terr.)	Port Phillip	Tropical Rock Lobster
NZ (New Zealand)	South West Victoria	Mackerel
EXT (External territories)	Westernport Bay	Reef Line
	Whole of Victoria	Inshore Net
	test	Offshore Net
		Trawl (Prawn, Scallop)
		N3,N9 and QFJA
		Harvest Fisheries
		Golden Perch
		Spiny Freshwater Crayfish
		Murray Cod
		Tuna

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2. Risk Category

Risk Category	Description
Sustainability	eg threat to breeding stock
Operational	eg inadequate planning and execution
Human Behaviour	eg regulatory avoidance and illegal activity
Economic	eg currency fluctuations, recession
Environmental	eg pollution
Security	eg unauthorised access
Financial	eg insufficient funding, budget over-runs
Natural events	eg drought, red-tide, deoxygenation
Political	eg change of sentiment and loss of support
Technology	eg superceding of equipment and technology "creep"
Market	eg loss or creation of markets, price and quality movements, entry of new competitors, lack of market intelligence
Stakeholder	eg loss of support, changing values, conflicting expectations
Project Management	eg cost over-runs, missed deadlines, changing scope
Staff	eg skill, experience, qualifications, resignations, retirements, loss of morale, OSH
Information	eg insufficient or misleading intelligence and data
Equipment	eg equipment breakdown or inadequacy
Communication	eg ineffective communication
Advice Related	eg provision of inappropriate, inadequate or wrong advice
Recognition	eg inadequate recognition of compliance requirements
Policy	eg inconsistent application
Legislation	eg ambiguous drafting, unenforceable provisions

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