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Fisheries Research and Development Corporation

Assessment of illegal catches of Australian abalone: development of desk-based survey methods.

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CONTENTS

NON-TECHNICAL SUMMARY	2
ACKNOWLEDGMENTS	4
BACKGROUND	5
NEED	6
OBJECTIVES	7
METHODS	7
PREPARATORY LITERATURE REVIEW	7
SITE VISITS AND DISCUSSIONS WITH STAKEHOLDERS	7
HISTORICAL ANALYSIS	8
DATA COLLATION AND ANALYSIS	9
RESULTS/DISCUSSION	9
BENEFITS	12
FURTHER DEVELOPMENT	12
PLANNED OUTCOMES	14
CONCLUSION	16
REFERENCES	18
APPENDIX 1: INTELLECTUAL PROPERTY	19
APPENDIX 2: STAFF	20
APPENDIX 3: OTHER RELEVANT MATERIAL	20
A: IMPROVING EXISTING SYSTEMS.....	21
1. <i>Enhancing the quantity and utility of data</i>	21
2. <i>Improving the format of official data systems</i>	22
B: UNOFFICIAL DATA SOURCES.....	24
ABBREVIATIONS:	25

NON-TECHNICAL SUMMARY

2000/112 Assessment of illegal catches of Australian abalone: development of desk-based survey methods.

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Objectives:

1. Develop statistically robust desk-based study methods to estimate illegal catches of abalone.
2. Apply the methodology to make contemporary and historical estimates using suitable data collected by government and non-government agencies.

Non Technical Summary

OUTCOMES ACHIEVED

Although the study was unable to produce an estimate of illegal catch, the research provided insights in relation to:

- how current systems and procedures might be improved;
- what further research might be appropriate to assist in the estimation of the level of illegal catch;
- establishing a precedent for future expansion of FRDC sponsored research into fisheries compliance.

The results were understandably disappointing for those seeking to validate anecdotal claims of large-scale illegal abalone fishing. However, this was only one of the study objectives and was clearly contingent on the outcomes from initial phases of the project. Responses to the AIC report from senior fisheries managers indicated that they believed it was an excellent document that will provide valuable guidance for improving the utility of compliance and intelligence databases.

Indeed, Victoria has recently embarked upon an illegal abalone catch recording process that will provide markedly improved statistics to support the longer-term goal of detecting trends and responses in enforcement.

This project has provided the first comprehensive, systematic, and nationwide collation and evaluation of quantitative data from official sources in relation to illegal abalone catches. It was only through such an exercise that the feasibility of using these intelligence and compliance data sources alone to derive estimates of illegal catches could have been determined.

Intelligence and compliance data holdings were established to serve respective fisheries agencies across Australia, and were not created specifically for research purposes. As a result, these data holdings have limited utility as sources of information for deriving estimates of illegal abalone catches. This amounted to a fundamental limitation of the present line of investigation. Intelligence and compliance data will only ever describe a proportion of actual offending. There will inevitably be an amount of abalone theft which goes undetected and/or unreported. As such, these data sources will only ever provide a minimum figure on the amount of actual theft.

The *quantified amounts* of illegal abalone listed on, or derived from, intelligence and compliance data holdings for the period 1 January 1996 to 31 December 2000 totalled slightly more than 50 tonnes. This represents less than 0.2% of the legal commercial catch for the same period if it is assumed that there is no overlap between intelligence and compliance data holdings.

As in other areas of quantitative criminology, assessing the scale of the “black figure” of unreported crime remains problematic. Recourse to survey methodologies may provide some answers, as may the use of sophisticated modelling techniques. The success of such strategies depends, however, on at least some “hard” reliable data being collected by official agencies in the first instance. The task for the future lies in allocating resources to facilitate such data collection, and training those who will be required to implement any new data collection techniques that are devised.

Numerous strategies may aid future attempts to devise such an estimate, and a series of recommendations were provided in relation to:

- enhancing the quality and utility of “official” data on illegal abalone catches;
- improving the format of official databases to enhance their searchability for quantitative research purposes; and
- future research strategies.

Fisheries Victoria has embarked on a process to implement the first two of these strategies, aimed at discerning trends within different categories of breaching abalone regulations.

KEYWORDS: Abalone, Illegal, Compliance.

Acknowledgments

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Commonwealth

- Australian Bureau of Agriculture and Resource Economics
- Australian Bureau of Criminal Intelligence
- Australian Bureau of Statistics
- Australian Customs Service
- Australian Fisheries Management Authority
- Australian Quarantine Inspection Service
- Australian Taxation Office
- Department of Agriculture, Forestry and Fisheries Australia
- Environment Australia
- National Crime Authority
- National Fisheries Compliance Committee

New South Wales

- New South Wales Fisheries

Northern Territory

- Department of Primary Industry & Fisheries

Queensland

- Queensland Boating and Fishery Patrol, Department of Primary Industries

South Australia

- Department of Primary Industries and Resources South Australia
- Abalone Industry Association of South Australia

Tasmania

- Abalone Fisheries Advisory Council
- Department of Primary Industries, Wildlife and the Environment
- Marine and Rescue Division, Tasmania Police
- Tasmanian Abalone Council
- Tasmanian Fishing Industry Council

Victoria

- Abalone Industry Victoria
- Commercial Abalone Fisheries Committee
- Department of Natural Resources and the Environment
- Fisheries Co-Management Council
- Seafood Industries Victoria
- Victoria Police

Western Australia

- Fisheries Western Australia

FINAL REPORT

2000/112 Title Assessment of illegal catches of Australian abalone: development of desk-based survey methods.
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Background

Abalone is one of Australia's most valuable fisheries resources accounting for annual export sales of \$223 million, from approximately 3,800 tonnes of abalone exported during the 1999–2000 financial year (ABARE 2001). Between 1996 and 2000, some 9,524 tonnes of canned abalone, and 8,030 tonnes of abalone in other forms, were exported from Australia. Abalone is a shellfish found in many southern coastal regions throughout Australia. Blacklip (*Haliotis rubra*) and greenlip (*H. laevigata*) abalone are the species harvested commercially in Australia, with smaller amounts of brownlip (*H. cornicopora*) and roe's (*H. roei*) abalone also harvested off the Western Australian coast. Because of its limited supply abalone is now a highly prized commodity, particularly for export to Asian markets. Since the 1980s, attempts have been made to regulate the harvest of abalone with current catch limits of 5,737 tonnes per annum nationwide.

Although illegal activity involving abalone resources in Australia is well known, there has been no previous attempt to collate and to analyse intelligence and compliance data relating to theft of abalone, more commonly described as abalone poaching. Nor have there been attempts to develop data collection strategies to facilitate quantitative estimations of the illegal catch of abalone.

During August 2000, the Marine and Freshwater Resources Institute (MAFRI) of Fisheries Victoria contracted the Australian Institute of Criminology (AIC) to evaluate fisheries intelligence and compliance-monitoring data holdings in relation to abalone theft in order to assess the utility of using data from such sources to derive estimates of illegal abalone catches. This data analysis and evaluation was then to form the basis for the recommendation of strategies for future data collection. The study was undertaken pursuant to the specifications in the research funding contract between the Fisheries Research and Development Corporation (FRDC) and Fisheries Victoria.

The study was planned to proceed in five phases. These were:

- a. to identify, summarise and evaluate existing data;
- b. to develop processes for compiling and analysing data;
- c. to analyse existing data and if feasible estimate illegal catches;
- d. to check the validity of estimates and revise if necessary; and
- e. to recommend strategies for future data collection.

The first three phases were completed in June 2001, at which time an interim report was submitted to MAFRI and the National Fisheries Compliance Committee (NFCC). The remaining phases were completed by December 2001.

This report provides a summary of the findings as well as the data collected during this study. It also makes recommendations about future directions, including suggestions for enhancing the collection, storage and collation of intelligence and compliance data as well as possibilities for additional research.

Need

The deficiency of having little detailed quantitative information on illegal catches of abalone in any State was identified as a high priority for redress in a recent review of abalone fishery research commissioned by the FRDC (FRDC Wild Abalone Fisheries Research & Development Needs Review, Project No. 98/170, pp. 69-70). The importance of obtaining estimates of the illegal catch was also highlighted at the 1999 National Abalone Compliance and National Abalone Research workshops. These workshops strongly supported the development of reproducible methods to establish time series of illegal catches for different geographic regions throughout Australia.

In 1999 the FRDC allocated \$0.5M over 3 years for MAFRI to develop an abalone fishery model suitable for all Australian abalone fisheries (Project 1999/116). Although a lack of estimates of illegal catch has not precluded the development of abalone fishery assessment models, it has compromised the application of these models for predicting stock sustainability because the true catch was unknown. Assessment modelling and risk analysis for the Victorian abalone fishery had demonstrated the sensitivity of stock reduction models to temporal trends in unknown catch.

Although contemporary levels of abalone resource theft are generally perceived to be high, the need to know the true quantity of illegally caught abalone persists regardless of whether the illegal catches are perceived to be high or low. Over-estimating the illegal catch can create assessment difficulties that are as serious as those occurring through assuming it to be zero. In contrast to the abundance of anecdotes about contemporary abalone resource theft, there is scant information about historical trends in illegal catches. Because past trends in total catch are required to draw conclusions regarding the sustainability of the current legal catch, there is a need to know what quantities of past catches were not reported.

Aside from modelling and stock assessment there are other reasons why estimates of illegal catch would be beneficial. From a fisheries management perspective the effectiveness of total allowable catch quotas as output controls on Australian abalone fisheries is severely compromised by illegal catches. Even if stock assessments are based solely on fishery independent data that are not compromised by illegal catch levels, management options when deciding whether to adjust catch quotas may be limited if the scale of resource theft is known. For instance, decreases in legal TAC will not reduce the illegal take and might precipitate an increased in unlicensed effort. Under these circumstances licensed fishers will inevitably bear the burden of any necessary reductions in catch output. Stakeholders would be understandably reluctant to take ownership of such management decisions. Fisheries enforcement would also benefit from estimates of illegal catches, particularly because the underpinning data could be utilised for assessments of compliance rates and evaluation of benefits per unit cost of alternative enforcement options.

Objectives

1. Develop statistically robust desk-based study methods to estimate illegal catches of abalone.
2. Apply the methodology to make contemporary and historical estimates using suitable data collected by government and non-government agencies.

Methods

Preparatory Literature Review

The criminological literature pertaining to the Australian abalone fishery is scant. A literature review found a small number of reports and media articles describing the nature of the illegal market in abalone, and various forms of abalone-related crime, in Australia (for instance, Burns 1999; Murphy 1994; Neales 1997). Links between abalone poaching and other criminal markets, and the involvement of organised crime groups in the distribution of illegal abalone, have been alleged in a small number of reports (Morgan & Papps 1996; Coffey & Hart 1999; Nicholl 1999).

However, the literature review revealed a lack of empirical research seeking to *quantify* abalone poaching in Australia. Indeed, there is a lack of empirical research worldwide on this topic. Occasionally, state fisheries agencies and other law enforcement agencies in Australia have undertaken assessments of the level of abalone poaching at a given time, either within particular states or on a national basis. However, these have not typically utilised rigorous scientific methods in deriving estimates. Such reports have usually provided no explanation of methods used, have stated that the estimate was based on anecdotal estimates from experienced personnel (without using any systematic formulae or extrapolation methods), or have made unsupported claims using limited data. In addition, these assessments have not, in the main, been public documents or, if released, have not fully disclosed their methods or sources of information. In some cases, estimates appear to have been selected arbitrarily with little supporting justification. Previous estimates of the amount of Australian abalone poached each year have ranged considerably. The smallest estimates have placed the level of theft at only a fraction (say 5–10 per cent) of the TAC. The largest have estimated the level of abalone theft to be equivalent to, or even greater than, the national TAC. Generally, estimates have tended to range between these two extremes.

Within this climate of “classified” prior research it is difficult to arrive at a figure representing the true level of illegal take in the Australian abalone fishery. The task of arriving at such a figure with absolute accuracy is, as with any other criminal activity, probably an impossible one. Yet efforts at estimation may be improved by undertaking a full interrogation of available data holdings, evaluating their appropriateness as a basis for deriving estimates of illegal activity, and if necessary, exploring the appropriateness of other means to supplement documented evidence. This was the global objective of the present research project.

Site Visits and Discussions with Stakeholders

Identification and collation of intelligence and compliance data relating to abalone was the mandate for the initial phases of this project. The first step in this exercise was to

identify federal, state and territory agencies holding such data. The primary agencies holding data of this nature were:

- state and territory fisheries departments;
- certain state police agencies (eg. Tasmania Police Marine and Rescue Division, Northern Territory Police); and
- certain federal government agencies (eg. Australian Customs Service, Australian Quarantine and Inspection Service).

Additional information which was not strictly intelligence or compliance data, but which nonetheless provided insight into quantifying the movement of Australian abalone, was also available from:

- federal (non-law enforcement) agencies (eg. Australian Bureau of Agricultural and Resource Economics, Australian Bureau of Statistics); and
- fisheries research agencies.

Discussions with stakeholders from industry as well as law enforcement provided additional information of value in gaining an understanding of the dynamics of the illegal abalone trade in Australia. These stakeholders also provided anecdotal quantitative information along with contextual insights that had implications for the utility of, or suggested deficiencies in, intelligence and compliance holdings as primary sources of data for deriving estimates of illegal abalone take.

Historical Analysis

As part of the quantification exercise, the project called for some historical analysis of abalone poaching activity in Australia. The timeframe selected for the present research was the five-year period encompassing 1 January 1996 to 31 December 2000. The reasons for limiting the analysis to this period were many. The primary consideration was one of feasibility. Discussions with fisheries agencies around Australia at the outset of the project revealed that although almost all had intelligence and prosecution databases, these databases had typically been in place only for the past five to ten years. In a number of states, intelligence reports only began to be reliably uploaded to their databases during the mid-1990s. Although intelligence holdings and prosecutions certainly exist for the period pre-1996, the fact remains that these holdings are in hard copy only. Manual searches of individual files would have been required to extract the relevant information. While possible, this would have been a time-consuming and resource-intensive pursuit. The designated five-year period was deemed sufficient to perform an initial evaluation of the suitability of intelligence and compliance holdings for quantifying the illegal catch of abalone in Australia, and provide for a limited historical analysis.

The following section provides a comprehensive summary of activities for phases 1–3. Some generic points concerning data management are presented first. Data holdings are then reviewed by jurisdiction. This approach enables discussion of differences between each agency's data holdings, modes of data storage, and ease of interrogation for current purposes.

This is followed by a discussion of the limitations of the data holdings. The final part of the report presents the recommendations developed under phase 5, concerning future data collection and data management, as well as strategies and recommendations for

further research.

Data Collation and Analysis

Research was predominantly undertaken in those Australian states containing abalone fisheries: Tasmania, Victoria, South Australia, Western Australia and New South Wales. Each of these States relevant agencies housing fisheries intelligence and compliance data participated. Data pertaining to the illegal catch and movement of abalone during the designated research period—1 January 1996 to 31 December 2000—were identified, collated and analysed. In addition, discussions with stakeholders from industry as well as law enforcement officers were held to learn more about the dynamics of the illegal abalone trade in Australia. Relevant commonwealth agencies with responsibility for fisheries related activities were also consulted.

To varying degrees, each abalone-producing state in Australia collects intelligence information (reports filed by fisheries officers) and compliance data (generally prosecution, infringement, warning or caution information). Given the difference in systems across jurisdictions, each required a different method to collect and analyse data. For the intelligence data in particular, a multi-faceted collation process was required. Quantitative intelligence reports—that is, those relevant reports that referred to amounts of illegal abalone—were coded into one of three basic categories:

- Quantifiable amounts: information coming from reliable sources (eg. fisheries or other law enforcement officers) which detailed specific weights or numbers of abalone;
- Unquantifiable amounts: information from reliable sources which contained reference to amounts of abalone which were not specifically quantifiable, such as “a bag” or “an amount” of abalone; and
- Alleged activity: information received from informants (usually of unknown reliability) about illegal abalone activity.

All amounts of abalone, from both the intelligence and compliance data holdings, were converted into meat-weight figures using abalone conversion rates specific to each state.

Results/Discussion

The following provides an overview of the *quantified amounts* of illegal abalone listed on or derived from intelligence and compliance data holdings for the period 1 January 1996 to 31 December 2000. All values correspond to meat-weight.

- On the basis of *intelligence* databases of all state fisheries services, *and* including figures from Customs’ intelligence database, the total amount of illegal abalone listed in intelligence holdings for the 5-year period was 21,973kg.
- The state with the greatest total quantifiable amount as listed in intelligence holdings was Victoria, with a total of 13,096kg for 1996–2000. This Victorian total accounts for almost 60 per cent of the national total listed above. The state with the least total amount for this period was Western Australia, with a total of 120kg.

- On the basis of *compliance* databases of all state fisheries services, the total amount of illegal abalone listed for the 5-year period was 28,119kg.
- Victoria again had the greatest total amount reflected in this data holding, containing cases representing 18,863kg of illegal abalone between 1996–2000. This constituted 67 per cent of the national compliance figure across the period studied. Queensland had the least amount, with a total of 1,376kg over the 5-year period.

The data collated from official sources across jurisdictions are summarised in Table 1. The total quantifiable amounts collated from each database for the 5-year period studied are presented, along with the total number of quantifiable incidents from which these amounts were taken. Also presented are the annual TACs for each abalone-producing state, to serve as a comparative reference point. When considering the amounts of illegal abalone collated from any of the data holdings for the 5-year period and comparing these amounts to the relevant annual state TAC, it is clear that the recorded and quantifiable amounts of illegal abalone represent only very minor percentages of the TACs. For instance, the total quantifiable amount of illegal abalone represented on Tasmania's intelligence database for the 5-year period, 4,611kg, amounts to only 0.1 per cent of Tasmania's TAC for a single year. Quantifiable amounts of illegal abalone collated from Western Australian intelligence database represent only 0.03 per cent of that state's TAC. Even the largest total amount collated—the Victorian compliance total, of 18,893kg—represents only 1.3 per cent of the Victorian annual TAC.

Clearly then, although the data collated represent a minimum figure on the level of illegal catch (as the data only represent detected and quantified theft), the documented level of illegal catch is well below the level of legal take.

A further way of considering the quantifiable data from official data holdings is to calculate “rates per detection”; that is, the average amount of abalone involved in detections or incidents reported in each database. Such rates may be a valuable tool for use in subsequent criminological research exercises as they can provide a baseline from which to extrapolate to the entire population of the illegal catch. For instance, future research may attempt to determine what proportion of actual theft is detected and recorded onto official databases. If such research were able to derive reliable scaling figures, these could then be applied to detection/seizure rates obtained through “hard data” to calculate a reasonable upper estimate of the illegal abalone catch. The use of extrapolation methods is discussed further under Planned Outcomes.

For each database in each jurisdiction, a “rate per detection” has been calculated. These rates appear in Table 1. Each rate corresponds to the average amount of abalone involved in quantifiable incidents from a particular data holding. Rates were calculated by dividing the total quantifiable amount of abalone collated from a given database by the number of incidents from which these amounts were derived. For instance, the Victorian “intelligence rate” was calculated by dividing the total quantified amount of abalone collated from the intelligence data holding: 13,096kg, by the number of quantifiable intelligence incidents: 136, to arrive at the rate of 96kg/incident.

Of interest is the difference between the rates derived from intelligence and compliance databases, as well as the difference between the rates for different jurisdictions.

Although a full understanding of the reasons for these differences would require further research, these rates give some indication of the seriousness of individual cases detected in each jurisdiction, at least in terms of the meat-weight figures.

Table 1: Summary of data holdings, and rates per detection (as a weight of abalone per incident)

State	Intelligence amounts 96–00 (kg)	No. of events	Rate (kg/event)	Compliance amounts 96–00 (kg)	No. of events	Rate (kg/event)	State TAC (kg) (annual)
Tas	4,611	27	171	1,677	56	30	2,780,000
Vic	13,096	136	96	18,893	356	53	1,440,000
SA	959	26	37	1,552	61	25	867,000
WA	120	13	9	2,319	527	4	345,000
NSW	2,471	48	52	2,332	378	6	305,000
Qld*				1,376	4	344	0
Customs	717	13	55				

* 1999–2000 only

There were a number of factors of relevance when assessing the utility of intelligence and compliance holdings for providing data to estimate the level of illegal abalone catch in Australia. Principal limitations include the following.

- In the absence of interlinked systems, it is not easy to determine the degree of overlap between intelligence and compliance databases.
- Intelligence and compliance systems only contain information on *detected* abalone-related crime. This raises the difficulty of determining the level of undetected poaching and/or the activity of unknown operators, particularly in the absence of field-based research.
- Not all detected or suspected abalone-related crime is recorded on respective fisheries systems.
- Useful quantitative information is not routinely stored in intelligence databases.
- The reliability of informant information is unknown. This raises the issue of whether this type of data should be included in an estimate of poaching in the absence of confirming evidence.
- Prosecution data tend to under-represent levels of illegal activity.
- Compliance and intelligence systems do not readily enable easy extraction of quantitative information.
- Information pertaining to the geographical location of illegal harvesting is problematic.
- There are legal barriers preventing access to certain data (ie. taxation records).

Given this array of limiting factors, it was inappropriate to estimate of the scale of abalone theft in Australia from these data sources. The quantitative data available were simply insufficient and unrepresentative.

Intelligence and compliance data holdings were established to serve respective fisheries agencies across Australia, and were not created specifically for research purposes. As a result, these data holdings have limited utility as sources of information for deriving

estimates of illegal abalone catches. This amounted to a fundamental limitation of the present line of investigation. Intelligence and compliance data will only ever describe a proportion of actual offending. There will inevitably be an amount of abalone theft which goes undetected and/or unreported. As such, these data sources will only ever provide a minimum figure on the amount of actual theft.

Benefits

Although the line of investigation adopted for this project was inadequate to derive definitive estimates of illegal catches of Australian abalone, a number of valuable outcomes were achieved. The project provided the first comprehensive, systematic, and nationwide collation and evaluation of quantitative data from official sources in relation to illegal abalone catches. It was only through such an exercise that the feasibility of using these data sources alone to derive an estimate could have been determined. Although it was shown that these sources alone, in their current format, were insufficient to produce an estimate of illegal catch, the research provided insights in relation to:

- how current systems and procedures might be improved; and
- further research that might be appropriate to assist in the estimation of the level of illegal catch.

Hopefully, when the recommendations of this report are implemented, benefits will flow in terms of adequate data to make quantitative estimates of trends among the illegal sector, that will in turn be translated into management strategies that provide increased resource security and access to the licensed sector.

This study was the first FRDC-funded project to focus on fisheries non-compliance of the unlicensed sector. A concurrent FRDC project (Optimising the efficiency of enforcement in commercial fisheries, Project Number 1998/156) in Western Australia examined non-compliance rates among licensed rock lobster fishers. Together these projects have made valuable contributions towards paving the way for future expansion of FRDC sponsored research into fisheries compliance.

Further Development

It must be acknowledged from the outset that intelligence and compliance databases were not developed primarily for research purposes. Rather, existing databases serve as repositories of information on detected crime, of which only one aspect is the quantitative amount of abalone stolen. Many intelligence reports are not about “detections” and therefore do not contain quantitative information on how much abalone has been taken. Similarly, although some compliance systems, such as prosecution databases, do contain details of the amount of illegal product allegedly stolen, often this detail is not critical from a law enforcement perspective, and thus not always entered on the system.

Despite these limitations, existing databases could be enhanced in terms of the quality, utility, and accessibility of quantitative information they hold. This would increase the

value of these holdings as tools for fisheries, for although successful fisheries law enforcement does not require the recording of exact quantitative information about stolen abalone, successful stock assessment does. Any such improvements would be, in the main, prospective. Little can be done to retrospectively enhance the quantitative detail of historical data. It is, however, possible to enhance both the amount and utility of future “official” data, and to improve the format of official collection and storage systems.

Strategies for enhancing the quality and utility of official data include:

- establishing consistent reporting guidelines across jurisdictions which would promote the full reporting of intelligence concerning illegal abalone, as well as the full referral of these data to central intelligence databases;
- encouraging greater quantitative detail in intelligence reports;
- ensuring that quantitative information on illegal take by the licensed sector is available and is included in the collation exercise;
- assessing allegations, especially those relating to large-scale illegal activity;
- ensuring that all quantitative data coming from long-term investigations is included in the collation exercise;
- encouraging attempts to determine the specific source reef or coastal area of stolen abalone;
- encouraging reporting by industry.

Strategies for improving the format of official data systems include:

- improving searchability for quantitative analysis purposes, including the adoption of a standard definition of the “illegal take”;
- improving the ability to locate relevant cases, and to locate quantitative information within those records;
- establishing a national fisheries intelligence system;
- establishing an effective case-management capacity within each jurisdiction’s compliance database;
- exploring the feasibility of case-management system(s) to enable electronic linkage between intelligence and compliance systems.

In addition to the above suggestions that deal with improving data collection practices in relation to official sources of information, it may be possible to estimate the actual level of illegal activity within the industry by carrying out various investigations into unofficial, or unreported matters. Potential strategies for supplementary data collection include: extrapolation from official data; survey methods; alternate stock assessment methodologies; triangulation of “catch” estimates with other data on the illegal abalone catch; and economic modelling.

Suggestions for future research include:

- gathering additional information (in particular, data about the number of unlicensed divers and detection rates in relation to illegal abalone catches) to enable extrapolation from current baseline figures;

- surveying knowledgeable people, such as known abalone poachers, fisheries officers, industry representatives and local residents, about abalone poaching. (Surveys should canvass areas including the number of unlicensed divers, frequency of offending, the size of illegal catches, and remote-area fishing, to assist an estimate of the black figure representing undetected crime);
- exploring ways of adapting stock assessment data for use in quantitative investigation of illegal take—in particular, by using stock assessment data to determine the extent to which the abalone resource is being depleted beyond expected natural parameters;
- triangulating catch estimates with “end of market” estimates by determining the amount of illegal abalone entering the market at various points in the distribution chain—for example, the amount of illegal abalone used for personal consumption, sale (domestically and internationally), and illegal export—through surveys and other data collection methods; and
- expanding the use of economic modelling across all fisheries agencies as a means of auditing the licensed sector to identify any discrepancies between declared abalone and profit margins, as well as any potential involvement in illegal activity.

Planned Outcomes

The aim of the present study was to evaluate existing data held on official systems and attempt to estimate illegal catches of abalone. However, the information collated during the present study was insufficient to provide an estimate of the scale of illegal abalone fishing in Australia. Despite this limitation in outcome, the project provided the first comprehensive, systematic, and nationwide collation and evaluation of quantitative data from official sources in relation to illegal abalone catches. It was only through such an exercise that the feasibility of using these data sources alone to derive an estimate could have been determined. Although it was shown that these sources alone, in their current format, were insufficient to produce an estimate of illegal catch, the research provided insights in relation to:

- how current systems and procedures might be improved; and
- further research that might be appropriate to assist in the estimation of the level of illegal catch.

In relation to the improvement of current systems and procedures the Special Investigations Group (SIG) of Fisheries Victoria has produced responses to each of the specific recommendations in the AIC report. These responses are listed in Appendix 3. Those recommendations aimed at improving the consistency of reporting in greater quantitative detail and the capacity to efficiently search and extract data from compliance and intelligence databases are currently being implemented in Victoria.

For example, in an endeavour to provide consistent quantitative information from prosecution briefs and intelligence reports an accompanying Illegal Abalone Catch Record form will be introduced. A prototype of this form is described as follows:

Illegal Abalone Catch Record

- Completed forms are to be submitted to the Special Investigations Group, Intelligence Office
- All forms should accompany an information report or a PIN or Brief reference number
- It is requested that officers identify themselves only by officer number on the form as it is anticipated that these forms may be released to other agencies.

The following additional information relates to the information to be included in the relevant fields:

<u>Field name</u>	<u>Information type</u>
Date of offence	<i>date offence was observed</i>
Species	<i>blacklip, greenlip, hybrid</i>
Form	<i>live in shell, whole meats, cut meats, IQF, frozen, dried, par boiled, canned, retort undersized</i>
Weight	<i>estimated or actual weight – if known</i>
Number	<i>estimated or actual weight – if known</i>
Reef code	<i>source of fish, reef code if known</i>
Location	<i>approximate location of fish when observed or seized</i>
Comment	<i>any other information relevant to the abalone – condition, size, age, etc.</i>

The above information should be assessed and entered under one of the three categories available:

Proven / Confirmed, Highly Likely / Unconfirmed or Probable / Unconfirmed

Confirmed / Proven *This is generally equivalent to an AI information rating and would apply only to seized abalone, ie. Suspicion is confirmed and fish is proven to be abalone on inspection*

Highly Likely / Unconfirmed *This rating would apply to observed activity, perhaps of a known offender, where it is reasonable to assume that observed bags contain illegal abalone. However, as no inspection or seizure took place, abalone cannot be confirmed.*

Probable / Unconfirmed *This rating would apply to situations such as similar fact cases where no abalone was physically sighted but evidence obtained indicates similar activity.*

It will be possible to have more than one set of information on each form. For example, if activity is observed on one day, and repeated the next day resulting in an apprehension and seizure, abalone observed on the first day would be entered in the Highly likely/unconfirmed column and the abalone seized on the second day would be entered in the confirmed/proven column. In this case, either date of offence would be appropriate, as the form would be attached to an IR or refer to the PIN or Brief number, information can be cross-referenced for further information at a later date.

It is anticipated that a similar approach could be adopted for capturing observations about time, place and nature of illegal activity directly observed by licensed abalone divers during the course of their fishing activities. Provision to record this information in a consistent manner could be accommodated in divers' fishing logbooks. Comparison of these observations with those from enforcement officers may facilitate estimation of detection rates for some categories of offences.

It is likely that a more complete quantitative description of abalone crime will be derived from multiple rather than single information sources and that co-operation and collaboration among key stakeholders will be required for its delivery.

Conclusion

The aim of the present study was to evaluate existing data held on official systems concerning illegal catches of Australian abalone. The core focus was upon quantifiable data, and the purpose of the research was to determine the feasibility of using such data to estimate the level of illegal take.

To enable some historical analysis, data was collated for the period 1 January 1996 to 31 December 2000. The quantified amounts of illegal abalone listed on or derived from intelligence and compliance data holdings during this period may be summarised as follows. All values correspond to meat-weight.

- On the basis of *intelligence* databases of all state fisheries services, *and* including figures from Customs' intelligence database, the total amount of illegal abalone listed in intelligence holdings for the 5-year period was 21,973kg.
- On the basis of *compliance* databases of all state fisheries services, the total amount of illegal abalone listed for the 5-year period was 28,119.1kg.

For a number of reasons, these data were determined to be unrepresentative of the true scale of the illegal catch, and at most could be described as a minimum figure in respect of the level of illegal abalone fishing. Limitations to the data and data systems included the following:

- Intelligence and compliance holdings only contained information on detected abalone-related crime.
- Not all detected or suspected abalone-related crime was recorded on respective fisheries data management systems.
- Useful quantitative information was not routinely stored in intelligence holdings.
- The reliability of informant information was unknown.
- Prosecution data tended to under-represent levels of illegal activity.
- Compliance and intelligence systems did not readily enable easy extraction of quantitative information.
- Information pertaining to the geographical location of illegal harvesting was problematic.

Although the information collated during the present study was insufficient to provide an estimate of the scale of illegal abalone fishing in Australia, the need for such an estimate remains. While the present line of investigation was inadequate to derive such an estimate, a number of valuable outcomes were achieved. The project provided the first comprehensive, systematic, and nationwide collation and evaluation of quantitative data from official sources in relation to illegal abalone catches. It was only through such an exercise that the feasibility of using these data sources alone to derive an estimate could have been determined. Although it was shown that these sources alone, in their current format, were insufficient to produce an estimate of illegal catch, the research provided insights in relation to:

- how current systems and procedures might be improved; and
- what further research might be appropriate to assist in the estimation of the level of illegal catch.

Numerous strategies may aid future attempts to devise such an estimate, and a series of recommendations were provided in relation to:

- enhancing the quality and utility of “official” data on illegal abalone catches; and
- improving the format of official databases to enhance their searchability for quantitative research purposes.

Although the recently concluded FRDC project, 1999/164 "Application of molecular genetics to the Australian abalone fisheries: forensic protocols for species identification and blacklip stock structure", was unable to demonstrate that abalone specimens of the same species could be unequivocally assigned to a specific geographic origin with the rigour required for successful prosecutions, there was sufficient discrimination for these DNA-based techniques to be of some use in determining the likely origin in some instances. This has some potential for spatial analysis of data about illegal catches. Consequently, Fisheries Victoria will be encouraging enforcement officers to collect tissue samples from seized catches to aid in both intelligence and data analysis.

As in other areas of quantitative criminology, assessing the scale of the “black figure” of unreported crime remains problematic. Recourse to survey methodologies may provide some answers, as may the use of sophisticated modelling techniques. The success of such strategies depends, however, on at least some “hard” reliable data being collected

by official agencies in the first instance. The task for the future lies in allocating resources to facilitate such data collection, and training those who will be required to implement any new data collection techniques that are devised.

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Appendix 1: Intellectual Property

No intellectual property has arisen from the research that is likely to lead to significant commercial benefits, patents or licences. Intellectual property associated with the data used during the project remains the confidential property of the participating government agencies. The intellectual property associated with the data analyses will be shared between MAFRI and FRDC.

Appendix 2: Staff

Name	Project Role	Position	Organisation
Harry Gorfine	Principal Investigator	Abalone Subprogram Leader	Marine & Freshwater Resources Institute
Murray Donaldson	Adviser	Chief Fisheries Investigator	Fisheries Victoria (new Chair NFCC)
Iain Bruce	Adviser	Analyst/Investigator	Special Investigations Group, Fisheries Victoria
Brian Hemming	Adviser	Ex-Chair	National Fisheries Compliance Committee
Rebecca Tailby	Contracted Researcher	Research Analyst	Australian Institute of Criminology
Frances Gant	Contracted Researcher	Research Assistant	Australian Institute of Criminology
Peter Grabosky	Adviser	Research Director	Australian Institute of Criminology

Appendix 3: Other relevant material

AIC Report: A final report for this project was submitted to MAFRI by the AIC during December 2001 in fulfilment of the research contract between the two organisations. Because dissemination of the detailed contents of the AIC report has the potential to compromise the integrity of fisheries enforcement it must remain confidential. It has however, been distributed among Directors of fisheries, Heads of fisheries enforcement agencies, members of the National Fisheries Compliance Committee, senior fisheries enforcement officers and the executive of FRDC. This Final Report to FRDC is an abridged version of the AIC report, with sensitive information omitted, that is intended for public distribution. The majority of the intellectual property in this report was developed by the AIC.

List of Recommendations *and SIG Comments.*

A: Improving Existing Systems

1. Enhancing the quantity and utility of data

1.1 Establish consistent reporting guidelines within and between jurisdictions that promote the full and consistent reporting of intelligence including quantitative information concerning the illegal abalone catch, as well as full referral of these data to the central intelligence database.

- Fully support consistent reporting guidelines within and between jurisdictions. Live weight equivalents should be the ultimate quantitative figure.
- No national database currently exists. Options are; (a) to utilise ABCI database. This will be costly and information cannot be extracted by fisheries agencies. There is also a minefield of privacy, FoI and other legal implications. NOT ACCEPTABLE (b) establish a national database within one jurisdiction that collects and maintains information on quantitative illegal take records consistent with the above mentioned guidelines. The information collected would be forwarded to the national coordinator in the nominated jurisdiction and be available to all participating jurisdictions.

1.2 Ensure that quantitative information on suspected illegal take by the licensed operators is recorded on the intelligence system, or stored in quota management systems in a manner that enables simple collation and extraction of relevant data.

- Intelligence on quota fraud is generally limited in quantity. Industry is a closed shop and very little information about illegal activities is reported. Trends detected in the data input process are currently referred to investigators for action. There are varying levels of sophistication with recording quota transactions, Victoria and Tasmania have robust systems, however other jurisdictions would need to upgrade there requirements in this regard.

1.3 “Unquantifiable” terms such as bag, crate and fishbin etc. should be avoided when describing the detection of illegal abalone. Officers should attempt to quantify precise amounts involved in each case when filing a field report. National standards could be developed to enhance this process.

- Agreed. NFCC to determine common measures and terms.

1.4 Fisheries investigators should seek to examine the veracity of allegations from informants regarding large-scale movement and trade of illegal abalone. The outcome of such examinations should be reported on the intelligence database and be linked to the original report containing the allegation.

- Agreed. Each jurisdiction to commit to this recommendation.

1.5 Quantitative data coming from long-term investigations should be fully recorded in the collation exercise and an indication given of the amounts of illegal catch that were investigated, actually charged, and in respect of which the offender pleaded guilty (see the section *Linkage of Intelligence and Compliance Systems—compiling from one system only*, for ways of improving the format of data sources to facilitate this).

- Agreed. Each jurisdiction should establish an operations register which acts as a case manager to eliminate duplication of information on both an intelligence system and a compliance (prosecution) system. It is not acceptable to integrate both systems as they have distinct and different purposes, most notably prosecution data is public information and intelligence is not. During the development of this report it was acknowledged that there was a deficiency and therefore Victoria established an operations register.

1.6 Attempts should be made to determine the specific source reef or coastal area from which abalone were illegally taken. A specific field should be incorporated in field-report forms as well as in the central database.

- Agreed. DNA technology developments will assist with this task. However it is possible to document the origin to at least coastal area detail as this is mostly known at the time of seizure. This information will be reported to the coordinator by the responsible officer who either seizes or recovers (finds) the abalone. Guidelines for reporting this information by modified intelligence report that details;
 - Name address, DOB of offender
 - abalone seized,
 - abalone alleged to be taken,
 - form of abalone,
 - live weight equivalent
 - reef code where abalone taken.

1.7 Efforts should be made to encourage the engagement of industry in reporting intelligence on illegal activity in the abalone industry to relevant law enforcement agencies.

- Agreed

2. Improving the format of official data systems

Improving searchability of existing systems for quantitative analysis purposes:

2.1 Prior to data collection, fisheries should define carefully the “illegal take”, ie. what cases/scenarios are to be included in the analysis. Maintenance of as much uniformity as possible in the definition across jurisdictions would facilitate comparability of data.

- Agreed. Any abalone not conforming to the National Docket system has been taken illegally.
- 2.2 A specific information field should be added (where this does not already exist) to intelligence report pro formas and intelligence databases, to record fish species.**
- Agreed. All databases should have a separate field for species.
- 2.3 A specific information field should be added (where this does not already exist) to prosecution summary pro formas and prosecution databases, to record fish species.**
- Agreed.
- 2.4 The capacity of compliance systems should be reviewed so as to enable broad searches across multiple abalone-related offences to be conducted, and to ensure that fisheries database personnel are able to programme such searches.**
- Agreed. Could be cost prohibitive. Refer to Offence Management Unit (OMU).
- 2.5 The current system for monitoring changes of legislation/ regulations and recording these changes on compliance database coding systems should be reviewed. There should be minimal disruption to database indexation schemes so that cumulative collation of similar/identical offence information across a period of time is not hindered by legislative change.**
- Agreed. Could be cost prohibitive. Refer OMU.
- 2.6 Specific information fields should be added to intelligence report pro formas and intelligence databases to enable the recording of quantitative data concerning illegal product.**
- Agreed. Refer 1.6
- 2.7 Specific fields should be added (where they do not already exist) to compliance databases to record quantitative data concerning the amounts of illegal abalone for which offenders were warned, issued with an infringement notice, prosecuted, convicted, and sentenced.**
- Agreed. Could be cost prohibitive. Refer OMU and 1.6.

Linking between, and within, database systems:

- 2.8 Consideration should be given to the establishment of a national fisheries intelligence database which incorporates an effective case-management capacity from all states and territories (as well as relevant commonwealth agencies which hold fisheries data).**
- Agreed. Highly unlikely due to costs and constraints associated with ACID and the inability for fisheries agencies to have influence and access to established national databases.
- 2.9 Consideration should be given to the establishment of an effective case-**

management capacity within each jurisdiction's compliance database.

- Agreed. Victoria already has in place.
- 2.10 Consideration should be given to creating a summary IR for cases involving multiple records (for instance, long term investigations), which lists the total amount of abalone involved in the case or investigation.**
- Agreed.
- 2.11 Consideration should be given to the establishment of case-management systems to enable electronic linkage to be undertaken between intelligence and compliance systems in order to avoid double-dipping on amounts included in the quantification exercise.**
- Not agreed. Systems are purpose built and linkage is not necessary or desirable (security issues) if other recommendations for refinement of reporting are adopted. A separate database with the consolidated information will be established. This database will collect and maintain prosecution records, case management records and intelligence information.
- 2.12 Future collation making use of official data sources should take into account the time-lag factor, especially with regard to compliance records. Greater emphasis on collation from intelligence systems may resolve some of the difficulties, particularly if a multi-system case management capacity were introduced.**
- Agreed. Refer 2.11

B: Unofficial Data Sources

- 2.13 Conduct new research to gather additional information (in particular, data about the number of unlicensed divers and detection rates in relation to illegal abalone catches) to enable extrapolation from current baseline figures.**
- Agreed. This will be on the agenda for a statewide compliance workshop in May 2002.
- 2.14 Survey knowledgeable people, such as known abalone poachers, fisheries officers, industry representatives and local residents, about abalone poaching. Surveys should canvass areas including the number of unlicensed divers, frequency of offending, the size of illegal catches, and remote-area fishing, to assist an estimate of the black figure representing undetected crime.**
- Agreed. Refer 2.13
- 2.15 Explore ways of adapting stock assessment data for use in quantitative investigation of illegal take—in particular, by using stock assessment data to determine the extent to which the abalone resource is being depleted beyond expected natural parameters.**
- Agreed. Refer Harry Gorfine. H.G. Response: There is no way of discriminating between the effects of legal and illegal fishing mortality at

the present scale of assessment. Mortality from illegal fishing is an integrated signal in changes in fishery independent abundance estimates and is notionally factored into fishery assessment modelling as unaccounted catch. To some extent there is capacity to conduct sensitivity tests to establish the possible range of unaccounted catch that can be reconciled within the modelling. This will not provide a definitive estimate of illegal catch. As more biological data are acquired it will be possible to model the fishery at finer spatial scales that may provide a better indication of the relative scale of illegal to legal catch. A program of systematic recording of shell-dumps and trails, both at sea and on land, has some potential to provide spatial and quantitative information. Relative numbers of shells, accumulation rates and size frequency can all be measured, although additional information would be required for robust interpretation of these statistics.

2.16 Estimate the amount of illegal abalone entering the market at various points in the distribution chain—for example, the amount of illegal abalone used for personal consumption, sale (domestically and internationally), and illegal export—through surveys and other data collection methods.

- Agreed. Refer 2.13

2.17 Expand the use of economic modelling across all fisheries agencies as a means of auditing the licensed sector to identify any discrepancies between declared abalone and profit margins, as well as any potential involvement in illegal activity.

- Agreed.

Abbreviations:

ABCI	Australian Bureau of Criminal Intelligence
ACID	Australian Criminal Intelligence Database
DOB	Date of Birth
FOI	Freedom of Information
IR	Intelligence Report
NFCC	National Fisheries Compliance Committee
OMU	Offence Management Unit



No. 225

The Illegal Market in Australian Abalone

Rebecca Tailby and Frances Gant

For some time there has been growing concern about the illegal trafficking of Australian abalone (a highly prized shellfish delicacy). As global populations of the resource decline, increased pressure is placed on Australia's abalone fishery to meet ongoing international demand. This strong demand, which is not being fully met through the legitimate trade, creates incentives for people to supply the black market with stolen or "poached" abalone. Abalone has become an attractive criminal commodity, and reports suggest that a profitable illegal market exists alongside the legitimate market. While abalone poached from Australian waters may find its way into the domestic market, the majority is destined for overseas export.

The first question always asked is "what is the size and value of the illegal market?" On the basis of information currently available, the Australian Institute of Criminology has not been able to answer this question. The AIC has a strong research interest in illicit markets and this paper explores the nature of the illicit market in Australian abalone. It examines the various players involved in this illegal trade, vulnerabilities in the legitimate industry, and potential options for disrupting the illicit market.

Adam Graycar
Director

Abalone is a gastropod mollusc found on rocky reefs along the Australian coastline but mainly harvested off the colder waters of the southern states. The meat of these shellfish is regarded as a delicacy in certain cultures and is highly sought after, particularly in Asian markets. Australia currently produces around one-third of the global wild abalone harvest, with national export earnings from fresh, chilled and frozen abalone rising from \$86.7 million in 1998–99 to \$102.5 million during 1999–2000 (ABARE 2002). Australia's stake in global supply has increased following the decline and/or disappearance of abalone populations in other parts of the world—including Japan, Mexico, South Africa and the United States (California)—due to negative environmental conditions, limited stocks, illegal fishing and poor fisheries management.

The increasing scarcity of abalone-producing reefs overseas and the growing pressure on Australia's abalone fishery to meet global demand have placed Australian abalone at a premium. While total allowable catch (TAC) limits on abalone harvesting have been set by each abalone-producing state in Australia to protect this resource, ongoing demand from consumers, coupled with high profits to be made from abalone sales, are providing the incentive for further amounts to be harvested illegally. The purpose of this paper is to explore such illegal harvesting and, more specifically, the illicit market in Australian abalone.

Methodology

This paper is based on research undertaken by the Australian Institute of Criminology on behalf of the Marine and Freshwater Resources Institute of Fisheries Victoria. The project involved analysis of fisheries-related intelligence and compliance data in order to derive an estimate of the scale of illegal abalone catches in Australia. Although a quantitative exercise, much qualitative information came to light during the course of the project and forms the basis of the following discussion.

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Information was obtained through three principal means:

- discussions with a range of stakeholders, including fisheries officers from all Australian jurisdictions, personnel from other law enforcement agencies responsible for fisheries compliance (such as Tasmania Police and the Australian Customs Service) and a range of abalone industry representatives;
- a comprehensive review of abalone-related intelligence and compliance data holdings in all jurisdictions; and
- a review of media and other literature.

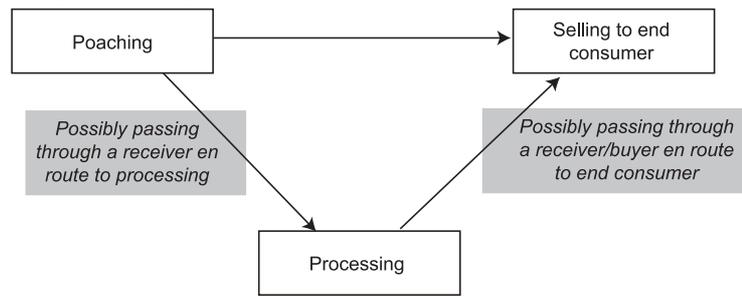
Regulation in the Abalone Industry

To ensure protection of Australia's abalone fishery and avoid over-exploitation, there is strong regulation of the abalone industry in Australia. In addition to TAC limits, there is an abalone licensing system which restricts the number of people who can legally harvest abalone. Abalone dive licenses are a valuable commercial asset, realising up to \$2 million when traded.

Respective state fisheries agencies undertake continuous assessment, monitoring and management of the abalone fishery. Each state has legislation and associated regulations outlining permitted and prohibited activity in the abalone fishery. Although certain regulatory controls pertain across all abalone fishing in Australia (such as minimum size limits and closed fishing seasons, which apply to commercial and recreational fishers alike), regulation is heavily focused on the commercial sector.

All commercial abalone divers must complete catch records upon landing their daily take of abalone. From this point on (that is, from catch through to sale) abalone must at all times be accompanied by conforming documentation (docketing) as proof of its legitimacy (see National Fisheries Compliance Committee 1999). This docketing system allows abalone to be tracked through the market. It also permits comparison of declared amounts along the chain (that is, from landing to delivery to processor to subsequent consignment) to enable detection of any discrepancies. Detailed quota-management systems exist in each state fisheries agency which enable reconciliation of diver, processor and export

Figure 1: Stages in the illegal abalone market



records, and the tracking of catch against quota limits.

Compliance monitoring by fisheries agencies encompasses the above aspects in relation to the licensed sector, and also includes policing of unlicensed poachers. Customs and the Australian Quarantine Inspection Service (AQIS) also have a role in compliance monitoring at the border.

The Illegal Market

Despite the extensive regulatory framework governing Australia's abalone fishery, illegal abalone harvesting and trading does occur. The capacity of individuals to enter the legal market is restricted by the limited availability of abalone dive licenses and the high costs of purchasing a license and associated set-up fees. When considered alongside the potential profits to be made through illegally harvesting and trading abalone, this combination of factors may motivate the entry of individuals to the illegal market. Figure 1 shows the stages in the illegal abalone market while Figure 2 shows the different ways in which abalone may be illegally caught, processed and either used by or sold to the end consumer. It should be noted that the methods used by those operating outside legal channels do not differ greatly to those used by legitimate divers and processors.

Abalone poachers can be loosely categorised into five types of offenders, varying in their levels of sophistication and method. Of course, these are neither exclusive nor exhaustive categories but rather provide a general overview of the different ways abalone is taken from the water.

Organised Poachers

Organised poachers share some characteristics with commercial licensed divers in that many work from boats and/or the shore, mostly

using surface-supplied air ("hookah equipment") or scuba (self-contained underwater breathing apparatus), and are generally proficient divers who are able to harvest large quantities of abalone efficiently. Many organised poachers operate in "crews" incorporating divers, deckhands, lookouts and couriers. Unlike licensed divers, poachers generally shuck their abalone (that is, remove the meat from the shell) under the water, returning only with the meat. This reduces the weight of the catch and makes the abalone easier to manage.

In order to avoid detection and maximise the size of catches, organised poachers are willing to:

- dive under the cover of darkness;
- dive in areas which are remote and/or difficult to access;
- use sophisticated technology to assist poaching (for example, infra-red night vision equipment) and to track or report the presence of compliance officers in the area through radios and scanners;
- cross state borders to harvest abalone; and
- fish for days at a time.

Many organised poachers have developed elaborate methods for concealing and moving illegally caught abalone. These include:

- hiding their catch either close to the beach or at sea, often submerged in a known location and/or with some form of beacon or buoy to mark the site for later pickup;
- building secret compartments in boats to conceal poached abalone;
- creating makeshift abalone storage receptacles in cars (for example, converting additional petrol tanks) to avoid detection during transit from the beach;
- hiring small planes to drop off divers in remote areas, returning later to collect and transport large catches of illegally caught abalone; and
- using hire vehicles to transport stolen catches to avoid asset forfeiture provisions if the authorities intercept the vehicle.

The majority of organised poachers make the greater part of their income through illicit means. It is estimated that one of the more well-known abalone poachers in Australia made in excess of \$1 million per year from the harvest and sale of illegal abalone (Neales 1997). The lucrative nature of the abalone trade is reportedly beginning to attract the interest of some organised crime figures. There are suggestions that outlaw motorcycle gangs and Asian crime figures have entered the market, acting as buyers and distributors and establishing illicit networks extending overseas to the consumer markets in Asia (Morgan & Papps 1996; Neales 1997; Nicholl 1999).

These trends are perhaps not surprising, given reports that organised criminal groups grew to dominate the illicit abalone market in some other abalone-producing countries such as South Africa (Gastrow 2001). It has been suggested that illegal Australian abalone is being traded for heroin and marijuana overseas (Coffey & Hart 1999). Within Australia, anecdotal evidence from several jurisdictions suggests links between the trade in illegal abalone and local illicit drug markets. The growing evidence of serious criminality, both in terms of the calibre of criminals taking up key

roles in the distribution of illegal abalone, and the links between the illegal abalone trade and other established transnational and local criminal markets, provides reason for concern.

Licensed Divers

While the majority of licensed divers operate legitimately within their industry, there may be a few who exploit their position by engaging in quota fraud. This is done either by harvesting catches which are not declared (that is, fishing “over their quota”), or by “fudging” catch weight records to misrepresent the true amount of abalone caught. Excess abalone may be supplied directly to consumers or to processors for illegal preparation and sale. Unlike organised poachers, licensed divers supplement their legitimate income with illicit activity.

Shore-based Divers

As the name suggests, shore-based divers generally poach abalone close to the beach. Rather than using a boat and hookah, shore-based divers prefer to use scuba equipment and enter the water via the beach or cliff faces. If not intending to harvest a large catch, shore-based divers may free-dive for abalone using mask, fins and snorkel. As with organised poachers, abalone is generally shucked under the

water and bagged. Bags are either carried to shore or left under the water to be picked up at a later time. While shore-based divers tend not to be as active as organised boat-based poachers in terms of the length of time spent poaching, they may still harvest significant catches. Shore-based divers have been known to cut their own walking tracks and trails to access abalone-rich coastal reefs, to negotiate with private land owners for access to certain cliffs/beaches, and to set up ropes and climbing aids to access poaching spots.

Extended Family Groups

Although not considered to be classic poachers, extended family groups also pose a threat to scarce abalone resources, particularly those within the intertidal zone. These groups—which can consist of up to 20 people—often operate on weekends. Groups typically harvest abalone to the cumulative recreational bag limit (usually with only a few members of the group actually doing the harvesting) and stockpile the goods. The methods used to poach abalone are generally basic, and most often involve wading in shallow water or using a snorkel and fins.

Having collected the combined bag limit, family groups will either:

- continue to harvest over the bag limit, hiding excess catch in and around poaching areas for later pick-up to avoid detection; or
- take the catch home, then return to harvest a second and sometimes a third time—this is known as “double-bagging” or “double-dipping”.

Much of the abalone taken by extended family groups is for personal use, although it has been suggested that excess amounts of abalone are used to supply local restaurants and other illicit buyers.

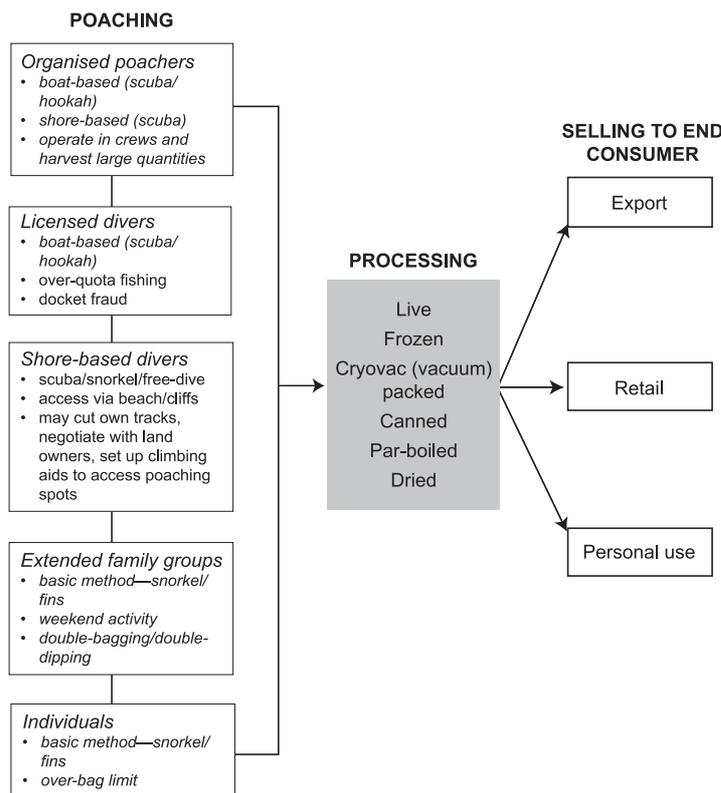
Individuals

Individuals may also take over-the-bag-limit abalone and stockpile, as well as hide, the fish. These people tend to be opportunistic offenders who poach as the need arises, whether for personal use or to earn some easy money. Again, the methods used are relatively basic.

Illegal Processing

Processing of abalone may be quite minimal, requiring the abalone to be shucked, frozen or parboiled; some abalone are even shipped “live”.

Figure 2: Methods used in each stage of the illegal abalone market



Alternatively, processing may be more sophisticated and involve canning, drying or cryovac (vacuum) packaging.

Illegal processing encompasses the processing of illegally caught abalone either by registered processors or by non-registered “backyard” processors. Legitimate processors may collude with licensed divers to disguise quota fraud activity and/or may accept illegally caught abalone from unlicensed divers for illegal processing.

Registered processors may disguise the movement of illicit abalone by:

- manipulating the amounts of abalone recorded on official fish transfer dockets in order to disguise the processing of off-quota abalone;
- over-packing export consignments, enabling some illicit abalone to be moved with legitimate consignments; or
- overstating “recovery rates”.

In South Australia and Western Australia, where abalone are permitted to be shucked prior to landing, recovery rates refer to the actual weight of abalone meat that remains after the loss of fluid (water) which occurs during transit from the beach to the processing factory. In the south-eastern Australian states, where abalone must be landed and transported whole to processing facilities, recovery rates refer to the proportion of the meat that remains after removal of the shell and viscera. Unscrupulous processors may claim an artificially high recovery rate in order to supplement the legal catch with illicit abalone, laundering it in the process. It is difficult to assess the level of illegal abalone being moved through registered processing premises, or the proportion of registered processors engaging in illegitimate activity.

As for processing by non-registered operators, fisheries officers report that abalone offenders have sometimes been caught processing abalone in makeshift rooms in private residences, using rather unsophisticated methods. Certainly in the case of live, frozen or cryovac abalone, preparing the product for sale is not necessarily a complicated process. However, a recent operation in Victoria highlights the level of organisation and sophistication that some illegal abalone processors are willing to adopt (see case study).

Case study: Tat Sang Loo

In *Tat Sang Loo* (unreported judgment of the Dandenong Magistrates Court, 17 March 1999), Loo represented the highest link of a Victorian network that facilitated the collection, payment, processing and distribution of illegally caught abalone into New South Wales and Queensland. Illegal abalone received by Loo was processed at his residence, half of which had been converted to an illegal processing factory. The “factory” comprised ceilings equipped with exhaust fans, three washing machines and bathtubs to wash abalone, and seven gas stoves and large cooking pots to cook the abalone. Three cryovac machines were also used to vacuum-seal the product and an entire room had been purpose-built as an abalone-drying kiln. Raids at this and additional premises resulted in the seizure of 31,004 abalone which had an estimated street value of \$750,000. Extensive records seized during the raids revealed that between October 1997 and September 1998, Loo had processed and consigned 9.8 tonnes of abalone to New South Wales and Queensland (wholesale value of \$1.35 million). The abalone were destined for wholesalers, Asian food markets and duty-free shops in Sydney and Surfers Paradise. Loo pleaded guilty to 14 charges of possessing, receiving and consigning excess abalone without a licence, and was sentenced to 18 months’ imprisonment. He has also been subject to various financial penalty orders totalling more than \$1 million.

Consumers

There is no one identifiable pathway for the movement of illegal abalone from ocean to end consumer, and indeed abalone may move through a number of hands before reaching the end consumer. For example, illegal abalone may move straight from a diver to a processor to a consumer. Alternatively, illegal processors may sell to receivers or direct to a network of buyers, many believed to be based in Melbourne, Sydney and the Gold Coast. Poached abalone may then be sold to restaurants and retail outlets over the counter or through consignment. Of course some illegal abalone never enters the market but is directly consumed by the poacher.

Legal and illegal abalone is predominantly intended for export, yet is usually first sold domestically to buyers. Within Australia, illegal abalone is generally transported via private means, such as air or road couriers. Occasionally, interstate transport may be as unsophisticated as a number of large eskies of abalone packed in ice and put in the back of a car or light plane. The majority of illegal Australian abalone gets marketed for sale and export, either direct to consumer markets in Asia, or indirectly via sale to Asian tourists and tour groups visiting Australia.

In the case of export, abalone may be concealed:

- through false labelling of export consignments, such as labelling canned abalone as some other product (for example, vegetables), or exporting small amounts of

dried abalone through the post and misdeclaring the contents;

- by mixing abalone with other product in export packaging so it passes undetected on cursory inspection—for example, placing a layer of lobster on top of a bin of abalone, and declaring the entire consignment as “lobster”; or
- in hand and/or cargo luggage of out-bound passengers, many of whom are tourists—there is evidence of organised tour scams where members of tour groups each carry out of Australia the legal limit of abalone (10kg) but on arrival at the destined country stockpile the goods for sale.

Intersection between Legal and Illegal Markets

As stated, the majority of illegal abalone activity is believed to occur outside the licensed sector, with those involved tending to poach, process and sell abalone to other like-minded people. It is possible, however, for poached abalone to enter the legitimate market, knowingly or otherwise. This can occur when:

- legitimate processors are willing to accept and process over-quota or “off-the-ticket” abalone from licensed divers—in other words, abalone not declared by the diver;
- registered processors accept poached abalone from unlicensed divers;
- retailers and end consumers are willing to buy it—retailers purchasing illegally caught and processed abalone may do so knowingly, attempting to disguise the purchase by “re-using” documentation from a legitimate abalone purchase; or

- consumers purchase poached abalone unknowingly—this occurs particularly as poached abalone can easily blend in with legitimate stock.

Essentially, those who are willing to purchase illegal abalone do so because it is cheaper than legitimately harvested abalone. In other cases, it may be an issue of scarcity.

Disrupting the Market for Illegal Abalone

The illicit trade in Australian abalone has a number of negative effects on the legitimate industry. Due to the clandestine nature of its harvest and subsequent handling, poached abalone may be of poor quality and a subsequent risk to human health. It can therefore adversely affect the image of Australian abalone on the international market. As is the case in other types of markets, illegal operators who have few overheads and accept lower prices for their abalone undercut legitimate operators in price. The presence of poachers supplying abalone to local buyers/restaurants at reduced prices can restrict the potential for sales in local legal markets. At a more fundamental level, large-scale sustained illegal fishing has the potential to threaten the very sustainability of Australia's abalone stocks.

Recognising the serious impact which abalone poaching may have on Australia's legitimate industry, numerous measures have been taken to deter criminal activity within Australia's abalone fishing industry. Each abalone-producing state has legislation carrying high pecuniary penalties and custodial sentences for abalone offending, and has dedicated abalone-crime investigators. In addition, some state courts are empowered to impose control orders on recidivist abalone offenders.

As with all markets, whether legal or illegal, the illicit market in abalone is characterised by a chain of distribution from the source of the product to the end consumer. As discussed, this chain is not an absolute progression from point A to B to C; goods may move through a number of market players. Having identified these players, as well as the law enforcement measures in place to deter offending within the industry as a whole, there are

additional measures which can be put in place to disrupt the market for illegal abalone at each stage. This is principally achieved by making it more difficult for people to illegally access, process and sell abalone.

Accessing Abalone

In the case of unlicensed abalone divers or those licensed divers who may fish in excess of their quota, it is difficult to monitor and police illicit catches. Unless unlicensed offenders are caught coming out of the water with over-the-bag-limit abalone, or licensed divers are caught in possession of undocumented or over-quota abalone, large quantities of abalone may be poached from Australian waters and moved from the beach undetected. It is here, however, that strategies aimed at disrupting the illicit market in abalone would be most beneficial, as they would reduce the offender's ability to access abalone stocks. Prevention of illicit harvesting is also the best outcome in terms of protecting the fishery and maintaining fish stocks.

To enable the detection and interception of unlicensed fishing activity, and to ensure licensed divers are complying with docketing and quota requirements and size restrictions, a law enforcement presence on the coast is critical. While a crucial point at which the flow of illegal abalone through the market can be prevented, the ability to enhance beach detection is problematic due to a number of factors, including:

- constraints on the level of resources committed to monitoring abalone-related activity;
- occupational health and safety regulations restricting the activities of fisheries officers in some jurisdictions; and
- difficulties associated with surveillance of the vast Australian coastline.

As well as policing by law enforcement, other avenues can be used to learn about and respond to potential illegal activity at the beach. Initiatives such as Fishwatch, a toll-free government service, encourage members of the community to report any suspicious activity relating to marine life—including abalone—to fisheries agencies. Such programs currently operate in several Australian states. Those within the licensed sector

are also in a good position to pass on any information about illegal operators and activity that they may come across. Industry should be encouraged to report this information through safe and effective reporting programs.

Processing Abalone

Fisheries agencies are responsible for auditing registered abalone processors. To assist the audit process, mandatory labelling of all legitimate processed abalone has recently been introduced. This initiative complements more traditional auditing procedures that include documentation checks using the quota management system and surprise inspections of processing facilities. These measures can be effective in monitoring the amounts of abalone moving through such factories, and detecting discrepancies in the paper trail suggestive of illicit product. However, inspections may be compromised by the fact that once incoming catches of abalone are combined with existing stock at the processing facility it becomes virtually impossible to determine whether abalone have been caught legally and by whom.

Another opportunity for auditing registered processors occurs when the product leaves the premises. Inspections of the amount of outgoing abalone, to ensure that consignments are declared and that the weight of the consignment is correct, are important to enable "in-out" reconciliation of stock.

Intervention at this stage of the chain is more straightforward in the case of backyard processors as the entire establishment is illegitimate, therefore any discovery of such facilities indicates illicit activity. The difficulty in such cases is that unsophisticated processing can be performed almost anywhere. Such establishments are typically discovered only after tip-offs from the public or informers, or through surveillance of divers engaged in illegal harvesting. This reinforces the importance of maintaining intelligence and effective policing strategies.

Agencies other than fisheries and police services can play a part in policing operations that involve the illegal processing of abalone—particularly from private/backyard premises. These might include

environment protection agencies, local councils and the Australian Taxation Office. Environmental protection agencies and local councils can monitor compliance with environmental regulations and by-laws such as waste disposal, noise pollution and zoning, while the Tax Office can be used to flag any discrepancies between employment, assets and income. These agencies also have the authority to inspect business premises, issue infringement notices, impose fines and investigate business records and financial accounts.

By applying this type of pressure on illegitimate traders to comply with regulations, these agencies increase the cost of illicit activity as well as the risk of detection and apprehension. In other words, they can assist fisheries and law enforcement services in disrupting the activity of those involved in the illicit abalone market.

Export and Sale

There are a number of measures that can be implemented at the final point in the Australian market (that is, where poached abalone is exported to overseas destinations). The majority, if not all, of the abalone intended for overseas export passes through an airport, whether in cargo, hand luggage, on a person, through the mail or by consignment. The Australian Customs Service therefore has an invaluable role through the inspection of luggage and passengers at airports, as well as in monitoring export consignments. AQIS has a similar role insofar as officers may conduct quality control inspections to ensure abalone product intended for export is fit for human consumption. Any detections and seizures of illegal abalone at this point pose significant obstacles to the supply of abalone to lucrative international markets.

While illegally obtained abalone bound for export can be detected through random searches and scans of luggage, passengers and consignments, Customs is also in an ideal position to play a proactive role should sufficient resources be available to follow leads provided by fisheries and other law enforcement agencies concerning the suspected movement of illegal abalone out of Australia. Given competing enforcement and policing priorities for Customs in terms of other illicit

goods, however, the interception of illegal or suspect abalone at the border may not be as high a priority. Furthermore, the above-mentioned strategies may do little to disrupt the domestic market in poached Australian abalone and that product which is not bound for overseas.

Timely intelligence sharing from state fisheries and police concerning illegal product headed for export serves to facilitate border interceptions. This information exchange between key stakeholders could be strengthened by the development of national information and reporting systems for fisheries intelligence. Recent progress has been made towards prohibiting the export of any abalone except for AQIS-approved product and domestic sales complying with the National Docketing System. Similarly, consideration of the inclusion of abalone as a scheduled export item under Customs legislation may provide additional legislative backing for the interception of illegal abalone exports.

To date there have been a number of multi-jurisdictional operations targeting the Australian black market in abalone which have succeeded due to strong cooperation between fisheries, state police and federal agencies such as Customs and AQIS. However, jurisdictional and cross-agency coordination issues can serve to hamper efforts to disrupt both the domestic and international black market trade in abalone. These factors, as well as differences in state legislation, are likely to pose ongoing difficulties for countering the illicit market across jurisdictions. In these cases, the Australian Fisheries Management Authority may have a role to play in coordinating responses to domestic abalone trafficking.

Conclusion

While some researchers have explored the involvement of criminal actors in illegal abalone markets overseas (Gastrow 2001; the National Crime Authority has also done some recent Australian research in this area), very little research has been conducted into the illicit abalone market in Australia. This paper sought to fill some of this gap by providing an overview of the illicit Australian abalone market based on fieldwork

and discussions with key stakeholders. The illegal market in poached abalone is a lucrative one which involves a variety of players ranging from suppliers, handlers, buyers and distributors. The difficulties inherent in policing illegal activity within the industry are numerous and stem from the fact that illegal harvesting takes place offshore and can occur at any number of sites along Australia's extensive southern coastline. Illegal processing can likewise occur almost anywhere, and there are possibilities of cross-border movement of stolen product. Continued assessment, monitoring, regulation and policing of the licensed and unlicensed abalone sectors are key strategies that must be used to address the threat of unsustainable harvesting from Australia's abalone fishery.

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