The Third National Abalone Convention
Held at the Hotel Grand Chancellor, Hobart
Tasmania 11-13 May, 2005.

Melinda Mullen

Project No. 2004/314

ACKNOWLEDGEMENTS

The Third National Abalone Convention would not have been such a success without the commitment of a dedicated team supported by the majority of the abalone industry.

Each State's Association, the Tasmanian Government, the Fisheries Research & Development Corporation and sponsors gave support, financially and in-kind.

The State Steering Committee comprising Dean Lisson (President – Tasmanian Abalone Council Ltd), Tasmanian Abalone Council Executive Members John Hoult, Berkeley Dilworth, Nigel Wallace, Tasmanian Abalone Council Administrative Officer Melinda Mullen, and Tasmanian Aquaculture & Fisheries Institute Research Officer Dr Craig Mundy. Advice from Michael Tokley (Abalone lndustry Assn of SA and Abalone Council Australia Ltd Chairman) also assisted greatly in developing the event.

Patrick Hone and Peter Horvat were equally supportive of the event.

Thanks to all those involved who helped make the event an unforgettable experience.

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1. Introduction

The third National Abalone Convention was held in Hobart, Tasmania from 11th –13th May, 2005. An organising committee comprising members of the Tasmanian Abalone Council (TAC) and Tasmanian Aquaculture & Fisheries Institute was responsible for the organising of the Convention.

1.1 Background

The opportunity to provide national recognition for Australia's abalone industry to highlight the true value of its members and their operations was facilitated through the event and the presence of a great audience, who's numbers far exceeded preliminary expectations.

1.2 Why a 3rd National Abalone Convention?

Australian abalone currently enjoys a relatively strong position in the market through steady demand for product. This will only continue as long as the resource is sustainable. It was agreed that industry would benefit through the application of leading edge or state of the art technology and world's best practices in management, research and resource protection.

At that stage, no mechanism existed for the effective exchange of ideas, or to consider leading edge technology, or to benefit from learning of the trials and tribulations other State's have experienced. The Convention was to present excellent opportunities for communications with contacts from all over the globe.

Previous Conventions held in South Australia and Victoria in 2001 and 2003 respectively were both successful events.

There was still a need for all States to be involved in a national forum and for industry Australia wide to focus on management, marketing, R&D issues, resource protection and commence formulating national plans or strategies to focus on achieving the desired outcomes.

1.3 Objectives

- To host a successful truly national Australian Abalone Convention
- To maximise the transfer of information for the promotion and cost effective and efficient ways to deal with common issues.
- To secure an economically viable event.
- To formulate a national plan dealing with common issues facing Australian abalone fisheries management.

Taking Stock was agreed upon as the theme for the Convention, a fitting theme, given that that is what the divers do in their work –take stock, and also that the industry, on a national level is 'Taking Stock' – with the formation of the Abalone Council Australia Ltd in the last few years, the launch of a National Scoping Study, etc.

2. Planning

The formation of the Steering Committee was a key component of the planning process. At the outset it was decided not to use the services of a Professional Conference Organiser, but rather use the services of the Committee and those of the Tasmanian Abalone Council Administrative Officer, Melinda Mullen. This decision was taken in a bid to keep costs down, but remembering that the TAC needed to be recompensed for the time spent in organising by Melinda. This enabled the TAC to maintain a real ownership of the Conference, and keep dealings with speakers, sponsors, venues, etc on a personal level. The venue for the Convention was decided as the Hotel Grand Chancellor, in Hobart.

2.1 The Role of the Steering Committee

The role of the Steering Committee was:

- To take ownership of the event by playing an active role in all facets of the planning process and implementation
- To be responsible and accountable for specific tasks and actions

2.2 Industry Support

This event was well supported by industry overall including significant contributions from all states, as well as specific individuals committing significant time and resources to the project.

2.3 Event Management Team

As stated earlier, Event Management was undertaken by Melinda Mullen, Administrative Officer of the Tasmanian Abalone Council Ltd.

Melinda, in conjunction with the Convention organising committee was responsible for the:

- Development of a detailed plan to achieve objectives
- Coordination of initial and ongoing liaison with the industry nationally
- Development and management of marketing and media plans to maximise the promotional opportunity
- Involvement in the attraction of funding from a variety of sources and sponsor management
- Overall management of the Conference including: venue liaison, speaker liaison, program development, a social program and the production of printed materials

The logo used for the event was that which had been developed prior to the inaugural National Abalone Convention.

3. Hosts

The hosts of an event such as a National Convention are of extreme importance and vital to the success or failure of the event. The Tasmanian Abalone Council Ltd. was host for the event, with support from every other State abalone industry association.

This included accountability for all facets involved with the development, planning and implementation of such an event. It is understood the Abalone Industry Association of SA will host the next National Abalone Convention in 2007.

4. Funding & Sponsorship

Funding is an extremely critical factor essential to the survival of the project, as without the necessary funding base the event would be destined to be nothing more than an idea.

A cocktail party launch of the Convention was held on 11th May 2004, at the Convention venue, with potential sponsors and industry members invited with the aim being to gather some momentum for the Convention. This event was attended by approximately 70 people. A range of sponsorship options were offered from $1,500 Trade Exhibitor to $20,000 Principal Sponsor. A variety of businesses and organisations signed on as sponsors of the Convention, with the total amount received from sponsorship being $53,500.

5. Speakers

Speakers are a core component of an event particularly at an industry national convention where they are asked to convey a focal point of a particular issue.

The organising Committee met several times in order to finalise the speakers making sure they offered information a broad range of topics within the theme. There were four main conference sessions – Post-Harvest, Diver, Management and Research. Local speakers as well as national and three international speakers were confirmed.

The organising committee were keen to ensure there were specific diver topics covered in an attempt to attract a large number of active divers to the Convention. Dr David Smart from the Hyperbaric Chamber at the Royal Hobart Hospital spoke on risk management in diving and certainly created a lot of interest. Dr Smart is soon to give a similar talk to the Diver Sub-Council of the TAC. In the Post-Harvest section, Nelson Lui gave an interesting talk on the Chinese market situation. The highlight in the Management theme had to be Allen Hansen's talk on the history of the Tasmanian industry. The research theme certainly offered delegates some "food for thought"! Overall the organising committee were pleased with all speakers and felt they gave delegates a broad spectrum of information.

Guidelines were established to the level of expenditure for travel and accommodation that the convention was to incur for each speaker. All speakers' costs were kept to a minimum.

6. Venue & Social Program

The Hotel Grand Chancellor on the waterfront in Hobart was deemed to be an appropriate venue for the event. The physical location for the event added to the overall appeal of the Convention. The hotel offered all modern conveniences with many rooms to use and the latest technology for staging the presentations.

In conjunction with the Conference sessions a social program was offered. This commenced with a welcome reception held at Tasmania's Government House, and hosted by His Excellency, The Governor of Tasmania on Wednesday 11th May. Delegates were transported to Government House by coach. On the evening of Thursday 12th May, a Cocktail function was held at the Hobart Function Centre on Elizabeth Pier. At this event delegates had a chance to network amongst other delegates/sponsors/speakers and as well as hors d'oeuvres were served some fine quality Tasmanian wild abalone. The abalone was prepared and cooked in the function room, enabling delegates to enjoy the delicacy as it was freshly cooked.

The final social event was the gala dinner, held on the evening of Friday 13th May at the Convention venue, Hotel Grand Chancellor. For the organising committee this was the culmination of a lot of hard work. The dinner was attended by 218 people and was a very enjoyable evening. The evening was kicked off by a roving act from the "Tiger Wrestlers" who certainly set the mood as one of fun and enjoyment. Local band "SugarTrain" ensured there were plenty of people enjoying themselves on the dance floor during the evening.

7. Registration & Delegates

Registration brochures were distributed to approximately 1,200 industry participants, researchers, managers in January 2005. The Committee had set a target of 250 attendees, and certainly hoped to get a large contingent of Tasmanian attendees, given that the Convention was being held in Hobart, although very few Tasmanians had attended previous conventions. Registrations certainly met our expectations, and were broken down as follows:

125	Full Registration Delegates
21	Partner Registration Delegates
60	Social Registration Delegates
24	Speakers
38	Sponsor/Exhibitor Delegates
268	Total Attendees

Approximately half of these attendees were from Tasmania. The organising committee were well satisfied with this result. Costs for registration were as follows:

$500	Full Registration
$400	Partner Registration
N/C	Welcome Reception
$70	Cocktail Function
$125	Gala Dinner
$40	Convention vest

The Convention vests proved extremely popular, with orders being received for approximately 100.

Hotel accommodation was available to be booked through Convention Registration, with three venue options being offered. All interstate delegates who booked accommodation through their registration received a complimentary "Taste of Tasmania" box containing a range of gourmet Tasmanian food products, delivered to their room.

Convention satchels and name-tags were distributed to delegates on arrival at the Registration desk. Satchels contained a range of information from sponsors, Tasmanian tourist information, an abalone recipe book, a Convention pen, and a full program of the Event.

8. Finance

The Convention received funding of $9,500 from the previous Convention in order to commence activities. The final balance of the account was approximately $36,000. The organising committee has met recently and agreed to pass on the equivalent amount to commence proceedings for the 4th Convention to the host state of that event, and also agreed that the remaining surplus funds should be retained by the TAC in lieu of the organising/management work done by Melinda Mullen. An invoice for this amount has been raised. All info-tech work for the Convention was conducted by another member of the organising committee, Dr Craig Mundy from TAFI, which also enabled a further saving of between $15,000 - $20,000.

9. Conclusion

The organising committee is certainly satisfied with the Convention, it was well attended, speakers were of a high calibre, the social program was appropriate, the venue and catering were certainly to our expectations. Overall a very successful event.

A California Abalone DiverÕs Perspective

History

The fishery for abalone in Southern California utilized five of the seven species found there. The sport fishery, traditionally snorkeling and beach picking, grew in the 60s, 70s, and 80s with new SCUBA divers and increased boating access. Though undocumented the sport take was known to heavily impact easily accessed areas and was estimated to exceed the commercial take in 1975. Around this time, commercial catches, which were documented, declined for all species in most areas. Few management regulations were changed in response to these declines. White Abalone (*h. sorenseni*), now listed as a endangered species by the Federal government, ceased to be caught in appreciable numbers by 1980 but no action was taken until 1996.

Since the 1930s the Sea Otter, Federally listed as a threatened species, expanded its range from a remnant population south of Monterey. By 1975, as otters moved into Red Abalone grounds in Central California the fishery there declined to zero. This caused compaction of fishing effort to the Channel Islands and mainland coast to the south. The otter continues to claim new area as it expands its range southward. It will be interesting to see what will happen when someone sees a sea otter eating a white abalone. The white abalones status is more dire under federal rules but the sea otter definitely has more clout because of its status as Òcharismatic megafauna.Ó As such, the Sea Otter enjoys a position in our society out of all proportion to its threatened status.

In 1984 a disease, later named Withering Syndrome (WS), was observed in Black abalone (*h. cracherodii*). Blacks were the most numerous of our species and population densities reached 1,000,000 per hectare. Green Abalone (*h. fulgens*), another prolific shallow water species, were also dramatically affected. Pink (*h. corrugata*) and Red Abalone (*h. rufescens*) were affected by WS to a lesser extent. Areas in colder water were affected less by the disease, which seems to correlate with water temperature and nutrient levels. Declines in giant Kelp (*macrocystis pyrifera*) and other bottom algae, which suffer in warm, nutrient poor water, occurred during the period from 1977 to 1998, thereby exacerbating declines in abalone.

In 1993 Black Abalone take was banned, followed by the closure of White, Green, and Pink Abalone fishing in 1996. In 1995 efforts to close the commercial Red Abalone fishery in Southern California, which originated from the sport fishery lobby, began. These efforts were fueled by the northern sportsmenÕs perception that the southern commercial fishery was a dodge for poached abalone from Northern California being foisted to the commercial southern fishery. The Red Abalone fishery in Southern California was deemed unsustainable and closed by the legislature in 1997. At that time, it was argued that there were insufficient data to support the need for closure at San Miguel and the Farallon Islands, though this perspective did not convince legislators to keep those islands open to harvest. Today a sport fishery, which is estimated to have taken 500,000 kilos of Red Abalone in 2003, still occurs North of San Francisco.

Little monitoring of the resource occurred before 1976. Other than compiling catch histories, none occurred from 1976 until 1994. From 1994 to 1999 the Department of Fish and Game (DFG) began size frequency and density monitoring efforts for Southern California which have faltered since 1999 due to budget cuts and research prioritizing.

After the El Nino of 1997-1998 we experienced cool, nutrient rich water for a few years and have seen a resurgence of our cool water favoring species including abalone. Though the temperature has risen in the last two years, recruitment in areas containing abalone has been dramatic. Those areas where the fishery was occurring at the time of the closure are proliferating though there is little data to prove these observations made by former Abalone divers.

The Abalone Recovery and Management Plan

The law which banned the fishery also mandated the creation of the Abalone Recovery and Management Plan. DFG is to create this plan, it will then be approved by the Fish and Game Commission. The preferred alternative of the plan doesnÕt change the status quo hence it has been eight years in the making.

The plan sets a Minimum Viable Population as 2,000 ab per hectare. Added to this is a ÒbufferÓ of 1,000 more ab per hectare. 3,000 per hectare is the minimum at which fishing is allowed to continue in a fishery that is open. In closed fisheries an additional 3,600 ab per hectare is added as a Òprecautionary bufferÓ and harvest is not allowed to begin until a level of 6,600 is reached. No clear explanation is given in the plan of the logic of allowing reduced fishing in an open fishery that is below 6,600/ha but not allowing reduced fishing and reopening when recovered areas rise above 3,000/ha.

ÒPrecautionÓ, the plan states, is needed to address Òdata poorÓ situations. Without extensive surveying to address this data poor situation little or no management confidence can be gained and the fishery in Southern California will remain closed. The northern sport fishery, where research and monitoring has continued, has been further restricted since 1997. Serial depletion of popular areas there continues. Finer scale biological monitoring and social data are needed to adequately track changes there.

Since 1999, due to budget cuts and a high priority placed on White Abalone work, DFG has done little monitoring of Red Abalone in Southern California and changes in their populations have gone unmarked. DFG shrinking budget and increased responsibilities have not been conducive to Red Abalone monitoring.

Those of us who regularly frequent these recovering abalone areas while harvesting Sea Urchin have tracked these changes. In response to these issues we fishermen have designed plans to monitor these areas using industry divers and their boats.

The Barefoot Ecologist

A paper by Jeremy Prince, The Barefoot EcologistÕs Toolbox, outlines many of the problems we are experiencing, it also suggests a solution. Jeremy wrote, *ÒIn the 1950s, China faced a similar looking national health problem. They responded with barefoot doctors, not top-end surgeons and technocrats, but low cost, generalist, medical practitioners trained to go out and deal with all the basic village ailments. Micro-stocks need assessment and management at local scales to prevent component stocks suffering overfishing. Community based and Territorial Rights based systems will prove essential for sustaining these resources. But who will service the technical needs of all these communities of stakeholders? Certainly not the existing Universities and Government Agencies funded by shrinking central governments!Ó*

In California, management is on a scale of many hundreds of miles while variations in micro-stocks are on scales of hundreds of yards. The need to assess stocks at fine scales is apparent. It is also apparent that our DFG canÕt afford to do it. The fishermen already possess much of the Essential Fishery Knowledge that indicates these variations. State biologists, while aware that there are variations, donÕt have the bottom time to know where variations begin and end. Budget restrictions will keep this dynamic in place if government is relied on to fill the data gaps. The solution, as Jeremy suggests, *ÒBarefoot Ecologists. Embodying the spirits of Johannes and Pauly, and equipped with a tool box borrowed from Walters, barefoot ecologists would be appropriately trained quantitative, ethno-fisheries ecology generalists, with a love for life, and insatiable curiosity. As with ChinaÕs barefoot doctor campaign, local people trained and equipped to return to local communities will always be far more effective, than visiting foreign experts.Ó*

The first step in a barefoot program for Red Abalone, similar to one being formed by our Sea Urchin industry, is to train the initial cadre of former ab divers in basic procedures of data collecting, After training in sampling methodology former commercial ab divers will use their own boats, equipment and crews to collect data from populations at San Miguel island.

A chart of the island dividing it into 1/5th nautical mile blocks was used to spatially orient information taken in a survey of divers in 2000. This chart will be updated at a much higher resolution and used in this project to direct sampling effort. Information gathered will be referenced with latitude and longitude and used to create a Geographic Information System (GIS) map for fine scale stock assessment.

Experienced former abalone divers will map the bottom qualitatively, descriptively, and visually and reference it with lat./long. The density and size frequency survey will use fixed points around which a 10 meter radius survey circle is rotated. All emergent abalone in the circle will be counted, measured and mapped within the circle by distance and direction from center. Divers will sample all 1/5th nautical mile blocks, both those deemed important in the 2000 survey and those not.

When an area reaches population levels used as reopening criteria, fishing could begin. Fine scale data would continue to be collected while harvesting and recorded in logbooks. These logbooks would be a source for timely information used to manage the harvest.

Initially, this effort will be funded by money which remains in an account originally set up when the fishery was open. This money, a tax on landings, was collected for research and enhancement of the fishery and is overseen by a committee composed of divers and DFG biologist/managers. When a fishery begins funds will again be collected to sustain ongoing data collection and other research.

Ultimately, one of our goals, as in our Sea Urchin and Lobster fisheries, is to certify the abalone fishery as ÒsustainableÕ using Marine Stewardship Council or similar guidelines. While the sea urchin and lobster fisheries may already ÒbeÓ sustainable, the guidelines for certification concerning conflict resolution are probably unattainable under CaliforniaÕs present processes for fishery management. That IÕm here, in Tasmania, talking about our plans for an abalone fishery is indicative of the lack of an effective conflict resolution process in California; a process that encourages an airing of new ideas and methods for management.

A law passed in 1998 set a new paradigm for fishery management processes in California. That law mandates fishermen's involvement in research planning, data gathering and interpretation, with an ultimate goal of co- management. All of these activities were first approached as solutions for problems relating to our abalone fishery. Some have used the term ÒPoster ChildÓ, in reference to the abalone fishery being the example of whatÕs wrong with all fisheries management in California. We envision it as a poster child representing how to fix our fisheries. Having participated as ÒstakeholdersÓ in all abalone related input opportunities we still find ourselves without a real place at the management table. That being said, we are still trying to make it all work.

Carl Sagan, a world renowned Astronomer, in his book, The Demon-Haunted World: Science as a Candle in the Dark, said, Ò*Science is an absolutely essential tool for any society with a hope of surviving well into the next century with its fundamental values intact--not just science as engaged in by its practitioners, but science understood and embraced by the entire human community. And if the scientists will not bring this about, who will?Ó*

Scientists, certainly, may lead such efforts, but fishermen, as beneficiaries of science, have a role to play as well.

RISK MANAGEMENT AND ABALONE DIVING

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INTRODUCTION

Contrary to popular belief, diving is a very safe occupation and this level of safety is improving with higher levels of training of participants in the activity. In figures derived from amalgamated data from the professional and recreational industries, serious incidents occur approximately

1:10,000 to 1:20,000 dives, and the death rates have been estimated at 1:95,000 to 1:200,000 dives (Edmonds et al 2002). Between 10 and 20 divers die each year in Australia, and this compares with a national annual death toll due to road trauma of nearly 3,000 (Edmonds and Walker 1989,1990). In the year to 30 June 2003 there were 262 cases of Decompression illness treated in Australia and 17 of these were in Tasmania (6.5%).

Over the four years 2001-2004, 56 divers were treated for decompression illness at Royal Hobart Hospital. Of these 56, 16 were recreational scuba divers (all with training), 17 were recreational Hookah divers (10 untrained, 5 trained, and 2 unknown), 12 were professional divers from the aquaculture industry, 7 were professional abalone divers and 4 other professional divers. Thus, abalone divers make up 12.5% of all divers treated, and their incidence of decompression illness is therefore is 1.4 cases per 100 divers per year (125 divers). It is not possible to comment on the relative incidence for the other groups, because the total numbers of divers and dives are unknown, and has not been formally studied. There is however a risk of decompression illness with every dive, akin to Russian Roulette with a minimum of 3 bullets in a 10,000 hole gun chamber. It is not possible to completely eliminate risk from diving, due to the fact that we are dealing with a biological animal (the diver) in a hostile and frequently changing environment.

RISK MANAGEMENT

Risk management is a systematic approach to improving safety and reducing adverse incidents, and the principles can be applied to almost any process or activity (Smart et al 1990). Risk management is covered by Australian Standard 4360. The process of risk management identifies the risks specific to an industry, assesses their potential impact. The risks are then treated. As part of the process, systems are needed to ensure that previously treated risks do not return, and that further risks are monitored.

"***Risk***" is a product of ***probability*** and ***consequence***. Probability is the chance that an adverse event will occur. Consequence is the impact of the adverse event on the diver. The higher the probability and the worse the consequence, the greater the health risk to the diver. Risk management aims to reduce adverse health events from diving to as low as possible whilst still maintaining productivity. In particular, divers should aim to completely prevent events that have catastrophic short or long-term consequences.

AIM

The aim of this presentation is to provide a medical perspective of risk management in diving. This presentation focuses on how risk management principles may be applied to improve diving safety and maintain the short-term and long-term health of divers. A major part of risk management is planning and anticipating risks, and taking action to prevent adverse events from occurring. By applying the basic principles of risk management to diving practice, the majority of abalone divers should be able to complete a 30 - 40 year career in the industry and retire from diving in good health without disability.

A MEDICAL PERSPECTIVE OF RISK MANAGEMENT IN DIVING

Based on the experience of diver morbidity treated at Royal Hobart Hospital, a medical perspective is provided below under each of the broad headings:

(1) Medical fitness to dive

There is no doubt that divers need to maintain optimum physical health. It is a physically demanding occupation in a potentially hostile environment. Annual medical assessment of fitness is required under Australian Standard 2299.1. Even more importantly, divers take

responsibility for their own day-to-day fitness to dive. It goes without saying that many long-term health issues result from individual choices regarding consumption of alcohol tobacco and other drugs. In abalone divers, long-term health problems from ear and sinus barotrauma are commonly encountered by diving physicians. Time spent in the short term recovering from such conditions, is well spent, rather than soldiering on, and causing permanent hearing impairment, or sinus injury.

Divers are encouraged to seek early advice from a diving medicine specialist if they experience health problems after diving. The most common clinical syndrome of decompression illness resembles a bout of influenza - feeling tired and lethargic, unable to concentrate, headache, unsteadiness and non-specific migratory muscle and joint pains. There may occasionally be nausea and vomiting. Musculoskeletal pains are common and may be restricted to one joint (most frequently the shoulder) or multiple joints. Skin rashes occur on rare occasions. Other non-neurological symptoms include chest pain, shortness of breath (due to venous bubbles causing pulmonary embolism - also known as "the chokes") and abdominal pain. Neurological syndromes can range from minor pins and needles, numbness and slight unsteadiness, through to paraplegia, hemiplegias, severe cognitive deficits and even loss of consciousness and seizures. Any of these symptoms and signs may be worsened by ascent to altitude (>300m) after diving – a significant issue in Tasmania.

Early treatment of diving related illness results in faster and more complete recovery. Decompression illness treated inside 24 hours has a 90% recovery rate compared with 50% for cases treated more than 24 hours after diving. For cerebral arterial gas embolism, treatment is required inside 4 hours to produce a 90% recovery. In Tasmania, there is a 24-hour diving emergency contact via the **Tasmanian Ambulance Service 000 number**. The diving medicine specialist is contacted once the alarm is raised, and provides input at the earliest stage to management of the diving casualty, and transport. In the majority of cases, divers are treated in the hyperbaric chamber within four hours of an emergency call. Early treatment also prevents long-term sequelae of diving such as bone necrosis.

(2) Education and training

Industry specific education and training is an essential process supporting diving safety. Well-trained divers have the skills and knowledge to recognise and prevent hazards, and respond to emergencies. In Tasmania, all abalone divers undergo training in accordance with the Tasmanian Abalone Industry Code of Practice, and the code of practice outlines many risk management procedures (Tasmanian Abalone Council 2002). This training constitutes a **minimum** entry platform from which to launch an abalone diving career. From a medical perspective, additional training beyond the basic minimum is always an advantage, as is the revision of skills; particularly in the area of diver rescue, and management of emergencies. Because diving accidents are infrequent, divers and their tenders are at risk of deskilling if emergency procedures are not regularly revised and practiced. The divers' tender is an integral part of the diving team, and has great responsibility in supporting the diver(s). The current Tasmanian Abalone Code of practice requires that tenders possess an up to date First Aid certificate that includes an oxygen therapy course. There does not appear to be any requirement for rescue training for divers or tenders, or the specific aspects of administration of 100% oxygen to the injured diver. Whilst the **probability** of needing to rescue an incapacitated or unconscious diver from the water is low, the **consequence** of a delay in rescue, or rescue in a vertical position could be catastrophic. Intravascular gas from both decompression illness and gas embolism pools at the highest part of the body. I offer these questions to all abalone divers: When did you and your tender last practice a rescue drill for an unconscious diver? Do you have a mechanism for lifting the diver into the boat while maintaining the diver in as close to horizontal position as possible? Do you and your tender know how to administer 100% oxygen? Practice of these procedures may save **your** life.

(3) Dive planning, and emergency procedures

Planning of the dive is an essential process to control risk. I will not cover the areas of operational planning, but will instead focus on areas that have impacted on the health of Tasmanian abalone divers in recent years. One of the most common problems experienced by abalone divers requiring recompression at RHH Diving and Hyperbaric Medicine Unit is the failure of surface air supply, resulting from compressor malfunction, or severance of air hoses (usually due to propellers). Divers were forced to undertake emergency ascents causing

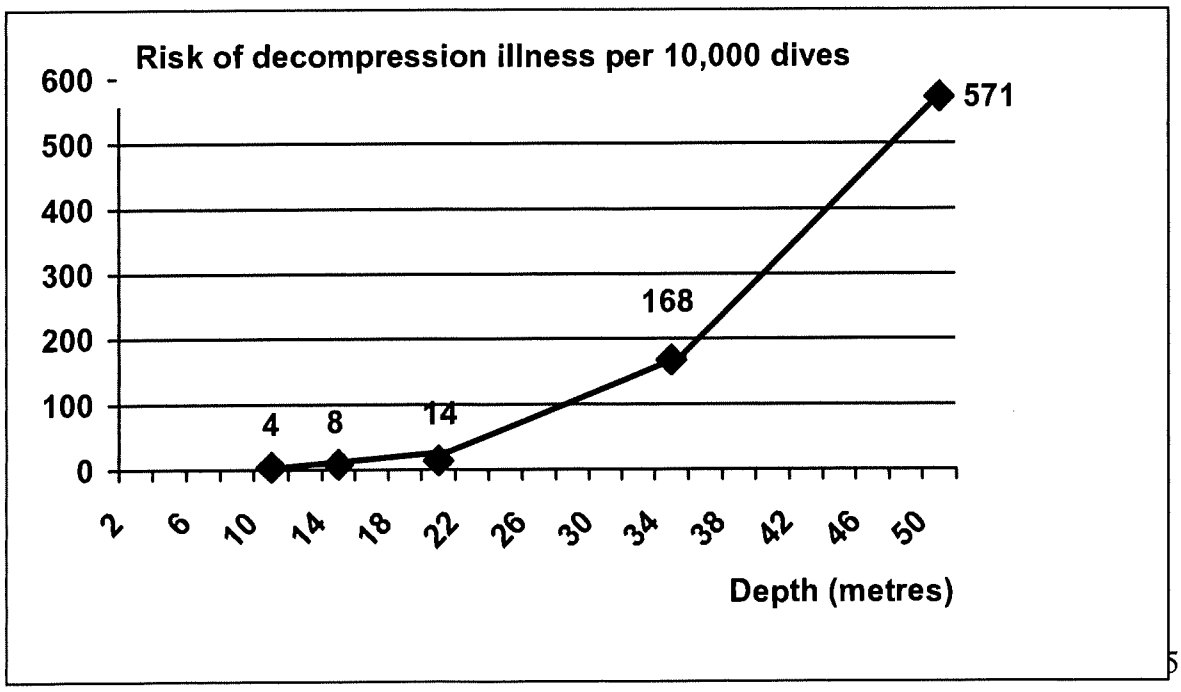
decompression accidents. It is my opinion that **emergency bail-out air cylinders with regulators and contents gauges must be mandatory during all abalone diving, regardless of depth.** In an out-of air situation, this simple risk management procedure allows the diver to undertake a controlled ascent; thus preventing a potentially fatal rapid ascent in a state of extreme stress. The current Tasmanian Abalone Industry Code of Practice mandates the bail out cylinder for depths greater than 15 metres. Gas embolism with neurological deficit has resulted from depths as shallow as 2 metres.

The planning process must also take into account the remoteness of the dive location, because greater degrees of self-sufficiency will be required for more remote locations. Divers should be in peak physical health when diving in more remote areas. Emergency equipment, procedures, and links to emergency assistance and recompression facility must be checked and tested, prior to departure. Supplies of oxygen must be sufficient to provide continuous treatment of an injured diver, the full return distance from the most remote site, with a 50% reserve. Emergency contact numbers should be checked. Remote diving also mandates a greater degree of conservatism in diving practice, to reduce risks of accidents.

(4) Dive Profiles

Deep diving poses an independent health hazard for all divers:

FIGURE SHOWING RISK OF DECOMPRESSION ILLNESS PER 10,000 DIVES, VERSUS DEPTH OF DIVE FOR CONTROLLED DIVES IN HYPERBARIC CHAMBERS



Reference: Dietz and Myers 1995 Undersea and Hyperbaric Med 22 (Supp):57

Where possible, abalone divers should maintain depths shallower than 20 metres. The no-decompression line is **not an equal risk line** and risk increases as divers descend deeper than 20 metres. The above data was taken from a 1995 study demonstrated of 25,164 chamber dives at the no decompression limit, and the risk of decompression illness increased significantly with depth. Deeper diving has also been associated with higher risk of dysbaric osteonecrosis (divers' "bone rot"). The effect of depth is compounded by repetitive dives and short surface intervals, due to greater nitrogen loads in the "fast" tissues such as the brain and circulation, and higher bubble loads in the body. Hookah diving at depths greater than 20 metres creates potential problems of adequate air volume delivery, due to increased ambient pressure.

Strategies to reduce risk in the dive-planning phase include:

(a) Table limits

Ensure that the tables or the computer schedules are adhered to, and keep inside table limits. US Navy tables dived to the limit have a 5.6 % decompression illness rate (Weathersby et al 1992), RNPL/BSAC and DCIEM tables approximately 0.5% (Shields and Lee 1986, Lauckner and Nishi 1984). The DCIEM tables are now backed by thousands of hours of human diving data, measuring decompression stress using Doppler ultrasound, and are used by most professional diving operations in Australia, including the Royal Australian Navy, and all Hyperbaric facilities

(b) Dive Profiles

Dive the deepest dive first, followed by shallower second and subsequent dives. A UHMS workshop on reverse profile diving concluded that there was limited evidence that reverse profile diving was more risky, however recent guinea pig experiments showed a high mortality in a series of 3 dives 12-24-36m, compared with no deaths for the same dives 36-24-12m (Bennett et al, personal communication, in press).

(c) Ascent Rates

Ascend slowly, < 18m per minute, preferably < 10m per minute. In many studies, rapid decompression is associated with greater bubble formation.

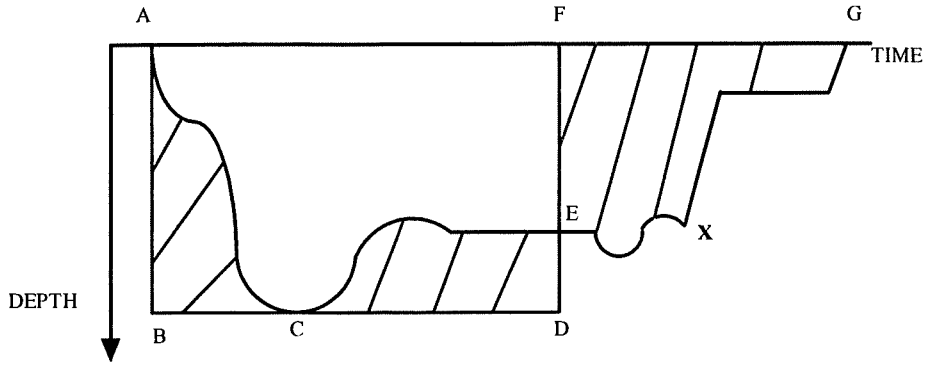
(d) Surface intervals

Plan for surface intervals of at least 2 hours. This allows significant offgassing of nitrogen from the body, due to its exponential removal from tissues. Repetitive dives at closer intervals have been shown to increase the risk of decompression illness. This was demonstrated with dives on the HMAS Swan in WA, in recent years (Mullins 2000).

(e) Dive Computers

Computers have become a very useful tool to assist recreational and professional divers (Gilliam 1992). The advantages of computers are that they are travel with the diver and are able to precisely monitor a multilevel dive profiles. Many Tasmanian abalone divers now use a computer to track their dive. Computers provide immediate feedback on diver ascent rates using alarms, and they also provide guidance on repetitive dive schedules. Computers have limitations, in that the models under which they operate have not been researched to as greater detail as "square dive profiles". With multilevel diving, computers provide credit for time not spent at the deepest depth, permitting longer dives. This is demonstrated in the figure below:

FIGURE: HYPOTHETICAL DIVE PROFILE SHOWING SQUARE DIVE LIMIT ABCDF VERSUS MULTI-LEVEL COMPUTER DIVE ABCEXG



The areas enclosed by ABCDE represent a safety margin created by not diving a precise square dive profile. In the above dive profile, the computer allows extra dive time EXG by the credit given for not spending time at maximum depth ABCDE. Hence if the computer is dived to the limit, then there is no safety factor left in the dive time. If something goes wrong at point X (eg a rapid ascent), then the diver is placed at greater risk than they would be with a dive time limit based on a square dive profile for the deepest point of the dive.

In hyperbaric chamber tests with repetitive diving, dive computers appear to operate less conservatively than dive tables (Lippmann J 1990). Divers also need a backup plan using easily accessible printed dive tables, should their computer fail. It goes without saying that the same computer should be used for the same diver, every dive, day after day, so that it accurately tracks **all** of the diver's activity. The situation is even more risky if decompression diving is undertaken, because decompression diving deliberately exceeds safe limits determined by the tables. Dive computer algorithms untested in terms of risk for decompression diving. Decompression diving carries an exponential increase in risk, and an advanced knowledge of dive tables. Despite its inclusion in the Industry code of practice, decompression diving is associated with an excessive degree of risk and is not recommended.

(f) Bounce Diving

Multiple ascents pose an independent risk factor for decompression illness. When limits for bounce diving were placed upon Tasmania's Aquaculture Industry, there was a significant reduction in decompression illness (Smart et al 1990, 1999).

(g) Ascent to Altitude after diving

Flying after abalone diving should be avoided for a minimum of 48 hours. Ascent to altitudes < 2400m after diving should also be limited in accordance with the Australian Standard 2299 (See figure and table after references). Because of the fairly extreme nature of abalone diving ascent to altitudes

greater than 300m should be avoided for 12 hours. There is very little quality data on the safety of ascents to altitudes of 300 – 2400m, and a conservative approach is advised.

(h) Nitrox Diving

Nitrox diving using oxygen concentrations greater than air (eg 32% or 40%), may reduce risk of decompression illness, but only if dived using air tables. Nitrox has the advantages of allowing longer dive times at a given depth, because of lower inspired Nitrogen partial pressure in the breathing mix. The advantage in dive time (in percentage terms) is maximal at 18 metres, which is within abalone diving depth ranges. However, when dived to the limits of the equivalent air depths it is unlikely to prevent DCI. Another risk from Nitrox diving that needs consideration is Oxygen toxicity. There are strict depth limits and also maximum time limits for Nitrox diving. Abalone divers should take into account the increased cost of nitrox diving and its logistic issues for remote area diving, before embracing Nitrox diving in their day to day practice.

(5) Diving equipment and maintenance

This paper will not go into detail in this area, except to emphasise that the diving equipment is keeping the diver alive in a hostile environment, and must be maintained in peak working order. The Tasmanian Abalone Industry code of practice outlines recommended maintenance schedules, and more comprehensive information is available in Australian Standard 2299.1. This document constitutes the default reference when detail is not covered in the Code of Practice. Abalone Divers should also fully familiarise themselves with the Australian Standard (Standards Australia 1999). Again I emphasise the need to carry functioning and well-maintained bail-out cylinders while diving and rescue/oxygen equipment in the boat.

(6) Emergency equipment

Administration of 100% oxygen is essential for all diving accidents. I offer another question: Did your first aid/oxygen therapy course teach how to administer 100% oxygen? Abalone diving is frequently undertaken in remote areas, considerable distances away from assistance.

The average diver breathes up to 15 Litres per minute when receiving 100% oxygen. The D-sized oxygen cylinder contains approximately 1400 litres, providing just over 90 minutes endurance. In your risk assessment of the dive site, will this be enough? Sufficient oxygen should be carried for all diving, because an episode of gas embolism is a possibility from any depth.

(7) Transport of the injured diver

The aim of prehospital management is to commence treatment with 100% oxygen and to transport the diver to a hyperbaric chamber for recompression chamber as quickly as possible without causing deterioration in their condition. The mode of transport of patients with serious diving illness needs to take into account factors such as the distance to the nearest chamber, available resources such as transportable recompression chambers, aircraft and helicopters, road ambulance and access to the sick diver. For road transport, detailed knowledge of road routes from the divers location to the chamber is also required, because even hills > 300m may result in worsening of the diver's condition. Air transport should not occur unless the aircraft can be pressurised to sea level. The choice of systems depends on the severity of the injury and consideration of local resources and geography. Once a call is made for emergency assistance, it is best left to medical specialists and paramedics directly involved in the incident.

(8) Recording of incidents and "near misses"

Industry-wide anonymous incident reporting has proven useful in identifying risks, and allows a systematic approach to remedy of problems identified. The opportunity exists for the Australian Abalone Industry to set up an incident reporting system to assist with risk management.

SUMMARY

Risk management is a systematic process applied to all aspects of diving operations. The process aims to reduce accidents and adverse outcomes to a minimum. Risk results from a combination of probability and consequence, and where this combination has major or extreme impact, the risk should not be tolerated. Risk management in diving encompasses medical fitness, education and training, dive planning, equipment and maintenance, emergency

procedures and equipment, and continual vigilance to identify and remedy new risks as they are identified.

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FIGURE SHOWING TASMANIAN ROAD ALTITUDES

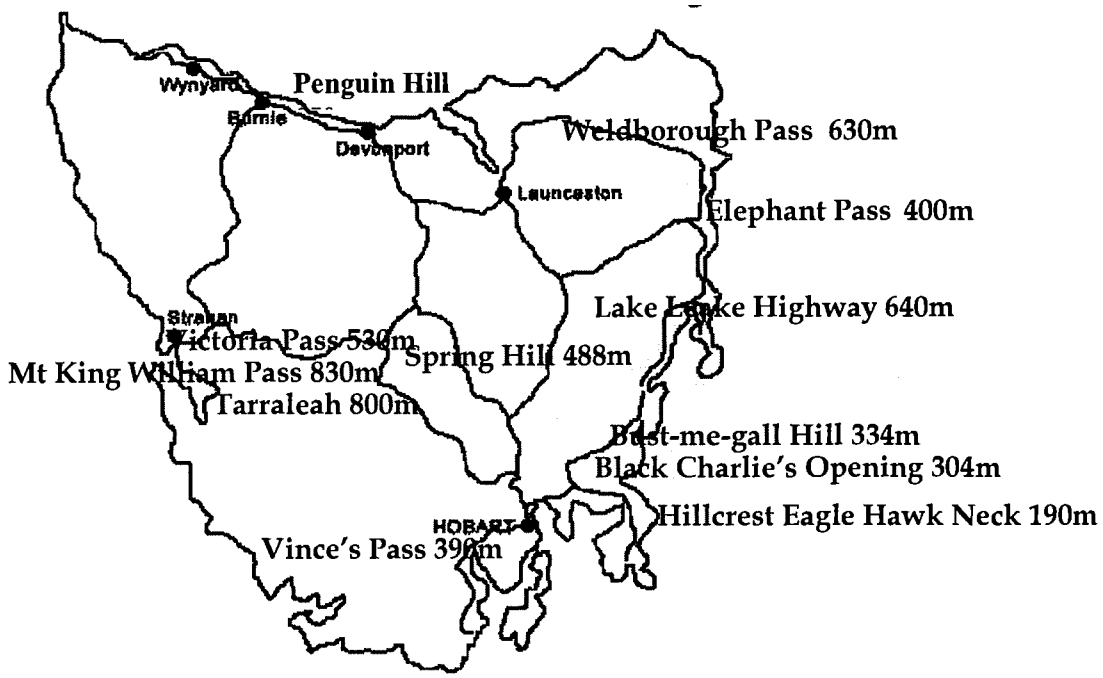


TABLE SHOWING ALLOWABLE TIMES TO TRAVEL TO ALTITUDE AFTER DIVING

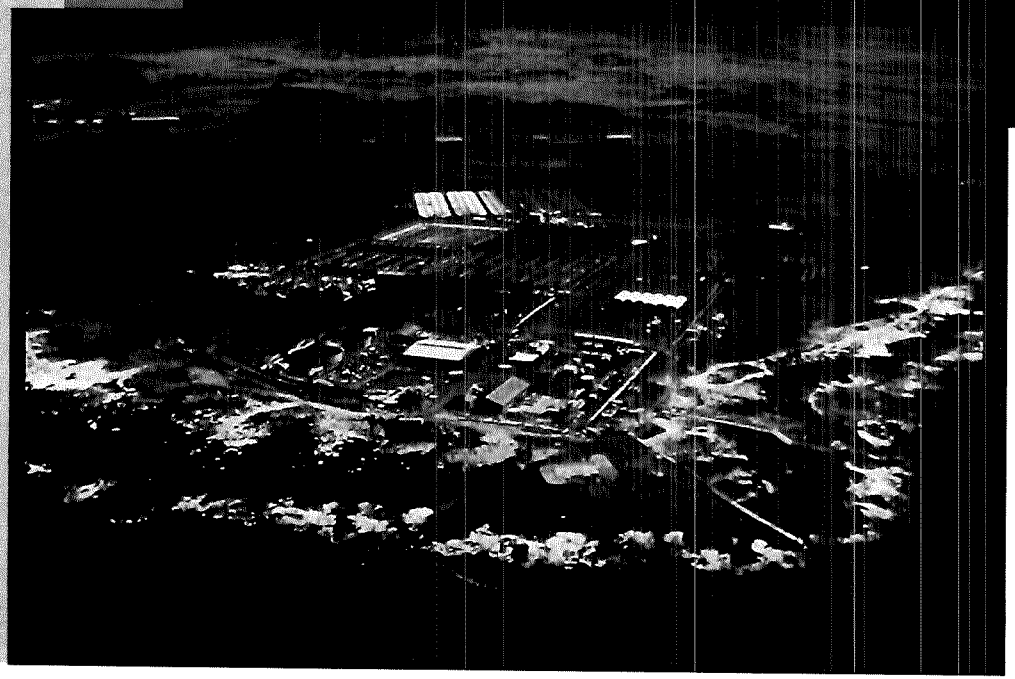
From: AS2299	Time after last dive, H		
Altitude (m)	Category of dive (see below)		
	1	2	3
0 - 150	Nil	Nil	2
150 - 600	Nil	2	12
600 - 2400	12	24	48
Greater than 2400	24	48	72

Category 1 = Single dive to 50 % of no-decompression limits, with no decompression or repetitive dives in previous few days.

Category 2 = Routine no-decompression diving; Single decompression dives.

Category 3 = Multiple decompression dives; Extreme exposures; Omitted decompression; Other adverse events.

An Overview of the Business of Abalone Farming in Australia



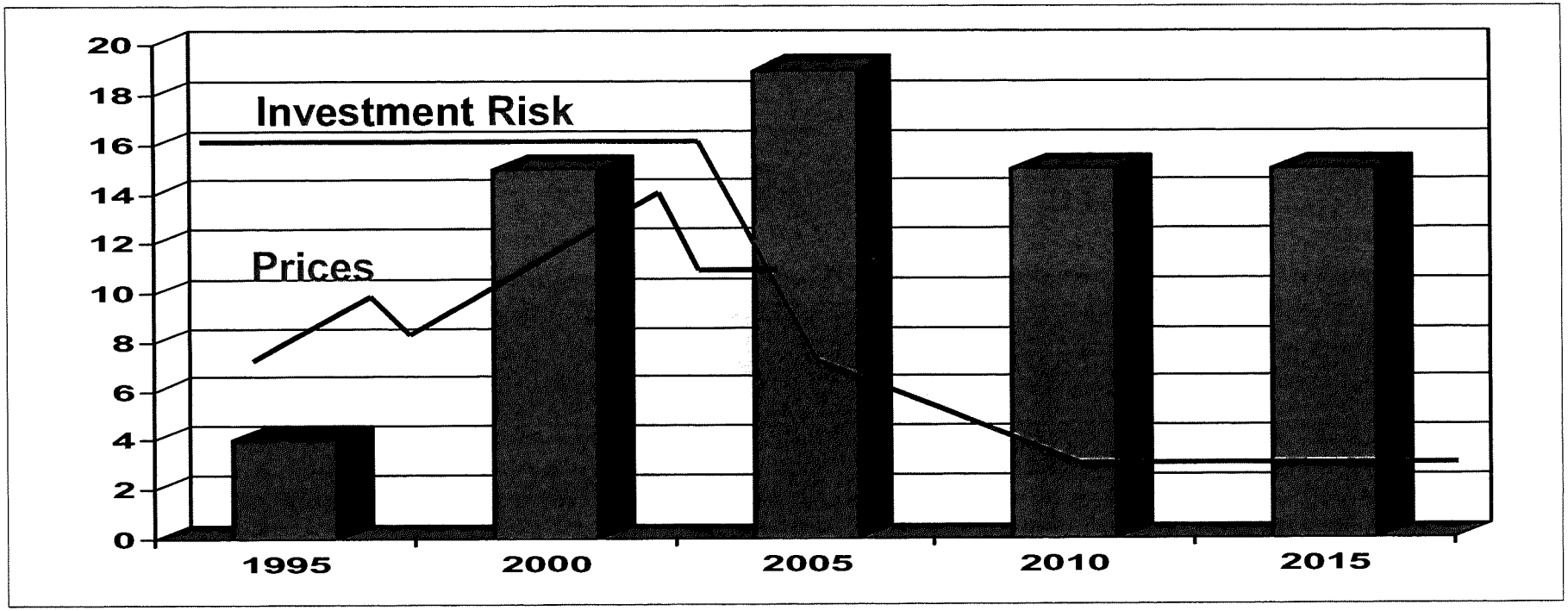
History

Projections

The Business

Industry Observations

Number of Abalone Farms in Australia



95 - 00

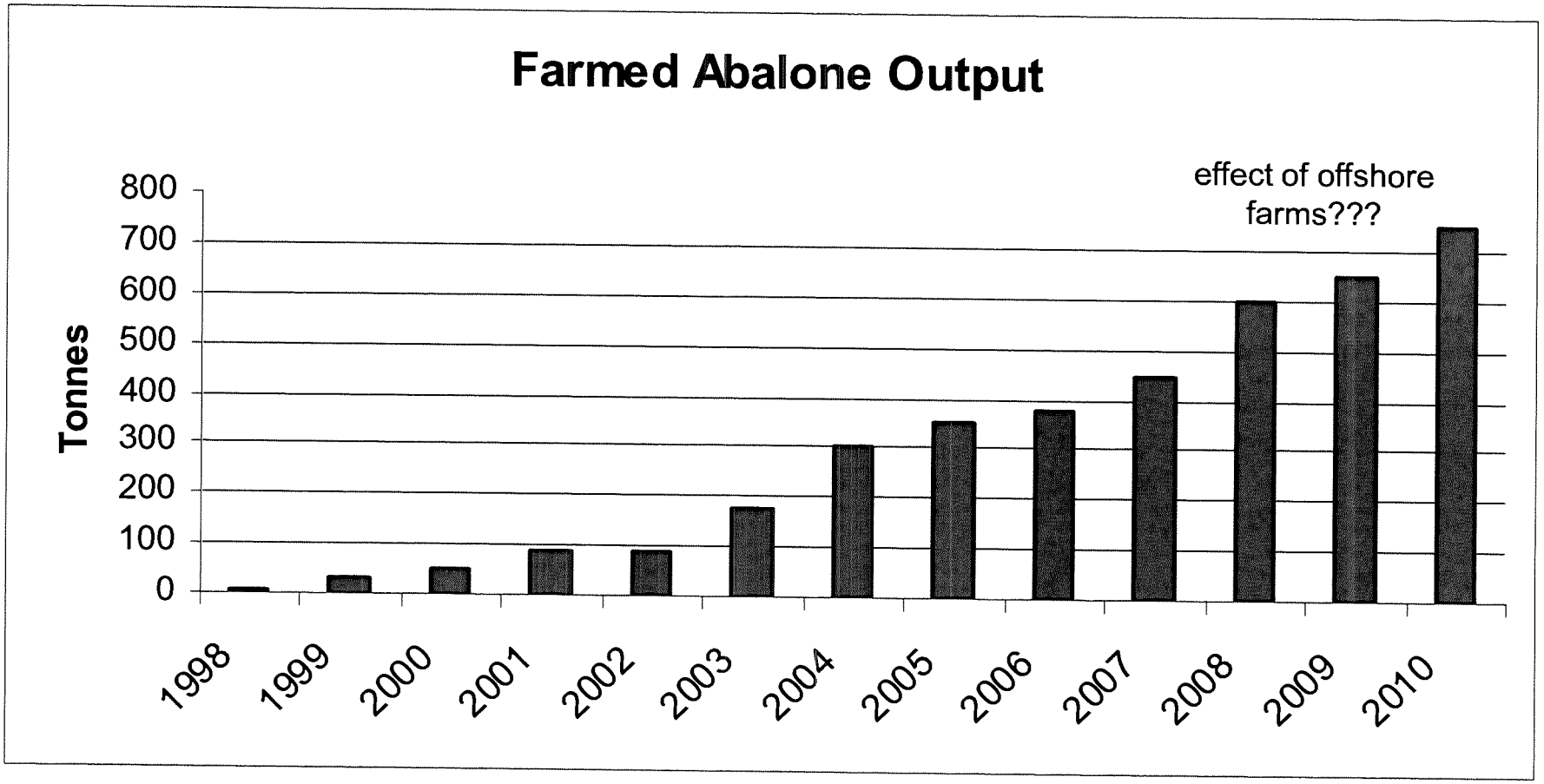
- New industry
- Sexy prospectuses
- Expected growth rates
- $A in the fifties
- Small Volumes - A$ 66/kg; prices going up

00 - 05

- Real growth rates
- Real costs
- Asian Crisis / SARS
- Less fav. A$
- A$35/kg
- Prices peaked in 2001

Beyond 05

- Bigger is better; expansions
- Amalgamations
- Offshore systems



Based on current farms only and their expected expansions

Approx production of 300 tonnes in 2004

Keys to a successful Abalone Farming Business

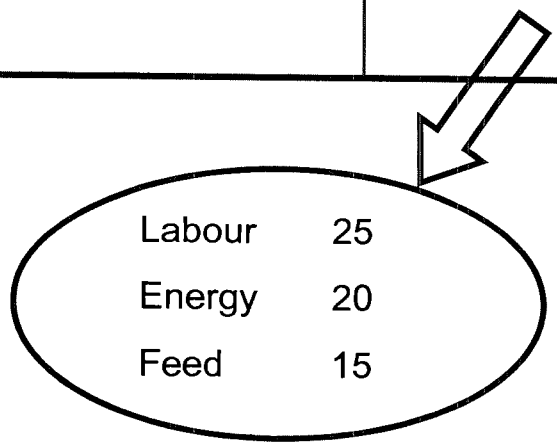
- Good site with good water quality
- Access to Good people (greatest cost)
- Marketing
- Strong Association (collaboration)

Cost Challenges

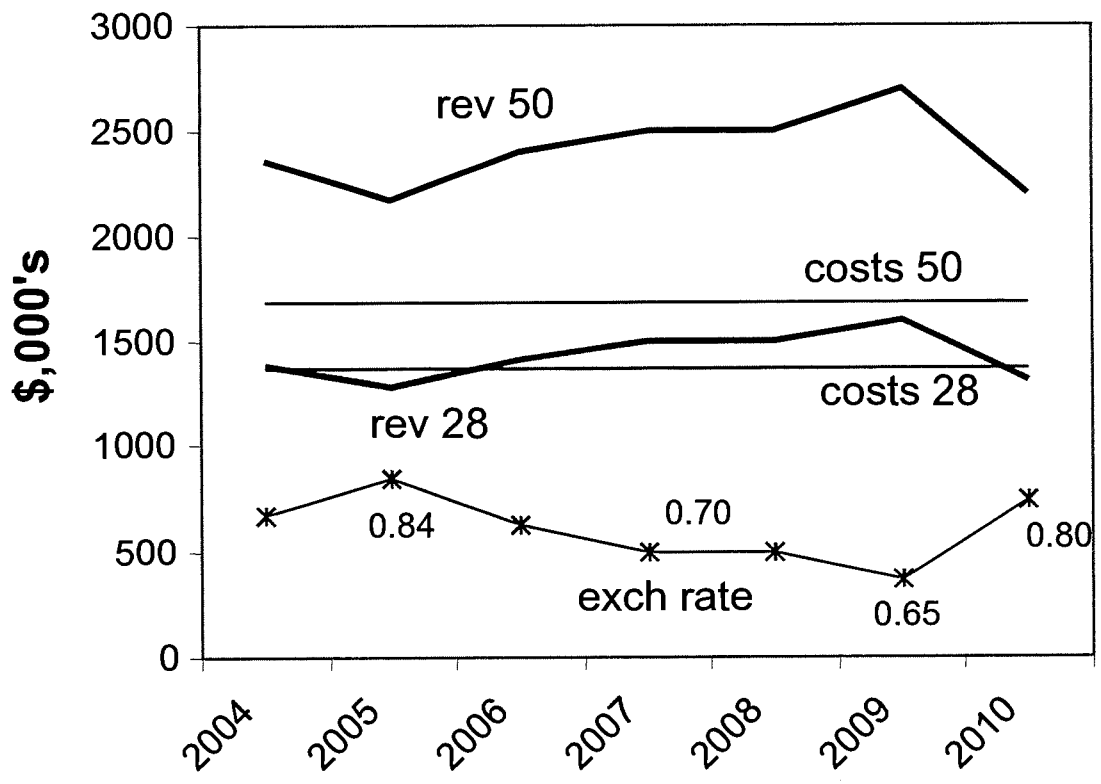
- Start up costs are significant.
- High level of fixed costs in operations phase
- ..are in $A, revenue in USD or Yen.

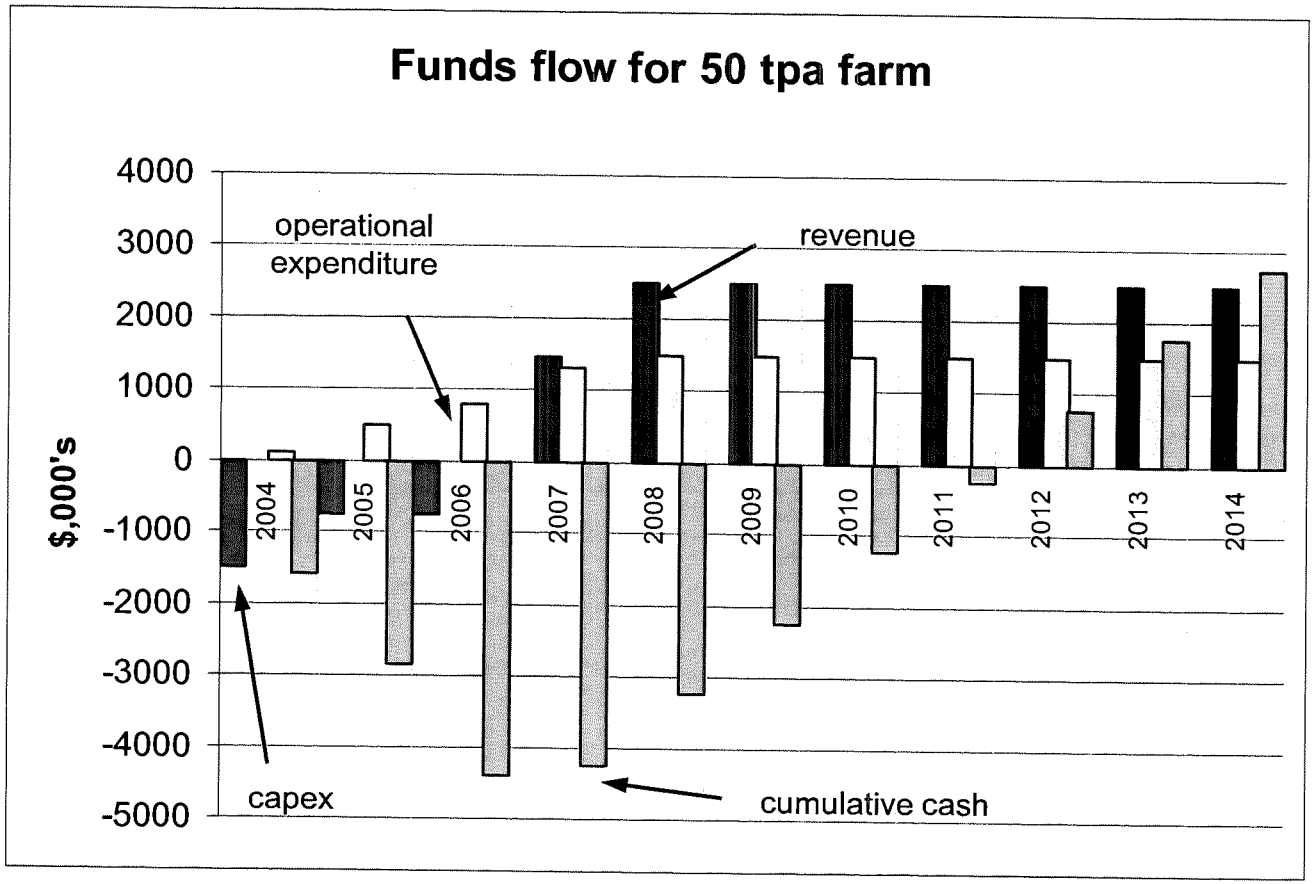
Cost Comparisons
Percentage Breakdowns

Cost Item	Processor	Farmer	Diver
Cost of Goods Sold	**90**	**10**	**0**
Overheads/ Administration	**5**	**25**	**20**
Operational Expenditure	**5**	**65**	**80**



Revenue and Costs for 28 tpa and 50tpa farms





capital expenditure approx $3mill **

IRR(10) =8%

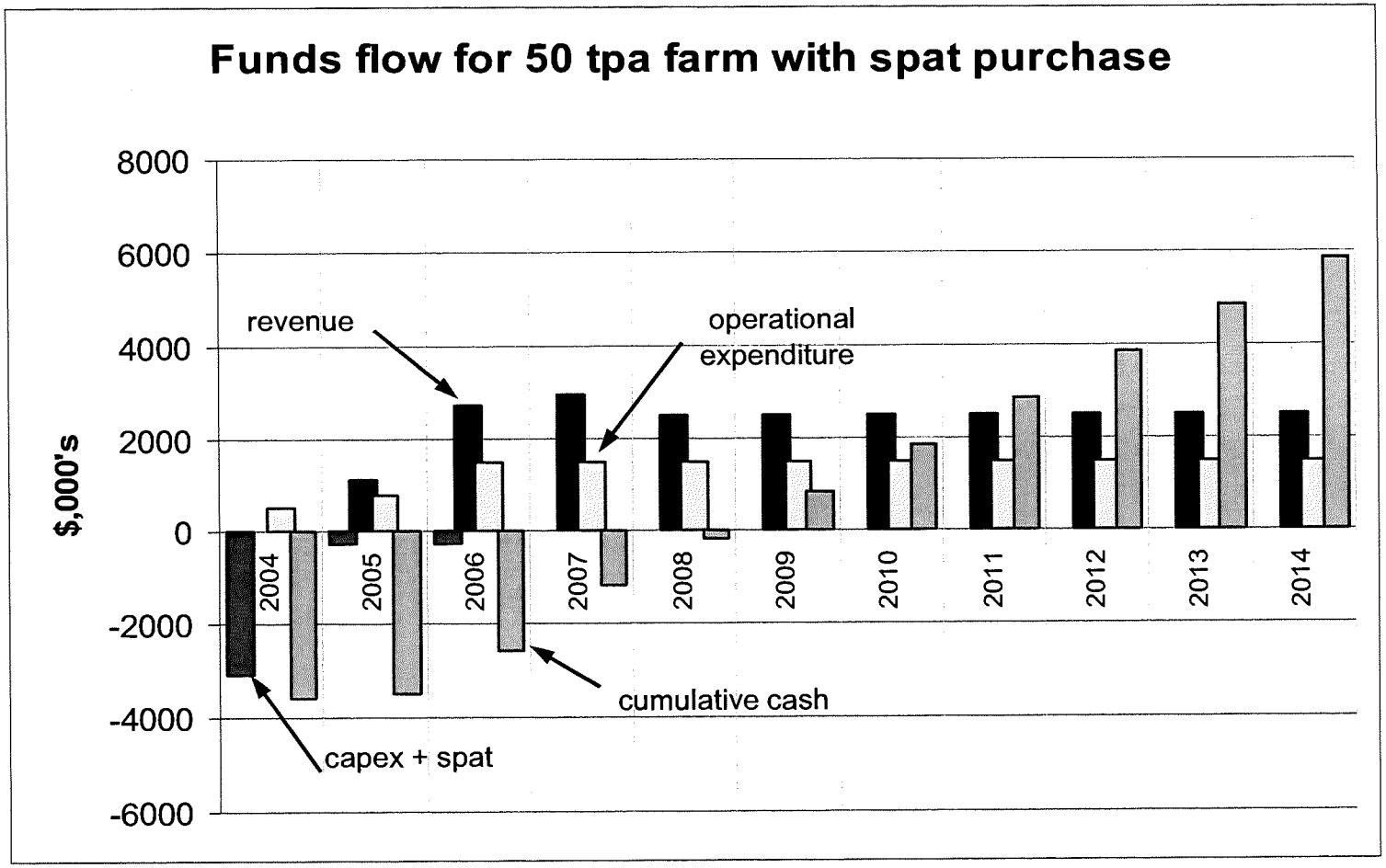
IRR(15) = 12%

Licence holder/diver

ROR to Total Capital

11% average (97-03)

EconSearch Pty Ltd

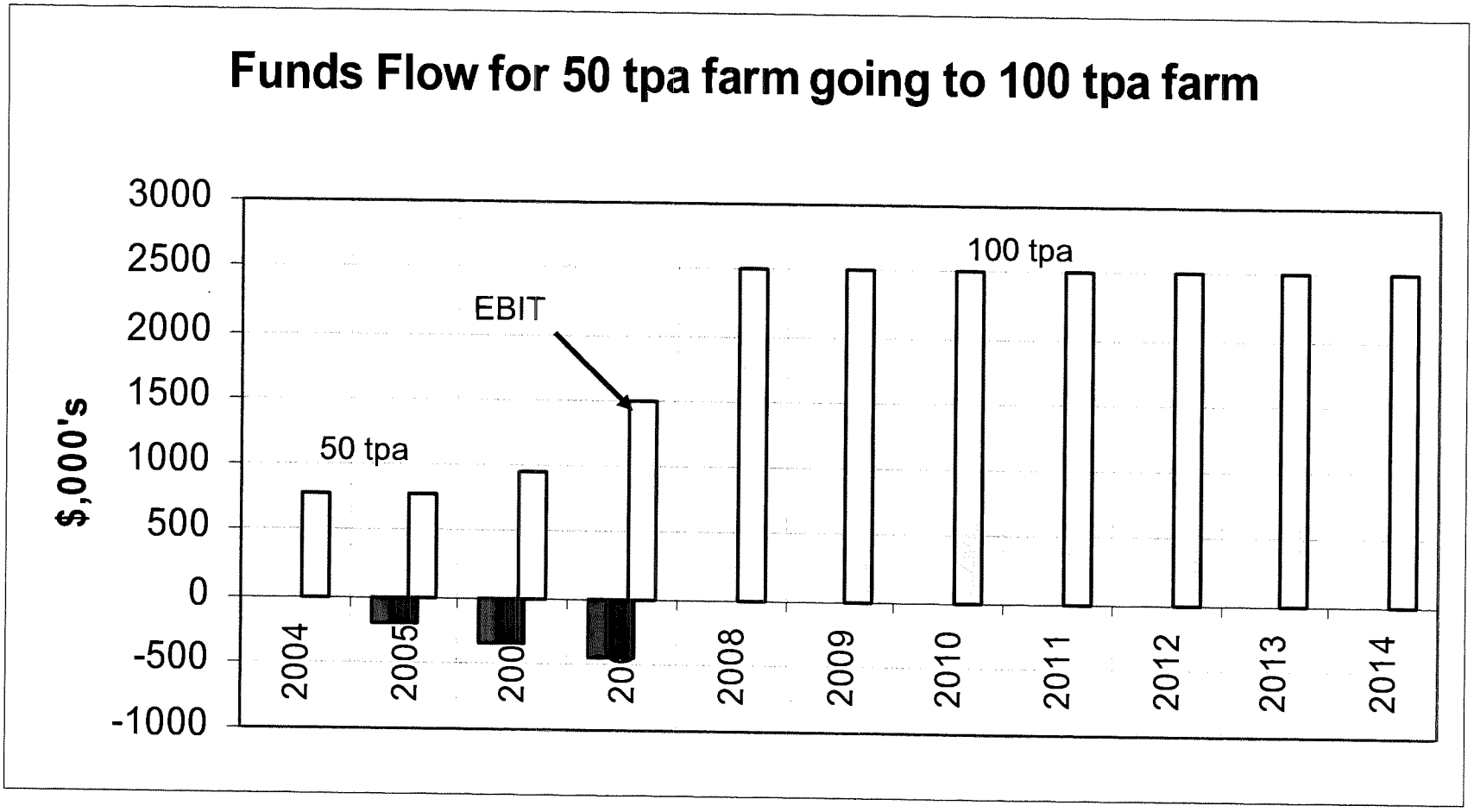


capital expenditure approx $3mill **

spat purchase $0.6 mill; some debt

IRR(10) =16%

IRR(15) = 20%



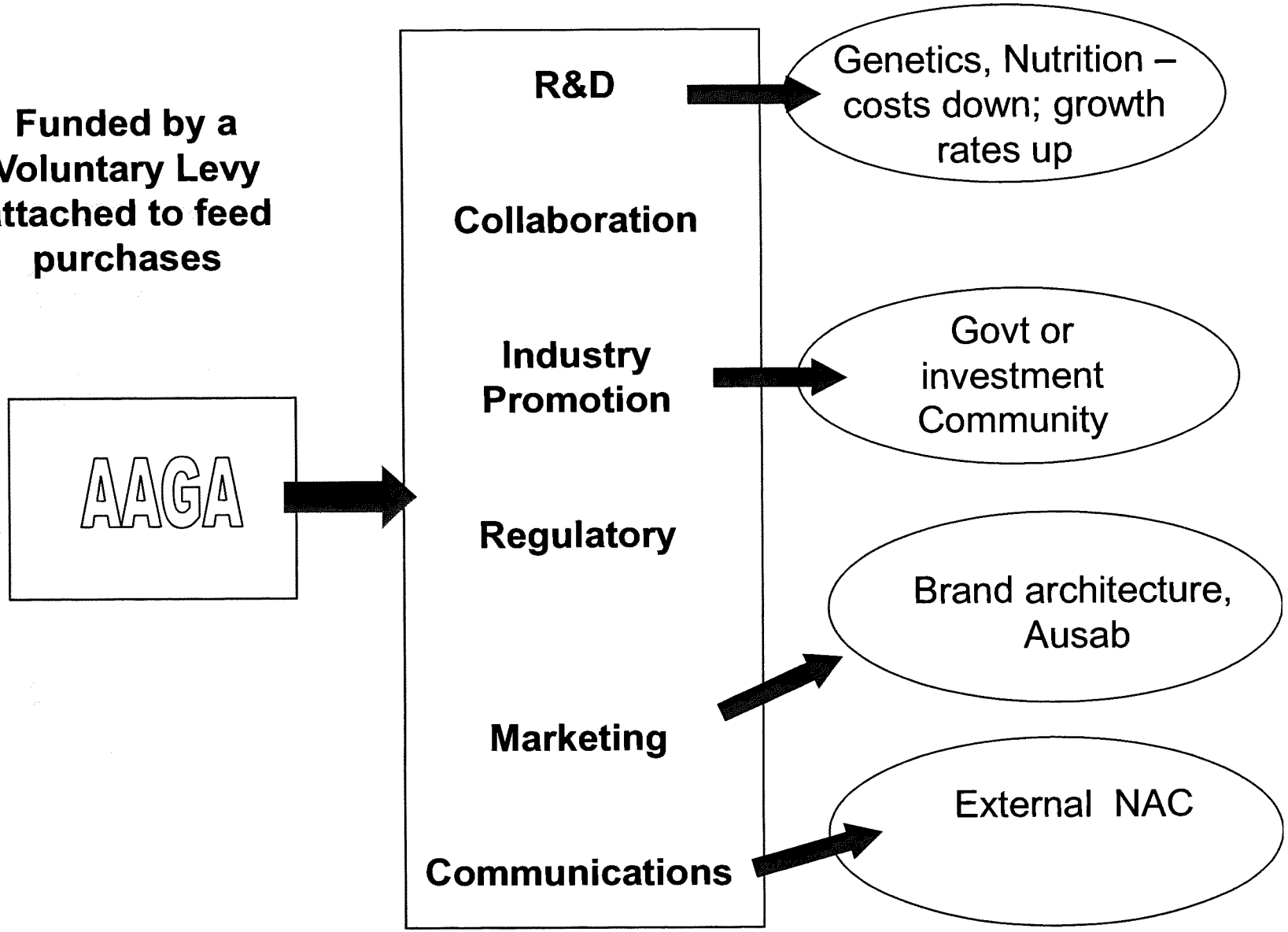
capital expenditure approx $2mill **

half equity ; half debt

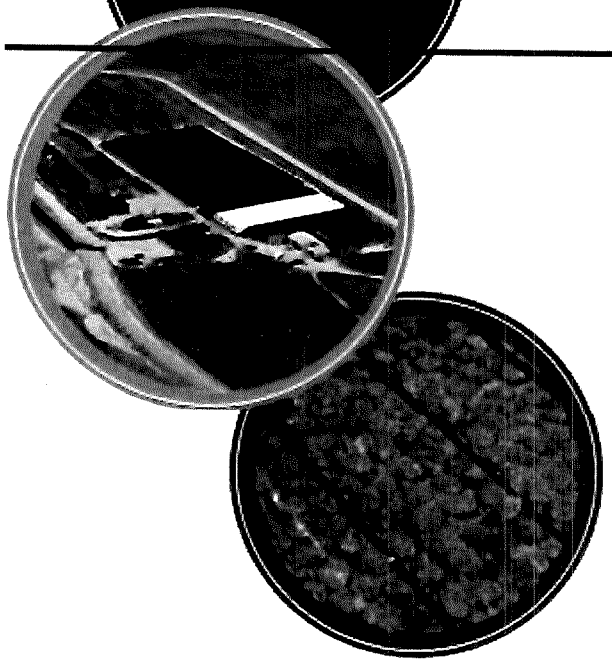
IRR(10) =70%

Australian Abalone Growers Association

Funded by a Voluntary Levy attached to feed purchases



About Ausab

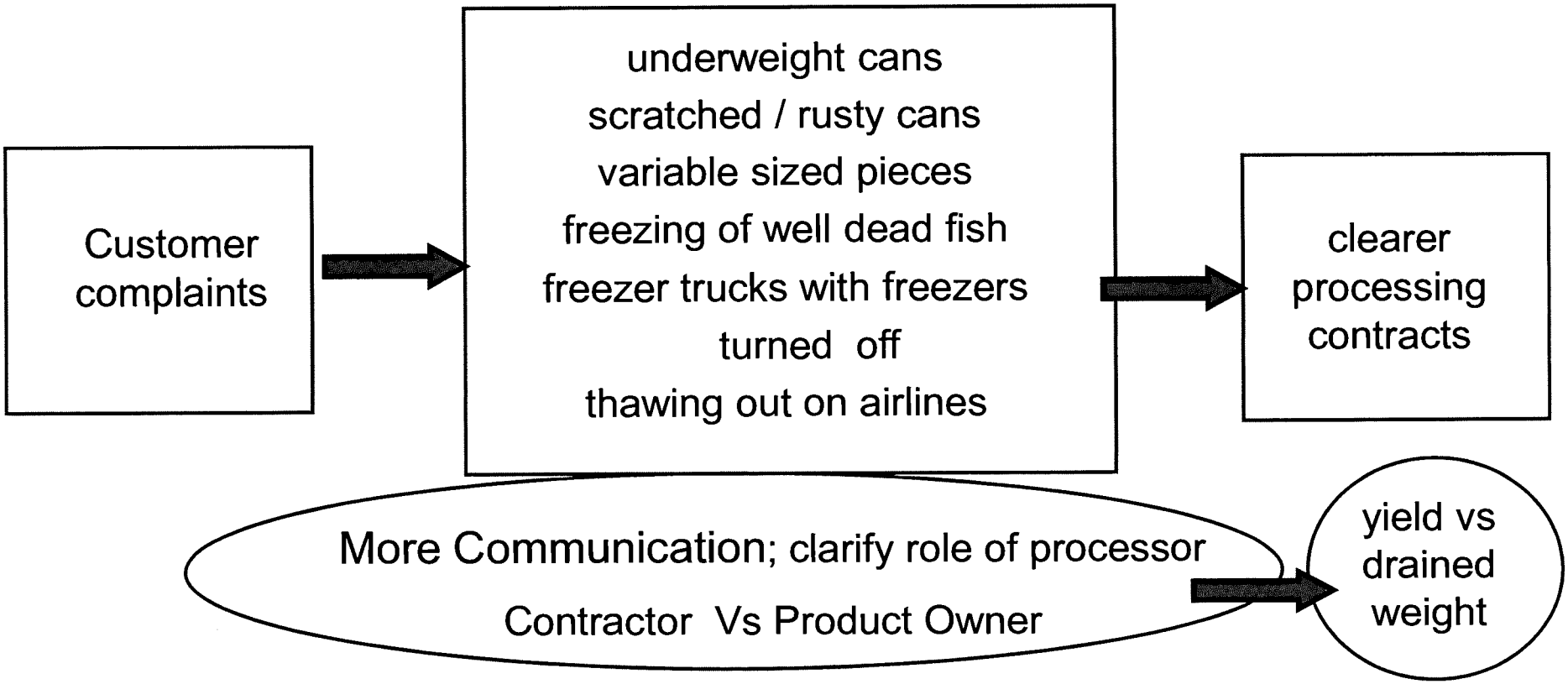


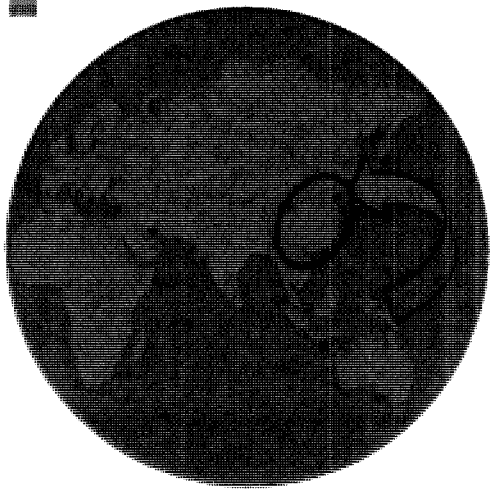
- Incorporated company to undertake industry's post harvest activities.
- Negotiate with customers and processors
- 6 farm members (shareholders) representing >75% of current supply
- Seeking to greatly improve post harvest activities

- **WE WILL NEVER KNOWINGLY SEND OUT INFERIOR PRODUCT**

Processing Requirements

- Opportunity for improvements in post harvest sector
- Lots of scrutiny on new products



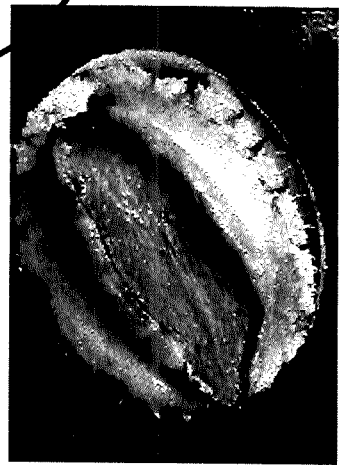


The Market

AAA ACA AAGA

ausab

The Product



第一飽

AN OVERVIEW OF CHINESE ABALONE MARKET

May 2005

by Nelson Lui

第一飽

Chinese Eating Culture

- 2500 years ago, the famous Chinese philosopher, Confucius, once said, "Eating is the first demand of all people." This depicts the attitude of Chinese people towards food.
- Chinese people regard eating as an art and are meticulous about the food they eat.

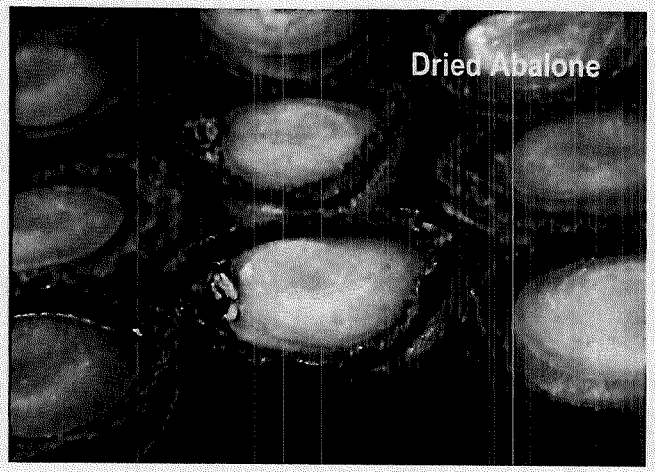
第一飽

Traditional Delicacies

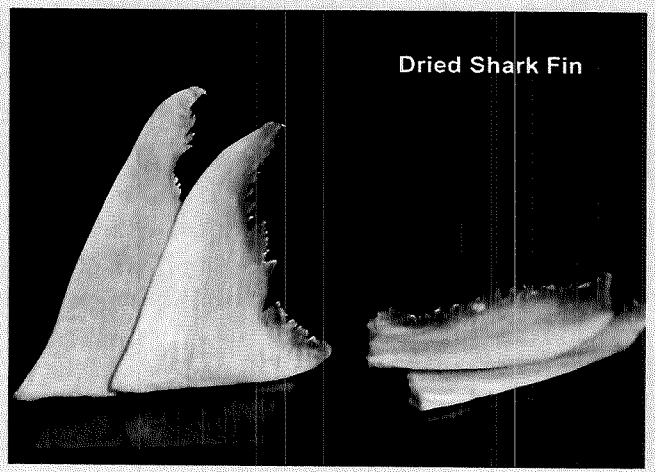
Traditional Chinese delicacies are normally classified into :

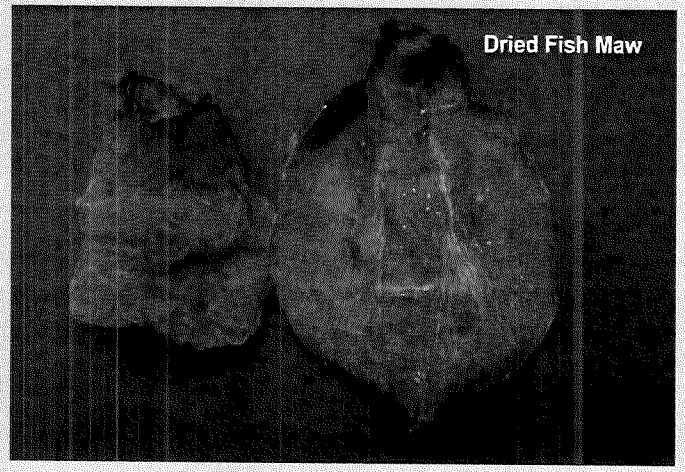
- *Land-based delicacies.*
- *Marine-based delicacies - The most famous marine delicacies in Chinese food are :*

第一飽



Dried Sea Cucumber





第一節

Why is Abalone considered as a traditional delicacy?

- According to Chinese medicine, eating abalone helps to:
  (1) strengthen the liver function
  (2) strengthen the kidney function
  (3) cure asthma
- It is a common believe of the Chinese that eating abalone has an aphrodisiac effect.

第一節

Forms of Abalone used in Chinese Food

	Can Form	Frozen Form	Live Form	Dried Form
Without Cooking:				
Sashimi & Suishi			˅	
Hot-pot			˅	
Appetizer & Snack	˅			
With Cooking:				
Soup	˅	˅		˅
Braised	˅	˅		˅
Steamed			˅	

第一節

The Abalone Market of China / Hong Kong

When we talk about the abalone market in China we cannot leave Hong Kong out. These markets are in fact two in one for the following reasons:

- Hong Kong is part of China after 1997.
- Hong Kong is duty-free city while China imposes heavy customs duty and VAT. As a result, abalone were officially imported into Hong Kong first before re-exporting to China through illegal channels.

第一節

China Tax on Imported Abalone

	Live / Frozen	Canned / Dried
Non-Most Favoured Nation		
Customs Duty	80.0 %	90.0 %
VAT (Value Added Tax)	13.0 %	17.0 %
Effective Tax Rate	103.4 %	122.3 %
Most Favoured Nation		
Customs Duty	19.2 %	8.3 %
VAT (Value Added Tax)	13.0 %	17.0 %
Effective Tax Rate	34.7 %	26.7 %

第一節

Statistical Data from Hong Kong Government

The following analyses will be based mainly on statistical data from the Hong Kong Government because :

- There is no reliable statistical data from China.
- Since most of the abalone re-exported into China (via illegal channel) has to be imported into Hong Kong first, the import statistics of Hong Kong should also reflect the abalone demand in China.

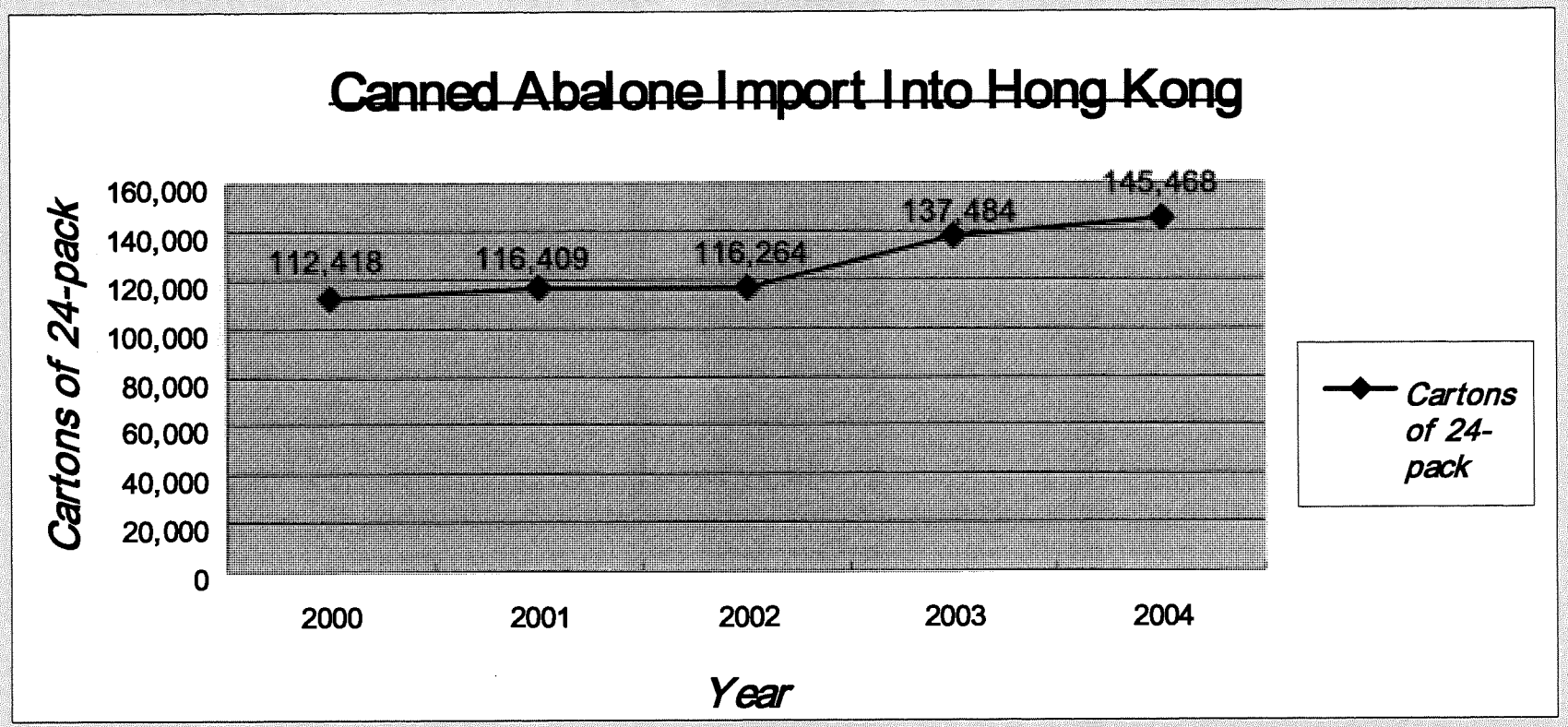
第一節

Canned Abalone imported into Hong Kong (1)

Exporting Country	2000 (24-pack carton)	2001 (25-pack carton)	2002 (26-pack carton)	2003 (27-pack carton)	2004 (28-pack carton)
U.S.A. & Mexico	10,274	6,776	8,595	11,189	9,508
Singapore	3,240	687	2,244	2,915	5,420
South Africa	11,098	9,816	11,192	9,745	9,920
Australia	51,370	58,420	56,067	75,039	84,307
New Zealand	35,229	37,146	36,883	34,281	33,490
Others	1,207	3,564	1,283	4,315	2,823
TOTAL	112,418	116,409	116,264	137,484	145,468

第一節

Canned Abalone imported into Hong Kong (2)



第一節

Live Abalone imported into Hong Kong

Exporting Country	2000 (Kg.)	2001 (Kg.)	2002 (Kg.)	2003 (Kg.)	2004 (Kg.)
U.S.A. & Mexico	899	2,478	560	584	260
Taiwan	158,267	58,687	56,371	9,254	0
China	26,998	2,241	24,852	6,150	11,341
South Africa	146,029	142,060	160,870	172,394	180,108
Australia	370,530	763,249	833,515	937,460	1,042,460
New Zealand	700	1,115	970	0	1,653
Others	3,663	2,241	4,032	1,844	470
TOTAL	707,086	972,071	1,081,170	1,127,686	1,236,292

第一節

Frozen Abalone imported into Hong Kong

Exporting Country	2000 (Kg.)	2001 (Kg.)	2002 (Kg.)	2003 (Kg.)	2004 (Kg.)
U.S.A.	9,580	13,196	11,580	6,531	13,955
Chile	10,500	49,500	0	48,343	19,975
Philippines	283,334	215,129	143,260	124,831	110,433
Malaysia	63,870	91,213	31,980	17,027	12,447
Singapore	750	46,073	83,596	45,910	10,332
Mozambique	45,212	65,547	106,164	56,126	33,707
Senegal	34,620	4,548	358	6,171	1,083
South Africa	144,878	92,876	89,557	94,925	184,304
Zimbabwe	0	916	33,648	200	0
Swaziland	26,060	39,775	55,685	2,755	0
Australia	186,072	180,542	189,374	235,349	247,006
New Zealand	59,123	12,565	42,343	2,238	582
Others	1,256	17,054	32,067	18,417	22,504
TOTAL	865,255	828,934	819,612	658,823	656,328

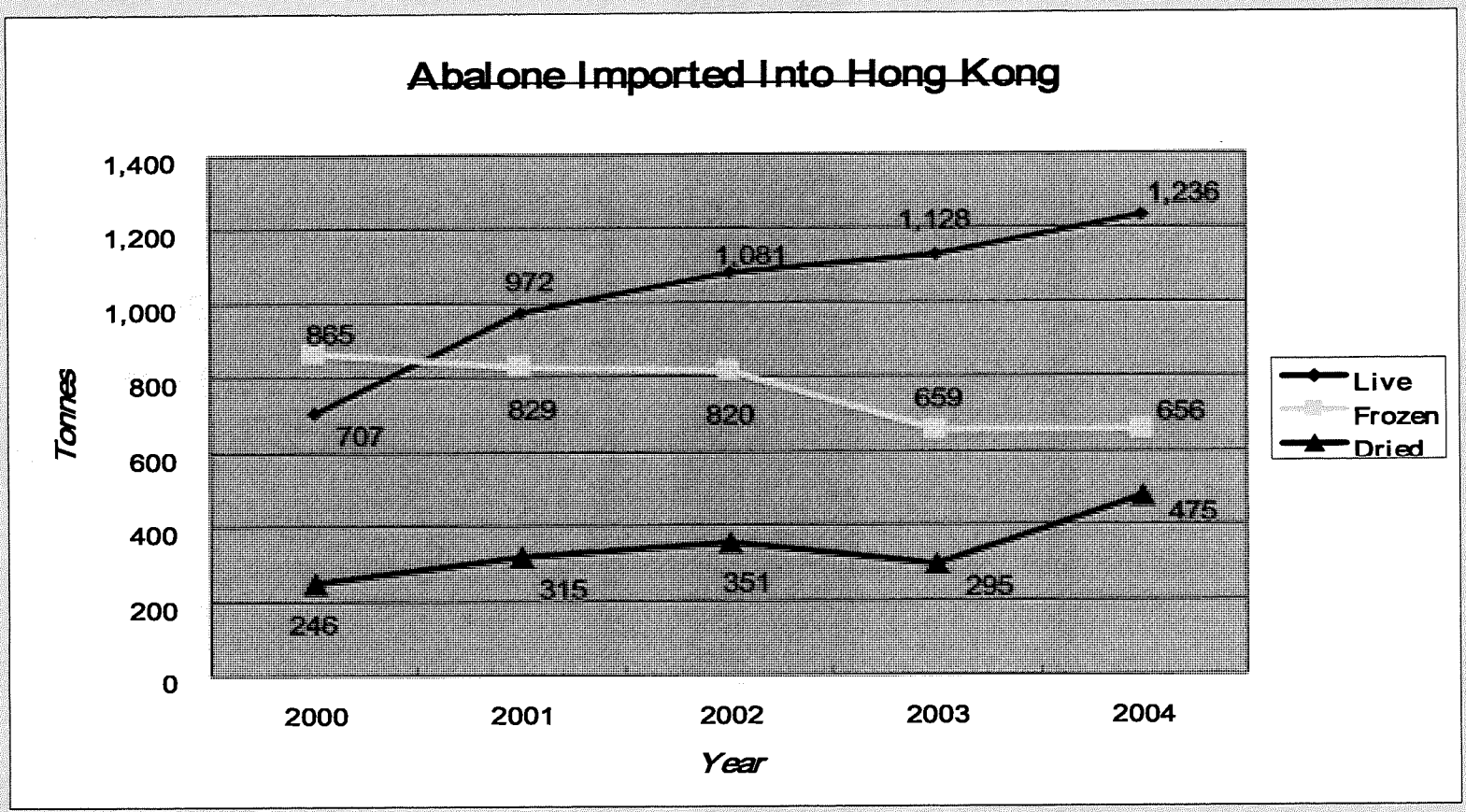
第一節

Dried Abalone imported into Hong Kong

Exporting Country	2000 (Kg.)	2001 (Kg.)	2002 (Kg.)	2003 (Kg.)	2004 (Kg.)
Oman	12,484	25,085	26,706	12,154	23,743
Indonesia	29,051	33,296	43,395	34,858	46,970
Philippines	22,626	35,576	12,519	5,579	22,085
Japan	24,410	20,881	25,423	35,404	36,805
Mozambique	32,097	64,492	71,196	36,932	8,878
South Africa	49,137	19,617	71,571	73,180	257,171
Australia	66,117	91,204	28,975	41,425	53,614
Others	10,075	24,395	71,364	55,498	25,581
TOTAL	245,997	314,546	351,149	295,030	474,847

第一節

Live, Frozen and Dried Abalone imported into Hong Kong



第一節

Conversion of imported abalone into raw material gross tonnage (1)

Other than the Live Form, the above-mentioned statistics do not reflect the raw abalone tonnage of imported into China. In order to find out the raw fish tonnage, the following conversion factors are being used :

- Canned Form – 19 Kg : 1 carton of 24-pack
- Live Form – 1 Kg : 1 Kg of live fish
- Frozen Form – 10 Kg : 4 Kg of frozen fish
- Dried Form – 10 Kg : 1 Kg of dried fish

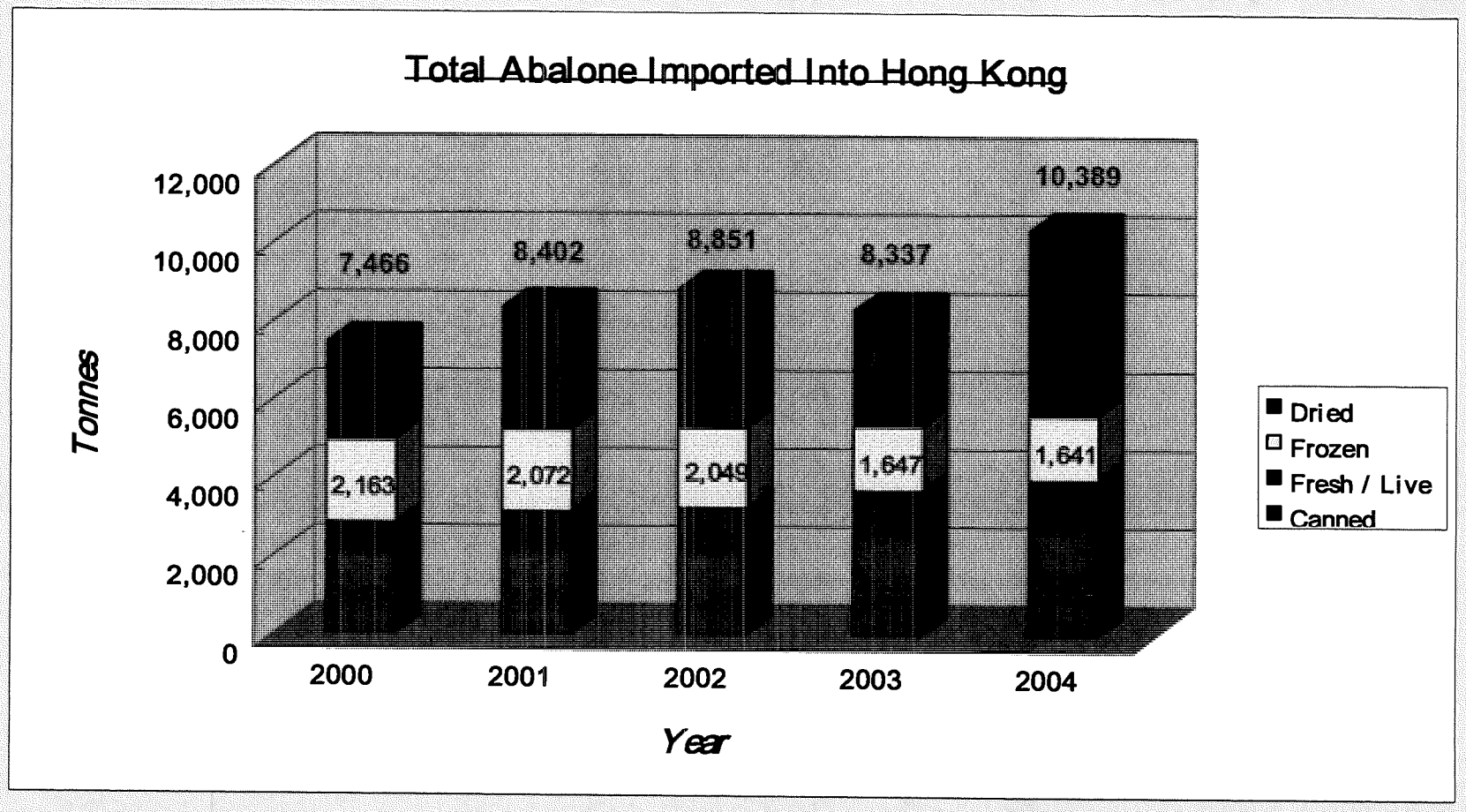
第一節

Conversion of imported abalone into raw material gross tonnage (2)

	2000 (Tonnes)	2001 (Tonnes)	2002 (Tonnes)	2003 (Tonnes)	2004 (Tonnes)
Canned	2,136	2,212	2,209	2,612	2,764
Live	707	972	1,081	1,128	1,236
Frozen	2,163	2,072	2,049	1,647	1,641
Dried	2,460	3,145	3,511	2,950	4,748
TOTAL	7,466	8,402	8,851	8,337	10,389

第一節

Conversion of imported abalone into raw material gross tonnage (3)



第一節

Summary of the Current Chinese Abalone Market

- **It has a demand of 10,400 tonnes of abalone per annum.**
- **The demand for canned, live and dried abalone in China are growing, while the demand for frozen abalone has dropped.**
- **Over 90% of the abalone imported into China are through illegal channels.**

第一節

Behaviour of the Illegal & Dishonest Importers

- They are spot buyers.
- They have no long term marketing strategy.
- They are unwilling to spend money and effort on advertising and promotion.
- They compete only on price.

第一節

Effect of Illegal & Dishonest Importers on the Chinese Abalone Market

- In the short run, smuggling helps to :
  - Achieve product presentation
  - Create business activities
- In the long run, smuggling will lead to :
  - Increase in criminal activities
  - Unfair competition
  - Market shrinkage

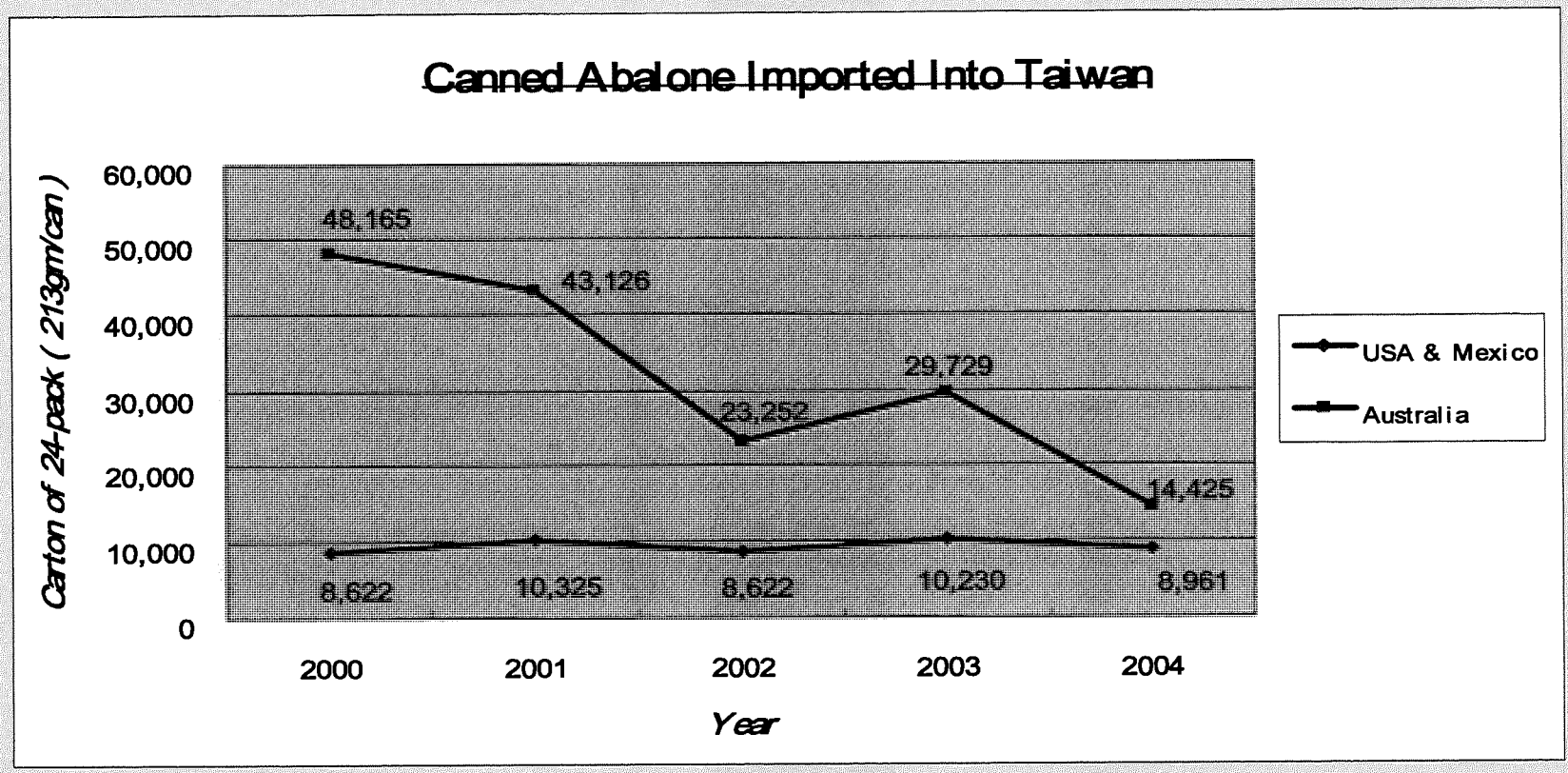
第一節

A Typical Example – Australian Canned Abalone in Taiwan

- **Illegal / dishonest importers first compete on price.**
- **Next they compete on weight – the lighter the better because the product will be cheaper (e.g. from 213gm to 200gm to 180gm to 150gm ….).**
- **Unfair competition drives the genuine businessmen out of the market.**
- **Eventually the market shrinks .**

第一節

Import Statistics of Canned Abalone in Taiwan



第一節

Outlook of the Chinese Abalone Market

- It is an enormous market since China has 1.3 population .
- The demand for abalone will keep on growing as the living standard of China continues to improve.
- Unless the Chinese government determines to put an end to the smuggling activities, the market will continue to be:
  - dominated by illegal importers
  - volatile

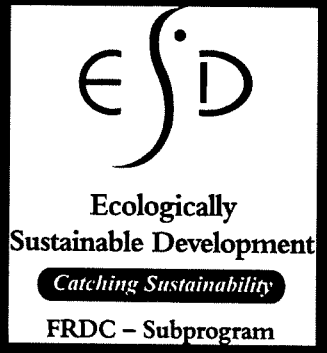
第一範

Thank You !

Using EBFM at a Regional Level to Inform Marine Planning

National Abalone Conference
May 2005

Dr Rick Fletcher
Department of Fisheries
Western Australia



Department of Fisheries
Government of Western Australia

Australian Government
Fisheries Research and Development Corporation

OUTLINE OF PRESENTATION

- Overview of tools from the National Framework for use in ESD issues
- What is EBFM? – linking all the concepts
- New initiatives for assisting cross fishery assessments and marine planning

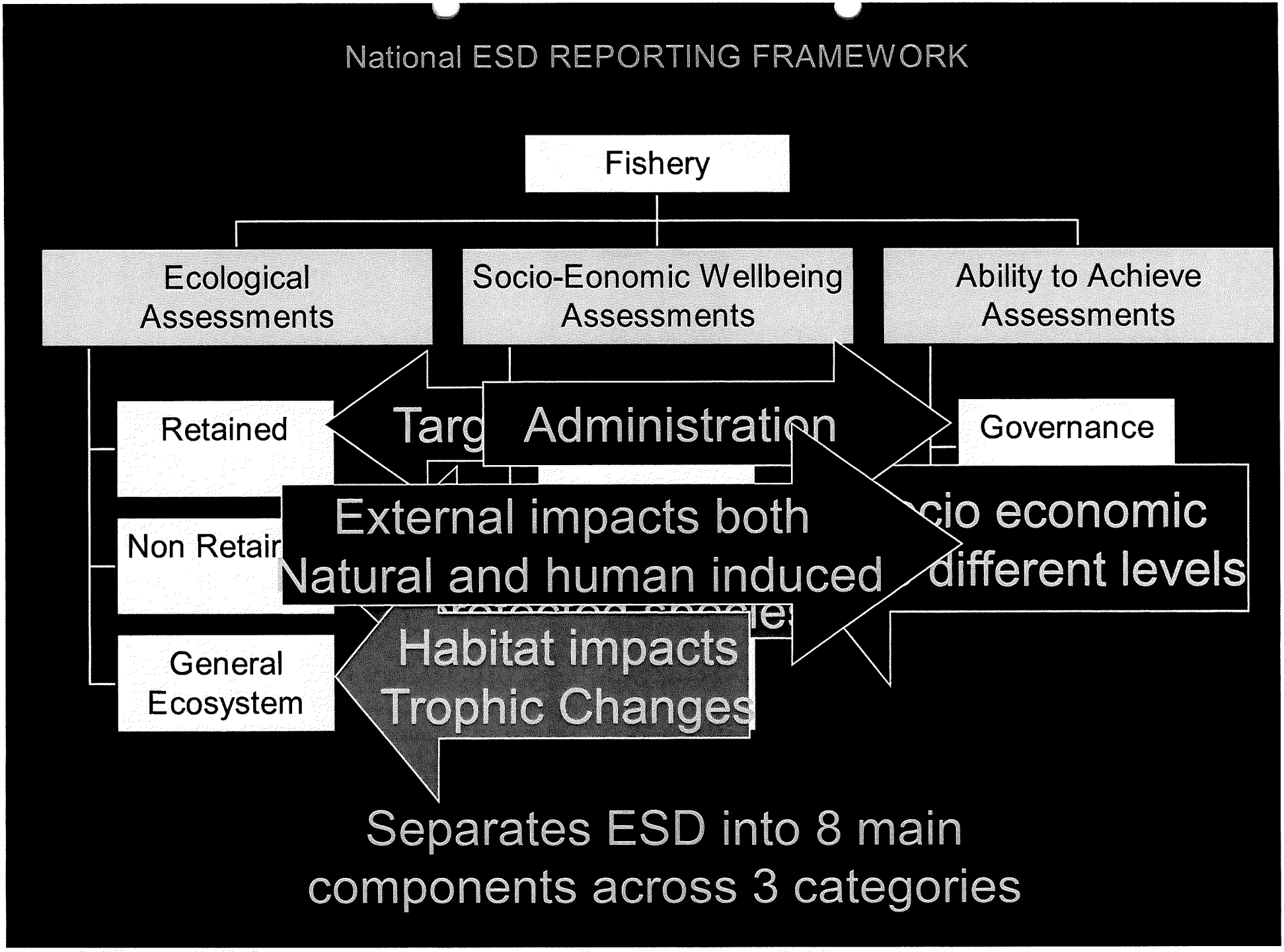
What is ESD in a fisheries context

- Incorporates the 5 major issues of interest – Target Species, Ecosystem, Social, Economic and Governance, long and short term objectives.
- This covers EBFM principles plus more
- It still means different things to different people – depending upon their perspective


Social Assessment Handbook
EXMOUTH GUL
PRAWN FISHER
EPORTS A
AVAILABL
ARE
SUBPROGRAM WEBSITE
www.fisheries-esd.com
Or
www.seafoodservices.com.au

How does the basic framework operate? - Part 1

Identify specific issues for each fishery by adapting a set of generic component trees in a workshop that includes all stakeholder groups


National ESD REPORTING FRAMEWORK
Fishery
Ecological Assessments
Socio-Eonomic Wellbeing Assessments
Ability to Achieve Assessments
Retained
Targ
Administration
Governance
External impacts both
Natural and human induced
cio economic
different levels
Non Retair
General Ecosystem
Habitat impacts
Trophic Changes
Separates ESD into 8 main components across 3 categories

How does the basic framework operate? Part 2

- Use a Qualitative Risk Assessment with all stakeholder groups involvement to determine appropriate level of response for each issue


RISK ASSESSMENT
Component Trees (issues identified)
Risk Assessment
NO DIRECT MANAGEMENT NEEDED
DIRECT MANAGEMENT IS NEEDED

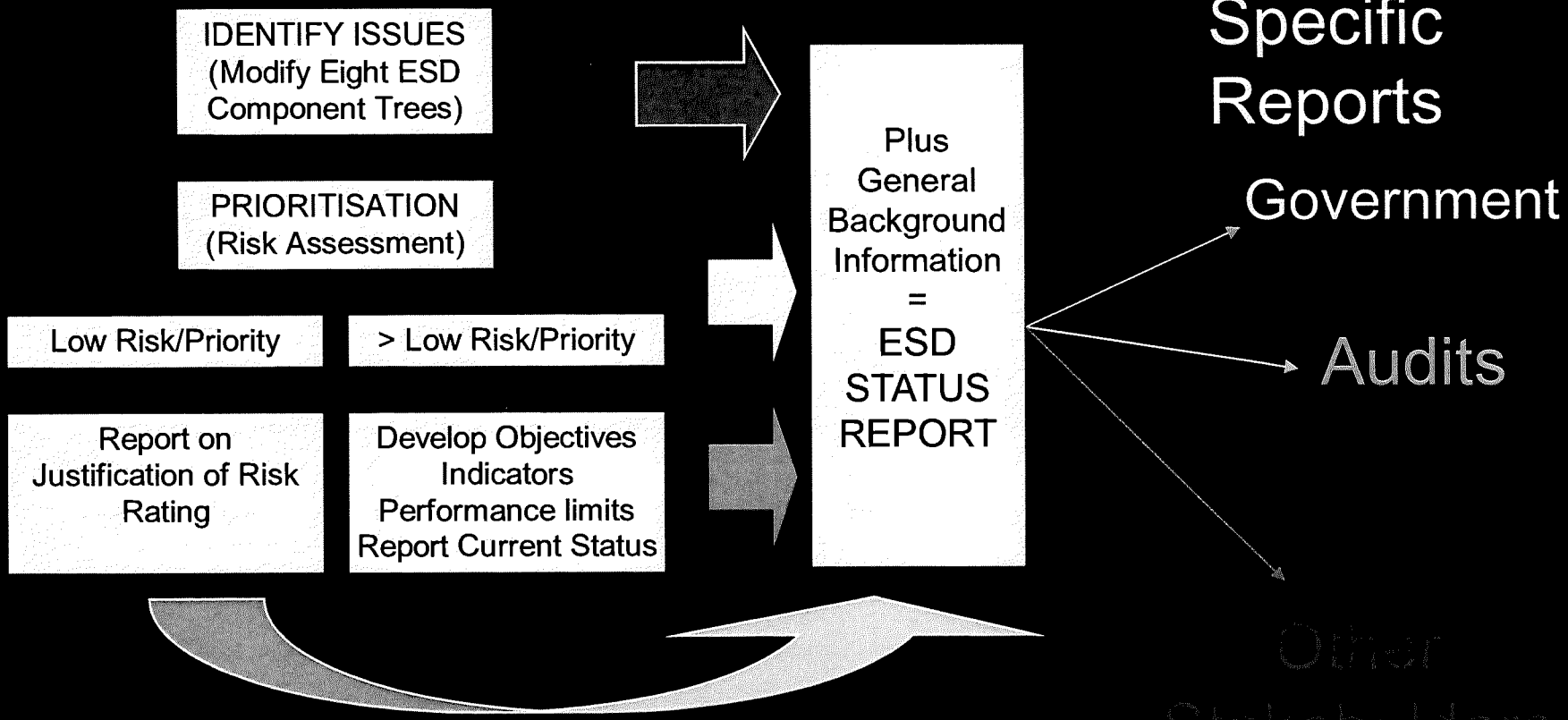
PART 2 Reporting

What <u>specifically</u> for this issue for this fishery do you want to achieve and WHY?

- Rationale for i
- Operational
- Indicator
- Performance M e (Justification)
- Data Requiremen
- Data Availability
- Evaluation
- Evaluation Reliability
- Management Respon *if Trigger is reached)*
- Summary of Actions and nclusions
- External Drivers

These need to link directly to the objectives

Summary of ESD Framework



How does this fit with other concepts such as EBM, EBFM, IOM and EMS??

- ESD is the overall goal and all the other terms (eg EBFM) describe strategies that are used to work towards ESD.
- The main difference between these strategies is the scope of issues covered

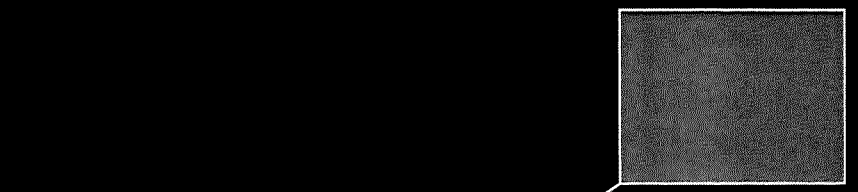
what can be - managed - influenced - being influenced).

- They form a hierarchy within the total ESD framework

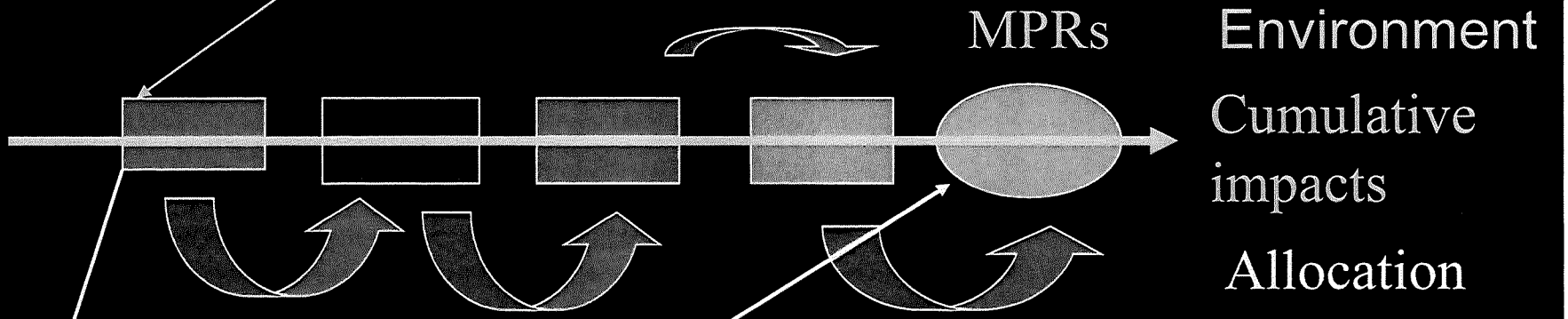
Industry EMS ► Fishery ESD ► EBFM ► EBM ► IOM ► "ESD"

National ESD Frameworks

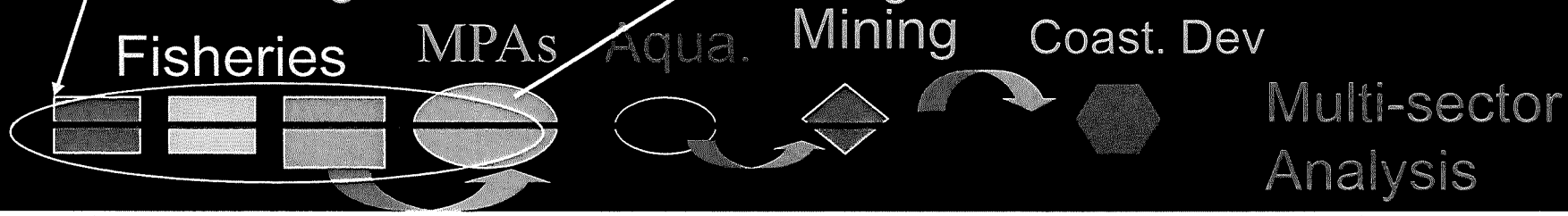
1. Fishery ESD – Management using ESD principles (single fishery)

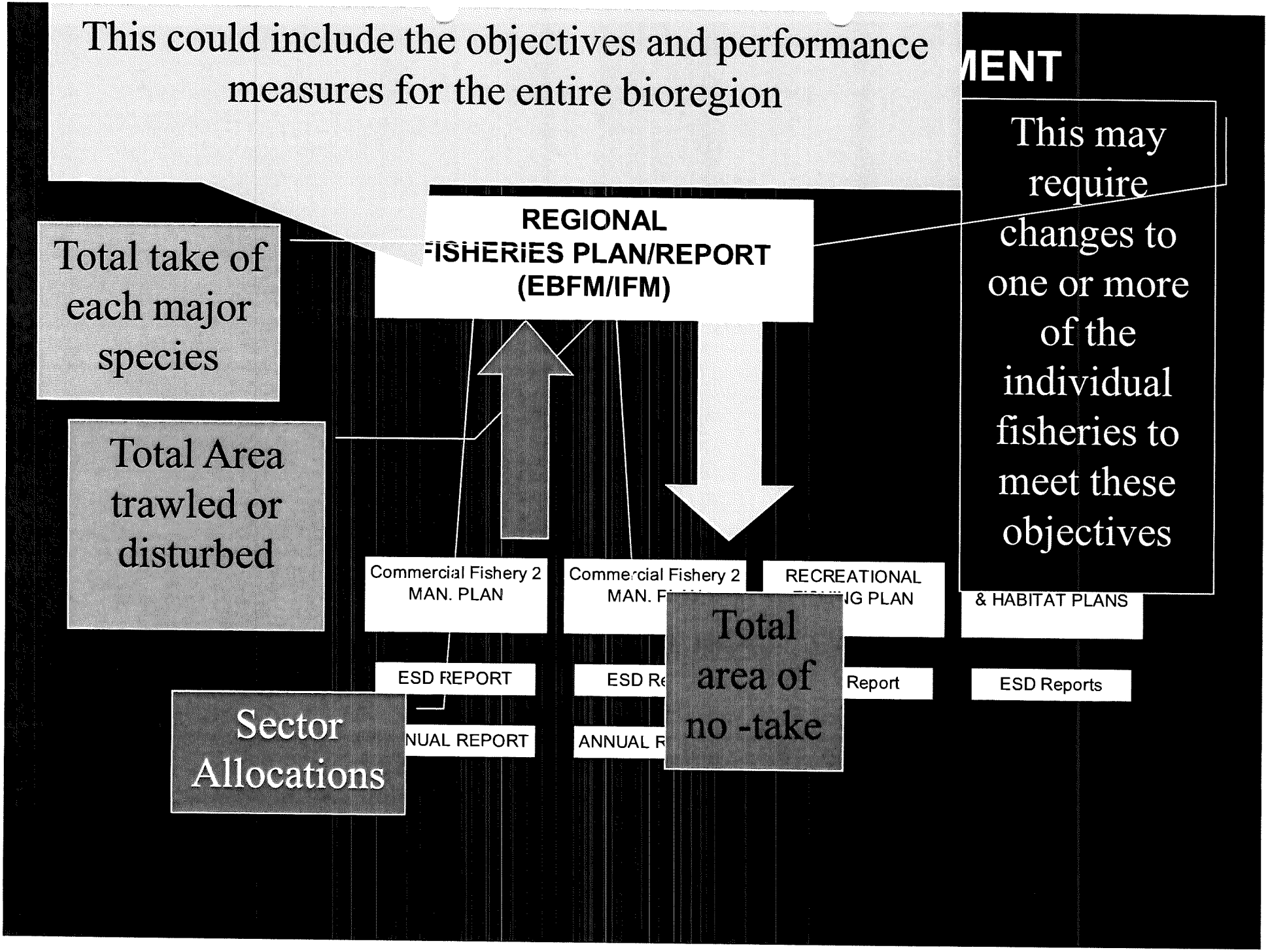


2. Ecosystem Based Fisheries Management (EBFM)
Multi-fisheries Assessment – Integrated Fisheries Management



3. EBM - Regional Marine Planning

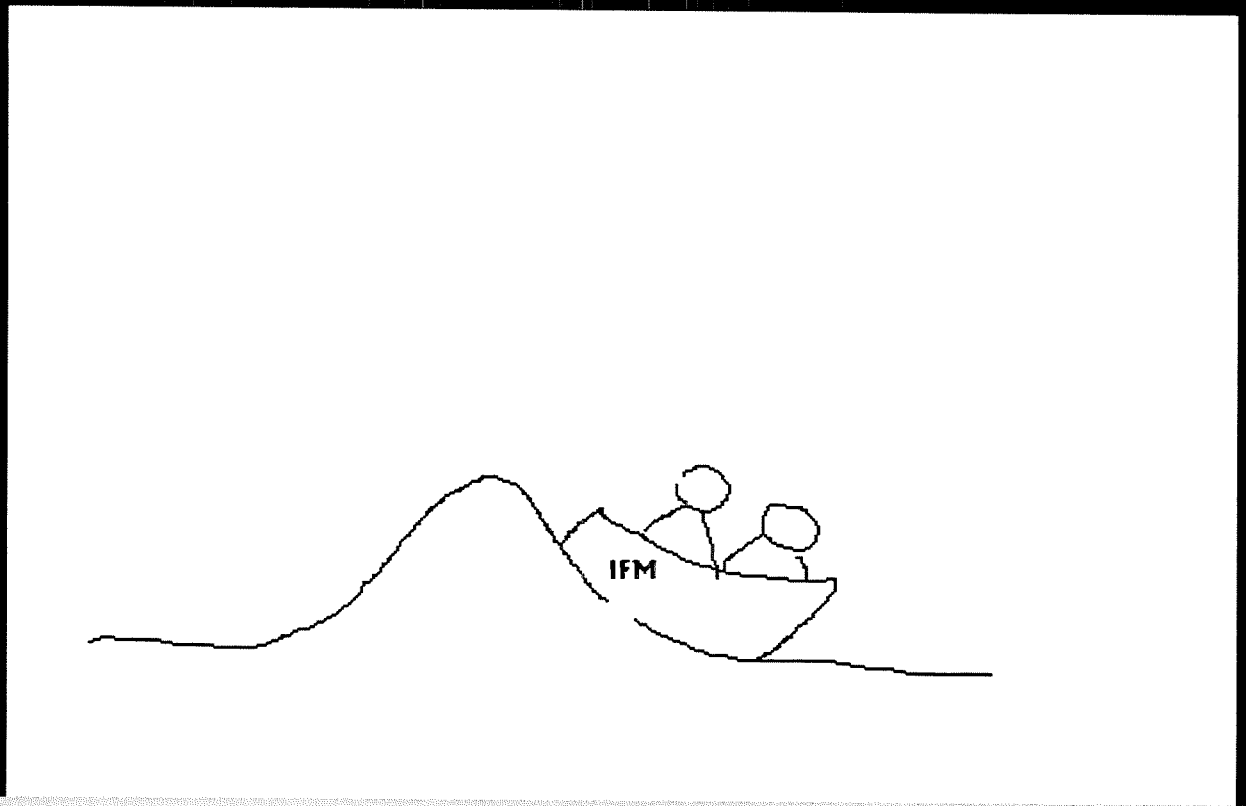



This could include the objectives and performance measures for the entire bioregion
MENT
This may require changes to one or more of the individual fisheries to meet these objectives
REGIONAL
FISHERIES PLAN/REPORT
(EBFM/IFM)
Total take of each major species
Total Area trawled or disturbed
Sector Allocations
Total area of no -take
Commercial Fishery 2 MAN. PLAN
Commercial Fishery 2 MAN. PL
RECREATIONAL
NG PLAN
& HABITAT PLANS
ESD REPORT
ESD Re
Report
ESD Reports
NUAL REPORT
ANNUAL R

EBFM Framework

- The draft ESD framework for EBFM/IFM is similar in structure to the single sector
- The key difference is that there may be more than one objective for some issues
- Different sectors may have different requirements
- It should also indicate how the management arrangements of individual fisheries are being coordinated to meet regional goals

How does EBFM/IFM fit into the system?

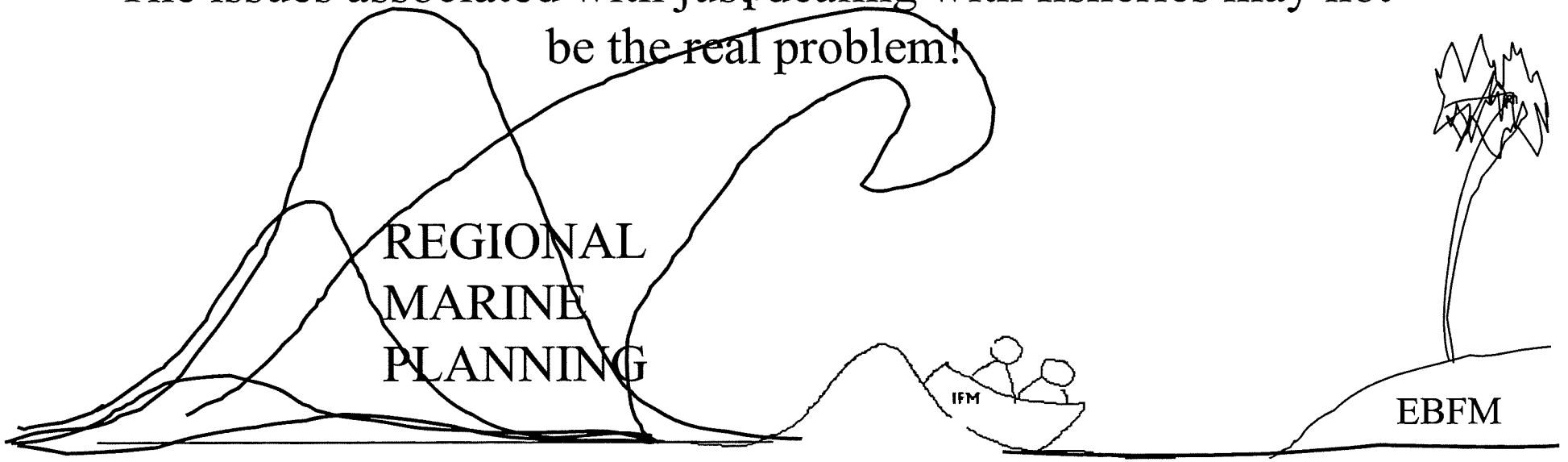


Trying to get agreement across different fishery sectors will be a bit of a bumpy ride!

HOWEVER!

The issues associated with just dealing with fisheries may not be the real problem!

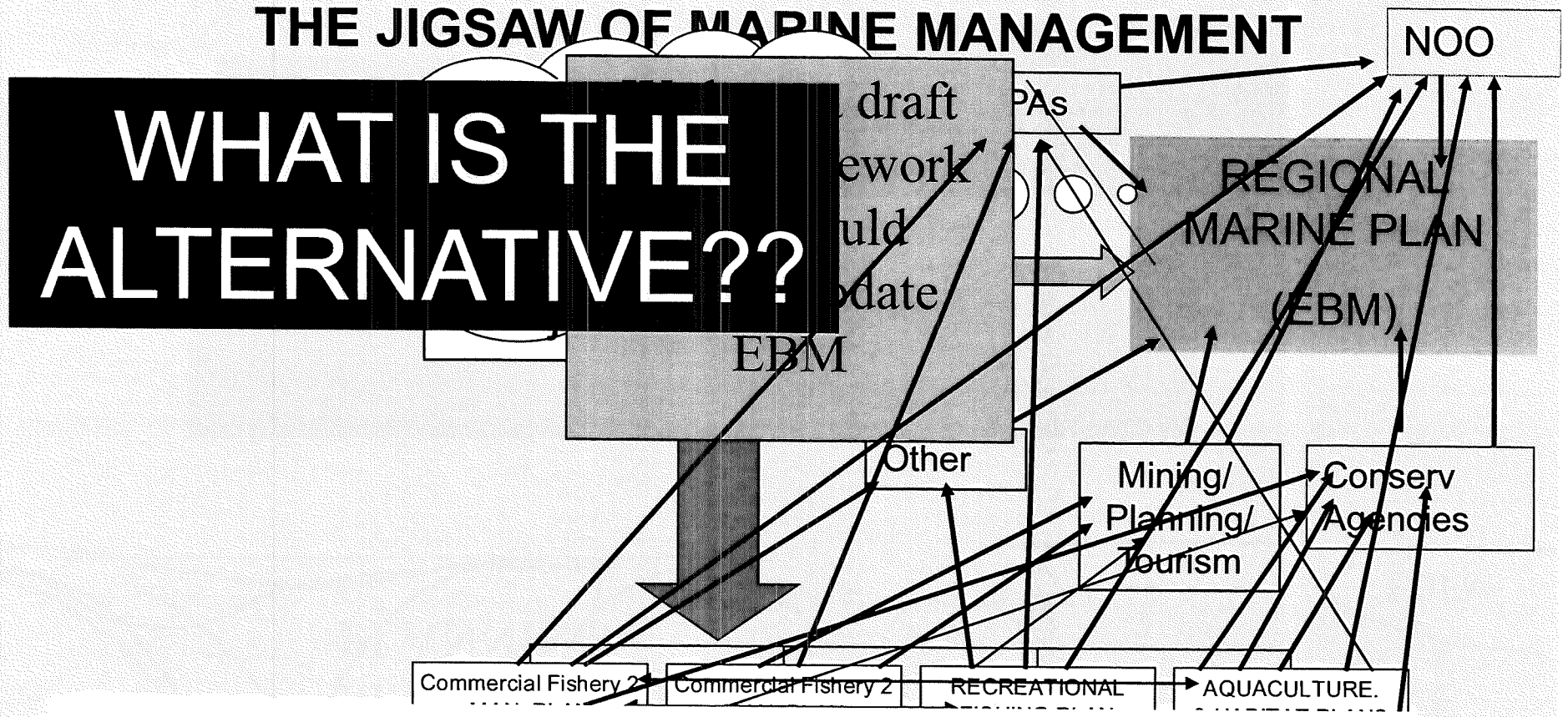
The issues associated with just dealing with fisheries may not be the real problem!



Regional Marine Planning may swamp EBFM/IFM Processes

So – it is important to do both concurrently and in a coordinated fashion - as much as possible

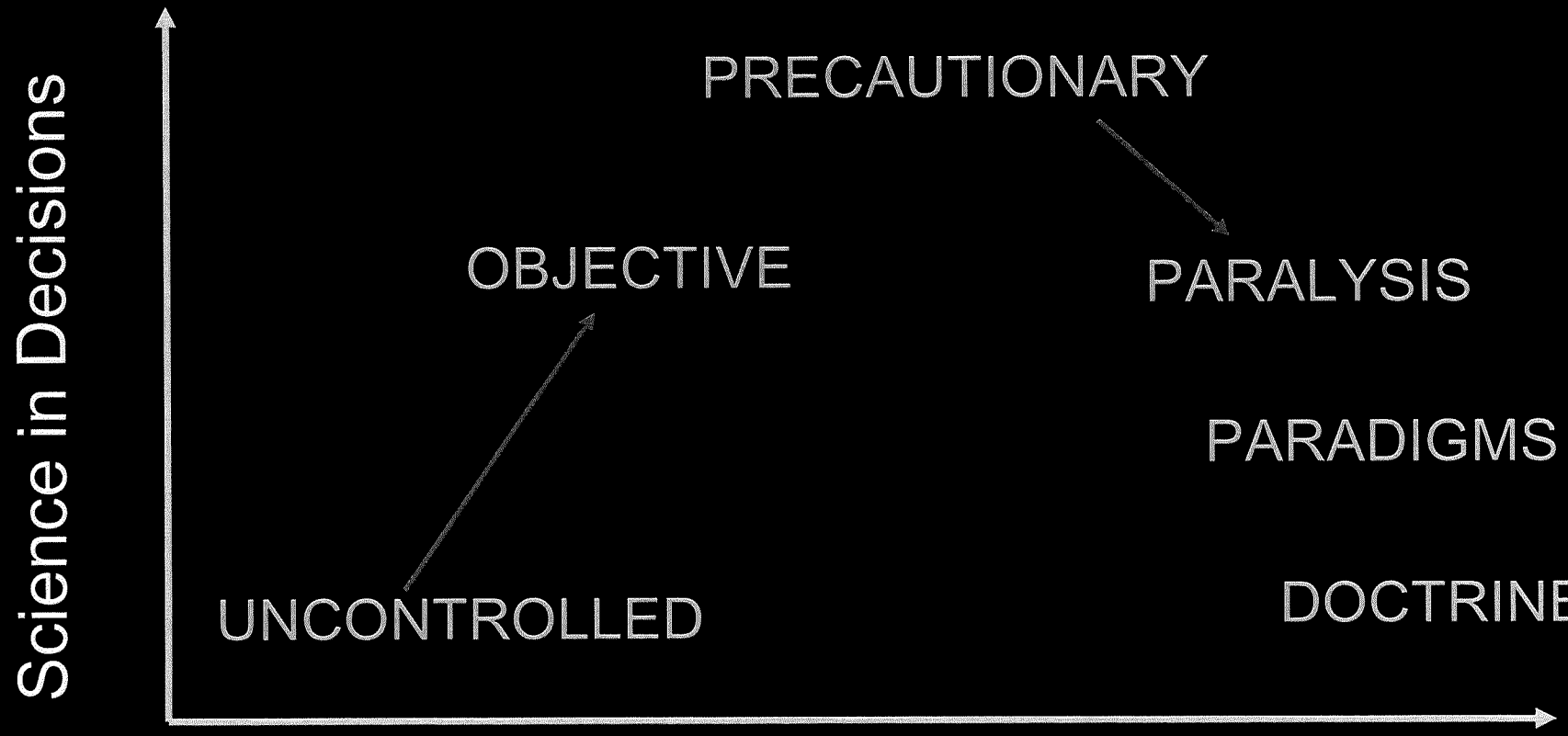
THE JIGSAW OF MARINE MANAGEMENT

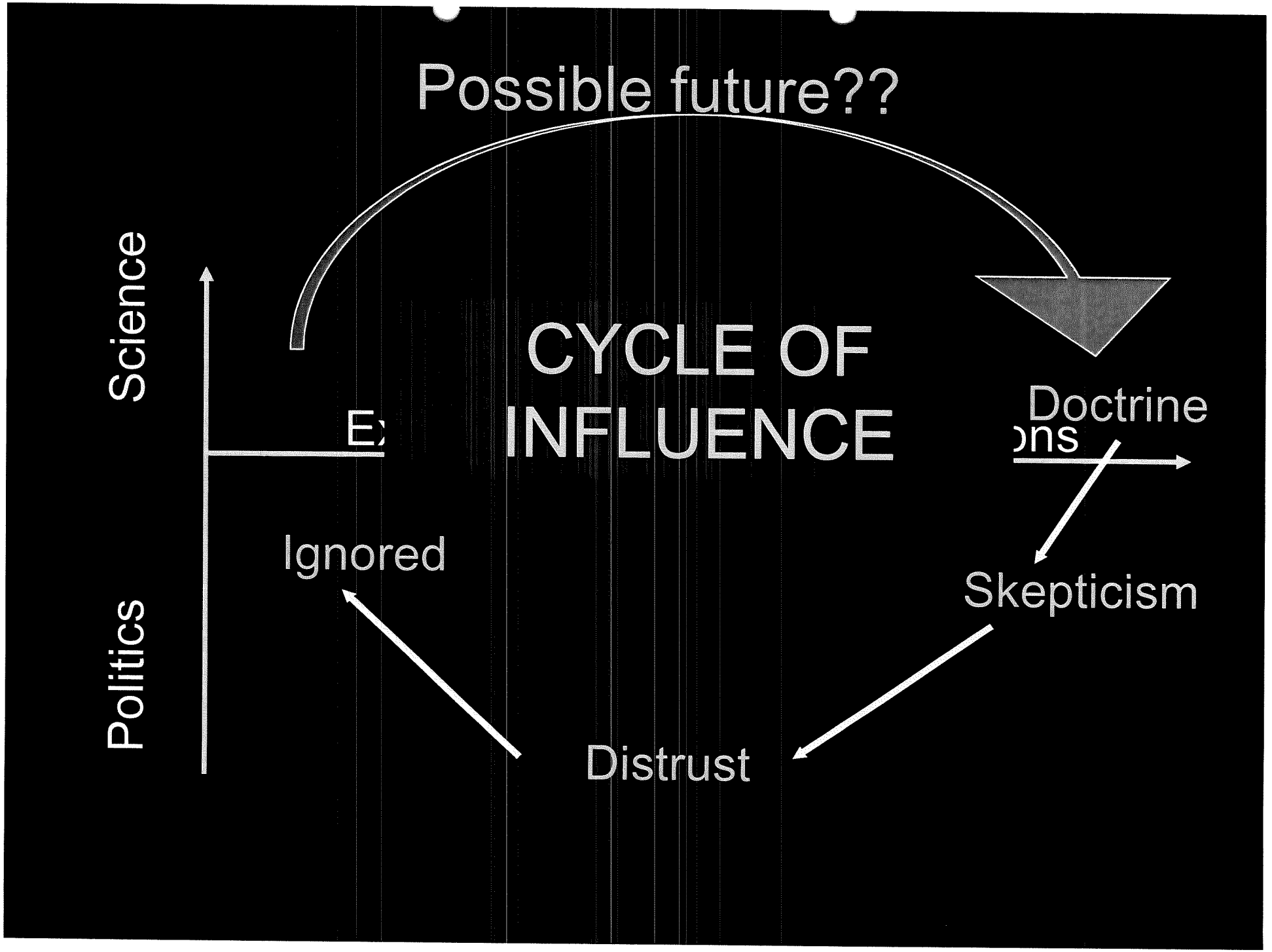


WHAT IS THE ALTERNATIVE??

- MULTIPLE PROCESSES, DUPLICATION,
- LACK OF INVOLVEMENT, OVERLOADING REPRESENTATIVES
- CHAOS THEORY IN ACTION!!

What Decision Framework is Used?




Possible future??
CYCLE OF INFLUENCE
Science
Politics
Doctrine
Skepticism
Distrust
Ignored

Summary

- These ESD frameworks/processes have turned philosophical concepts into practical outcomes
- Explicitly identifying issues, objectives and their linkages allows decision making based on data not rhetoric
- Improves transparency and acceptance amongst main stakeholder groups (Risk Assessment critical)
- ESD Frameworks for individual sectors now available - no structural reason why extension to multi sectors not possible

Conclusions

- Need to apply similar levels of rigour and discipline to the development of marine plans
- Recognise that some issues are only sensibly assessed and addressed at the multi-fishery/sector level – allocations, many ecosystem impacts
- We hope the use of the ESD framework can improve the processes and overall governance
- BUT

Conclusions

- Recognise the decision framework being used –

is this a science/knowledge based process or a doctrine based decision?

- Consensus of opinion is a tool for "politics" not science


Social Assessment Handbook
EXMOUTH GULF PRAWN FISHERY
THE FAO ASSESSMENT MANUAL FOR WILD CAPTURE FISHERIES
ALL REPORTS AND MANUALS ARE AVAILABLE FROM THE SUBPROGRAM WEBSITE
www.fisheries-esd.com
Or
www.seafoodservices.com.au
Department of Fisheries

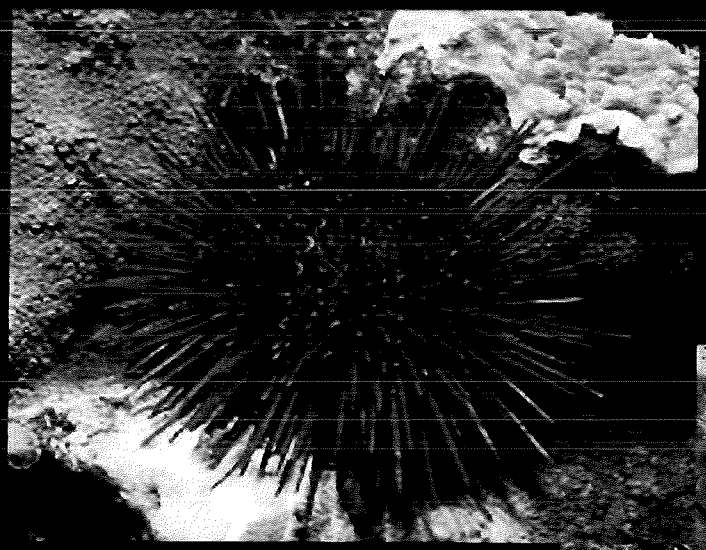
Managing the effects of sea urchins on the abalone fishery in NSW

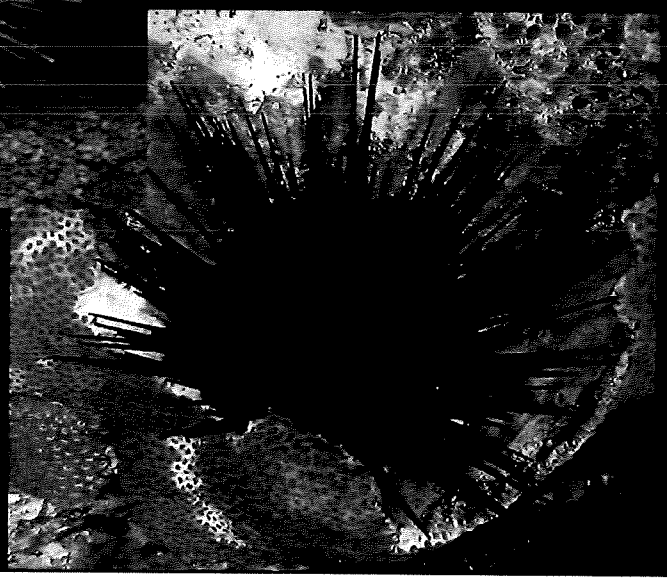
Duncan Worthington

A summary

- What do urchins do to abalone and their habitat?
- Where do they do it and is it changing?
- Have they expanded and is it natural?

- How can we reduce their effects?
  - Develop the fishery?
  - Removing urchins?
  - Understanding biology?
  - Reseeding or moving abalone?

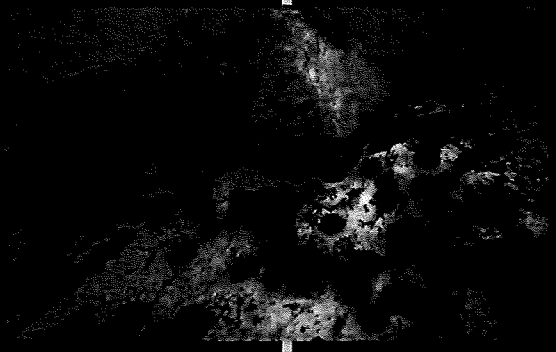




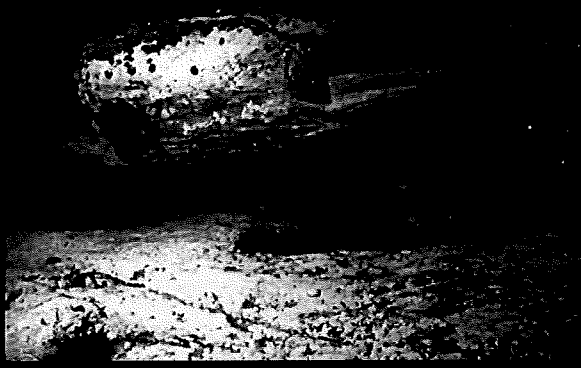
Few urchins

Good habitat and abalone

Many urchins



No weed and few abalone



A summary

- What do urchins do to abalone and their habitat?
-
-

- How can we reduce their effects?
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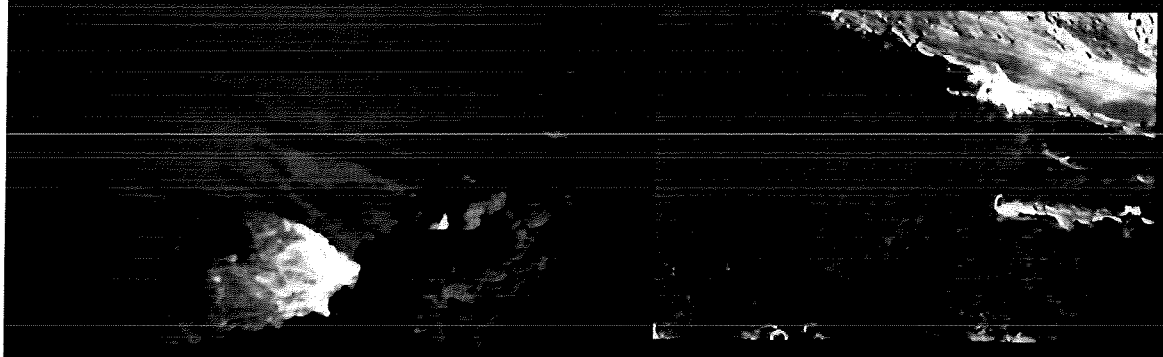
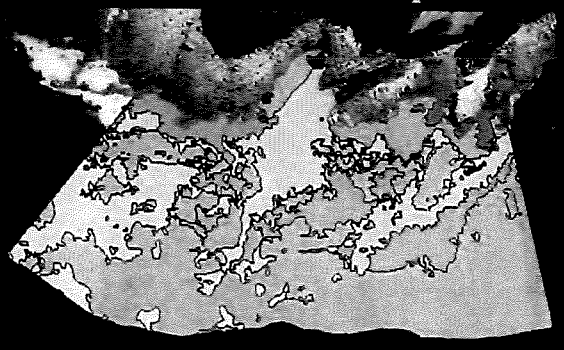
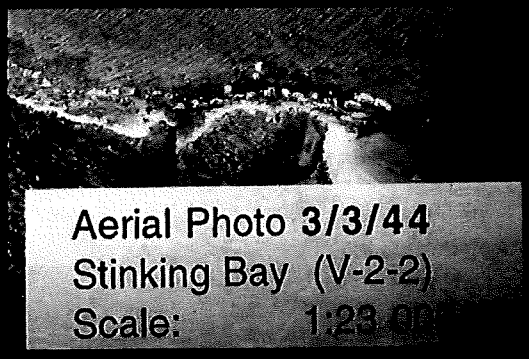
Over-head photos



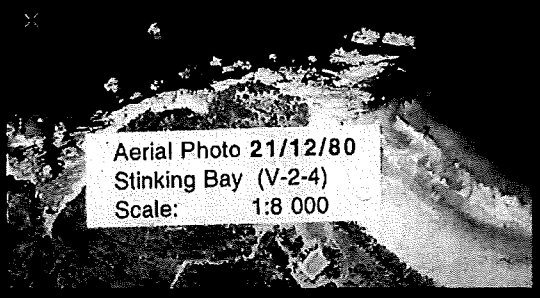
Habitat maps



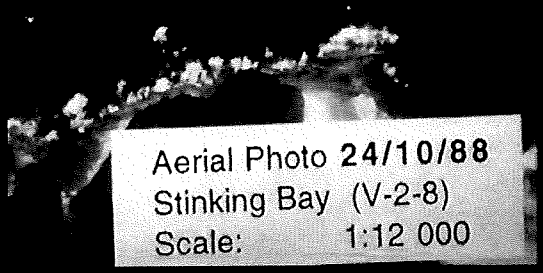
1944



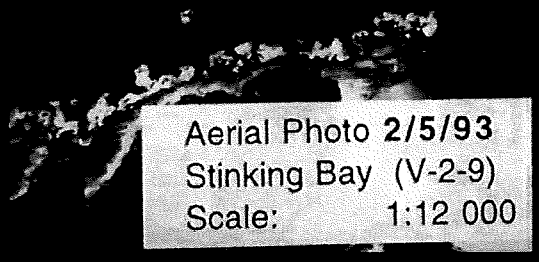
1980



1988



1993



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-
  -
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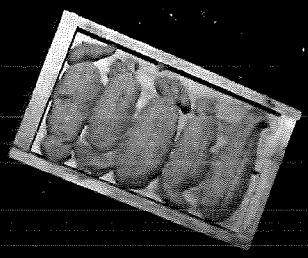
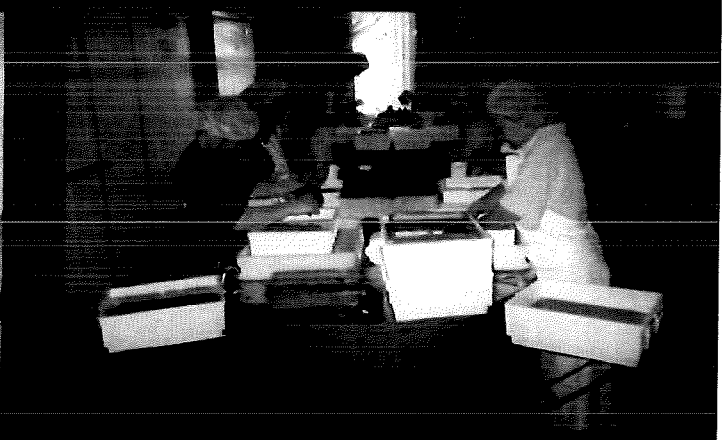
Develop the fishery





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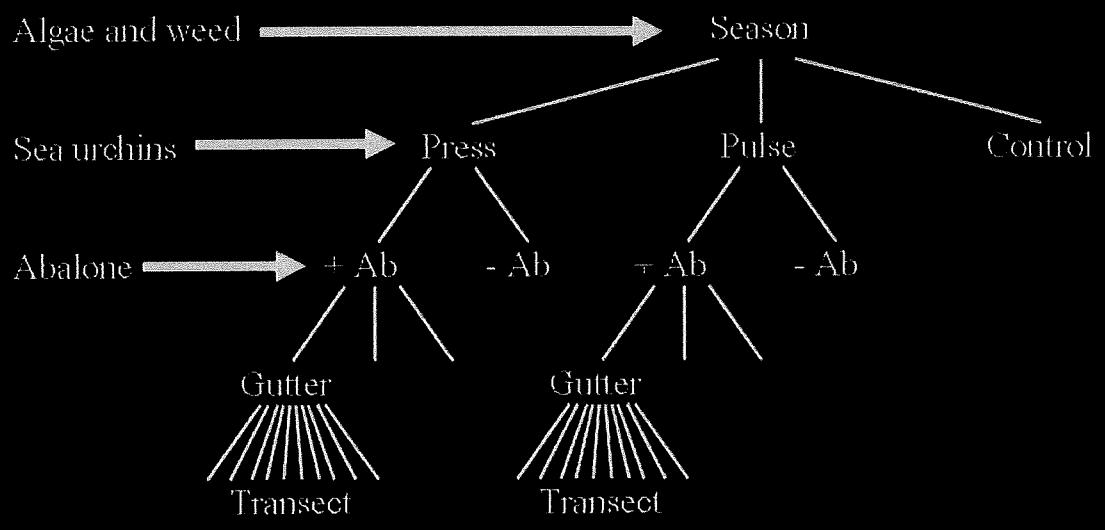
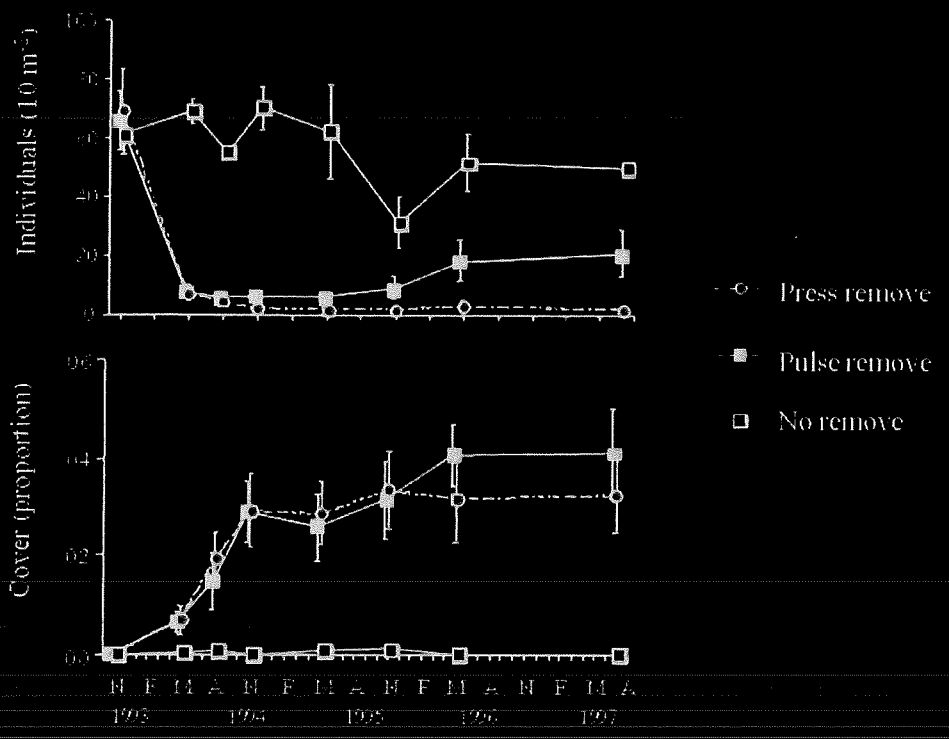
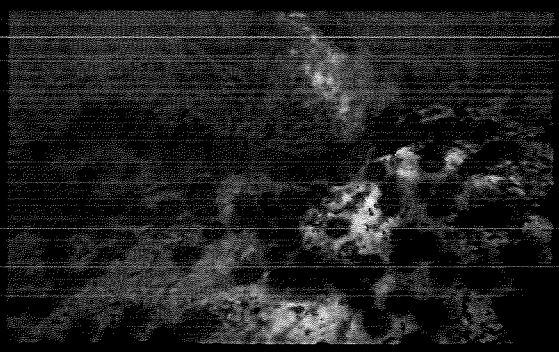
Design of experiment

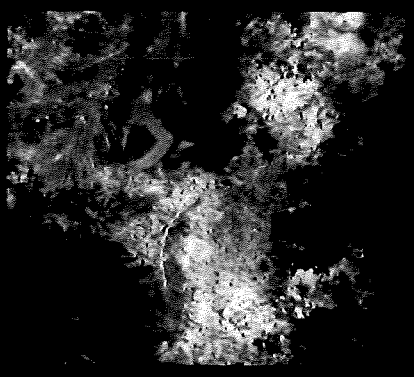


Sea urchins and foliose algae

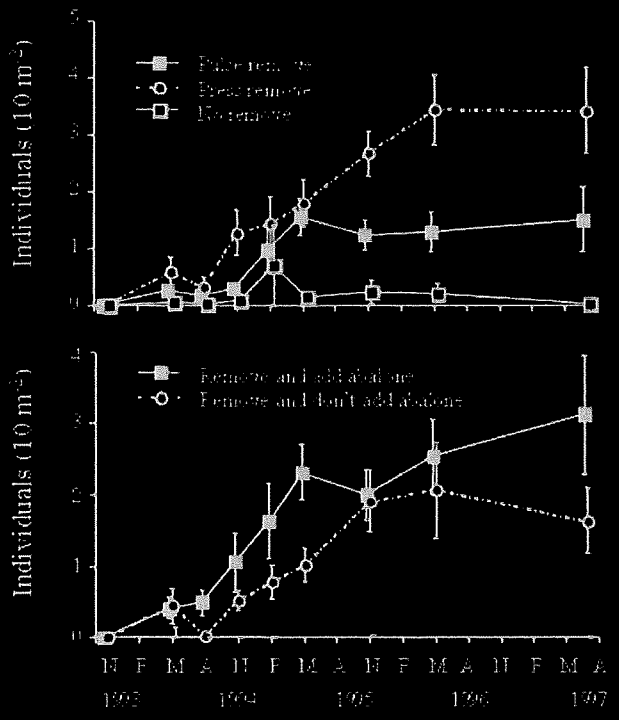


Effect on weed and habitat





Recruitment of small abalone



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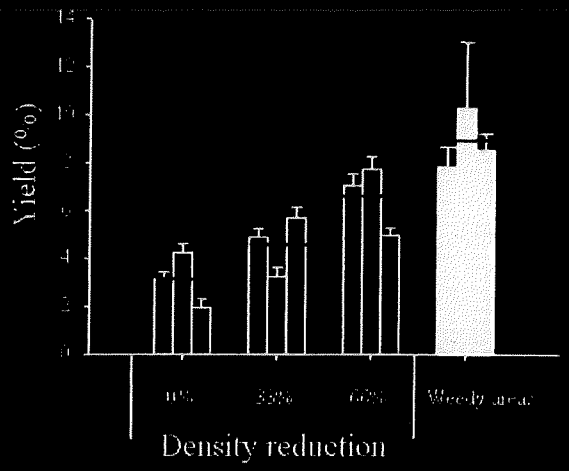
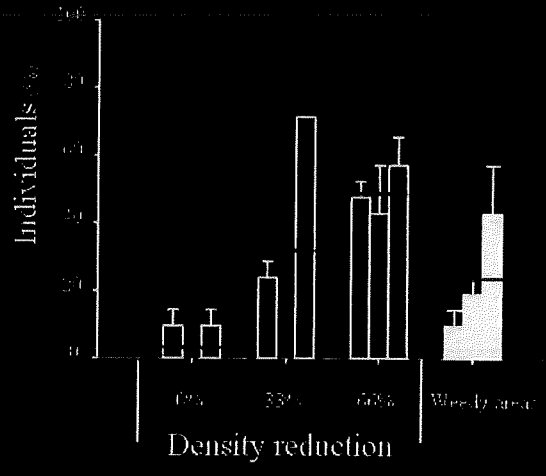
Sea urchin roe quality

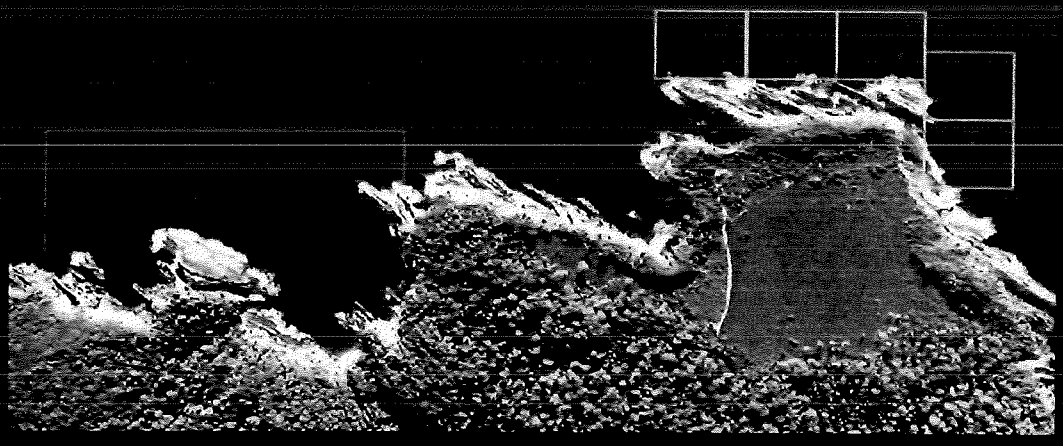
Roe yield - after

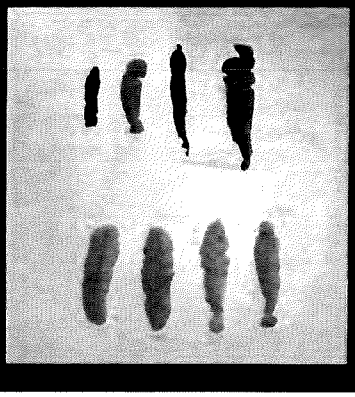


Roe colour - after



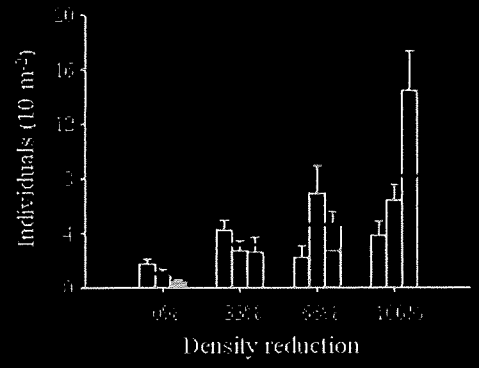
Reduced 66%

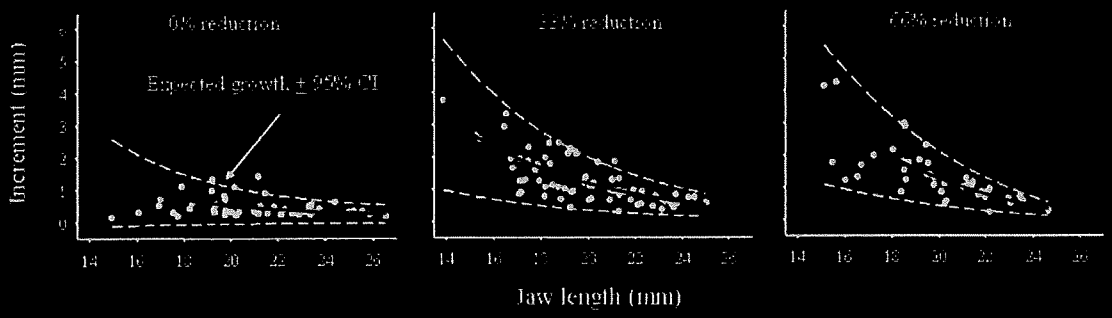




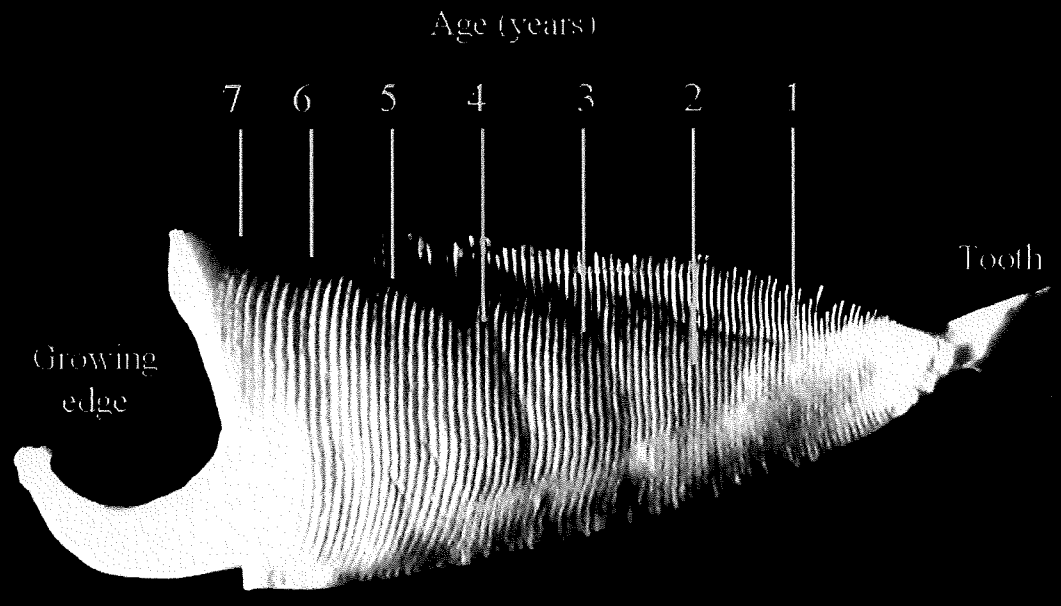
Reduced 66%

Urchin recruitment and growth

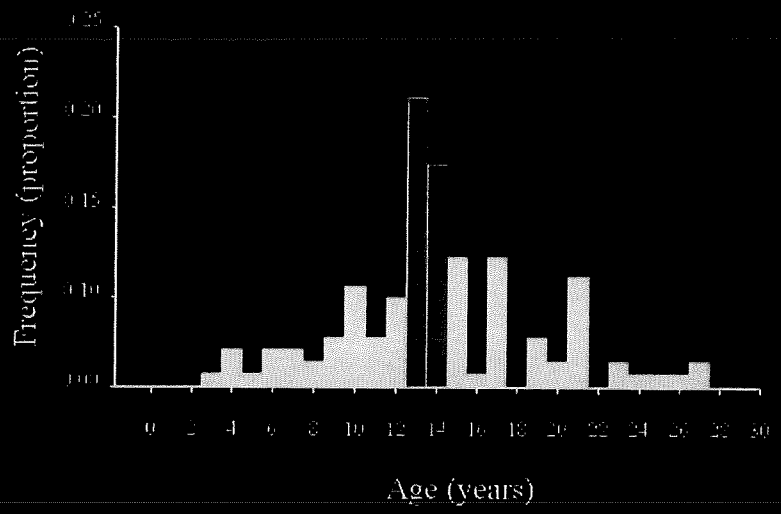




Sea urchin jaw



Urchin age structure



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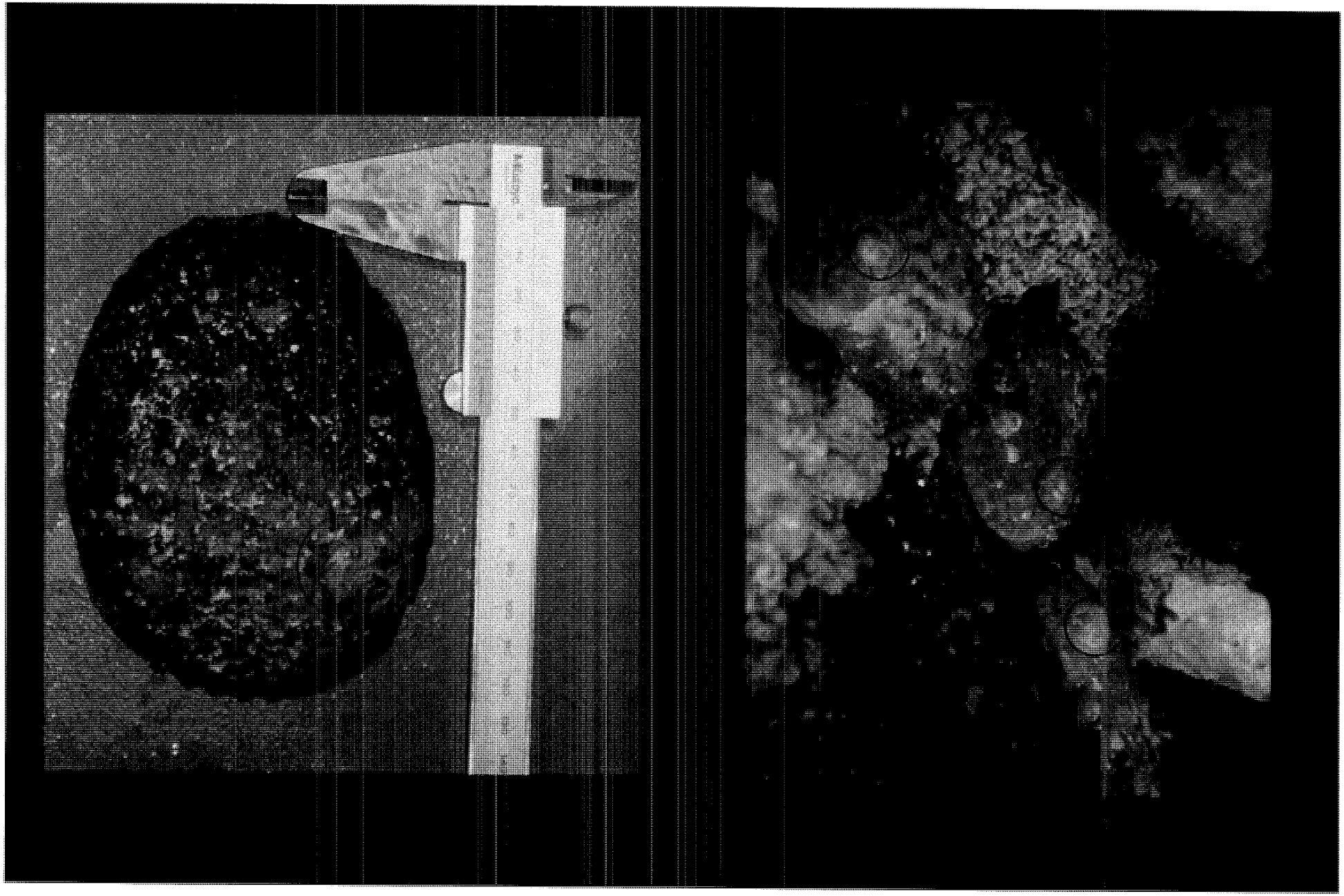

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National levies

Benefit or cost

Joe Moro
Chairman
AMIA

National levies

Many agricultural industries have levies.

These can be used for a range of purposes.

In horticulture 2 common levies

Marketing and Promotion
Research and Development.

amia
Australian Mango Industry Association Ltd.

Benefits

Industries undertake activities on their own behalf and not rely on individuals or government

Industry has the opportunity to better manage its own future

amia
Australian Mango Industry Association Ltd.

Benefits

The levy is compulsory, there are no free riders

Benefits shared by all levy payers

amia
Australian Mango Industry Association Ltd.

Levy management

Levy collection is managed by the Federal Government

In horticulture levies are managed by industry in partnership with Horticulture Australia

Industry needs to follow 12 levy principals to have levy introduced

amia
Australian Mango Industry Association Ltd.

Levy implementation

Widespread consultation

Majority support

ama
Australian Mango Industry Association Ltd.

Mangoes

Mangoes are a great example of the challenges faced by an industry in attempting to implement a levy

Mangoes contains a range of dynamic individuals

amia
Australian Mango Industry Association Ltd.

Consultation

Initially the levy rate was proposed at 24.5cents per tray (3.5cents per kg)

A ballot was conducted throughout Australia, and the proposal was just carried in most regions, but there was vehement opposition by some growers

amia
Australian Mango Industry Association Ltd.

For and against

Significant opposition

Compromise position was presented.

Cut the rate to 12.25cents per tray (1.75cents per kg) and a cap on the levy on individual growers.

amia
Australian Mango Industry Association Ltd.

Agreement

This proposal caused wide dissent, and even split the AMIA Board.

The Board recommended to Horticulture Australia to implement the cut levy rate (12.25cents per tray)

amia
Australian Mango Industry Association Ltd.

Implementation

Government agreed to implement the levy

Industry to undertake another ballot within 5 years

ama
Australian Mango Industry Association Ltd.

Papaya and Lychees

Other horticultural industries have also implemented levy's in recent times.

The papaya industry and the lychee industry both implemented levies within the past 3 years.

- Little opposition

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Costs

If there is not general support, the levy process can be an issue that causes widespread disharmony.

Industry leaders need a good grasp of the industry's views before they embark on the levy process

Where money is involved, attitudes are often sharpened

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Benefits

The challenge for any industry with a levy is to demonstrate the benefits to levy payers.

Introduction is worthwhile, but a challenge.

If done correctly, it can help bring the industry together.

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