Where Did We Go Wrong?

A Critical Assessment of Management in the Bluff Oyster Fishery

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Abstract

More than a century of dredging for oysters in the Foveaux Strait has resulted in a decimated fishery. In 1999 the Parliamentary Commissioner for the Environment asked the question: Where did we go wrong? This thesis provides answers to this question by presenting information provided by the Bluff oyster fishermen. In order to gain as much exposure to the community of fishermen as possible, a cumulative period of approximately six months was spent living in the town of Bluff between 2002 and 2007. During this time relationships were built with key informants, and a total of more than 50 community members were interviewed. The thesis describes the practical knowledge of the oyster fishermen, and places it in the context of more that 40 years of modern scientific studies concerned with the fishery. The finding are that since 1996 when the Quota Management System was introduced in the fishery, the most knowledgeable and responsible people in the fishery have been systematically excluded from roles in management. The practical knowledge of fishermen has been discounted in an industry and government led management system, which is an elaborate justification for continued maximum exploitation of the fishery. The theoretical contribution of the thesis lies in its description of belonging as a factor as important as that of property-rights in a sustainable resource system. The practical knowledge and conservation-mindedness of the fishery elders are characteristics of belonging, but not necessarily of ownership. Fishery management should recognize belonging as cultural capital, and make use of it under the present system (i.e. the Quota Management System) by according fishermen rights of management and access to the oyster fishery.

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1 Introduction

The tragedy of the Bluff oyster fishery is not the result of an absence of formally established property rights, nor the lack of a strong central government body. Both these are present in the fishery, however neither have prevented its decline.[1] The loss of their fishery is deeply felt by the Bluff fishermen. Some are retired, some have other work, some are unemployed. Where they were once rich with the natural and social wealth of the fishery, today they shake their heads in dismay. 'Its stuffed!' they say. The chance of a feed of oysters has disappeared from the lives of many in the community like the pigeons from Trafalgar Square. Yet there are oysters left for some. Property rights arrangements in the fishery are such that a number of companies have consolidated their rights over the diminished resource. A combination of exclusive managerial power and sharp price rises for Bluff oysters, has allowed the industry to continue profiting from the fishery despite catches that are less than 10 per cent of their historical levels. To justify the continued exploitation of a critically diminished fishery the industry ignores popular sentiment, and relies on support from the New Zealand government to advance views in opposition to those of conservation-minded fishermen.[2]

Divided views on the Bluff oyster fishery are nowhere better illustrated than in the recent appearance of two films on the subject. The first, *Bluffed*, by Katie McSweeny premiered at the Natural History Film School premieres in Dunedin in June 2007, the other appeared on TV1's *Country Calendar* on July 14th 2007. In the film *Bluffed*, retired fisherman Murray Black tells the story of the ruin of the Foveaux Strait oyster habitat by oyster dredging, and the struggle of fishermen and scientists to advance an understanding of the fishery as an ecosystem desperately in need of rebuilding. Murray's story was supported in

[1] The titles of recent magazine articles are descriptive of the physical state of the fishery: 'Bluff Oyster Fishery in Ruins', Rob Tipa, *Te Karaka,* Sept. 2006; 'On the Rocks', Bruce Ansley, *New Zealand Listener*, Nov.11-17, 2006; 'Dire Strait', John Cranfield, *New Zealand Geographic*, March-April 2007.

[2] Throughout this thesis the nouns fisherman and fishermen are used when referring to the Bluff oyster fishers. The gender specific forms are used in order to avoid confusion. In the 1990s the Bluff Oyster Management Company began to refer to its membership as oyster fishers. This was presumably an attempt by the Company whose members were, by and large, not fishers, to assert its connection with the fishing side of the industry.

the film by interviews with the former chief scientist attached to the Bluff oyster fishery, Dr. John Cranfield, himself retired and living in Wellington.

A completely different story is told by the *Country Calendar* film. The film tells the story of the Calder partners, owner/operators in the oyster fishery. In contrast to the sombre tone of the McSweeny film, Country Calendar chose to film under the brilliant southern sun; the Calders were interviewed on the oyster wharves, and at their busy processing facilities. The picture painted was one of a hardworking and successful enterprise with great promise for the future. The recent hard times of the fishery were acknowledged, but an optimistic view of the recovery of the fishery prevailed. The views of the Calders are supported in the *Country Calendar* film by Dr. Keith Michael, the current lead scientist studying the fishery for the New Zealand Ministry for Fisheries and the Bluff oyster industry.

In the current management of the fishery where the power holders are the oyster industry; the NZ Ministry of Fisheries (MFISH) and the National Institute of Water and Atmosphere (NIWA) the views of the Calders prevail. The *Country Calendar* film supports the current power arrangements, and *Bluffed* is a protest film by those with no power to affect the way in which the fishery is currently managed. This polarization, opposition and conflict is a central, almost overwhelming, characteristic of the fishery. Earlier this year a presentation in Bluff on the environmental impacts of dredging, given by a scientist sympathetic to conservationist views, was disrupted by an angry group of oyster fishermen concerned about the threat to their livelihoods. This behaviour was condemned by other fishermen, mainly older and retired members of the fishing community who support a conservationist approach, and have formed a community group called the Bluff Oyster Fishing Forum to communicate their concerns to the public. However, the Ministry has not recognized the Bluff Oyster Fishing Forum as an official stakeholder group for the purpose of fishery management. Current management therefore proceeds without any input from the group of conservation-minded fishermen.

The oyster industry continues its harvesting of the fishery in the knowledge that the community is divided over the issue of fishery closure. Conservation-minded fishermen have spoken out on the implications of the low catches, and have warned of an imminent, and irrevocable collapse should fishing continue in the manner currently practised. However, when property rights were privatized in the fishery the conservation-minded

fishermen lost their management rights. Their message, if heeded at all, does not translate into changes. An old pattern of intensification of effort in the face of decline still prevails. Fisheries managers admit there are biological problems (i.e. oyster disease) in the fishery, but official sources lead one to believe that everything that can be done is being done, and that oyster catches are down but they are expected to improve. The catastrophic environmental damage from a century of oyster dredging highlighted by McSweeny's film is being discounted by the Ministry of Fisheries.[3] Media coverage of the opening of the oyster season typically presents the view of an optimistic industry, 'Plenty of oysters for sale'; ' Great quality this year'; 'Bluff Oyster Season Off To Great Start', and so on (TV1 News, March 1st, 2007). However, the people of Bluff are aware of industry hubris; they are aware that problems in the oyster fishery cannot be explained away by the occurrence of disease, and they know that there are social and political problems underlying the fishery crisis about which something could and should be done. But the experts are not expert when dealing with the human side of the fishery, and the fishermens' story of dispossession, and their awareness of the inevitable demise of the fishery is marginalized, ignored, or even discredited at the level at which important decisions are made.

The view presented above has been called inflammatory, and has been attacked as the view of only one man, or of a small group. However it is a view that few dare to dispute, based on facts that are widely known in the Bluff fishing community. It is the purpose of this thesis to present these facts upon which the radical sounding statements of this introduction are based. The reader will see that the views introduced here are not the views of one person, or the opinion of the researcher, but rather those of a respectable community founded on a long history.

[3] *Bluffed* by Katie McSweeny was judged best film at the Atearoa Environmental Film Awards in 2007. Another film on the Bluff Oyster Fishery, *The Last Wild Oyster* by Bojun Bjorkman-Chiswell, also supportive of the positions of conservation-minded fishermen, premiered at the San Francisco Ocean Film Festival, Feb. 2008.

1.1 The Research Questions

The Parliamentary Commissioner for the Environment (PCE) addressed the problem of the Bluff oyster fishery as part of a wide-ranging report on the marine environment that appeared in 1999. The Parliamentary Commissioner asked the question, 'Where did we go wrong?' from which the title of this thesis is taken. The Commissioner's review included the catch history of the fishery as presented in the graph below, and stated that,

> Management of the resource under a quota system did not result in the development of a thorough understanding of the ecosystem and habitat on which the oysters depend. The poor state of the fishery meant quota owners have been more concerned with their own survival, with little capacity for understanding what effect their collective efforts were having on the condition of the oyster beds. (PCE, 1999)

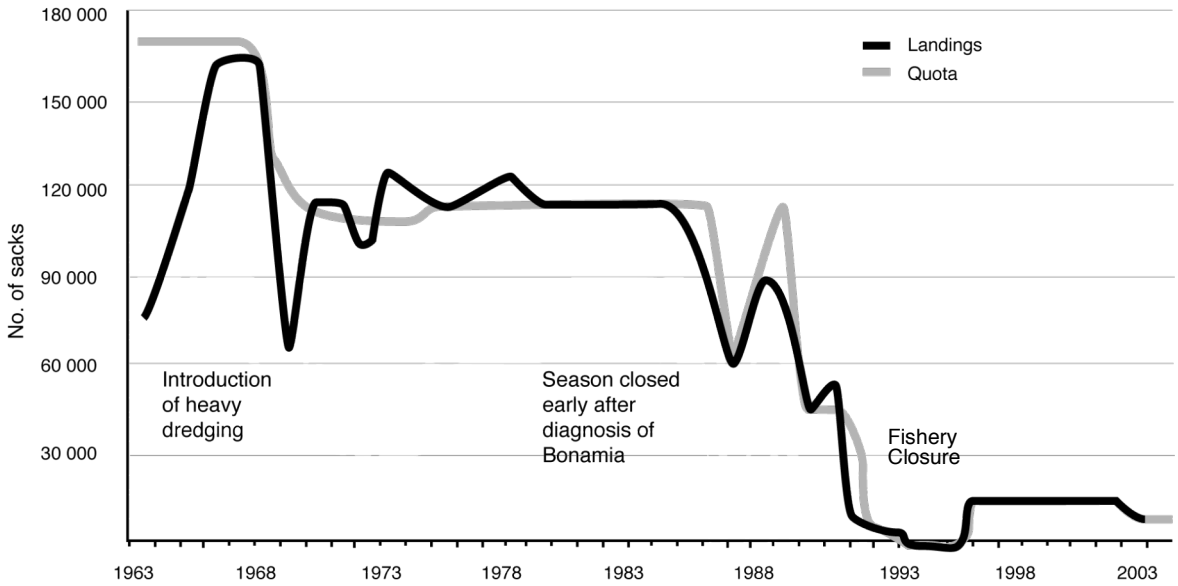


Figure 1.1 — Foveaux Strait Oyster Catch Statistics 1963 - 2003, source (PCE 1999).

As a starting point for answering the question of what went wrong the PCE takes a step back from the immediate environmental problems of the fishery and considers fishery policy in general together with a mention of the marine commons.

> "These two fundamental approaches to managing a natural resource have tended to dominate the debates about fisheries management in New Zealand. They can be seen as opposite points on a spectrum—from full central Government control, through to private ownership and management of the resource where individuals, local communities or private agencies have responsibility for its ongoing sustainability. The debate between these basic frameworks for marine environmental management has thus far been largely a matter of perception and ideology. **More work is needed on the actual effectiveness of different management approaches, and the actual environmental outcomes that have been achieved** [emphasis added], in order to assess more clearly and reliably their benefits and limitations. More importantly, **more attention is needed to alternative approaches that recognize the complexities of managing resources, for which some property rights are held, within a complex ecosystem "commons"**[emphasis added]. (PCE, 1999)

In addition to succinctly presenting the leading research question of this thesis, i.e. 'Where did we go wrong?' with the Bluff oyster fishery, the PCE provides some guidance on how the question might be answered. The effectiveness of different management approaches together with their environmental outcomes is mentioned. Also mentioned is the need to consider alternative approaches within the complex nature of marine commons. Complexity is invoked frequently in the literature of the commons, not as an excuse for inaction, but as a guide and an encouragement to engage in deeper analysis. In the context of the Bluff oyster fishery, complexity means discovering the social and political history of the fishery in conjunction with the physical and social consequences of different forms of fishery management. Complexity also means having to deal with more than one reference system or paradigm within which the discussion is situated (e.g. the official view *vs* the fishermens' view). The 'alternative approaches' encouraged by the PCE may refer to a system in which the practical knowledge of fishermen is recognized on a level equal to that of science.

This thesis is built around three research questions. The main question: Where did we go wrong? And two subsidiary questions: What management systems have been used, and what were the results during the history of the fishery? And, what alternative approaches stemming from an understanding of a complex marine commons can be suggested? The

main question assumes that something has, in fact, gone wrong and that 'we' are responsible. This assumption is examined directly below in *Section 1.2* which provides an introduction to the method used. The first two questions are largely historical, the latter somewhat theoretical. Where this thesis is breaking new ground is that the information on which it is based comes from the fishermen themselves. Even in the liberal era within which we now live systemic discrimination of certain groups of people continues to exist. The formally uneducated fisherman, for example, has little power compared to a fishery scientist when arguments for and against key decisions are being weighed by the Ministry. An example of discrimination against fishermen from the 1960s may serve to illustrate.

In 1968 a biologist named Martin Toop working for the Marine Department found himself in trouble with his employers. Toop was stationed at the Bluff oyster laboratory where he had come into contact with Bluff Fishermen. His information concerning overexploitation of the fishery came from fishermen and made headlines. The newspaper articles are unfortunately missing from the record, all that remains is Minister Scott's response.

> … I presume that after three months on this work Mr. Toop assumes he knows more about this fishery than New Zealand marine biologists who have spent three years doing a scientific study of these oyster beds, and that he disagrees with their findings". He [Mr. Scott] "… would like to know whether Mr. Toop based his comment on scientific grounds or by just talking to oystermen? (Fishing, 1968)

Though he would not admit it, the Minister was forced to acknowledge the relevance of the issue in question, i.e. the serial depletion of oyster beds through overfishing, and shortly afterward announced a number of conservation measures. Toop, however, had to appear before Ministry officials in Wellington and was sacked. Minister Scott's dismissal of the concerns of the Bluff fishermen, and for his own employees, is shocking in today's context, and yet the Bluff Fishermen are still waiting for recognition in official circles.

This thesis is an attempt to change the historical invisibility of the fishermens' position. It relies in large part on information derived from interviews with fishermen. It is grounded in the fishermens' perspective, and seeks to document their concerns. Several answers to the main research questions are provided by fishermen. The doubling of the fleet in the 1960s and the introduction of heavy dredges in the 1970s are examples of reasons provided by the fishermen to explain the demise of the fishery. These simple answers

furnish invaluable information on the fishery. One may then also ask: Why, if the problems are known, has nothing been done?

Answers to research question regarding alternative approaches to management draw out much more information on the persistent troubles facing the fishery. The fishermen say that management must heed the practical experience of the fishermen, and this, in fact, is a main theme of this thesis. The academic path to this conclusion consists in the formulation of two hypotheses. The first relates to the question of where we went wrong, and suggests that a fishery must be understood primarily as a *social* rather than a physical, or an economic (in the narrowest sense of the word) phenomenon. Failure to attend to the social side of the Bluff oyster fishery not only ignores the cultural wealth of the fishery, which is arguably as important as its monetary value, but leads to all kinds of problems, not the least of which is a decline in the physical side of the fishery. The second hypothesis, which is grounded in the current literature relating to common pool resources and socio-ecological systems, proposes that the conservation-minded fishermen have an ecological role in the fishery. This latter hypothesis leads to the suggestion that the way forward in management of the fishery is to take full advantage of the existing practical knowledge, the wisdom and the commitment of the conservation-minded fishermen.

1.2 Methodology

The story of the Bluff oyster fishery is political, and constantly challenges one to take sides. 'They won't tell you the truth …', a law faculty member warned as the prospect of going to Bluff to talk to fishermen was discussed at the University of Otago. This sentiment was re-iterated years later by an unsympathetic oyster fisherman complaining that the accounts of the fishery in the media (to some extent based on this research) were the views of only one man (an outspoken fisherman), and therefore not the truth. Wittingly and unwittingly the researcher becomes drawn into, and to some extent becomes a part of the politics of the fishery. Because of this, particular care has been taken to provide, in the Chapter entitled *Methodology*, a description of how the field research was conducted, the nature of the interviews, and a description of the documentary record. The research was begun in 2002 and continued into 2008. A total of about six months was spent living in the town of Bluff during this period. Numerous shorter visits were also made, and on several occasions other researchers from the University of Otago joined the interviews and meetings with the Bluff fishermen.

Implicit in the main research question: 'Where did we go wrong?' is the assumption that we have gone wrong. Hence the question can only be answered by those who admit two things, first that there is something wrong, and secondly that 'we' are responsible. With a few exceptions, it is the conservation-minded Bluff oyster fishermen who have responded affirmatively, and are therefore in a position to provide answers. The thesis is a valuable discovery of a close understanding held by part of the Bluff community. The views found in this thesis contribute to the formation of a representation of the Bluff oyster fishery distinct from that of 'official' sources. The descriptions of the fishery given here are an assertion of the culture of the Bluff fishermen, and that culture, it will be argued, is vital to the health of the fishery.

1.3 Thesis outline

1.3.1 The Bluff Oyster Fishery

The historical records of the Bluff oyster fishery begin with reference to Stewart Island in the 19th Century. Ironically, more is known about the Steward Island period than is known of the fishery in the first half century of the 20th Century. There are a few newspaper articles, and a few scientific papers (see particularly Sorensen 1968, who reviews all historical oyster surveys) that give some insight into the golden era of the Bluff Oyster fishery, but no published histories exist an exception being David Johnson's book *Hooked* which contains a chapter on the Bluff oyster fishery (Johnson 2004). John Cranfield's 1999 article on the changes in distribution of epifaunal reefs in Foveaux Strait provides an important history of the Foveaux Strait oyster beds based in part on his interviews and extensive interactions over many years with the Bluff oyster fishermen (J Cranfield, Michael, & Doonan, 1999). Cranfield's history of the fishery is supplemented in this thesis by illustrations of the Bluff oyster fishery drawn from both science, and from interviews with fishermen. The thesis is an attempt to convery the fishermens' understanding of the Foveaux Strait oyster beds. To begin to see the fishery from the point of view of fishermen should help in understanding the fishermens' position which is presented in Chapter 6.

1.3.1.1 Social History and Maori Involvement

The social history of the fishery, and the history of Bluff oyster management are treated following the historical overview. The term social history is used a little arbitrarily as the whole thesis might be considered a social history, and practically every facet of the fishery has a social aspect. In this case, however, the social history concentrates on the relationship of two social groups in Bluff: the merchants and the fishermen. That the social history of the fishery should have received so little official attention over the years is extraordinary given the large effect social and political organization can have on the physical fishery. It is particularly important in light of the hypothesis and arguments concerning socio-ecological systems that follow later in the thesis that attention is paid early to the social groupings and the ways in which these function with respect to management. This thesis presents the hypothesis that conservation of the fishery is an

ecological function performed by social actors. The description of the fishermens' attempts at conservation is contrasted in Chapter 8 with the rationale for the Quota Management System, according to which, a conservation ethic is supposed to automatically accrue to property-rights holders.

One of the limitations of this thesis is the fact that it does not explore the oyster fishery from the perspective of Maori. Instead it is a thesis told from the perspective of fishermen in general. Response to this research in Bluff (i.e. feedback from a distribution of an early research paper, see Knight 2004) indicated there was concern that a Maori perspective had not been adequately included, and an attempt has been made to remedy this by including interviews with two Maori kaumatua (kaumatua is the Maori term for their traditional elders). Both individuals participated in a number of interviews, and were also present at group discussions/meetings. Maori oyster fishermen make up a large percentage of the Bluff oyster fishermen and this research has generally not distinguished Maori from Pakeha in considering the fishermens' position. However, in the case of the two Maori kaumatua an exception is made because of their high profile as active proponents of the traditional Maori way of life. Further presentation of Maori issues is made by describing the Maori community in Bluff, and the Maori Settlement in which tribal ownership of some oyster quota was established.

1.3.1.2 Management History

The history and analysis of management occupies by far the largest space in this thesis because the research question, 'Where did we go wrong?', is primarily a management question. Management is also the major concern of the key respondents in discussing the history of the fishery—as it is to anyone interested in survival of the fishery today. It is the history of management in the modern era (post-1960) together with the changes over the last decade that are the principal concern. Early management, like the early social history, is largely undocumented, though some information on early fishing closures, scientific surveys etc. is available, and has been included in this thesis.

The management history from 1970 to the present is reasonably well known from the oral histories of fishermen backed up by the documentary record. The last four decades can be roughly divided between the period when the fishery was managed through advice from the Foveaux Strait Oyster Advisory Committee (FSOAC), 1970—1996, and the period following the institution of the New Zealand Quota Management System (QMS), 1998—

present. As this research is based in the fishing community it resounds with the losses suffered by the fishermen as a result of the QMS. This fisheries management system regulates the distribution of wealth accruing from the nation's fisheries. The economic rationale behind the QMS is very much aligned with a political movement in which privatisation and redistribution of public wealth has been a central strategy (Kelsey, 1993). If some have gained from the system, others have lost. Associated with the losses are questions of social justice. These need to be raised, for what could be more important to the dispossessed? Remarkably, in all the interviews with Bluff oystermen, none mentioned loss of personal income as a critical issue. Practically all attention and comment focused on the health of the fishery, and the need for conservation. While many fishermen have lost their livelihoods together with their working connection with the fishery, they never complain about their own losses. They talk, instead, about the health of the fishery, and the importance of saving the oyster beds for future generations. This is perhaps one of the reasons why the social injustice that has resulted from implementing the QMS is treated in this thesis as part of a hypothesis with an ecological focus rather than, for example, the outlining of a claim for personal or social compensation.

Fishermen are angry that their views have been dismissed in current management, and that they are no longer consulted in a meaningful way. They know that they are among the most knowledgeable, and experienced actors in the fishery, and they know that the Government of New Zealand is aware of this fact. Problems in the fishery are not due to ignorance on the part of government, they are mainly intentional and related to the process of privatisation. Prior to the QMS the management of the fishery under the FSOAC was truly inclusive. Not one conservation issue raised in this thesis, and not one of the many views of fishermen with respect to management, was not intimately known and thoroughly discussed at FSOAC. However, previous management knowledge is at risk of disappearing from the record, and one purpose of this thesis is to collate and present not only the fishermens' knowledge, but many previous scientific findings together with other discussion.

1.3.1.3 Fishery science

The published fisheries science concerning the Bluff oyster fishery spans a long period (at least from the 1960s to the present), and is remarkable in terms of the support it provides to the views of fishermen. The environmental impact of heavy dredging, for example, is as powerfully described by (J Cranfield, Manighetti, Michael, & Hill, 2003) as it is in any of the accounts of fishermen noted for their direct forms of speech. Paradoxically, the majority of the published science is rejected by the Ministry of Fisheries (Allen Frazer, pers. comm.). This is understandable only in terms of the political economy of the fishery. The Ministry works closely with the industry who feel threatened by the emphasis in scientific work on environmental modification through anthropogenic activities (J Cranfield, Manighetti, Michael, & Hill, 2003; J Cranfield, Michael, & Doonan, 1999).

Ordinarily fishermens' views might be contrasted with those of science and represent an opposing viewpoint, hence the separation in this thesis between the 'Scientific and Industry' position and the 'Fishermens' position. However, it is important to recognize that both sides of the debate on the Bluff oyster fishery combine fishermens' knowledge with science. The practical knowledge of fishermen and the scientific toolbox have both been available to researchers (Cranfield 1999 provides many examples of inclusion of fishermen's knowledge alongside scientific method), and so the real crux of the issue is a question of how these different kinds of knowledge are selected and used for different social and political purposes in the industry.

1.3.1.4 New Zealand Ministry of Fisheries—The 'Official' position

Presentation of the official version of the management of the Bluff oyster fishery has its difficulties; already mentioned is the fact that the government has not publicly reported on the management of the fishery. Policy on the subject takes the form of very general rhetoric, and detailed information on the specific activities of the Ministry such as the formulation of fisheries plans, has to be interpreted with prior knowledge of debates around the contentious issues. Nevertheless the Ministry releases an annual report of its Shellfish Working Group, intended as a detailed and comprehensive position paper to inform the Minister on the state of the fishery. The report provides information on which to base the decision of the Minister with respect to the setting of quota in the fishery (Fisheries, 2006). Careful reading of the Working Group report clarifies the Government's

position on the critical issues of overfishing and environmental destruction. Less than one short paragraph is devoted to these issues in a science paper of some 30 pages. Most of the report is concerned with attempts to calculate the population of oysters from which the fishing industry then receives its quota for the year. The political context of the way in which fisheries science is used in the industry is examined in Chapter 7.

1.3.2 Results

1.3.2.1 The Community of Fishermen and Fishermens' Knowledge

The question: Where did we go wrong? is partly answered in this thesis by the proposition that the voices of the fishermen regarding conservation were tuned out at various critical points by the Ministry. This is a social and political phenomenon. In this respect the thesis attempts to do two things. One is to describe the existence of the Bluff oyster fishermen as a social group, and a social force active in the political organization of the fishery. Congruent with the failure to listen to fishermen is a denial of the existence of the conservation minded fishermen as a group to be included in management. Hence the need to assert the existence of, and to attempt to describe the extent of, the group referred to in this thesis as the Bluff oyster fishermen and the conservation-minded fishermen. The second objective of the thesis is to present the information on conservation that comes from the fishermen and which has failed, for political reasons, to receive the attention it deserves.

Oral histories of the elder fishermen commencing in the period 1940-50 are relied upon to produce a schematic diagram of the oyster fishing fleet from which the practical organization and extent of the community of fishermen in the latter half of the 20th Century becomes apparent. This provides a basis for identifying the conservation-minded fishermen upon whose information the thesis is built. The interviews have helped to form a synthesis of the concept of fishermens' knowledge. This knowledge is explained with reference to critical issues in the oyster fishery such as: traditional fishing methods; conservation practices; overfishing; oyster disease; environmental destruction etc. Knowledge is part of culture and so an attempt is made wherever possible to describe any aspects of the Bluff oyster fishing culture that may be relevant and serve to describe the existence of the social side of the fishery. The effort is one of attempting to build on the legacy of the past. The object then is to find a way to make that past available so that management of the fishery can be *connected*, as well as inclusive.

1.3.3 Analysis

This chapter is mainly concerned with the first of the two subdivisions of the main research question, namely, the effectiveness of various management methods and their environmental impact. This is a restatement of the fishermens' experience of the fishery, and an attempt to draw together the interview material with the large volume of documentary record. It is a re-telling and a continuation of the management history, and it is also the application of an intellectual analysis, which, although present in the views of fishermen, is also stated in more academic terms. The QMS, and the way in which this was applied to the Bluff oyster fishery, naturally figures very largely in these discussions. One argument introduced in the analysis is that the QMS was applied to the Bluff oyster fishery as part of a national policy with very little study of the local situation. Far from a simple administrative tool, the analysis followed here describes the imposition of the QMS upon the Bluff oyster fishery as a revolutionary act with far reaching social, political, and environmental consequences. The QMS gave almost all power in management of the fishery to the merchants and the owners of the industry. This change practically eliminated the conservation-minded fishermen from any further role in the fishery. For the conservation-minded fishermen, their exclusion has meant the elimination of all restraint in exploitating the fishery. An example of this is the recent abandoning of a long-standing regulation which limited oyster dredging to daylight hours. The link between the political-economic organization of the fishery, and the lifting of conservation measures leads to the second main hypothesis of this thesis. Namely, that social and political organization can have a negative impact on the physical health of the fishery, and should be considered in the overall ecology.

1.3.4 Discussion

The second of the two subdivisions of the main research question concerns alternate approaches to management of the Bluff oyster fishery within the context of a marine commons. This discussion is academic and is founded upon the literature of property-rights and common property developed in the work of Bromley, Ostrom and others

(Daniel W Bromley, 2001; Daniel W Bromley & Feeny, 1992; Feeny, Berkes, McCay, & Acheson, 1990; Elinor Ostrom, 1990). The literature of the commons provides a conceptual framework that is useful for analyzing what happened to the Bluff oyster fishery when it was brought into the QMS; common property was enclosed, and management rights were restricted to the owners of individual transferable quota (ITQ). The fishery continued to operate as a commons, albeit with reduced access by fishermen, as various owners continued to exploit a common pool resource. Question is then raised of how successfully the resulting commons regime has operated since the introduction of the QMS, and how it compares with the features and design principles of successful common pool resource systems described in the literature.

The design principles developed by Ostrom assume that questions of assignment of property-rights have been previously addressed and resolved. While assignment of property-rights occurred with the introduction of the QMS, the issue of dispossession of the fishermen was left to fester. This was a social justice issue, but one with ecological ramifications. When conservation-minded fishermen were eliminated from management, restraints on levels of exploitation were also eliminated. A relatively new literature on socio-ecological systems provides an interesting context for this aspect of the fishery (Fikret Berkes, 1996; Fikret. Berkes, Colding, & Folke, 2003; Fikret Berkes, Folke, & Colding, 1998), and a link back to the property rights literature is provided by introducing the concept of belonging alongside that of ownership. Belonging is described as an attribute of fishermen who have a long association with the Bluff oyster fishery resulting in the adoption of a conservation ethic. The concept of ownership, on which current management relies, lacks this socio-ecological dimension, and is hence not necessarily sufficient *per se* in establishing a sustainable fishery.

1.3.5 Conclusion

There are any number of answers to the question of where we went wrong in managing the Bluff oyster fishery, and many of these are revealed at various points in the thesis. Input controls may well have mitigated some of the damage caused by the introduction of heavy dredges to the fishery in the 1970s; fishery closures and rotational fishing might have been

introduced to better effect, other forms of restraint might have been practised, and so on. However, we cannot change the past, and so the research question becomes, 'Where **are** we going wrong in managing the Bluff oyster fishery?' The thesis allows the fishermen of Bluff to answer this question. This thesis may represent the first time that the views of the Bluff fishermen are presented and recorded. Answers to the question take the form of contextual findings rather than scientific conclusions. The interest should be in the detail of the way the question is answered, in the voices of the fishermen as they look back over their lives and work. However some abstraction from the concrete practicality of the fishermens' stories is academically necessary, and the conclusion does offer some suggestions not contained in the data obtained during the interviews. By and large the fishermen have refrained from making suggestions as to how the fishery should be managed. However, one fisherman did express the sentiments of many when he suggested, in the characteristically succinct fashion of fishermen, that what the fishery needs is, '… a wee spell.'

2 Methodology

This study is specifically located within the Bluff oyster fishing community and is mainly concerned with discovering views of a particular group, i.e. a group that is identified in this thesis as the 'conservation-minded' fishermen. There are all kinds of fishermen with all kinds of views in Bluff, and this thesis does not attempt to represent them all. The conservation-minded fishermen are those representing a long-standing conservation ethic among the fishermen as demonstrated in their many community activities over decades. The fact that thesis develops from information provided by fishermen, means that the results may create a much different impression of the fishery from that espoused by industry and government. This need not in any way invalidate what the fishermen have to say. The objective after all, is simply to listen, and record whatever stories the fishermen might wish to relate. Attention needs to be paid, however, to demonstrating the academic integrity of the research. This is done below by describing some of the standard parameters of qualitative research design and using these to explain the collection and analysis of data.

The thesis does not limit itself to presenting the voices of fishermen in answer to the main research questions. The voices of fishermen are interpreted, organized into themes, and finally used to create the first hypothesis which is a tentative answer to these questions. The hypothesis is that a fishery must be understood as an integral whole with particular emphasis on social aspects. The social and the physical sides of the fishery, it is argued, are connected. It is further argued that the morality of the conservation-minded fishermen has an ecological role necessary to the sustainability of the fishery.

2.1 The Qualitative Method

Qualitative research is a method appropriate to the social sciences, which broadens the scientific method with creative solutions to some of the philosophical problems inherent in the quantitative research method. The qualitative method allows freer association of the

subjects and objects of research than is possible with quantitative research. Qualitative research may be more interested in the qualities (the nature) of certain phenomena rather than the quantity (e.g. the number of times the phenomenon occurs). Qulitative research may be used to combine qualities; meanings might change with circumstances, truths may become conditional and variable—all things which do not lend themselves to quantification. Take, for example the links between political and social organization, and the physical health of a fishery. Only a holistic view, freely associating relationships across time and space would be capable of exploring the more subtle aspects of the connection.

Qualitative research allows meaning to emerge from observation, in its own way, and on its own terms, as opposed to testing preconceived ideas and ordering the subjects of research to suit the experiment. In-dwelling (i.e. a close and prolonged contact with the subjects of research) is one technique associated with qualitative research used in the course of this thesis. This in-dwelling takes account of the human-as-instrument to achieve an involvement with the subject which only human relationships are capable of eliciting (Maykut & Morehouse., 1994; Shaffir & Stebbins, 1991). The fact that a researcher will bring his own personality, his own politics, his own biases into these relationships does not invalidate the results of the reseach. On the contrary, a commitment whether moral, emotional, political, or more likely a combination of these, is probably a requirement on the part of the researcher. Human relationships take time, and effort, and a source of energy is needed which only these deeper (i.e. moral) levels of life can provide.

2.2 Data Collection

2.2.1 Key informants

The cornerstone of this thesis is in-depth, unstructured interviewing with key informants. Of these, three were central and offered a great deal of themselves over a period of more than four years. Relationships with key informants were built in a variety of circumstances from the relaxed atmosphere of their homes to community meetings. Two of these informants, Murray Black and Allan Lee have, chosen to be named in this research. Murray Black was an oyster boat skipper for twenty years, a longstanding member of the Foveaux Strait Oyster Advisory Committee, and chairman of the Bluff Oyster Catchers

Union from 1989-2000. Murray is the leading voice of the conservation-minded fishermen. His house overlooks the fishing harbour where the oysters are landed each day, and there is not much going on in the oyster industry in Bluff that escapes his attention. He often expresses anger and frustration at an industry bent on capturing, as he believes, the last of the breeding stock of oysters. Murray was present at the 2007 Premiere of Katie McSweeny's film documentary, 'Bluffed', on the Bluff oyster fishery in which he played a leading role. Fifteen-hundred people applauded the film showing their respect for Murray's many years of voluntary efforts aimed at conservation in the Bluff oyster fishery.

Alan Lee's father was an oyster opener in Bluff and Alan first began oystering as a reliever on the oyster vessel RITA in 1948. In 1950 Allan went the TOREA as a Deckhand. He worked on this vessel until the late 1950s. At this time he spent a few years working in an engineering workshop before he became Skipper of the RITA in 1964. He remained Skipper of this vessel for the remainder of his working life and retired from the fishery in the mid-1990s. During Allan's working career he often accompanied scientists to the oyster beds and assisted in the collection of scientific data that was used by researchers to assess the condition of the fishery.

The third key informant on the conservation-minded fishermens' position requested not to be named, and it would undermine his anonymity to describe the informant's qualifications in detail. All three informants come from Bluff fishing families and have had a life-long association with the Bluff oyster fishery. All were oyster skippers for many years and held leadership roles in the fishery, contributing to management and conservation. Interviews and conversations with the informants were supported by more than 30 years of documentary evidence. Two of the informants provided extensive files containing practically every document on the oyster fishery that passed through their hands during their many years of involvement. The fishermen were generous with these documents, trusting them out of their sight for lengthy periods (see Appendix A of this thesis for a bibliography of fishermen's documents). The documents included records of meetings; correspondence; newspaper clippings; research papers of all sorts, and scientific reports, painstakingly classified and maintained for decades.

2.2.2 Community Interviews

By 2003 at least five conservation-minded fishermen had been identified as having similar conservationist views. All of these were respectable members of the community, who had publicly voiced their concern about the continuing decline in the fishery. All five had extensive experience as oyster skippers, and as participants in management. None were currently fishing either having lost their positions in the fishery after the introduction of the QMS, or having retired for other reasons. Interviews with these central figures fell on the continuum between in-depth interviewing and the one to one-and-one-half-hour semi-structured interviews that began in the community in 2004-2005. The community interviews were advertised by posters in the town of Bluff, by advertisement in the local daily, the Southland Times, and as a result of a local interest article in the same newspaper. Interviews were held in the old Post Office, now a lodge offering accommodation to visitors. Only a small number (5-6) people made the effort to attend these interviews, and one or two of these became active in the focus groups that followed. The seemingly low numbers were discussed with fishermen who said it was to be expected in Bluff, that is the way that people were, and that if more interviews were needed, it would be necessary to 'go knocking on doors'.

It was not difficult to obtain the names and addresses of local people with knowledge of the fishery. Almost everyone encountered was able to suggest one or two further interviewees and by the end of the summer of 2005 a total of more than fifty Bluff oyster fishermen had been contacted. This included currently employed fishermen as well as those who were unemployed or no longer worked in the fishery. Also included in this group were a number of close family members of fishermen and important local community members. This sample size should be put into the perspective of the fishery which presently numbers 12 boats and approximately 50 currently working fishermen.

The purpose of the community interviews was not only to gain information on the fishery, but also to learn more about the culture of oyster fishing and the community. To some extent the community interviews did support and validate the in-depth interviews with the key informants helping ensure that no glaring incongruities existed, that nothing important was overlooked, and that alternate viewpoints were considered. The interviews were generally unstructured, though certain questions had been predetermined and were

sometimes referred to during interviews. In a number of cases the interviews led to further home visits and friendships were developed. This was the case particularly with the older members of the community (at least two of whom were in their nineties) who were quite often at home during the day—unlike the active fishermen who were often away. Sadly, three of the elderly fishermen died during the course of 2006-2007.

2.2.3 Focus Groups

Some but not all of the community interviews were tape-recorded. Approximately 15 hours of taped interviews were transcribed as a result of the community interviews, and a community database containing approximately 65 names was created. The database of community names was used as a basis to write personal letters encouraging attendance at meetings of what came to be called the Bluff Oyster Fishing Forum (BOFF). This was a fishermens' group that began in March 2006 and held four meetings during the remainder of that year and into the next. The meetings of BOFF were understood by the fishermen as a continuation of research into the fishery, but they also had a topical component in that current fishery management was discussed. It was also understood by the fishermen that the existence of the Forum has helped make the public and the Government aware of the existence of a fishermens' voice and fishermens' interest group.

Having worked only with individual interviews it was interesting and revealing to experience the fishermen in a group situation (the group size varied, but had a minimum core of 5-6 members). One of the most gratifying aspects of the meetings was the way in which the fishermen appeared to enjoy being with one another. The meetings were recorded on a digital video recorder and were processed and archived. An important function of the BOFF in terms of this thesis is that it provided further direct evidence of the way in which fishermen respond to the main research question, 'Where have we gone wrong?' This evidence has been used to further support the positions emerging from the in-depth interviews.

2.2.4 Secondary sources

The large collection of documents in the files of the fishermen form the bulk of the secondary sources used in the preparation of this thesis. There are a few important secondary sources not included in the fishermens' files: Coote and Ellis have separately written a social history of Bluff, and a family reminiscence in which Bluff fishermen are

important (Coote, 1994; Ellis, 2000). Howard's history of Rakiura (Stewart Island, *circa* 1935), contains valuable information on the early oyster fishery, as does Pearson's Report on Oyster Cultivation from 1877 (Howard, 1940; Pearson, 1877). Important sources well known to the Bluff fishermen are the scientific reports by Stead, see (D. H. Stead, 1964 circa, 1971); Bill Robjohns' 1970 publication (re-issued in 1979) entitled simply, *Bluff Oyster Industry* (H.C. Robjohns, 1970), and the several articles spanning more than 30 years by Dr. John Cranfield, the lead scientist of the modern—post 1960s era (see References for the more important of these articles).

The history sections of this thesis are largely compiled from secondary sources though it is discussions with fishermen that have served to highlight the important happenings and provide a context for the historical events. A management history has never before been written, and is drawn from discussions with fishermen backed by original documents such as the Minutes of the Foveaux Strait Oyster Advisory Committee 1970-1990 (F. I. Board, 1973, 1976). The section on social history is drawn from discussions with fishermen, and some original documents including newspaper articles, together with some interpretive structuring on the part of the author. The almost universal acknowledgement in Bluff of the importance of the merchants as a group wielding power in the fishery led to the analysis of the fishery in terms of relationships between the merchants and other (notably the fishermen) groups. The management history of of the fishery has been followed through the records, kept by fishermen. These consisted of minutes of meetings; correspondence and reports from the Oystermen's union; minutes of the Foveaux Strait Oyster Advisory Committee (FSOAC), and minutes of the Bluff Oyster Planning Group (BOPG).

2.2.5 Official Sources and the Science Providers

While this thesis advances the fishermens' assessment of the Bluff Oyster fishery, information coming from government and science sources has also to be taken into account. There is a considerable body of official reporting on the Bluff oyster fishery, most of which falls under the rubric of fisheries science. In addition there is the published scientific articles relating to the fishery. For the purpose of this thesis, the official reports, and published scientific studies were reviewed, and efforts were made to meet with officials from the Ministry of Fisheries, and from the National Institute of Water and Atmosphere (NIWA), the government's primary provider for scientific study. These

meetings took place locally, in Dunedin, Invercargill and Bluff, and also at the Capital, Wellington where the leading scientists, John Cranfield and Keith Michael were visited. The purpose of these meetings was to elicit the position of Government with respect to the fishery, to get first hand scientific views on the fishery, and to ascertain both management practices and scientific methods.

In addition to official sources, information was obtained from parties with long-standing scientific association with the fishery. This information gathering took the form of interviews with one independent science provider, well known and respected in the industry, and one retired fisheries technician. The technician was particularly well known and respected by the oyster fishermen during a decades-long local involvement with the fishery. A fisheries scientist formerly with NIWA with a long involvement in the Foveaux Strait Blue Cod fishery, that has significant scientific overlaps with the oyster fishery, was also forthcoming with information during this research.

Three formal management meetings at which Ministry officials and/or science providers were present were held during the course of research, and a dialogue was maintained with the local Ministry official. In a recent development, a special visit by the Chief Economist of the Ministry took place at the University of Otago *á propos* the Foveaux Strait Oyster fishery, and this, and fisheries policy in general were discussed at length.

2.2.6 Industry Sources and Interviews

Two leading representatives of the Bluff oyster industry, as well as four of lesser profile were interviewed during the period of research. Both of the leading representatives had at one time been chairmen of the Bluff Oyster Management Company. One industry figure interviewed is a well-known fisherman, having appeared recently in the media, see for example (Zealand, 2007). A number of additional industry figures were reached by telephone, but either due to distance or lack of inclination were not available for further interviews. One former industry figure was very critical of the industry, and even one of the current leading supporters of the industry cited greed on the part of the merchants as having been a problem in the fishery. Almost unanimously however, the industry presents a united stand disavowing poor management, and short-term economic thinking, and doing their best to be optimistic about the future of the fishery. While the industry interviews were of little value, therefore, in directly addressing the research questions (if the problem is not recognized, no discussion can issue), they do have value in helping to describe the

social structure and the attitudes accompanying the social and political conflicts surrounding the fishery.

2.3 Research Strategy and Data Analysis

Within the overall concept of a qualitative method the stance taken by this researcher has elements of what Blakie describes as *empathetic observer*, *faithful reporter* and *conscientizer*. Only the latter needs explanation, and means that the researcher allows his own consciousness to be changed in engagement with the subjects of the research. All of these descriptions imply an explicit personal element and recognize that the researcher becomes part of the subject being researched (Blaikie, 2000). The chosen research strategy is an *abductive* one. Blakie describes this strategy in the following way:

> The starting-point is the social world of the social actors being investigated: their construction of reality, their way of conceptualizing and giving meaning to their social world, their tacit knowledge. … the researcher has to enter their world in order to discover the motives and reasons that accompany social activities. The task is then to redescribe these motives and actions, and the situations in which they occur, in the technical language of social scientific discourse (Blaikie, 2000).

It was essential to the research that as much time as possible be spent living in the town of Bluff. This was primarily to enable contact with the fishermen, and secondarily to develop a closeness to the place and the people that was helpful in interpreting the information provided by the fishermen. Key informants were able to initiate contact when it was convenient for them. As the list of contacts grew it was important to be on site in order to arrange interviews. The work was to some extent like that of a salesperson. Each day required the discipline of telephoning potential contacts, and asking for interviews. Sometimes the work involved visiting the wharves of Bluff and meeting with fishermen on their boats. Most people were interviewed more than once during the course of the research; this was to provide feedback as the work progressed, or to seek information.

The fishermen answer the main research question ‘Where did we go wrong?’ by providing their representations of the fishery. One of the purposes of the analysis is therefore to try to

bring forward this representation. As work with the interviews and secondary sources progressed it was possible to identify themes in the data. One of these themes was the contrast between the practical knowledge of the fishermen, and the science used to justify current exploitation in the fishery. Another theme concerns the impact of the New Zealand Quota Management System (QMS) on the fishermen of Bluff, and on the physical fishery, 'the beds' as the fishermen would say. The two major themes relate to emerging hypotheses such as the existence of a conservation ethic among the fishermen, and links between socio-economic organization and the physical health of the fishery (social-ecological connectedness). These themes are carried through to Chapter 8 where they are treated in context with the relevant literature.

2.4 Provisions for trustworthiness and ethical consent

The main concern with respect to the trustworthiness of the thesis is whether or not the fishermens' position is correctly and fairly portrayed; in other words whether the key or principal informants recognize themselves in the thesis and are happy with the presentation. Trustworthiness was provided for in this respect by the fequency of contacts with the informants, and by allowing time for problems or differences to be discovered. The research was originally compiled into a series of papers and made available on the internet (P. Knight, 2003, 2004). The informants were provided with hard copies of all research and asked for comment prior to any dissemination on the web or at conferences. This only ever resulted in a few minor changes; the papers were generally well accepted, occasionally even praised. Transcripts of the individual community interviews were provided to participants along with copies of papers that related to the ideas and information discussed at interviews. This communication resulted, over time, in a small amount of feedback.

Ethical consent for research involving human beings was obtained by application to the University of Otago. Ethical consent was contingent upon consultation with Maori, which was accomplished readily due to the authors' contact with the Maori community in Bluff.

3 The Bluff Oyster Fishery

3.1 History and Setting

3.1.1 The Foveaux Strait

Foveaux Strait lies in an east-west direction at the southernmost tip of New Zealand, and separates Stewart Island from the mainland by a distance varying between 20 and 50 kilometres. It is a broad strait of green water and white-capped waves, open in the west to the Roaring Forties then shelving and narrowing 80 kilometres to the eastward. Toward the east the Strait is overlooked by Bluff Hill (Motupöhue) to the north, and is bordered on the south by a range of several peaks that climb westward from outlying islands along the northeastern shores of Stewart Island. In the shallower waters of the eastern approach lies Ruapuke (pronounced Roo-a-poo-kee) Island, owned by Maori; Bird Island, which is uninhabited, is a close neighbour of Ruapuke Island to the southeast.

Many generations of fishers have built their lives around the abundance of the Foveaux Strait. In the 19th Century whales were hunted from the shore as well as from whaling ships. Whalers sighted their prey from Lookout Point which now forms one of the many resting places on the well-maintained walking tracks that are the main feature of the south side of Bluff Hill. When the whales and seals were killed off, fish and oysters became the mainstay of the Foveaux Strait fishing economy.

3.1.2 The Town of Bluff

From the top of Bluff Hill, surrounded on three sides by the sea, one looks south across the Foveaux Strait to the mountains of Stewart Island. To the north lies the town, and the wide horseshoe shaped shallow embayment which forms the harbor. Further north lies the hinterland, and in the distance the town of Invercargill. The town of Bluff is somewhat protected from the prevailing cold southerlies by the imposing hill which also provides a sunny, north-facing slope upon which most of the houses of the town are built (Bluff is nevertheless a blustery town; in 2007 a Sou'west gale blew down a large brick building in the town centre). The town of Bluff and the Bluff Hill are part of a peninsula that forms the south-east closing arm of the horseshoe-shaped harbour. Most of the wide expanse of the larger harbour is not used by shipping which is restricted to the industrial wharves of

Bluff Island Harbour, and the Town Wharf. Bluff Island Harbour was built by the Town of Bluff on reclaimed land in the 1950s. The original oyster wharf was made inaccessible by the project and the Bluff oyster fleet moved to the Town Wharf (the old wooden wharf that lies in an east-west direction at the foot of Bluff Hill), and later to the new wharves built at Bluff Island Harbour.

Across the narrow harbour-entrance, opposite the town of Bluff, lies the Tiwai Point aluminium smelter. A mile-long wharf servicing the smelter cuts the soft lines of the tidal flats to the north, and extends to the deeper water of the harbour channel. Every house with a view in Bluff looks out over the harbour, with the bright lights, buildings and chimney of the smelter beyond. The sea-entrance to Bluff harbour is opposite Stirling Point at the southeastern limit of the town. Here the tide flows rapidly past the rocks and beds of kelp; the beaches and rocks are clean and fresh and one looks up through the misty sea air to the extremity of Bluff Hill clothed in a mantle of native bush. Stirling Point Light is one of a series of navigational aids marking the narrow and difficult entrance to the ship channel. Navigating the channel requires at least two major course changes through the rocky entrance. Large ships are frequent visitors to the Port of Bluff, and two tugs and a pilot boat can regularly escort ships in and out of the harbour.

3.1.3 The Fishing Culture

There is an old saying in Southland that, 'If you're from Bluff you're rough and tough.' The waterfront pubs once hosted a lively revelry, complete with the occasional brawl. The oystermen took no pains to dispel the dissolute reputation created in large part by the more transient longshoremen and meat freezing plant workers. But, if the oystermen were rough and tough it was from their ability to withstand the numbing tedium of culching oysters for long hours at sea. Culching is the process of separating legal-sized oysters from the rest of the material brought up by the dredges. Deck hands stand at benches where the contents of the dredge are dumped and select the oysters with extraordinary dexterity. Having to be up at 4:00 am for six days a week does not leave much time for troublemaking. No doubt the fishermen as a group suffered their share of alcoholism and other forms of ill health, but this was encompassed within a fishing culture exemplifying responsibility, and stability of character. Oyster skippers enjoyed a top social status in Bluff commensurate with their abilities to operate a complex physical plant in the extreme environment of Foveaux Strait, and to provide for the safety and economic success of their crew. The retired oyster

skippers upon whom much of the research rests are predominantly family men whose homes, even of the very oldest, are exemplars of good maintenance. Many of these elders remain currently employed, always in work of a practical nature.

It is not easy to understand the love the Bluff fishermen had for the cold, hard work; indeed one or two described it as an impossibly hard way of life. However, there is something special about a group of fishermen that have spent their lives in the fishery and have been initiated by their elders. The skills and abilities of the Bluff fishermen were those of prime seamen. Furthermore there would have been humour, fun, and rewards in plenty for a young fisherman. 'You left your worries at the wharf', the fishermen say. Children often stopped at the oyster wharf, where they were allowed on the boats to gather up oysters left on deck after the unloading, and would sometimes ride the mile back up the harbor from the oyster wharf to the main wharf where the oyster boats berthed. As late as the 1980s children growing up in Bluff could recite the names of the oyster boats as they might a multiplication table: The *WAITANGI*, THE *HIRERE*, THE *TOILER* … .

3.1.4 Bluff oysters

Oysters from Foveaux Strait are known throughout the country as Bluff oysters. Distinct from the Rock Oyster (also called Pacific Oyster) cultivated in other parts of the country, Bluff oysters are wild, and are caught by dredging. The location of the Foveaux Strait oyster beds has been known to the Bluff oystermen since early in the 20th Century (see *Figure 3.6* for a map of Foveaux Strait oyster beds). The oysters occur in patches within the broad areas referred to by the fishermen as 'beds', the locations of the 'patches' or 'tows', were the guarded secrets of the oyster skippers. Their 'marks', i.e. landmarks fixing the location of the patches, were recorded in logbooks, and the information they contained was passed from father to son in the fishery.

Dredging is accomplished from oyster boats (60-70 feet long) and involves lowering two heavy steel dredges (3.75 m wide) by cable to the seafloor where they are dragged across the bottom in ten-minute long elliptical tows. Oysters are scooped up by the dredges and hauled to the surface where they are washed by repeatedly dunking the dredges, and then deposited on benches on the decks to be culched.

For many decades the Bluff oyster fishery prospered and the Town of Bluff identified strongly with the fishery. As recently as the 1980s, if one braved a cold, pre-dawn, winter

morning at Bluff Harbour, one could have found twenty-three oyster boats warming up their engines, and their stoves alongside the fishermens' wharf. They were beamy, tug-like vessels; some built early in the century had seen decades of work. The boats were designed with plenty of deck space; culching benches were placed along the port side where the dredges were shipped, the starboard side remaining open for the load of full oyster sacks. The traditional oyster boats had a small wheelhouse just abaft the anchor winch. Below deck was a galley and fo'c'sle, which the crew accessed either from a companionway aft, or from stairs leading from the wheelhouse. In the early morning dark, cooked breakfasts were prepared. The boats would wait for the decision to leave, which depended on the weather conditions. Then one boat would slip her lines and the whole fleet would take to the channel, making its way down the narrow path to the sea that, on the Pilot's advice should be navigated only at slack water. Late in the afternoon the same boats would return, many with a noticeable starboard list from the weight of oyster sacks stacked on the deck.

The record for a day's catch is attributed to Nobby Calder (*circa* 1950) for returning with 208 sacks. The story of the biggest catch is told in different ways. The number of sacks of oysters ranges between 208 and 230. At that time the oysters were not bagged at sea and were unloaded onto an underwater storage platform under the old oyster wharf at Bluff. The catch in question caused the underwater structure upon which the oysters were unloaded, to collapse, which made recovering and counting the oysters more difficult. At approximately 800 oysters a sack and today's (conservatively estimated) price of $15 a dozen for Bluff oysters, Nobby's catch for the day would have been worth $208,000.

In order to rest the oysters during their spawning season, which occurs in the summer months, oyster fishermen in Foveaux Strait worked through the harsh and challenging winter from February to August. The traditional working week was from Monday to Saturday with Sundays and holidays as rest days. In the days of sail, oyster vessels often could not make headway against the strong tidal flows or contrary winds in the entrance to Bluff Harbour. Oyster fisherman Sonny Calder, who grew up in Bluff in the Depression years, recalls his father telling him how his boat might make it only as far as the pilot station. If the tide wasn't right they would have to stay there all night and go out fishing the next morning. Sometimes, his father said, they would be away three days before they could get home (Coote, 1994). Work on the boats was brisk and unremitting. Observers all

agree that, while the wages for the fishermen were relatively high compared with other labouring work, the fishermens' money was well earned.

The fishermen have always been entitled to take oysters from the catch in addition to their wages. This allowance, known as the 'oystermen's feed', and which for each boat might have amounted to as much as half a sack a day in earlier times, has become the subject of controversy as the oyster population has plummeted and the price of oysters has skyrocketed. In earlier times—perhaps as late as the 1960s and 1970s, oysters were often given away for the asking at the oyster wharf. Bluff has always had a reputation for hospitality and the oystermen's feed would often go to providing for visiting teams at the local rugby club, and for other civic events. Friends and neighbours of fishermen also received an occasional gift of oysters. Now the oystermen's feed has been eliminated by regulation (though the oystermen are allowed to bring home the amateur catch limit of 50 oysters a day). Oyster fishermen see the regulation eliminating the oystermen's feed as a failure by the government to properly acknowledge their customary rights (Murray Black, interview data).

3.1.5 The early fishery

Bluff claims the honour of being the first town established in New Zealand. Its early settlers were involved in the whaling and sealing industries that developed at Bluff Harbour around 1830. Not long after, the commercial oyster industry originated on Stewart Island. At that time the Rakiura (Maori) people gathered oysters from the foreshore at Oyster Cove, Port Adventure. The early Europeans worked with the aboriginal people and brought oysters from Stewart Island to markets on the mainland by sailing cutter. Certain families became prominent, owning vessels used in the trade, and when the industry was established in Bluff in the early 1900s, these families developed shore facilities for storing and processing oysters (H C Robjohns, 1979). These were the beginnings of the group known today colloquially as: the owners; the boat owners; the merchants, and most recently, the quota holders. As time went on, the owners developed an oyster industry with oyster opening factories. Some of these facilities were in Bluff near the waterfront and close to the oyster boats and the harbour, others were in the town of Invercargill 15 kilometres to the north. The Calder family's oyster factory employed thirty-one openers during the busy seasons of the 1960s. Sacks of unopened oysters were also sold to the

public at large, and the owners developed relationships with retailers locally and nationally.

3.1.6 History of the Oyster Beds

There is much about the one-hundred-and-fifty year history of exploitation of the Bluff oyster fishery that remains relatively undiscovered. However, through administrative records, scientific surveys and oral accounts it is possible to construct a history of exploitation of the Foveaux Strait oyster beds. The early history (19th Century) relies on Pearson and Howard (Howard, 1940; Pearson, 1877). The estuarine (shallow, inter-tidal) oyster beds at Oyster Cove (Port Adventure), on Stewart Island were exhausted as early as 1867 ('plundered with unseemly rapacity', are the words used by Howard), but exploration in the Foveaux Strait began to reveal new beds. The Port William Bed (*Figure 3.1*) was found in 1867 and was fished for four years before it too was exhausted. The Half Moon Bay Bed was discovered in 1872 lying between Bench Island and Fish rock in 19—23 fathoms. Howard states of the early fishing of these beds:

> They put to sea in such numbers that the disgusted discoverers wrote … complaining of the injury likely to be done … [the beds were] worked with disregard for the future … the oysterers gave no thought to the conservation of the source of their profits. (Howard, 1940)

The oyster fishermen were sufficiently concerned about depletion to request and receive a closure of the Half Moon Bay Bed by a government regulation in 1877. Port Adventure had already been closed to dredging since 1872 (Pearson, 1877).

The term 'bed', as used by the fishermen, refers to a general area within which oysters are found. These locations have been known to fishermen for generations and are shown in *Figure 3.6*. The symbols (ellipses) depicting the beds are meant only to indicate general areas indicated by fishermen and not their exact spatial extent. Figures *3.1* through *3.6* show the location of the Foveaux Strait oyster beds as a function of historical understanding. The point is to convey the fishermens' understanding

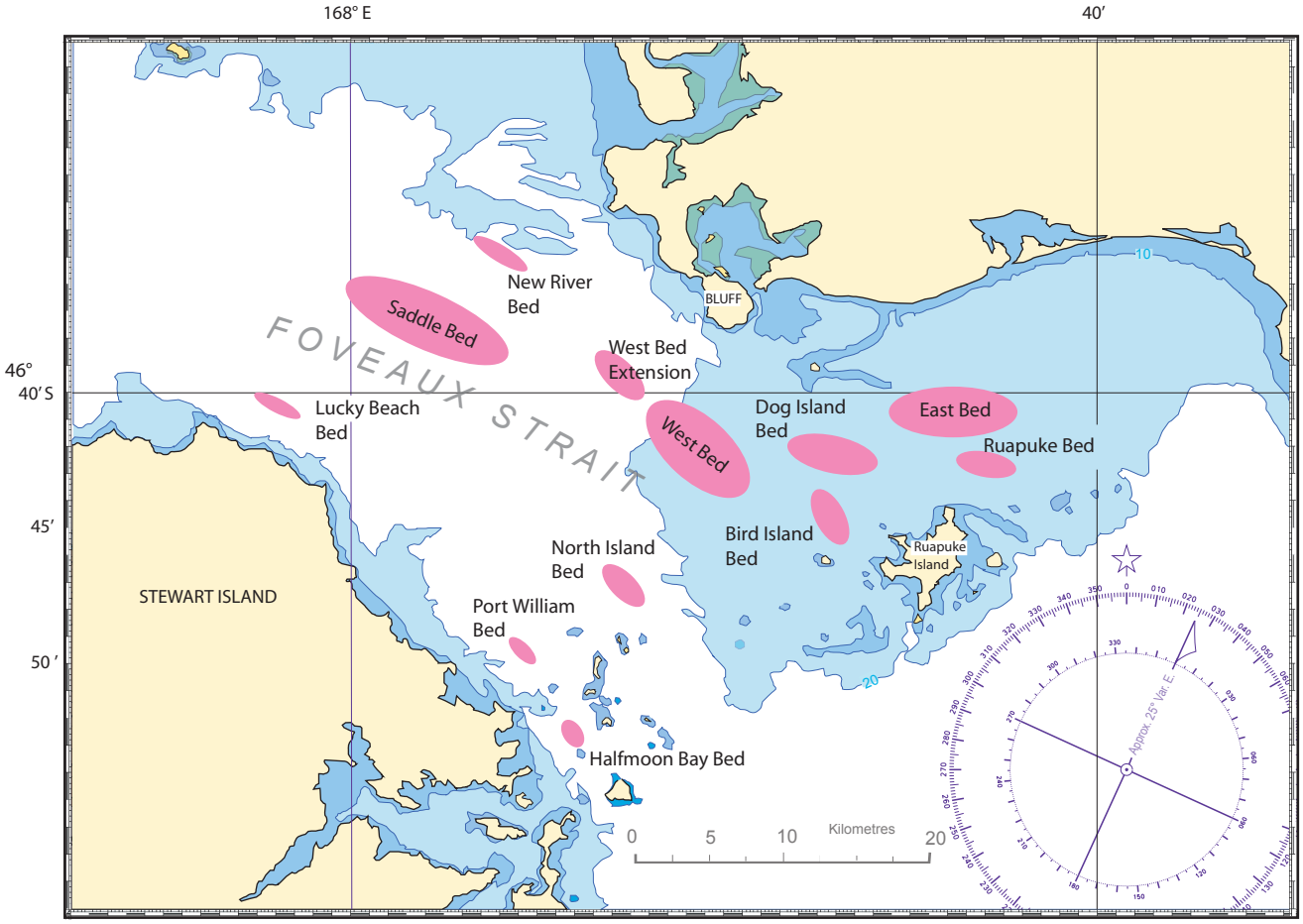


Figure 3.1—Position of oyster beds in Foveaux Strait determined in a survey using a commercial oyster vessel in 1905 (Survey 1 redrawn from Hunter 1906) — adapted from (Cranfield 1999).

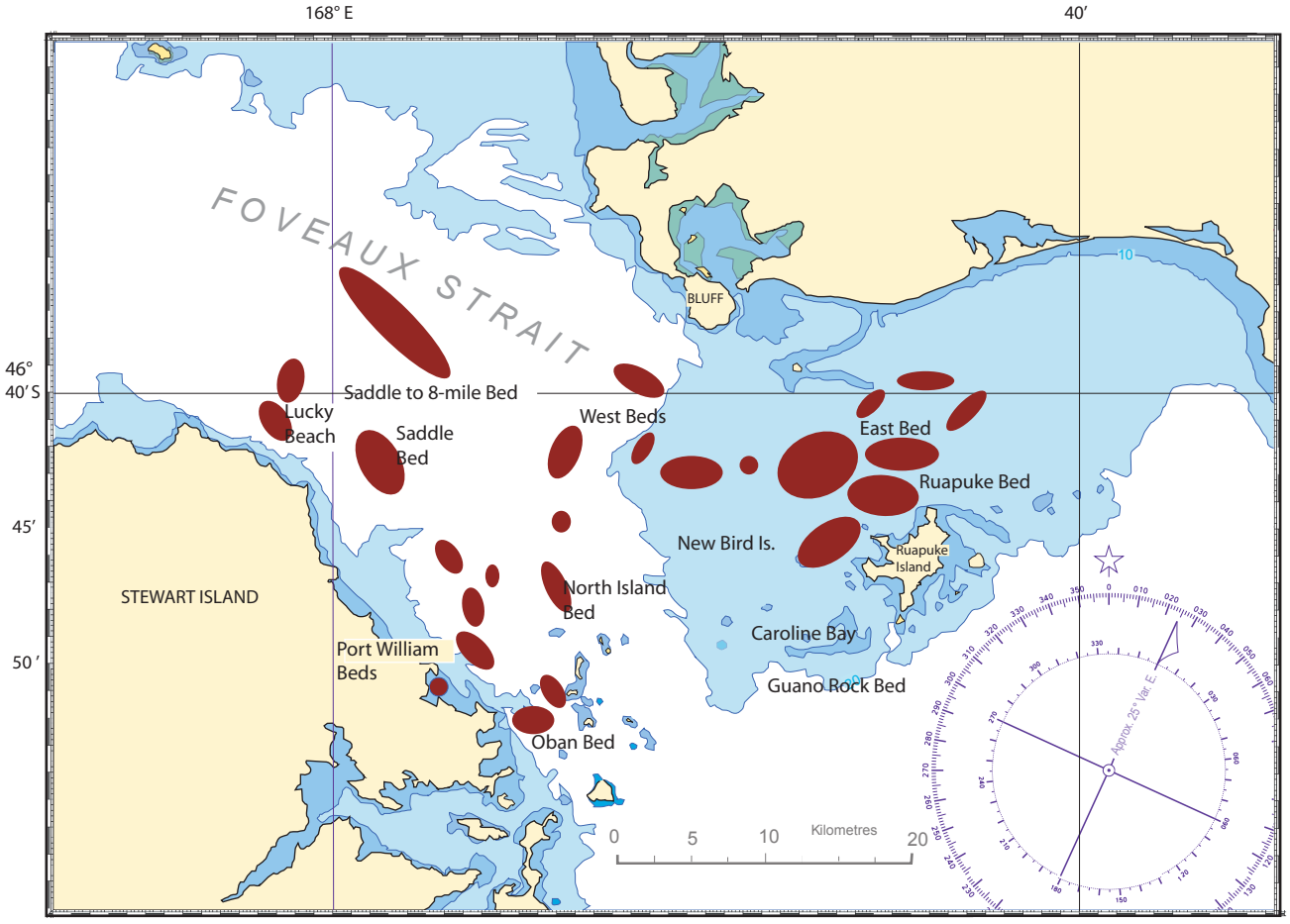


Figure 3.2 —Position of oyster beds in Foveaux Strait determined in a survey by Young 1926-1927. Adapted from (Sorensen, 1968).

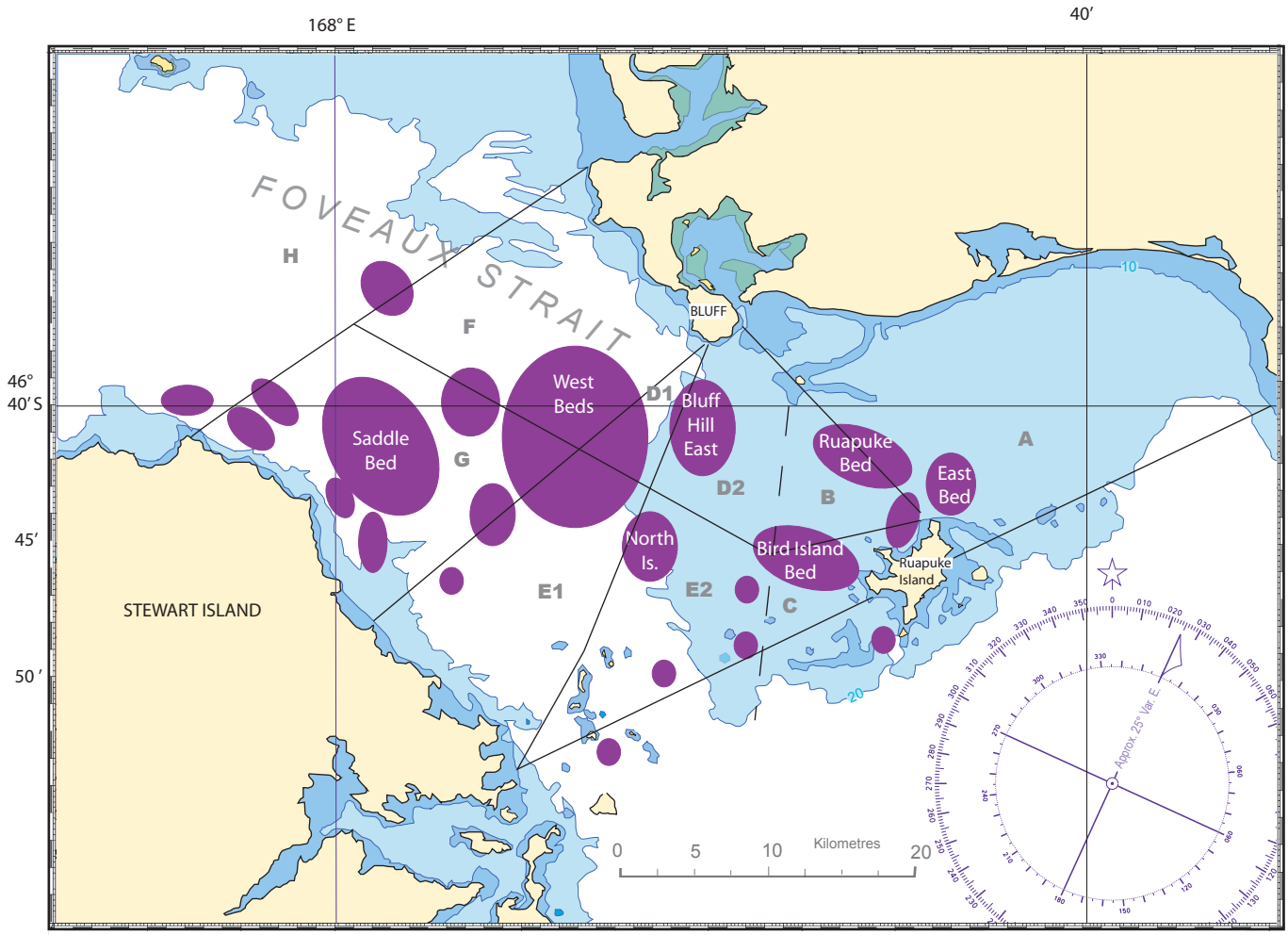


Figure 3.3—Location of oyster beds in Foveaux Strait (adapted from Stead 1971). Also shown are divisions later called statistical areas and used by government in regulation of the fishery.

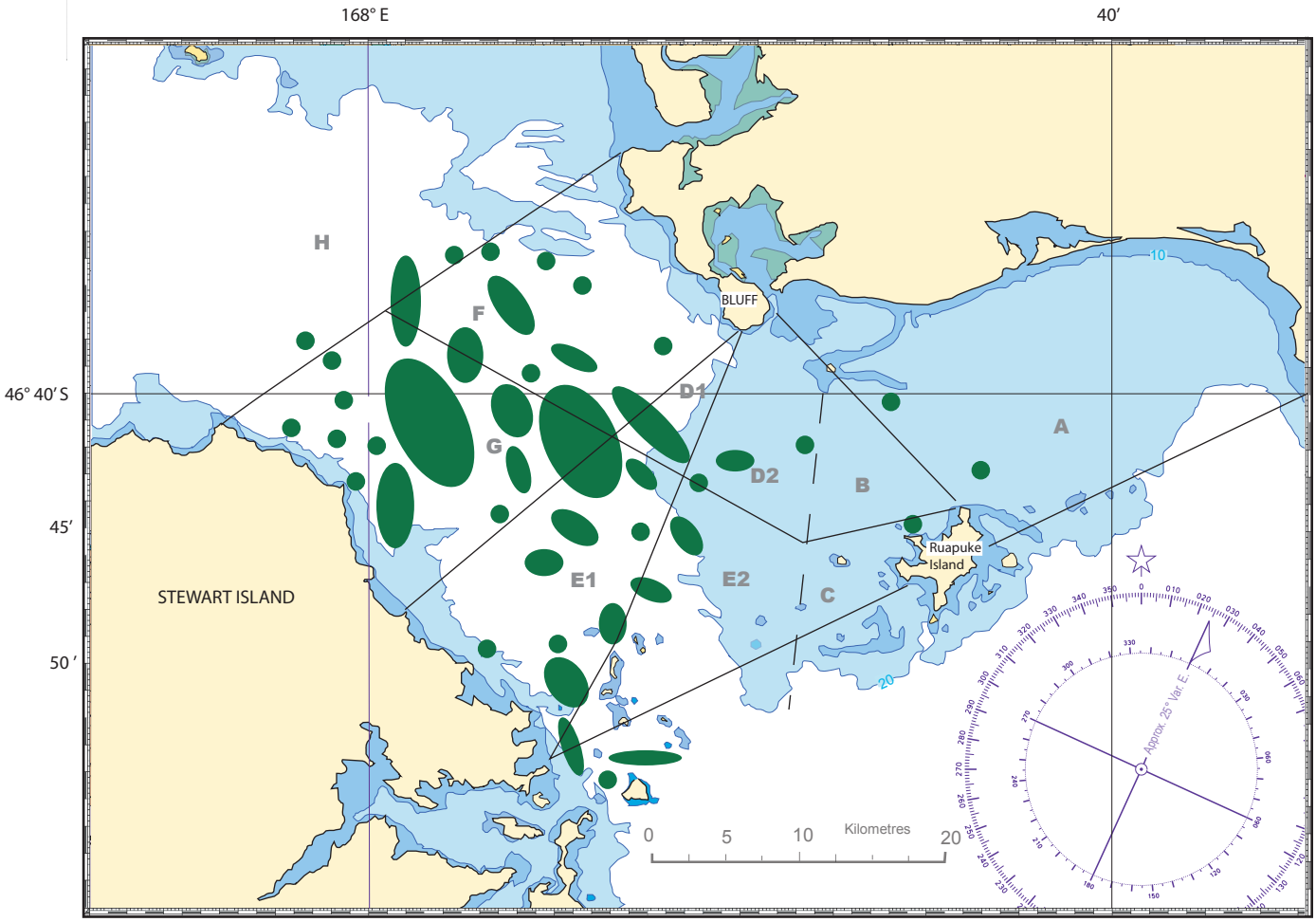


Figure 3.4—Locations at which mulloch was found in survey of 1962-1964. Adapted from (Stead 1971).

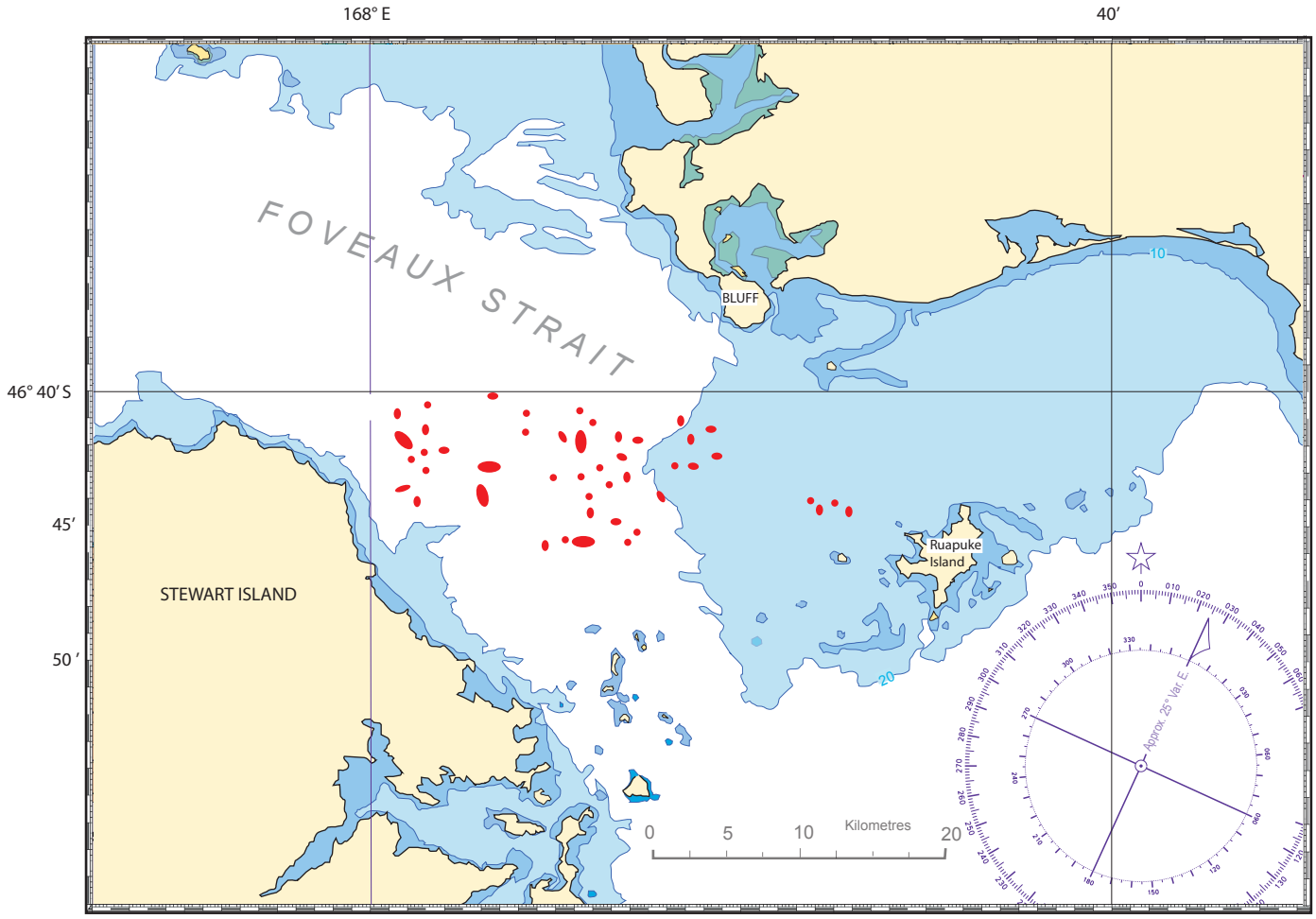


Figure 3.5—Areas of high densities of oysters as discovered by Cranfield from high resolution survey (0.3 nm grid) in 1975. Patches of oysters within the beds correspond with fishermens' description of oyster 'tows'. All fishing effort in 1974-1975 was concentrated on the areas shown which have a combined area of approx. 12 sq km. (adpated from Cranfield 1979).

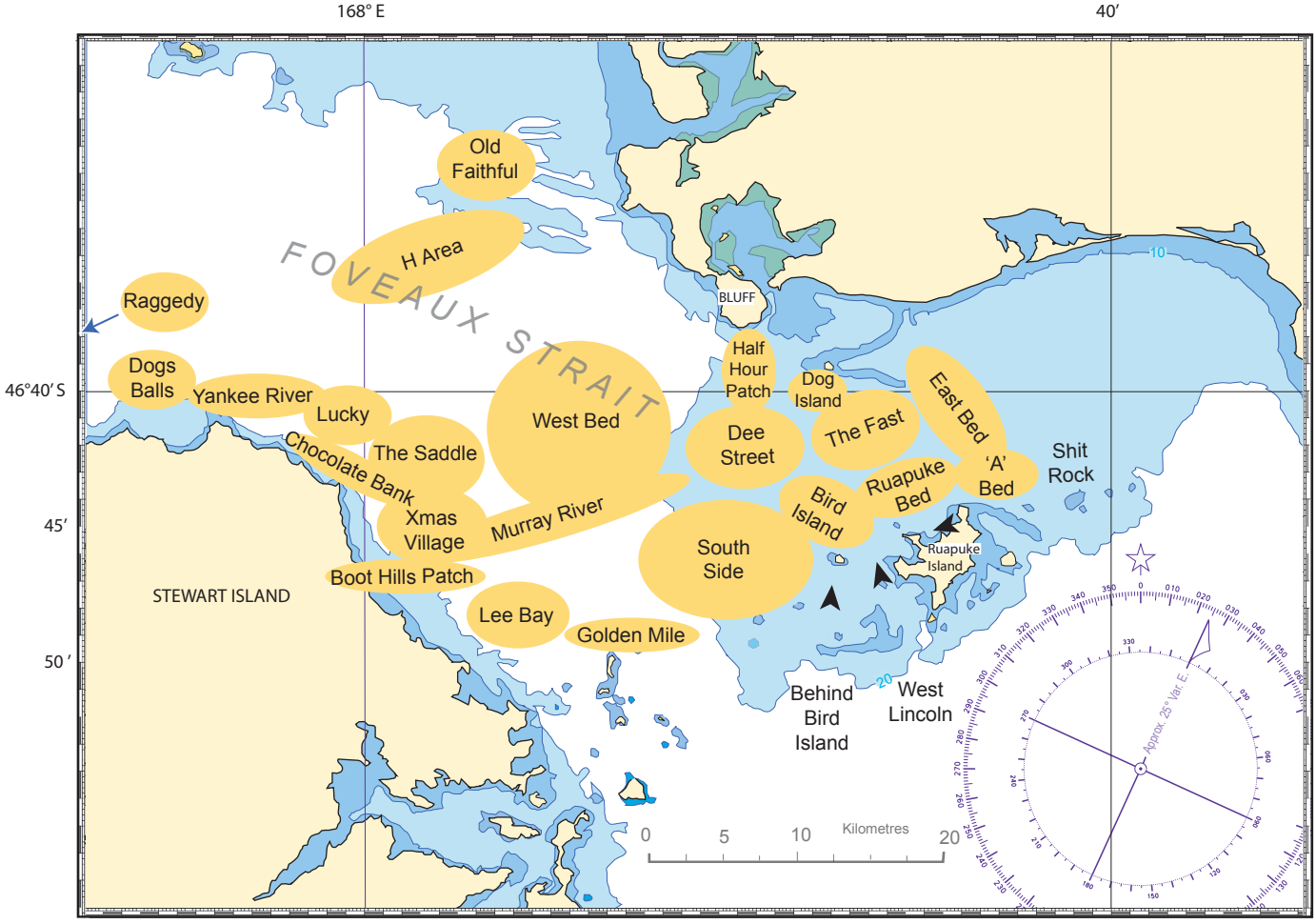


Figure 3.6—Location of oyster beds in Foveaux Strait as compiled from maps of fishing activity provided by fishermen. The elliptical symbols showing the location of beds are meant to indicate only the general location and not the spatial extent of the beds (adapted from Hall *et. al*. 2007).

of the oyster beds of Foveaux Strait as discreet phenomena. The location of all the main beds has been well known from at least the 1920s (*Figure 3.2*), and have not changed in position or extent.

The exact spatial extent of the beds in central and western Foveaux Strait was described by Cranfield in the 1970s. Working closely with fishermen and employing scientific surveys, Cranfield discovered that the oyster beds were much more limited in extent than generally thought. It was found that the area of the commercial fishery during the 1974-75 seasons covered only 6 to 7 sq. nm—a tenth, or less of the size of the oyster bearing areas estimated by Stead in the 1960s (conpare *Figure 3.3* and *Figure 3.5*). The oysters are not evenly distributed within the larger areas of the beds indicated by fishermen, but occur in patches separated by barren ground. Cranfield noted that fishermen suggested that oysters occurred in ribbons elongated up- and down-tide (Allen & Cranfield, 1979). Fishermen needed a fine sense of position and a high level of technical competence to stay on their tows as the difference between catching oysters or coming up empty could amount to as little as a boat length on the seafloor (Interview data).

Cranfield relates the history of the fishery as follows:

> Between 1882 and 1898, fishers, while exploring Foveaux Strait more widely, found further larger oyster beds in the east. The extensive East Bed was discovered in 1888 and from that time until the late 1940s was the centre of the oyster fishery. The bed was 7.2 km long and 3.6 km wide and was one of the largest individual beds exploited in Foveaux Strait. During the period of exploitation of the East Bed fishing effort in the oyster fishery increased substantially. The number of tows a sailing cutter could make each day was greatly increased in 1890 with the introduction of small oil-powered engines to raise the dredge. In 1913, sailing cutters began to be replaced by steam-powered vessels that towed two 3.35 m wide dredges. … The installation of sorting benches in 1928 increased sorting efficiency and resulted in higher landings. The greater efficiency of sorting resulted in fishers being able to almost double the number of dredge tows they could make each day. Fishing effort increased further in 1936 with the addition of two new vessels and with the introduction of diesel power. Diesel power expedited the shooting and recovery of dredges and the increased fishing effort is reflected in the almost doubling of the catch again in 1936.
>
> The seafloor of the East Bed area was almost completely blanketed by epifaunal reefs when first commercially fished for oysters. Dredging progressively reduced this reef cover

> and subsequent fishing of the denuded seafloor reduced the oyster population to commercial extinction by 1949.
>
> …
>
> After the collapse of the East Bed fishery in 1949, the fleet transferred the focus of their fishing of eastern Foveaux Strait to the Ruapuke Bed [Note: the Ruapuke Bed bed refered to by Cranfield is the A Bed shown in *Figure 3.2* . Cranfield notes elsewhere this confusion in naming]. The catch of oysters from the Ruapuke Bed rose steadily from almost 23 million in 1950 to 53 million in 1959. During 1960, fishing of this bed became uneconomic, and after a further 16 million oysters were caught fishers abandoned it. In 1964 the bed was formally closed to fishing by regulation to allow the oyster population to rebuild. … This oyster bed was left open to commercial fishing after 1980 but catching oysters there has remained uneconomic to this day. (J Cranfield, Michael, & Doonan, 1999)

Over the past few years with the rise in the selling price of oysters, fishers have returned to the East and the Ruapuke Beds. However, catch rates have not increased on these beds, and are still well below what was considered commercially viable when the beds were originally abandoned. A catch rate of between 8 and 11 sacks of oysters an hour would have been considered commercially viable prior to 1985 (interview data). Today catch rates are not likely to exceed 2 sacks an hour anywhere in the Foveaux Strait (M. o. Fisheries, 2006). The fishery has survived only because of a large increase in the price of oysters. Fishermen now return to the old areas and through the relaxation of input controls (i.e. allowing fishing during darkness), together with the use of GPS in conjunction with chart plotters (the fishermen are able to plot their tows precisely in conjunction with an updated, graphical database) a profitable return is still obtained.

The history of the Foveaux Strait oyster beds from the perspective of the fishermen is a story of the serial depletion of all the Foveaux Strait oyster fishing grounds. It has been possible, through interviews, to compile a map of oyster beds as they were known historically by the fishermen (see *Figure 3.6*). Though most of the beds shown in *Figure 3.6* were known to fishermen from very early in the fishery's history the fishing effort tended to concentrate on local areas with particular beds favoured during particular periods. However, fishing strategy was always the same; the beds were dredged until the catch rate became uneconomic. Cranfield describes the fishing of the oyster bed known to

the fishermen as Dee Street (so called because, 'it was as busy as Invercargill's main street—Dee St. on a Friday night'):

> In 1978, the fleet focused fishing on a newly exploited medium sized oyster bed south of bluff Hill that became termed 'D' Street. Fishers found that this bed consisted of alternating trips of epifauna with dense oysters and strips without oysters. A side-scan sonar traverse of part of this bed in 1978, before this local heavy exploitation began, found that the seafloor consisted of alternating strips of epifaunal reefs that ranged from 80 to 100 m in width and strips of sandy substrata that ranged from 80 to 500 m in width. … In the following 5 years most of the 23 vessels regularly concentrated exploiting this area, first removing most of the epifaunal reefs and then most of the oysters from this bed (fisher's observations). The oyster catch from this bed can be isolated from catch statistics and shows the progressive increase in oyster catch during this process followed by the commercial extinction of oysters in this area by 1983. (J Cranfield, Michael, & Doonan, 1999)

Throughout the Foveaux Strait, the beds were worked to commercial extinction one patch at a time. Natural variations in productivity tended to obscure this process. Fishermen might leave an area and return to find it more productive than when they left it. But despite these local variations, the overall pattern is that, between 1970 and 2000, all of the Foveaux Strait oyster beds shown in *Figure 3.6* were fished to a level from which the fishermen fear there will be no recovery (Interview data).

3.1.7 Community mapping of the Foveaux Strait Oyster Beds

Naming of the Foveaux Strait oyster beds is an exercise in community mapping that helps develop understanding of the Bluff fishermens' knowledge. In 2006, sixteen Bluff fishermen took part in a mapping project aimed at discovering the history of the fishery from the perspective of fishermen see (Hall, Moore, Knight, & Hankey, 2008). A map showing the fishermens' names for the oyster beds of Foveaux Strait appears as *Figure 3.6*. The map showing the fishermens' names for the beds is used here, not to identify patches or indicate the size of fishery, but rather as background for understanding the stories the fishermen tell about the way the fishery has been exploited and about the destruction of once-rich oyster beds.

The named beds are not meant as spatial directions to where oysters may be caught. Oysters occur in very localized 'patches' within the larger areas of the beds, with large

areas of barren ground between. Actual oyster bearing areas are only a small fraction of the symbolized areas shown on the map. Cranfield estimated in the 1970s that only approximately 12 sq km of the more than 1000 sq km of Foveaux Strait was actual oyster bearing ground (H. J. Cranfield, Michael, & Doonan, 1995). *Figure 3.5* is a map compiled from survey information showing the very limited areas within the larger areas of the beds where the oysters were located. To find the rich patches was the principle skill of the oyster skippers and it was information very carefully guarded and passed down through generations of oyster fishermen.

Naming of the oyster beds of Foveaux Strait is important in asserting the paradigm of fishermens' knowledge. The oyster beds of Foveaux Strait have always been known by name among the fishermen. Until the surveys of Stead in the 1960s at which time statistical areas were introduced, scientists also used the fishermens' names to describe the oyster beds. *Figure 3.1* and *Figure 3.2* show the oyster beds of Foveaux Strait as surveyed and named by Hunter in 1906, and by Young in 1926-27 respectively. The survey of oyster bearing areas by Stead (1960-1964) is shown in *Figure 3.3.* Figure 3.6 is a map compiled by Hall *et. al.* from fishermens' knowledge in 2006. These maps help demonstrate that the main oyster beds of Foveaux Strait have long been known by fishermen; in fact, almost all of the main oyster beds were known to fishermen as early as 1920. Fishermen in Bluff are adamant that all the oyster beds of Foveaux Strait have been discovered long ago, and that there are no oysters anywhere in Foveaux Strait but in these known locations.

Knowledge of the location of the main beds by fishermen should be 'read' in conjunction with the fishermens' description of their 'patches' or 'tows' within the general area of the oyster beds. These are the areas where oysters were once found in abundance. Fishermen describe the patches or tows as strips in between which there was barren ground. The fishermens' descriptions are supported by scientific surveys. In the 1970s J. H. Cranfield was able to compare the fishermens' description of oyster patches to evidence from direct observation, i.e.: diving, underwater camera, and side scan sonar, see (Cranfield *et. al.*1999). Why the oysters should breed and live only on the isolated strips described by fishermen is not known, though Cranfield has suggested a connection with the existence of helical circulation patterns in the water column (Cranfield *et. al.* 2003).

Two points are important to following the fishermens' understanding. The first is the discreet location of the oyster patches and the second is that the fishermen knew where virtually all the oysters patches in Foveaux Strait were located. What the fishermen didn't know (until they visited them) was exactly what the expected catch rates might be on the different beds, and the various patches within those beds. One of the uses of the scientific oyster surveys, which have been regularly performed on annual or bi-annual basis since the fishery closure in 1992, has been to indicate to fishermen what the catch rates might be on the beds with which they are already intimately familiar.

3.1.8 The 1970s—decline and signs of overfishing

Twelve years after A Bed was closed in 1964 it was found that the bed only contained from 5% to 10% of its original area (H C Robjohns, 1979). The 1970s were thus overshadowed by an awareness of decline in the Foveaux Strait oyster fishery. In 1971 the Bluff Oyster Merchants voiced fears that the total stock of oysters was being depleted (Merchants, 1971). The oyster industry reacted to the decline by intensifying fishing effort. The introduction of much heavier, double-bit, dredges as well as more precise positioning technology (i.e. radar), caused a rapid, but short-term increase in catch rates (J Cranfield, Michael, Vignaux, & Roderique, 1996). Catch rates are measured by a statistic called catch per unit effort (CUPE). This statistic is used to compare productivity of the fishery over lengthy periods and to account for changing circumstances that might not be apparent if only the total catch is considered. The catch effort statistic has a corollary in the mean catch rate traditionally used by the fishermen to govern their fishing movements.

A number of conservation-type practices were introduced but failed. For example, efforts by government authority to spread the fishing fleet—to keep the boats off the highly exploited beds—resulted in compliance problems, with fishermen breaking regulations. A fisheries officer named J. Clausen wrote the following verses to describe the problem circa 1973:

The oyster season has now past
Gone for a time the days of graft
When some poor guy sat up the mast
Watching 'or the Straits so vast

The patrol boat is upon his mind
For poaching was the act defined
With winches all set up to 'grind'

To get caught - that is the crime

You didn't know from whence we'd come
Out from the land, or down the sun
But come we did - to quote a pun
Just like the old proverbial 'Hun'

Those lines that are drawn upon the chart
Are not some mystic work of art
Each sector is there to play a part
To help the Beds and save the Heart

Across these lines the boats do creep
A richer harvest for to reap?
Or is it just they can't resist a peep
Where there's a line it must be breached

The boats they scatter far and wide
Slow ones say "we blame the tide "
Never to be said an oysterman lied
Such upright guys have naught to hide

But caught they are upon these Beds
Their excuse could have been guessed ahead
"I've lost a dredge " the skipper said
Not "hungry mouths that must be fed "

At night the boats return to port
With the fruit of labours they have sort
Some crews for sure have worked a raught
And hope like hell they won't be caught

There's no delight and that's for sure
As from emptied sacks the oyster pour
Onto the deck to be done once more
And reculched till the hands are raw

The season closes for six months
When its other fish the lads do hunt
Which gives the time which does not blunt
The edge to pull some other stunt

Now when the season opens up this year
And the boats do take aboard their gear
Lets make harsh words and reculches rare
So come on lads - LETS PLAY IT FAIR

Clausen's verses capture aspects of the fishery that are otherwise undocumented. Clausen implies a dishonest and undisciplined fleet that made for considerable trouble in enforcing the rules. The fact that the oyster fishermen are addressed in the verses like naughty schoolboys could mean that the management system had the character of a rigid and essentially oppressive control from above (i.e. fishermen had no real responsibility and therefore did not act responsibly). It could also mean that the rules were too restrictive or misconceived, and hence were being intentionally broken. Or it could mean that the fishermen/industry were selfishly breaking the rules to increase profits at the expense of the fishery.

The management measures advocated by the owners, and acquiesced to by the fishermen, during the 1970s led to overfishing rather than conservation. New regulations promoted a form of rotational fishing, but protected, and even increased, in some cases, the 115,000-sack quota. Attempts to spread the fishing effort had the adverse effect of concentrating effort in particular locations. An incentive to comply with the regulations took the form of allowing the fleet to catch oysters over and above the quota limits as long as they came from the boundary areas. What looked like a good idea on paper, that of forcing the fleet to prospect in the large boundary areas, outside the central or 'designated' beds (for boundary areas see areas H, K and L in *Figure 3.3*), ignored the fact that there were few oysters in these boundary areas. Those that did exist in commercial quantities were located in small, already discovered, beds. The viewpoint of the older fishermen—who were well aware of the limited beds in H area—was that oyster larvae from the patches in H area would drift down the Strait with the prevailing weather and current thereby seeding the central beds. They felt that the H area beds ought to be left alone; instead these beds took the full brunt of the fishing effort (Murray Black, interview data; see also *Fig 4.1* showing the oyster fleet concentrated on a small oyster bed in H Area).

3.1.9 The 1980s and the Outbreak of disease in the Foveaux Strait oyster beds

The 1980s were a time of increasing awareness of eco-systemic change, and continued demise in the oyster stocks. A fisherman explains 'I used to bring my wife home beautifully coloured fan shells and sea horses, but by the mid-eighties these were no longer coming up in the tows ' (Interview data). Cranfield has mapped the disappearance of the original oyster habitat, and states that by the early 80s this habitat was present only on the periphery of the oyster beds in southern and western Foveaux Strait (J Cranfield, Michael,

& Doonan, 1999). In a letter to the Oyster Boat Owners Association in 1984, Newman, an oyster industry boat owner, tried to draw attention to the declining catch rate. He advanced the argument that the Foveaux Strait oyster fishery had passed the limit of sustainable fishing and that an even sharper decline might be expected (Newman, 1984).

In 1986 ravages by a disease caused by the parasite *Bonamia sp*. changed the face of the fishery. Because the disease doers not affect humans, oysters could continue to be landed, but where once there had been rich beds of oysters there were now only empty shells (called 'clocks' in the fishery)—the dead oysters having released their valves and perished. The disease was first discovered in the western part of Foveaux Strait and was observed to progress at a rate of three nautical miles a year from west to east. By 1990 the entire Strait had been affected by the wave of disease. The government responded to the outbreak by closing the oyster season on July 26th 1986 (slightly early for the season) and committing resources to for a survey to monitor the disease in succeeding years. Fisheries scientists of the National Institute of Water and Atmosphere (NIWA) were to make a large contribution to the fishery through their investigations of the disease (H. J. Cranfield, Doonan, & Michael, 1991).

The oyster disease known colloquially as *Bonamia* (after the French scientist Bon Amie who discovered it) is now considered to be endemic to the Foveaux Strait, meaning that it is thought to have always been present in the fishery rather than introduced from outside sources. Oyster samples frozen in the 1960s have been examined and *Bonamia* diagnosed in retrospect. Fishermens' historical accounts tell of isolated poor seasons which are now linked to *Bonamia*. Despite very high mortality from the disease, the fishery had traditionally recovered rapidly and outbreaks of the disease were relatively rare, only one or two epizootics inferred from fishermens' data in the first half of the 20th Century. However, outbreaks of the disease have increased in frequency in the past twenty years to the point where the disease is almost continually present. Cranfield, supported in his position by fishermen, has suggested a link between increased prevalence of *Bonamia* and the elimination of the rich bio-chemical environment produced by epifaunal reefs. His arguments are based on a geographic analysis of disease outbreak and prevalence mapped against the geographic distribution of the environmentally deteriorating oyster beds (J Cranfield, Michael, & Doonan, 1999).

3.1.10 Fishery closure—fishery contraction

The Bluff oyster fishery was closed in 1993, and remained so in 1994 and 1995 (see, *Sec 4.1.1.3*). When the oyster fishery reopened in 1996 there were fewer boats and fewer fishermen than previously. Contraction in the industry was the result of three years of closed seasons followed by a much-reduced quota in 1996. The fishermen were the largest group to lose their jobs, but some consolidation of quota also took place among the owners. At least one owner left the industry after settling with the Government over Maori claims. There were 23 vessels in the fishery in 1996; 15 in 1997, and 12 in 2002. Some owners felt that smaller numbers meant more management control, and hence better results (F. I. Board, 1996). From an administrative perspective, involvement by fewer numbers would make it simpler to empower the remaining for the purpoe of management. With reduction in numbers of owners and fishermen came a contraction of range in opinion. According to Murray Black, ‘ a lot were responsible [to environmental considerations in the fishery] a lot were not; it was the ones who were not responsible that have been kept on.’

3.2 Social History of he Bluff Oyster Fishery

The present-day fishermen have their origin as a group in the sailors and fishermen that manned the oyster cutters of the 19th Century. Their coherence as a group over the years has been aided by a division of labour enhanced by the profitability and stability of the fishery. Fishermen felt well recompensed for their labour, and often remained with the same boats and crews for many years, some for a lifetime. Concentrations of oysters may have varied from year to year, but skippers had their known patches and fishing consisted of applying a hard physical effort in a familiar manner for a known reward. The Bluff fishermen therefore have something in common with industrial workers in their group solidarity and security of employment—as opposed to trawling, for example, where the labour force is more fluid. Deckhands had the task of emptying the dredges, separating the catch, and managing the deck cargo; engineers and cooks were needed; and the location of the oyster beds and the technique of dredging became the lore of the oyster skippers. Some of this lore has been passed down through generations of oyster fishermen, and old charts

and notebooks detailing the ‘tows’ of the early skippers were traditionally treated with great respect.

The Bluff oyster fishery is unlike most other fisheries in that it has a long history of industrial organization of its labour force. Because the fishery was profitable and stable for many decades, oyster Fishermen developed a society and a culture which is perhaps unique to this fishery. The Fishermen were content to let the oyster Merchants provide the physical plant (boats and factories), and to pay their wages, while they retained knowledge of the oyster beds, and the ways of fishermen. The Oystermen’s Union was, from the beginnings of the documentary record in 1970, an active and important force in managing the fishery. The socio-political rivalry between the Merchants and the Fishermen was an important characteristic of the fishery. The relationship was occasionally confrontational but often mutually respectful and cooperative.

The boundary between fishermen and owners is not rigid. Both the owners and the fishermen have had a continuous and intimate relationship throughout the history of the fishery. There are owners that have come up through the industry, ‘practical men’ who have, ‘done the hard yards’, and there are owners who still skipper oyster vessels. On the other hand, several of the owners are now second generation onshore managers and are chided by the fishermen as, ‘never having had salt water in their gum boots!’ Because of the present management system based upon individual transferable quota, some owners are today even further removed from Bluff and from the sea; the fishermen often scorn these ‘absentee landlords’. Divisions within the fishery are not limited to class differences. Within the ranks of the fishermen there are some who support the status quo, believing that fishing should continue, and there are others who believe that the oyster beds are being systematically overfished at the expense of any hope for the future of the fishery. These differences are deeply felt in the town of Bluff.

3.2.1 Bluff Oystercatchers’ Union

The oyster fishermen are employees of the oyster companies. The companies own and are responsible for maintaining the boats, while the oyster skippers manage the vessels and employment of the crews. The skipper also determines the location of his fishing effort, and the oyster catching technique. Skippers, engineers, deckhands and bed hands (those responsible for unloading the oysters from the boats) have for many years been organized under the Oyster Catchers Union, a branch of the New Zealand Seafarers’ Union. The

Union's primary activity was to negotiate with the owners over wages prior to the opening of the oyster season each year. Meetings of the Union were held at the rugby club, or the Returned Servicemen's Association, and the Union has always retained an executive and a secretary. Union correspondence forms an important contribution to this research, and while union influence has very much diminished in recent years, the form and the personnel of the organization continue to serve the Bluff fishermen (Murray Black, interview data).

Relations between the owners and the fishermen were testy, but straightforward in the 1960s and 1970s. Boats were often tied to the wharf during the first week of the oyster season in industrial action as the Union negotiated a share of the profits for the fishermen. 'If words were spoken they were quickly forgotten ', says Murray Black, an oyster boat skipper since 1972 and former chairman of the Oyster Catchers Union. Murray felt that, the older generation of owners understood the fishermen, that many were returned servicemen, and therefore honourable, practical men. Murray now feels that the traditional relationship between owners and fishermen is gone; owners are seen as protecting their own interests and as having betrayed the fishermen. Murray cites the *Southern Enterprise* dispute as an example. In 1969, there was an attempt to enter an additional fishing vessel, the *Southern Enterprise,* to the fishery. Fishermen halted work in protest at this incursion into what was clearly understood in Bluff as a limited fishery. In an approach that was officially denied, the boat owners informed the Union, *sotto voce,* that they were not able to take action, however, should the fishermen choose to do so the owners would 'See the fishermen right!' (MB, interview data).

The *Southern Enterprise* was blacklisted in the port of Bluff and the government was forced to negotiate. Eventually a deal was struck whereby the *Southern Enterprise* would be allowed to enter the fishery as the 23rd licensed vessel, but the number of boats would henceforth be capped at 23. The owner's interests were thus secured with the concurrence and support of the fishermen. But in the 1990s a new legal regime relating to the Quota Management System, and the Employment Contracts Act, placed the fishermen in a vulnerable position with respect to the owners; many fishermen lost their livelihoods, and this was felt as a bitter betrayal by many fishermen (Murray Black, interview data).

One problem encountered during this research was that a number of the currently fishing oyster skippers were cautious in voicing their opinions. Fishermen can be ostracized for

saying the wrong things (i.e. things that might hurt each other's financial prospects). Because of the decline in the fishery there are fewer oyster boats operating and fewer jobs. The threat of unemployment is particularly real since the oystercatchers union has become ineffective. Merchants are able to choose whether or not to place their quota with a particular skipper or boat. If a fisherman causes trouble for a merchant, that owner can transfer quota to another boat putting the troublesome skipper and crew out of work. It is not simply fear of corporate reprisal that can affect a fisherman's views; fishermen will naturally want to protect their livelihood and income. Just as there is a division of opinion between fishermen and merchants over the causes of decline in the fishery, there is a division among fishermen as to what level of exploitation the fishery can sustain. This difference finds simple expression in a division between those who believe the fishery should be closed, and those who want the fishery to remain open. One supposes that it is the currently fishing skippers who want to keep the fishery open and those who have left the fishery—and consequently have nothing to lose—that would like to see the fishery closed, but this is not necessarily the case. Despite the tension, and the social and economic dangers surrounding them, some currently fishing skippers were willing to be interviewed. A number of these skippers believed that the fishery should be closed, though none would voluntarily stop fishing only to see themselves replaced on the vessels they used to operate by other less scrupulous skippers.

Group pressure to conform to a position that will strengthen the perceived economic advantages of a certain group, in this case the currently fishing skippers and their crews, is one factor affecting social relations in Bluff. Another characteristic of Bluff society is the social division between merchants and fishermen. Despite very serious blows to the organization and strength of labour in the Bluff oyster fishery, the traditional structure and means of distribution of wealth remain the same. Some fishermen claim that they are making more money in oystering than they ever have. The oyster merchants have maintained the profitability of the industry through price increases; the proportion of the total wealth accruing to owners remains high and perpetuates a marked distinction in wealth between the fishermen and merchants.

Ownership in the oyster industry has always meant ownership of boats, and shore facilities. The government issued licences or permits that allowed the owners to harvest oysters. As licences and boat quotas could not be transferred, all 23 vessels of the oyster

fleet needed to be kept in service; the situation produced a stable workforce in which the Oyster Catchers Union could thrive. Licences to catch oysters were not transferable, even between vessels belonging to the same company. This non-transferability of licences gave the fishery a very special character. Owners could never be sure that, if a licence holder passed away or if an oyster boat was lost at sea, the licence would not also be lost. The fleet became something of an anachronism as the licences were tied to gradually aging vessels. Though the licences created a right to harvest oysters, the right was strictly limited, and lacked many of the attributes we associate with property. Also, the power to issue licences was held by the Minister who had statutory authority to allow socio-economic considerations to affect their renewal. The owners needed to be inclusive and conservation minded in their management of the fishery if only to put on a good face vis-à-vis the Minister of Fisheries.

The Employment Contracts Act 1991 emasculated the power of the fishermens' union drastically by reducing the power of the fishermen as a united force in the industry, but it could not eliminate the individual power of workers, particularly such a skilled and independent group as the fishermen. If the people who own the quota had to catch it themselves—an often heard remonstrance in fishing circles—there might not be such a problem, but in the oyster fishery the quota owners have to rely on the fishermen to catch their quota. Under present circumstances the owners have some power of coercion over the fishermen—the threat of dismissal—but in working relations there are many ways in which workers also exercise power. It is only the fishermen that have the power to bring into effect, or not to bring into effect a plan for the fishery. In an era where a legal plan may be a requirement for management of the fishery, the goodwill and cooperation of the fishermen is still essential to the interests of the owners.

3.2.2 The Bluff Oyster fishing companies

The fishery schematics found in *Figure 5.1 — 5.3,* are useful for identifying the oyster companies involved in the Bluff oyster fishery. Each fishing vessel is connected in the diagrams to a particular oyster company (or group of companies). In this way a picture of the group identified in this thesis as the 'merchants' or 'owners' is created. Some companies have come and gone but there are some with long histories, and a number of families continue to be influential. A history of the Bluff Oyster Merchants would provide additional background and context for further understanding of the fishery. No

comprehensive history of the Bluff Oyster Merchants exists, though a brief account of political aspects of this side of the industry is available in Johnson's history of New Zealand fisheries (see Johnson 2004). The ownership structure of the oyster fishery has changed since the introduction of the Quota Management System in the mid-1990s. In addition to the traditional oyster companies who are owners of quota in the fishery, there are other quota owners to be considered. These background quota holders are similar in some ways to the private shareholders in the oyster companies of the past. Today oyster companies have consolidated their efforts and reduced their fleet; because of the much-reduced catches they are able to catch the quota for other owners. Some, but not all of the individual quota owners are shown on the fishery schematic diagram.

3.2.3 Social ramifications upon introduction of the Quota Management System

On May 4th 1998, the Southland Times reported an interview with Dick Ryan, an oyster fisher and spokesman for the Oyster Catchers and Bedhands section of the Seafarers' Union. Dick Ryan stated that:

> "More than 70 jobs have been lost since the introduction last year of individual transferable quotas." [Author's note: This was, in a later article, broken down into 40 fishing jobs, and 30 flow-on jobs.]
>
> "What hurt the most was people have lost their jobs without apology, counselling or redundancy payments … They've just been thrown on the scrap heap … There's a lot of anger in Bluff about this. People have been left in the cold with no help or advice … Some skippers with up to 30 years' experience have been told they were no longer needed, without so much as a thank you, never mind a gold watch."

The same newspaper article also carried news of the $6 million compensation package paid by the Government to oyster companies in order to secure a Maori share in the fishery. The settlement of Maori fishing rights is followed in the article by a stark contrast between the description of the fortunes of the fishermen, above, and those of the owners as a result of the settlement.

3.2.4 Maori involvement in the Bluff oyster fishery

In writing about the Maori side to the town of Bluff and its oyster fishery, one risks creating an impression of racial division that could be quite misleading. Bluff is different from many of the towns in the south of New Zealand that are dominated by the Pakeha, or New Zealand European culture (New Zealanders use the Maori word 'Pakeha' to refer to New Zealanders of European descent). Bluff is approximately 50% Maori by population, and Pakeha and Maori are well integrated across social classes (Coote 1994). Some Maori, as with Pakeha, are relatively recent arrivals in Bluff, coming to take advantage of the busy and independent economy that Bluff has enjoyed for many years. Others are descended from the indigenous inhabitants of the coasts and islands of Foveaux Strait, and have been involved in sea fisheries and oystering from the origins of these industries in the area. Historically, Maori from Bluff may have made up a majority of the workers in the oyster fishery.

Maori in Bluff have a strong traditional presence, and maintain a traditional ethos, particularly in terms of their economic relationship to kai moana (food from the sea). The Te Rau Aroha Marae, which is the meeting hall and spiritual centre of the local iwi (tribal grouping) is a beautifully built and maintained complex in the heart of Bluff. The Marae displays an astonishing level of artistry and wealth of cultural meaning that can deeply impress a visitor. The Bluff Maori runanga (local tribal council) have a particularly important role in contemporary fisheries management as customary fishers. Customary and recreational fishers are two of the officially recognized 'stakeholder' groups with whom the Ministry are obliged, under the Fisheries Act 1996, to consult on matters of fishery management.

3.2.4.1 The Maori Settlement

The introduction of the New Zealand Quota Management System at a national level in the offshore fisheries in the early 1990s led to affirmation by the Waitangi Tribunal of Maori fishing rights. And it was the ineluctable move of government toward institution of the Quota Management System that precipitated a settlement in 1992 between government and Maori. The Fisheries Settlement Act 1992 allotted Maori a 36% share of all offshore species quota, as well as a right to 20% of quota for all new species to be phased into the QMS in the future. When the government moved to introduce individual transferable

quotas to the Bluff oyster fishery in 1996 (prior to the fishery's formal induction into the QMS system), the Treaty of Waitangi Fisheries Commission stepped in, threatening litigation to secure the 20% Maori right. With fears that an oyster season might be stopped by injunction if the Maori claims were not settled, the government reached an agreement with the Bluff oyster companies. The owners would receive $6 million by relinquishing four boat licences which would pass to Maori. Thus the Ngai Tahu ki Awarua received, and fished oyster quota in the 1997 season.[4] The payout to the boat owners raised eyebrows at the time, (e.g. Southland Times 26-2-97, 'Labour says cost too high'), but only as to the amount of the compensation, rather than the justice of paying off those who had already profited substantially from the industry. Fishermen, on the other hand thought that it was unfair that money was awarded to the owners with no compensation to fishermen particularly in light of the unemployment which was to follow introduction of the QMS (Interview data).

When the Treaty of Waitangi Fisheries Commission (Te Ohu Kai Moana) passed its 20% interest in the Bluff Oyster fishery to Ngai Tahu Fisheries Ltd, a new element of Maori business was created in the Bluff oyster industry. Within two years Ngai Tahu Fisheries had become aligned with the Bluff oyster companies (e.g. Southland Times 6-5-98, 'Barnes strikes oyster deal with Ngai Tahu') and had become part of the group known as the owners. There are therefore a range of Maori interests in the Bluff Oyster fishery from commercial, through customary to traditional. Furthermore, Ngai Tahu (the national leadership of the Ngai Tahu tribe, as distinct from its commercial fisheries interests, Ngai Tahu Fisheries Ltd) itself has played an important role in raising public awareness of the crisis in the Bluff Oyster fishery through its quarterly magazine *Te Karaka*.

3.2.4.2 Two Maori kaumatua

Bubba Thomson and Tiny Metzger are two Maori elders that have consented to be named and have their positions presented in this thesis. Bubba Thompson attended a meeting at the Bluff Marae in March 2005 where he spoke of the critical state of the fishery and the need to change current practices. This was done in the face of a powerful professional presentation by NIWA scientist Keith Michael in which continued exploitation of the fishery was advocated (Te Rau Aroha Marae, March 27th, 2004). It is particularly courageous for Bubba to be vocal in his opposition to current management of the oyster

[4] Ngai Tahu is the tribal name for all Maori of South Island, New Zealand; Awarua is the name of the local Bluff runanga, or tribal council.

fishery because in his words the oyster fishery is a *tapu*, or forbidden subject in much of the Maori community in Bluff because of the ownership of oyster quota and an oyster vessel by the local *runanga*. The position of Bubba and Tiny with regard to the oyster fishery is identical with that of the conservation-minded fishermen as it is presented in the *Results* section of this thesis. In short, they identify a serious crisis in the fishery caused by overfishing and environmental destruction.

Tiny Metzger, so named, no doubt, after his size, remains tall and strait despite his more than 70 years, and possesses the iron grip of so many of the Bluff fishermen. Tiny was not an oyster fisherman by trade, his skills as shipwright were however often called for in the oyster industry, and Tiny is an integral and accepted member of the Bluff fishing community. Like many of the elder fishermen of Bluff, Tiny's house is shipshape, comfortable, near the sea and full of the light from the full skies of a seaside village.

Tiny quips that of all the fishermen in Bluff there were only two that weren't Maori. He was brought up by his grandparents, and was thus the recipient of all the knowledge and practice that is often impossible to pass directly to one's children. He learned young that one sought information on the Kai Moana (food from the sea) from the Kaitiaki, the people that knew the fishery in that area. He learned, for example that the Whitebait should be taken as soon as they arrived in the rivers, and to stop the fishery as soon as the fish became 'gutty', an indication that the fish were ready to spawn.

"Our people lived for so long", says Tiny, " … and the sea was the main source of food."

Tiny is a practical man; I would normally find him on his feet in coveralls, in between jobs, near tools. The last time I visited there was a traditional Maori inflatable boat (inflated with seaweed sacks) being built on the front lawn. Hanging from the wall of the garage were traditional baskets made from flax and containing the airtight seaweed bladders in which *Titi* (muttonbirds—Sooty Shearwaters) are preserved, Tiny's family one of the last practising the traditional ways of the seabird fishery.

Tiny's immense practical knowledge, and his many services to the community have been recognized formally through civic honours awarded by the New Zealand Government; he is a dedicated and active member of the Awarau runanga, and is always busy with friends and family. When asked to participate in the Bluff Oyster Fishing Forum, a group of elder Bluff oyster fishermen concerned about the state of the fishery, he agreed immediately.

No one is able to describe the absurdity of remote government management of a local fishery with more incisive humour than Tiny. “The whole system is a lie to all we were taught from the cradle, it is so stupid! … Everything that the Ministry has touched goes against everything … and they are so right!” “ Not long ago the Government put in place legislation whereby Councils and agencies must consult with Maori. Instead of consultation, people from MFish come and tell us what they are going to do.” Tiny describes problems in the management of both Paua (Abalone) and seals. Tiny believes the seal population should be reduced on the basis of a knowledge of the amount of food present in the local system. A national Marine Mammals Protection Act, however, is not capable of the flexibility needed to cope with a wide range of different ecological situations. According to Tiny, in Maori times various individuals had responsibilities for certain paua beds. An individual gains intimate knowledge of those beds, knowing intuitively how much to take. The national Quota Management System, however, is not capable of the level of sophistication needed to manage Paua beds by allowing individuals exclusive responsibilities at the largest of scales. “The trouble with a government agency is that by the time they identify a problem, it’s too late.”

In working around the oyster fleet Tiny recalls the lighter dredges used prior to the 1970s. Tiny had repaired the cotton bags on these dredges. He is among those alarmed at the environmental effects of the heavier dredges with a double bit and three times the weight of the older dredges. “There was a hill on the bottom of the sea out from Bird Island, you could see the sea mounting up over the rise. But something happened. Ray Hardwick [an oyster skipper] said yes we took the harrows and flattened that out!”. “[The new dredges] … are mini bulldozers. If you keep dredging into those hills you’re going to level the whole thing out.”

On the current management of the Bluff Oyster fishery Tiny echoed the same message given by so many of the Bluff fishermen, “The Owners have an investment and they want a return. … Its absolutely hopeless, they will take the last!”

4 History of fishery management

The management of the Bluff Oyster fishery has depended through the course of its history on a combination of three things: the traditional environmental knowledge of the Bluff fishermen; a significant scientific contribution in the form of surveys and biological investigation from the government's Marine Department (later the Ministry of Agriculture and Fisheries, and today the Ministry of Fisheries), and the power of government to regulate the fishery. Changes in legislation were the result of recommendations by the Chief Fisheries Officer (today the Minister), who was informed by: the fisheries scientific establishment; working groups within government, and through public dissemination of information including information from the fishermen themselves. Invercargill's newspaper the Southland Times has long covered the oyster fishery often with a sensitivity to the views of local fishermen.

Oystering in Foveaux Strait was from very early on a controlled fishery in the legal sense of the word. The Oyster Fisheries Act 1866 established a licensing system and for almost a century oyster boat numbers were kept between five and twelve boats. The danger of overfishing (exhausting the oyster beds through over-exploitation) was understood through the experiences of the rapid destruction of the Stewart Island beds in the latter 19th century (Cranfield, 1975; J Cranfield, Michael, & Doonan, 1999). Conservation measures introduced in the early 20th century included the licensing system; a minimum size restriction for legally harvestable oysters of one and three quarter inches established in 1905, and an official survey of the fishing grounds in 1906 (H C Robjohns, 1979).

4.1 The modern era—management post-1960

In 1963 the government de-licensed the oyster fishery. There is some indication that de-licensing stemmed from government concern with the monopoly on oysters held by the wealthy oyster companies. Political pressure from those wanting to enter the lucrative fishery may have also influenced the decision. Most probably, however, the Bluff oyster

fishery was included with a general government policy of the day that aimed to stimulate the fishing industry through the lifting of previously restrictive policies (Page, 1994; Riley, 1980). This broad-brush application of a national policy without due regard for the particular circumstances was to occur again in 1997 when the Foveaux Strait oyster fishery was brought into the quota management system (QMS). As a result of de-licensing the oyster fleet doubled over the years 1963-1969 reaching a high of 23 vessels (which number became the limit after the *Southern Enterprise* affair—*cf* Sec 3.1.9). The late Bill Robjohns, oyster boat owner and oyster historian, a man credited with immense local knowledge of the oyster industry, called de-licensing the biggest mistake in the history of management of the fishery (Chapple, 1990). What little conservation was being achieved in the fishery through the licensing of vessels ceased to exist. A government imposed quota of 170,000 sacks a year prevailed during the 1960s, but in retrospect, many considered this figure too high; the actual catch of the fishing fleet never reached the quota. This meant that during the 1960s there was no effective limit on the number of oysters caught.

The early 1960s saw a renewal of scientific interest in the Bluff oyster fishery and the publication of a series of Fisheries Technical Reports of which those authored by D. H. Stead of the Marine Department are notable (D. H. Stead, 1971). Stead's reports were based on extensive surveys and provided a technical and scientific literature that served as a basis for government management (i.e. quota setting) in the fishery. Quota is set by the government based on estimates of the oyster population, and a model of the fishery that projects that population into the future. However, scientists are not always right and fishermen sometimes voice alternative views. In a counterpoint dialogue critical of Stead's reports, fishermen and owners made a lengthy submission to the 1970 Parliamentary Select Committee on Fishing (Merchants, 1970). The conservative (i.e. conservation-minded) tone of this submission and the unity that allowed fishermen and owners to speak out together was obviously influential. Quota in the early seventies was reduced by at least a third of the annual take of the 1960s, and by the late seventies, with increasing scientific corroboration and justification, quota was set at 115,000 sacks a season. The 115,000-sack quota made for an even figure of 5000 sacks for each of the 23 oyster boats in the fishery.

Figure 4.1— Photographs showing the Bluff oyster fishing fleet off the Bishop Islands between Black Rock and Ruggedy Passage, in 1992. The photos are indicative of the intensity of exploitation that has resulted in the serial depletion of all the Foveaux Strait oyster beds (Source: Fishermens' records).

4.2 The Foveaux Strait Oyster Advisory Committee

The Foveaux Strait Oyster Advisory Committee (FSOAC) originated in discussions of the Fishing Industry Board in 1969/70. The desire was to form a committee that might, '…keep the Board informed of conditions and problems at Bluff and to use the Fishing Industry Board as liaison between sectors of the industry, the industry and the Minister, and the Marine Department'. The owners (known also as the merchants) saw the special committee, ' … as a non-voting forum at which any grievances of sections of the industry may be aired' (Merchants, 1970). FSOAC was established as a subsidiary organ of the Fishing Industry Board; it drew two representatives from the owners; two from the fishermen; two from the oyster openers, and four from oyster retailers. Representatives of the then Marine Department, as well as several scientists, and representatives of the Fishing Industry Board also attended meetings of FSOAC. The forum was approved by the 1970/71 Select Committee inquiry into the fishing industry, and the report of the Select Committee urged the Department and the industry to use FSOAC to the full (Campbell, 1979).

In 1979, after almost a decade of experience, the owners, in a submission to the Fisheries Policy Committee of the Fishing Industry Board, highly recommended FSOAC and held it to be a good example of co-operative fisheries management. The submission listed numerous advantages of co-operative fisheries management including, '… the preservation and increase of knowledge and experience in the industry through the more settled and generally more harmonious atmosphere within industry and between industry and Ministry' (Campbell, 1979). While the management of the Bluff oyster fishery had always been a top down, government affair, the FSOAC displayed an important co-operative and inclusive side to this management. Until the advent of the Nelson Scallop Management Board in the late eighties, FSOAC enjoyed a reputation as the top fisheries management grouping in the country (Murray Black, Interview data).

4.3 Management 1990-1993

The first three years of the last decade of the 20th century were the beginning of a highly stressful period in the management of the Bluff oyster fishery. Disease was continuing to run its course, and with an attrition rate up to 90 percent of oysters in some areas, the oyster population was in critical decline. Cranfield showed that by 1992 oyster stocks in the Foveaux Strait may have been below 10% of virgin biomass (Doonan, Cranfield, & Michail, 1994). Fishermen were staunch advocates of conservation measures during this period arguing for lower quotas at meetings of FSOAC in marked contrast to the perennially optimistic owners (N. Z. F. I. Board, 1992a, 1992b). The management of the fishery came to be characterised by conflicting views of quota limits communicated to the Minister by the meetings of FSOAC. The Minister would take note of the FSOAC resolutions together with advice from the Chair of the Fishing Industry Board (FIB), consolidate them with the recommendations of the Ministry working groups and set the quota. The fishermen were helped to some extent by the Chair of the FIB who attended meetings of FSOAC and who, according to Murray Black, was able also to inform the Minister about the nature of the conflicts at the meetings that did not always appear in the record (Murray Black, interview data.).

One contentious issue highlighted in the 1991 season was that of extra quota. The extra quota of 400 sacks for each vessel was to be taken only once the regular quota had been met, and was to be fished from a so-called firebreak area central to the oyster fishing grounds. The Ministry's theory of a firebreak reducing the spread of disease was ridiculed by the fishermen who believed the extra quota was an outright concession to political pressure by the owners for a larger quota. The fishermen believed that the disease had already passed the firebreak area, and were very concerned that any additional quota would only further reduce the already depleted and fragile central beds. The beginning of the season had been delayed for a month due to industrial action and the owners found themselves running out of time to catch the additional 400 sacks. In a move that was contested by the fishermen, the owners applied to the Minister for an extension of the season. The Minister denied the extension and the season closed without the extra quota having been taken.

The year 1992 was a particularly stressful season both for owners and fishermen as the Minister, the Honorable Mr. Kidd, had traveled to Mexico in the middle of the oyster season and was unavailable to help sort out the damage the Ministry had created through setting up of inappropriate regulations for the season. The regulations forced the fleet back into area H (the same bad policy that Clausen had attempted to enforce in the 1970s) where boats were once again over-exploiting limited areas. In an attempt to save the small beds in H area and to distribute the fishing effort, fishermen appealed to the Ministry of Fisheries to allow them back into the central beds. With the Minister not responding, the fishermen refused to fish; they tied their boats to the wharves and waited. During the lay-up by the fishermen, certain family run boats continued to fish, working every day they could. 'They were legally allowed to do so, but were morally wrong', Murray Black states, 'There are no oyster beds of significance in those areas [H area] now (Interview data)'.

4.4 The Bluff Oyster Planning Group—1994-1996

In 1993, after repeated surveys to monitor the progress of disease in the Foveaux Strait oysters, and fearing that as a result of disease the population of oysters had fallen below the critical minimum of virgin biomass, the government closed the Foveaux Strait oyster fishery. The fishery remained closed in 1994 and 1995 during which time surveys began to show that the disease caused by Bonamia had run its course, and that the oyster population had begun to increase. The Foveaux Strait Oyster Advisory Committee continued to meet during the period of the closure of the fishery, but with increasing dissatisfaction on the part of the owners who had begun to feel that they would be better served by dealing directly with the Minister, i.e. excluding the fishermen from discussions (Murray Black, Interview data).

At a FSOAC meeting in February 1994, a strategy was advanced of forming a small committee, or think-tank that would concentrate on a plan for the future management of the fishery. The suggestion was eagerly taken up by the Ministry—perhaps as a way of avoiding the fractious roles that had hardened within FSOAC—and in April 1994 the Bluff Oyster Planning Group (BOPG) had its first meeting. The BOPG was formed by specific invitation and represented boat owners, the Enhancement Company, and the fishermen.

The BOPG met frequently over the following two years; discussions at BOPG were wide-ranging, eclectic, and well-informed; ideas fell into place and by May 1995 a plan for the future of the fishery had been drafted (BOPG, 1995).

Under the heading, 'Measures to prevent depletion of the beds', the draft plan of the Bluff Oyster Planning Group put forward a number of thoughtful and advanced propositions. Accurately delineating and managing the beds through intimate knowledge of each was suggested. For example, it was thought that each bed might be individually assessed in terms of what it needed: e.g. return of shell; enhancement through deposit of spat; translocating; thinning or leaving fallow. Many other conservation strategies were tabled: such as the use of lighter dredges to protect the environment; daily catch limits; the use of mean catch rates to regulate exploitation of beds, and use of oyster numbers and green weight to avoid the uncertainties inherent in tallying by sacks. The draft plan also recognized the importance of group management dynamic in the health of the fishery. The plan promoted openness, communication, and community involvement. In a prescient statement the plan recognized that the ownership structure of the industry is inextricably linked to management, and yet it did not explore the issue through to any conclusions. Transferability of quota (i.e. the possibility of fishing more than one quota on a vessel and the ability to move quota between vessels) was approved.

The plan, or code of conduct as the fishermen sometimes referred to it, was widely discussed from 1994 to 1996 and appeared to receive industry acceptance and support. However, in 2003 after five years of management under the Quota Management System, when a prominent fisherman/owner was asked about the Bluff Oyster Group plan, he just shook his head; the plan had by then become a dead issue (Interview data). The principal movers of the plan were the first to lose their jobs in the fishery after the introduction of the Quota Management System (QMS), and those that remained tended not to be outspoken on conservation. It is very possible that the owners never had any more than a token interest in the plan, for after they consolidated their power through the political changes that occurred in the fishery in 1996 the idea of a code of practice based on conservation was effectively scuttled.

4.5 Introduction of the Quota Management System—1998

Before the introduction of the Quota Management System (QMS) the Bluff oyster fishery was regulated by a balance of power that was linked to institutions that had developed over a lengthy period (such as the 23-boat licence limit), and slowly evolving socio-political relationships. This all changed abruptly in April 1998 when the government brought the Bluff oyster fishery into the Quota Management System. This was accomplished by the Fisheries (Foveaux Strait) Dredge Oyster Fisher Amendment Act, 1998. The term QMS subsumes the institution of individual transferable quotas (ITQs). The Bluff oyster fishery had been managed for decades under a quota system (in fact the development of the QMS drew much from the Foveaux Strait example), and it was not quota management *per se* that so deeply affected the fishery. It was the creation of a new form of property right: the individual transferable quota that dispossessed the fishermen. The 1998 Amendment Act was also the instrument by which 20% of ITQ in the fishery were awarded to Maori interests. The institutions, or rules on which the balance of power in the Bluff oyster fishery was based, were replaced with new rules. These new institutions had little, if any, connection with local conditions or the sociology of the fishery. The new rules were supported by the owners, but opposed by many fishermen.

The first action by the owners after the introduction of ITQs was to concentrate their quota on only half the number of vessels. With the fleet thus reduced, half of the Bluff oyster fishermen lost their jobs. There was an old joke around the oyster fleet that if and when you had to retire from oystering, the only other job that might be available to an old oysterman was making tea in an engineering workshop. But even in Bluff where engineering shops are like pubs on every corner, there weren't enough jobs around. Many fishermen became dependent on social welfare to provide the necessities of life. While the decision to reduce the workforce may have been difficult for owners who were sympathetic to the fishermen, the advantages to the owner group were formidable. 'They must have had to pinch themselves every day to see if they were awake … ', Murray Black recalls. The owners were awarded millions of dollars by the government in oyster quota buy-outs needed to settle Maori claims, and they had property rights to the remaining fishery entrenched in perpetuity. A token management role still existed for fishermen; they would be welcome at meetings of the new Bluff Oyster Management Company (the

successor to the Enhancement Co.), but always under threat that their particular boat could be the next one to have its quota transferred. In other words any fisherman outspoken on matters of conservation might very well find himself without a boat and without a job.

4.6 Bluff Oyster Enhancement Company

The conflict between conservation and exploitation, as divisive as ever, had taken a new turn with the formation, by the owners, of the Bluff Oyster Enhancement Company. Intervention to enhance the breeding of oysters had been experimented with as early as 1970 when shell return experiments were carried out in the Foveaux Strait. The idea behind these first experiments was to try to harness some of the larvae and pinhead-sized oysters that remained on the surfaces of the opened shell. The experiments were not successful due to the very high-energy environment in Foveaux Strait; the returned shell was quickly swept away or covered up. However, interest in enhancement is ever present in the fishery mainly due to the work, over decades, of an independent marine scientist named Bob Street. He has led several experiments in oyster breeding, and oyster seeding and tagging in Bluff Harbour and the Foveaux Strait, and enjoys a well-earned reputation and respect in the Bluff oystering community. The Bluff Oyster Enhancement Company, formed by the owners as a response to season closures, made use of the experience of Bob Street to initiate an enhancement programme. Wild oyster spawn was collected and used in seeding experiments within Bluff Harbour. The oysters needed for the programme were taken by special permit during the oyster spawning season (the summer months), with the dual purpose of providing spawn, and providing a source of revenue for the programme. However, only a small fraction of the oysters caught for the programme contained spawn, the majority found their value in being sold by the owners.

Made up exclusively of the group known as the owners (the owners of the Bluff oyster companies, oyster boats and oyster licences), the Bluff Oyster Enhancement Company had operated an out-of-season oyster fishery by special permit during the oyster closure from 1993-1995 inclusive. Oyster enhancement involved the capture of a million oysters each year during the spawning season. The enhancement programme was a contentious point in Bluff because it removed 1 million oysters each season from the already endangered beds,

and because the owners were generating revenue from the fishery when the fishery was officially closed (by on-selling the oysters caught for enhancement purposes). The enhancement programme continued until the year 2000 (a special permit was denied by the government in 1999) and ceased after it became clear that enhancement would have to be funded by the companies without the income generated by special permit oyster sales. Criticism of the enhancement programme by the larger Bluff community was not directed at oyster enhancement *per se* which is seen as necessary in the fishery, but was directed at the Company for its failure to include representatives of the larger community in the project, or to produce and communicate the results from its experiments.

4.7 The Bluff Oyster Management Company Limited

The Bluff Oyster Management Company Limited (BOMCL) was formed in 1996-1997. The BOMCL had existed already for some years as the Bluff Oyster Enhancement Company (formed in 1992). As the change in name from enhancement to management implies, the BOMCL must have envisioned a greater role for itself in the management of the fishery. The fact that a leadership role for the BOMCL was not discussed in the Bluff Oyster Planning Groups's (BOPG) Draft Plan, indicates that the company's management role stemmed from its own initiative rather than that of the larger community. This would not have been possible without acceptance, even encouragement, of the BOMCL by the Ministry of Fisheries (MFish). The Ministry must have been cognizant of the fact that the BOMCL was poised to take over the role of the local management group, and that it would seek exclusivity in this respect. There is indication in the record that the BOMCL had penetrated the establishment (i.e. national) management structure through attendance at stock assessment meetings in Wellington, and had entered into the cost recovery initiative of MFish as early as July 1996.

In April 2003 at the beginning of the oyster season in Bluff there was a meeting of oyster boat skippers at the New Eagle Hotel in Bluff. The oyster skippers met out of concern for what some felt was a 'disaster' occurring in the fishery. There is no record of exactly what was said, or what took place at the meeting, but a flurry of newspaper articles around the date of the meetings provide some information (e.g. Southland Times, April 4th, 2003).

Many oystermen simply did not believe there were enough oysters left in the fishery to continue fishing, and a number chose this moment to end their involvement. David Skeggs, the then director of the Bluff Oyster Management Company (BOMC) under pressure of criticism for continuing to promote a business as usual attitude chose to deny the charges of the seriousness of the fishery slump (Southland Times, April 29th, 2003). The highly charged, crisis-management approach was a far cry from the orderly management under which the industry had operated in the past. It reflected a lack of management, and one can only suppose that whatever management meetings were taking place within the companies involved in the BOMC were not adequately addressing the fishermens' concerns.

4.8 Recent Management History

Management of the Bluff oyster fishery from 1996-2006 relied largely on the setting of quota by the Minister of Fisheries on advice from the Ministry's science providers. Meetings at which the information relevant to the setting of quota levels was discussed took place in the capital city of Wellington many hundreds of kilometres from Bluff and, while the meetings were technically 'public' and attended by representatives of the merchants, they were practically inaccessible to fishermen. There has never been an offer, for example, to allow fishermen reimbursement for the expense of attending at meetings.

In 2006, after a period of 10 years in which the fishery was managed by quota, but without any formal plan, the Ministry of Fisheries, (presumably to carry out its mandate to ensure a sustainable fishery), has formulated a plan for the Bluff oyster fishery (Ministry, 2006). A number of conservation-minded fishermen (many of them now retired) have objected that there was little input from fishermen in formulating this plan, that it was 'a done deal', simply reflecting the merchant's position (Interview data). Despite considerable media attention on the Bluff oyster fishery in 2006 including TV and radio news, front-page headlines, and magazine articles (Ansley, 2006; John Cranfield, 2007; McKinlay, 2006; Tipa, 2006), and the release of Katie McSweeny's documentary film, *Bluffed*, or perhaps because of this pressure, the Ministry of Fisheries has kept its fishery planning group

closed to input from the conservation-minded fishermen.[5] In official correspondence the Ministry asserts its openness and willingness to include conservation minded fishermen in planning for the fishery, but in practice the fishermen continue to be excluded (Anderton, 2007). The conservation-minded fishermen of Bluff lament the fact that there are no conservation measures being applied in the fishery. Fishermen who at one time were respected experts in a diverse and inclusive management group are now hapless outsiders, the unheeded voices of protest.

[5] Another film on the Bluff Oyster fishery, 'The Last Wild Oyster' by Bojun Bjorkman-Chiswell premiered at the San Francisco Ocean Film Festival in February 2008.

5 Government Surveys and Scientific Research

5.1 Early surveys

A review of the history of scientific surveys in the Foveaux Strait oyster fishery is given by (Sorensen, 1968). M.W. Young, the Biologist attached to the government's Marine Fisheries Investigation Station at Portobello, made a survey and produced a report during the years 1927-1929. Young stated that,

> … oysters were found at intervals in the Straits and in some places were in such quantity as to constitute beds of commercial importance which were known by **definite local names** [emphasis added]. … occasionally new patches are discovered, but they are generally of small area. (Sorensen 1968, p. 7)

Young made a number of recommendations regarding conservation, but it was not until the Sea Fisheries Investigation Committee (1937), of which Young was also a member, that his recommendations were partially implemented (Sorensen, 1968). Young's 1937 recommendations included closing the East and Ruapuke beds (see *Figure 3.2*). The East and Ruapuke beds were not closed, however, and it was not until 1963 that these beds were finally allowed to rest. It was presumed that the oyster beds would recover during closure, but ten years later it was observed that the beds in question covered only a twentieth part of their former area (Cranfield, 1975).

A survey in 1945 by Captain E. Watson is reviewed by (Sorensen 1968). No map of this survey exists but it is clear from the report that the focus of fishing activity at that time was on the East beds, and that there were concerns about overexploitation, and that " … our procedure to limit the annual catch is fully justified" (Sorensen 1968). Conservation measures at that time included restricting the oyster fleet to 12 vessels; a size restriction on takeable oysters; a minimum five-month hiatus from fishing during the summer months to protect the spawning oysters, and a 7,000 sack vessel quota. It is interesting to note in respect of quota that the quota for each boat exceeded by 2,000 sacks the 5,000 sack quota that was established *circa* 1970, and which was the norm in the industry during the 1970s

and 1980s. The 7,000 sack quota (which records indicate many of the vessels achieved) was caught with dredges which were much lighter than those used by the fleet after 1970, and without enabling navigation technologies. The fishing effort in terms of manpower must have been extraordinary, and the fishery itself rich by any measure. A final point noted by Sorensen in his review of Watson's survey was, '… that oysters are not to be found in Foveaux Strait in payable quantities apart from the known beds …', and that '… oyster grounds in Foveaux Strait were in fact limited to those areas already known …' (Sorensen 1968, p. 23).

5.2 D.H. Stead

During the 1960s a scientist named D.H. Stead was the lead scientist employed by the Marine Department and assigned to study the Bluff Oyster Fishery. In 1962 Stead estimated and recommended an annual take of 134 million oysters, or 170, 000 sacks (D.H. Stead, 1962). This figure was calculated as 10 *per cent* of the standing crop of takeable oysters as estimated by survey. Stead's estimate though subsequently criticized by fishermen as much higher than their experience suggested, was nevertheless politically fortuitous coming at a time when the fishery was being de-licensed. The oyster fleet never actually caught 170,000 sacks in a season, though they came close in 1967-68. A quota which is set above the fishing capacity of the fleet is obviously not a conservation measure and did nothing to address the serial depletion of the beds of which the earlier scientists had warned, and of which Stead was well aware (Stead 1971, p. 62). It took Stead until 1971 to publish his report based on the surveys of 1962-1964. Fishermen had criticized early versions of Stead's report paragraph by paragraph (Interview data), particularly with respect to his population estimates, and when the report appeared, the suggested quota (still calculated as a percentage of the population) was 125,550 sacks. The quota was further reduced over the next few years until it was pegged at 115,000 sacks which equated evenly to 5000 sacks for each vessel in the fishery.

The results of Stead's surveys are summarized in *Figures 3.3* and *3.4*. Stead sampled on a square mile grid, and his results were interpolated such that if oysters were caught anywhere in a square mile block they were mapped as occurring throughout that grid. One

might argue that this overestimation might be balanced by under-estimation of those grids where oysters were not found in abundance at the sample site. Nevertheless, given the discontinuous, discreet description of the patches known to fishermen, and given uncertainties in calculating the sample dredge catching efficiency, the final uncertainty of the population estimate is large. Stead's map (*Figure 3.3*) shows a commercial fishery area of approximately 100 sq nautical miles. Understanding the discontinuous distribution of patches of oysters, Stead reduced the extent of the fishery to 50 sq nautical miles to perform his calculations of stock size. Yet Cranfield, found in 1974-1975 that the area of the commercial fishery actually dredged during those years was only a tenth the size of Stead's conservatively reduced figure (see *Figure 3.5*). This implies that Stead's population estimates could have been incorrect by a factor of 10, which, in turn, fits with the fishermens' belief that, in many cases, 90% or more of the takeable oysters were being removed from the beds.

5.2.1 Statistical Areas

The maps showing the oyster beds identified by fishermen and scientists (Figures 3.1—3.6) may be compared with the map showing the division of the oyster fishery into the so-called 'statistical areas' (see *Figure 3.3*). The statistical areas, though modified from time to time, have been in existence since the 1960s. They are used by government in management of the fishery for both regulation of fishing effort, and to statistically assess the productivity of the fishery. Fishermen have been required for many years to report on the location and size of their daily catches *vis á vis* the statistical areas. This information is used to compile fishery statistics such as Catch Per Unit Effort (CPUE). Quotas were frequently set for groups of the statistical areas so as to spread fishing effort evenly over the entire fishery area (Cranfield 1996, p.4). The boundaries of the statistical areas were developed with prominent landmarks in mind with a view to easy identification of the areas within which fishing vessels might be located at sea.

The statistical areas have been purposefully de-stressed as an illustration of the oyster fishery in this thesis because they lead to a way of understanding the fishery which is at odds with that of the fishermen. Chapter 6 of this thesis presents an analysis of the Foveaux Strait oyster beds as a discreet phenomenon as opposed to a continuous one. It will be argued that viewing the fishery from the perspective of statistical areas leads to a continuous assessment, one which is at odds with the physical reality of the fishery. The

continuous view, is an abstraction associated with numerical quantification which has led some scientists to constructs that are diametrically opposed to the factual evidence of the senses. The fishermen ask, "If the oysters [that the scientists have quantified] are there, why aren't we catching them?"

5.3 J.H. Cranfield

Dr. John Cranfield was, (and remains in the view of the author), the leading figure of the science community throughout the modern history of the fishery. Cranfield was a government scientist until the privatization of fisheries science in New Zealand, and then a senior scientist with the National Institute of Water and Atmosphere (NIWA) until his retirement in 2004.

Cranfield began interviewing oyster fishermen in the 1960s. Throughout his career Cranfield collected historical, environmental, and other fishery related information from the Bluff fishermen. This he combined with the results of scientific surveys to provide a compelling picture of catastrophic modification of the Foveaux Strait seafloor environment as a result of 140 years of oyster dredging (J Cranfield, Manighetti, Michael, & Hill, 2003; J Cranfield, Michael, & Doonan, 1999). In examining the early history with a view to understanding changes in the seafloor habitat of the oyster, Cranfield notes that once the early oyster beds were depleted they were never again fished commercially, this despite the fact that they were fished relatively un-invasively by hand hauled dredges that were drifted by the tide. Cranfield notes that 100 years after commercial exploitation of the Port William and Half Moon Bay beds (see *Figure 3.1*) ceased, a survey by Stead encountered oysters only in small quantities.

In 1974-1975, Cranfield carried out the most comprehensive surveys yet undertaken with sampling techniques that allowed for a much higher spatial resolution of the oyster producing areas than was obtained in previous surveys (see *Figure 3.5*). The surveys were of a quality that has allowed his survey results to be combined with data from subsequent surveys in the 1990s to establish a 1970s baseline estimate of oyster populations. It was also possible for Cranfield, in more recent years, to estimate the virgin biomass of the fishery and the surviving percentage of this population at various times. Scientists

generally believe that fisheries populations will continue to reproduce (i.e. that there will be a sustainable fishery) as long as the fish population remains above 20% of the virgin biomass. Government figures showed an estimated oyster population of 1140 million in 1975 (Annala, Sullivan, O'Brien, Smith, & Varian, 2002). A quota of approximately 88 million meant an exploitation rate of around 8%. On paper, in the mid-seventies, the fishery looked in good shape, though subsequently there were concerns that even Cranfield (who was critical of Stead's overstimation of oyster bearing areas) may have overestimated the oyster population from his surveys in 1974-75 (Doonan, Cranfield, & Michail, 1994).

More revealing than absolute catch levels in the fishery are the statistics on catch effort. Fishermen have been required for many years to complete Catch Effort Landing Return forms which detail the size of their catches, the amount of time taken to make the catch and the area in which fishing has taken place. Analysing the Catch Per Unit Effort data in the 1990s, Cranfield makes the following observations,

> This interpretation of the Catch Per Unit Effort (CPUE) data suggests that the oyster population has declined steadily from 1975 to 1985 and the apparent increases in abundance merely reflect impact of technological improvements in fishing.
>
> … The fact that such aids [GPS navigation] are required to day to maintain catch rates that 30 years ago were achieved by landmark navigation indicates that abundance of oyster has diminished substantially in this period.
>
> … it seems likely that the fishery is being exploited at much higher levels than management has appreciated. The could be the result of 1. The size of the population actually fished commercially is much smaller that that for which the yield is estimated, or 2. The sustainable exploitation rate used to estimate yield is not actually sustainable. ((J Cranfield, Michael, Vignaux, & Roderique, 1996)

In summary, the population models, estimates of maximum sustainable yield, and so forth used by scientists to set limits on the exploitation of the fishery could not be counted upon to describe the fishery with sufficient precision to prevent its decline. Though awareness of this limitation was growing in the 1990s, the idea that the fishery can be managed through the quantification and manipulation of certain numerical indices remains the basis of fishery management to this day.

5.3.1 Environmental Modification

The oyster beds of Foveaux Strait were originally found in conjunction with epifaunal reefs—a principal component of which is accumulation of the invertebrate bryozoa (Cranfield, 1999). Epifaunal reef is the scientific term for what the fishermen knew as mulloch. The position and extent of a sample of these reefs, obtained from sidescan sonar survey, correspond with fishermens' traditional descriptions of clearly demarcated and dense oyster beds separated by large areas of barren (of oysters) ground. The oyster beds appear lenticular in shape and are elongated in the direction of the tidal flow, i.e. in an east-west direction (Cranfield, 1979). Traditional knowledge put the most productive oystering locations adjacent to but not necessarily among the mulloch.

Cranfield mapped the progressive removal of all epifaunal reefs from the oyster beds of Foveaux Strait. He then became interested in what had happened to the crushed bryzoan corals that at one time formed the reefs. His findings were published in (J Cranfield, Manighetti, Michael, & Hill, 2003). Cranfield took core samples from the sand wave fields in the southwest of Foveaux Strait. He found that the the surficial deposits were mainly crushed bryozoa. The remains of the mulloch beds of Foveaux Strait, crushed and released into the water column, were washed away, and carried by the strong tidal currents until deposited on the sand wave fields of the southern Strait (*Figure 5.1*). What Cranfield describes is an enormous anthropogenic modification of, not only the benthic environment, but also the surficial sedimentology of Foveaux Strait. Cranfield's findings are shocking, but not at all inconsistent with the potential impact of a fleet of light bulldozers repeatedly covering the same ground over a period of many years. Reports from recreational divers and from scientists studying blue cod habitat confirm that the seafloor after commercial dredging is simply 'raked gravel' (Carbines, 2006). What is remarkable about Cranfield's findings is not the results, which admittedly raise uncomfortable questions of environmental responsibility, but the creative, and yet painstaking way in which science has been used to demonstrate the findings.

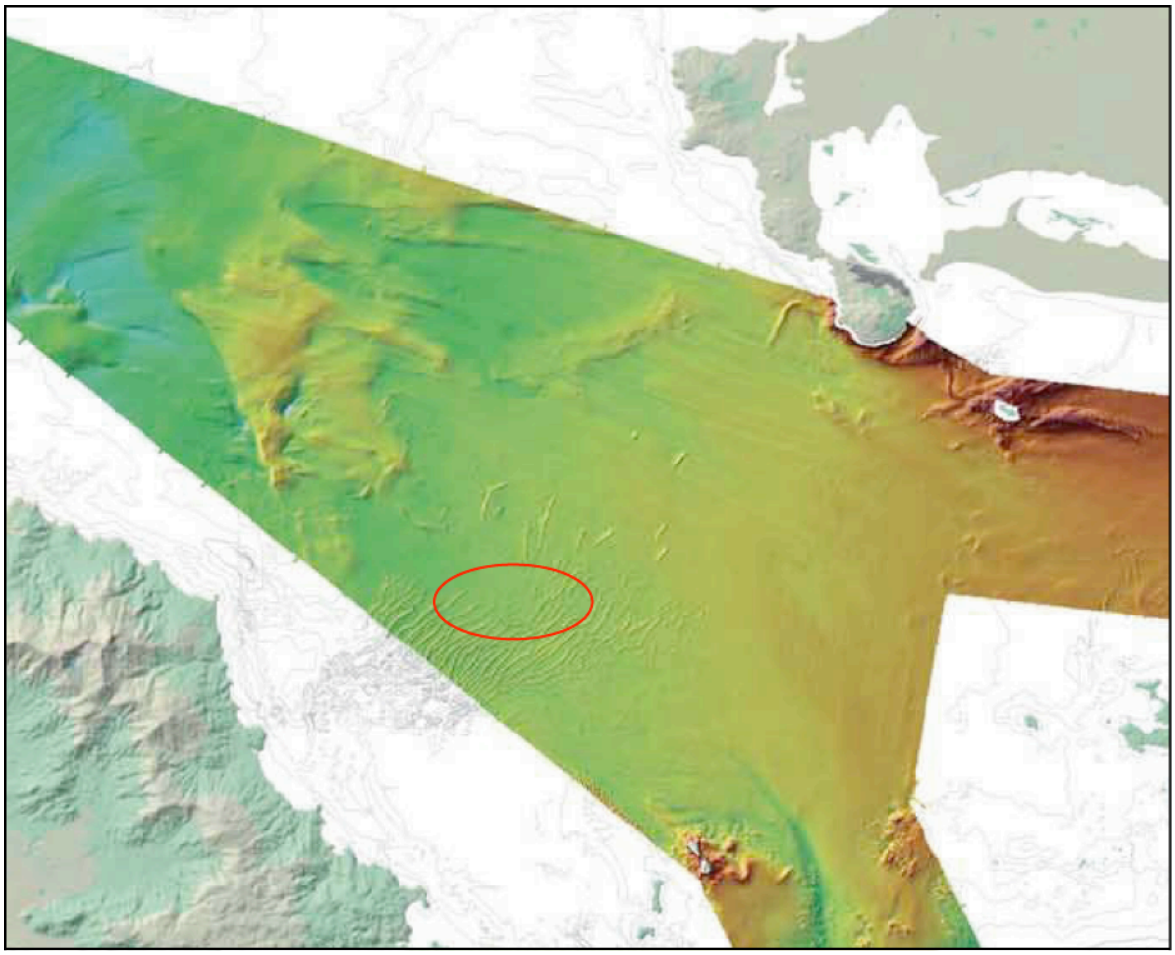


Figure 5.1—Map of swathe bathymetrey of Foveaux Strait. The area indicated is the sand wave field from which Cranfiled studied surficial deposits. See (Cranfield et.al. 2003). Source of illustration (Michael 2006).

5.4 K.P. Michael

After Cranfield's departure from the National Institute for Water and Atmosphere (NIWA), Keith Michael, who had been named in a number of Cranfield's papers and who had a lengthy involvement with the Bluff Oyster fishery, became the lead researcher on the Buff Oyster fishery for NIWA. Because NIWA are the preferred science provider for the Ministry of Fisheries, one could say that Michael has become the lead government scientist for the fishery.

The Ministry of Fisheries is currently engaged the a process of formulating a management plan for the Bluff Oyster Fishery. This management plan needs a scientific basis, and so Keith Michael has worked for the past few years on providing the Ministry with the research results needed for the formulation of a plan, see (Keith Michael, Droger, Richardson, & Hill, 2006).

Much of the contents of Michael's recent report (in draft form yet tabled at management meetings in Invercargill and Bluff) build on the previous work by Cranfield and Michael with respect to identifying the nature of the benthos associated with the oyster beds. However the report also contains purportedly new research revealing that Michael and Cranfield had actually been quite wrong in their views about the fishery in previous papers. The link between mulloch and the oyster beds, for example, appears in the light of this new research to have been overemphasized. Destructive fishing practices are not mentioned, but the effect of storms on the floor of Foveaux Strait receive a great deal of attention, and are apparently responsible for radical changes in the oyster beds. It is worth noting here that in this respect too it seems that the accepted knowledge in the fishery had been wrong. For exampleSorensen had noted in 1968 that:

> 'Sanding [becoming covered by sand] has little effect on Straits oyster beds although, according to fishermen, edges of some beds are covered from time to time.' (Sorensen, 1968, p.19)

When Keith Michael's report was circulated in draft form in 2006, it received so much criticism, the Ministry of Fisheries had to withdraw the document pending review. One of the contents of Michael's report was a study of traditional environmental knowledge of the Bluff fishermen. The Ministry hired a researcher from overseas who visited Bluff for a

two-week period in 2006 to interview fishermen. The results of these interviews appear to be in accord with Michael's new scientific discoveries, and lead to a re-evaluation of the history of the fishery along quite different lines from the history presented by the fishermen in this thesis.

5.5 The New Zealand Ministry of Fisheries—Official Position

The main statement of the Government's position on the Bluff Oyster fishery is found in a document entitled, *Stock Assessments and Yield Estimates—Dredge Oyster (OYS 5),* which is an annual report of the Ministry of Fisheries, Shellfish Working Group (Fisheries, 2006). This document of approximately 30 pages remains practically identical from one year to the next, though it slowly accumulates data from the latest government surveys as this data becomes available. Fishermen read the MFish document closely and are immediately able to put their fingers on the points which they feel matter.

In a section entitled 'Concentration of fishing on localized populations', the Ministry reports that,

> … **it is not known what effect intensive fishing will have** [emphasis added] on the prevalence and intensity of infection by *B. exitiosa* or the long-term recovery of the oyster population (Ministry of Fisheries 2006, p.25).
>
> …
>
> Although the rebuilding of the oyster population from the current low levels may be dependant on habitat restoration (Cranfield et al. 1999), **there is no direct evidence to link accelerated modification of oyster habitat with increased disease mortality or reduced oyster production** [emphasis added] in the fishery (Minsitry of Fisheries 2006, p.27).

These statements, although admitting 'intensive fishing', do not recognize any negative consequences of the activity. The official position is that there is no 'direct evidence' from which to link oyster disease and environmental destruction. Neither can a link be made between the 'accelerated modification' of the oyster habitat (i.e. mulloch), and decline of

the fishery; according to the Ministry there is simply no direct evidence to support the contention.

Perhaps most contentious of all to the Bluff Oyster fishermen is a statement to be found in the Ministry report which justifies current exploitation patterns, and, in the opinion of fishermen, uses the prevalence of disease in the fishery as a kind of scapegoat or smokescreen behind which to hide overfishing.

> ... projections from the Foveaux Strait oyster stock assessment model indicate that **current catch levels are unlikely to have any significant impact on future stock levels** [emphasis added]. Instead, future disease mortality will determine future stock status. (Fisheries 2006, p.27)

6 Interview Results—The Fishermens' Perspective

6.1 The Oyster Fleet and the community of fishermen

There are many references in this research to the Bluff fishermen; the conservation-minded fishermen; the community of fishermen, and so on. Some attention is needed therefore to define what is meant by these terms. The chapter on methodology went some way to explaining the sources of information used in the thesis. It described the key informants, the extent of the community interviews, and the composition of the focus groups. However, fishermens' knowledge, and the ideas that derive from that knowledge which are presented in this thesis, belong to a wider social group than that from which the interview samples were drawn. This wider group is described in this thesis as the Bluff fishing culture, referring to a multigenerational population of fishermen, fishermens' families and extended community. It is implied in the thesis that this group has been central to the social structure of the town of Bluff, and has continuing importance as a social presence and social force.

The knowledge of the Bluff fishermen is described below. It is important for the validity and integrity of that knowledge that it be conceived not as the knowledge of a few individuals, but as the representative knowledge of a longstanding group of oyster fishermen. The knowledge of the Bluff fishermen has a cultural weight that brings with it a worthiness based on long testing, validation, experience and refinement. For this reason a schematic diagram of the fishery has been produced with the intention of providing simultaneously an overview of the fishery in terms of companies and leading fishermen, together with the oyster vessels around which crews were organized. Some of this information can be inferred from the history of the fishery described in the Chapter 3. The size of the fleet, for instance, could be deduced from the section on the fishery history. The naming of the boats and the listing of the skippers are not meant so much as provision of detailed information, though this is part of it, but as an assertion of community. During the course of interviews with oyster fishermen, one of the principal facets that emerged was a proffering of information on the make-up of the oyster fleet, the names of the boats, what

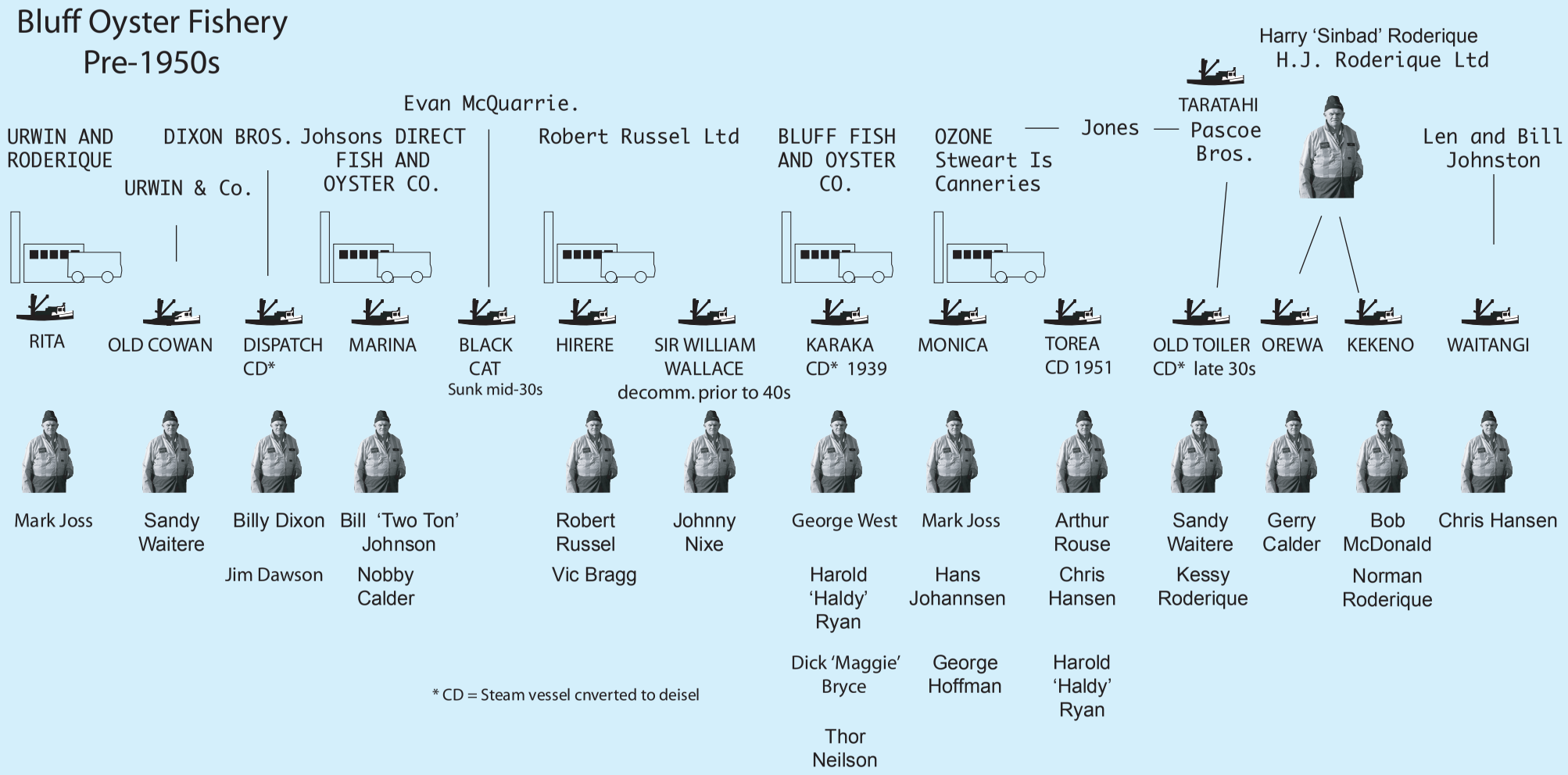

Bluff Oyster Fishery
Pre-1950s
Harry 'Sinbad' Roderique
H.J. Roderique Ltd
Evan McQuarrie.
URWIN AND RODERIQUE
DIXON BROS.
Johsons DIRECT FISH AND OYSTER CO.
Robert Russel Ltd
BLUFF FISH AND OYSTER CO.
OZONE Stweart Is Canneries
Jones
TARATAHI
Pascoe Bros.
Len and Bill Johnston
URWIN & Co.
RITA
OLD COWAN
DISPATCH CD*
MARINA
BLACK CAT
Sunk mid-30s
HIRERE
SIR WILLIAM WALLACE
decomm. prior to 40s
KARAKA CD* 1939
MONICA
TOREA CD 1951
OLD TOILER CD* late 30s
OREWA
KEKENO
WAITANGI
Mark Joss
Sandy Waitere
Billy Dixon
Jim Dawson
Bill 'Two Ton' Johnson
Nobby Calder
Robert Russel
Vic Bragg
Johnny Nixe
George West
Harold 'Haldy' Ryan
Dick 'Maggie' Bryce
Thor Neilson
Mark Joss
Hans Johannsen
George Hoffman
Arthur Rouse
Chris Hansen
Harold 'Haldy' Ryan
Sandy Waitere
Kessy Roderique
Gerry Calder
Bob McDonald
Norman Roderique
Chris Hansen
* CD = Steam vessel cnverted to deisel

Figure 6.1

Bluff Oyster Fishery
Circa 1955

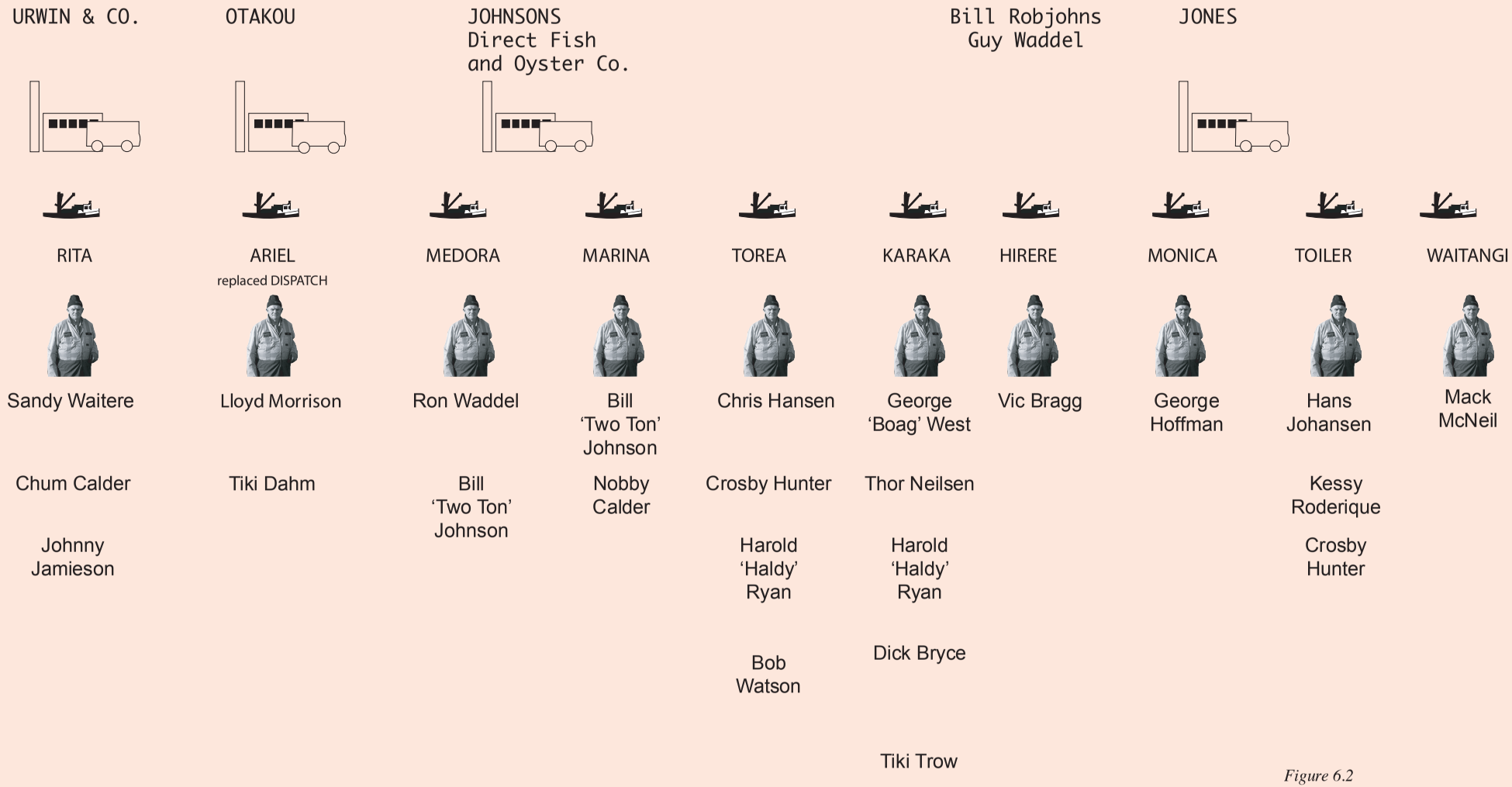
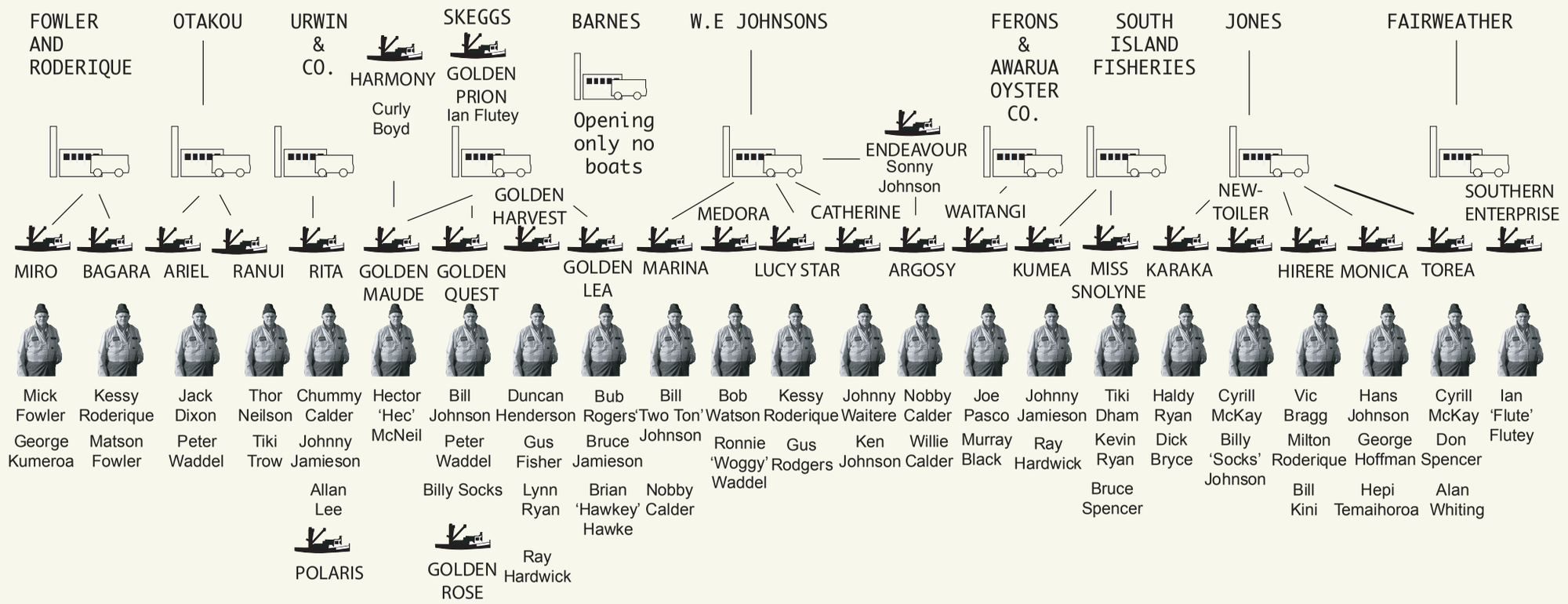
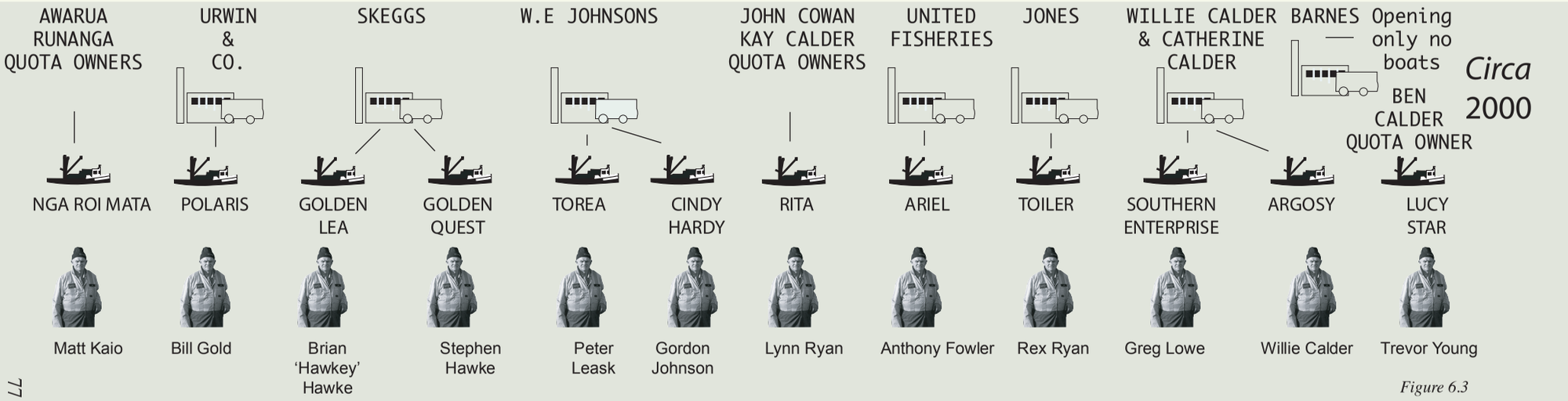


Figure 6.2

BLUFF OYSTER FISHERY MODERN PERIOD

Circa 1970





Circa 2000

Figure 6.3

the boats were like, who skippered them, and who were crew. In community mapping, a relationship with place is engendered, in mapping out the family tree of the oyster fleet the fishermens' relationships with each other and with their elders are engendered.

The oral history of the elder Bluff fishermen begins with their own youth and accounts of the generation of oyster skippers who first inspired them. Interview data often indicated respect among the Bluff oyster fishermen for their elders in the fishery. The names of the elders would crop up in discussions on conservation, in stories, and often reference to these elders would be accompanied with marks of respect, sometimes with reference to their service records in the war or their community standing. Perhaps with a shake of the head, a wry smile and the words, 'They were hard men'. The fleet diagrams (*Figures 6.1 — 6.3*) are divided into the 'Golden Era'—up to approximately 1960, which was the era prior to that of worrying decline—and the 'Modern Period'. The eldest living informant has some recollection of the steam era in the fishery, and the diagrams name some of the pre-war steam vessels which were eventually converted to diesel.

In the Golden Era of the fishery overfishing was not absent, and one might argue that the 1950s held the seeds of the later decline. However, the 1950s were a time when the fishermen enjoyed a robust fishery and could still speak of cultivating the fishery and practising conservation in a meaningful way. The Golden Era is thus important in the context of fishermens' ideas of conservation, providing the best example of what a sustainable oyster fishery may have looked like.

The modern period (post-1960s) was a time of expansion in the fishery, the number of boats doubled resulting in new opportunities for the fishermen, but also a breakdown in the knowledge structure and traditional passage of expertise within the workforce. The elder generation of independent and highly respected 'hard men' slowly gave way to a fleet in which less knowledgeable men competed with those better schooled and more representative of conservation and good practice in the fishery. One of the characteristics of the conservation-minded fishermen who formed the core of those interviewed, and who had been asked to answer the research questions posed by this thesis is that they often refered back to the generations of fishermen who preceded them; they are strongly *connected* to the knowledge, practice and ethics of their elders. One recent development in fishery management is an effort by government and industry to create a new understanding of the fishery, i.e. one in which the current low catch rates might be considered normal.

Such attempts are fiercely resisted by the conservation-minded fishermen who believe that the fishery can only be properly understood in terms of its whole history. A fisherman recalling typical catches of 50 or more sacks a day is much more likely to be alarmed at seeing typical catches of 10 sacks a day than a new entrant to the fishery who is told by his employers that 10 sacks a day constitutes a good and profitable catch.

6.2 Fishermen's culture and morality

The discussion of fishermen's knowledge is presented in connection with, and to help describe, the concept of *belonging*. An aspect of *belonging* related to fishermen's knowledge, but slightly wider in scope is the association of *belonging* with fishermen's culture. Here the focus of interest is on the unique way of life and the culture that has developed over a hundred and fifty years of Bluff's fishery. There are probably many aspects of the fishermen's culture that are relevant to the theme of *belonging*, but here the focus is on the fishermen's moral sense. The word moral is used not in the narrow sense of adhering to prescriptive rules, although this may result of such adherence, but rather in the wider sense of responsibility to the fishery and the behaviour and commitment that goes with that responsibility. Moral values complement fishermen's knowledge and play an important role in conservation of the fishery. *Belonging* is characterized by a certain kind of thinking, as well as certain ways of behaviour. In this section aspects of fishermen's culture and morality are described. Once again, the purpose here is to identify a quality of *belonging*, and to make a case for the existence of a relationship that cannot be experienced directly.

The wharves of Bluff are home to a fisherman's culture that reached a high period in the middle of the last century. The fishing culture of the time was exemplified by the gatherings that took place in the fo'c'sle of oyster vessels on stormy winter mornings. On such days crews of several vessels, attracted by a welcoming light in the fo'c'sle of one of the boats, would gather around the warmth of the stove for a cup of tea and the company of friends. The eyes of older fishermen sparkle at the recollection of these times, marvelling at the extraordinary company and story telling that were part of these gatherings (Interview data).

In addition to their social aspect, the fo'c'sle meetings were an opportunity for fishermen to exchange information and to agree upon their fishing strategies. In such a society norms are formed and peer respect is obtained by becoming a 'good' fisherman. A good fisherman was expected to catch high tallies of oysters while respecting other fishermen and also the health of the fishery. 'Mollyhawking', meaning following other boats around and encroaching on another skipper's 'tow', was discouraged. Skippers worked their tows individually, and were able to husband the resource by moving from area to area practising a form of rotational fishing of the oyster beds. When catch rates in sacks per hour dropped beneath a certain level (historically approximately eight sacks), fishermen moved to other areas. Though this strategy has broken down with the fishery's depletion to the extent that eight sacks might represent an entire day's catch, fishermen know of the conservation efforts of their elders, and continue to judge whether one is a good oysterman, or not according to the norms established by their elders (Interview data).

The information in this chapter argues for the existence of a conservation ethic among fishermen. The existence of this ethic does not mean that its opposite, a taste for unbridled exploitation, does not also exist among the fishermen. The Bluff fishermen have admitted to the willful destruction of several important oyster beds in the past. During the interviews with fishermen numerous accounts of overfishing were recorded. However, the admission of poor practice and the willingness to discuss, and to potentially rectify these wrongs is itself a part of a conservation ethic. The conservation-minded stance of the fishermen in opposition to the exploitative attitude of the oyster merchants is well documented by many years of evidence in the form of minutes of management meetings and newspaper articles. Fishermen in Bluff have been speaking out against overfishing at least since the 1930s, and it is difficult to ascribe self-interest as a reason for doing so (Truth, 1938). Fishermen risk social consequences within their community for taking a conservationist (unpopular) stance, as well as loss of income that is the result of reduced catches.

6.3 Fishermens' knowledge

In this thesis the term fishermens' knowledge is preferred to that of traditional environmental knowledge or fishers' ecological knowledge for its simplicity and inclusiveness. Traditional environmental knowledge (TEK) implies indigenous knowledge and/or folk wisdom associated with deeply historical resource systems. This description holds to some extent as regards the Bluff oyster fishery, the commercial beginnings of which involved the Rakiura Maori of Stewart Island during the 19th Century. But, it is important to recognize that the knowledge of the Bluff fishermen has developed in conjunction with science; it has both learned from and contributed to scientific research. One of the key informants of this research uses the term 'practical' to describe fishermens' knowledge, a term that is useful when comparing fishermens' knowledge with other kinds of knowledge. Most available information on the Bluff oyster fishery is shared between scientists, fishermen and managers; so it is not the facts themselves, but the way the facts are emphasized, and the way experience is brought to bear in interpreting the facts that make for different kinds of knowledge in the fishery. Fishermens' knowledge is bound to a particular place and particular circumstances.

In discussing fishermens' knowledge, the principal aim is not to try to establish whether or not the Bluff fishermen are right or wrong with respect to the critical issues. The fact that the fishermens' ideas may lead to views, explanations and conclusions that differ from those at the Ministry of Fisheries is important, but as a first step it is important to simply assert the existence of fishermens' knowledge. In developing understanding of fishermens' knowledge it is enlightening to compare and contrast fishermens' knowledge with the scientific knowledge used to justify current fishery management. There are some firmly held positions on the major issues that appear to pertain to different paradigms or different conceptual bases. While these might be loosely characterized as practical *vs* scientific, the situation is far from that simple. Scientists will themselves choose to emphasize one or other research direction. One of the longest serving senior scientists of the Bluff oyster fishery, Dr. John Cranfield, was very sensitive to fishermens' knowledge and used the insights of fishermen extensively in his research (see for example Cranfield *et. al*. 1999). Other scientists tend to use science in ways that strictly limit the ability to intuit or infer relationships and causes from the observations of fishermen.

The fact that views are divided between merchants and fishermen is problematic in making the case for fisherman's knowledge. Some merchants are almost entirely land-based, but others have a long history of practical involvement in the fishery. The position of these highly experienced fishermen/merchants is consistent generally with the views of the land-based merchants, but not with the practical knowledge of the majority of fishermen. The term fisherman's knowledge is thus here limited to the positions held by the fishermen/workers rather than by the fishermen/merchants. The fisherman/workers knowledge is preferred to that of the fishermen/merchants as indicative of fishermens' knowledge in part because the fishermen/workers are more numerous, but also because the position of the merchants and fishermen/merchants is well represented in present management of the fishery where it forms the dominant and reigning paradigm in opposition to that of the fishermen/workers. The difference in paradigm between fishermen and merchants, or fishermen and government officials can be illustrated in reference to three crucial, interrelated issues in the fishery. These are: the rate of exploitation of the fishery; the environmental impact of heavy dredges, and oyster disease. These topics will now be explored in more detail according to the information provided during interviews with fishermen.

6.3.1 Conservation—Catch Rates—Serial depletion

The Bluff fishermen have expressed a long-standing, and continuing concern with conservation, including pressure to close oyster beds. These conservationist claims have been supported by the press, and are documented in Chapter 4 under the discussion of fishery management. Informal management of the oyster fishery by the fishermen took the form of self-regulation based on the economic return of an oyster bed expressed in sacks of oyster caught in one hour. If an oyster boat skipper dredged less than eight sacks of oysters in one hour, he would search for a more productive area (Murray Black and Alan Lee. interview data. See also Cranfield, 1999 who cites the same figure of eight sacks/hr based on fishers' data). This fishing strategy was economically driven, as a fisherman will naturally want to maximize return, but it had an important reciprocal effect of leaving enough oysters on the seafloor to reproduce and to rebuild the fishery.

With many productive beds to choose from and only two to four beds worked in a season by any one boat, the oyster skippers enjoyed something of a sustainable resource management system—the over-exploitation and eventual depletion of East and Ruapuke

beds notwithstanding (*cf. Sec. 3.1.1.6*). However, de-licensing of the fishery in the 1960s, which resulted in a doubling of the fleet, combined with a disease outbreak in 1962-1963, upset the already precarious balance between exploitation and conservation. From the 1960s to the present the history of the fishery has been one of steady decline. This decline has been offset in terms of oysters landed (and even temporarily reversed) by the introduction of more efficient catching technology (e.g. heavy dredges, and pin-point navigation), but these technologies only precipitated a swifter decline once their effects took hold (see *Figure 1.1*). Today's seasonal catch limit of 7.5 million oysters is a very small percentage of the 115 million oysters landed yearly during the 1970s and early 1980s.

The environmental effects of dredging were dramatically revealed to the Bluff oyster fishers during the Modern Period (post-1960) through the serial depletion of oyster beds. All the Bluff oyster fishers know of oyster beds that were fished to commercial extinction through intense fishing pressure, and many will admit having participated in this destruction. *Figure 4.1* shows aerial photographs of the Bluff oyster fishing fleet concentrated in a small area, and practising very intensive fishing. The photos were taken in 1992 but could be representative of many other locations and times. In 1974, 28,000 sacks were taken out of the Lee Bay Bed over a six-week period. The intense pressure was the result of an unfortunate government attempt to do precisely the opposite, i.e. to spread fishing effort (see *Sec. 6.2*). The bed has never recovered. 'When the bed was first fished it was prolific … the dredges would come up full, but today, … I could eat what you could catch on the Lee Bay bed.' (Interview data). In the early 1980s the bed named, 'Dee Street', was fished to below a catch rate of six sacks an hour. Further west, during the late 80s, both 'The Chocolate Bank' and 'The Saddle' were fished down to a catch rate that made it uneconomical to continue fishing, or, a level at which the conservation-minded fishermen would say the beds needed resting (refer to *Figure 3.6* for location of these oyster beds). None of these areas have regained their productivity. If they are still visited by fishermen today it is only because catch rates of one and two sacks an hour have become profitable due to a roughly doubling of the price of oysters over the last decade.

As catch rates decline and the selling price of oysters rises, fishermen come under increasing pressure to abandon previously held wisdom concerning the point at which an oyster bed should be left undisturbed. At one time it was considered uneconomical to

continue fishing a bed that was producing less than eight sacks of oysters an hour. Today eight sacks might constitute the entire day's catch. Continuing profitability is an argument for continuing to exploit the fishery even though catch rates are down to between one and two sacks an hour. Some believe that as long as there is money to be made, the fishery must be in good enough condition to warrant an open fishery. However, using economic indicators alone does not take into account the necessity of leaving oysters on the sea floor from which the fishery might rebuild. Fishermen fear that to work at the level of two sacks an hour is to cut deeply into the reproductive capacity of the fishery. Moreover, the effect of repeatedly raking of the seafloor with heavy dredges to obtain such relatively low returns has an environmental cost which is not being factored into the economics of the fishery. The old rule was to allow an area to rest once it had been fished down to a catch rate of eight sacks an hour. In the 1970s and 1980s the beds such as Lee Bay cited above were fished to below six sacks an hour (Interview data). The fishermen say that six sacks an hour is no guarantee that there is enough left for the bed to rebuild, especially if the bed has been the focus of intense pressure by the whole fleet using heavy dredges. 'Show me a bed that has ever recovered from the levels that we've now fished them to …', demanded Murray Black on Nov.16th 2006 at a public meeting at Te Rau Aharoa Marae in Bluff.

Dredging is so invasive a fishing technique, and the heavy dredges have such a destructive impact on the oyster environment, that when a bed is fished to commercial extinction, it may well be permanently destroyed. Even those oyster beds that were fished to commercial extinction with much less invasive gear in the 19th Century have still not regenerated. A scientific survey by Stead in 1960-1962 of the Port William and Half Moon Bay Beds showed only a very few oysters present, and this almost one-hundred years after commercial fishing ceased (Stead 1971, cited in Cranfield *et al* 1999).

6.3.2 Introduction of Heavy Dredges

As catch rates declined in the 1960s and 1970s fishermen began experimenting with heavier dredges. The new dredges weighed three times that of the older dredges (450 kg as opposed to 150 kg). The new dredge had a double-bit (the bit is the bar on the lower side at the mouth of the dredge that is in contact with the bottom), and freed the fishers from much constraint in dredging technique. The earlier single-bit dredge, with a steel ring bottom on the bit side of the bag and a rope mesh on the upper, required a delicate and judicious skirting of the oyster bed in the direction dictated by the flow of the tide.

Skippers needed skill to avoid capsizing the dredge which would cease fishing, and possibly have its rope bag torn up, if overturned. The double-bit dredge with a steel ring mesh on both bottom and top of the dredge catches oysters no matter which side is up, and hence releases the skipper from the constraint of dredging with the tide (Interview data). This ability to vary direction results in a more invasive dredging of the beds (J Cranfield, Michael, & Doonan, 1999). Where once fishermen were forced to conserve the beds as a necessity of not becoming entangled and clogged by mulloch, they were now able to drag right through the reefs and the mulloch, dispersing the epifaunal reefs and exposing the rich oyster patches beneath.

Retired oyster skipper Alan Lee describes the performance of the heavy dredge in the following manner:

> "Cran [John Cranfield], he was down and [Keith] Michael, three of them with Gordon Crowther. We were over in the West Bed and Gordon wanted to ride the dredge over the bottom. So we did this. This was the days of the light dredges, and he said when he came up, that even though the dredge was going across the ocean floor, at a bit less than walking pace, and it was bouncing along, it would go so far and then bounce, go along further building up momentum and then bounce again. A few years later we had the heavy dredges on, and it was Keith Michael who went down this time. He said that this dredge just sat on the bottom and ploughed a track on the ocean floor about 15cm deep, it never lifted off the bottom; it was ploughing stuff out the sides." (Interview data)

The introduction of the heavy dredges caused an initial peak in catch rates. Once the mulloch had been removed the dredges filled quickly with oysters; more tows *per* hour were possible resulting in even greater catch rates and daily tallies. The downside to the bonanza was the destruction of the epifaunal reefs; where there was once a rich benthic fauna there was soon only sand and gravel.

The heavy, double-bit dredges have been cited by many Bluff fishermen as very destructive of the oyster bearing eco-system, and also very hard on the immature oysters that come into contact with the dredges. The damage done by the dredges to the oyster population is known as incidental mortality. Cranfield has estimated that even when the fishery was in a relatively healthy state the same area of oyster bed might be run over with the dredges fifteen times—and quite likely three or four times this often—in a season (J Cranfield, Michael, & Doonan, 1999). An examination of the track plotters of oyster

vessels today reveals dense patterns of overlapping lines (spaghetti coverage) covering small areas of the seafloor (personal observation). The heavy dredges represent a kind of exploitation that the conservation-minded fishermen believe is similar to strip mining or clear-cutting of forest. Faced by the merchant's denial of eco-systemic damage caused by repeated heavy dredging, the Bluff fishermen joke, "If you don't think dredging damages the bottom, lie down on the dock and I'll tow the dredge over you!"

Research and experimentation aimed at a return to lighter, less damaging dredges was accomplished during the 1990s (Lee, 1994; Keith Michael, Doonan, & Cranfield, 1998), and use of lighter dredges is advocated among the conservation-minded fishermen. However when catch rates of only two sacks *per* hour are currently being obtained with heavy dredges that are much more efficient at catching oysters than the lighter ones, a return to lighter dredges would mean a reduction in catches, or perhaps not catching anything at all.

6.3.3 Oyster Disease

The emphasis placed on the effects of oyster disease also highlights differences between the fishermen's knowledge and the opinions of the fishery scientists. Fishermen believe that the government is using oyster disease as a scapegoat for the woes of the industry, and as a means of avoiding facing the issue of overfishing. Science has been telling the industry for the past two years that fishing pressure will have no significant effect on the total oyster population if the devastating effects of disease are taken into account (*cf. Sec.5.2.5*). The Ministry of Fisheries believe that mortality from oyster disease will outweigh any negative impact on the total oyster population that fishing pressure might cause. "The oysters are going to die anyway, you might as well catch them", is the position held by the lead scientist from the National Institute for Water and Atmospheric Research (Dr. Keith Michael, pers.comm.). I was surprised, on the occasion of joining an oyster boat for a day, to hear one fishermen talking about the number of millions of oysters that would die that year from disease in Foveaux Strait. This is not fishermens' knowledge, it is knowledge that has been introduced into the fishery by the scientists. Fishermen have no way of making this kind of calculation. Because a fishermen cannot possibly know which oysters will die of disease and which will not. He will tell you that it is better not to catch any oysters at all. Fishermen also know that, because of stresses inflicted on the oysters

(including disease), and the damage to the environment caused by heavy dredges, fishing ought not to be taking place when the fishery is at such a low point (Interview data).

The conservation-minded fishermen are not insensitive to the gravity of oyster disease, and are keenly interested in, and supportive of scientific research into *Bonamia*. Based on information from the oral tradition, they understand that *Bonamia* is endemic, meaning that the disease has always been present in the Foveaux Strait oyster beds. However the disease by itself has never in the past threatened the very existence of the fishery. For it to do so now must mean that there are other factors beside the disease that combine to produce a particularly grave circumstance including much more frequent and persistent epizootics of the *bonamia* parasite. The loss of the original oyster environment (i.e. the epifaunal reefs), and the serial depletion of the once rich oyster beds, are to the conservation-minded fishermen the obvious reasons for the oysters being increasingly vulnerable to disease. Other factors potentially related to oyster disease that have been discussed are changes in the water column chemistry and biological conditions as a result of the alteration by damming of the flow of a major river that feeds the Foveaux Strait. The Waiau River flows into the Foveaux Strait at Te Waewae Bay and at least two respondents believed that the supply of limestone from this river, which is similar in chemical composition to the shell of oysters, had been an important nutrient for the oysters. Furthermore the aluminium smelter at Tiwai Point opposite the town of Bluff was signaled as a potential source of pollutants that might affect the oyster fishery (from both air fall-out in the Strait, and leaching from stockpiled waste materials).

6.3.4 Evaluation of fishery health and stock size

Trying to reach agreement on the state of the fishery is also illustrative of the differences between fishermen's knowledge and that of the government managers and scientists by which they are informed. Fishermen believe that the Ministry of Fisheries has consistently overestimated oyster populations, and hence quota levels. The main reason for this belief on the part of fishermen is due to the fact that MFish calculates population and distribution of oysters using a different scale from that which informs the practical experience of fishermen operates. Fishermen know that fishing pressure is intense on local populations of oysters. They believe that particular oyster beds are targeted and often fished to extinction. The Ministry, by contrast. calculates oyster populations based on statistical methods that average and extrapolate population values over areas much larger than the

individual oyster beds targeted by fishermen. The Ministry has attempted to show that only a sustainable portion of the total population of oysters is fished in any year (less than 10 per cent). Fishermen know, however, that in targeting specific populations of oysters, up to 90% or more of the oysters are taken.

The Ministry of Fisheries understands that only a very small part of the Foveaux Strait is dredged for oysters, and so the population estimates for the fishery are based not on the whole area of the Strait, but only on those areas where fishing actually takes place. The size of the areas deemed commercial, and hence used for the purpose of calculating the oyster population (and setting quota sizes), are determined on the basis of survey results. Yield estimates for the fishery from 1996 to 1999 were based on areas in which a standard survey tow resulted in a catch of 400 or more takeable oysters. However, since the year 2000 the requirement to judge commercial ground on the basis of 400 oyster tows has been removed. Any area now declared commercial by the industry can presently be used in calculating oyster population in the fishery (Fisheries, 2006). The current quota size calculated on the basis of a fishery size of more than 300 square kilometers (*cf. Sec 5.1.1.3* where Cranfield estimated a fishery size of approx. 12 square kilometers), is scoffed at by fishermen. 'If the oysters are there why aren't they catching them?' asks Murray Black.

The fishermen believe that the quota set by the Ministry simply follows the decline in the fishery, rather than preventing that decline. Bluff oyster merchants brag that they have shelved half their quota entitlement for the past few years out of conservation-mindedness, but the fishermen see this only as confirmation of their belief that the oyster population is so low that the higher quota could not be caught.[6]

6.3.5 The oyster environment—ecosystem destruction

The Bluff fishermen were eyewitnesses to the changes in the Foveaux Strait ecosystem that occurred between 1950 and 1980. Perhaps the most significant of these changes was the disappearance of the mulloch (also spelled mullock)— the fisherman's term for the original benthos of the oyster beds. There are seaweeds, sponges, sea egg, starfish, octopuses, sea horses, cockles and much more involved in the story of the Bluff oyster. The oyster is only one of many creatures supported by a complex ecosystem on the floor

[6] Quota in the fishery is currently set by the Ministry of Fisheries at 15,000,000 oysters. However the industry has held to a self-imposed quota of 7,500,000 oysters for the past three years.

of Foveaux Strait. Bill Robjohns an oyster merchant and historian of the Bluff oyster fishery, described mulloch in the following way:

> " The word 'mulloch' is derived from an Australian mining term 'mull' meaning dirt. … Mulloch is a smelly matted up conglomeration of bryozoans (six species), hydroids (ferny material), nesting mussels, sponges (at least three varieties), sea egg, starfish, annelid worms, crabs, octopuses, chitons, sea-horses, pipe fish, cockles etc." (Robjohns, 1979, p.10)

The mulloch was a nuisance to the oyster fishermen in that it interfered with the catching of the oysters; it was also something of a wonder. A number of the older skippers described a treacle-like substance contained in the mulloch that would stream out of the dredges as they were brought aboard.

> ' … it was light yellow like that dishwashing liquid, and oily. If it got on your gloves you wouldn't be able to pick up an oyster. You'd look up at the dredges and it would blow into your eyes, and did it ever sting!' (Interview data)

Although mulloch was a difficult substance to deal with for the fishermen, they began to be concerned about its disappearance as early as the 1970s (Robjohns 1970). By the 1980s it had become a matter of great concern. In a letter of 7th September, 1988, industry leader Bill Robjohns wrote to the Foveaux Strait Oyster Advisory Committee on behalf of the Oystermen's Society asking for scientific support to answer the question: "Where has all the mulloch gone?" (H. C. Robjohns, 1988) The link between the mulloch and the oysters was one of the most longstanding observed occurrences in the history of the fishery. It is thus with regret that one fisherman concluded his description of mulloch with the observation that, 'There's no mulloch anywhere in the Strait now that I know of.' Other fishermen confirm that the mulloch has completely disappeared from oyster beds in Foveaux Strait, though it is believed to still occur in limited areas peripheral to the fishery in which there are no oysters (i.e in area that has never been commercially dredged for oysters).

The association between mulloch and oysters is well documented from the era in which mulloch was still found in the Strait (J Cranfield, Michael, & Roderique, 1997). In a letter to the Foveaux Strait Oyster Advisory Committee in 1973, Bill 'Two Ton' Johnson, one of the leading fishermen of the era described the Lee Bay bed as having been 'heavy with

mulloch' when first dredged. In suggesting a strategy for fishing in what came to be known as 'H Area', Two Ton stated that " … this area is also heavy with mullock. **The oysters will be beneath this** [emphasis added]." (Johnson, 1973). Stead similarly discusses the need to break up the mulloch to improve areas for dredging (Stead 1971, p. 59). In 1962 Stead reported that,

> The large masses of 'mullock' material on the West Bed present a difficult problem due to the extent and frequency of the patches or strips. Improvement of oyster ground should occur if these areas are well worked either by normal commercial oystering, or by special dredging or harrowing, possibly during the off season" (D.H. Stead, 1962)

One fishermen slapped his thigh and laughed outright at this comment of Stead when it was discussed during an interview. Not only was a scientist recommending that the fishermen destroy the oyster bearing habitat by 'harrowing' the beds, he was also recommending doing it during the off season, in other words, when the oyster were spawning!

Figure 3.4 shows areas in which Stead found mulloch in his surveys from 1962-1964. Comparing this map with the fishermens' maps of the oyster beds further demonstrates that the occurrence of mulloch coincided with with the oyster beds themselves. *Figure 3.4* shows very little mulloch in the area of the East Bed, but it will be recalled that the East Bed had sustained more than half a century of fishing and was denuded of mulloch through that process (*cf* Cranfield 1999, p. 474).

The heavy dredges which were introduced in the 1970s allowed fishermen to quickly remove the remaining mulloch in Foveaux Strait. Cranfield states that by the early 1980s epifaunal reefs were present only on the periphery of the oyster beds in southern and western Foveaux Strait. This is how he describes the effects of dredging,

> The targeted dredging of epifaunal reefs broke up the structural framework of anastomosing branches of C. elegans … welded together by encrusting bryozoa, ascidians, sponges and tubiculous polychates. Much of the epifauna was retained by the dredge and discarded from the vessel during sorting of the catch. Fishers' observations suggest that the epifauna remaining was destabilized and rapidly eroded by the strong tidal currents. … Living oysters are heavy and not moved by currents … so oyster beds have retained the highly localized distribution of the reefs on which oyster had originally grown. Fishers found that the catch rate of oysters on an oyster bed increased as epifaunal reefs were

> eliminated. With no epifauna to saturate them dredges continued fishing effectively for the entire tow. As oyster could then be caught more rapidly, continued heavy fishing could reduce oyster density to commercial extinction in a few years. (J Cranfield, Michael, & Doonan, 1999)

It is widely believed by both fishermen and scientists that the rich bio-chemical environment of the mulloch (described by Cranfield and other scientists as epifaunal bryzoan reefs) provided a nurturing environment for the oysters and protected them from disease (Bjorkman-Chiswell, 2008). Marine Scientist Keith Probert of Otago Univerisity, an expert on bryozoa, explained how epifaunal reefs are composed of creatures practising 'chemical warfare' on each other (Pers. comm.). In addition to the busy bio-chemical environment that might have served to somehow protect the oysters, bryzoans, like oysters and other creatures found on the epifaunal reefs, are filter feeders and would have helped, through ingestion, to reduce the levels of the parasite *Bonamia* in the vicinity of the reefs.

6.3.6 Conservation—The issue of sack size

The conservation-minded fishermen interviewed during the course of this research received their educations in conservation through their participation in the oyster catchers union. This is one reason why the small sample of key informants has been judged representative of the larger group of fishermen. The union was active for decades providing historical continuity for the fishermens' position. The most important continuing issue (along with wage negotiations) was conservation. The oystercatchers union was a means for fishermen, through representation, to participate in management meetings at which they felt it their duty to advocate conservation (*cf* Sec. 4.1.1.3). The size of the annual oyster quota, together with fishery openings and closures, were high-profile conservation issues over which there was frequent opposition between the union and the vessel owners. A seemingly minor issue that occupied the union for almost two decades (1979—1996) was the issue of sack sizes. The issue is interesting for it illustrates the hard work and tenacity of the fishermen with respect to the details of conservation.

An ancient strategy for gain in the face of established reciprocal exchange relations, is to change the unit of measure; this is only really possible with non-standard forms of measurement and was probably a major reason for the legislation of standards (Scott,

1998). Faced with rigorous limits in the form of a maximum quota, and the fixed costs of production, the Bluff oyster merchants, who used a non-standard measure, i.e. the sack, decided around 1979 that they would increase the size of their sacks. If the sacks were only a few inches larger in dimension more oysters would be accommodated, which meant a non-regulated, disguised, increase in quota (for quotas at that time, it will be recalled, were regulated in sack numbers—5000 sacks a vessel). The outside measurements of the sacks were increased from 39 by 22 inches, to 43 by 23 inches. Furthermore the material of which the sacks were made, previously jute, was changed to polypropylene. The new material stretched (creating an even larger sack) and did not require an inside seam which further increased its size over that of the jute sacks. The fishermen who filled the sacks at sea by transferring oysters from a box on deck (2 boxes made up 1 sack of oysters), were issued with new boxes also larger in size than those they had been using.

The oystermans' position on the new sacks was made clear to the Foveaux Strait Oyster Advisory Committee in a letter from the Union in 1981 (Society, 1981). It was not an easy victory and came only after eighteen years of effort, but in 1996 the fishermen were eventually successful in having the unit of measure changed from sacks to the number of oysters landed. The change was in line with the fisheries science, which calculated the oyster population size by number of oysters. In studying changes to the regulations in 1996, the government invited the fishermen to report on sack sizes to a Select Committee, and the resulting changes to the law meant that the Bluff oyster fishery was the only fishery in the country that was regulated by number rather than by greenweight.

7 Analysis

7.1 Introduction

When the Parliamentary Commissioner for the Environment (PCE) asked the question, 'What went wrong?' He was not asking what went wrong in the hearts of men, he was asking what went wrong in *managing* the fishery. How is it that the greed which is often cited by both the Bluff fishermen and the Bluff merchants should have been allowed to ruin the fishery? The answer to the question of what went wrong is both simple and complex; it can be answered in one word, greed, but it also takes a volume of social analysis to understand how the checks and balances with which society attempts to deal with the sharing of the Earth's goods, despite the universality of greed, failed to operate to save the fishery.

The analysis in this chapter looks again at the history of management that was outlined in Chapter 4. The research question addressed here concerns the different forms of management in the history of the fishery and their outcomes. But posing the question in this way implies a gap between management and the fishery. It is as if there were two entities, separate, but dependent upon one another. This thesis hypothesizes that the social, cultural and political aspects of a fishery are integral, that without them the fishery does not exist in the form in which we normally understand it. What is called management *is*, in fact, *the* fishery. The nature of management is crucial; outcomes on the physical side of the fishery follow directly from the quality of management. It follows that if management is unbalanced, the fishery itself will be unbalanced.

In this chapter the period during which the Foveaux Strait Oyster Advisory Committee (FSOAC) was active is described again with a view to understanding the tension between over-exploitation and conservation. The 1995 Draft Plan is examined closely with a view to demonstrating the quality of planning which was the product of a group made up of both fishermen and merchants. Social and political events upon which the power of the various groups still depends are described along with the consequences for fishery management. Whether or not the physical fishery would have been better off if the QMS

had never been applied is impossible to answer. It is not difficult, however to argue that the social and community aspects of the fishery have suffered greatly under the QMS. Therefore the nature of community participation in the fishery, and the type and the quality of management both before and after the application of the QMS is described. Who was involved? What was the basis of planning for the fishery management? What conservation measures were considered?

There is a also a need to understand why government, which had traditionally been a helpful facilitator in the fishery, abandoned the fishermen, at the same time as giving over the fishery to the merchants in the form of individual transferable quotas (ITQs). This can only be explained by looking at the larger political framework. The structure for the management of the fishery at the national level is examined. The Ministry of Fisheries and the National Institute of Water and Atmosphere (the science provider for Mfish) are studied with a view to better understanding the character of the fishery in the post-QMS period. Once the groups active in management at both local and national level have been described, it is possible to discuss the various standpoints on the issues as political positions belonging to social groups in conflict. The opposing beliefs in the fishery can be atributed to the social and political standpoints of the protagonists. The extent to which the opposing forces in the fishery are entrenched with respect to their positions is an indication of the level of the social conflict involved. The conflict appears to be reaching its zenith at a time when the fishery is at its lowest point ever.

7.2 Local Management—the pre-QMS Period

7.2.1 The Foveaux Strait Oyster Advisory Committee

The modern history of the fishery can be divided into two main periods: pre-QMS and post-QMS. The pre-QMS period is better named the period of the Foveaux Strait Oyster Advisory Committee (FSOAC), which it may be recalled, was a committee of the Fisheries Industry Board of the New Zealand Government. It is worth looking in some detail at the activities of FSOAC while paying attention to the way in which, what must be the central concern of any resource system, i.e. the tension between exploitation and

conservation, is represented in the Bluff oyster fishery by the relationship between two groups, the fishermen and the merchants.

The Bluff oyster merchants tended to dominate the written records of FSOAC during the period of the 1970s; this was due, in part, to their retaining Jim Campbell, a fisheries consultant who was also Chairman of the Fishing Industry Board. In 1970 the fishermen and the owners made a joint submission to the Select Committee on Fishing. The document demonstrates a practicality and unity, a local perspective in a fishery that had considered its first major scientific assessment, the Stead report (see *Sec 5.2.2*). Many of the scientific conclusions were successfully challenged, and a reduction in quota from that suggested by the scientists was obtained (Merchants, 1970). In 1973, in frustration at the inability of FSOAC to reach a consensus, the owners formally submitted a document to the Minister that made a number of suggestions for management of the fishery (Merchants, 1973). It was this submission that resulted in the failed rotational fishing experiments that inspired the verses of the fisheries officer, J. Clausen (see *Sec. 3.1.1.7*).

In 1979 the merchants made a second formal submission, this time to the Fisheries Policy Committee of the Fishing Industry Board (Campbell, 1979). This latter submission came at a time when the government was once again reviewing whether additional licences should be issued to the industry. The owners opposed issuing of additional licences. A change in position is apparent in the 1979 submission; whereas the submission of 1970 to the Select Committee had a consistently conservationist approach, the later arguments tended to be more economic in nature; they were more protective of industry profit than of oysters. In spite of conflict between the owners and the fishermen over conservation, ten years of meetings appeared not to have dulled the enthusiasm of the owner/merchants for the FSOAC forum, and they stated in their submission that there existed, ‘ … no better example of co-operative management of a fishery than that practised in the Foveaux Strait Oyster Industry’ (Campbell, 1979).

A meeting of a subcommittee of the Foveaux Strait Oyster Advisory Committee (FSOAC) on June 15th 1984 revealed an urgency which was a change from the expansive and generous mood of a decade earlier (F. I. Board, 1984). The need for conservation was acknowledged, but the meeting criticised a letter that a fellow merchant named Newman had sent to FSOAC, describing the decline in the fishery, as a ‘prediction of doom’. It is from this meeting that one can mark the beginning of a conflict that was dominant at

FSOAC meetings for the rest of the eighties—indeed it was probably this conflict that caused FSOAC's demise in the mid-nineties. The conflict was between conservation on the one hand, and maximum exploitation on the other. Boundaries were not absolutely rigid, but in general, the fishermen were to take the side of conservation, and the owners the side of maximum exploitation (F. I. Board, 1986). Why the fishermen should have been the ones to take the side of the longer-term interests (at the expense of what was, for many, their only source of income) is an interesting question. Murray Black has suggested that the owners had branched out (i.e. invested elsewhere) over the good years of the fishery and had interests outside of the oyster fishery that could sustain them. Some of the owners were by now representatives of fishing companies with many and diverse interests. Because the fishermen had only the oysters to support their way of life, Murray reckons they were more protective of their fishery. Furthermore, the fishery represented more than a financial interest to the fishermen; it was a unique way of life, for which there could be no substitute. It is also worth noting that the fishermen had a very long history of petitioning for the closure of oyster beds.

The conflict between conservation and exploitation (i.e. between the fishermen and the merchants) took place mainly around FSOAC's recommendations to the government on quota levels. It would take some years, spurred by the outbreak of disease, for the conflict to reach its peak. Reduction in quota was not yet being mooted in 1984. However, hints of future changes in the fishery can be found in discussions regarding the economic desirability of transferring quota between vessels. Transferability would turn out to be an economic necessity in a scaled-down fishery; it would also turn out to be a means for the owners to prevail in the conflict between conservation and exploitation, a fisherman outspoken on conservation might find himself unemployed when the quota for his vessel was switched to another (interview data). At FSOAC meetings the merchants faced harsh criticism from the Union on the work of their Enhancement Company, and their arguments for limited openings of the fishing seasons were continually opposed by the fishermen. The Oyster Catchers Union (representing the Bluff oyster fishermen) supported oyster enhancement, but were skeptical about the efforts of the Enhancement Company (*cf* Sec. 4.1.1.6). The fact that the company was set up by the merchants without including any oyster fishermen, and that information on the progress of the enhancement programme was not forthcoming from the company, was resented by the Union. Management of the fishery was undermined, it was felt, by exclusion of the Union from important planning

information. The company eventually obtained a special permit to catch 4000 sacks of oysters during each of the closed seasons. The conservation-minded fishermen, left out of the process, and beginning to suspect the company of catching oysters for profit in addition to enhancement, took the position that the spawning oysters should remain undisturbed on the oyster beds of Foveaux Strait.

By 1994 meetings of FSOAC had become so divisive it was questioned whether FSOAC could continue to function (F. I. Board, 1994). The merchants had nevertheless experienced many years of opposition from the fishermen, and the conflict itself was not enough to make them quit. The owners had to belong to FSOAC for they had to meet the fishermen face to face in order to advance their own position and interests in a forum in which there was a quasi-balance of management rights. However, a move was in the works to disenfranchise the fishermen. The owners knew that the QMS was going to be introduced, and that their long struggle in the forum of FSOAC was coming to an end. The Ministry also knew what was coming, though as we see from the following section they kept the fishermen working on the Draft Plan.

7.2.2 Bluff Oyster Planning Group and the 1995 Draft Plan

The Bluff Oyster Planning Group (BOPG) was formed in 1994 under FSOAC. The idea was to develop a small think-tank that might more successfully address issues that had become unwieldy to discuss at meetings of FSOAC. As it happens, the Foveaux Strait Oyster Advisory Group did not convene again after the formation of the BOPG. According to the Ministry of Fisheries, the BOPG was never more than a special purpose group, which, having accomplished its purpose in the drafting of the 1995 Plan for the Bluff Oyster Fishery, was no longer needed (Allan Frazer, pers. comm.). However the Bluff Oyster Planning Group minutes reveal that the dissolution of the group was not generally anticipated (BOPG 1996). Allowing the group to terminate was suggested as one option by the Ministry representative, but there was no consensus on this point (BOPG, 1996). It was established practice in the historical management of the fishery for either the Fishing Industry Board or the Ministry itself to take responsibility for facilitating management meetings. If the Ministry stopped the facilitating process (for example, by simply ceasing to announce meetings) then the group would terminate. This is in fact what happened; the Ministry stopped calling further meetings, and the BOPG did not meet again after its August 1996 meeting. A possible explanation why the BOPG was no longer convened, is

that there was another local group in Bluff that was vying for a greater role in management, and that the time was ripe for its political ascendancy. This was an organization of the merchants called the Bluff Oyster Management Company.

7.2.3 1995 Plan for the Foveaux Strait Oyster Fishery

At this point it is appropriate to review the 1995 Draft Plan for the Foveaux Strait Oyster Fishery, which was the outcome of the work by the Bluff Oyster Planning Group. Although the 1995 Draft Plan was shelved long ago, it still the only management plan in existence to address the crisis in the fishery. The Bluff Oyster Management Company formulated a plan in 2004, but this was neither publicized, nor implemented. Furthermore the current plan (2006-2007) being formulated by the Ministry of Fisheries and the Bluff Oyster Management Company is completely lacking in input from the conservation-minded fishermen. The recent Draft Plan by the Ministry of Fisheries working group was reviewed by the conservation-minded fishermen and discussed at community meetings between March and November 2006. The objections of the fishermen to the Draft Plan were publicly voiced at the Te Rau Aroha Marae on Novermber 16th 2006. In short, the fishermen note that the Ministry/industry plan contained no conservation measures, and, in fact, lifted the longstanding conservation regulation that prohibited dredging during daylight hours, and has thus undermined conservation by lengthening the fishing season.

The 1995 Draft Plan covers three kinds of controls. The first has to do with the setting of quota in the fishery, and relates very closely to the spatial distribution, and estimation of the oyster population. Also included in this section are provisions for more accurate tallying of oyster catches—i.e. a switch from sack counts to individual counts. The conservation-minded fishermen fought hard for a switch from sacks to numbers because of uncertainty in sack sizes. The fishermen suspected the companies of increasing the physical size of the oyster sacks as a means of increasing quota. In a fishery in serious decline every oyster assumes importance, and the issue of sack-count vs. counting individual oysters, was an important conservation issue in the fishery.

The second provision of the plan has to do with the impact of fishing methods on the marine environment, and concerns the long-term effects of intensive dredging on the health of the fishery. Population science and environmental science might also be called the easier and the harder issues (John Cranfield, pers. comm.). This is not intended to convey that creation of population models for fisheries is in any way trivial, only that the

processes involved are far more certain of quantitative results than might be achieved with the more qualitative approach associated with ecosystems/habitat research.

The third category of issues or measures included in the Draft Plan was proposed due to concern 'communication within the industry'. The plan recognizes that management is a social process that requires a special attention to communication. Of the three categories of issues/measures, the first, that relating to population models, and the technique used for tallying oysters, is already be implemented. However, it is the second and third categories of issues/measures that concern the future of the fishery, and involve long-term commitment in terms of research; discipline, and innovation, that are more integral to the concept of sustainability. Some of the measures proposed were, '… to prevent localised depletion of oyster beds'; 'reducing incidental mortality'; and efforts to enhance the fishery through collection of spat and return of shell. In the Draft Plan under the headingThe reader is referred to the Plan itself for more detail. Under the heading 'Measures to prevent localized depletion of oyster beds', many constructive suggestions were made. Some of these suggestions require modern hydrographic technology (i.e. vessel monitoring systems), and are eminently viable options for the industry.

The 1995 Draft Plan suggested management of the fishery at a large scale (i.e. at the level of the beds themselves), and envisioned "… shifting the focus from a wild harvest approach towards 'farming' the fishery …", and was to allow, "a variety of proactive measures to be undertaken in order to enhance, protect and maximize yields from the beds (BOPG 1995)." These sustainability measures were discussed and endorsed at a meeting of the industry in Invercargill in January 1996 (Board 1996). After acceptance of the 1995 Plan by the industry, the Ministry incorporated many of its provisions into a Code of Practice for the 1996 oyster season (Fisheries 1996). However, the voluntary Code of Practice was not observed in the fishery after the fishery reopened in 1996. Though the 1995 Draft Plan was officially accepted by the oyster industry at the January 1996 FSOAC meeting in Invercargill, Murray Black feels there was anything but unanimity of acceptance of the Plan by the owners in reality.

Where the 1995 Draft Plan did have a limited success was in influencing scientific research. A research programme that included experimentation with lighter dredges, and a study of incidental mortality due to dredging (i.e. a study of the damage done to the larger population of undersize oysters due to dredging) was carried out by fishermen and the

National Institute of Water and Atmosphere (NIWA) in the years following the formulation of the plan. However, without a local structure with which to effect changes in fishing technology or behaviour, the results of the research could never be implemented.

It is impossible not to see the mark of the Bluff fishermen on the 1995 Draft Plan for the Bluff Oyster Fishery. Two senior fishermen were active participants, and the conservation-mindedness typical of the fishermen in the FOSAC forum is clearly represented. Unfortunately, social forces were already at work that would shortly result in the Draft Plan being shelved and FOSAC ceasing to exist. Few of the many intelligent, creative propositions (*cf* Sec 4.1.1.4) put forth in the plan would ever be discussed again.

7.2.4 The Oyster Catchers Union; oyster fishing licences and transferability of rights; introduction of the QMS.

The Oyster Catchers Union had an opportunity to comment at length upon the draft plan put forward by the BOPG. Remarkably, the union stated that it was not opposed to transferability of oyster licences suggesting only that quota ought not be owned in absentia, and that workers should be compensated for any redundancy that might result from implementation of the Plan. Transferability of licences was still a long way from instituting ITQs, which the Union, by letter to the Ministry, did strongly oppose (Stuart & Union, 1995). The Union might have been expected to shoulder some of the overall reduction in size of the fishery, it nevertheless seems overly generous on the part of the union to have remained relatively silent about the very mechanism (transferability) by which many were to lose their employ.

Murray Black, former head of the Oystercatchers Union, was asked why the Union had not fought harder against the introduction of the Quota Management System (QMS) to the Foveaux Strait oyster fishery. He replied forcefully, ‘We weren’t going to stop the QMS!’ The inevitability of introducing the QMS shows a remarkable lack of local consultation and study. It was the single greatest change in fishery management coming at a time when the fishery was in its most precarious position ever, and the fishermen had no real input. The consequences of entering the QMS were, for many, the end of everything they had fought for over 30 years, and yet the record does not show any discussion foreboding the

fate that awaited the industry.[7] That the QMS was to radically alter the balance of power, which until 1997 had allowed a workable, if imperfect, system of co-management, was given no mention in the Government's background paper on the QMS that was circulated for discussion among the different groups making up the industry (Fisheries, 1996).

The Union's opposition to the establishment of the QMS in the Bluff Oyster fishery is documented in a submission to the government. In that submission the fishermen state:

> This fishery should not become a share market commodity. Nobody should be forced to fish quota. Those who do not wish to fish, would leave that quota to help rebuild the fishery.
>
> 'The former Minister of Fisheries, Mr Doug Kidd must be given credit for not introducing this fishery into the ITQ system, and we refer back to a statement attributed to Mr Kidd in 1986 and when in opposition at that time.
>
>> 'The whole scheme is totally stacked against young, energetic fishermen getting into the industry because in addition to having to purchase a boat they will also have to raise the capital to buy ITQs is available and if not pay a high rent
>>
>> The scheme opens the way for fishing to fall into the hands of a few operators or even absentee owners.'
>
> What Mr Kidd said then, has become true today. The high rent/leases are inhibiting employment opportunities and are putting the profitability of many fishermen at risk.
>
> If we look at the price paid for quota, such as with the recent Maori fishing settlement which was in excess of one million dollars per fishing permit (vessels and assests were not included0, and this form a fishery with a harvest level of just 13% of what was previously harvested and with no guarantee of sustainability, these costs have put quota prices way beyond the reach of the oyster fisherman.

[7] The Hansard record of Parliamentary discussion at the time of passage of the Bill contains only lackadaisical commentary, and inappropriate pleasantaries.

> We, the working Oyster Catchers and Bedhands, are also stakeholders in this fishery, but to date have been paid no compensation or redundancy payments for the loss of jobs arising from the Maori Settlement and restrictions on the taking of oysters. (Union, 1998)

The introduction of the QMS appears to have caught the fishermen off guard. Perhaps the fishermen felt that the government had for so long been their quiet ally in the constant struggle with the owners, that they had little to fear in that direction. After the establishment of the QMS, a letter from the Union to the new Minister for Fisheries, John Luxton reflects an awakening of the fishermen to, what was for them, a grim reality. The fishermen realized that they had lost almost everything, but it was absurdly late, and Luxton brushed off any suggestion of compensation to the fishermen with cruel ease (Luxton, 1997). In effect the government had betrayed the many years of co-management, consultation and support the fishermen had enjoyed under the previous Minister Doug Kidd (MB, interview data).

7.2.5 Employment Contracts Act

The Bluff Oyster Planning Group was representative of two long-standing, often opposing, forces in the industry: the fishermen and the owners. But anti-union legislation had by this time broken the power of the oyster catchers union and the two fishermens' representatives in the Bluff Oyster Planning Group had, through a variety of circumstances—political and economic—lost their work as oyster boat skippers. According to Union spokesperson Murray Black, the *Employment Contracts Act 1992* took away the bargaining power of the Union who were no longer able to either negotiate wages, or to discuss redundancy. With their feet knocked out from under them, the contribution toward management that the conservation-minded fishermen had enjoyed for at least the previous ten years (at the FSOAC and BOPG fora) was set to disappear. The conservation ethos would continue in the private lives and individual efforts of the fishermen, but as a political force within the fishery the Union and the conservation-minded fishermen were finished. Henceforth, what little power remains with the fishermen gets used in a somewhat covert struggle (negotiations on wages no longer have the public character of former times) for personal benefit rather than in support of the group and the fishery as a whole.

7.2.6 Summary

The analysis followed here is that management is a forum within which opposing social forces come together, and socio-political power relations are played out. The co-existence

of opposing elements contained conflict, but some of the achievements of FSOAC may have been due to this tension. Following the thread of this thesis, the most important character of the pre-QMS, period of the fishery was its inclusiveness. This inclusiveness produced the 1995 Draft Plan which was by far the best strategy to date for confronting the decline in the fishery.

The BOPG worked for two years, often meeting monthly during 1994 and 1995, to formulate the Draft Plan for the industry. However fundamental legal changes in the fishery—i.e. the introduction of the QMS—created uncertainty vis-à-vis future management of the fishery (BOPG 1996). The result was that the work of the BOPG, particularly the rules for collective action were never pursued by the industry. This squandering of social value (the expense of forming institutions for collective action is well documented in the literature) is a charge the QMS has yet to answer. The general lack of provisioning for management on introduction of the QMS was, in hindsight, extraordinary for an industry that boasted a long history of intensive management.

From the point of view of the Bluff fishermen, there is no doubt that management before the introduction of the QMS was far superior to post-QMS management. Fishermen state that conservation efforts virtually stopped after introduction of the QMS. For the recipients of ITQs on the other hand, management improved a great deal after the introduction of the QMS; the continual demands of the fishermen for conservation measures were eliminated. Generally speaking, judgements on the outcomes of the establishment of the QMS are thus relative to the socio-political position of those involved. In order to answer the research questions of this thesis, however, it is necessary only to describe how the fishermen think and feel about the changes in management brought about as a consequence of the QMS. But pursuing the research question to the formulation of a hypothesis does require that some comment be made on the fishermens' position. Some of the social consequences of the QMS are now evident. Exclusion of the conservation-minded fishermen from a central role in management is wrong from the perspective of social justice. But when the work of the conservation-minded fishermen with respect to the 1995 Draft Plan, is compared with the lack of any code of conduct in the fishery from the establishment of the QMS to the present, it becomes a case of the social impinging on the physical ecology of the fishery.

7.3 The New Zealand Quota Management System

Criticisms of the New Zealand Quota Management System are met with a little surprise in New Zealand. There has been quite a lot of positive comment in the literature (Yandle, 2001, 2003; Yandle & Dewees, 2003). New Zealand is considered something of a successful pioneer in applying a strict property-rights/market based-approach to fishery management. However two cautions should immediately be raised in regard to the application of the QMS to fisheries in New Zealand. The first is noted by (Hersoug, 2002), and is the fact that very little study has been made of the social consequences of establishing the QMS; the second is that there is a great range of differences between physical and social situations of fisheries in New Zealand. An offshore pelagic fishery may have very little in common with an inshore shell-fishery. Detailed study of the potential consequences of applying the QMS in each different type of social and ecological situation was really needed before imposition of the system generally throughout the country. Nothing of this kind was done in the case of the Bluff Oyster fishery. The parliamentary record reveals a striking lack of discussion on the Bill to bring the Bluff oyster fishery into the QMS. The concerns of Bluff fishermen spelled out in a letter to the Minister received no attention whatsoever (Union, 1995). It is something of a brutal approach to apply a one-size-fits-all solution, only to find out afterward what problems might arise. Nevertheless, this is what took place in the case of the Bluff oyster fishery.

With the introduction into law of the QMS in 1998, the Bluff oyster fishery entered a markedly new phase in its history. The QMS is hailed as a 'property-rights system' of management. But property-rights are a universal cultural attribute, probably present in every system of goods-sharing. Property-rights have always played a role in the management of the Bluff oyster fishery. In this context the historic licensing system together with the industrial contracts between employers and fishermen can be seen as institutions forming a set of property rights. These rights were formal and informal rights that included fishermen in the management of the resource. In fact it was on the basis of existing property rights that the new rights in the fishery Individual Transferrable Quota (ITQ) were assigned. The trouble was that only ownership rights were transferred to the new system. The right of management, also a *bona fide* property-right, which the fishermen had formally enjoyed since the creation of FSOAC in 1970, was eliminated

without compensation. And so it is necessary to qualify the definition of a 'property-rights system', to more fully describe what this term means in the context of the Bluff oyster fishery. If the term property-rights system refers to a system in which property-rights form an inviolable basis of the system, how is it that such a system can establish itself precisely through the violation of property-rights (i.e. the elimination of the fishermens' right to management)? Addressing such a question means examining the broader political and economic context within which the QMS operates. The institutions available for resource management (i.e. the tools of the trade), need to be considered in conjunction with the policy; political infrastructure; goodwill, and facilitation required to bring these institutions into effect.

7.4 Two levels of fishery management: central and local.

There are two important foci of management with respect to the Bluff oyster fishery, namely, the national and the local levels of activity. The national level subsumes the science associated with population surveys and population models. This is the main focus of the scientific management establishment, i.e. the Ministry of Fisheries in conjunction with its science provider, i.e. the National Institute of Water and Atmosphere (NIWA). The local level takes into account the traditional ecological knowledge (TEK) of fishers and is developed from contributions across all social groupings in the fishery. This grouping of management into national and local foci is a heuristic device rather than a strictly categorical analysis. Local fishermen take part in the population surveys directed by scientists from Wellington, and importantly, some scientists develop ideas that originate in the local culture.

An eco-systemic approach (i.e. insistence on the importance of oyster habitat), is gathering momentum in the establishment science associated with the fishery, but there is still a strong propensity for establishment science to concentrate on the oysters in isolation from their environment. If science can show the population to be at a certain level then it can also determine rates of exploitation to maintain or grow the parent population. It is this—not so simple—numbers game that has always formed the principal basis for the management of the fishery at the national level. In a filmed interview a Ministry

representative has said that, if necessary, the fishery can be made sustainable simply by lowering the quota (Bjorkman-Chiswell, 2008). The reduction of fishery management fishery to the determination of one quantity (i.e. allowable quota), must have some attraction for government; in a fishery ruled by a policy with an economic rationale, setting of quota is a little like the setting of interest rates by a national bank.

In his study of high-modernist interventions into human projects, Scott describes the way in which centralized control operates:

> Certain forms of knowledge and control require a narrowing of vision. The great advantage of such vision is that it brings into sharp focus certain limited aspects of an otherwise far more complex and unwieldy reality. (Scott, 1998)

The complex realities of fisheries must be understood by the Ministry. Is it correct that the Ministry of Fisheries of New Zealand has adopted a form of knowledge and control that purposefully ignores important aspects of the fishery? Or is it that the Ministry of Fisheries has simply not got the resources to do the work that is required?

7.4.1 National Level Management

The kind of management described up to this point has been local management. The Foveaux Strait Oyster Advisory Committee (FSOAC) for example operated to solve issues between a diverse group of highly practical people, on location. The dynamics at the local level have eclipsed a higher-level management, that has been present in the fishery all along. With the demise in local management, however, the central government apparatus becomes larger in presence. The gap left in local management by the demise of the pre-QMS management structure (i.e. FSOAC and the Bluff Oyster Planning Group), did not alter the general character of management *at the national level* in the years following introduction of the QMS. Consultation had changed dramatically but the fisheries science used to set quotas within the industry remained the same. The Ministry of Fisheries' structure responsible for the Bluff oyster fishery consists of the Shellfish Working Group (which includes a group whose purpose is to plan research), and a position of Fisheries Policy Analyst. The groups are based in Wellington, and the post of Policy Analyst is filled by a field officer in the Dunedin office of the Ministry of Fisheries. The combined efforts, and reports of these elements of a management team, are compiled, and submitted as advice to the Minister for Fisheries. The Minister is responsible under the Fisheries Acts

of 1996 and 1999 for the sustainable management of the fishery, and is empowered to set the oyster quota for the year and to close the oyster season should this be required for conservation.

Management of the Bluff oyster fishery in the years following the introduction of the QMS is difficult to determine. Where there were previously detailed documentary records carefully collected and available through the Seafarers' Union, the demise of the Union also meant an end to a clear history. Minutes of the Shellfish Working Group under the Ministry of Fisheries, although public, had to be applied for under the Freedom of Information Act. As it turns out the minutes did not record any of the discussions that took place at the meetings, and were consequently of little use. The contrast with information gathering at the local level is remarkable. At that local level one comes into contact with people with passionate interest in the fishery and its place in their economy. One receives personal and practical information delivered in concise and prosaic fashion. The information is informed sometimes by humour, sometimes by anger, but all contains rich personal meaning and all is vitally interesting. Contrast the local story as told by the fishermen with the general approach, and statements published by the Ministry of Fisheries (Fisheries, 1996). These are written in high-sounding, bureaucratic jargon, and are intended, one supposes, principally for the Ministry itself. The problems dealt with by the Ministry of Fisheries are not so much human as they are political; the fishery loses its character of a human system: men; women; boats; work, and smelly muck dredged from the depths, and becomes instead an abstracted attempt at public relations. If there is management of the fishery taking place, it is a management detached from the life of the fishery.

7.4.1.1 The role of NIWA

The National Institute of Water and Atmospheric Research (NIWA) has been noted previously as the principal science providers for the Bluff oyster fishery.[8] NIWA are contracted by the Ministry of Fisheries. NIWA also receive funding through the national Foundation for Science and Technology (FRST), and it is through this last source of funding that most of the eco-systemic research into the fishery (including anthropogenic factors) has been accomplished. NIWA go to some lengths to assert that they are not

[8] Reports (unpublished) by the independent marine scientist Bob Street form a second important source of science in the fishery. The Bluff Oyster Management Company contracted independent surveys in 1992 and 1993 by marine scientist Dave Stead. Stead's unpublished report is treated by (Cranfield and Michael 1999).

involved in the management of the fishery, an irony considering the extent of the knowledge and information they possess. Each research project and/or survey undertaken by NIWA is fully reported and its publications are generally available through the Ministry. The Ministry incorporates much of the information contained in the scientific reports in its own Shellfish Working Group reports which then become the main basis for discussions on management (here understood in the relatively narrow sense of calculating quota sizes) of the fishery.

Prior to 1996 much fisheries science was accomplished in-house by the Ministry (then the Ministry of Agriculture and Food—MAF). The creation of the new Ministry of Fisheries in 1996 resulted in a 'funder/provider split', through which the science arm of the Ministry was transferred to NIWA, with the Ministry remaining responsible for policy. The idea behind the funder/provider split is to make government more efficient by imposing a business model on the provision of government services. The term funder/provider split was very common in the political dialogue of the 1990s with some even calling it, 'funder-provider theology'. The 'reform' movement was still very much alive in the 1990s in New Zealand with numerous privatizations, and the continuing divorce of government from its, once extensive, ability in providing services (Kelsey, 1993).

NIWA had already been reorganized, as a result of reforms in public administration earlier in the 1990s from a department of government into a Crown research institution. However, the name Crown ought not to be confused as a government departmentt: NIWA has become a private corporation and is no longer an arm of government. This is important because one must consider the influence of the commercial imperative and the competitive research funding on the nature of the agency. Whether or not the commercialization of science in New Zealand has had an effect on management of the Bluff oyster fishery is a relevant question.

The way in which the work of the scientist Dr. John Cranfield is treated by the Ministry and NIWA may be relevant in a discussion of political bias. Cranfield was associated with the oyster fishery in Bluff for well over 30 years. During this time he has produced science associated with both the scientific method, and the traditional environmental knowledge (TEK) in the fishery. In very general terms the fisheries science is concerned with assessing oyster populations; TEK focuses on oyster habitat, and is inherently eco-systemic in approach. The oyster habitat studies of Cranfield and his colleagues at NIWA

have been published in prestigious international journals of marine science, but have been marginalized by the Ministry (Allan Frazer, pers. comm.). It is the oyster population information that the Ministry is mainly interested in disseminating. Cranfield, who has done more than any other scientist to demonstrate the extent of environmental modification caused by oyster dredging in Foveaux Strait, was seen as a threat by the oyster industry. In February 2004 Cranfield retired, though not without there being concerns that he was relieved of a place in the science community associated with the New Zealand Government for political reasons. Cranfield has since established a private consultancy in seafloor processes, and continues to make a valuable contribution to understanding the Bluff oyster fishery (See for example Cranfield 2007).

7.4.1.2 The Shellfish Working Group

Once a year a key document, produced by the Ministy of Fisheries Shellfish Working Group, is adopted by the Fishery Assessment Plenary of the Ministry of Fisheries—see for example: (Annala, Sullivan, O'Brien, Smith, & Varian, 2002). This document comprises stock assessments and yield estimates for all fisheries in New Zealand. The part of the plenary proceedings in which the Bluff oyster fishery is considered is entitled: Dredge Oyster (OYU 5)–Foveaux Strait (Ostrea chilensis). Some of the information reproduced each year in the document, is updated from the Ministry of Fisheries reports on stock assessment submitted by NIWA to the Ministry. See for example: (K Michael, Dunn, Andrew, & Breen, 2001). The Ministry's OYU5 document runs to approximately 35 pages, and completely avoids the issues of overfishing and the massive environmental impact of dredging that are the main concerns and interests of the Bluff fishermen.

The Ministry document focuses on oyster disease, and forecasts of population sizes so that a quota may be set for the year. At the national level at which the Ministry is working the whole of management seems to collapse into a narrow focus on oyster population surveys. One has to credit the Ministry position as logical and rational. If, for example, the total oyster population in Foveaux Strait is calculated to be 300 million oysters, and it is estimated that disease will kill 150 million of this stock; the 15 million oyster quota for the year which the fishers will take becomes almost a minor consideration compared to how many oysters will be killed by disease. The trouble with the population/disease reasoning is that it is abstract. The abstract reasoning of the scientists substitutes for a more immediate, practical understanding of the fishery. There is political reason for the abstract

approach as it takes the focus off the invasive, destructive reality of dredging of the Foveaux Strait oyster beds.

The Ministry's Shellfish Working Group meetings are public, but not in the sense of the participants having reasonable and appropriate opportunity to voice their views. The Shellfish Working Group meetings are held in Wellington, the most recent of these in the NIWA board room at Greta Point. The gathering consists of high-level fisheries officials and NIWA scientists. Industry representatives are usually present, and also occasionally a representative of Maori or environmental matters. The meetings are an opportunity to review the scientific reports relating to the fishery that might have been published in the period since the last meeting, and that underpin the advice to the Minister concerning the total allowable catch for the season. The meetings are not a place to critically examine the establishment approach to the fishery, or to voice social and political concerns.

7.5 The Ministry of Fisheries—Science and Policy

The real power to affect the Bluff oyster fishery rests with the Ministry of Fisheries whose decisions are based on long-standing traditions including particular ways of obtaining scientific advice. The difficulty here is that science is not purely objective. The remark of a veteran New Zealand politician on the appointment of a new Minister of Fisheries is relevant. His opinion was that the new Minister would be, "… quickly gobbled up by the industry". [9] Under political pressure the Ministry may be quite capable of taking a stand based on scientific convention (traditional scientific practice in the industry), even if it's the wrong stand, rather than to make decisions based on the traditional environmental knowledge of fishermen. This is particularly true if the fishers environmental knowledge might affect the industry.

Before the Quota Management System was instituted, the then Ministry of Agriculture and Fisheries had seemed a benign facilitator supplying unique expertise as only one component of a community of participants. With the introduction of the QMS one senses a switch in the Ministry from facilitator to QMS supporter. By introducing the QMS, the

[9] Otago Daily Times, Feb 25th 2004, "Reshuffle lands Benson-Pope in 'fish tank of sharks' ''.

government made a power-play that placed the Ministry in new and unknown territory. The Quota Management System is more than a simple set of rules for organizing a fishery. The implicit side of the QMS is a political ideology resembling that of neo-liberalism. Just as there is a need to separate politics from science—or at least recognize and honour both aspects in the discussion—so there is a need in New Zealand fisheries to be clear about whether the discussion is about institutions for management—the administrative tools—or whether the discussion is really a clash over political ideology. At the top levels of the fisheries bureaucracy the ideological side of the the QMS plays an important role, hence we hear of a 'culture change' over the past several years within the Ministry (Laurel Teirney, pers. comm.).

Some exploration of the ideological side of the QMS is necessary at this point. The Bluff oyster fishery had for many years been managed under a quota system. What is new, and important in the QMS is the way in which resources are shared—or not shared. A characteristic of neo-liberalism is a movement toward enclosure of what has traditionally been the public domain. At least one writer has described this process as the second great enclosure movement (Prashad, 2003). The first extensive enclosure movement was the privatization of the pastoral commons of the European peasantry beginning in the 17th Century. The modern enclosure movement is not directed at land, but at what have been, until recently, public services, and common goods—e.g. systems of public health; provision and ownership of water; clean air; education; systems of communication. Agreements on services and trade established internationally by fora such as the World Trade Organization are concrete manifestations of this. The QMS should be seen as part of movement toward enclosure of the commons, for it is from this context that it derives a rationale. QMS protagonists need something underlying and sustaining to which their efforts might be referred and this is provided by the vision of growth and economic well-being that are strived for under modern capitalism. Privatizing common goods and services creates private wealth and is justified by arguing that society as a whole enjoys the trickle down effect of the enclosure. The ideology suffers from the basic flaw of all ideologies in that it represents one group more that others; in this case, those standing to benefit most from enclosure. So in cleaving to a particular ideology QMS protagonists inevitably associate themselves with the group benefiting most from that ideology. The Ministry is caught in the contradiction of having to represent both fishermen and merchants, but having to do so within an ideology that is more favorable to the merchants.

Under the present regime, the Ministry faces constraints in managing fisheries in New Zealand. In the case of the Fiordland fisheries the Ministry has found itself in the embarrassing position of being unable to participate in the formation of a comprehensive plan for the West Coast fishery. This latter was a community effort in which the Ministry might have been expected to take part (Teirney, 2003). In the case of the Bluff oyster fishery, a hands-off approach by the Ministry increases the power of the owners in the short term, but will contribute nothing to the long-term sustainability of the fishery, which will require the participation of a wider community of interest. Again the Ministry is caught in the impossible position of trying to resolve the contradiction between the interests of the owners and its public role of stewardship. A way through the difficulty would be to acknowledge the ideological underpinnings of the QMS. If the Quota Management System could become only one of a number of administrative tools available to the Ministry instead of an ideal which the entire Ministry must adopt, then the Ministry might recover some freedom over the constraints it now faces. Property rights, which are at the heart of the QMS need to be treated, not as the inviolable basis of a sacrosanct ideology, but simply as institutions that can be changed or adjusted at any time as happened when the QMS was introduced.

7.6 Bluff Oyster Management Company

One of the tenets of QMS ideology is that in a privatized fishery the self-interest of owners will ensure that the resource is conserved. Management responsibility would ideally be transferred from the Ministry of Fisheries to the owners of quota. The Bluff Oyster Management Company (BOMC) was created as an association of quota owners, and the Ministry looked toward the BOMC to assume management responsibilities.

Management implies having a plan for the fishery, something that the Bluff Oyster Management Company has repeatedly been criticized for its failure to produce (McCarthy, 2003). A plan for the fishery had been meticulously formulated by 1995, but as has been described earlier the plan was not brought into effect by the BOMC once it came to enjoy exclusive management powers. In the eleven years since the Bluff Oyster Planning Group completed the Draft Plan which was then shelved, the fishery has operated without a plan,

and apparently without organized management (at least not a management that is open to public scrutiny or that consults the wider community). The Bluff Oyster Management Company did formulate a plan for the fishery, this was provided by a fisheries consultant from Christchurch, however, that plan was never brought into effect or made public. The reason for the non-implementation of the plan, according to the then BOMC Chairman, was that the Ministry of Fisheries failed to produce a firm statement on the form to be adopted for fisheries plans (David Skeggs, pers. comm.). However, there would have been nothing to stop the BOMC from attempting to adopt various management measures (i.e. applying its plan) within its membership, independently of the Ministry.

7.7 The QMS and Stakeholder Groups

In placing the management of the country's fisheries in the hands of quota holders, The Ministry should retain certain key responsibilities with which it is tasked in the Fisheries Acts of 1996 and 1999. The Ministry must set standards and oversee the management practices of the quota holders; it must also try to ensure sustainability of the fisheries through setting the level of exploitation (quota), and through ecosystem management. It is expected that the government and quota holders will cooperate to achieve these ends and that one way of accomplishing this will be through the formulation of fisheries plans.

This system of government and quota holder management does not include all those with rights in New Zealand fisheries. Somehow the Government will need to find ways to allow fishers, and other New Zealand citizens that may *not* be quota holders, but to whom the fisheries nevertheless belong in many important ways, access to the system. This means involving persons other than quota holders or the Ministry in the management of fisheries. The Ministry calls these others 'stakeholder groups'. Because the stakeholder groups are something of an afterthought or add-on to the basic system, the system lacks rigour in defining the membership of these groups, and in defining the extent of their powers under the system.

The Ministry has, nevertheless, identified three broad categories of stakeholder groups. These are: recreational; customary, and environmental groups. The recreational groups are represented by associations of recreational and sports fishers. These groups should not be

underestimated as the recreational fishing industry in New Zealand is large in monetary value, and is associated with a public right to fish that is jealously guarded as a 'birthright'. Recreational limits are generous enough that the recreational take may form an important part of a family economy. Customary fishers are primarily Maori fishermen and women.[10] Whether *non*-Maori groups who have had a long customary involvement in a fishery might obtain customary status is an important question for future consideration. In recent Government statements pertaining to the planned Sea-bed and Foreshore Act, customary groups are not limited to Maori, but might include other groups with long customary association with the sea-bed and foreshore. This could be an important precedent for the case of the Bluff oyster fishery and could offer the opportunity for fishermen to organize independently of the Maori customary stakeholder group. The recognized environmental groups in New Zealand are: The Royal Forest and Bird Protection Society of New Zealand; Greenpeace, and ECO. The latter is an umbrella group of environment and conservation organizations in New Zealand.

While the Ministry of Fisheries may be required by law to consult with stakeholder groups, it is unclear precisely how this takes place. In the case of the Bluff oyster fishery, notices are occasionally sent to the Bluff community (e.g. the Runanga) advising them of the Minister's position with respect to the fishery and usually inviting comment. Often the context of these communications by the Ministry to the community precludes any real input from local people, who see the important Ministry decisions (i.e. on whether or not to open the oyster season) as more or less a *fait accompli*. And while the local fisheries policy advisor may understand the community well and be sympathetic to the views of its members, distance from the fishery and the requirements of working within the fisheries bureaucracy do not allow an effective representation of the fishermens' position.

Consultation among stakeholder groups in the formulation of fisheries plans is recognized as a necessity by both the Bluff Oyster Management Company and the main science

[10] Maori rights to fisheries in New Zealand are well-established and much progress has been made in the past fifteen years in devising legal institutions that provide for Maori fisheries. A significant role for Maori in commercial fisheries in New Zealand was established through the Fisheries Settlement Act 1992 which allowed Maori 50% of the country's offshore fishing capacity. On the traditional side, and in recognition of the close relationship between Maori and the smaller scale coastal economies, provision is made in law for the creation of Mataitai or traditional take areas that may be governed by councils of local Maori people.

provider NIWA.[11] But what form might this consultation take? The word co-management has not yet surfaced in the discussions to date between the BOMC and the community, but co-management does appear to offer an opportunity to begin to resolve the many problems facing the Bluff oyster fishery. In a case study of co-management in the Paua (Abalone) fishery in South Island New Zealand, researchers Bathgate and Memon describe a number of problems with the consultation process. A working group consisting of Maori; the commercial fishing sector; the recreational sector, and environmental interests is described (Bathgate & Memon, 2000). This co-management group initially achieved a number of important management successes for the Paua fishery in area 5 (e.g. development of a harvesting code of practice; opening communication channels between competing interests; providing a forum for sharing ideas, and making policy recommendations). However, despite the several successes in the early years, the PAU 5 Working Group eventually ceased to meet, and so failed to deliver a long-term management solution. The primary reason cited for the group's demise is that it did not receive property-rights (Bathgate and Memon 2000). The wider social, economic and political context is also cited by Bathgate and Memon as reason for difficulties in co-management:

> The problems in ensuring adequate representation and community involvement in PAU 5 exemplify the difficulties facing any attempt to introduce cooperative resource management strategies into a highly individualistic and capitalist society such as New Zealand. Recent moves toward cooperative stakeholder strategies within fisheries management appear to be something of an enigma. Or rather, they reflect the inability of the purely commercial, individualistic approach of the market economy to sustainably manage marine ecoystems. (Bathgate and Memon 2000, p 257)

Bathgate and Memon correctly emphasize the importance of the effect of political ideology on the resource management framework, but are wrong to locate this problem in the New Zealand society as a whole. The problem Bathgate and Memon describe is located within the Ministry. It is the Ministry who have the power to advance co-management, and it is up to the Ministry to create an institutional framework that will allow this to be established.

Important as it is to recognize the different paradigms (epistemologies) within which various views on the fishery are situated, it is also important to be mindful of the various

[11] Meeting between the Bluff Oyster Management Company, the National Institute for Water and Atmosphere, and the Awarua runanga in Bluff on March 27th, 2004.

economic interests that are operating in the fishery, and the role of government in supporting and securing property-rights. It is the political agenda, i.e. the defence of a property rights basis for fisheries management that determines the extent and range of government's 'scientific' interest and concern with the fishery. Lip service is being paid by government to the participation of stakeholders, but unless the stakeholders possess well defined property-rights, so-called consultation is merely notification to the public of decisions made by the real power holders.

Despite the repeated requests by the Bluff Oyster Fishing Forum to participate in the official planning group for the Bluff Oyster fishery no invitation to participate in the most recent management meeting was issued. Word was issued by the Ministry days before the meeting stating its location. This ostensibly cleared the Ministry of the charge of excluding the local community. However, the meeting was held within the security of the Port of Bluff compound, rather than in the normal community meeting places (i.e. churches, town hall, marae, RSA etc.). Requests to the Ministry to contribute to the agenda of the meeting were ignored. With less than one weeks notice given of the meeting, and no opportunity provided to discuss the fishermens' concerns, the Bluff Oyster Fishing Forum were effectively discouraged from attendance.

7.8 Summary

The QMS is a system conceived in isolation and operated by a remote bureaucracy. It is not about oysters and people, it is about quota numbers and property-rights. The focus on a single variable, quota allowance, neglects the whole complex sphere of human and social relations within the fishery; as such the QMS is really a form of non-management at the very highest level. What management there has been is either completely private (and therefore inscrutable), such as the meetings of the Bluff Oyster Management Company, or high-level Ministry/science meetings at which a particular agenda (related to the quota setting process) is strictly observed, and at which local-level traditional ecological knowledge (TEK) concerns are not subjects for discussion. While the fishery and industry establishment have indicated the necessity of including a wider membership in fisheries

management, this involvement is certainly not for dealing with the social and political side of the fishery.

The Ministry's Shellfish Working Group analysis fails to capture the practical view of the fishery. The locals know that the present state of the fishery is the result of the massive cumulative effect of decades of intensive dredging; they have a gut-level, prescient knowledge that the fishery is in a state of ruin. However, not all of the Bluff community recognize the human impact on the state of the fishery. Denial of the destruction of the Foveaux Strait oyster beds permeates the industry from bottom (fishermen) to the top (scientists). The flip-side of this is that here is actually a great amount of awareness in the Ministry and in NIWA concerning the extent of habitat destruction in Foveaux Strait. NIWA's long-range research plans are certainly mindful of an ecosystemic approach to fisheries science, and are concerned with sea-floor habitat. Nevertheless, there is still a large gap or lag between the practical views of the conservaton-minded, and the bringing into effect of environmental rules for the fishery.

If ever there was a stratagem to avoid discussing the wider management issues relevant to the Bluff oyster fishery, it is the single-minded focus on the oyster disease caused by the parasite *Bonamia* as the major cause of problems in the industry. That *Bonamia* should figure large is understandable; hundreds of millions of oysters died in the epizootic of the early 1990s, sufficient to cause the oyster population to fall to critically low levels. Just as the fishery appeared to be recovering (aided by a three-year closure of the commercial fishery from 1993 to 1995), a new *Bonamia* outbreak was identified in the year 2000. The Bluff fishermen have no objection to the Ministry encouraging study of *Bonamia* and making it the focus of management measures, but not in isolation from the other main concerns. The fishermen believe that overfishing and environmental destruction have contributed to the prevalence of *Bonamia.* Moreover, while it is possible to do something immediately about fishing methods, strategies for combating *Bonamia* are virtually non-existent.

The locals know that the problem with the Bluff oyster fishery is a human one; it might be helped by scientific information, but it is ultimately a question of human attitudes and relationship with nature. What is needed is an institutional framework that recognizes these important aspects of the fishery. There should be a social and political forum in addition to the scientific one. At a fishery meeting organized by NIWA and hosted by the

Awarua Rūnanga in Bluff on March 27th 2004, NIWA it was stressed that the meeting could not deal with management. Unfortunately for the meeting, most of the people present were primarily concerned about what can be done about communicating their views and having these acted upon by fishery management. Scientific meetings are necessary, but if the participants need to deal with social and political issues this fact will overwhelm any discussion of the science. At the March 27th meeting science was the cover, but all parties (even the scientists) were actually engaged in politics—though this is was far from clear at the time. Because of this confusion, science suffers the fate of being perceived as a political tool rather than a means of communicating understanding.

When the QMS was introduced to the Bluff oyster fishery in the mid-1990s it replaced a system of management that was much more inclusive than that now practised. A fishery management system that was a model of co-management providing several key checks and constraints, was abandoned in favour of a system that has only exacerbated the tragedy of overexploitation associated with open access. Theoretically, the free-for-all of open access fishing is prevented by the establishment of private-property rights; in the case of the Bluff oyster fishery, imposing the QMS had the opposite effect. The BOF was, and still is, an open access fishery. ITQs have done nothing in the case of the BOF to avert the tragedy of the commons. Almost the only remaining management technique is that of setting quota, and it is very difficult to avoid the fishermens' conclusion that each year the quota simply follows the population decline of the oyster. A number of leading Bluff fishermen believe that the oyster merchants, who currently hold the property-rights in the fishery, and who own the Bluff oyster fishing fleet, are locked in a competition among themselves that represents the final stage of the fishery's demise, the destruction of the last remaining breeding stock of oysters. I accept the fishermens' position under the logic of the *precautionary principle*, and argue that a reversal of the theoretical workings of the QMS described by the fishermen has occurred because of a failure by managers to consider important socio-cultural aspects of the fishery.

8 Discussion

8.1 Assessing the Bluff Oyster fishery in terms of common pool resource management theory

A central question, of this study is whether common property management theory might contribute to the sustainable management of the Bluff oyster fishery. The Bluff fishery as a case study is both enticing and off-putting in this respect. It possesses several important features of a commons management system, while presenting a history of conflict and exclusion that would seem incompatible with governing a commons. It is usual in common pool resource (CPR) studies that one seeks to understand, encourage, or to protect the rights of a user group to self-govern and to perpetuate their economies. Often these groups are admired for their strong relationship to place and traditional environmental knowledge. In the Bluff oyster fishery, however, it is currently owner/managers who are removed from the fishermen by way of wealth and occupation that are the dominant power in management.

The 1995 Draft Plan for the Bluff oyster fishery notes, among several other problems: distrust between sectors; poor communication between sectors; lack of involvement by all sectors in decision making; blaming other parties; historic bad relationships, and misinformation or mistaken interpretation of messages. Nevertheless, the fact that the 1995 Plan described these problems indicates a high level of potential for resolving them—awareness being the first step in the process of change. High levels of conflict must not be allowed to overshadow the co-operative achievements of the industry. There have been occasions throughout the recent history of the fishery when opposing sides have spoken with one voice. The 1995 Draft Plan for the fishery is perhaps the best example of opposing forces combining to produce a first-rate result. In the case of the Bluff oyster fishery, this positive, sustainability-building result (i.e. the 1995 Draft Plan for the fishery) was not produced through a simplification or a rationalization of the fishery, but was developed through a richness associated with conflict and complexity.

The introduction of individual transferable quotas (ITQs) to the Bluff oyster fishery represented a rationalization of the property-rights holders in the fishery, and led to simplification through elimination of opposing parties, in management. However, the changes have undermined sustainability particularly when the social aspects of sustainability are considered—i.e. dispossession—and no indication has followed that the problems of commons management have been successfully addressed.

How exactly did introduction of the QMS cause changes in the management of the Bluff oyster fishery? A technical explanation can be found in examining the property rights that existed before and after the introduction of the QMS. In the analysis that follows the words access; management, and transfer indicate certain rights associated with different forms of property. *Access*, for example means the right to participate in the fishery to some extent, depending on what other rights are held. For an explanation of the use of, and the background to this analytic terminology see (P. D. Knight, 2002; Elinor Ostrom & Schlager, 1993; E Ostrom & Schlager, 1996).

Under the licensing system both owners and fishermen had *access* to the fishery, and both had *management* rights in the fishery. These rights were not necessarily *de jure* rights but they were *de facto* rights. They had been developed over many years into an informal, traditional common pool resource system. Upon introduction of the full QMS system, (including the establishment of individual transferable quota), the owners obtained the right of *access*; the right to *manage*, and the right to *transfer* their interests. But, the new system took away much of the *access* to the fishery that the fishermen previously enjoyed while at the same time almost completely eliminating their rights of *management.* Neither fishermen, nor owners had previously held the right to *transfer*, or the right to assign new rights in the fishery. This latter was, before establishment of the QMS, the exclusive right of government.

Many fishermen, among them key conservationists and members of the Bluff fishing community, that have volunteered a great deal of time throughout their working lives to fishery management feel effectively excluded from a continuing role in the fishery (interview data). I have chosen the word *feel*, in this context quite carefully. This is to avoid an argument with the Ministry over whether or not fishermen have the opportunity to participate in management of the fishery (*cf Sec*. 6.1.3.7). There can be no doubt over the feelings of the fishermen in this respect. “We don’t run the fishery, it’s run by

scientists in Wellington", was the unsolicited comment of the top currently fishing oyster skipper. It should be noted that fishing skippers are invited to certain management meetings, where they occasionally provide input to discussions. This, however, under the eye of their employers, and in a forum strictly dominated by the official standpoint of NIWA and the Ministry (*cf Sec 6.1.3.5* and footnotes corresponding).

The turning of oyster licences into property-rights was accomplished by the government through the exchange of the original oyster licences for individual transferable quotas (ITQs). The licence to catch oysters, which had once been a privilege that the government was able to withdraw, has now become an exclusive right granted in perpetuity. According to theory, conservation of the fishery under the new system will take place through the self-discipline of owners protecting their longer-term interests. The government retains the power to set quota under the ITQ system (including the power to close the fishery), but also engages in negotiation over quota levels with the quota holders. Other stakeholders may be admitted to these negotiations, but in practice the new system affords much less access to the Bluff oyster fishermen than they enjoyed during the years when the Foveaux Strait Oyster Advisory Committee met regularly in Invercargill (Interview data.). Natural justice should have awarded the Bluff oyster fishermen, to whom the oyster fishery had belonged in political, social, and moral senses for well over a hundred years, a share in the legal ownership of the fishery. Yet they received nothing. The government argued that the QMS would bring conservation to fisheries, yet conservation of the society and culture that had previously included fishermen in management did not enter into the calculations. With elimination of the fishermen, the government also eliminated the best plan for the conservation of the fishery (the Code of Practice or Plan formulated by the Bluff Oyster Planning Group in 1995).

The Bluff Oyster fishery presents an important case study among the great many that now form part of the burgeoning literature associated with common pool resource systems (CPRs). The Bluff fishermen will say that their fishery is a failed CPR example, based on the declining productivity and unsolved social problems described in this thesis. The theorists of CPRs have attempted to describe the properties of successful CPRs using tools of institutional analysis and design. The design principles for sustainable regimes, described in (Buck, 1998) include the following:

- Clearly defined boundaries
- Operational rules congruent with local conditions
- Collective choice arrangements
- Monitoring
- Graduated Sanctions
- Conflict resolution mechanisms
- Rights to organize regimes
- Nested enterprises

The above institutional building blocks derived from empirical study of many successful and non-successful CPRs are unfortunately of little use in studying the case of the Bluff oyster fishery, which fails to pass certain elementary conditions necessary to the functioning of a common pool resource system. The basic conditions are that an inclusive and democratic spirit prevails, and that a common understanding based on practical knowledge is available. This thesis ought by now to have demonstrated why the conservation-minded fishermen of Bluff believe these conditions do not exist. Furthermore the thesis may have gone some way in convincing the reader that the reasons for this are social ones. The argument will be raised that a common pool resource system cannot possible include everyone and that some degree of exclusion is inevitable. Property-rights have the function of helping to define who the legitimate user group of the CPR will be. In this case the problem is one of coming to terms with who is the legitimate user group. With the bringing into force of the QMS in New Zealand property-rights were decided based on the catch histories of fishers. Such a 'thin' analysis, neglectful of social issues, when applied to the Bluff Oyster fishery had very serious consequences. In the section that follows a case is made for the assignment of property rights based on social and cultural criteria in addtion to legal ownership.

8.2 Ownership and Belonging[12]

About fifteen years ago, Jim Roderique, now eighty years old, and a Bluff fisherman all his life, had an encounter with the late Stan Jones, one of the Bluff oyster fishery's influential oyster merchants. A newspaper article of that period had appeared in which Jim had warned of the destruction of the oyster environment caused by the use of heavy oyster dredges (Murphy, 1992). The article elicited the following exchange of views,

"You keep your bloody nose out of it", Stan told Jim, and then continued, "We merchants own the Foveaux Strait."

"The Foveaux Strait belongs to the people of New Zealand", Jim protested, "and what about the future generations?"

"What have they done for me?" Stan replied.

"You bloody prick, they're not even born yet!" was Jim's reply (Interview data).

Jim Roderique's and Stan Jones' use of the terms *own*, and *belong* is deeply meaningful. The word *belong* speaks to a fuller relationship between people and their local resources than does ownership. Ownership also requires some explanation. The Bluff oyster merchants are imbued with a strong sense of ownership. Their claims to exclusive rights in harvesting and managing the Bluff oyster fishery are based upon the ownership of individual transferable quotas (ITQs). ITQs are equivalent to property-rights, and so the term ITQ carries with it connotations of the *fee simple* exclusive enjoyment of private property on land. The problem is that the powerful connotations of exclusivity associated with ownership carry more weight than do other rights, including those of participation by those who do not possess ITQs. Stakeholder groups may have some ill-defined management rights under the Fisheries Act 1996, but these don't measure up to the much better defined rights of ownership associated with ITQs (P. Knight, 2004). Are the connotations of exclusivity and ownership associated with ITQs excessive? Neither the

[12] Much of the material in this section of the thesis appeared in Knight, (2007), *Ownership and Belonging in the Bluff Oyster Fishery of New Zealand*, Maritime Studies (MAST) Vol. 5, No. 2.

seabed nor the oysters, in their wild state, are owned by the ITQ holders. The owners possess only the right to harvest a certain quota of oysters within the sustainability criteria set out in the Fisheries Act 1996.[13]

The word *belong* is used here to describe the relationship between people and the fishery because it represents a concept powerful enough to balance that of ownership. Belonging connotes relationships between people; between people and place, and between people and resource systems. It also contains the social and moral foundation necessary to the popular legitimacy of property-rights. Furthermore, belonging implies an object or entity to which one belongs. Just as property-rights have an object, something one owns, so belonging implies something one belongs to. Community is one important object of belonging. At a higher level, it is culture that is the object of belonging.

One reason why there has been so little recognition of the Bluff fishermen in recent fisheries management is that, lacking a structured organization, the fishermen are presumed, conveniently for the purposes of management, not to exist. As well as providing a concept that can balance the excessively important idea of ownership in the theory of managing the Bluff oyster fishery, elaborating the idea of belonging helps demonstrate the existence of the community of fishermen in Bluff— a community that is presently ignored in managing the fishery.

There are three aspects of belonging that have been described in this thesis. The first is an association of belonging with fishermens' knowledge. Belonging brings with it a practical knowledge which is important in that it differs from the dominant form of knowledge that prevails in management of the fishery. In describing fishermens' knowledge an important characteristic of belonging is revealed. At the same time the community that holds this knowledge is also made known in fishery management circles. Another aspect of belonging investigated is the link between belonging and social discord. For people in Bluff, fisheries management theory and practice are lived out in the realities of daily life. A characteristic of belonging, therefore, is participation in the social disputes that result from perceptions of unfair sharing of the resource. The differences between merchants and fishermen are important in this respect because they describe a culture in which people are engaged on a political level. If a community is defined by its knowledge then it is also defined through its social and political struggles, and asserting their positions in these

[13] See also the Fisheries Ammendment Acts 1998-99.

disputes is one of the basic characteristics of a community. It is extremely important in any fisheries management decision to take into account the social political antagonisms that characterize a fishery such as those not currently acknowledged in the Bluff oyster fishery.

A third aspect of belonging implicit in the study of the history of management of the fishery is an association between belonging and fishermens' culture. The culture is represented in the unique way of life that has developed over a hundred and fifty years of Bluff's fishery history. There are probably many aspects of the fishermens' culture that are relevant to the theme of belonging, but the focus in this thesis is on the fishermens' moral sense. The word moral is used here not in the narrow sense of adhering to prescriptive rules, dos and don'ts, although these may result, but rather in a wider sense of responsibility to the fishery and the behaviour and commitment that goes with that responsibility. The deep moral values of fishermen, expressed in their long history of conservation-minded activity, are as important to the health of the fishery as fishermens' knowledge.

The goods of the Earth are shared through the institution of property-rights. They have existed in one form or another from time immemorial—there is nothing new in the idea that such rights are a key requisite to sustainable resource management. In the case of the Bluff oyster fishery, property rights are embedded in the culture of the commons (Jentoft, McCay, & Wilson, 1998). One does not own the culture of the commons, one belongs to it. If property rights are detached from the commons, a form of ownership is created that is incompatible with the culture of the commons. In so doing the whole socio-ecological system is put at risk. The system cannot run well on a concept as narrow as ownership alone. The change in management represented by the QMS did not introduce management based on property rights, it changed the nature of previously existing property rights from rights associated with belonging to rights associated with ownership. This is not managing the commons, it is a form of enclosure. Care must be given in introducing rules (institutions) that are in harmony with the spirit and character of the commons.

Addressing the social side of the Bluff fishery means addressing the question of disposession that has not so far received attention from the Ministry of Fisheries. The dispossession of fishers and their families needs to be formally recognized and compensation discussed. Moreover, management of the fishery must reconnect with the practical knowledge of the Bluff fishermen, both those dispossessed and no longer fishing,

and those still oystering. In order for this to happen a democratic fishermens' association with legal status must be included in the management structure of the fishery. The common property rights superseeded by the QMS included more than rights of participation in management; they carried with them the very essence of the fishery in a socio-cultural sense. There is a practical knowledge, a way of life, including a strong moral sense, that is part of the legacy of the fishery, and it is this legacy that should, as it did in the past, inform the management of the fishery. The history of the fishery up to 1996 covers a period in which many mistakes were made. What is needed is the capacity to learn from these mistakes. This capacity lies in the socio-cultural capital associated with the fishery. The mistake is to operate at the level of property-rights without simultaneously studying the culture. Property-rights are a powerful institution, but they must not be wielded in isolation. They are embedded in the fishing culture, and until it is understood how firmly they are embedded, and to have fully honoured the deeper concept of belonging, management based on property rights will not work the way the theorists had postulated.

8.3 Cultural Survival—socio-ecological systems

Cultural survival is an anthropological concept introduced in the context of indigenous societies, but which may have important application for the survival of indigenous-like cultures within contemporary society. Together with human relationships, relationships with the natural world and with particular places provide meaning in life. When relationships with the natural world include a direct dependence and sustenance, as is the case when food and other goods are collected almost directly with one's own hands from the local environment, there exists, what I term, a primary economy of place (PEP). I argue that primary economies of place are indigenous-like, and believe the analogy is particularly applicable when, as in the case of the Bluff oyster fishery, wild food is being gathered. Such economies, when practised in sustainable ways, are uniquely interesting for those studying the morality of life sustaining processes. Primary economies of place are socio-ecological systems within which people are involved in relationships that give deep meaning to their lives.

For decades in the West, and particularly since the dawning of an awareness of a global environmental crisis, writers have looked toward indigenous cultures as an inspiration in right-living and right-attitude *vis à vis* the natural world. And there is more to it than simply protecting the environment. Long-term relationships with place, (and in the case of indigenous people these can amount to tens of thousands of years), may produce a depth of knowledge that has as much to do with human potential for life as it does appreciating and helping to sustain nature.

Primary economies of place need not be tens of thousands of years old to begin to share in the possession of a knowledge heritage and to merit a stance of respectful, expectant inquiry on behalf of the researcher. In his book *The Unsettling of America*, Wendell Berry describes the loss of knowledge that accompanied the disappearance of family farms as the foundation of the rural economy in the United States (Berry, 1977). Berry signals a deep cultural loss as a result of abandoning a relationship between humans and nature that was vastly superior in moral and other ways to the relationships inherent in the industrial organization of food production that succeeded it. Berry's life and work exemplify the culture he has seen disappearing in rural America and the importance of his writings both fictional and non-fictional serve as examples of the idea of cultural survival relevant to this thesis.

In Hargreaves photo essay *On the Next Tide* (Hargreaves, 1998), a kind of folk record, of inshore fishing in New Zealand is presented. The work is beautiful, but poignantly sad in that it captures what is explicitly described as the disappearance of a fishing culture. Is this disappearance inevitable? How does one judge what is simply natural attrition and change, and what is a foolish squandering of cultural heritage? What is it exactly that must be valued, protected and transmitted in the way of our cultural knowledge of primary economies and place? These are the basic questions on which this thesis bears.

Three ideas follow from the statements of the primacy of certain resource systems. The first is that the involvement of people is organic, meaning that people are an integral part of the system, and on equal footing with any other component; in fact there is no hierarchy of belonging; the resource system must include the people along with everything else. The second is that people are an active part of the resource system. The system depends upon the intelligence, the choices, the energy, and the will of he people involved to see that the system will be maintained, and enhanced. The third idea is that a conscious attention needs

to be brought to bear on the first and second points by all those involved. This conscious attention might be termed resource management, though it should be made clear from the start that resource management is a weak term that fails to capture the organic quality and self reflection of people maintaining their relationships with each other and the natural world. Neither does the term resource management capture the responsibilities inherent in the relationships of the people belonging to the resource system. Hence a new term is required that will express the need for and the importance of understanding how people go about looking after their primary economies. In this thesis there is an attempt to record the opinions and concerns of the Bluff oyster fishermen on this subject which is fully present in every aspect of their lives.

8.4 Ideological influences—modernism and neo-liberalism

The recent history of the Bluff oyster fishery has to be read against the background of the national/international political situation. This situation, known in New Zealand as 'The Reforms' is profoundly anti-democratic in the sense that governance involves many less people than previously in the political arena; the demise of trade unionism is one side of this containment, the number of people employed by government is another. The viewpoints of those remaining in political power are consequently also narrower in range.[14] Because the QMS is embedded in a larger political system it is likely that the system will affect the outcomes attributed to the QMS. Just how much the results are due to the QMS alone, and how much they are a consequence of the combined system needs to be worked out. The post-QMS period eliminated socio-political conflict from within the core fishery management forum, because it eliminated the fishermen from this forum. In doing so it replaced healthy conflict with an unbalanced attitude toward exploitation, while at the same time overshadowing the fishery by social injustice.

In the case of the Bluff Oyster fishery advances in fisheries theory and policy such as those advocating co-management and participation of fishermen are acknowledged in theory, made part of the rhetoric of management, but co-opted in practice to become part of the

[14] The concentration of political power in New Zealand is meticulously documented in Jane Kelsy's 1993 book, *Rolling back the State : privatisation of power in Aotearoa/New Zealand*.

top down, industry focused, exclusive process fishermen have been struggling with for generations. Why, one might ask, is there a reluctance to examine the social consequences of the QMS and why might the system as a whole not be open to question or to change?

Part of the answer lies at the highest levels of government administration. One is not always aware of the political and economic beliefs that underpin access to and distribution of resources within society. Hersoug's book on the New Zealand Quota Management System takes its title from the rallying cry of one of New Zealand's most zealous political 'reformers', and therefore—perhaps only unconsciously—links the Quota Management System with the neo-liberal political agenda.[15] Hersoug wrote his book while attached to the Ministry of Fisheries in Wellington and though he is aware of the existence of social consequences brought about by the QMS, one might surmise that he is too cautious politically to bring into question the overall social justice of the system, or to include any of the social effects of the system in his research.

ITQs are a legal/administrative concept, but fisheries policy requires an explanation, a theory, some kind of structure around which the concept might be developed. But this is where things become difficult to assess. The idea that the assignment of permanent property-rights will lead to good stewardship on the part of the owners, who, as rational actors, are bound to protect their property, is a belief accompanying a particular ideology, but it is not a scientific fact to use as a basis for the entire management rationale of a fishery (Rees, 2006). To compensate for this weakness, QMS proponents refer to the economic ideology of neo-liberalism believing it fits in with the way government is headed these days. But to refer back to neo-liberal economic thinking, means falling prey to all the contradictions of that thinking. Hence the contradiction between democratic ideals (i.e. sharing wealth and power), and the profit motive of neo-liberal capitalism. Government, caught within this contradiction, has ended up by doing nothing. Not one of the critical issues of social and environmental justice, expounded at length in this thesis, has yet to be addressed.

[15] Hersoug, B. (2002). Unfinished Business: New Zeland's experience with rights-based fisheries management. Delft, Eburon. C.f.: Douglas., R. (1993). Unfinished business, Random House New Zealand.

It cannot be ascertained whether the historic institutions for collective action under which the Bluff oyster fishery operated were sustainable because they were changed precisely at the point in time at which they faced their greatest challenge. There is no doubt that historical management of the fishery could be classed as mis-management, in that the far-reaching environmental consequences of the fishery have never been addressed. This was, however, not caused by institutions *per se*, as it was caused by the mindset (or the lack of mindfulness) of the participants in the fishery. Some institutional change may have been necessary in the management of the Bluff oyster fishery, and individual transferable quotas may have been a necessary and appropriate institution to apply. However, ITQs do not provide an answer to the central management problem of the fishery, which is the exclusion of important points of view. Sustainable management requires a common view of the fishery, independent of the justifications and rationalizations that are a result of self-interest and collective denial. These are problems of human understanding and communication which can be addressed only in an open forum. ITQs have not resulted in changing management of the Bluff oyster fishery because it was the thinking of key people with power in the fishery, and not the institutions that needed changing.

There is much empirical evidence now emerging from the current literature on the commons showing that people are generally clever and cooperative, and can find solutions to difficult human problems including husbandry and fair sharing of resources. Furthermore the longer a social grouping has worked on a particular problem the better their solution is likely to be. This is one reason for the great interest in indigenous knowledge; it draws, in some cases, from thousands of years of refinement. The Bluff fishermen, who boast a 150 year history of oyster fishing should be able to find their way through the present fishery crisis, and save their fishery for future generations. What then is lacking? The technical answer to the question lies in property-rights. Fishermen lack the property-rights they need, in this case, rights of management. It will be strongly argued, however, that there are quota holders who do hold management rights in the fishery. Are they not clever and cooperative enough to be able to manage the fishery? The answer to this question lies deeper than the property rights approach. It is necessary to think a little more deeply than a strict property rights analysis will allow. There is a need to turn to the wisdom inherent in the culture of the fishery. A solution needs to spring from the complete historical complex rather than only a part of it. A very serious mistake on the part of the Ministry was to apply property-rights theory in the form of the Quota Management System

throughout the country's fisheries without taking into account the widely different settings in which it would be applied. Success in a few areas has come at the expense of others. And through a scientific concentration on the fish themselves rather than the human/fish ecosystem, enormous cultural losses have taken place. Who, at the time of the introduction of the QMS thought of the preservation of fishing culture? Even today the Department of Conservation works hard to preserve a natural and historical heritage, but ignores present-day living societies. Conserve the animals, yes, but in isolation from the people who have had longstanding relationships with those animals and the larger natural environment.

In his book 'The Moral Dimension', Amitai Etzioni decries a purely rational approach to economics (Etzioni, 1988). Theories of resource management are based on what is believed to be the rational choice decisions of individuals, but without allowing for the possibility that individuals might choose to modify their self-interested behaviour for moral reasons. While overlooking the moral dimension at the individual level it is also overlooked at the level of the whole culture. The Bluff oyster fishing culture possessed a group morality that is still evident today in the conservation-minded fishermen who have contributed so much to the arguments found in this thesis. The Government of New Zealand has failed the Bluff oyster fishery because of an unfair division of property-rights under the QMS. But the reason that unfair division has led to the final destruction of the fishery is not an issue of abstract moral justice, but the fact that the conscience of the fishery, its moral voice, was silenced by the QMS.

One of the findings of this thesis is that inequitable distribution leads to bad management of a resource. Management may be better when rights to a resource are distributed more widely. There are many ways in which property rights can be separated or combined. *Management* rights are property rights—though not as complete as those rights associated with ITQs, which also include the right to exclude others. Much could be done to improve the inequitable distribution of property-rights that was caused by the introduction of the QMS into the Bluff oyster fishery by restoring the rights of Bluff fishermen in managing the fishery.

9 Conclusion and Recommendations

Two well know issues are at the forefront of human endeavour at this time. These are: preservation of the environment, and equitable sharing of resources. A third, perhaps equally important imperative, is present in the current study: This is the necessity to preserve human cultures, and in particular those that are unique and closely related to the natural economy of the local environment. Preserving or defending human culture is often a case of social justice. If there is one point that must be made in the context of this thesis, it is that management of the commons must take place within an environment in which social justice prevails. Or, worded differently, if there is no social justice then there can be no environmental justice, nor any pretence of good management.

It is the fishermen who possess what is known in Bluff as practical knowledge. But it is the owners who in the long term prevail in the management of the resource. This has caused a steep decline in the fishery, and in the Bluff oyster fishing culture—a situation that can only be rectified by restoring the participation in management of all those belonging to the Bluff fishing community. Ultimately, sustainability in the oyster fishery should include human as well as biological concerns. As Curtin points out, it is not enough to save the tigers if you have to destroy the culture of the forest people in order to do so (Curtin, 1999). A premise of this work is that environmental and social justice ought to be considered inseparable. The oyster fishing culture is therefore as worthy of protection as the oyster beds themselves. The immediate effort is to study the way the fishery has been managed. The deeper aim is to try to portray the contribution that the Bluff oyster fishing culture—as represented by the Bluff oyster fishermen—has had in the conservation of the fishery, and what role it might play in the future. Perhaps the biological survival of the oyster is more closely tied to the cultural survival of the fishermen than is presently suspected. When fishermen struggle to conserve oysters they struggle at the same time to conserve their culture. There are many multi-generational fishing families living in Bluff. The combined environmental knowledge and relationship to place of the Bluff fishermen might be styled indigenous in its richness. A management system for the Bluff oyster, fishery must fully include the knowledge and experience of these people.

The answer to what went wrong in the management of the Bluff oyster fishery is that fishery management cannot be based solely on property-rights. Property rights have to be accompanied by other institutions that will ensure the co-operation of a wide and knowledgeable community. The Bluff oyster fishery has had, through its entire one hundred-and-fifty-year history, clearly defined property rights. Rights to catch oysters had always been tightly limited and jealously guarded. Hence the introduction of ITQs did nothing to aid in clarifying property-rights. The unfortunate effect of the QMS was that previously existing institutions for cooperation between rights-holders were eliminated in favour of a too-thin adherence to the idea that property-rights would automatically protect the longevity of the resource under the QMS. Future directions must now be concerned with trying to re-establish those institutions for cooperation that the fishery previously enjoyed. It is in the socio-cultural capital associated with belonging that the missing links to building a sustainable resource system are to be found.

Historically, managing the fishery was a balance between opposing forces with fishermen consistently supporting conservationist strategies while the merchants continually promoted exploitation. When the fishery was brought into the QMS it was not simply a question of downsizing—which is what the depleted stocks required—instead the essential character of the fishery was changed. The Oystermen's Union was practically eliminated, and with it, the most positive means of expression the fishermen had in the fishery. Today only the exploitative side of the fishery remains: without equity, without checks, and ill-suited to the responsibility of managing a commons. Excluding fishermen from management thereby forcing them into the role of protestors has served to raise public awareness of problems in the fishery, but has done nothing to directly address conservation issues. At the time of writing the 2008 oyster season has just opened; the daily catch in sacks might average 20 sacks compared to 70 sacks which was the average before the decline set in. This has increased slightly from the previous year when catches of only 10 sacks were common. The conservation-minded lament the fact however that as soon as a little recovery may be indicated the fishermen continue to practise unabated exploitation that can only result in a further demise. The pattern of serial depletion described in Chapters 3 and 5 continues.

Though the Ministry is consulting the larger community, this consultation is somewhat ad hoc; the role of those consulted lacks an official cast, or a legally sanctioned role in the

management of the fishery. The Ministry together with the Bluff Oyster Management Company, and the National Institute for Water and Atmospheric research (NIWA), dominate the management and scientific approaches to the fishery respectively. The Bluff community is not organized, and individual voices, while compelling, have no actual effect on management. Murray Black is one of the most outspoken of the oystermen and represents the thinking of an important group of conservation-minded fishermen. He believes that the fishery is being dredged to the last oyster. His opinion is based upon close observation of catch rates which he believes are so low that there are no longer enough oysters left from which the fishery might recover in the future. "At the end of the day …", Black says, "… the evidence is on the deck of the boat". This practical assessment of the fishery, referring to the very low catch rates experienced in recent years, is at odds with the official position represented in reports from the Ministry of Fisheries, and with a recent press release by the Minister which states: "Fishing is believed to have relatively little influence on the beds given the losses to *Bonamia* … The reduced commercial catch limit will help ensure that the fishery recovers as rapidly as possible once the disease has run its course (Benson-Pope 2004)."

The focus of the Ministry reports and the scientific investigations performed under contract to the Ministry is on oyster disease, and on the counting of oysters for the purpose of calculating yield of the fishery (Dunn, 2004; Keith Michael, Dunn, & Forman, 2004). It is a narrow focus which comes from a long history, solidly entrenched, and not without political support. The BOMC find themselves reasonably well served under the Ministry/NIWA approach. They do not, for obvious reasons, support the more conservationist approaches of: the environmental movement; some customary users; the Oystercatchers' Union, and a number of important members of the local community who are representative of conservation-minded fishermen and their families in Bluff.

For several years an eco-systemic approach with a focus on oyster habitat has been gaining momentum. It is becoming accepted by the scientific community that the issue of oyster disease cannot be addressed in isolation from the issue of habitat destruction. Fisheries Advisor Rose Grindley states, "The potential for adverse impacts on the seabed from dredging is widely recognised." Grindley goes on to state that the problem is one of determining, "… what level of dredging is appropriate." (Grindley, 2004). It is clear that dredging is much too destructive to be allowed to continue in an uncontrolled manner.

However, it appears that the industry intends to continue oyster dredging without establishing formally sanctioned management measures that address the major social and environmental problems facing the fishery. It is therefore up to those outside the present management structure to advance a sustainable approach to the fishery, one in which humans are included in the ecology of the fishery, and one in keeping with the precautionary principle embodied by NZ fisheries legislation. The following conditions will need to be met:

1. In general, greater recognition should be given to the Bluff oyster fishing community's way of life and body of knowledge in all management decisions affecting the oyster fishery. This might be accomplished by making a community group such as the Bluff Oyster Fishing Forum a recognized stakeholder in the fishery under the QMS.

2. The community should be represented at meetings to discuss management of the oyster fishery.

3. Formal property-rights in the fishery must be accorded to the wider community, but these may be limited to rights of management and access.

4. The community should be empowered to approve, or not to approve of management measures.

5. The 1995 Draft Plan for the Bluff oyster fishery, created by the Bluff Oyster Planning Group, should be re-tabled and made the basis for future management plans.

The Quota Management System (QMS) is probably here to stay in New Zealand fisheries management, and so ways of working within and around the system to rebuild and vitalize the local inshore fishery economies is needed. The QMS is partially responsible for the decline of much small-scale, local fishing culture (Hargreaves 1998). Fishers will need to stand up to the bureaucrats and scientists, produce arguments and win powers in the system. They must attempt to change a management system i.e. the QMS that places quota holders closer to the centre of the system than they are themselves.

Attention needs to shift away from trying to influence government policy, away from

criticizing mismanagement of the Bluff oyster fishery by those in power, and refocus instead on all that is important in the fishery, namely the fishing people, the fishing culture, the place, and the community.

During the writing of this thesis, the interest has shifted from the environmental struggle to conserve the resource, to the cultural struggle on the part of the fishermen to preserve their way of life, and a body of knowledge. A lot has been made of fishermens' knowledge in recent times, and yet this is only one aspect of fishermens' culture and society. What is needed are creative ways of recording, exploring and celebrating as much of the Bluff fishing culture as possible. Culture and society, these are the neglected subjects without which management of the Bluff oyster fishery cannot move forward, but they are also important in and of themselves, for it is through them that one learns of the diversity, independence and freedom inherent in the economy of a local fishery.

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Appendix A

OysterBibliography

Showing 318 out of 318 references.

Author	Year	Title
Hunter	1906	Report on Oyster-Beds in Foveaux Strait
Truth	1938	Bluff Oyster Beds Threatened, Famed Industry Menaced, Immediate Closing of Coast Area Urged
Kennedy	1946	Dredging of Oysters is Not An Easy Task
SouthlandNews	1955	Large New Oyster Bed Discoverred Recently Close to Dog Island
Newspaper	1956	Old seafarer looks back at eventful life
representative	1957	Truth Looks Into the Oyster Industry
Stead	1964	Fisheries Technical Report No. 59 survey of Foveaux Strait Oyster Beds 1964
Stead	1966	Efficiency of Oyster Dredges, Underwater Observations in Foveaux Strait
Sorensen	1968	Dredge Oyster Surveys Foveaux Strait Pre-1960
Fishing	1968	Mr Scott gets tough with research worker abut Foveaux statement
CommFish	1968	Mr Scott gets tough with research worker about Foveaux statement
Unknown	1969	Oystermen's Dispute [Southern Enterprise]
Robjohns	1970	Bluff Oyster Industry
Merchants	1970	Submissions by the Bluff Oyster Merchants to the 1970 Parliamentary Select Committee on Fishing
unknown	1970	Controls on Oyster Industry Interim Measure
Group	1970s	Well-known old Bluff sea dog, Captain Harry Roderique dies
Unknown	1970s	Sea's Succuent Harvest—At a Price
Stead	1971	Survey of Foveaux Strait Oyster Beds 1960-1964
Merchants	1971	Submissions by the Bluff Oyster Merchants to the Hon. A. McCready Minister of Marine
Department	1971	Return of Shell: Progress report
Street	1971	Oyster Shell Return Experiment-Foveaux Strait 1970-1971
Stead	1971	Observations on the Biology and Ecology of the Foveaux Strait Dredge Oyster (Ostrea Lutaria Hutton)
Branson	1972	Return of Oyster Shell to the Sea
FSOAC	1973	... for improving the Utilization and Management of the Foveaux Strait Oyster Beds
Merchants	1973	Submissions by the Bluff Oyster Merchants to the Hon. C.J. Moyle Minister of Agriculture and Fisheries
Board	1973	Quotas and Methods of Allocating Them
Board	1973	Minutes of a meeting of the foveaux Strait Oyster Advisory committee of the Fishiing Industry Board held at Invercargill on Tuesday Novem
Sanson	1973	The World of the Oyster
Campbell	1973	Quotas and Methods of Allocating Them. December 6th 1973 ...

Author	Year	Title
Clausen	1974	Untitled poem
Cranfield	1975	Bluff Oysters (1)
Cranfield	1975	Bluff Oysters (2)
Board	1976	Minutes of a meeting of the Foveauz Strait Oyster Advisory Committee of the Fishing Industry Board held at Invercargill on 22 November 1
Campbell	1979	Draft of submissions by the Foveaux Strait Oyster Boatowners Association to the Fisheries Policy Committee of the fishing Industry Board—
Cranfield	1979	Background paper for licensing authority Bluff oysters and Bluff oyster fishery
Robjohns	1979	Bluff Oyster Industry
Owners	1979	Minutes of a meeting of the Oyster Boat Owners Association
Owners	1979	Minutes of a meeting of the Oyster Boat Owners Association
FishBoard	1979	Letter to Barry Thomas Boat Owners Assc.
Memo	1979	Memorandum of matters discussed with Oyster boat Owners and Union Members on 2nd May 1979
Authority	1980	Statement by the Fisheries Authority of reasons for decison pursuant to Section 24 of the Fisheries At 1983
Stern	1980	Permission Given By Official
Times	1980	Export of Oysters Unlikely
Stern	1980	Illegal Export of Oysters
Unknown	1982	Excerpt from pre-season meeting
Fowler	1983	Letter from Southland Oysterman's Society to the Fishing License Authority
Peters	1983	Letter from Fisheries Licensing Authority to Southland Oystermen's Society
Campbell	1983	Letter/Report from Campbell to the Boatowners Association re: discussion paper entitled 'future Policy for the Inshore Fishery'.
Times	1983	Front page photo of fishing boats
Cranfield	1983	The 1983 Foveaux Strait Oyster Season
Thomas	1983	Report to Oyster Boat Owners from Broad, Christie & Partners, Chartered Accountants
Newman	1984	Letter to the Oyster boat Owners' Association re: Fisheries research Division Report
Board	1984	Notes from a meeting of a sub-committee of the Foveaux Strait Oyster Advisory Committee
O'Halloran	1984	the Impact of Bottom Trawling on the foveaux Strait Oyster Beds
HighCourt	1984	Evidence given by Brian Turnbull Cunningham In the High Court of New Zealand Invercargill Registry between Fowler & Roderique Limited an
Newman	1984	Letter from Maurice Newman to Murray Black
HighCourt	1984	Evidence given by Walter Momo Fowler In the High Court of New Zealand Invercargill Registry between Fowler & Roderique Limited and the A
Cranfield	1985	the 1984 Foveaux Strait oyster season

Author	Year	Title
Hickman	1985	A parental problem
Board	1986	Minutes of Research Sub-Committee of FSOAC, 27 February 1986
Times	1986	National Attacks Fish Policy
Dunedin	1986	Exprot of Bluff Oysters
Dinamani	1986	Foveaux Strait oyster disease survey
Hine	1986	Bonamia: an overseas perspective
Times	1986	Oyster Increase Unexplained
Ministry	1986	Draft Emergency Policy Foveaux Strait Dredge Oyster Fishery 1986
Unknown	1986	1986 Settlement Terms - Oystercatchers
Times	1986	Oyster 'Barons' in box seat
Dinamani	1987	Report on investigations into the disease outbreak in Foveaux Strait oysters, Tiostrea lutaria 1986-19867
Robjohns	1988	Letter from H.C. Robjohns (Bluff Fish and Oyster Co.) to Mr. D. riordan, Economic Analyst, Maffish, Wellington
FAMS	1989	Draft Background Paper
HighCourt	1989	In the Hight Court of New Zealand Administrative Division, Under the Fisheries AQct 1983, in the matter of a dertermination of the Fisherie
Times	1989	Oyster beds cannot sustain increased quota
Times	1989	Divergent views on oyster beds
Times	1989	Oystermen upset call for quota reduction ignored
Times	1989	4000-sack oyster quota for rest of season
Robjohns	1989	Telex to Minister of Fisheries from Bill Robjohns
Catley	1989	Oystering—a sobering way to start a crisp mid-winter day
Cranfiled	1989	Letter to Murray Black
Owners	1989	Minutes of a meeting of the Oyster Boat Owners Association held in the offices of Ernst & Whitney on Thursday, 8th of June 1989.
Chapple	1990	?Foveaux Strait Oyster Fishery?(title missing from article)
Herrick	1990	Oyster quota halved to save stocks
Herrick	1990	Supplies of healthy oysters dwindling
Times	1990	Oyster report disputed
Times	1990	Oyster beds may need 30 years to recover
Street	1990	Lettr to B. Thomas (Jan 12) , Bluff Oyster Merchants Association re: Return of Shell
Street	1990	Letter to Mr. M. Rankin, (Feb 23) Bluff Oyster Merchants Association: Re: methods of settling oyster larvae on shell in British Columbia.

Author	Year	Title
Times	1990	Condition of oysters dominates meeting
Roderique	1990	untitled statement on sustainability
Oystercatchers(N	1991	Observations on the season and proposal for management
Cranfield	1991	Assessment of the effects of mortality due to Banamia on the oyster population of Foveaux Strait in 1990 and the outlook for managemen
McKoy	1991	Letter to Dick Brown Manager MAF Southern Region re: Multi-vessel Survey (grid survey for population and mortality due to Bonamia)
Black	1991	Statement on Firebreak
Fisheries	1991	Allocation Issues and the Economic Efficiency of the Catching Sector
Morrison	1991	Oyster fleet calling it quits for season
Morrison	1991	Oystermen slam boat owners' statements
Branson	1991	Foveaux Strait Oysters, a fishery at the crossroads
Fisheries	1991	Memo-Bluff Oysters: Multi-vessel survey
Times	1991	Oyster season ends August 31
Chapple	1991	No more is the world their oyster
Times	1991	Reprieve for oyster lovers
Times	1991	Oyster beds
Roderique	1991	Fishery Condensed Survey
Roderique	1991	Untitled observations on 1990 and 1991 seasons (Letter to the Minister?)
Board	1992	Minutes of Foveaux Strait Oyster Advisory Committee, 26 March 1992 (ITQs)
Board	1992	Minutes of FSOAC 20/11/92
Fisheries	1992	Foveaux Strait Dredge Oyster Fishery 1992 Season
Morrison	1992	Oystermen not happy
Morrison	1992	Lack of action frustrates oystermen
Roderique	1992	Letter to D. Kidd, Minister asking for spread of effort during season
Times	1992	Good and bad news in oyster survey
Kidd	1992	Letter to T B Stewart Re: Fishery management 1992 season
Kidd	1992	Press release re: Oyster Season Extended
Union	1992	Letter to Doug Kidd (Minister) asking that fleet be given room to move and warning of strip mining H area.
Kidd	1992	Letter to the Seafarer's Union Re: request to be given room to move and transferability of catch limits
Board	1992	Wellington Meeting

Author	Year	Title
Kidd	1992	Letter to Stuart re: overfishing of H and K areas
Owners&Catcher	1992	Submission to the Minister of Fisheries from Oyster Boat Owners and Oyster Catchers
Stuart	1992	Letter to I. Rankin, Bluff Oyster Enhancement Co.
Stead	1992	Foveaux Strait Oyster Survey Nov-Dec 1992, Interim Report
Murphy	1992	Oysterman fears for future of beds
Black	1993	Bluff Oyster Fishery Faces Closure
Cosgriff	1993	Doubts cast on oyster program
Times	1993	Lack of information on enhancement company concerns seafarers' union
unknown	1993	Third Report on Oyster
Board	1994	Minutes of Foveaux Strait Oyster Advisory Committee, 10 February 1994
Lee	1994	Untitled report on light dredge experiment
Hammer	1994	Go easy, say oystermen
Union	1994	Re: Letter to FIB re:Tension with Oyster Enhancement Co. over quota for research
Hammer	1994	Oysters on the mend
Times	1994	Care needed on oyster decision
Hammer	1994	Kidd: No to oysters
Brown	1994	Letter to Murray Black re: formation of Oyster Planning Group
BOPG	1994	Minutes from meeting of 21 April 1994
Frazer	1994	Southern Currents: Foveaux Strait Dredge Oyster Fishery
Stuart	1994	Letter to Bluff Oyster Enhancement Co.
Oystercatchers	1994	Recommendations to try and assist in ensuring a viable oyster fishery
Hammer	1994	Oysters test toxic again
Nixon	1994	Spat brews on oyster dredging
Stuart	1994	Letter to the Minister Doug Kidd re: Oyster Enhancement Co.
Street	1994	Oyster Enhancement Trials in Foveaux Strait
Nixon	1994	Oyster results exciting
Union	1994	Special Meeting re: Enhancement
Doonan	1994	Catastrophic reuction of the oyster, Tiostrea Chilensis (Bivalvia: Ostreidaw), in Foveaux Strait, New Zealand, due to infestation by the proti
Coote	1994	From the Bluff: a social history

Author	Year	Title
Cranfield	1995	Funding proposal: Impact of dredging for oysters on bottom communities and sediments in Foveaux Strait and the effect of these changes
Cranfield	1995	Letter to Milton Roderique re: 1970 exploitation rate
Nixon	1995	Kidd to rule on oysters
Kidd	1995	Letter to Terence Stuart re: Bluff Oyster Enhancement Co. (reply to Stuart's letter of 30/12/94
Hammer	1995	Undersized oysters seized
Nixon	1995	Boat owners call for limited oyster season
BOPG	1995	A Draft Plan for the Foveaux Strait Oyster Fishery
Times	1995	Boat owners calling for oyster season
Nixon	1995	Oyster survey might lead to 1996 season
Cosgriff	1995	Scientist says oyster beds ot monitored enough
Times	1995	Reports hold key to oyster season
Union	1995	Letter to FSOAC re: Comments on BOPG Draft Plan
Fisheries	1995	Letter from Allen Frazer to Terence Stuart re: Request to Enhancement company for catch effort landing records
Stuart	1995	Letter from T. Stuart to Minister Doug Kidd re: lack of response to Draft Plan by Boatowners, also comments on ITQ and enhancement
Black	1995	Fishery Condensed Survey
Kidd	1995	Letter to T. Stuart re: Letter on lack of response from Enhancement Co. and Fishery Condensed Survey
Nixon	1995	Oysters beat off bonamia
Nixon	1995	Few oyster boats set for dredging
Times	1995	Oyster recovery is good news
Barton	1995	Ray of hope for Bulff Oysters
Cranfield	1995	Design of Foveaux Strait oyster survey, October 1995
Sreet	1995	Oyster Enhancement Trials in Foveaux Strait
Street	1995	Bluff Oyster Larvae - A by-product from the fishery
Board	1995	Notice of Meeting 26 January 1996
BOPG	1995	Minutes of the Planning Group 17 May 1995
Cranfield	1995	Distribution of foveaux Strait oyster (Tiostrea chilensis) and prevalence of infection by Bonamia sp. in March 1995
Nixon	1995	Foveuax oyster season likely to start in June
Times	1995	Oyster recovery under-estimated say boat owners
Cranfield	1995	Foveaux Strait oyster (Tiostrea chilensis) assessment 1995 (Draft)

Author	Year	Title
BOPG	1996	Minutes of BOPG: 8 August 1996
Nixon	1996	Legal action over oysters
Cranfield	1996	Foveaux Strait oyster (Tiostrea chilensis) assessment 1995
TAU	1996	TOKM goes to court over oysters
Group	1996	Draft Oyster Report-Shellfish Working Group
Fisheries	1996	Inclusion of the Foveaux Strait dredge oyster fishery into the quota management system
Cranfield	1996	CPUE of the foveaux Strait Oyster fishery 1972-1985
Cranfield	1996	Incidental mortality of foveaux Strait dredge oysters during dredging (project proposal)
Frazer	1996	Memo to Oyster Planning Group Members Re: Reassessment of group's reccommendation 3(c) .. catch limit for any 1996 season
Branson	1996	Notice of Meeting Friday 26 January 1996
Branson	1996	Letter to the Minister, recommendations for open season 1996
BOPG	1997	Letter to Allen Frazer
Company	1997	Submission by the Bluff Oyster Management Company Limited to the Primary Production Select Committee on the Fisheries (Foveaux Strait
Roderique	1997	Recommendations to Assist in Ensuring a Viable Oyster Fishery
Nixon	1997	Fishermen being forced to quit
Mitchell	1997	The vessel 'Calamaris' commenced oystering yesterday ...
Group	1997	Minutes of Shellfish Fishery Assessment Working Group 12 December 1997
Nixon	1997	Team after oyster quota
Nixon	1997	Ngai Tahu may seek joint venture for oyster fishery
Nixon	1997	Boat Owners welcome deal
Hilborn	1997	Two steps forward - one step back
Cranfield	1997	Draft final research report: 1997 Foveaux Strait oyster survey
Nixon	1997	Labour says cost too high
Kirk	1997	Govt to pay $6 million for Maoris to share oysters`
Stuart	1997	Letter to Allen Frazer re: Bob Street's research preferred over that of Management Co.
Nixon	1997	Oyster processing companies combine forces
Nixon	1997	Oystermen's union to seek job loss compensation
lLuxton	1997	Letter to Terence Stuart re: compensation
SeafoodNZ	1997	Phil Major—resigns from top policy position

Author	Year	Title
Cranfield	1997	Where there's mullock there's gold: Long term changes in the distribution of biogenic reefs (mullock) and oysters (gold) in foveaux Striat ca
Thrush	1997	Fishing: Ecosystem Effects and Resource Sustainability
Zealand	1997	Phil Major—Resigns from top policy position
Cranfield	1997	Foveaux Strait oyster (Tiostrea chilensis) assessment, 1997
TOKM	1997	Report of the Te Ohu Kai Moana Treaty of Waitangi Fisheries commission Report of Commissioners for the year ended 30 September 1997
Fisheries	1998	The Shellfish Working Group's Foveaux Strait oyster stock assessment, final report
Legat	1998	The Killing Seas
Street	1998	Foveaux Strait Oyster Fishery Recent Trends and Future Development
Union	1998	Submissions by NZ Seafarers' Union Oystercatchers and Bedhands Section re: Fisheries (Foveaux Strait Dredge Oyster Fishery) Amendment
Times	1998	Oystermen victims of industry restructuring
Mitchell	1998	Oystering Started on Friday (Notes changes in industry)
Times	1998	Oyster export ban set to be lifted
Times	1998	Oyster season to be extended
Moana	1998	Annual report for year ended 30 September 1997
Nixon	1998	Inproved oyster catches could boost quota
Nixon	1998	Fishermen demand more say
Nixon	1998	Fishermen scarce as hump back whales at industry conferences
NZPA	1998	No more fish for the pan mabee [Gov't report recommends handing management of the whole fishery resource to quota holders]
Company	1998	Notes on the meeting between the company and oyster boat skippers held on 27 July 1998
Union	1998	Notes of a meeting with Oyster Boat Owners, MAF, Oyster Boat Skippers and Executive held 2 October 1998
Frazer	1998	Letter to Milton Roderique re: BOPG and research into lighter dredges
Michael	1998	By Dredge
Fisheries	1998	Letter to Murray Black announcing Fisheries Stakeholder Meeting on 16th Feb. 1998
Stuart	1998	Letter to Allen Frazer from Terence Stuart Re: Plans for reopening the Foveaux Stratit Dredge Oyster Fishery
Times	1998	Oyster export ban set to be lifted
Times	1998	Export plan for oysters
Mitchell	1998	Oystering started on Friday
Times	1998	Oyster season to be extended
Times	1998	Nelson oyster fishermen want change to season

Author	Year	Title
Times	1998	Demand for oysters stronger than ever
Nixon	1998	Barnes strikes oyster deal with Ngai Tahu
Cranfield	1998	Bluff Oysters and Bonamia
Times	1998	Tutekawa Wyllie
Nixon	1998	Fishing Fleet Declines
Cranfield	1998	Dredge survey of Foveaux Strait oysters, 1997
Bryant	1998	Calls for quota increase
Cranfield	1998	Impacts of oyster dredging on the Foveaux Strait environment
Times	1999	Oyster season early
Stevens	1999	The lot of the independent fisherman
Aldworth	1999	$6m oyster compo as 'too much'
Aldworth	1999	Call for oyster trials to stop
Aldworth	1999	Extension granted for oyster permit
Aldworth	1999	Oyster extension sought
Cranfield	1999	Changes in the distribution of epifaunal reefs and oyster during 130 years of dredging for oysters in foveaux Strait, southern New Zealand
Andrew	1999	Letter to Milton Roderique re: NIWA and Bluff Oyster Management Co. working to improve management in Bluff Oyster Fishery
Cranfield	1999	Foveaux Strait oyster (Tiostrea chilensis) assessment, 1997
Aldworth	1999	Oyster season kicks off
Peacocke	1999	Year-round Bluff oysters a possibility
Aldworth	1999	Roy defends $6m oyster deal
SeafoodNZ	1999	Oysters on the comeback - for now
Aldworth	1999	First reserach oysters dredged
Aldworth	1999	Oyster changes probable
SeafoodNZ	1999	Unique Seabed Community protected at Spirits Bay
Cranfield	1999	Collating existing data of abundance from the Foveaux Strait oyster fishery
Dunn	2000	Revised estimates of natural mortality for the Foveaux Strait oyster (Ostrea chilensis)
Cranfield	2001	Promising signs of regeneration of blue cod and oyster habitat changed by dredging in Foveaux Strait, southern New Zealand
Michael	2001	Foveaux Strait dredge oyster (Tiostrea chilensis) stock assessment 1999
Jackson	2001	Historical Overfishing and the Recent Collapse of Coastal Ecosystems

Author	Year	Title
Annala	2002	Report from the Fishery Assessment Plenary, May 2002: stock assessments and yield estimates
Cranfield	2003	Effects of oyster dredging on the distribution of bryozoan biogenic feefs and associated sediments in Foveaux Strait, southern New Zealand
McCarthy	2003	Oyster firm attacks critics
McCarthy	2003	Oyster Beds need to be left alone
McCarthy	2003	Oyster season in doubt
McCarthy	2003	Bluff oysters in 'sorry state'
Grindley	2004	The Ministry Replies
Michael	2004	A survey of infection by Bonamia exitiosa in oysters andrecruitment at selected sites within Foveaux Strait in January2004.
Dunn	2004	Research progress report on the development of a length-basedstock assessment model for Foveaux Strait oysters
Benson-Pope	2004	Bluff oyster season opens March 28
Times	unkno	Old -timer writes on oyster industry
Calder	unkno	Transcribed taped Interview with Sonny and Nobby Calder
Photo	unkno	Group of men hand culching oysters on a sailing vessel
Roderique	unkno	Brief History of the Bluff Oyster Fishery

Appendix B

Above: This photo is from the files of Milton Roderique. "Them's Roderiques" was all Milton had to say.

Above: From the files of Aurthur Williams. Culching benches had come into use by this time.

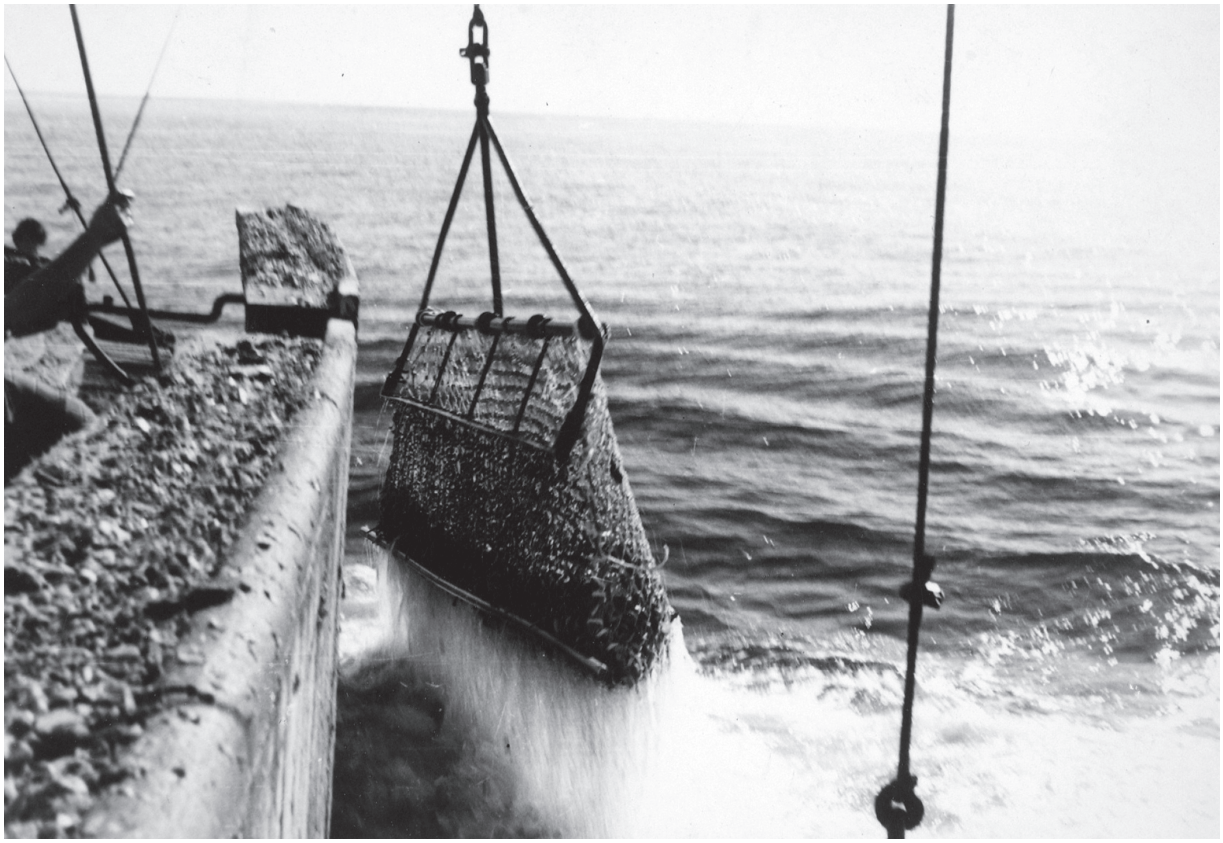
Above: Bluff Fisherman and spokesperson Murray Black. Photo from 2004.

Above: Photo from the files of Jim Roderique. From the days of sail.

Above: Photo from the files of Jim Roderique. The KEKENO at the Bluff oyster wharf 1948.

Photos courtesy of Arthur Williams. Bluff Oyster fishery circa 1960. Note the lighter dredges employed pre-1970 (foreground left) had a rope mesh on the upper surface.

Photos courtesy Authur Williams



Photos courtesy Authur Williams. Above, washing the dredge by repeated dunkings before bringing aboard. Below, the Bluff fleet returns to port. During the '60s, '70s boats would often return early in the afternon with their daily quota—sometimes as many as 100 sacks was the daily catch of only one boat.

Photo courtesy Authur Williams. The Foveaux Strait in fine weather

Photos courtesy In Fluty (circa 1980s). Top right a deckhand works culching the oysters. Top left, Skipper Ian 'Flute' Fluty works the winches that raise and lower the dredges. Bottom, heavy dredges with double bit bar and steel ring bags top and bottom. A deck hand releases the dredge contents from the bottom of the dredge, a method much easier than that employed earlier.