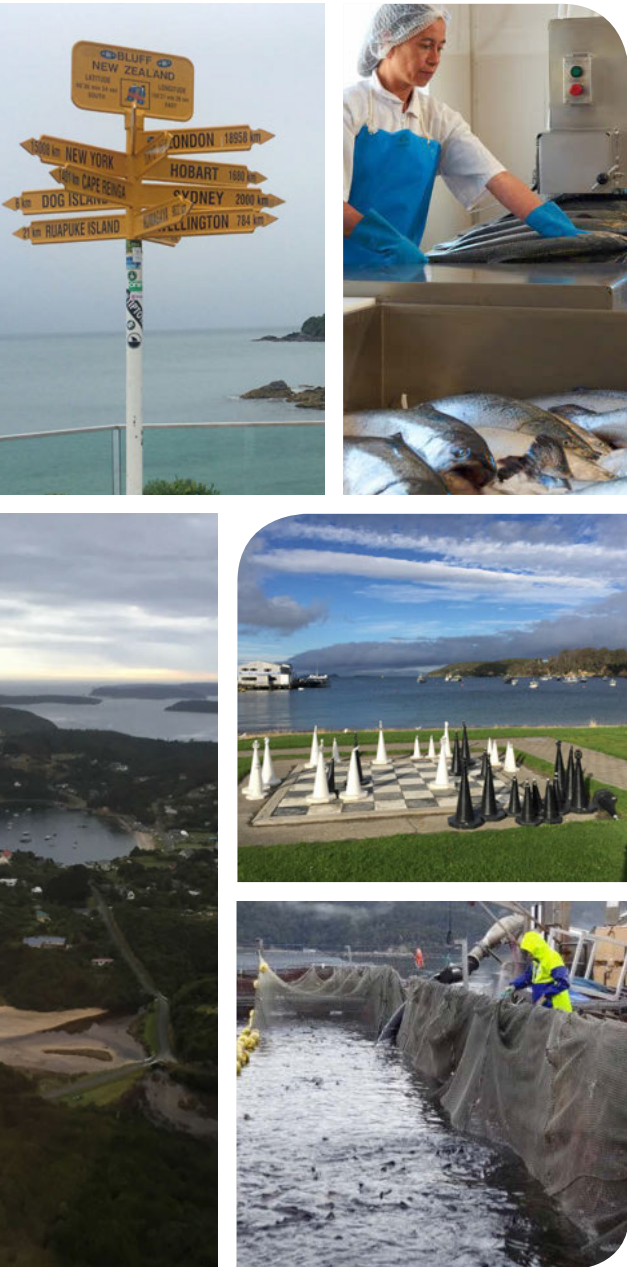




The Social and Community Effects of Aquaculture

A case study of Southland aquaculture

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**Prepared for Aquaculture Unit
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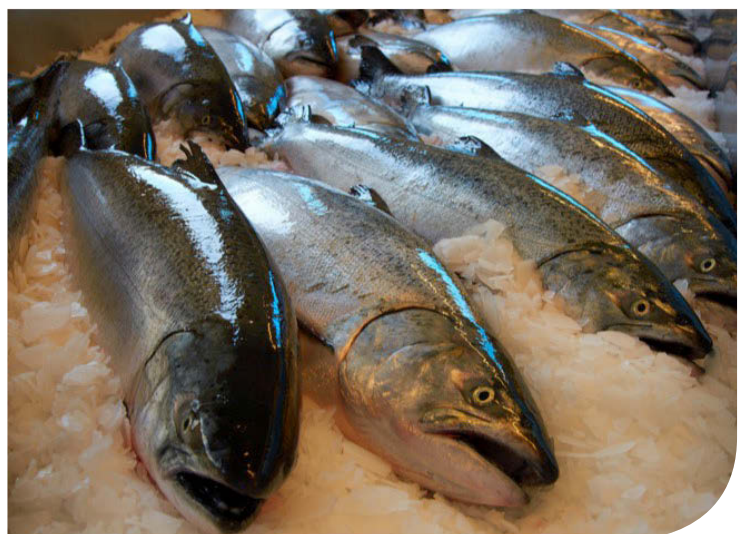
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Executive Summary

This research continues the Ministry for Primary Industries (MPI) Aquaculture Unit work programme on the social effects of aquaculture. MPI commissioned research on a case study in Southland to describe what has or what is occurring in social terms as a result of the aquaculture industry's activities (retrospective and current). This research was intended to fill a gap in the knowledge base about the social effects of aquaculture development and thereby contribute to informing more complete assessments of future aquaculture developments (prospective) wherever they may be proposed.

The research used a mix of desk based, face to face interviews (66 representatives of organisations) and a survey of 130 aquaculture staff (response rate of 50 percent). The geographical scope of the research related to the aquaculture activity in the region, meaning most of the work focused on Stewart Island and Bluff, with substantially lesser effort in Invercargill. The findings are presented below.

The social effects in Stewart Island and Bluff are remarkable for their positive nature. Despite participants being asked about negative effects experienced, nothing remotely significant was described. Instead, a highly positive and significant social picture has emerged, where the companies and employees have jointly contributed. There is no doubt that the communities of Stewart Island and Bluff are significantly socially richer due to the presence of aquaculture.

Social findings for individuals and households on Stewart Island

Over the past 25 years marine farming activities have grown steadily in scale and created a modest number of full-time jobs for Stewart Island residents. Most of these jobs provide an annual income that is above the median income for Stewart Island residents. All employees came from existing jobs but more than half earned less income when they started working in aquaculture. Like many New Zealanders, many report having only just enough or not enough money to meet their everyday needs.

Most aquaculture staff on Stewart Island now see themselves as 'more employable' because their jobs have given them opportunities to gain new skills. Even though there are particular challenges to living on Stewart Island and working

in marine farming, the work-style of marine farms for Island residents has had relatively little effect on staff physical, mental health or sense of self-esteem. Full-time work in aquaculture appears to have enhanced social engagement both from a personal and a community perspective with one-in-four staff reporting an increased sense of life satisfaction.

There are potential risks of drug and alcohol problems in a small, isolated community but the aquaculture industry's drug and alcohol-testing regime provides a degree of deterrence against such risks in the workplace.

Social findings for the Stewart Island Community

The aquaculture industry has brought people, income and skills to the Stewart Island community at a time when commercial fishing was declining significantly. Aquaculture now has the added advantage of not being a seasonal activity so that it provides consistent year-round work for staff and a continuous presence in the community. Aquaculture staff living on the Island have increased from 18 to 23 over the past 12 years meaning an increased level of resources is available to the community from the staff spending. The smaller aquaculture companies also create substantial community value by sustaining vital community services, and by being business innovators.

Many local businesses depend on aquaculture and for four businesses the dependence is substantial. Significant growth is occurring in half of these businesses as aquaculture has grown, while the others have stable activity. Furthermore, several are critically dependent on aquaculture business for their commercial viability meaning that an additional 5 full-time and 3 part-time jobs on the Island also depend on the current level of aquaculture activity. Aquaculture has also created the opportunity for new on-Island skills and capacity to develop within other workplaces.

The Community Centre is an exceptional community resource for a community of this size and is used in some way by most Island residents. The aquaculture industry on Stewart Island has been central to the development and on-going maintenance of the Community Centre. Key individuals in the industry have

driven many parts of this initiative, and the Centre is an excellent example of the industry working together for a social good.

The aquaculture industry also supports the community's school in several socially relevant ways, such as funding the highly regarded KiwiCan programme, helping with school camps and adding value to the curriculum, as well as via the Community Centre providing the children with access to a first-class facility.

The aquaculture industry allows employees to undertake critical volunteer services at no cost to the staff or community and further assists such community organisations with product for fund-raising efforts.

The industry makes cash donations and these reduce the stress of fundraising in this small community. In a small community where sustaining community services can be challenging and relatively costly, the 20 percent of residents associated with marine farms helps significantly – it would be even more challenging without them.

A sense of social responsibility to the local community on Stewart Island is evident in various ways - through the tagging of KiwiCan donations to the local community and by allowing staff to take substantial volunteer roles. These include the community centre, the volunteer fire brigade, the childcare centre, and the golf club. The aquaculture staff appear to 'punch above their weight' in terms of voluntary involvements in a number of important Island institutions. Overall, this adds substantially to social cohesion in the Island community.

Aquaculture is now seen to contribute to the identity of the Island community, including, for many Islanders, a sense of 'who we are'. Increasingly Island residents take pride in their community's association with the high quality products from local aquaculture – salmon, oysters and mussels. These outcomes exist even though the marine farms are not visible from anywhere in Oban itself, the farms are not visited regularly by most Island residents, and the food products have so far largely been ignored in Island promotions.

Tourism, rather than aquaculture has the largest bearing on housing on Stewart Island.

Social findings for individuals and households in Bluff

Aquaculture processing in Bluff supports 77 jobs directly, and most of these staff live locally. A further 30 jobs are provided from the supply-chain businesses.

The range of salaries is wide, due to the mix of part-time and full-time work. Most of these jobs provide an annual income that is above the median income for Bluff residents and also higher paid than previous positions. Importantly, in about one-third of cases, the aquaculture jobs in Bluff have gone to people who were entering the labour market for the first time, or re-entering. But even with all of this positive data, as seen in the rest of New Zealand, many staff still struggle to meet their everyday needs from the income they get.

Compared with previous positions, aquaculture staff now see themselves as 'more employable' and most staff say they have learned new skills. However accidents and injuries occur. Since starting their aquaculture job, there has been little change in staff physical or mental health, while for nearly all staff their self respect and overall satisfaction with life has either been maintained or increased, while one-quarter report increased social contact since starting their job in aquaculture.

Social findings for the Bluff community

Employment in Bluff has been hit hard in the past so aquaculture jobs are valued highly by locals. The jobs contribute to sustaining Bluff. Aquaculture employers are willing to give people a chance and this can have substantial positive social outcomes for those individuals and the community. Furthermore, local businesses try to hire locals to keep the salary and wage spend in Bluff.

Supply chain businesses gain either a small fraction of income from aquaculture companies, or a substantial fraction, or for four businesses it underpins their viability. Aquaculture also supports supplier businesses to diversify their skills and contributes to staff enjoying their work, adding diversity to Southland's primary industries and adding scale to the fishing industry as a whole.

Sanford make two financial donations to Bluff, one large and one small in size. But even the small amount has a modest effect on those who receive it. The large donation supports the KiwiCan programme. This programme delivers a significant social benefit to Bluff School, parents, children and Bluff by explicitly teaching skills and values to Bluff children.

Non-financial donations of product are more common than financial donations in Bluff. The product has a modest social effect for some of those who receive it and a highly significant effect for others. In particular the effects include: signifying a trusting relationship; cementing Sanford as part of the community; supporting the mana of the runanga; helping to

deliver on local identity; and showcasing the quality of life in the region.

Sanford resources have been useful for developing local skills and enabling a community-led organisation to communicate with the Bluff community (via a sponsored coloured newsletter). The donation of an old salmon cage to Bluff Coastguard improved access to the Coastguard boat and respectful handling of people who had died at sea. Although the need has yet to arise, the Bluff Coastguard has an understanding with Sanford that their boat – the San Hauraki – is available as a back-up vessel should it ever be required, providing both increased capacity and increased certainty of response.

The contribution of Sanford employees to the delivery of critical social services such as the Bluff Volunteer Fire Brigade, Bluff Coastguard, and St John Ambulance is significant – all at no cost to the volunteer or the community to deliver these social services to the Bluff community. Aquaculture employees and their children contribute to the sustainability of community

organisations and Sanford staff perform important functions within these community organisations. Such contributions extend across the life course and into retirement.

A large workplace such as Sanford performs a social engagement function within a small town such as Bluff.

Aquaculture product contributes to the local identity of Bluff and Southland, though more could be achieved in the future and in the future the aquaculture industry and suppliers could come out of the shadows and demonstrate the substantial social contribution made to the Bluff community by aquaculture. There has been no substantial effect on housing from the slow growing aquaculture industry in Bluff.

Invercargill

At a community level, the social and community effects of the aquaculture industry on Invercargill are negligible when compared with the effects identified for Stewart Island and for Bluff.

1 Introduction and rationale

In 2012, the Ministry for Primary Industries (MPI) Aquaculture Unit began a work programme dealing with the social effects of aquaculture, including:

- Guidelines on how to undertake social impact assessment within the aquaculture industry; and
- A report on how primary industry might improve its social licence to operate (Quigley and Baines, 2014)

The Guidelines work identified that while employment (paid jobs) was often listed as a social outcome of aquaculture, there was little detail about the flow-on social effects of these paid jobs. Therefore the Ministry for Primary Industries wanted to improve its information base on the social impacts of job creation, so the social benefits of new primary industry development proposals can be better considered.

As a result, two further investigations have been commissioned by the MPI Aquaculture Unit.

In 2014, a literature review was prepared (Quigley and Baines, 2014a) on the social value of a paid job, exploring the flow-on social effects that may occur from creating paid jobs. The literature review confirmed a causal link – that having a paid job does indeed cause beneficial social outcomes to occur. Furthermore, these beneficial outcomes occur for the individual, their household and the community in which they live and work.

The report on the social value of a paid job suggested some useful lines of enquiry for any future research/assessments. In particular, it could inform a practical conceptual framework¹ for any future social assessment of primary industry developments.

Consequently in 2015, MPI commissioned the researchers to conduct this case study to describe what has or what is occurring in social terms as a result of the aquaculture industry's activities (retrospective and current) in Stewart Island and Bluff. This research was intended to fill a gap in the knowledge base about the social effects of aquaculture development and thereby contribute to informing more complete assessments of future aquaculture developments (prospective) wherever they may be proposed.

1.1 How to read this report

We have placed the most interesting information (discussion and findings) at the beginning of the report. The important and necessary explanation of approach and methods is at the end.

¹ Refer to Tables 1 and 2 in Quigley and Baines, 2014a, pp.2-3.

2 Discussion

The social effects of aquaculture are captured in the following two diagrams, indicating the significant positive social effects of the aquaculture industry on Stewart Island and Bluff. Social effects in Invercargill were negligible. The social effects in Stewart Island and Bluff are remarkable for their positive nature. Despite participants being asked about negative effects experienced, nothing significant was described. Instead, a highly positive and significant social picture has emerged, where the companies and employees have jointly contributed. There is no doubt that the communities of Stewart Island and Bluff are significantly richer socially, due to the presence of aquaculture.

The principal negative social outcome described is from the staff survey where thirty out of sixty-four staff who responded to our survey (i.e 47 percent²) describe having not enough or only just enough income to meet their everyday needs. This however is not an issue for the aquaculture sector alone, but is an issue for all of New Zealand: national data is comparable, showing many New Zealanders, in work and not, struggle to meet their everyday needs.

² Given the modest sample size of survey respondents, percentage figures provided in this report should be treated as indicative.

Stewart Island	Effects		
	Direct Effects	Community Effects	Individual and household effects
Aquaculture industry	Aquaculture employment (25 jobs)	Fills a gap from other industries employment downturn. Retains residents and attracts new arrivals. Enables local hiring to occur. Broadens community skill base and nurtures innovation. Financially sustains the town year round (not seasonal). Allows staff to live an outdoors lifestyle.	Proportion of aquaculture staff: • none were from a previous position of unemployment or not looking for work (e.g. childcare) • 42% were from a previous position of having a lower income
	Aquaculture financial donations	Learning outcomes for children and families supported. Community Centre's ongoing maintenance costs partly covered and consequent social benefits from the Centre for the primary school and all community members.	• 75% now see themselves as more employable • 92% have learned new skills • 91% have learned new skills on the job, 54% from courses • 58% have reported an accident or injury to their employer
	Aquaculture product donations	Reduces fundraising stress in a small community. Helps locals to deliver on local identity to visitors. Supports local fundraising.	
	Aquaculture employees and owners	Sustain vital community volunteer services (Fire Brigade, St John Ambulance) at no cost to employee. Sustain community organisations via membership. Sustain community organisations via taking on important roles e.g. Childcare Centre Chair and Board members. No substantial effect on housing.	90% Island-resident aquaculture staff earn above the median wage of all Island employment. 58% have not enough or only just enough income to meet everyday needs.
	Aquaculture product and farms	A dichotomy: Product contributes to the local identity; yet aquaculture farms are out of sight and product is not always easily accessible nor widely used in promotion of the Island. School visits to the farms which support curriculum learning.	Since starting their job, the proportion of aquaculture staff who have maintained or improved: • physical health (83%) • mental health (92%) • social contact (83%) • self-respect (100%).
Supply chain businesses	Supply chain business employment (8 additional jobs)	Retains residents and attracts new arrivals. Enables local hiring to occur. Fills a gap from other industries employment downturn.	75% aquaculture employees are actively involved in community organisations.
	Viability of supply chain businesses supported	Percent revenue from aquaculture ranges from significant to small depending on the company. Affects viability of some. Broadened skill base and additional services able to be offered.	

Bluff	Effects		
	Direct Effects	Community Effects	Individual and household effects
Aquaculture industry (Sanford)	Aquaculture employment (77 jobs)	Enables local hiring to occur. Fills a gap from other industries employment downturn. Enables people to be lifted out of unemployment. Financially sustains the town.	Proportion of aquaculture staff: 30% were from a previous position of unemployment or not looking for work (e.g. childcare) 70% were from a previous position of having a lower income 52% now see themselves as more employable 81% have learned new skills 96% have learned new skills on the job, 43% from courses 67% have reported an accident or injury to their employer
	Aquaculture financial donations	Learning outcomes for children and families supported.	
	Aquaculture product donations	Signifies two way relationship. Cements Sanford as part of community. Supports mana of runanga. Helps locals to deliver on local identity to visitors. Showcases quality of life in Southland to visitors.	
	Aquaculture resources	Supports local fundraising. Enables community-led organisation to communicate with Bluff. Faster and respectful response by Coastguard. Back up boat for Coastguard.	
	Aquaculture employees	Sustain vital community volunteer services (Coastguard, Fire Brigade, St John Ambulance) at no cost to employee. Sustain community organisations via membership. Sustain community organisations via taking on important roles. No substantial effect on housing.	At least 87% Bluff aquaculture staff earn above the median wage of all Bluff employment. 53% have not enough or only just enough income to meet everyday needs. Since starting their job, the proportion of aquaculture staff who have maintained or improved: - physical health (77%) - mental health (84%) - social contact (87%) - self-respect (97%). 52% employees are actively involved in community organisations.
	Aquaculture product	Contributes to the local identity of Bluff.	
	Sanford as a large employer	Performs a social hub function for Bluff.	
Supply chain businesses	Additional employment (30 jobs)	Enables people to be lifted out of unemployment. Enables local hiring to occur. Fills a gap from other industries employment downturn.	

2.1 The drivers or causes of social effects

We have found that social and community effects associated with aquaculture in the Southland communities studied are brought about through a variety of mechanisms.

Businesses involved in aquaculture –

- a) **provide employment**, which has a range of social benefits for the individuals employed, influences where these individuals choose to live, and thereby makes available the skills and energy of these individuals to contribute to community activities and community organisations outside of the workplace.
- b) **make available company resources** (equipment and facilities), which also facilitates community activities or the delivery of services within the community.
- c) **make financial and/or free product contributions** to various community organisations, many of which operate on a substantially voluntary basis.
- d) **provide revenue for materials or services from other companies** which, in varying degrees, support these other business activities, the level of local employment they provide, and broaden the base and self-reliance of local community business activity.
- e) **provide a range of other benefits to these supply-chain businesses**, such as providing a steady year-round flow of income, enabling them to develop new skills and experience in marine equipment, providing new types of business activity not available elsewhere and providing good training opportunities for apprentices. Supply-chain businesses in Bluff and Stewart Island (geographically co-located to aquaculture processing or farming) had higher levels of dependence on aquaculture than businesses further away in Invercargill. Consequently, far higher numbers of supply-chain employees were from Bluff and Stewart Island companies than Invercargill.

Through this range of mechanisms, aquaculture activity contributes to the development of human (individual) capital and social (collective) capital available in the communities of Stewart Island and Bluff.

2.2 The human dimension

The largest component of aquaculture's contribution to human capital in these communities is in the form of the employees of the aquaculture businesses, including the owners and managers who live locally. Through their paid employment, many are enabled to support households – partners and dependent children – who similarly are then available to participate in community activities and community organisations. Employees, their partners and their children contribute to the membership of teams and community organisations. Also, there is ample evidence of their contributions to the administration of some of these community organisations (e.g. to clubs and societies) and to the delivery of community organisations, such as volunteer-based emergency services.

Our case study has found that many of the most significant social benefits at a community level have been facilitated by individuals working within the aquaculture industry who have been long-time residents in their community - and therefore committed to promoting the wellbeing of their community.

2.3 The time dimension

The Time dimension is critical in various ways to any consideration of the significance of the social and community effects of aquaculture in these communities –

- a) **timing:** what else is happening in these communities during the period when aquaculture has become established? In both Stewart Island and Bluff, aquaculture has become an established employer at a time when these communities – particularly Bluff – were experiencing significant declines in job opportunities in other historically important industries. While aquaculture development so far in the region has not been on a scale that could compensate for these other job losses, these circumstances serve to highlight the significance of aquaculture's contribution to both communities.
- b) **growth over time:** while most of the detail on social and community effects in this case study describes the current situation, it is clear that the present scale of effects did not occur immediately but grew steadily, particularly over the past fifteen years.
- c) **consequential and cumulative changes over time:** some of the community effects evident now have taken time to accumulate – in time, the local production of farmed seafood has resulted in its quality presentation on menus, in festivals and in specialty retail outlets to the point where it is now part of the identity that locals associate with and are proud of; the relationships and trust evident between aquaculture companies and numerous community members in both Stewart Island and Bluff – the social capital – did not happen overnight, but accumulated over time through sustained commitment.

3 Social findings

As noted in the introduction to this report, this research has been structured to align with the conceptual framework set out in our previous research on the Social Value of a Job. With this in mind, the findings of this research on the social and community effects of aquaculture are presented here in three sections: for the community of Stewart Island (Section 3.1); for the community of Bluff (Section 3.2); and for Invercargill (Section 3.3).

3.1 Stewart Island

3.11 Social findings for individuals and households on Stewart Island

3.111 Jobs

Over the past 25 years marine farming activities have grown steadily in scale and created a modest number of full-time jobs for Stewart Island residents

At the present time, we estimate 23 individuals are in full-time employment at the salmon and mussel/oyster farms in Big Glory Bay and living on Stewart Island, as well as 2 individuals in part-time employment and living on Stewart Island, and one other person periodically living on the Island. Therefore 25 individuals living on Stewart Island are currently earning income from their direct involvement in aquaculture. For at least 23, it is likely their main source of income.

Historical data indicate the following trend in aquaculture employment (see Table 1).

Table 1. Historical Stewart Island Employment

Year	Numbers employed full time
1990	7
1995	9
2000	18
2005	19
2010	23
2015	23

Source: Aquaculture company data estimates combined.

3.112 Income from jobs

Most of these jobs provide an annual income that is above the median income for Stewart Island residents

Current levels of gross income are spread across a wide range. The employee survey responses indicate that 90 percent of Stewart Island's aquaculture employees are earning above the median income when compared with the following 2013 census data for Stewart Island (See Table 2).

Table 2. Census income data for Stewart Island

Income Descriptor	Income level
26 percent of Stewart Island residents 15+years	Less than \$20,000
Median, for people aged 15 years and over	\$29,900
28 percent of Stewart Island residents 15+years	More than \$50,000

All employees came from existing jobs...

The proportion of Stewart Island-resident aquaculture employees earning more than \$50,000 annually is in line with the resident population as a whole. Most Island-resident aquaculture employees came from previous full-time employment in other jobs, while 33 percent were previously engaged in seasonal work. However, none came from a previous situation of unemployment.

... and more than half earned less income when they started working in aquaculture.

Although overall they are earning above the median income, fewer than half (42 percent) experienced an increase in annual income over their previous employment, while 58 percent reported a decrease.

Like many New Zealanders, many report having only just enough or not enough money to meet their everyday needs.

This situation is further reflected in responses about the adequacy of household income where 42 percent report that they have enough or more than enough total household income to meet their everyday household needs, while 58 percent report that they have only just enough or not enough. These results are very similar to the New Zealand norm from the New Zealand Household Economic Survey, showing even those in employment are often struggling.

3.113 *Social outcomes from jobs*

Opportunities to gain new skills mean that most aquaculture employees on Stewart Island now see themselves as 'more employable'.

Most Stewart Island-resident aquaculture employees (75 percent) now see themselves as more employable as a result of their experience in the aquaculture industry. This sentiment is clearly linked to the opportunities for gaining new skills while working on the marine farms (91 percent), with 9 percent putting themselves through a particular training course and 45 percent being sent on a training course by their employer.

Even though there are particular challenges to living on Stewart Island and working in marine farming ...

With reference to working conditions – 'working on the marine farms is not easy work - conditions can be tough here in Stewart Island.' Indeed working in aquaculture is not without its physical, occupational risks. 50 percent of all aquaculture employees working on the marine farms or in harvesting activities acknowledged accidents or injuries which they have reported to their employer. Because a higher proportion of these workers live in Stewart Island, the incidence of accident or injury has been greater for them (58 percent).

For some prospective employees, a negative perception about the relative cost of accommodation and/or the relative lack of services available on the Island is a deterrent to a job in aquaculture in Big Glory Bay.

... the work-style of marine farms for Island residents has had relatively little effect on employees physical,...

Effects of work-style on individual physical health do not appear to have been significant for these people working in aquaculture on the Island – with 75 percent self-reporting no change, while 8 percent self-report an improvement and 16 percent self-report a deterioration in physical health.

... mental health...
... or sense of self-esteem.

Responses about effects of work-style on individual mental health are similar to those regarding physical health – 92 percent self-reporting no change, with similar responses about the effects on their sense of self-esteem.

There are potential risks of drug and alcohol problems in a small, isolated community.

While several interviewees on Stewart Island commented on the culture of alcohol and drug use within the community, the health service described the alcohol and drug problems on Stewart Island as no worse than elsewhere. They also described how the drug testing programme was helping to change community attitudes about drugs and alcohol. The Police reported 'a very low crime rate' on the Island. However, the consumption of alcohol was associated with the majority of incidents requiring attendance or investigation by Police, such as thefts, violence and/or disorder.

... but Sanford's drug and alcohol-testing regime provides a deterrent against such risks in the workplace.

Sanford operates a drug and alcohol-testing regime prior to employment and during employment. Furthermore, one farm manager observed that 'there are people who want the job, but they know they'd fail the drug test, so don't apply.'

... but Sanford's drug and alcohol-testing regime provides a deterrent against such risks in the workplace.

Sanford operates a drug and alcohol-testing regime prior to employment and during employment. Furthermore, one farm manager observed that 'there are people who want the job, but they know they'd fail the drug test, so don't apply.'

Full-time work in aquaculture appears to have enhanced social engagement both from a personal

In terms of social engagement and participation, a substantial proportion (42 percent) of the Stewart Island-resident aquaculture workforce reported an increase in the number of social contacts and outings since they had taken up the job, perhaps reflecting the geographical and social compactness of the Island community, while 17 percent reported a decline in the number of social contacts and outings, likely reflecting that taking up the job had dislocated them from their previous community of residence as reported elsewhere.

.... and a community perspective.....

A common theme in responses from Stewart Island interviewees was the positive sentiment about how involvement and employment in aquaculture has brought 'new faces to the Island – that's good.' Against a trend of an increasingly ageing Island population over the past two decades – the median age of Island residents in 1996 was 41, while in 2013 the median age had risen to almost 49. 'They bring diversity of age and ethnicity to the community.' Others describe it as 'bringing fresh blood into the community' with new skills and contributions to community activities.

...with one-in-four staff reporting an increased sense of life satisfaction.

A significant proportion of staff working on the farms in Big Glory Bay are reported to view positively 'the outdoor nature of the work'. When not working, they are frequently 'walking, hunting, fishing, diving; it's a way of life for them; it's critical to who they are.' Self-reporting reveals that 25 percent of Stewart Island-resident aquaculture staff believe that their job has boosted their sense of life satisfaction. None expressed the opposite view.

3.12 Social findings for the Stewart Island community

3.121 Local employment and its contribution to Stewart Island

The aquaculture industry has brought people, income and skills to the Stewart Island community.....

There are a number of different ways in which the socio-economic activities of an industry contribute to the resources available to its host community. They include the

- The dollar spend from employees' wages/salaries in local businesses;
- The dollar spend by the aquaculture companies in buying essential goods and services and the additional indirect employment which this sustains;
- Contributions to community services and community fund-raising activities;
- The contributions of the partners (of aquaculture employees) to other work in the local community on a paid or voluntary basis;
- Maintaining the community's skill base by retaining residents and broadening the community's skill base with new arrivals, and the innovation within the community nurtured by this skill base.

...at a time when commercial fishing was declining significantly.

In the Stewart Island context, with its recent history of population decline, the contributions from the aquaculture industry over the past two decades have added significance. The timing of aquaculture development has been important for Stewart Island, as captured by several interviewee comments: *'When commercial fishing activity based on the Island declined, lots of families left. Aquaculture has offset this somewhat'. 'When the quota was sold to the big players processing on Stewart Island plummeted. As the natural fishing dropped off, aquaculture has partially filled that gap'*. In some instances (in half of responses), getting a job in aquaculture allowed them to stay living in the same community, while for the remainder, the job in aquaculture brought them to Stewart Island.

Aquaculture now has the added advantage of not being a seasonal activity so that it provides consistent year-round work.

Another theme received even greater emphasis – the fact that aquaculture in Big Glory Bay has grown to the point where it is no longer a seasonal activity. Interviewees observed:

- *'Aquaculture is not seasonal and it sustains the Island.'*
- *'Whether the Island has one teacher or two will ultimately be determined by aquaculture, not from seasonal tourism.'*
- *'Aquaculture is typically better than other industries on the Island though, as they are quite seasonal and if they can't get the work hours to make enough money, or the season goes belly-up for whatever reason - it's terrible for those people/families.'*
- *'It's year round, unlike tourism and accommodation which is seasonal. It's more stable for everyone. Aquaculture doesn't close down over winter. People live here all year long.'*
- *'Aquaculture which now operates 12 months of the year is becoming important to Stewart Island because many local businesses are highly seasonal; it provides jobs all the year round now - the viability of other small businesses on the Island would be much less without the steady flow of aquaculture-related business.'*

3.122 Aquaculture company spend in the community and on supply chain businesses

Aquaculture staff living on the Island have increased from 18 to 23 over the past 12 years...

Many participants described the idea that 'aquaculture has provided jobs that otherwise wouldn't be there.' We previously estimated there are 23 full-time staff currently living on Stewart Island. In 2000 the corresponding number was 18.

The following table provides census data against which to estimate the significance of the increase in resources available to the community that is associated with direct employment in aquaculture.

Table 3. Resources available to the community

Variable	2001	2013
Total Usually Resident Population (A)	387	378
# Occupied dwellings (= households) (B)	237	216
Number employed (C)	240	231
Resident population 15 years or older (D)	354	324
Aquaculture employees (F-T), in 2000 (E)	18	
Aquaculture employees (F-T), in 2015 (F)		23
% increase in (C) associated with (E)	8%	
% increase in (D) associated with (E)	5%	
% increase in (C) associated with (F)		11%
% increase in (D) associated with (F)		8%

... meaning an increasing level of resources available to the community from their personal spending.

These estimates suggest that the increased level of resources available to the community through the local expenditure of aquaculture employees is currently between 8 percent and 11 percent, having risen from a range of 5 percent to 8 percent in 2000/01, as the total resident population declined slightly.

Similarly, many local businesses depend on aquaculture...

For this case study research, ten businesses operating on Stewart Island were interviewed, representing food and accommodation (4), transport (2), technical services (2) and retailing (2). All these businesses have commercial dealings with aquaculture companies, and all are staffed by people who live on Stewart Island as permanent residents. Collectively, they are currently staffed by 39 full-time, 10 part-time and 2 casual workers, corresponding to ~22 percent of the current resident Island workforce.

The degree of business dependence on aquaculture, as represented by the percent of current annual business revenue earned from all the local aquaculture companies collectively is summarised in the following table.

Table 4. Revenue from aquaculture

percent current revenue from aquaculture	Number of companies
>50%	1
25-49%	3
5-24%	2
0-4%	4

...and for four businesses it is substantial.

Significant growth is occurring in half of these businesses as aquaculture has grown, while the others have stable activity.

Furthermore, several are critically dependent on aquaculture business for their commercial viability.....

.... meaning that an additional 5 full-time and 3 part-time jobs on the Island also depend on the current level of aquaculture activity.

Aquaculture has also created the opportunity for new on-Island skills and capacity to develop.

Of the ten businesses, five have experienced significant growth in their aquaculture-related business activities over the past five years. Notably three of the four businesses with the highest levels of inter-dependency (i.e. more than 25 percent of current revenue from aquaculture) have experienced growth. The remaining five businesses have experienced stable levels of activity.

As the following comments illustrate, the nature and degree of dependence on aquaculture varies from company to company -

- *'The local aquaculture industry is critical to the viability of our business; we wouldn't be providing the service at all without the aquaculture business'*
- *'100 percent reliant on aquaculture – Stewart Island has its own brand'*
- *'It would leave a big hole if they weren't here – all related to people; we roster extra staff when farm workers arrive en masse at 3.30pm'*
- *'In the winter, every customer counts'*
- *'Without aquaculture all year round, our greatest demand would all be out of season'*
- *'Keeps a steady flow of income during the season'.*

The current level of indirect employment related to aquaculture company spending on supplies of goods and services from Stewart Island businesses is estimated to be 5 full-time and 3 part-time positions. This indirect employment was found in only three of the ten businesses interviewed, all of which are at the high end of the inter-dependency scale. A fourth business reported that work hours across all staff would be adjusted if the aquaculture spending reduced, rather than reducing actual staff numbers.

One service company operating in Stewart Island observed 'It has allowed us to develop new skills and experience in marine equipment; previously operators had to get these specialist services from Invercargill or Bluff'

3.123 Corporate social responsibility on Stewart Island

Nowhere is the increasingly important role of the local aquaculture industry in the Stewart Island community better exemplified than in its relationship to the on-going funding of the Community Centre in Oban.

The Community Centre is an exceptional community resource for a community of this size and is used in some way by most Island residents.

The nature and multiple uses of the Community Centre are described in Section 4.21 under *Community Facilities* for Stewart Island. It is evident that a very high proportion of the Island's resident population uses the Community Centre in some way or other, as do many visitors to the Island

The aquaculture industry on Stewart Island has been central to the development and on-going maintenance of the Community Centre in Oban.

Construction of the Community Centre in 2000 was funded by community fundraising activities. The profits from one line of mussel farming (still owned by EEC Ltd, an aquaculture company based on Stewart Island, and managed and harvested by Sanford) supports about 30 percent of the on-going maintenance costs for the Centre.

Key individuals from aquaculture have driven many parts of this initiative, and is an excellent example of the industry working together for a social good.

The aquaculture industry also supports the community's school in several socially relevant ways, such as funding the highly regarded KiwiCan programme...

...helping with school camps and adding value to the curriculum...

...and via the Community Centre providing the children with access to a first-class facility.

The aquaculture industry also allows employees to undertake critical volunteer services at no cost to the staff or community...

A further 30 percent is funded from another local fundraising innovation³ – bottled water which is captured off the roof of the Community Centre building – while the remaining 40 percent comes from a mix of rates, membership subscriptions, rental and hire fees and donations. The Community Centre is one of the community enhancements that have resulted from the entrepreneurial abilities of people within the local aquaculture industry and the industry working together. It would be difficult for the community to fund the on-going physical maintenance of the facility without the on-going contribution from dedicated aquaculture revenues. *'The Community Centre is fantastic - amazing story of local initiative - funding from the mussel line and the bottled water scheme from the Community Centre roof'.*

Aquaculture companies support Halfmoon Bay School's educational programmes in several ways. With a substantial annual cash contribution from Sanford, the Foundation for Youth Development's Kiwi Can programme brings two instructors to the school one day every fortnight, all year. *'The Kiwi Can staff are young and sporty and relate well to the kids, are good role models to them. They teach them about respect and responsibility in a fun way'.* The way it is organised, this programme also helps the School save costs as shown in this comment. *'The Kiwi Can staff come to school on days when staff have planned leave, saving a day's reliever costs'.*

School camps also take advantage of the aquaculture activities in Big Glory Bay as described in this comment. *'We have an excellent relationship with EEC and Sanford. The Juniors go to camp on Bravo (island, at the entrance to Big Glory Bay) and as part of that camp they go and look at the Salmon farms in Big Glory Bay. It's awesome, the kids love it. It fits so well into the Social Studies curriculum in the 'production and process' section. It's right there in front of their eyes'.*

Along with the neighbouring Early Childhood Centre (Rugrats), the school has priority access to the Community Centre facilities during school hours. It was described by the principal in this way: *'It'd be a great resource for any school, but we have it for a school with 21 kids. There is a full food service-level kitchen, a production space and stage, squash courts, open spaces and a gym for the older kids. We use the open space for all-weather physical education (PE), the social room and stage for productions and music programmes. We've run yoga units there, perception motor programmes there. The hallway is used to display our children's art to the public. We use the cooking unit for a whole term.'*

Aquaculture employees resident on Stewart Island play an essential role in the local Volunteer Fire Brigade. Of the current complement of 23 volunteers, 6 work in aquaculture. This represents a significant level of financial resourcing, since their employer continues to pay the staff when they are called away from work to attend Volunteer Fire Brigade duties. Active callouts may number 15-25 a year, while the required training for each volunteer amounts to at least 7-8 days. The Fire Brigade Chief said: *'It's a major commitment for employers to let staff go for this length of time and to pay them while they are training. The fact that the companies employing our volunteers allow them to be on-call is absolutely critical to our function'.*

³ Driven by an aquaculture industry person

... and further assists the community with product for fund-raising efforts.

Numerous comments were forthcoming about all the aquaculture companies providing 'product' free to assist fund-raising activities or similar events. These comments are further exemplified by the following –

- *'Community groups often use product for fund raising'*
- Halfmoon Bay School: *'we get salmon and mussels when we ask for them, ongoing for fundraising activities and big events'*
- Stewart Island Volunteer Fire Brigade: *'Whenever we have an honours night, we are given product to use in the celebrations'*
- *'We never have to buy any seafood locally; there is always product available for the annual Christmas party'*
- *'Often get access to free product - mussels, salmon - available to anyone living locally; we get a text to come on down to the wharf and collect some product'*
- *'Free product for fund raising is wonderful support from all the companies'.*

Some donations are cash and reduce the stress of fundraising in this small community.

In the case of Rugrats (ECC), the contribution from aquaculture to fundraising comes in the form of a \$1,000 donation periodically. Given the need to raise about \$10,000 annually in donations, this takes some of the stress out of fund raising, but due to the occasional nature, it is used to fund whatever is required at the time, rather than on-going functions.

In a small community where sustaining community services can be challenging and relatively costly, the 20 percent of residents associated with marine farms help significantly – it would be even more challenging without them.

Numerous interviewees in Stewart Island commented on the small population base on which to support community services, and consequently the significance of this additional employment, as witnessed by these comments: *'Aquaculture is a significant employer, allowing people to live on the island and support island services. Bluff and Stewart Island communities would be much smaller without it.'* *'If it wasn't for those farms, there'd be a lot less people living here'.* *'About 10 percent of residents, and if you count their partners and children it might be closer to 20 percent of the resident population; this feeds into the school roll - overall, it's a big part of the community'.* This observation is reinforced by the 2013 census data which recorded that the average household size in Stewart Island was indeed 2.0 persons per household.

It is often the case in small, rural (or island) communities that special provision (over and above the application of simple population-based formulae) needs to be made to support essential services. This is the case with the local Fire Service, medical centre and school. However, these 'special provisions' can leave such communities vulnerable to loss of service if government policy settings change. [See Findings elsewhere in regard to volunteer contributions to the Stewart Island Volunteer Fire Brigade.]

3.124 Level of civic engagement by aquaculture employees

A sense of social responsibility to the local community on Stewart Island is evident in various ways ...

The collaboration between the most active aquaculture companies operating in Big Glory Bay over the on-going funding of the Community Centre and the attitude by these companies to release their staff for emergency volunteer commitments without any loss of pay is testimony to a strong sense of corporate social responsibility at the present time.

...through the tagging of donations to the community the industry operates in...

In making a substantial annual contribution (\$30,000/year) to the Foundation for Youth Development's Kiwi Can programme for nine schools in Southland, Sanford stipulated that Halfmoon Bay School had to be amongst the schools which received the programme.

... and by allowing staff to take substantial volunteer roles including on the

From the interviews conducted for this research, the following summarises the involvement of resident aquaculture employees in a number of Stewart Island community organisations –

community centre,...

- The Community Centre is administered by a Trust and supported by a manager; aquaculture company owner/employees have held positions of Chair, Treasurer and Secretary at various times;

...the volunteer fire brigade,...

- The Stewart Island VFB currently has 23 volunteer members, including five officers (Chief, Deputy Chief, Senior Station Officer and two officers). Of the current complement of 23 volunteers, 6 are aquaculture employees (i.e. 26 percent), while the current Deputy Chief Fire Officer is an aquaculture employee, as was the previous Deputy (i.e. 20 percent of the Officers).

... the childcare centre, and...

- Rugrats (ECC) has a governance group of 6 parents and the head teacher. The current Chair and one other board member are partners of aquaculture employees (i.e. 29 percent).

... the golf club.

- Stewart Island Golf Club has 35 current members, of whom 10 are aquaculture employees (i.e. 29 percent), as is the current President of the Club.

The aquaculture staff appear to 'punch above their weight' in terms of voluntary involvements in a number of important Island institutions.

It is interesting to note that aquaculture employees or their partners have a greater presence in several of these community organisations – Volunteer Fire Brigade (26 percent), Rugrats (29 percent), Golf Club (29 percent) – than their proportion of the resident population (about 12 percent). These observations are confirmed by the responses to the employee survey, which reveal that 75 percent of Island-resident employees have been actively involved in some community organization, including sports teams or voluntary organisations. These include volunteering for the local Fire Brigade, St John Ambulance Service or Early Childhood Centre (Rugrats), membership of the Lions service organization or a local environmental trust, or collecting for the hospice, and membership of the Ringa Ringa Golf Club. Partners have also actively supported the Fire Brigade and Rugrats.

Overall, this adds substantially to social cohesion in the Island community.

The role of the Community Centre as one important hub of social activity on the Island should not be overlooked in terms of its contribution to social cohesion.

3.125 *Contribution to local community identity*

Aquaculture is now seen to be contributing to the local identity, including...

An interesting dichotomy is apparent on the question of aquaculture's contribution to local identity for Stewart Island and Stewart Islanders. Most local residents interviewed for this research were aware of the substantial contributions that the aquaculture industry, operating in Big Glory Bay, makes to the life, economy and identity of the Island, as seen in these comments:

... 'who we are', ...

... and as a food source to be proud of.

These outcomes exist even though...

... the marine farms are not visible from anywhere in Oban itself, the farms are not regularly visited, ...

... some products are sometimes hard to buy locally and...

... high quality food is largely ignored in Island promotions.

- *'Aquaculture foods are part of the identity, of who we are'*
- *'Stewart Island has its own brand'*
- *'We always have salmon and oysters on the menu - a major part of our menu; a real attraction for tourists and locals alike - all from farmed product - a real drawcard. Part of the identity.'*

While there is little doubt in locals' minds that high quality farmed seafood has become a central feature of living on Stewart Island and for visitors to Stewart Island, the industry itself is largely hidden from view on the Island and the marketing of products is extremely selective, as seen in these comments:

- *'The industry is operating largely out of sight in Big Glory Bay'*
- *'Aquaculture does not compete with other sectors for space at the present time; nor is it in-their-face'*
- *'There used to be some tourism interest in visiting farms in Big Glory Bay 8-10 years ago and previously, but no one seems to go there now - not sure why this is so'*
- *'Farmed product is marketed in local restaurants on the island but not easily acquired by the general public'*
- *'Stewart Islands Promotions is not using aquaculture as a selling point for the Island; up until now it has never had a promotions officer - now one has been appointed'*

3.126 Housing on Stewart Island

Tourism, rather than aquaculture, has the largest bearing on housing on Stewart Island.

The scale and quality of housing and accommodation on Stewart Island is influenced more by tourism activity than by employment levels in aquaculture or any other industry.



3.2 Bluff

3.21 Social findings for individuals and households in Bluff

3.211 Jobs

Aquaculture processing in Bluff contributes 77 direct jobs, of which most staff live locally.

A further 30 jobs are provided from the supply chain businesses.

Aquaculture currently contributes 77 jobs⁴ directly into Bluff township. From these jobs, seventy staff live locally out of a total resident population of 1794. In the Bluff context, Sanford is the only company that currently processes farmed product for sale to consumers. The Sanford processing factory has 75 percent of its capacity dedicated to aquaculture (salmon) and the balance to wet fish. Other businesses supply aquaculture companies, for example with oyster spat⁵, engineering services, transport, real estate services, etc. These supply-chain companies added a further 30 jobs (26 full-time, 4 part-time).

Historical data indicates the following trend in such employment.

When all jobs in aquaculture are compared with all jobs available in Bluff, 12 percent of all local jobs are based on aquaculture (See Table 5).

Table 5. Number of jobs in the aquaculture industry and supply chain businesses

Aquaculture jobs in Bluff	Bluff jobs dependent on aquaculture or supplying aquaculture	Total Bluff jobs based on aquaculture	Total local jobs in Bluff (2013)	Percent of total local jobs based on aquaculture
77	30	107	870	12 percent

3.212 Income from jobs

The range of salaries is wide due to the mix of part time and full time work.

Most of these jobs provide an annual income that is above the median income for Bluff residents....

Current levels of gross income are spread across a wide range due to the part-time nature of work for some employees. The employee survey responses indicate that 87 percent of Bluff's aquaculture employees are earning above the median income (\$28,200) when compared with the following 2013 census data for Bluff.

Table 6. Census (2013) income bands for Bluff

Income Descriptor	Income level
37 percent of Bluff residents 15+years	Less than \$20,000
Median, for people aged 15 years and over	\$28,200
21 percent of Bluff residents 15+years	More than \$50,000

The proportion of Bluff-resident aquaculture employees earning more than \$50,000 annually (32 percent) is ahead of the Bluff resident population as a whole (21 percent).

⁴ 102 jobs in the processing factory, of which ¾ are related to aquaculture

⁵ For the purpose of this report the oyster spat companies were classified as a supplier company rather than an aquaculture company: due to the simplicity this creates when describing context, and their non-use of water space in Bluff (and hence no need for aquaculture consent permits).

...and also higher paid than their previous position.

Importantly, one-third of the aquaculture jobs in Bluff have gone to people who were entering the labour market for the first time, or re-entering.

Even with all of this positive data, many staff still struggle to meet their everyday needs.

As well as earning above the median Bluff income, 70 percent experienced an increase in annual income over their previous situation, 16 percent were about the same, while 13 percent reported a decrease. Again this is important as it shows that for most people an aquaculture job has been a boost to their ability to meet their everyday needs.

Approximately one-third of Bluff-resident aquaculture employees came from previous full-time employment in other jobs (30 percent), while 39 percent were previously engaged in seasonal or casual work. Nearly one-third (30 percent) came from either a previous situation of unemployment or a previous situation of not looking for work (from school, from caring for children). This is important as the academic literature is clear that the individual social benefits of employment are greatest for those people moving from a situation of no paid employment to paid employment.

This situation is reflected in responses about the adequacy of household income to meet everyday needs, where 22 percent of Bluff aquaculture staff report that they don't have enough money to meet their everyday needs and 31 percent have only just enough money. About half have enough (40 percent) or more than enough (six percent) total household income to meet their everyday needs. This is similar to national norms from the 2013 New Zealand Household Economic Survey,⁶ reflecting that even those in employment often struggle to meet their everyday needs.

3.213 *Social outcomes from jobs*

Aquaculture staff see themselves as 'more employable'...

...and most staff say they have learned new skills.

However...

...accidents and injuries occur.

Since starting their aquaculture job, there has been little change on staff physical or mental health, ...

... while for nearly all staff their self respect and overall satisfaction with life has either been maintained or increased.

About half of Bluff aquaculture employees (52 percent) now see themselves as more employable as a result of their experience in the aquaculture industry.

This sentiment is clearly linked to the opportunities for gaining new skills while working in processing where 81 percent of staff said they had learned new skills. Over two-thirds (69 percent) had learnt new skills on the job, while 39 percent had been sent on a training course by their employer and 4 percent had put themselves through additional training.

Working in aquaculture is not without its physical and occupational risks. Two-thirds (67 percent) of Bluff aquaculture employees acknowledged accidents or injuries during the course of their employment which they have reported to their employer.

Effects of work-style on individual physical health do not appear to have been significant for these people since starting their aquaculture job in Bluff – with 58 percent self-reporting no change, while 19 percent self-report an improvement and 23 percent self-report a deterioration.

Self respect follows a different pattern where 97 percent of staff reported either an increase in self-respect (31 percent) or self-respect staying the same (66 percent). Very similar results existed for overall satisfaction with life since starting the job, where life satisfaction has generally improved or stayed the same.

⁶ Fifty-seven percent of nationwide respondents reported their income was enough or more than enough to meet their everyday needs.

.... and one-in-four report increased social contact.

In terms of social engagement and participation, the results show the vast majority of Bluff aquaculture workers have maintained the number of social contacts since beginning their job (64 percent), with about one-quarter reporting increased numbers of social contacts (23 percent) and fewer reporting a reduction in social contact (13 percent).

3.22 Social findings for the Bluff community

3.221 Local employment and its contribution to Bluff

Local businesses try to hire locals to keep the salary and wage spend in Bluff.

Within aquaculture and the supply-chain businesses based in Bluff we found a strong culture of attempting to hire people who lived locally, wherever possible. *'The reason I live locally and hire locally is that it makes the money go round locally'.*

Employment in Bluff has been hit hard in the past so aquaculture jobs are valued highly by locals...

Several participants noted that aquaculture created a new source of jobs for the local economy at a time when the total number of job opportunities in the town had declined markedly. *'Sanford picked up some of the slack when other companies dropped off'. 'Aquaculture has stopped the town slipping into the doldrums'. 'Sanford created jobs in aquaculture at a time when they were most needed in Bluff, after the loss of the freezing works and the modernisation of the port through containerisation'.*

... and contributes to sustaining Bluff.

Several participants made a firm link between aquaculture jobs and the sustainability of Bluff town itself. *'Aquaculture has provided jobs that otherwise wouldn't be there'. 'Aquaculture companies help with the sustainability of the industry, help the sustainability of Bluff and the sustainability of us, our town, of who we are'. 'It would be a dark day for Bluff if Sanford wasn't here'. 'There're no negatives in my opinion the more employment the better down here'.*

Aquaculture employers are willing to give people a chance and this can have substantial positive social outcomes.

Not only do employers describe a preference to hire locally, three employers also described a culture where people were given a chance, to get a job straight off the unemployment benefit or people with special needs. Such employment can be transformational for individuals, families and communities. *'Sanford is a huge employer in Bluff – they're always willing to employ Bluffies - give them a chance, even if they're unemployed. If it works out, that's a good outcome, better than crime and prison'. 'Sanford gives people a chance - gets them into work locally, including people with special needs'. 'It gives lower skilled people jobs - gives them a chance'. 'Three out of five of our staff were taken off the benefit'. These interview findings were borne out by the staff survey findings reported in the earlier section.*

3.222 Aquaculture company spend on supply chain businesses

Supply-chain businesses gain either a small fraction of income from aquaculture companies, a substantial fraction...

For the Bluff businesses which supply aquaculture, two described aquaculture as contributing a small fraction of income (5 percent or less of income), whereas for 2 businesses aquaculture was a solid source of income (5-24 percent of income) and for three others it was substantial (25-49 percent of income) and typically provided an important stream of work. *'While they're a significant client, this level of business is not the difference between viability and unviability'. 'It's a steady stream of business'.*

.. and for four businesses it underpins their viability.

Two businesses, spat production companies, were not surprisingly wholly reliant on aquaculture companies for their income. Also for two of the three businesses between 25-49 percent of income, aquaculture underpinned their business viability. *‘[Sanford] is the difference between viability and non-viability; [we] wouldn’t have a business without aquaculture’. ‘If we didn’t have aquaculture in the market for freight services to Stewart Island, we wouldn’t be running a freight service at all, it’s critical for viability’.*

Table 7. Revenue from aquaculture

Percent current revenue from aquaculture	Number of companies
>50%	2
25-49%	3
5-24%	2
0-4%	2

Sanford works with most suppliers.

In Bluff, for three of the nine businesses the only aquaculture company they supply is Sanford, whereas two companies do not work with Sanford at all. The remaining four businesses work with a mix of Sanford and other aquaculture companies. While Sanford is the only aquaculture company in Bluff and clearly creates the majority of the flow-on benefits for supplier businesses, the presence of smaller aquaculture companies in Stewart Island has some critical social benefits:

.. and for four businesses it underpins their viability.

- The existing freight service (of goods and materials) between Bluff and Stewart Island would not operate. All freight to Stewart Island would become even more expensive and the level of service would be substantially reduced. *‘If we didn’t have aquaculture freight services to Stewart Island, we wouldn’t be running a freight service at all’.*
- The innovations in oyster hatchery and paua hatchery operations have been strongly influenced by the interests of the smaller aquaculture companies.

The smaller aquaculture companies also create substantial community value by sustaining vital community services and by being business innovators.

Aquaculture also supports supplier businesses to diversify their skills and contributes to staff enjoying their work, ...

Several Bluff businesses described how aquaculture provided work opportunities that didn’t occur elsewhere. In turn this provided a good training ground for young people who benefit from being exposed to different types of work. *‘The specialism and variety makes it a great training ground for apprentices’.* Also, having aquaculture-type work provided a pleasant change to the type of work the employees got to undertake. *‘It diversifies the type of work we do, giving us greater experience and making our days more interesting’.*

... adding diversity to Southland’s primary industries and adding scale to the fishing industry as a whole.

Southland is a region dominated by land-based primary industries and several participants noted that aquaculture provides diversity to the jobs available in Southland and can complement the existing primary industries. *‘Aquaculture is seen as a positive renewable industry in the region’.* Aquaculture also supports the regional fishing industry by contributing to scale, thereby supporting retention of skills in the supply-chain businesses and keeping prices competitive.

The resources available to the community from the personal spend of staff has increased as the total population has declined.

The following table provides census data against which to estimate the significance of the increase in resources available to the community that is associated with direct employment in aquaculture.

Table 8. Resources available to the community

Variable	2001	2013
Total Usually Resident Population (A)	1,932	1,794
# Occupied dwellings (= households) (B)	816	807
Number employed (C)	822	870
Resident population 15 years or older (D)	1,506	1,440
Aquaculture employees (F-T), in 2000 (E)	62	
Aquaculture employees (F-T), in 2015 (F)		77
% increase in (C) associated with (E)	8%	
% increase in (D) associated with (E)	4%	
% increase in (C) associated with (F)		10%
% increase in (D) associated with (F)		6%

These estimates suggest that the level of resources available to the community through the personal local spending of aquaculture employees is currently between 6 percent and 10 percent, having risen from a range of 4 percent to 8 percent in 2000/01.

3.223 Corporate social responsibility by Sanford in Bluff

Sanford make two financial donations to Bluff, ...

Despite the fact that most community groups interviewed in Bluff have not approached Sanford for donations, they are aware that Sanford has made substantial contributions to the Bluff community. *'Sanford is a major sponsor of the whole area and community'. 'Sanford is generous with its donations and support of local community groups and events'.*

one large...

A large annual donation is made by Sanford (approximately \$30,000) to the Southland Foundation for Youth Development. This amount is used to part-fund the KiwiCan programme in Bluff School and Oban School (Stewart Island). Furthermore, the current Operations Manager at Sanford chairs the Southland Foundation which raises money to fund the Kiwi Can programme in five other Southland schools.

...and one small in size. But even the small amount has a modest effect on those who receive it.

Sanford has also donated \$1,000 to Bluff Sea Scouts. While such a comparatively small amount does not mean the difference between something occurring or not (in this case buying uniforms to attend the National Sea Scouts Regatta), it did have the effect of reducing the stress on families and participants needing to fundraise money in what is a low income community. For the children, the scoutmaster said the uniforms contributed to their confidence and team spirit.

The KiwiCan programme delivers a significant social benefit to Bluff School, parents, children and Bluff by explicitly teaching skills and values to Bluff children.

The KiwiCan programme is delivered to 1500 children throughout Southland. This case study focused on Bluff School and Oban School due to the direct amount of the Sanford contribution and the request by Sanford to tag their donation to these two schools. The programme explicitly teaches values/skills complementing what the teachers are trying to do in all interactions, but this is the only time such teaching is explicitly done. Bluff School also notes that the two KiwiCan teachers are good role models for the children via their positive nature and health-promoting behaviours. Bluff school identified that without the funding the programme wouldn't happen and the explicit teaching of values wouldn't happen either. The Bluff School principal believes the programme supports the children, parents, teachers and Bluff community in attempting to 'grow great kids'. The values taught include responsibility, positivity, resilience, cooperation, decision making, etc. *'It is a huge benefit. I'm not one for programmes because they take away from teaching time, but this is the only one I allow in my school'*. From a social perspective it was also interesting to note that the programme helped the school deliver on their vision statement. The principal described how the school vision reflected the broad goals of developing a great young person, which aligned well with the KiwiCan programme. *'It helps us achieve our school vision'*.

The social investment is ongoing, just as the aquaculture industry is ongoing.

Also the investment is partly due to the many individuals in Sanford who make it happen.

The year-in-year-out nature of donations to KiwiCan is another example of how Sanford has developed a long term approach to its social contribution in Bluff. Many participants in the case study commented how Sanford was *'part of this community'*. This may in part be related to the long-term nature of the aquaculture industry. *'They are a long term industry - they're not going to turn up their toes anytime soon so they are in that community for the long haul'*. This may also be due to the many individuals at Sanford who see Sanford as part of the community, and therefore needing to play Sanford's part in the Bluff community. *'He's a good man, he's a Bluffie'* (participant talking about why Sanford donate into Bluff).

Other initiatives support Sanford staff.

Sanford Bluff has an initiative where an occupational physiotherapist visits once per week as a preventative measure, treating people who have discomfort symptoms and also carrying out workplace assessments. A relationship with Awarua Whanau Services allows Sanford staff access to free health advice and testing.

Non-financial donations of product are more common than financial donations in Bluff.

Donation of product, such as salmon, mussels and oysters were made to four community organisations, while six organisations spoken to had not had product donations. Of those organisations who did not receive product donations, most said they had not asked for them, but felt if they had a need or had asked, they would have likely received them. While some may think that donation of products might have low impact, for the organisations that received product, a modest effect was seen in these situations:

The product has a modest social effect for some of those who receive it and...

- Allowing the Bluff Rugby Club to meet its requirement for host responsibility when serving alcohol, with a quality food, instead of with crisps and pies.
- Use of products to celebrate local achievement by the Bluff Volunteer Fire Brigade. *'We get fish and mussels for our annual awards..... 25 years of service, medals, presentations'*.

...a highly significant effect for others.
In particular by signifying a trusting
relationship, ...

...cementing Sanford as part of the
community, ...

...supporting the mana of the runanga,...

...helping to deliver on local identity and...

...showcasing the quality of life in the region.

Use of Sanford resources has also been
useful for developing local skills ...

In some situations the effect of product donations is highly significant:

- Sanford donate a small amount of product to the Bluff Yacht Club's annual race, the Oyster Regatta. While it is seen as a small gesture by the Yacht Club, it also signifies a two way relationship of respect and trust. In return the Bluff Yacht Club helps the aquaculture industry whenever possible (e.g. in recent consent hearings regarding modest changes to consent conditions) and the industry helps the Yacht Club in return (e.g. by ensuring any structures in Bluff Harbour are well marked with buoys before big races). *'There's a trust and understanding. We're all in this community together and we all work together. We have a really positive relationship with the industry.'*
- Sanford donate product for tangi and big events at the Marae and this also continues a strong relationship between Sanford and Awarua Runanga. *'It's a two way thing – we're also supportive of Sanford. We're always saying positive things about Sanford whenever anyone asks. We'd tell them [Sanford] if we had an issue with them!' Awarua Runanga see Sanford as an integral part of the community. 'When big stuff is happening in this community, the whole community swings in, and that includes Sanford.'*
- Salmon and mussels are considered mana-enhancing kai by Awarua Runanga. While historically salmon was not present in Southland and therefore not used as a food on the marae, it has now come into regular use. Salmon is now keenly anticipated by locals and visitors alike on such occasions.
- Allowing the Bluff Rugby club to be perceived positively by visitors when hosting annual 'high profile' games, and for the recent 125th jubilee celebrations of the club. *'Bluff is famous for its seafood and the salmon helps us deliver on our identity.'*
- The Bluff Volunteer Fire Brigade received Sanford product when it hosted the annual Fire Brigade Golf Tournament. It helped them showcase the quality of life in Southland to the visiting brigades. *'The food is iconic. We've just held the regional golf tournament here, and the other regions would want to come back here every year. Here they get oysters, mussels, salmon, lobster, blue cod. Other places you get egg sandwiches'*. This gifting of product is one symbol of a two-way relationship between Sanford and the Bluff Volunteer Fire Brigade. *'It's a two way relationship. We help Sanford by cleaning their nets, we get practice with our fire hoses. We also get product if we ever ask for it'.*

Sanford allows the use of its coolstore by the Bluff Volunteer Fire Brigade for training purposes – training in the dark. The Fire Service also trains volunteers for high pressure hose work while helping out Sanford by cleaning Sanford nets. Neither of these situations is critical as both could be done elsewhere, and so they are judged as having a modest significance.

... and of high significance, by enabling a community-led organisation to communicate with the Bluff community.

Highly significant social effects were achieved by the donation of an old salmon cage to Bluff Coastguard.

Another physical resource that is available from Sanford (though not yet used) provides a sense of reassurance to a critical social service.

Sanford computers/printers are used to create/print a community newsletter every quarter (by the 2024 Rejuvenation Committee). The colour newsletter is delivered to every household in Bluff (approximately 800). The 2024 Rejuvenation Committee supports locally led initiatives to rejuvenate physical areas and undertake local events, all in preparation to celebrate Bluff township's 200th anniversary in 2024. *'The newsletter just wouldn't happen without the support of Sanford'*. This was judged to be a significant social contribution. A 2024 Rejuvenation Committee initiative (to upgrade the park and view looking out over Ocean Beach) was financially supported by Southern Marine Farms (paua hatchery company) located at Ocean Beach.

The Bluff Coastguard's Sanford Berth (made from an old salmon cage and named after Sanford) gave the Coastguard a permanent floating berth. Previously the coastguard had jumped from berth to berth and had no 'home'. The berth is the only floating berth at the port and allows level and fast access to the Coastguard boat: important in emergencies. Another highly significant effect is that the floating berth has allowed bodies to be removed respectfully. *'We've had some tough times here recently, having to deal with dead people. The grieving families don't want to see their loved ones being moved on a crane - that'd just be cruel. The families are going through enough and we typically know the people too. They're our friends. We can treat them with respect.'* The physical infrastructure provided by Sanford (at no cost to Bluff Coastguard) has allowed them to respond rapidly and also respond respectfully for their community.

A Sanford boat (The Douglas) has been used in a rescue in the past. However, of greater significance is the Sanford boat San Hauraki. The San Hauraki is the biggest boat in Southland and Bluff Coastguard believes the boat is there as a back-up if ever needed. *'We've used the Sanford boat (The Douglas) once as a search vessel too - giving us greater coverage of a search area. We can ask the San Hauraki to help us if we need to. We've never had to ask, but we know if we did ask we'd get it. It's the biggest boat in Southland and can sail when the ferries and other boats can't. It's great to know it's there as a backup.'*

3.224 Level of civic engagement by aquaculture employees

The contribution of Sanford employees to the delivery of critical social services such as the Bluff Volunteer Fire Brigade, ...

Sanford employee's make a highly significant contribution to sustaining vital community functions. Of the 25 members of the Bluff Volunteer Fire Brigade, Sanford has two senior firemen, two regular firemen and one secretary (16 percent of the Brigade, and one administrator). Importantly, the senior firemen can captain the fire truck. Furthermore, the captain of the Fire Brigade describes Sanford staff as particularly helpful for providing cover when other volunteers are away (others work all over the district, work on boats, etc) because most Sanford staff are based in Bluff and are nearly always 'on the spot'. The captain confirmed the secretary was very important for the smooth running of the Brigade. *'Yeah, she keeps on top of the paperwork - she's an absolute star and saves us from all that. The paperwork is immense. Every callout is forms galore, let alone the minutes to the meetings'*.

... Bluff Coastguard, and ...

A similar story is told by the Bluff Coastguard where 6 of 40 Coastguard crew are Sanford employees, and most are senior crew or skippers. *'If they weren't there we'd have a real hole regarding years of seamanship experience, knowledge of Foveaux Strait and skills.* Again, Sanford staff 'punch above their weight' with 15 percent of the Coastguard, yet Sanford staff make up 4 percent of the total population of Bluff. In a town based around fishing and ports, and for the people living on Stewart Island, Coastguard is a critical social service. Another factor which points to the highly significant effect of the aquaculture industry for Bluff Coastguard is the information provided. After receiving a distress signal one of the first actions of the Coastguard base is to assess the relevant weather and sea conditions. Sanford provide weather and sea condition reports to Bluff Coastguard about Foveaux Strait and Stewart Island – meaning an appropriate and safer response from the Coastguard can be made. *'[Sanford] They're Johnny on the spot. We regularly radio them about conditions over there [Stewart Island], it's 22km away, before assessing how we'll operate'.*

... St John Ambulance is significant.

Similarly for St John Ambulance (Bluff), Sanford provides 1 volunteer out of a total of fourteen (7 percent). The St John Ambulance Director described how the Sanford staff member was allowed to be instantly released from her work, allowing a speedy response which was critical for a good patient outcome. There is a substantial time commitment in on-going training (four weeks per year) and call outs (twice per week, 2 hours each time). The benefits flow both ways since it means Sanford has a person with First Aid skills in its factory, as well as providing a First Responder for St John Ambulance.

Similarly, a Sanford staff member has a position on the Southland Institute of Technology Board for the Environmental Management Degree course. This is done free of charge as a community gesture.

All at no cost to the volunteer to deliver these social goods to Bluff.

What is impressive is how Sanford allows its staff to deliver these critical community services without docking their wages. This is not universal across all businesses as confirmed by the St John Ambulance director. *'Not all employers are in a position to be so generous'.*

Aquaculture employees and their children contribute to the sustainability of community organisations and ...

Only one community organisation did not have an aquaculture employee as a member – the Bluff Yacht Club, and all current members live in Invercargill. In contrast, the proportion of Sanford staff and their children who participate in local community groups is highly significant for most of the community organisations and schools/early childhood education centres in Bluff. The participation contributes to the sustainability of many community organisations, and consequently these organisations contribute to the richness of opportunities for all people living in Bluff. Sanford staff and children make up membership in the following organisations:

- Bluff Sea Scouts (eight of 25 children; 32 percent)
- Bluff Rugby Club (42 of 175 adult and child members; 24 percent)
- Bluff Kindergarten (four of 24 children; 17 percent)
- Bluff School (18 of 145 children enrolled; 12 percent)
- St Teresa's School (one of 11 children enrolled; six percent)

... Sanford staff perform important functions within these community organisations.

Sanford staff make highly significant contributions to the management and day-to-day running of community organisations, including:

- 2024 Rejuvenation Committee (one of 17 members, but importantly she is the secretary who writes the newsletters and provides access to the Sanford printers)
- Bluff Sea Scouts (four leaders from Sanford, three of whom are also on the committee)
- Bluff Senior Citizens (two of six committee members are ex-Sanford employee's).

The contribution extends across the life course and into retirement.

The contribution of Sanford employee's to community organisations spans the lifecourse: from children (Sea scouts) to senior citizens. Also of interest is how ex-aquaculture industry employees continue to contribute socially to the community, even in retirement.

A large workplace such as Sanford performs a social engagement function within a small town such as Bluff.

One participant described how Sanford acts like a social/community hub, particularly for older employee's and those who don't have children at school (the other social hub in town). *'Nearly every family has some sort of connection to the place - so if you want something known, or want something to get out in the community - just run it through Sanford'*. These interview findings were also supported by the staff survey findings.

3.225 Contribution to local community identity

Aquaculture product contributes to the local identity of Bluff and Southland, ...

A final theme that emerged from many participants was how aquaculture products (salmon, mussels and oysters) contributed to the identity and quality of life for those living in Bluff and Southland. These products sit beside blue cod, crayfish, paua, Bluff Oysters and more: presenting an exceptional diversity and quality of kai moana. As described earlier, aquaculture product was mana-enhancing kai for Awarua Runanga, it helped the Bluff Rugby Club deliver on the identify of Bluff, and was described as iconic food by the Bluff Volunteer Fire Brigade. There is no doubt that locally produced food can be a substantial source of pride for local people, and act as a draw-card for tourists if the food is of particularly high quality or only available locally. Aquaculture product, particularly the salmon (quality) and farmed oysters (scarcity and quality) deliver on these attributes.

...though more could be achieved in the future...

In contrast, two participants, both of whom had a substantial remit for promoting tourism (Venture Southland, Stewart Island Promotions) described a big gap in the quality of the raw aquaculture product (very high) and how it was most commonly presented to visitors/tourists (deep fried, can't see production easily, can't easily buy raw farmed oysters). Both organisations acknowledged pockets of excellent food processing (e.g. Stewart Island Smoked Salmon) and farmed oyster presentation (e.g. South Seas Hotel).

... and in the future the aquaculture industry and suppliers could come out of the shadows and demonstrate the substantial social contribution made to the Bluff community by aquaculture.

Many participants were unable to distinguish the difference between fishing in general (e.g. quota) and aquaculture. Participants described that aquaculture has a low profile in Bluff, whereas *'if Sanford is mentioned, everyone knows about it'*. Similar to the identity discussion above, while kai moana and fishing is a distinct part of Bluff's identity, aquaculture itself was seen by several currently to be *'below the radar'*. The hatchery companies (NZ Bluff Oyster Ltd and Tio Ltd) expressly enjoyed their low profile in the community, allowing them to just get on with quietly growing their companies until they are big enough to make more substantial contributions. To complement the low profile of aquaculture in Bluff, Sanford is not seen as a shiny corporate, instead by some Sanford is seen simply: *'they're a fish factory, a place of employment'*. The lack of aquaculture industry identity in Bluff can best be summed up by this quote, *'Sanford does a lot that people don't know about'*. While Sanford has been classified as the only aquaculture company in Bluff in our report, it is worth noting the two spat supply companies are happy to maintain the low-key profile of aquaculture in Bluff, for the moment at least.

3.226 Housing in Bluff

There has been no substantial effect on housing from the slow growing aquaculture industry in Bluff.

One social question is whether an industry has the ability to affect the housing market, and thereby affect local residents. In Bluff there has been no substantial effect of aquaculture on housing, positive or negative, due to the slow growth of the aquaculture industry over the last thirty years. *'It's not unbalanced either way'*.



3.3 Invercargill and other areas

Of the 130 people employed directly by aquaculture companies in this Southland case study, 35 (or 27 percent) live elsewhere, apart from Stewart Island and Bluff, and mostly in Invercargill. Even if we assume that these 35 employees all live in Invercargill, this represents less than 0.1 percent of the resident population in 2013. It is evident that, at a community level, the social and community effects of the regional aquaculture industry are likely to be negligible when compared with the effects identified above in the particular local communities of Bluff and Stewart Island, where employee numbers represent 4 percent and 7 percent respectively of the resident population.

To complement the investigations in Stewart Island and Bluff, for this case study research, six businesses operating in Invercargill were interviewed because the aquaculture companies identified them as part of their supply chain. The six businesses represented transport (3), marine engineering (1), electrical services (1) and environmental planning (1). All these businesses have commercial dealings with one or several of the aquaculture companies, and all are staffed by people who live in Invercargill. Collectively, they are currently staffed by 116 full-time, 8 part-time and 14 contracted individuals.

The degree of business dependence on aquaculture, as represented by the percent of current annual business revenue earned from all the local aquaculture companies collectively is summarised in the following table.

Table 9. Revenue from aquaculture

Percent current revenue from aquaculture	Number of companies
11-15%	1
5-10%	2
<5%	3

Of the six businesses, three have experienced significant growth in their aquaculture-related business activities over the past five years.

As the following comments illustrate, the nature and degree of dependence on aquaculture varies from company to company -

- *'It has been a growth industry, even without increased water space; and there has been more water space recently with the oyster operation in Horseshoe Bay.'*
- *'It's a foot in the door; exposure to the company; potential for things to take off.'*
- *'This is a specialist niche market locally/regionally for us, and it suits our company vision and strategy to support the region's food production and processing capacity - well aligned to this; good value to our brand and reputation.'*
- *'Southland is the only branch throughout NZ that moves this volume of perishables.'*
- *'Our business caters to many different sectors; each is important - part of our diverse client base.'*

The current level of indirect employment related to aquaculture company spend on supplies of goods and services from the Invercargill businesses interviewed is estimated to be 2 full-time, 2 part-time positions, and one contracted position. This indirect employment was found in only three of the six businesses interviewed, all of which are at the higher end of the inter-dependency scale.

4 The setting for this research

In this section we summarise various aspects of the setting for this case study research. We begin by summarising the development of aquaculture activity in Southland over the past three decades, with some reference to other significant regional economic changes and recent trends. In terms of social setting, our primary interest is in the communities of Stewart Island and Bluff which are most closely associated with aquaculture and the processing of aquaculture products.

4.1 Aquaculture in Southland

As allowed within the Southland's Regional Coastal Plan,⁷ aquaculture farms in Southland have been present in two locations: Big Glory Bay in Stewart Island and Bluff Harbour.

4.11 Big Glory Bay, Stewart Island

Salmon farming and harvesting:

Aquaculture farming in Big Glory Bay began in earnest with caged salmon farming and mussel farming in the 1980s, although several smaller initiatives in mussels and oysters pre-1970 were recounted by long-time residents of the Island.⁸ As many as six or seven companies were involved in salmon farming at the beginning. However, an algal bloom in 1989 had devastating effects resulting in the demise of most of these early salmon farming operations. Currently, Sanford is the only company with salmon farming operations in Big Glory Bay, with operations first established and producing in 1987.⁹ Only since about 2005 has caged salmon been harvested from the farm on a year-round basis. Product is transported direct to Bluff using the company's own vessel.

Table 10. Salmon production and related direct employment - 1987-2015

Year	Tonnes	Farm staff	Factory staff
1987	186	6	15
1990	515	8	25
1995	1100	11	30
2000	1400	13	40
2005	1600	15	40
2010			
2015	3200	19	50

Source: Sanford.

Salmon processing:

Before the algal bloom devastated the local caged salmon industry in Big Glory Bay, two small processing factories had been established on Stewart Island, at Horseshoe Bay and Halfmoon Bay. These factories employed about 10 and 20 staff respectively, all of whom lived on the Island, but the jobs were lost with the demise of most of the salmon farms. These figures indicate that salmon-based aquaculture resulted in a larger number of Island-based jobs in the 1980s than all the present aquaculture activity does in 2015.

Caged salmon has since been processed in Sanford's Bluff factory. Three quarters of Sanford processing activity in Bluff is processing farmed product, with one-quarter processing wet fish (from the wild fishery caught under quota management).

⁷ <http://www.es.govt.nz/publications/plans/coastal-plan/>

⁸ 'Two Ton Johnson' had mussel lines well before 1970 and Maurice Newman had an oyster farm for years.

⁹ Although the company operated then under the name of Stewart Island Salmon Company.

Mussel and oyster farming and harvesting:

Six companies¹⁰ currently own or operate mussel farms in Big Glory Bay and have done so since the 1990s. However, active servicing of these mussel farms, including seeding and harvesting operations (requiring substantial mechanical equipment) is largely carried out by two companies.¹¹ One is based in Stewart Island and the other in Bluff. Again, only since about 2005 have mussels been harvested on a year-round basis. Two vessels¹² transport the mussels to Bluff.

Mussel processing:

Some years ago, all Sanford mussel processing moved from Bluff to Christchurch. Consequently, all the farmed mussels from Big Glory Bay are trucked to Christchurch for processing in one of two factories.¹³

Table 11. Mussel production¹⁴

Year	Tonnes	Farm staff
1990	120	3
1995	600	4
2000	900	8
2005	2540	16
2010	2775	18
2015	2400	18

Oyster farming:

In recent years, oyster farming has been introduced to mussel licence areas in Big Glory Bay by three of the six companies operating there. This required a variation to the previous licences. However, difficulties have been experienced with producing and sustaining oyster spat in Big Glory Bay, with consequences for production levels. This has led to the development of recent ventures in oyster spat production on land.¹⁵ Two company groupings operate in oyster farming: Sanford with Tio Ltd; and NZ Bluff Oysters Ltd with EEC/Maass Barrett Ltd.

Table 12. Farmed oyster production - 2011-2014

Year	kg
2011	82
2012	1,579
2014	815

Source: MPI.

10 EEC Ltd, Gorton Fisheries, Maass-Barrett, Rough Gully, Sanford and Schofield Sea Farms.

11 EEC Ltd and Sanford

12 Owned by Rakiura Shipping and Sanford, which provide reciprocal back-up capacity to each other in situations where one vessel is out of service.

13 Owned by Sanford and Southern Seafoods. During the finalisation of this report, Sanford Ltd announced the Riccarton, Christchurch mussel processing factory was closing and processing was moving to Havelock.

14 Data are combined from company returns.

15 Two companies - Tio Ltd and NZ Bluff Oysters Ltd - operate separate oyster spat nurseries at the old Ocean Beach freezing works site (on land).

4.12 Bluff Harbour

Several aquaculture licences have been issued for Bluff Harbour and several ventures have trialed aquaculture in the harbour. However these have all been abandoned due to water quality and rough climate conditions. At the present time there are no aquaculture operations in the harbour for any species.

4.13 Land-based aquaculture

As noted above, several aquaculture operations have evolved on land. Two produce oyster spat and are variously linked to aquaculture companies operating in Big Glory Bay. There is also a third company which has been involved for a number of years in a paua hatchery at the old Ocean Beach freezing works site.

4.14 Aquaculture employees

Apart from company owners, it is estimated that there are currently 49 employees directly involved in aquaculture¹⁶ in Stewart Island and Bluff, and a further 77 in processing the output of this aquaculture activity (salmon only) in Bluff, three quarters of whom live in Bluff.

Of the 49 directly employed in aquaculture operations (by the aquaculture companies), it is estimated that 25 currently live on Stewart Island,¹⁷ 11 currently live in Bluff and 13 live elsewhere.

4.2 The social setting

Invercargill is the economic hub of Southland. While some of the companies that provide goods or services to the aquaculture companies are based in Invercargill - and some of these have been interviewed for this case study research - our primary focus for social assessment purposes has been the two local communities most closely associated with the historical (and current) aquaculture farming and processing operations in the region - Stewart Island and Bluff.

4.21 Stewart Island/Rakiura

Rakiura National Park occupies 85 percent of the island's 1,570 square kilometres of land. A network of walking tracks is well established around the northern and western perimeter as far as Masons Bay and Doughboy Bay, and also leading across the centre of the Island to the head of Patterson Inlet. Stewart Island is promoted as an eco-tourist destination.

Settlement:

The only town on Stewart Island/Rakiura is Oban, although several other settlements existed in the nineteenth century.¹⁸ Oban is the residential centre for the island community and spreads from Horseshoe Bay in the north through Halfmoon Bay to Patterson Inlet in the south. It is the administrative, commercial, service and social centre for the island community.

Resident population:

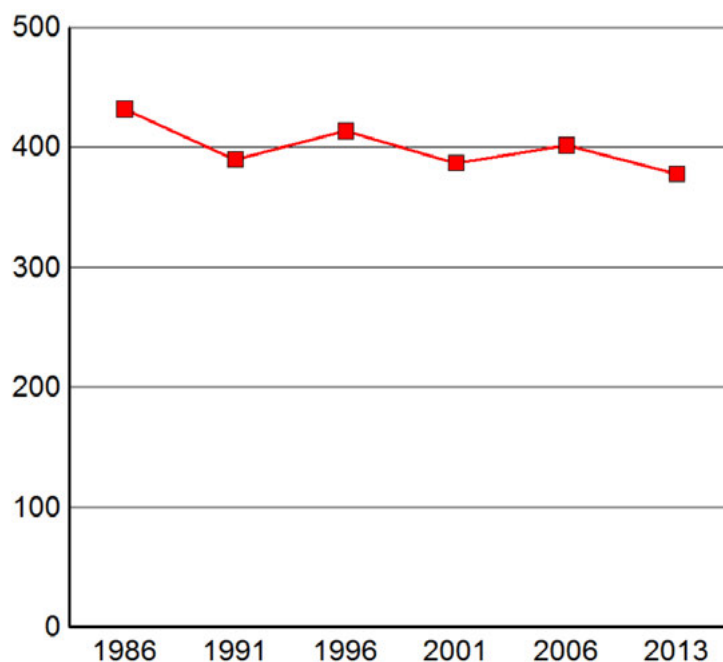
Over the last three decades (since aquaculture first established), the resident population of the Island has been in gradual decline, with the latest census in 2013 recording 378 Usually Resident individuals, a decline of 12 percent. The majority of this decline occurred between 1986 and 1991 and is attributed to changes in how wild fisheries activities were undertaken (see below). Over the same period, the Usually Resident population of Southland District, of which Stewart Island is a part, decreased by 10 percent (See Figure 1 below).

¹⁶ i.e. working on the salmon farm, mussel farms or vessels owned by the aquaculture companies.

¹⁷ Including company owners brings this estimate to 28.

¹⁸ Port Pegasus was located on the southern coast and once hosted several stores and a post office, but is now uninhabited. Port William existed briefly on the northern coast.

Figure 1. Stewart Island Usually Resident population. 1986 to 2013



Employment:

Fishing for cod, lobster and paua was historically the most important sector of the Stewart Island economy during the 1960s and 1970s, as was the case for similar coastal towns around Southland - Waikawa, Bluff and Riverton.¹⁹ However, the subsequent two decades saw significant changes in the focus of Southland wild fisheries, changing from coastal to deep sea and in fishing capacity, particularly after the quota management system was introduced in 1986. This prompted a move to fewer and larger boats, with fewer boats based in Stewart Island and consequently less fish processing on Stewart Island.²⁰ During this same period, tourism has remained an important source of employment and income for resident Stewart Islanders, though it is seasonal in nature.

The 2001 census recorded 39 residents employed in primary industries,²¹ a similar figure²² by 2013 - recorded as 36. Over the same period, two industry categories representing employees in tourism activity - 'Accommodation, Cafes and Restaurants' and 'Cultural and Recreational Services' - have increased (see Table 14 below for employment numbers by category). Tourism numbers were approximately 30,000 in 1978 and are the same now, the only substantial change is the cruise ships leading to day peaks. Employment in retailing activities remained constant. Total employment on Stewart Island declined marginally from 240 in 2001, to 231 in 2013, while those recording themselves in the census as unemployed fell from 12 in 2001 to 3 in 2013.

¹⁹ McClintock, 2000, pp.1-2

²⁰ A number of people interviewed for this research suggested this may have been one of the more significant reasons for the decline in resident population.

²¹ Agriculture, forestry and fishing, which in Stewart Island is predominantly fishing. Furthermore, 'fishing' will include aquaculture in these statistics.

²² The difference of 3 between 2001 and 2013 is within the margin of rounding for census statistics.

Table 13. Principal industry categories of employment on Stewart Island – 2001 and 2013

Industry group	2001		2013	
	Number	Percent	Number	Percent
Agriculture, Forestry and Fishing	39	16%	36	16%
Accommodation, Cafes and Restaurants	36	15%	42	18%
Transport and Storage	36	15%	24	10%
Cultural and Recreational Services	21	9%	27	12%
Financial, Insurance, property and Business Services	18	8%	24	10%
Retail trade	15	6%	15	6%
Manufacturing (including processing)	15	6%	12	5%
Education services	9	4%	9	4%
Health and community services	6	3%	6	3%
All industries	240	100%	231	100%

Stewart Island has evolved a diverse range of accommodation options. These include the hotel and four motels, several backpacker establishments, several lodges, and a selection of both hosted and self-catering options. While total bed numbers are likely to be well in excess of 200, the primary market is the summer tourist season when accommodation can be fully occupied on occasions. The tourism focus - during a season which generally spans Labour weekend to Easter - has a large influence on tariffs (increased cost) and the availability of year-round rental accommodation on the Island for the resident population (difficult to find good quality accommodation year round).

Services:

Access to Stewart Island is by daily ferry services²³ between Bluff and Oban (approximately one hour sailing time); and daily flights²⁴ between Invercargill and the Ryan's Creek aerodrome on the Island (approximately 15-20 minute flight time). In-coming and out-going postal services for the Island community are hosted in the airline office in Oban.

Since 1988, electricity supply on the Island has been provided by centralised diesel generators, replacing individual generators used previously. Consequently, electricity costs on the Island are about four times the cost faced by mainland consumers.²⁵

Oban hosts a medical centre staffed by a Nurse Specialist who is multi-skilled for nearly all eventualities in the life course (from birth to palliative care to general medical services). They are primary responders in medical emergencies and the Centre also holds basic pharmacy stock for typical illnesses. Oban has a well-equipped Volunteer Fire Brigade with two appliances and a current complement of 23 volunteers. Since 2000, the numbers of volunteers has fluctuated between 8 and 23. There are no paid officers. The Volunteer Fire Brigade attends about a dozen fire call-outs a year, provides assistance with boat salvage (2-3 per year), traffic accidents²⁶ and medical alerts, providing back-up to the nurse and police, and helping injured trampers.

A Police station is located on the hill behind the township²⁷ staffed by a single police officer, who explained that the main focus of incidents and Police attendances on the Island is for thefts and violence and disorder associated with alcohol. However, the reported crime rate is described as '*very low*'.

²³ Real Journeys operates the ferry service with two vessels

²⁴ Stewart Island Flights, previously known as Southern Air, operates three scheduled return flights each day as well as non-scheduled flights in response to demand. The airline also offers flights to Masons Bay, Doughboy Bay and West Ruggedy Beach.

²⁵ www.stewartisland.co.nz

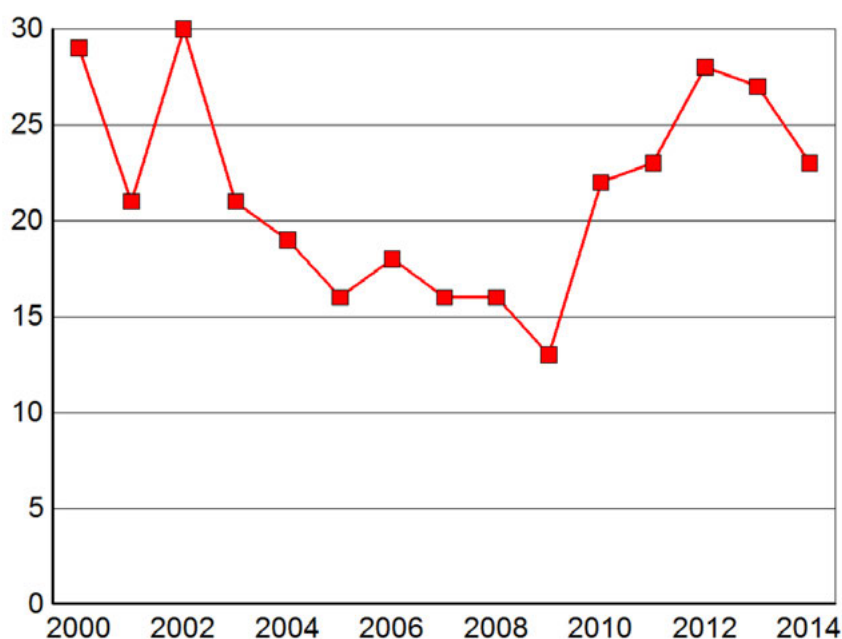
²⁶ The Volunteer Fire Brigade has full extrication gear; note there is no back-up from the mainland for at least several hours

²⁷ At the corner of Golden Bay Road and View Street, directly opposite the playing field.

Presbyterian and Anglican churches also hold services, with the Presbyterean church relying on visiting ministers while the Anglican church has a resident minister, with services held monthly.

Halfmoon Bay Primary School is a full primary (ages 5-13 years), which has had a decile rating varying from 7 (from 2000 to 2002) to 3 (from 2003 to 2007) and now stands at 4. There are 2.5 full time equivalent teachers at the school. Its roll has fluctuated considerably since 2000, between a high of 30 and a low of 13 and now stands at 21. Some degree of fluctuation is not uncommon in small rural or remote community schools, as cohorts of children pass through the school. Where communities do not have secondary schools accessible by daily transport – as is the case with Stewart Island – such fluctuations can be amplified if families choose to re-locate when their oldest child reaches secondary school age, taking younger siblings at the same time. However, Halfmoon Bay Primary has experienced additional influences from the likes of the Department of Conservation reorganization and the changes to the wild fisheries sector. Unlike most other schools in New Zealand, Halfmoon Bay School is the main user of the co-located Community Centre which can be used as an additional high quality space for learning and teaching (see more information on the Community Centre below).

Figure 2. Halfmoon Bay primary school roll – 2000 to 2014



Co-located with the primary school is the only Early Childhood Centre on the Island, known as Rakiura Rugrats. The Centre operates one session/day, with 4 year-olds attending an extra session once a week in preparation for going to school. The capacity of the facility is for 21 children. Currently 17 are attending.

Community facilities:

The most significant community facility is the Community Centre, opened in 2000. This facility provides an indoor sports stadium large enough for a full-sized basketball court, a social room with stage and commercial kitchen facilities, a gym with exercise equipment, a squash court, a library and public toilets. The pre-school and school have priority access to the indoor sports stadium during school hours. Other community uses of this space currently include a 1-hour Taekwondo class mid-week (9 participants at present); 1-hour boot camp three times/week (Tues/Thurs/Sat) (9-12 participants). Furthermore, visiting schools on school camps make extensive use during the evenings and in wet weather. The social room is used for a wide variety of community functions – hired out for weddings (mostly to visitors to the Island; about 6 per year); funerals for residents; the school puts on an end-of-term concert 4 times a year and a play every alternate year; visiting schools on school camps hire the commercial kitchen and equipment; a weekly class of swiss-ball exercises (about 6 participants); a weekly Tai Chi class (about 6 participants); plus a variety of local events such as expos, the Easter

Sunday Quiz, master Chef, quilting displays, a singles ball and locals ball once a year. It is also hired out by outside organisations (Department of Conservation, Southland District Council, Environment Southland) when bringing visiting presentations. The whole complex is used for a day in January when the Southland District runs a school holiday programme event for all children present.

Across the road from the Community Centre is a smaller building, adjacent to the bowling green, which is available for hire for similar uses and is able to accommodate smaller-sized groups.

4.22 Bluff

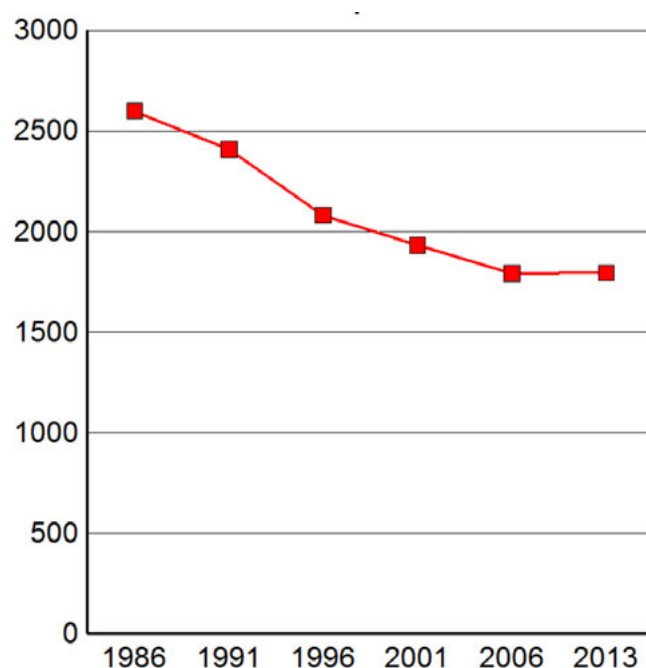
Settlement:

Bluff (27 km south of Invercargill) is New Zealand's southernmost town and site of Southland's port (Southport). Bluff is an old settlement. When sailors arrived in the harbour in 1813 they encountered a Ngāi Tahu settlement on the side of Bluff Hill which had existed for generations. Bluff became a busy port town and many current community organisations were started over 125 years ago, while Awarua Rūnanga traces its beginnings far earlier still. Bluff is the oldest continuously occupied European settlement in New Zealand.

Resident population:

During much of the past three decades since aquaculture first established in Big Glory Bay, the resident population of Bluff has declined steadily and significantly. The resident population in 2006 was 30 percent lower than in 1986, but appears to have stabilised at this level, as shown by 2013 census results. Over the same period, usually resident populations of both Invercargill City and Southland District declined by 10 percent, in contrast to the total New Zealand population which grew by 30 percent.

Figure 3. Bluff Usually Resident population – 1986 to 2013



Employment:

While fishing for cod, lobster, paua and oyster dredging have long been important elements of the Bluff economy, along with related marine engineering businesses. Southport has been a major employer over many decades. The nearby Ocean Beach Freezing works was a very large employer until closure in 1991. Although a substantial industrial activity, workers at the Tiwai Point aluminium smelter immediately across Bluff harbour have generally lived in Invercargill rather than Bluff, due to the travel distance by road.²⁸

Changes in these major employment sectors (see Table 15 below) have been influential in the decline of Bluff's population. Closure of Ocean Beach freezing works in 1991 resulted in the loss of many jobs.²⁹ *'When freezing works closed down, large numbers of people, often many members of the same extended family, were suddenly out of work. The whole community was affected as spending power dropped sharply'*.³⁰ This was followed several years later in the early 1990s by the transformation of port operations to containerisation, resulting in further substantial job losses.³¹ The parasite *Bonamia* devastated the harvest of Foveaux Strait oysters from 1986 to the mid-1990s, further affecting employment. Meat and seafood processing continue to be large employers in Southland with the seafood processing plants located in Bluff, Invercargill and Stewart Island processing both deep water fish species and farmed produce.³²

School re-structuring in the early 2000s may also have contributed to the decline in Bluff's resident population, when intermediate schools were focused on Invercargill, requiring children of intermediate school age to commute by bus.

Table 14. Principal industry categories of employment in Bluff – 2001 and 2013

Industry group	2001		2013	
	Number	Percent	Number	Percent
Manufacturing, including marine engineering and food processing	234	28%	231	27%
Transport and Storage	111	14%	111	13%
Agriculture, Forestry and Fishing	105	13%	87	10%
Retail trade	57	7%	54	6%
Financial, Insurance, property and Business Services	57	7%	54	6%
Health and community services	39	5%	54	6%
Accommodation, Cafes and Restaurants	36	4%	45	5%
Educational services	36	4%	30	3%
Cultural and Recreational Services	12	1%	12	1%
All industries	822	100%	870	100%

Services:

Stirling Point is the southernmost point (and some would say beginning) of State Highway 1. It is a popular spot for tourists to take photos. If not leaving Bluff by boat (via the port), a vehicle trip up SH1 to Invercargill takes approximately 20 minutes. The closest airport is Invercargill airport, although private helicopter services are available just out of Bluff. Bluff is the ferry crossing point to Stewart Island (while Stewart Island Flights depart from Invercargill Airport).

28 While the aluminium smelter appears to be just across the harbour from Bluff, the road distance is 33km from Bluff township and 25km from Invercargill.

29 Estimated by one interviewee at about 2,000.

30 www.teara.govt.nz/en/agricultural-processing-industries/page-8 - accessed 22 March 2015

31 A stevedore interviewed for this research estimated a port workforce in the 1980s of some 450, compared with a current workforce of about 100.

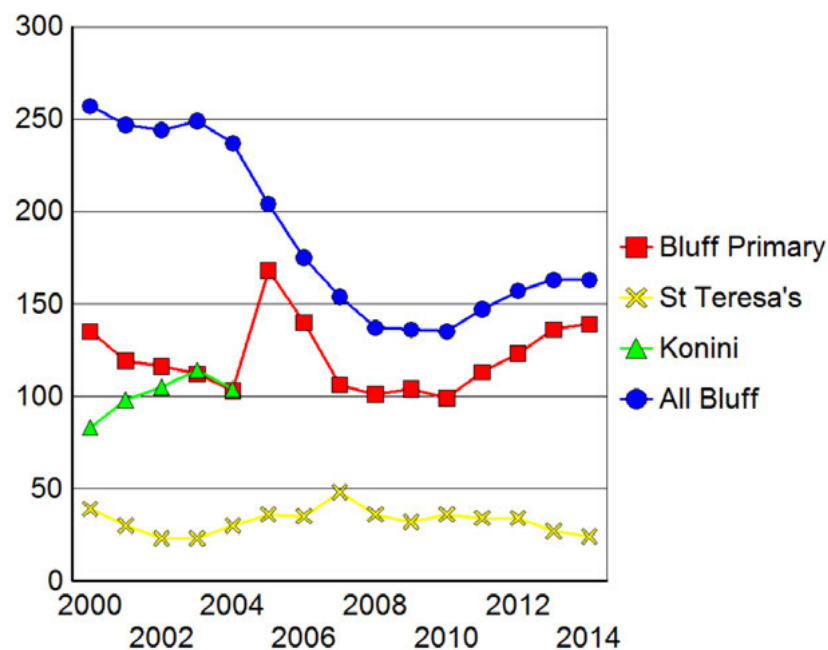
32 <http://www.southlandnz.com/Work/Industries/Food-and-processing> - accessed 22 march 2015

Bluff has a medical centre run by a Community Trust to provide General Practice access for residents of the town. Fifteen hundred of the 1800 Bluff residents are on their roll. Bluff has a well-equipped Volunteer Fire Brigade with two appliances and a current complement of 25 volunteers. The Volunteer Fire Brigade attends about 60 call-outs a year, predominantly chimney fires, storm damage and ambulance back-up (very few traffic accident call-outs). A Police station is staffed by two police officers undertaking general policing duties. St John Ambulance in Bluff has a single fully-equipped vehicle undertaking approximately 2 callouts per week. St John also run First Aid training courses and have a venue for hire.

Bluff Coastguard is a volunteer-run organisation delivering sea-based search and rescue. They also spend about 1/3rd of their hours on community education focused on safe recreational boating, navigation courses and first aid courses. The Coastguard has a floating berth in Southport with a single vessel (currently in the process of fundraising for a new boat). There are 40 volunteers in Bluff Coastguard.

Bluff School is a full primary school (ages 5-13 years) which has a decile rating of 3 (previously 2). The current school roll is 145 children. Bluff School merged with Konini School in 2005 (causing a roll increase at Bluff School), but even with this, over the last 15 years the roll for Bluff school has changed little. St Teresa's School is an integrated catholic primary school with a current roll of 16 pupils and a decile rating of 3. St Teresa's roll has also fluctuated over the last 15 years and is at a historical low at this time. Overall, there has been a substantial decrease in the number of children attending primary schools in Bluff over the last 15 years (from over 250 in 2000, to 160 in 2015).

Figure 4. Bluff primary school rolls – 2000 to 2014



Bluff Kindergarten is a sessional kindergarten offering one session per day of early childhood education. There is a declining roll at the kindergarten and the current roll is 24 children, of whom 23 are in some manner associated with the fishing industry or aquaculture. This underscores the 'fishing port nature' of the town.

Community facilities and organisations:

The most substantial community facility in Bluff is the Te Rau Aroha Marae. It's the world's southernmost marae. Its wharenui is colourful with rich carvings designed by Dr Colin Whiting. The marae is used as a meeting place for celebrations, bereavements, wānanga (for learning) and hui (meetings). Awarua Rūnanga is one of 18 Ngāi Tahu rūnanga. While the marae is the base, the rūnanga runs an early childhood education centre, study and homework centre, research and development arm, Awarua Whanau services (health and social services), Awarua Tio development, and Awarua Synergy (previously running an 'energy efficiency in homes' programme to insulate and heat over 600 homes in Bluff). Awarua Rūnanga supports the majority of aquaculture industry employees in Bluff can whakapapa back to Awarua Rūnanga.

The Bluff Rugby Club is 125 years old and has three senior rugby teams and 4 junior/ schoolboy teams (175 members) playing in the Southland competition. The club owns the building and the ground is owned by Council. The large facility also has a bar and squash courts. The ground is used only for rugby, though the building allows an all-weather boot camp to run 3 times a week.

Bluff Sea Scouts has a roll of 15 children and has been operating since 1940. The club teaches leadership, respect, responsibility and other personal skills via rowing, sailing, swimming and seamanship.

Bluff Yacht Club uses Bluff Harbour for recreational sailing and competitions year-round. The club has developed a map of the harbour showing their 'top of tide' racing and this has set the benchmark for the location of recreational use of the harbour. Despite all of the members living in Invercargill, the club describes a very good relationship with the Bluff community.

The Bluff 2024 Rejuvenation Committee is a community-led organisation which has undertaken community-led initiatives such as murals, a mosaic mural, adopt a street, a quarterly newsletter (delivered to every house in Bluff), new entrance sign to Bluff, entrance plantings, and helping Bluff Promotions with their events: Bert Munro, Bluff Hill Grunt and Oyster Festival.

Bluff Senior Citizens provides a venue and opportunity for older people to get together.

Regional and local governance:

Southland District Council is divided into five wards with 12 elected councillors. One Ward is Stewart Island Rakiura (one councillor) and a community board of six. Another is Waihopai Toetoes (encompassing Bluff, with two councillors) and a Bluff community board of six. The Council manages roads, water supplies, sewerage schemes, cemeteries, community halls, community housing units, libraries, reserves and parks, and much more. The Community Board provides local input to their relevant councillor(s) for consideration at council meetings.

Environment Southland has many roles, but in relation to this case study it is the regulating body which sets the rules around what aquaculture farming can be done, where and how. It administers this via the Regional Coastal Plan. The Plan was developed by the Policy team after community consultation and covers the area from the mean high tide mark to 12 nautical miles out to sea. The Consents Team administers and issues consents; and a further team checks compliance via inspections, and prosecutes if required. Aquaculture consents are typically issued for long periods of time. For example the Sanford consent is not due for re-consenting until 2025.

Te Ao Mārama Incorporated represents the four rūnanga of Murihiku in resource consent processes. It is funded by all seven councils in the lower South Island for this role. Te Ao Mārama simplifies the resource consent process regarding consultation with Maori by providing a single point of contact with Ngāi Tahu. It is Te Ao Mārama's responsibility to get the Maori consultation right, and this includes any aquaculture consents. Te Ao Mārama Incorporated have also been involved in the recent aquaculture zoning work led by Environment Southland.

Venture Southland is the Regional Economic Development Agency. In relation to this case study it has planning functions, provides investment advice, administers the Callaghan research fund that aquaculture company start-ups can access, and acts as an honest broker between (and within) industry and Government. Venture Southland is the driving force behind the Southland Aquaculture Strategy.

The Department of Conservation administers Rakiura National Park (established in 2003). The Park has an extensive network of 280 kilometres of walking tracks (the longest in New Zealand) and the Park covers 85 percent of Stewart Island (157,000 hectares). Stewart Island is strongly marketed as an eco-tourism destination with the Park being the main attraction.

5 References

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Quigley R and Baines J (2014a). The social value of a job. MPI Information Paper No: 2014/24.

Roskrige M and Pawar S (2015). Southland Region Labour Market Assessment 2014-2031. University of Waikato, January 2015.

Stewart Islands Promotions - website: www.stewartisland.co.nz

6 Appendix

– Approach and methods

The researchers adopted a multi-method approach to gathering information for this case study, including:

- accessing official statistics, particularly data from various census of population and dwellings (1986-2013);
- previous research documents (see reference section);
- systematic structured interviewing of Stewart Island, Bluff and Invercargill representatives from:
 - aquaculture companies;
 - companies that supply goods or services to aquaculture companies, and companies dependent on materials from aquaculture companies
 - service providers and community organisations operating in Stewart Island and Bluff
 - local and regional government representatives.
- a survey of aquaculture company employees.

Overall, this research has engaged with 66 organisations (predominantly via face to face interviews with a key individual) in these Southland communities, without whose assistance and willing co-operation the research would not have been possible. The survey of 130 aquaculture workers (102 Bluff, 28 Stewart Island) had 65 responses (exactly 50 percent response rate – a very good response for a postal survey).

As noted in the Introduction, the collection of information in the interviews and the employee survey was guided³³ by the conceptual framework described in the report 'The social value of a job'. Furthermore, the interviews were coded into themes based on the same conceptual framework, and new themes were added as required.

³³ Reference to that conceptual framework indicates that this case study provided an opportunity to gather empirical data on some of the social effects identified. Data for other aspects would generally require long-term, population-based epidemiological studies, and therefore be well beyond the scope of this case study research.

7 Appendix

– Organisations interviewed for this assessment

3 March	Gorton Fisheries (mussels) CRA-8 Management Committee St Teresa's School
4 March	Halls Refrigerated Transport
9 March	Sanford Aquaculture Bluff Engineering Riverton Fisheries Company Bluff Electrical Osborn Engineering Bluff Rugby Club Bluff Maritime Museum Bluff Kindergarten Bluff 2024 Rejuvenation Committee Southern Seafoods
10 March	EEC Ltd (mussels) South Seas Hotel Stewart Island Backpackers Rakiura Shipping Stewart Island Water Taxis and Eco-tours Stewart Island Volunteer Fire Brigade Maass-Barrett (mussels) NZ Bluff Oyster Company Ltd Awarua Runanga Invercargill Airport Perpetual Real Estate (Bluff)
11 March	Stewart Island Four Square Peter Ross Automotive (fuel and repairs), Stewart Island Stewart Island Police Stewart Island Community Centre Bay Motel, Stewart Island Halfmoon Bay School Bluff Medical Centre Bluff Sea Scouts Bluff Coastguard

Department of Conservation (Stewart Island staff)
Stewart Island Ward Councillor, Southland District Council
Stewart Island Golf Club
Stewart Island Promotions
Stewart Island Smoked Salmon

12 March

Stewart Island Flights
Stewart Island single residential unit rental (example)
Bluff Volunteer Fire Brigade
Bluff Police
Bluff Promotions
Bluff St John Ambulance
Bluff Senior Citizens
Bluff Sand Supplies and Cartage
Te Ao Marama Incorporated
Bluff Yacht Club
Environment Southland
Venture Southland
Invercargill City Council
Real Journeys

13 March

Bluff Community Board
Rough Gully (mussels)
Bonisch Environmental
EIS Electrical
NZ Couriers
Tio Ltd (Oyster spats)
Southport
Mussel farm manager, Sanford
Bluff School
Southland Institute of Technology

19 March

Gough Bros (marine engineers)
Churchill Restaurant and Oyster Bar, Stewart Island
Stewart Island Medical Centre