



Annual Environmental Management Report



July 2020 - June 2021

Developed by South Coast Mariculture

South Coast Mariculture Annual Environmental Management Report

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More information

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Cover image: Underwater at South Coast Mariculture Callala North Lease (AL 15/001) November 2020

Executive Summary

This report details the performance of the South Coast Mariculture marine aquaculture leases between 1st July 2020 and 31st June 2021. The report complies with State Significant Infrastructure Approval SS1-5657 that an Annual Environmental Management Report be submitted to the NSW Department of Planning and Environment, the NSW Office of Environment and Heritage and the Commonwealth Department of Environment and Energy.

For the purposes of this report the South Coast Mariculture leases will be referred to as:

AL 15/001 = Callala North Lease

AL 15/002 = Callala South Lease

AL 15/003 = Vincentia Lease

The report covers a range of activities including: construction and deployment; operation and maintenance; environmental monitoring and biosecurity; research; transport of spat; marine fauna interactions; navigational interactions; compliance with standards and performance measures and community engagement.

The report highlights compliance with consent conditions and provides examples of where and when standards were exceeded. The report also identifies any non-compliance issues during this review period.

Independent benthic environmental surveys were undertaken by the University of Newcastle prior to infrastructure deployment on the Callala North lease in 2019 and after spat stocking in 2020. These baseline and update surveys, based on water quality, gross seabed characteristics, sedimentary characteristics (particularly %TOC), benthic macroinvertebrate taxa and fishes, provide no evidence that the present stocking of mussels at the Callala North lease is having an adverse effect on the marine environment in this area of Jervis Bay. It is noted that annual benthic environmental sampling is to be continued at the same time of year (winter), with the next occasion expected to be in July / August 2021

During the reporting period there was:

- successful continued stocking of Callala North lease (AL 15/001) with Blue Mussel spat (*Mytilus galloprovincialis*)
- successful harvest of mussels from Callala North lease (AL 15/001) in November 2020
- no significant unexplained mortality or illness of mussels;
- no new introduced pest/species identified on the lease;
- no aquatic fauna entanglement incidents;
- there were 6 - 12 dolphins and no whales recorded within and around the Callala North lease (AL 15/001);
- an investigation into a potential approval process non-compliance by the Department (outcome pending)
- attendance of South Coast Mariculture directors and staff at community engagement forums;
- one water quality, benthic and video monitoring study conducted by an independent contractor from the University of Newcastle;
- operational training of staff;
- review of operational and emergency management plans; and
- employment of 9 full-time, 11 casual and 1 part-time staff members at South Coast Mariculture

This report also outlines any incidents related to operational matters that occurred on the South Coast Mariculture leases during the reporting period including:

- zero infrastructure malfunctions;
- marine fauna monitoring with zero entanglements and only one sighting within the lease area;
- one complaint registered and addressed;

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List of Abbreviations

EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPA	Environmental Protection Authority
EP&A Act	Environmental Planning and Assessment Act (1979)
FM Act	New South Wales Fisheries Management Act (1994)
IALA	International Association of Lighthouse Authorities
LGA	Local Government Area
MMR	Marine Mammal Research group Jervis Bay
MSDS	Material Safety Data Sheet
NPWS	National Parks and Wildlife Service
NSW DPI	New South Wales Department of Primary Industries
NSW DoPI	New South Wales Department of Planning and Infrastructure
NSW OEH	New South Wales Office of Environment and Heritage
POEO Act	Protection of the Environment Operations Act (1997)
JBMP	Jervis Bay Marine Park
NSW RMS	New South Wales Roads and Maritime Service
SCM	South Coast Mariculture
SWMS	Safe Work Method Statement
TMP	Traffic Management Plan
TOC	Total Organic Carbon
WH&S	Work Health and Safety

1. Introduction

The NSW Government recognises the need to develop sustainable and viable aquaculture. In November 2014, Fisheries NSW, a division of the NSW Department of Primary Industries (NSW DPI), obtained State Significant Infrastructure Approval SSI-5657 from the NSW Government Department of Planning and the Environment to establish three commercial extensive aquaculture leases totaling 50 Hectares within the marine embayment of Jervis Bay, NSW. The conditions of the approval stated that lease development must be initiated by November 2019.

South Coast Mariculture Pty Ltd was successful in securing the approval from Fisheries NSW to develop these leases, and in 2018 obtained lease-based aquaculture permit AP2554 from NSW DPI to culture a number of marine bivalve and aquatic plant species on the leases.

South Coast Mariculture has worked in close consultation with NSW DPI, local, state and federal government agencies, community groups, private enterprise and numerous other stakeholders to ensure that the planning, development, infrastructure deployment, operations and environmental management of the South Coast Mariculture lease/s meet the conditions of the SSI-5657 and that the development has a net positive impact for the environment, the local community and the Jervis Bay region.

Jervis Bay is one of only three marine embayments on the NSW coast that are suitable for extensive aquaculture. The other embayments are Port Stephens, which has an established edible oyster industry and Twofold Bay, which already has extensive Blue Mussel aquaculture (Joyce *et. al.*, 2010). The Jervis Bay leases will assist in providing food security during seasonal fluctuations that may affect Port Stephens and Twofold Bay.

The viability of the operation of the South Coast Mariculture Commercial Extensive Aquaculture Leases is dependent upon preserving the quality of the surrounding marine environment.



Figure 1: Regional Map of Jervis Bay and the locations for the South Coast Mariculture Commercial Extensive Aquaculture Leases (Source: Fisheries NSW 2012).

1.1 Lease Site Locations

Figure 1 shows the locations of the South Coast Mariculture lease sites. The leases occupy a total area of 50 hectares consisting of the following coordinates outlined below:

- AL15/001 (Callala North) - 20 hectares (Coordinates: -35° 1' 11.899" 150° 42' 39.666"; -35° 1' 27.615" 150° 42' 53.655"; -35° 1' 33.944" 150° 42' 43.147"; -35° 1' 18.228" 150° 42' 29.158");
- AL15/002 (Callala South) - 20 hectares (Coordinates: -35° 1' 38.188" 150° 42' 21.156"; -35° 1' 53.796" 150° 42' 35.324"; -35° 2' 0.206" 150° 42' 24.887"; -35° 1' 44.597", -150° 42' 10.720"); and
- AL15/003 (Vincentia) - 10 hectares (Coordinates: -35° 3' 35.483" 150° 41' 13.244"; -35° 3' 42.122" 150° 41' 21.910"; -35° 3' 49.960" 150° 41' 13.027"; -35° 3' 43.321" 150° 41' 4.361").

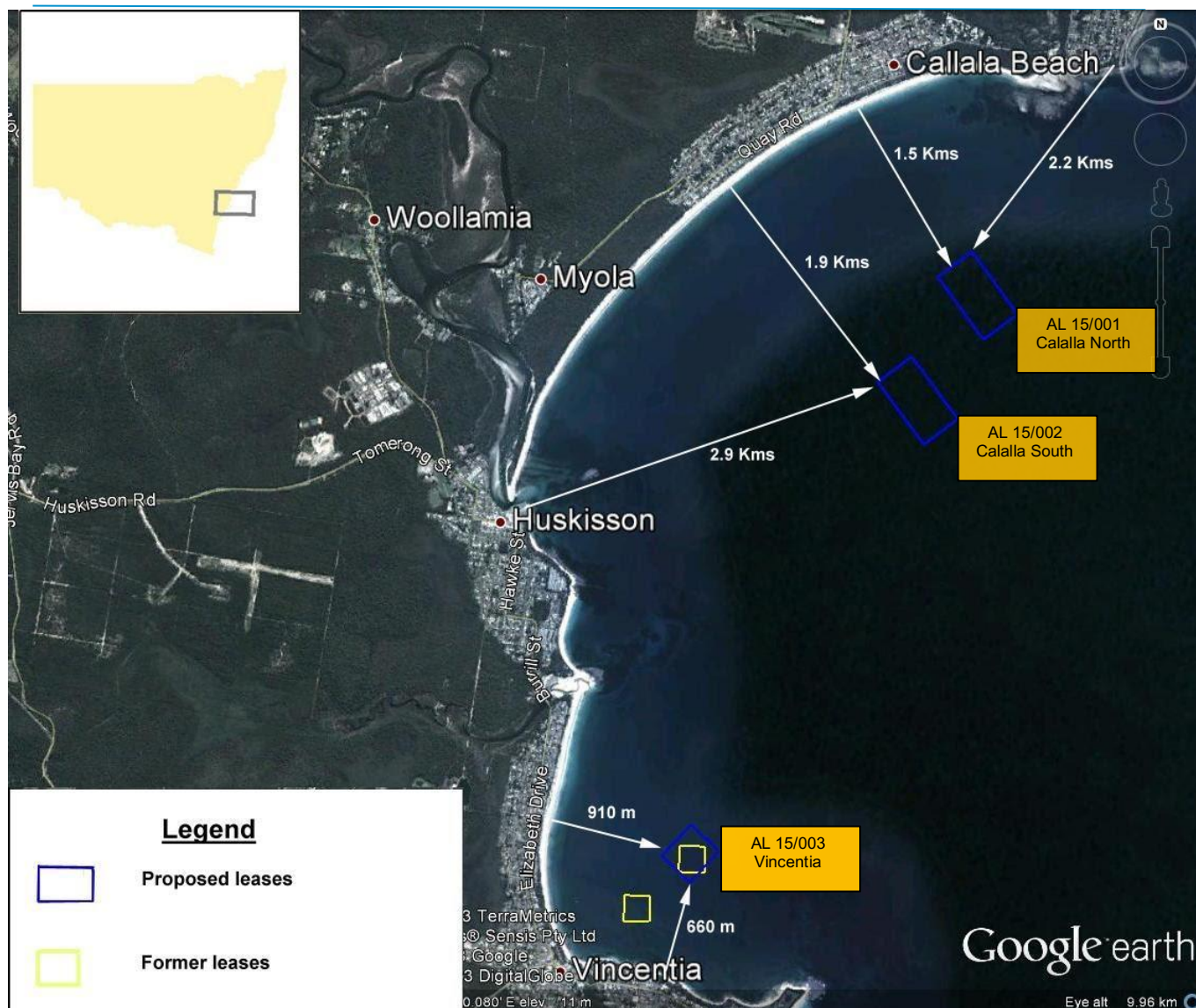


Figure 2: Location of the Commercial Shellfish Aquaculture Leases and the former Blue Mussel leases in Jervis Bay (Source: Fisheries NSW, 2013).

The Callala Leases (north and south) are located approximately 1.5 km and 1.9 km southeast of Callala Beach, respectively. The Vincentia Lease is approximately 660 m north of Orion Beach in Vincentia (Figure 2).

In compliance with consent condition E7 of the State Significant Infrastructure Approval SSI-5657 the Annual Environmental Management Report will assess environmental and socio-economic impacts of the South Coast Mariculture Commercial Extensive Aquaculture Leases, evaluate the effectiveness of mitigation, monitoring and management measures, and make modifications to the operation of the leases in accordance with the report findings.

The annual environment report will consist of the following information:

- The standards and performance measures that apply to the development;
- Description of the operations that have been carried out during the reporting period;
- Annual water and benthic monitoring report;
- Non-compliance report and actions taken to meet compliance
- Annual marine fauna interaction/observations report;
- Annual navigation incidents report;
- Annual complaints report;
- Annual diseases, parasites and pests report;
- Annual structural integrity and stability report and;
- Details of monitoring results with commentary on any effects of the development compared to relevant guidelines, pre-lease sampling or control sites and an analysis of any trends or key findings.

2. SCM Commercial Extensive Aquaculture Lease Operational Status

2.1 Vincentia AL15/003

The Vincentia lease AL15/003 has not yet been developed.

2.2 Callala South AL15/002

The Callala South lease AL15/002 has not yet been developed.

2.3 Callala North AL15/001

Callala North lease AL15/002 infrastructure was first deployed in June 2019. The lease infrastructure consists of 6m screw anchors at the end of each system connected to lengths of chain and polypropylene hard lay UV stabilized rope (25 – 35mm in diameter) which is connected to the main backbone rope. Dropper lines are suspended from these backbone ropes. End buoys are attached at each end of the system and support buoys are attached along each backbone rope. Four navigation buoys are positioned on the corners of the commercial lease.

The lease was first seeded in May 2020 with wild caught *Mytilus galloprovincialis* spat translocated from Two Fold Bay lease AL06/002.

Over the course of 2020, South Coast Mariculture has carried out normal farming operations of seeding and floating *Mytilus galloprovincialis* including carrying out routine inspections and maintenance of the infrastructure at Callala North (AL15/001).

The Callala North lease was first harvested commercially in November 2020.



2.4 Deployment

There was no new lease infrastructure deployment carried out between July 2020 and June 2021

3. Operations and Maintenance

3.1. Stock Management

Callala North lease was first stocked in May 2020 with spat translocated from Twofold Bay stocking from July 2020 proceeded as follows:

Shipment Logbook Number	Date of Shipment	Source Estuary	Source Lease	Volume Moved / kg	Destination Estuary	Destination Lease
17609	7/07/2020	Two Fold Bay #52	AL 06/002	4000	Jervis Bay #25	AL 15/001
17610	9/07/2020	Two Fold Bay #52	AL 06/002	1200	Jervis Bay #25	AL 15/001
17611	18/11/2020	Two Fold Bay #52	AL 08/098	2400	Jervis Bay #25	AL 15/001
17612	14/12/2020	Two Fold Bay #52	AL 08/098	2400	Jervis Bay #25	AL 15/001
17613	14/12/2020	Two Fold Bay #52	AL 07/098	2400	Jervis Bay #25	AL 15/001
17614	15/12/2020	Two Fold Bay #52	AL 07/098	2400	Jervis Bay #25	AL 15/001
17615	15/12/2020	Two Fold Bay #52	AL 07/098	3200	Jervis Bay #25	AL 15/001
17616	17/12/2020	Two Fold Bay #52	AL 07/098	3200	Jervis Bay #25	AL 15/001
17617	22/12/2020	Two Fold Bay #52	AL 07/098	2000	Jervis Bay #25	AL 15/001
17618	23/12/2020	Two Fold Bay #52	AL 07/098	3200	Jervis Bay #25	AL 15/001
17619	7/01/2021	Two Fold Bay #52	AL 06/002	2400	Jervis Bay #25	AL 15/001
17620	13/01/2021	Two Fold Bay #52	AL 07/098	1600	Jervis Bay #25	AL 15/001

17621	14/01/2021	Two Fold Bay #52	AL 07/098	1600	Jervis Bay #25	AL 15/001
17622	15/01/2021	Two Fold Bay #52	AL 07/098	1600	Jervis Bay #25	AL 15/001
17623	18/01/2021	Two Fold Bay #52	AL 07/098	1600	Jervis Bay #25	AL 15/001
17624	20/01/2021	Two Fold Bay #52	AL 07/098	1600	Jervis Bay #25	AL 15/001
17625	1/02/2021	Two Fold Bay #52	AL 07/098	1600	Jervis Bay #25	AL 15/001
17626	2/03/2021	Two Fold Bay #52	AL 07/098	2000	Jervis Bay #25	AL 15/001
17627	3/03/2021	Two Fold Bay #52	AL 07/098	2000	Jervis Bay #25	AL 15/001
17628	8/03/2021	Two Fold Bay #52	AL 07/098	2400	Jervis Bay #25	AL 15/001
17629	9/03/2021	Two Fold Bay #52	AL 07/098	2400	Jervis Bay #25	AL 15/001
17630	16/03/2021	Two Fold Bay #52	AL 07/098	1600	Jervis Bay #25	AL 15/001
17631	21/04/2021	Two Fold Bay #52	AL 07/098	1600	Jervis Bay #25	AL 15/001
17632	27/04/2021	Two Fold Bay #52	AL 08/098	1600	Jervis Bay #25	AL 15/001
17633	1/06/2021	Two Fold Bay #52	AL 08/098	1600	Jervis Bay #25	AL 15/001
17634	22/06/2021	Two Fold Bay #52	AL 08/098	2000	Jervis Bay #25	AL 15/001
17635	29/06/2021	Two Fold Bay #52	AL 08/098	2400	Jervis Bay #25	AL 15/001

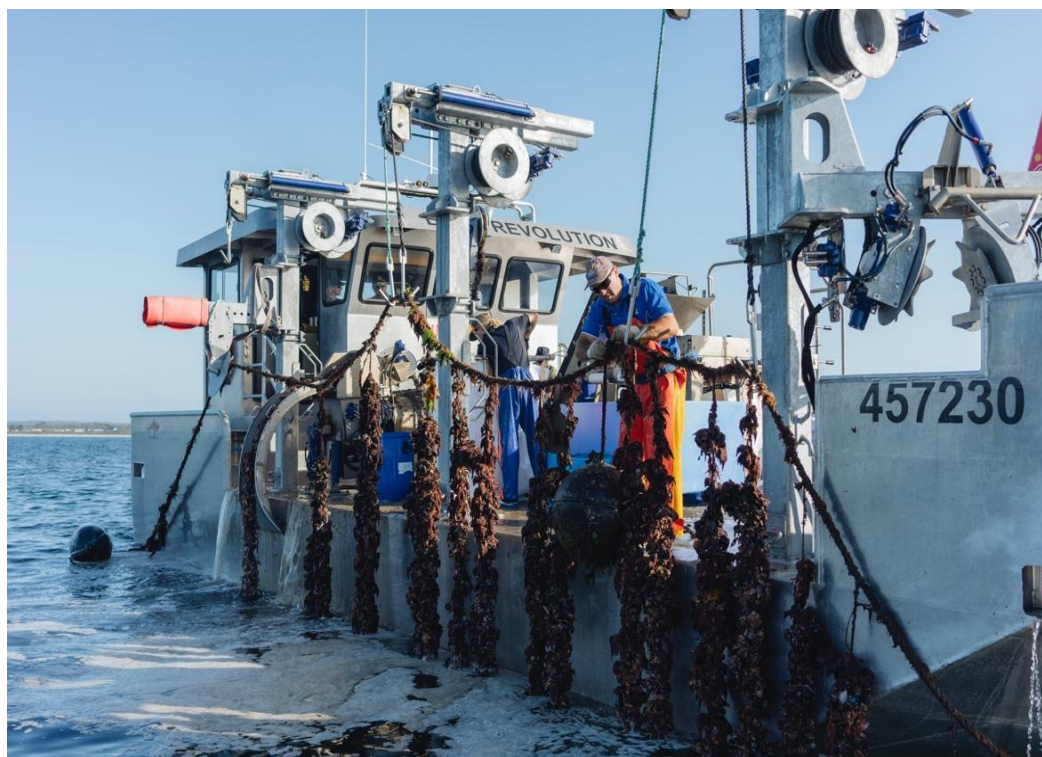
Table 1: Callala North Lease (AL 15/001) stocking records July 2020 - June 2021 (Source: SCM, 2021)

Spat was collected and transported in accordance with the NSW DPI spat translocation protocol. NSW DPI were contacted 48hrs prior to spat collection on each occasion.

The health status and growth rates of the stock were routinely monitored using visual checks. Overall the Blue Mussels grown out at Callala North lease displayed excellent health, survival and growth rates.

3.2. Harvest

Harvesting commenced on the first stocked Callala North (AL 15/001) lines in November 2020. Trial volumes were harvested first, and larger, more consistent volumes began to be harvested in early 2021. Mussels were sold live to seafood wholesalers and auctioned through the Sydney Fish Market. At harvest, the mussel ropes are pulled up and the mussels are stripped from the rope, tumbled to remove fouling and sorted to remove damaged stock and anything other than mussels. Stripped ropes and buoys are stowed for cleaning and line redeployment. Any organic waste collected during harvesting is retained on board and taken back to shore for disposal. The mussels are harvested into a large bag or bin on the deck of the work vessel *Blue Revolution*. Once the desired volume of mussels has been harvested, the product is transported to South Coast Mariculture's processing facility in Huskisson for processing and packing for market.



3.3. Mussel Line Infrastructure

The South Coast Mariculture Callala North (AL 15/001) mussel line infrastructure has been inspected regularly since its deployment in 2019. Visual inspections are undertaken by SCM staff on arrival at the Callala North lease each work day for any infrastructure issues that may require maintenance.

Routine inspections are conducted weekly and any associated maintenance has been undertaken as required covering components of the infrastructure including buoys, anchors, ropes, chains, and connectors, as well as the cardinal markers.

3.4. Biofouling Removal

The lease infrastructure is naturally colonised by a range of marine biofouling organisms, including algae, ascidians, molluscs and barnacles. The removal of this biofouling is important to reduce resistance to currents and wave action which may jeopardise the integrity of the infrastructure e.g. stress moorings.

Buoys and ropes are removed from the lease during harvest and are cleaned and dried before being re-deployed for spat stocking.



Figure 5: Biofouling being removed from a buoy during harvest. (Source: South Coast Mariculture 2020)

3.5. Waste Management

The quantity and types of wastes generated by the SCM operations during the first year of operation have been summarised in Table 2. All waste storage containers have been inspected weekly to ensure that they are maintained in a condition appropriate for their use and containment of the specific waste.

Waste Type	Quantity	Date	Method/Place of Disposal
Domestic Waste from Wheelhouse	2 – 3 kg per week	During harvest and lease operations FY 2020- 2021	Brought to shore for landfill
Organic Waste from Harvest and Processing	10 tonnes (estimate)	FY 2020 - 2021	Landfill

Table 2: Summary of waste generated by the South Coast Mariculture operations 2020. (Source: SCM, 2021)

Skips and bins have been monitored regularly to ensure that cross contamination doesn't occur. All waste removed from the site including products for reuse, have also been monitored to ensure there is no cross contamination. SCM will continue to review the type of surplus materials produced and where possible change the site design and operation to minimise products that go to landfill. Recycling or reuse of waste is a priority.

3.6. Land Based Operations

South Coast Mariculture operates a mussel processing facility at Huskisson where the mussels are cleaned, graded and packed live for market.

Wet storage tanks have been installed at the South Coast Mariculture processing facility at Huskisson and are built and operated in compliance with NSW Food Authority requirements. The purpose of the wet storage facility is to increase the efficiency of harvest and processing operations by enabling mussels to be harvested the day before processing and dispatch.

In addition to the processing facility at Huskisson South Coast Mariculture also operates a shed with and office and storage space for lease infrastructure components, gear and vehicles.

4. Chemical Use, Disease and Introduced Pests

4.1. Chemical Use

No chemicals have been used on the South Coast Mariculture marine leases.

Ozone is used to disinfect the incoming seawater in the wet storage tanks at the land-based Huskisson site and when empty, tanks are cleaned with a chlorine-based detergent.

4.2. Disease and Introduced Pests

The risk of endemic diseases and parasites affecting the mussels on the leases is identified as very low. A number of preventative measures have been employed to mitigate the potential impact of endemic diseases, parasites and pests on cultured stock including the following:

- Inspection of spat health before stocking
- Adherence to NSW DPI Blue Mussel spat translocation biosecurity protocol (Two Fold Bay to Jervis Bay)
- Biofouling management;
- Maintaining appropriate stocking densities;
- Inspecting mussel health.
- Collecting samples for laboratory examination; and
- Maintenance of personnel and farm equipment hygiene.

Mussels are inspected routinely when harvesting or stocking to assess health and survival.

4.3. Disease and Parasites

The health status of the stock has been regularly inspected, including the potential occurrence of disease and parasites. There has been no significant disease or parasitic event on the South Coast Mariculture Callala North lease during the reporting period.

Naturally occurring barnacle over-catch has been identified as an issue that negatively impacts the appearance and marketability of the mussels. Barnacle over-catch is scraped off the mussels at the SCM land-based processing facility prior to sale so that the mussel appearance meets consumer quality specifications.

The incidence of barnacle over-catch is being monitored through production and processing records and there are plans to engage a marine biology research organization to research the barnacle species affecting the leases and investigate potential barnacle over-catch mitigation solutions such as timing and spat size when stocking, stock husbandry and barnacle removal during processing.

4.4. Stock – Mortality and Disease

There have been no significant mortality or disease events on the South Coast Mariculture Callala North (AL 15/001) lease. Marine scavenger species (small fish and crustaceans) present on the lease are likely to have consumed any Blue Mussel mortalities if they have occurred.

If a significant unexplained mortality or health issue should arise, samples of affected mussels will be sent to an approved veterinary laboratory for diagnosis.

4.5. Transfer of Spat

All spat (juvenile seed stock) transfers to the South Coast Mariculture marine leases have been in accordance with the NSW DPI Blue Mussel Spat Translocation Protocol (Two Fold Bay to Jervis

Bay) as per condition 4.3 of the South Coast Mariculture aquaculture permit AP2554

The protocol specifies:

- Pre-translocation inspection conditions
- Pre-translocation treatment of spat conditions
- Reporting conditions
- Shipment documentation

NSW DPI Fisheries Officers have inspected spat translocations on a number of occasions and have been satisfied that SCM is following the protocol as written.

4.6. Introduced Pests

Marine pests can potentially be spread by ballast water, and vessel hull biofouling (Commonwealth of Australia, 2009).

Service vessels and infrastructure for the SCM leases sourced from outside NSW could represent a marine pest risk for the region, so movement of service vessels and infrastructure has complied with the *National Biofouling Management Guidelines for Commercial Fishing Vessels* (Commonwealth of Australia, 2009). If the origin port of the vessel is known to have significant marine pest issues, a risk assessment is required, and mitigation measures must be undertaken to prevent translocation of pests.

Between July 2020 and June 2021 no new SCM vessels were brought to the lease site from outside NSW.

The lease infrastructure has been colonised naturally by a range of marine biofouling organisms, including algae, ascidians, molluscs and barnacles. Inspections of the South Coast Mariculture infrastructure and biofouling organisms have been regularly undertaken to ensure early detection of potential pest species. No new pest species have been observed in the last year.

4.7. Training

Regular on-the-job training has been undertaken by South Coast Mariculture operations / production staff to support the objectives of the Environmental Management Plan, including:

- Waste management training;
- Chemical handler training;
- Stock health and pest identification training;
- Training against all standard operating procedures;

Four staff are now currently trained by the NSW Food Authority in NSW Shellfish Program water and meat sampling.

5. Monitoring

5.1. Water Quality and Benthic Monitoring Program

The Water Quality and Benthic Environment Monitoring Program has been implemented by South Coast Mariculture to assess and mitigate potential impacts from the operation and is consistent with consent conditions issued under SSI-5657.

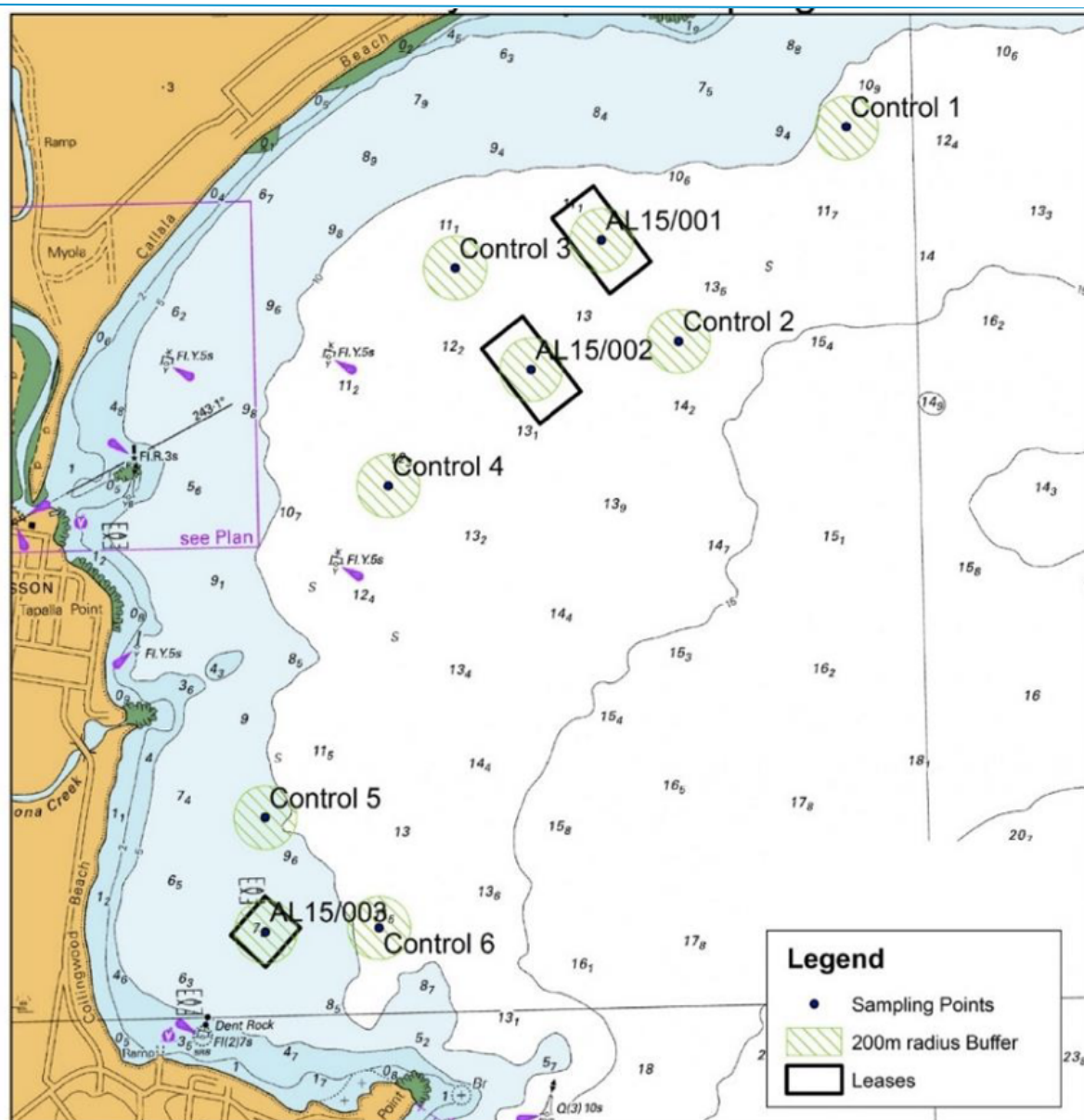
The Program includes monitoring of: water quality, seabed surveys, sedimentary characteristics (including TOC), benthic macroinvertebrates and fish; samples and video footage are taken from under the leases.

The first or Baseline survey event for the Water Quality and Benthic Environment Monitoring Program was conducted by the University of Newcastle in July 2019.

The Baseline survey is intended to provide pre-farming measurements of the range of variables that have been approved in order to assess the environmental performance of the shellfish leases. The results from future sampling events within and around the shellfish leases will be referenced against both this baseline data and the data collected concurrently at the control sites.

The second sampling event (Update 1) for the Water Quality and Benthic Environment Monitoring Program was conducted by the University of Newcastle in August 2020.

It is noted that an annual benthic survey is to be carried out at the same time of year (winter), with the Update 2 expected to be in July/August 2021 and Update 3 expected to be in July/August 2022.



SITE	LATITUDE	LONGITUDE
AL15/001	35° 1' 22.967"	150° 42' 41.398" E
AL15/002	35° 1' 49.131"	150° 42' 23.020" E
AL15/003	35° 3' 42.802"	150° 41' 13.188" E
Control 1	35° 1' 0.958" S	150° 43' 43.429" E
Control 2	35° 1' 44.008"	150° 43' 0.162" E
Control 3	35° 1' 27.997"	150° 42' 4.545" E
Control 4	35° 2' 12.196"	150° 41' 46.531" E
Control 5	35° 3' 19.414"	150° 41' 13.744" E
Control 6	35° 3' 42.530"	150° 41' 41.706" E

Source: data from NSW DPI and Australian Hydrographic Service
Datum: GDA94 MGA Zone 56

NOT TO BE USED FOR NAVIGATION
The State of New South Wales, the Department of Primary Industries and Australian Hydrographic Service, their employees, officers, agents or servants are not responsible for the result of any actions taken on the basis of the information contained on the map, or for any errors,

Prepared by Aquaculture Management October 2015

Figure 6: Map showing sampling points for benthic sampling program (Source: NSW DPI 2015). Benthic Environment Monitoring Program.

5.1.1. Benthic Survey Update 1 Summary

The Update Survey 1 Report is attached as an appendix (Appendix 1) and is available on the South Coast Mariculture website (www.southcoastmariculture.com.au) and the results are

summarised below:

In August 2020, sampling of the water quality and seabed environment was undertaken at the preexisting southern (Vincentia (AI 15/003)) and new northern (Callala North (AI 15/001 and Callala South (AI 15/002)) lease sites, with two associated controls for each lease, in Jervis Bay. This sampling represents the Update 1 survey and was sampled in the same way as for the Baseline study in July 2019, enabling non-confounded comparisons.

Water quality varied little among the nine sites and between bottom and surface waters. The waters were cool (16°C), pH was 7.7 and waters were always fully saturated with oxygen. Salinities were slightly less than seawater (32-33) and also of that recorded in Baseline, likely related to heavy rainfalls in late July 2020.

Remote Operated Vehicle (ROV) surveys showed that the seabed at all sites was sandy substrates, with drift algae and small attached macrophytes sometimes present. Small sharks and rays, seastars and some fish of commercial and recreational importance were observed, and also smaller fish species that were associated with drift algae. Masses of drift algae were present at four sites but were not structured in “rows” recorded during Baseline and kelp fragments were still only recorded at Vincentia.

Neither flathead (*Platycephalus* spp.) and large schools of Yellowtail Scad were observed during ROV, unlike Baseline, although they were “captured” using BRUVS. Single and small clumps of mussels were sometimes observed on the seabed at CN.L, but with no evidence of darker sediments around those mussels that could imply sediment anoxia. The mooring base now has a substantial amount of encrusting organisms that have developed since Baseline and may eventually impact the durability of the structure. No further inspections of the lease infrastructure or the mussels themselves were undertaken.

The % Total Organic Carbon (%TOC) in the sediments at the Callala North Lease site (where mussels are presently stocked) and all other sites did not change significantly between the two winter sampling periods (Baseline and Update 1), indicating that there is no statistical evidence that the stocking of mussels is acting to increase the %TOC beneath the Lease site. Thus, mean (and SE) values for %TOC at the Callala North Lease site were 0.040 (0.004) at Update 1, which was less than the 0.068 (0.008) at Baseline. The lack of a significant difference means there is no requirement (as per South Coast Mariculture (2015)) to examine and enumerate the benthic macroinvertebrate taxa for this report.

The mean %TOC values from Update 1 were typically lower at Callala North and Callala South (0.040-0.070) than at Vincentia (0.137-0.195), with the %TOC at the three sites in the last location slightly (but not significantly) higher in Update 1 vs Baseline (noting that no mussels are presently stocked at this site). The apparent increase in %TOC at the three sites in Vincentia may warrant future investigation as this indicator of organic enrichment may be arising from sources that are unrelated to the stocking of mussels (see e.g. Pelleteir, 2011).

Sedimentary characteristics of mean grain size and %mud were generally similar to Baseline. Thus, mean grain size was similar between the lease and the two control sites at each of the three locations and significantly smaller at the Vincentia location (167-193 µm) vs Callala North and Callala South (237-263 µm). This pattern in mean grain size was reflected by the %mud being higher at Vincentia (0.11-0.15) vs all other sites (0.01-0.03).

All replicates for the benthic macroinvertebrate taxa were collected, sieved and picked. During picking of the samples, a similar range of taxa was observed to that of Baseline. Samples are safely stored at

Thirty one of the 36 Baited Remote Underwater Video Systems (BRUVS) deployments recorded a total of 754 organisms. Yellowtail Scad (374) were again very common but were present in smaller schools than in Baseline. Unlike Baseline, substantial numbers of Trumpeter Whiting and Blue-spotted Flathead were observed, which partially explains the significantly higher taxa richness in Update 1.

The fish assemblages significantly differed between Update 1 and Baseline, but the biological significance is difficult to assess, given the presently limited understanding of temporal (including annual) changes in fish assemblages in Jervis Bay. The fish assemblages at CN.L (where mussels are presently stocked) were not statistically significant from those of any of the other sites in the study area.

The results from this Update 1 survey, based on water quality, gross seabed characteristics, sedimentary characteristics (particularly %TOC), benthic macroinvertebrate taxa and fishes, provide no evidence that the present stocking of mussels at CN.L is having an adverse effect on the marine environment in this area of Jervis Bay. It is noted that annual sampling is to be continued at the same time of year (winter), with the next occasion expected to be in July/August 2021

6. Marine Fauna Interactions

The Marine Fauna Interaction Management Plan has been developed to identify and mitigate potential impacts on marine fauna through direct and indirect interactions with the South Coast Mariculture. The plan includes a Marine Fauna Interaction Protocol, Marine Fauna Monitoring Program and an Observer Protocol have been prepared as a combined document as the matters are interrelated.

The South Coast Mariculture Marine Fauna Interaction Committee consists of representatives from NSW National Parks and Wildlife Service, NSW DPI and South Coast Mariculture. Notably the South Coast Mariculture operations team has extensive experience in managing interactions with marine wildlife around shellfish aquaculture operations. All members of the SCM operations team have been informed about the Marine Fauna Interaction Management Plan and received appropriate training.

All marine fauna interactions within the SCM shellfish leases have been monitored since the infrastructure was installed in June 2019. There have been two recorded incidents of marine fauna observed within the lease area:

- A seal was observed swimming through the Callala North lease on the 4/09/2020. Species could not be identified.
- A pod of 6 – 12 dolphins were observed swimming through the Callala North lease on the 14/09/2020. Species could not be identified.

Dolphins are regularly seen in Jervis Bay and the SCM operations team frequently observe dolphins in the bay during water sample collection or navigating to and from the leases. Whales and seals have been observed by the SCM operations crew out in the bay but no whales have been observed within or in close proximity to the leases.

There is a local Jervis Bay Marine Mammal Research group (MMR) that monitors marine mammal numbers in and around the bay. (www.marinemammalresearch.com). SCM has been in contact with MMR to suggest a possible collaboration of data gathering to improve understanding of marine mammal movement in JB. This could deliver improved management practices at SCM with regard to marine mammal interactions / contact with the leases.

Date	Observations (travelling to & from SCM lease)				Observations (in and around lease)						
	Humpback Whale	Sea l	Dolphin	Obs	Humpback Whale	Seal	Dolphin	Obs	Nature Of Interaction	Entangle	Comments & Actions
Jul 2020 – June 2021			Number varies	Daily dolphin sightings in the bay travelling to and from the lease							
4/9/2020						1		Swimming between the lines	Observed from the SCM vessel when tied up	Nil	
14/9/2020							6 - 12	Close to lease – travelling North. Playful, happy	Pod swam through lease. Observed from the SCM vessel	Nil	

Table 3: Summary of marine fauna interactions with the SCM leases July 2020 – June 2021. (Source: SCM, 2021)



Figure 7: Dolphins swimming through Callala North lease (AL 15/001) 14/09/2020. (Source: South Coast Mariculture, 2020)

6.2.1 Marine Turtles

During the reporting period there were no observations of marine turtles within or in close proximity to the SCM leases.

6.2.2 Marine Mammal Entanglement

There have been no reports of entanglements of marine mammals in SCM lease infrastructure during the reporting period.

7. Standards / Performance Measures and Environmental Targets/Strategies

In accordance with the SSI-5657 consent conditions the SCM operations team developed an Environmental Management Plan (EMP) which outlines the management practices and procedures to meet the standards and performance measures that apply to the SCM marine aquaculture lease development.

The EMP contains a number of sub plans which provide further details on the respective standards and performance measures that apply to specific activities.

The EMP and associated sub plans have recently undergone a review to ensure that they are still relevant in meeting the conditions within the SSI-657 consent and/or standards and conditions for operation of the SCM marine aquaculture leases.

Independent environmental sampling that has been undertaken in 2019 (baseline) prior to lease development and in 2020 (update 1) subsequent to lease development and stocking has found no significant impact on benthic invertebrate ecology or water column chemistry within the SCM marine leases or at the control sites.

The environmental benthic monitoring is to continue annually for at least three years from the commencement of operation, with survey Updates 2 and 3 to be completed in mid 2021 and mid 2022 respectively to assess any potential change as production biomass of stock increases through time.

8. Navigational Interactions

SCM has worked closely in conjunction with NSW RMS to ensure that the Callala North (AL 15/001) lease area is safely delineated to ensure navigational safety

The cardinal markers at the corner points of the Callala North leases (North, East, South, West) are IALA compliant Spar Buoys. Each of the four cardinal buoys has a specific buoy colour combination and day shape as follows:

The buoy flash pattern complies with the following:

- Continuous fast flashes = north;
- Three fast flashes = east;
- Six short fast flashes and one long flash = south; and
- Nine fast flashes = west.

South Coast Mariculture has adopted the recommendation from RMS for Quick (Q) flashing speed for Lease 1 Callala (AL15/001). In future when the lease is developed a Very Quick (VQ) flashing speed will be adopted for Lease 2 Callala AL15/002 to differentiate between the two leases for vessels.

There are two yellow light buoys at midway length for the Callala North lease. These use a 5 quick flash every 20 seconds flash character to distinguish these markers from the cardinal buoys.

8.1. Navigation Incidents

There has been one incident reported by RMS during the reporting period. On 07/09/2020 a trailer boat hit the SCM marine aquaculture lease at Callala North (AL 15/001). The impact damaged floats on the lease backbone of line 1B. The lease was clearly marked with the Cardinal markers fully functioning and floats on the line. The cause of the incident was reported by RMS as the trailer boat skipper being at fault and not paying attention. Repairs to damaged floats on line 1B were carried out on 08/09/2020.

SCM has reviewed the current navigational setup and has discussed internally that the use of orange floats in the middle of the perimeter lines and at the ends of the lines could improve visibility for other boat users around the lease. NSW RMS have said that they would support this improvement if approval is granted by the Department of Planning and Environment.

9. Structural Integrity and Stability

The Callala North (AL 15/001) lease infrastructure has been monitored in accordance with the Structural Integrity and Stability Program outlined in the SCM EMP. Inspections of lease infrastructure have been conducted routinely (weekly) during the reporting period, focusing on evidence of faults, damage, excessive biofouling and loose lines or buoys.

Inspections have been particularly important after severe weather in order to minimise marine fauna entanglements and navigation hazards.

An annual detailed service inspection was undertaken on 09/06/2021 to cover all aspects of the infrastructure including cardinal marks, anchors, ropes, chains and connectors.

Table 4 lists all infrastructure faults and subsequent corrective actions recorded during the reporting period.

No excessive or unusual biofouling has been observed during the reporting period.

Date	Infrastructure Type	Fault	Lease	Maintenance / Corrective Action
7/9/2020	Floats	Recreational fishing vessel damaged floats on backbone line 1B due to lack of care and attention by person in charge of this vessel.	Callala North AL 15/001	Floats were replaced on 8/9/2020

Table 4: List of infrastructure faults and corrective actions recorded July 2020 - June 2021. (Source SCM, 2021)



10. Compliance

A number of actions have been undertaken to ensure compliance with the consent conditions of the State Significant Infrastructure Approval SS1-5657

10.1. Training

SCM personnel including employees, contractors and subcontractors, have received appropriate induction training and have the required skills and qualifications to fulfil their respective roles in a competent manner.

Minimum environmental training has included:

- An induction onto the SCM marine aquaculture leases and land-based sites;
- A briefing on the importance of conformity with the environmental policy, procedures and requirements of the Environmental Management Plan (OEMP), as well as their roles and responsibilities;
- Specialised environmental training and instruction required for undertaking allocated tasks, especially in regard to compliance with the environmental conditions of the SSI-5657 consent;
- Other specific training and instruction requirements including emergency response and operation of specific equipment; and
- Regular meetings which have included discussions on safety issues, risk assessments and controls.

10.2. Site Meetings, Toolbox Meetings and Contractor Meetings

Any daily items or ongoing matters applicable to the environmental management of the SCM marine aquaculture leases have been addressed by staff, consultants and subcontractors during site meetings, toolbox meetings and contractor meetings which have been conducted on an as needed basis. Minutes have been kept for all meetings

10.3. Environmental Monitoring

A benthic monitoring program has been developed and implemented to meet condition D12. Independent benthic and water quality sampling and analysis has been carried out annually to provide baseline data plus comparative data following stocking of the lease. Water quality, benthic fauna, sediment chemistry and particle size have been analysed which included ROV video surveys.

10.4. Review of Environmental Management Plans

A review of the Environmental Management Plan (EMP) was conducted by the SCM team in April 2021 after the operations had commenced on the SCM marine aquaculture leases. The EMP was reviewed for usage, effectiveness and compliance issues. The EMP will continue to be reviewed by the SCM operations team every six months.

10.5. Independent Environmental Auditing

As per the SSI-5657 approval conditions (E11), an independent environmental audit (IEA) is required to be commissioned within 2 years of the deployment of lease infrastructure. South Coast Mariculture has been granted an extension to the inaugural IEA commissioning date to 1st October 2021 on the basis of operational progress delays caused by the NSW bushfires in 2019 / 2020 and Covid 19 in 2020 / 2021.

10.6. Non-Compliance

Non-compliance is defined as a non-fulfilment of a specified requirement (either legal, specified or policy) and a corrective action is defined as an action taken to eliminate the cause of a detected non-compliance and to mitigate any environmental impact.

On 23/3/21 the Department of Planning and Environment (NSW DPE) issued SCM with a notice to furnish information and records in relation to an investigation into whether South Coast Mariculture Pty Ltd (SCM) have met their obligations under section 5.14(2) of the Environmental Planning and Assessment Act 1979 (Act). The Department is investigating whether SCM has breached conditions of the SSI approval, relating to Jervis Bay Aquaculture Facility (JBAF) Project Approval SSI-5657 (Approval).

On 19/4/21 SCM responded to the Department and provided a response plus the required documentation and records. On 5/5/21 the Department contacted SCM with a request for further documentation, which has been provided.

The potential breach relates specifically to the document lodgment stage of the approval process and timing of document lodgment and corrective action is currently underway by SCM in collaboration with NSW DPE as of 30/6/2021.

10.7. Community Consultation

The South Coast Mariculture project has been embraced by the local Jervis Bay community. During the reporting period SCM has worked closely with the people and businesses of the Jervis Bay region to ensure full transparency of the project from the beginning and to build positive relationships and foster strong links with groups such as:

- Jervis Bay Marine Rescue
- Shoalhaven City Council
- Australian Maritime Museum
- Callala Beach Progress Association
- Vincentia Ratepayers and Residents Association
- Huskisson Woollamia Community Voice

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- Huskisson Primary School
 - Jerrinja Aboriginal Land Council
 - Jervis Bay Recreational Fishing
 - Jervis Bay Recreational Diving
 - Wollongong University
 - Australian Hydrographic Office
 - Kiama Lions Club

In addition SCM has been in communication with the following state and federal government departments and bodies:

- NSW Dept. Primary Industries
- NSW Roads and Maritime Services
- NSW Food Authority
- NSW Port Authority
- Marine Parks Authority
- Royal Australian Navy
- Crown Lands

Jervis Bay mussels are now featured on the menu of the Jervis Bay Hotel and other local restaurants and are becoming a drawcard for visitors to the region.

South Coast Mariculture has worked with local schools such as the Huskisson Primary School and supported student work experience and education about mussel aquaculture and the marine environment.

During the reporting period the South Coast Mariculture team has had regular interactions with local members of the community at the Huskisson wharf where people often stop to ask about the SCM marine aquaculture leases and the mussels. A strong community focussed culture has been fostered within the SCM team so that all community interactions are handled with transparency, positivity and patience and feedback is noted and complaints are recorded and addressed.

The SCM team has participated in Jervis Bay clean up days. The Jervis Bay mussel story has been published extensively in the media with segments on [ABC's Landline](#), on local television and radio and on the [BBC Reel](#) – giving great exposure to the project, to Jervis Bay and the greater Jervis Bay region.

Numerous government, non-government and stakeholder visitors have been taken out to the leases on regular occasions through the reporting period.

The SCM website (www.southcoastmariculture.com.au) has been developed so that environmental management, reporting and statutory approval documents are publicly available as per condition E13 of the conditions



Figure 9: Local school group engaging with South Coast Mariculture crew 01/12/2020. (Source South Coast Mariculture 2020)

11. Feedback and Complaints

In compliance with condition E5 of the State Significant Infrastructure Approval SS1-5657, the Community Stakeholder Communication Plan for the SCM marine aquaculture leases details the following:

- Identification of relevant community and other stakeholders;
- Details of procedures and mechanisms used to inform the community (including local aboriginal communities) and stakeholders of the developments progress and other issues;
- Processes to receive and manage feedback and complaints; and
- Phone, email and mail contact details for the development including a 24 hour contact number.

Local councils have been informed of the procedures so that on receipt of any complaints they are able to redirect issues to the appropriate regulatory departments.

South Coast Mariculture's Feedback and Complaints Handling Protocols includes:

- A contact number and a site contact person who manages complaints;
- A feedback and complaints register (See Section 4.1);
- Proposed mitigation measures and follow up with the complainant;
- Contingency measures when repeated complaints are received including provisions for additional monitoring and amelioration measures;
- Compliance performance agreements with residents; and
- Reporting procedures to relevant government agencies or Council.

Feedback and complaints about the SCM marine aquaculture leases, land-based sites or company operations is registered via the following options:

- Mail: PO Box 6115, Griffith, ACT 2603
- Email: info@southcoastmariculture.com.au

11.1. Feedback and Complaints Register

A feedback and complaints register has been maintained by South Coast Mariculture and is regularly reviewed to determine the most appropriate response. The register lists information such as the following for feedback and complaints:

- Date;
- Person/s receiving the complaint;
- Name, address and contact phone number of person(s) making the complaint;
- Specific details of the nature of the feedback or complaint; and
- Action undertaken in response to the feedback or complaint.

A record will also be made about whether the complaint originated from normal operational procedures, an 'incident' or occasional procedure:

If from occasional procedures, discussions should be held with complainants regarding whether it was the timing or nature of the impact and how the impacts can be better managed. In many cases an agreement can be reached between parties regarding procedures, timetables, duration and

intensity;

If it resulted from normal operation procedures, these procedures should be reviewed in discussion with the relevant approval authorities. A summary of the feedback and complaints register will be included in the Annual Report that will be submitted to the Director-General. Feedback and complaints received during the past year will be compared to those received in previous years.

11.2. Complaints Received During Reporting Period

During the reporting period there has been **one registered complaint received on 21/03/2021**. The details were recorded on the complaints register. The summary of the complaint and resolution is below:

The SCM operations team was loading equipment on to the SCM vessel the Blue Revolution at 7.30am on the morning of the 21/03/2021 prior to going to the lease to start harvesting. They were approached by a member of the public (the complainant) who asked to speak with the SCM owner.

The SCM Operations Manager introduced himself and asked if he could assist. The complainant told him that she would like to lodge a complaint about the SCM vessel being moored so close to the houses. The complainant also said that there had been a smell coming from the boat over the weekend.

The SCM Operations Manager explained to the complainant that they had been caught out in extreme weather on the Friday and had been unable to deploy the seed spat that they had on board. Due to the weekend the spat had to be left bagged on board to be disposed of on the Monday. The spat had deteriorated and started to smell which is what the complainant had experienced. The SCM Operations Manager explained that this was an extreme circumstance and would not happen again. In the event that there was a similar situation, any unused spat would be taken to the SCM cold storage facility and held there until it could be disposed of. He also explained that the mooring is under the jurisdiction of NSW RMS and that SCM will consult with RMS to try to get the mooring moved.

The complainant also mentioned that the noise of the vessel leaving in the morning was a nuisance. The complainant said that the team was starting too early, at 5am, however the SCM Operations Manager corrected this in that the team doesn't start any earlier than 6am during summer because the operation is not approved to, nor is it safe to operate the vessel outside of daylight hours. He also noted that the team will start at 7am throughout winter.

The complaint was also formally received by the Woollamai Precinct Advisory Committee as follows:

From: REDACTED

Sent: Monday, 29 March 2021 7:48 PM

To: offtap1@msn.com

Subject: Woollamia Wharf Committee

Hi REDACTED

Following on from the meeting at the boat ramp today I would like to attend your next committee meeting and have a few issues to raise, which you have requested I email to you.

Point 1 – not relevant to this complaint

Point 2. The current placement of the Blue Revolution vessel.

This vessel is already disrupting the right to the residence's quiet enjoyment of their properties.

My understanding is that the Operations Manager at South Coast Mariculture as well as REDACTED

are keen to have this vessel moved further downstream away from the residential area.

My objection to this vessel is that it is aesthetically displeasing and is not in line with the beauty of this area; the noise from the motors when they start the vessel in the mornings and then maneuver off the mooring and the recent problem with the overpowering smell coming from the boat over an entire weekend from spats being left on the vessel.

Points 3 – 4 not relevant to this complaint

I look forward to the meeting and to discussion of these and other points that may be raised.

Kind regards

REDACTED

Corrective Action being implemented by SCM is:

The complaint is both an occasional and operational complaint in nature and has been discussed internally within the SCM operations team. There are discussions between SCM and NSW RMS with regard to moving the mooring point for the SCM Blue Revolution vessel downstream and thereby further away from local residences.

12. References

Commonwealth of Australia (2009) National Biofouling Management Guidelines for Commercial Fishing Vessels. Commonwealth of Australia.

Joyce, A., Rubio-Zuazo, A.M. and Winberg, P.C. (2010) Environmental and SocioEconomic Considerations for Aquaculture in Jervis Bay, NSW. Fisheries Research and Development Corporation, Canberra.

Web References

Web Reference 1

Benthic Survey Update 1

<https://www.southcoastmariculture.com.au/sustainability/environmental-reporting>

13. Appendices

13.1. Appendix 1 – Update Survey 1

For full pdf see:

www.southcoastmariculture.com.au/sustainability/environmental-reporting

UPDATE 1: Characterisation of the water and seabed environment of the recently-developed mussel farm in Jervis Bay.

Margaret Platell, Troy Gaston and Vincent Raoult
University of Newcastle

Draft Final Report to South Coast Mariculture

April 2021

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