Mid West Aquaculture Development Zone

Waste Management Plan

Prepared by

Department of Fisheries, Western Australia

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1. Introduction

1.1 Background

In late 2011, the Minister for Fisheries announced a funding package to enable the establishment of two regional aquaculture development zones to further aquaculture investment in Western Australia. The first of these, the Kimberley Aquaculture Development Zone in WA's northern waters, was officially declared in August 2014. The Mid West Aquaculture Development Zone (MWADZ), located in the southern part of the Abrolhos Islands Fish Habitat Protection Area, is the second proposed regional zone.

The proposal for the MWADZ was referred to the Environmental Protection Authority (EPA) in May 2013 which set the level of Environmental Impact Assessment (EIA) at Public Environmental Review (PER). The requirements of the EIA are defined in the Environmental Scoping Document (ESD, 2013) prepared by the EPA. The Minister for Fisheries is the proponent for the MWADZ and the Department of Fisheries (Department) is managing the proposal on his behalf. This document addresses the following ESD requirement:

'*A waste management plan to address all waste generated on site in addition to potential fuel and oil spills. This plan must include fish processing waste, dead fish and sewage treatment'*.

1.2 Purpose and Scope

Aquaculture activities produce a variety of waste products, both biological and non-biological. The Waste Management Plan (WMP) for the MWADZ intends to provide high level guidance to waste management within the MWADZ only[1].

The purpose of this WMP is to identify, describe and provide guidance on the:

- various waste products that are common to aquaculture facilities, including general rubbish and sewage treatment;
- potential fuel and oil spills, including appropriate action and reporting; and
- disposal of biological waste common to aquaculture facilities (e.g. processing waste and mortalities/culls) including appropriate biosecurity considerations.

The WMP is designed to forecast the overall waste management requirements within the zone. Individual operators will be required to address specific waste management requirements where they fall outside this generic WMP for the zone.

[1] This WMP does not include any waste associated with the Abrolhos Islands reserve. Waste disposal on the reserve must be in accordance with the *Fish Resources Management Regulations 1995*.

1.3 Objectives

The following waste management objectives will be applied to the zone:

- Comply with applicable environment protection legislation.
- Comply with applicable fisheries legislation and best practices guidelines and codes.
- Minimise adverse effects to the marine environment.
- Minimise potential biosecurity risks from the zone.
- Minimise potential risks to human health.
- Adhere to the waste hierarchy framework (e.g. avoid, reduce, re-use and recycle waste where appropriate).

1.4 Project Overview

The MWADZ is located in the Abrolhos Islands Fish Habitat Protection Area (FHPA) between the Pelsaert and Easter groups of the Abrolhos archipelago, approximately 65km west of Geraldton. The zone comprises two areas, together totalling approximately 3,000 hectares. The Northern Area is located between the Easter and Pelsaert Island Groups and is approximately 2,200 hectares. The Southern Area is approximately 800 hectares (an existing aquaculture lease) and is located north of the Pelsaert Group (Figure 1).

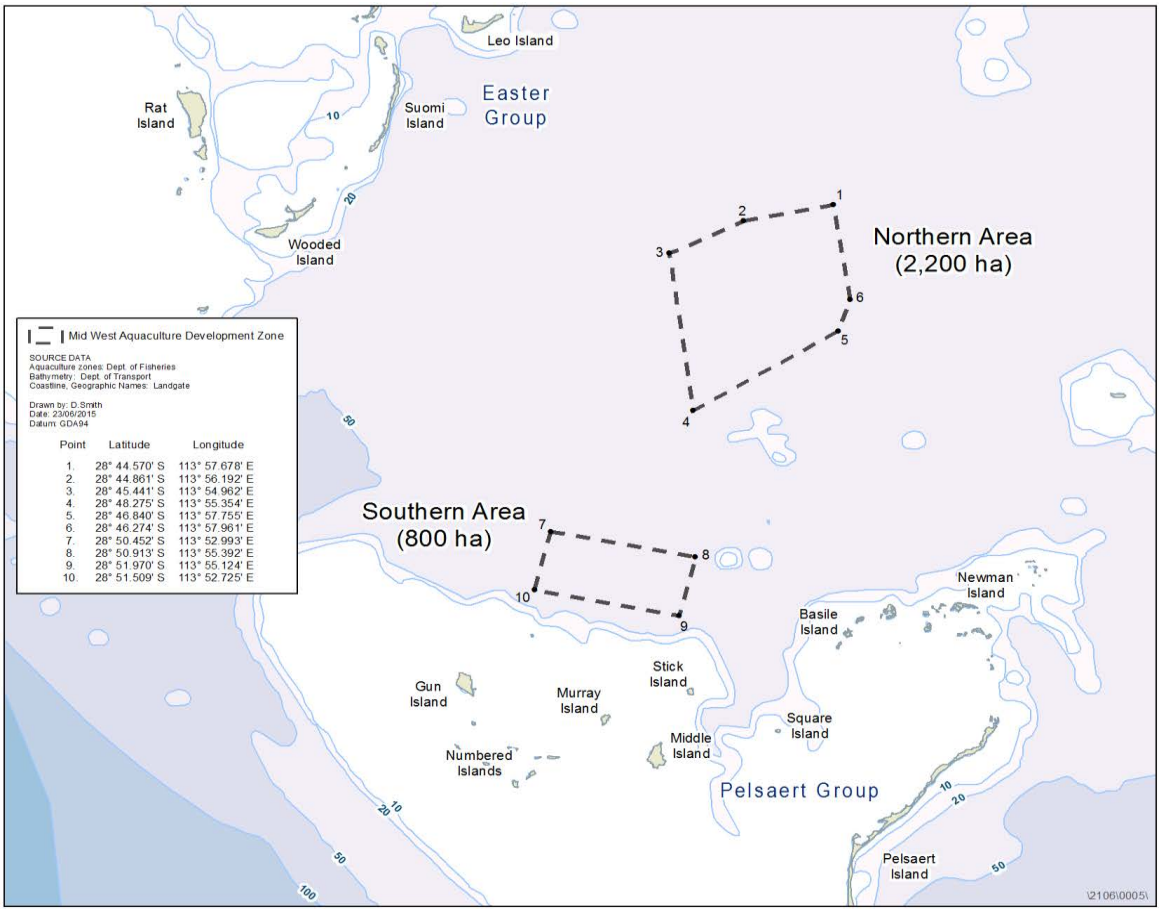

Figure 1: Location of the proposed Mid West Aquaculture Development Zone

There is no land-based component to the MWADZ.

2. Legislation and Policy Framework

Regulatory requirements in Western Australia for waste management in the marine environment are administered through a number of Acts, Regulations, Policies, Guidelines and Codes of Practice, including the:

- *Fish Resources Management Act 1994*
- Fish Resources Management Regulations 1995
- *Environmental Protection Act 1986*
- Environmental Protection Regulations 1987
- Environmental Protection (Unauthorised Discharges) Regulations 2004
- *Pollution of Waters by Oil and Noxious Substances Act 1997*
- *Health Act 1911*
- Marine Order 96 (Marine Pollution Prevention – Sewage) 2009
- *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*

2.1 Specific Aquaculture Legislation and Policy Frameworks

Waste management procedures are required to be clearly documented in the statutory Management and Environmental Monitoring Plan (MEMP). The MEMP requirements have been developed with input from the EPA and the former Department of Environment and Conservation (DEC), including the Marine Parks and Reserves Authority (MPRA). Under s.92A of the *Fish Resources Management Act 1994* (FRMA) all applications for an aquaculture licence must be accompanied by a MEMP [unless exempt under s.92A(4)].

For operations within an Aquaculture Development Zone the following is required:

- EIA assessment by the EPA
- MEMP
- Ministerial Statement (Minister for Environment)
- EMMP (including this document)
- Aquaculture Development Zone Management Policy

In terms of waste management, MEMPs specifically require operators to *inter alia* address:

- Waste and waste water management (including biosecurity procedures)
- Disposal of waste
- Quarantine and disease-testing management (including recovery of sea cage mortalities) (DoF, 2013 MEMP Guidance Statement)

Separate from the legislative management framework outlined above, the Aquaculture Council of Western Australia (ACWA) has developed an updated Environmental Code of Practice for the Sustainable Management of Western Australia's Marine Finfish Aquaculture Industry (CoP).

An industry initiative, the CoP focuses on best practice through a documented environmental management system. It recommends a continual improvement requirement by the business through periodic reviews and evaluations to identify and implement opportunities for improvement.

Among its other objectives, the CoP provides a mechanism for environmental self-regulation of the marine finfish aquaculture sector as a valuable alternative to detailed regulation of every aspect of the industry's activity. It could also lead to the development of a system of environmental accreditation.

While the CoP is associated with the zone management policy, it is not a requirement under legislation. Compliance with it is voluntary, not mandatory. Therefore, it is considered to be outside (but supportive of) the legislative management framework.

3. Best Practice Management

3.1 General

All operators, staff and contractors are required to comply with this WMP, facility-specific requirements through the MEMP process and other applicable environmental protection legislation. Adherence to best practice guidelines, including the ACWA Environmental Code of Practice, is actively encouraged.

In line with the EPA's Guidance for the Assessment of Environmental Factors Implementing Best Practice in proposals submitted to the Environmental Impact Assessment process No. 55 (EPA, 2003) the Department strongly encourages the use of the Waste Hierarchy:

1. Avoidance of waste production;
2. Reuse of wastes;
3. Recycling wastes to create useful products;
4. Recovery of energy from wastes;
5. Treatment of wastes to render them benign;
6. Containment of wastes in secure, properly managed structures; and
7. Disposal of waste safely in the long term.

However, any reuse or recycling of aquaculture facility products must be done in accordance with biosecurity procedures.

3.2 Instruction and Training

All staff and contractors at individual operations will be provided with a copy of the WMP and MEMP and receive an onsite induction on waste management, including appropriate biosecurity handling procedures.

4. Minimising Waste

The minimisation of all waste within the zone will be encouraged. More specifically, beyond the avoidance of waste production, materials fall into three main categories for waste management purposes:

1. Reuse

Off cuts, spare netting, ropes, etc. that can potentially be used in future operations or for repair should be appropriately decontaminated and labelled and stored for future use.

2. Recycle

Materials that cannot be used in their present form but could potentially be used for other purposes should be appropriately decontaminated, labelled, recorded and stored for future reference.

3. Landfill on the mainland

If materials cannot be reused or recycled they must be returned to the mainland and disposed of in landfill under the appropriate council permits. See individual sections of this WMP for the disposal of biological wastes.

5. Waste Management within the MWADZ

This WMP outlines the overarching waste management procedures that govern all aquaculture operations that occur within the MWADZ. Derived proposals (i.e. individual operations within the MWADZ) will also be required to comply with the waste management requirements within their individual MEMPs.

An annual systematic review of individual facilities should be undertaken to further develop and improve WMPs.

5.1 Fish Feed and Fish Faeces

Fish feed and fish faeces waste from marine based aquaculture can potentially have a significant impact on the environment. This is particularly true where there are low currents, tides and wave amplitude that, in turn, drive minimal water exchange.

The zone location has been chosen to take advantage of the relatively deep, clean, well-flushed waters and open sandy sea floor between the Pelsaert and Easter groups of the Abrolhos Islands. However, the risk of waste accumulation for any aquaculture operation needs to be managed.

To address this issue, fish feed and faeces waste should be managed according to best-practice techniques, including:

- Rotation of stock
- Fallowing or resting of sites
- Stocking densities appropriate to site water flow, depth and sediment type characteristics
- Appropriate feeding methods to minimise over feeding

Operators will be required to address the management of feed and faeces waste in relation to their specific activities and level of operation. Detailed management arrangements and mitigation measures must be addressed in the MEMP and approved by the Department prior to the commencement of operations.

5.2 Stock Mortalities and Culls

All aquaculture operations experience stock mortality and/or harvest of unsaleable stock. Disposal of dead fish also requires consideration of appropriate biosecurity handling procedures (see section 6).

To discourage scavenging or predation by marine fauna, dead stock will be removed from sea cages on a daily basis and disposed to landfill on the mainland in accordance with waste management authority (City of Geraldton) regulations. Under no circumstances is biological waste to be disposed of at sea.

To minimise mortality, the following control techniques should be implemented:

- Minimise stock stress during inspections and dead stock collection.
- Implement a Veterinary Health Plan and promptly address any health or welfare problems (in consultation with fish health experts where appropriate).
- Maintain complete records of each inspection, including number of mortalities removed and likely cause of death (determined by appropriately-competent person). Mortalities can then be subtracted from total population to maintain population estimates.

- Daily removal (weather permitting) and disposal of dead or moribund (wounded or sick) stock to ensure predatory species are not attracted to the farm as well as limit any risk of disease spread.

5.3 Harvesting and Processing Wastes

The only processing permitted to be undertaken at sea is harvesting, slaughtering, bleeding, washing and chilling of fish. Any additional processing must take place at an approved facility on land. All organic waste, including blood, is prohibited from disposal at sea under Regulation 62 of the Fish Resources Management Regulations 1995.

Organic waste, including blood water, must be sealed in watertight containers, taken to the mainland and disposed of in landfill under the relevant waste authority regulations.

5.4 Sewage

Sewage must be either:

- treated, using a sewage disposal system approved by the Department of Health, prior to disposal at sea in accordance with the Department of Transport's Strategy for Management of Sewage Discharge from Vessels into the Marine Environment 2015 (Strategy); or
- stored in tanks on the vessel and disposed of on land at a licensed disposal site in accordance with Local Government Authority by-laws.

Under the Strategy, no discharge of sewage from vessels (either treated or untreated) is permitted within Zone 1 (as defined in the Strategy) fish habitat protection areas where the dilution/dissipation factor is deemed unsatisfactory.

The MWADZ location has specifically been chosen for its high level of water exchange and, as such, is likely to fall under Zone 2 of the Strategy. This means discharge is only permitted from vessels with approved treatment systems.

As part of the broader Abrolhos Islands Management Plan, a WMP is being developed to cover the combined Abrolhos Islands Reserve and the surrounding FHPA. If necessary, the MWADZ WMP and the content of MEMPs associated with operators within the zone will be amended to reflect any additional requirements specified in the Abrolhos-wide WMP.

5.5 Rubbish and Pest/Scavenger Control

Waste material (e.g. empty feed bags, old ropes, floats, net mesh and any other discarded equipment, as well as staff domestic waste such as food scraps, papers, plastic packaging, etc.) must be placed in sealed waste containers and/or securely stowed on board the vessel and disposed of in landfill on the mainland in accordance with the relevant waste management regulations (City of Geraldton as the waste management authority). Such waste should be removed daily to prevent local build-up of material that can attract pests (e.g. insects) and scavengers (e.g. silver gulls).

Marine debris can be harmful to the environment and farm staff must ensure it is disposed of correctly. Similarly, if marine debris is sighted within or around the aquaculture operation, its collection and disposal is an environmental responsibility to be met by all operators.

5.6 Oil and Oily Waste

To reduce the potential for oil and oily wastes (including fuel) generated through vessel operations to enter the environment, any used oil or oil-soaked absorbents must be securely stored in tanks on the vessel and disposed at an appropriately-licensed oil recycling facility (available at most mainland ports). Containers used to transport such wastes must be sealed and secured for the duration of their relocation.

If oil or oily waste is discharged into the marine environment, licence holders must immediately report the marine oil spill to the Department of Transport (DoT) on (08) 9480 9924 (24-hour reporting number) or e-mail (marine.pollution@transport.wa.gov.au.).

Should an oil spill occur, do not pour anything onto the oil. If a marine oil spill kit is on hand it may be possible to mop up the spill with absorbent pads and contain it.

Refer to the DoT website (http://www.transport.wa.gov.au/imarine/report-marine-pollution-and-oil-spills.asp) for further information regarding requirements for oil spill or pollution situations.

5.7 Biofouling

Removal of marine fouling from sea cages may be undertaken *in situ* using physical or mechanical methods; or achieved by removing the nets and drying/cleaning on the mainland.

If operators choose to clean sea cages on site within the MWADZ, it is recommended this be done on a very regular (almost continuous) basis so as to prevent any heavy accumulation of biofouling that could translate to a correspondingly heavy release of biological material into the water column when removed from the aquaculture gear.

A regime of regular biofouling removal optimises the flow of water through the sea cages (with resulting benefits to the aquaculture stock) and reduces the potential for any marine pest to become established.

The *National Biofouling Management Guidelines for the Aquaculture Industry* (http://www.marinepests.gov.au/marine_pests/publications/Pages/national_biofouling_management_guidelines_aquaculture_industry.aspx) should be referred to for further information on recommended approaches for control of biofouling to minimise the spread of exotic species that may associated with moving aquaculture stock and equipment.

6. Biosecurity

Biosecurity is a specific concern for the disposal of biological wastes, particularly in the case of unexplained stock mortality.

Fisheries legislation requires all aquaculture licence holders [unless exempt under section 92A(4)] to have a MEMP, which includes biosecurity procedures. All licence holders operating within the zone will be required to have an approved MEMP for their operation that has been developed in accordance with the "*Aquaculture Management and Environmental Monitoring Plan (MEMP) Guidance Statement*" (www.fish.wa.gov.au/Documents/Aquaculture/memp_guidance_statement.pdf) that is available on the Department's website at www.fish.wa.gov.au.

Biosecurity procedures must include, but are not limited to:

- record keeping (such as translocation approvals, health certificates, disease management records, fish escape reports, unusual mortality reports, internal and external stock transfers, facility and stock inspections, facility access records for staff and visitors);
- aquaculture gear and vessels used (such as maintenance, disinfection and inspections);
- biosecurity emergency procedures;
- disposal of waste (such as dead fish, diseased, contaminated or infected fish stocks);
- disease testing protocols and quarantine; and
- management of fish escapes.

The Department has a Fish Health Unit that provides a range of services to investigate the health problems of wild and farmed fish stocks, including 'fish kills' or sudden mortalities. In the event of large unexplained mortalities, licensees must contact the Fish Health Unit (see section 7.2) and assist them to determine the cause of death and degree of risk posed by such deaths. This includes collecting key data and samples to allow a thorough investigation into the cause of the fish kill.

To minimise the risk of potential transfer of disease through either carcasses or equipment, the following basic protocols should be adhered to:

- Biological material should be separated from other waste and kept away from water bodies and other contaminates pathways to minimise the risk of spreading pathogenic agents.
- Personnel should maintain appropriate hygiene procedures including the use of safety gear (e.g. gloves).
- In the event of a fish kill, key data and samples should be stored to allow a thorough investigation.
- No disposal of stock mortalities or culls at sea (it is an offence under the *Environmental Protection Act 1986* to do otherwise). All stock mortalities must be placed in sealed containers for transport, returned to the mainland and disposed of in landfill according to local waste authority regulations.

The zone will be treated as one biosecurity unit due to the relative close proximity of aquaculture operations and the physical environment within the Zeewijk Channel.

6.1 Disease Management

Disease prevention, rather than treatment, is vital in any aquaculture operation; but even more so in an aquaculture zone where aquaculture operations may be located in close proximity to one another.

The following management strategies will be implemented to minimise the risk of a fish disease outbreak. In addition to the procedures and protocols outlined in individual MEMPs, licence holders must comply with the following minimum requirements:

- stock (fish) must be marine finfish of a species that occurs naturally within the Mid West region (a condition of the Ministerial Statement);
- all stock, other than brood stock sourced under permit from the wild and taken in the Mid West region, must be certified disease-free and accompanied by a health certificate issued by the Department before being moved into the zone;
- a stock health surveillance program and quarantine procedures must be implemented; and
- a biosecurity manager for each operation must be appointed and responsible for ensuring biosecurity measures are implemented.

In the event of a disease outbreak:

- the licence holder must report the outbreak (according to section 7.2 below);
- any pharmaceuticals such as antibiotics that are used must be prescribed by a veterinarian or approved by the Australian Pesticides and Veterinary Medicines Authority and administered in accordance with the recommended dosages;
- stock must not be moved without the written approval of the Principal Research Scientist in the Department's Fish Health Unit;
- vessel movements between individual sites is to be restricted;
- disinfection of equipment, vessels and barges down to and including the waterline should be done prior to movement and in accordance with the CoP; and
- any other aquaculture operators within the zone must be informed immediately.

7. Reporting

7.1 General Reporting Requirements

In accordance with MEMP requirements, licence holders are required to submit a MEMP Report to the Department annually. These reports include:

- monitoring results undertaken as components of the MEMP compliance requirements;
- summary of any significant exceedance of environmental monitoring values (as defined in the EMMP);
- reactive management actions;
- biosecurity measures implemented/issues;
- chemical usage; and
- marine fauna interactions.

Individual licence holders will report any injury or entanglement of rare or protected fauna immediately to DPaW[2].

7.2 Biosecurity/Incident Reporting Requirements

Licence holders within the MWADZ will report incidents to the Department by calling (08) 9482 7333 or by email to aquaculture@fish.wa.gov.au or biosecurity@fish.wa.gov.au within 24 hours of:

- any suspected escape from a fish farm, or circumstances which gives rise to a significant risk of escape;
- all unusual mortalities (noting the Regulation 69 requirements outlined below); and
- any exceedance of an environmental monitoring threshold value.

[2] Refer to the MWADZ Marine Fauna Interaction Plan.

Disease reporting requirements are stipulated in Regulation 69(d), (e), (f), (g) and (h) of the Fish Resources Management Regulations 1995 (FRMR). All employees of operators within the zone must be aware of these regulations, which are intended to provide for adequate monitoring and adaptive management of any emerging disease risks.

Under Regulation 69, aquaculture licence holders must notify the CEO of the Department in writing within 24 hours of becoming aware or suspecting that fish may be affected by any disease. Any material, significant or unusually high fish mortalities must be reported, as they may be caused by disease. To minimise the interval between the CEO first being notified of suspected disease outbreaks and the CEO giving directions appropriate to each incident in response, aquaculture licence holders must provide details of the disease outbreak, or suspected disease, as soon as possible (but within the prescribed timeframes) by e-mail to each of the following:

- fishhealth1@fish.wa.gov.au; and
- aquaculture@fish.wa.gov.au; and
- biosecurity@fish.wa.gov.au

The e-mails should have the subject heading: “NOTIFICATION TO CEO UNDER REG 69.”

E-mail notifications to each of these three addresses within the prescribed timeframes meets the requirements of both this management policy and those of Regulation 69.

8. References

Environmental Scoping Document Mid West Aquaculture Development Zone Assessment No. 1972, Environmental Protection Authority, 24 July 2013

Environmental Code of Practice for the Sustainable Management of Western Australia's Marine Finfish Aquaculture Industry; ACWA/DoF, 2013

Aquaculture Management and Environmental Monitoring Plan Guidance Statement, Department of Fisheries, August 2013.

Fish Kill Incident Response Manual Department of Fisheries/Department of Water

Environmental Protection Authority Guidance for the Assessment of Environmental Factors Implementing Best Practice in proposals submitted to the Environmental Impact Assessment process No. 55 December 2003

Aquatic Animal Health Code

Tucker, C.S & Hargreaves, J.A. Eds *Environmental Best Management Practices for Aquaculture – Facilities Operation and Maintenance pages 316 – 320* Blackwell Publishing, 2008.