

JOINT MANAGEMENT AGREEMENT

BETWEEN

THE MINISTER FOR PRIMARY INDUSTRIES

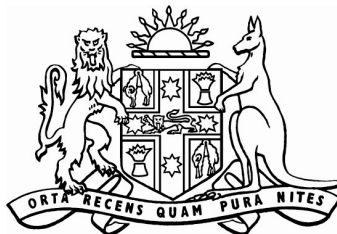
AND

**THE DIRECTOR-GENERAL OF THE
DEPARTMENT OF INDUSTRY AND INVESTMENT**

FOR

The NSW Shark Meshing (Bather Protection) Program

August 2009



**New South Wales
Government**

JOINT MANAGEMENT AGREEMENT UNDER PART 7A DIVISION 8 OF THE FISHERIES MANAGEMENT ACT 1994

AGREEMENT dated

PARTIES

The Minister for Primary Industries

AND

The Director-General of the Department of Industry and Investment (DI&I).

1. LEGISLATIVE CONTEXT

- 1.1. Harming Threatened Species, Populations or Ecological Communities is an offence under the *Fisheries Management Act 1994*.
- 1.2. It is a defence to prosecution under the *Fisheries Management Act 1994* for harming Threatened Species, Populations or Ecological Communities if the activity was authorised by, and done in accordance with, a joint management agreement made under Part 7A Division 8 of the *Fisheries Management Act 1994*.
- 1.3. The purpose of this Agreement is to manage the carrying out of Shark Meshing by DI&I to the extent to which it may result in harm to Fish and Marine Vegetation that are Threatened Species, Populations or Ecological Communities.
- 1.4. If DI&I carries out Shark Meshing in accordance with this Agreement it will have a defence to prosecution for harming Fish and Marine Vegetation which are Threatened Species, Populations or Ecological Communities.
- 1.5. Nothing in this Agreement affects the operation of any other Act or Regulation, or relieves the Parties to this Agreement from complying with any other Acts or Regulation.

2. DEFINITIONS

- 2.1. In this Agreement unless the contrary intention appears:

“**Agreement**” means this document ‘*Joint Management Agreement for the NSW Shark Meshing (Bather Protection) Program*’ and the arrangements provided therein.

“**DECCW**” means the NSW Department of Environment, Climate Change and Water.

“**DI&I**” means the NSW Department of Industry and Investment.

“**Fish**” has the same meaning as section 5 of the *Fisheries Management Act 1994*.

“**Fisheries Scientific Committee**” means the Fisheries Scientific Committee established under section 221ZA of the *Fisheries Management Act 1994*.

“Management Plan” means the Management Plan for the NSW Shark Meshing (Bather Protection) Program prepared by the DI&I as amended from time to time in accordance with clause 10.2. The current version of the Management Plan is attached and marked Annexure A to this Agreement.

“Marine Vegetation” has the same meaning as in the *Fisheries Management Act 1994*.

“Meshing Season” means the period between 1 September and 30 April of the next consecutive calendar year.

“Nets” means bottom-set synthetic filament mesh nets, 150m in length, with 60cm mesh size and 6m in depth, set in a generally parallel direction off the beach, anchored in approximately 10m depth of water with a weighted bottom line (leadline) and a floated top line (floatline). The Nets are identified by surface floats.

“Non-Target Species” means all vertebrate species other than whaler sharks (bull, dusky, bronze, blacktip and spinner), tiger shark, white shark, mako (shortfin) shark, and broad-nosed sevengill shark.

“Parties to this Agreement” means the Minister for Primary Industries and the Director-General of DI&I.

“Release Plan” means any guidelines prepared by DECCW or DI&I for the disentanglement and release of marine mammals, marine reptiles and marine birds.

“Shark Meshing” means the placing of nets around beaches or other waters at the 51 beaches listed in Table 1 of the Management Plan to protect the public from sharks.

“Threatened Species, Populations and Ecological Communities and Threatened Species, Population or Ecological Community” have the same meanings as in the *Fisheries Management Act 1994*.

“Trigger Point” means those trigger points identified in clause 12 of the Management Plan.

3. COMMENCEMENT AND EXPIRATION DATE

- 3.1. This Agreement has effect from the day the last party signed this Agreement and remains in force until terminated in accordance with clause 11.

4. THREATENED SPECIES AND POPULATIONS TO WHICH THE AGREEMENT APPLIES

- 4.1. This Agreement applies to Fish and Marine Vegetation which are Threatened Species, Populations or Ecological Communities.

5. ACTION MANAGED BY THIS AGREEMENT

- 5.1. This Agreement manages Shark Meshing carried out by the DI&I which may result in harm to Fish and Marine Vegetation identified in clause 4.

6. OBJECTIVES OF THE AGREEMENT

6.1. The objectives of this Agreement are to:

- 6.1.1. Minimise the impact of Shark Meshing on Fish and Marine Vegetation which are a Threatened Species, Population or Ecological Community.
- 6.1.2. Ensure that Shark Meshing does not jeopardise the survival or conservation status of Threatened Species, Populations or Ecological Communities, or cause species that are not threatened to become threatened.

7. ACHIEVEMENT OF THE OBJECTIVE

7.1. To achieve the objective of this Agreement:

- 7.1.1. DI&I will only carry out Shark Meshing in accordance with this Agreement and the Management Plan;
- 7.1.2. DI&I will only carry out Shark Meshing during the Meshing Season;
- 7.1.3. DI&I will ensure that Nets are fitted with acoustic warning devices;
- 7.1.4. DI&I will require that contractors comply with by-catch reduction protocols and release protocols contained in the Management Plan and any Release Plans;
- 7.1.5. DI&I will continue research into methods of minimising by-catch of Non-Target Species through implementation of the strategic research and monitoring program contained in the Management Plan; and
- 7.1.6. The Parties to this Agreement will ensure that comprehensive Release Plans are in place.

7.2. Despite clause 7.1.2 on seasons commencing or concluding on a weekend, the Nets may be set up to 2 days before the 1 September or retrieved up to 2 days after the 30 April. This variation is limited to seasons commencing on a weekend (2012 & 2013) and seasons concluding on a weekend (2010 & 2011) for the 5 year period prior to review of this Agreement.

8. MEASURES BY WHICH PROGRESS TOWARDS ACHIEVING THE OBJECTIVE IS TO BE ASSESSED & RESPONSIBILITY FOR THEIR IMPLEMENTATION

8.1. The Parties to this Agreement agree that progress towards achieving the objective of this Agreement will be assessed by the measures in this clause 8.

8.2. **Measure:** Monthly Catch Summary Report **Responsibility:** DI&I

- 8.2.1. DI&I will prepare monthly catch summary reports in accordance with the Management Plan.
- 8.2.2. DI&I will provide monthly catch summary reports to DECCW and the Fisheries Scientific Committee.

8.3. **Measure:** Annual Performance Report **Responsibility:** DI&I

- 8.3.1. DI&I will prepare an annual performance report which will:
- a) document the progress towards implementing the Management Plan.
 - b) assess the performance of the Management Plan and this Agreement in mitigating impacts on Threatened Species, Populations and Ecological Communities.
- 8.3.2. DI&I will prepare the annual performance report in accordance with the Management Plan.
- 8.3.3. DI&I will provide the annual performance report prior to 31 July each year to:
- a) the Fisheries Scientific Committee to inform their annual reviews as provided for in section 221Y(2)(a) of the *Fisheries Management Act 1994*; and
 - b) the Minister for Primary Industries.
- 8.3.4. DI&I will make the annual performance report publicly available.

8.4. **Measure:** Review Report **Responsibility:** DI&I

- 8.4.1. DI&I will prepare a review report after the completion of each Meshing Season in response to either of the following circumstances:
- a) the annual performance report prepared in accordance with clause 8.3 identifies that a Trigger Point has been tripped;
 - b) the annual performance report prepared in accordance with clause 8.3 identifies that timeframes under the Management Plan have not been met.
- 8.4.2. DI&I will prepare the review report in accordance with the Management Plan.
- 8.4.3. The review report may make recommendations for remedial action.
- 8.4.4. DI&I will provide the review report to the Minister for Primary Industries and the Fisheries Scientific Committee.
- 8.4.5. DI&I will make the review report publicly available.

9. REVIEW OF AGREEMENT

- 9.1. This Agreement is to be reviewed by the Parties to this Agreement five years from the date of commencement, or following the listing of a new species, population or ecological community under the *Fisheries Management Act 1994* that may be directly and detrimentally affected by Shark Meshing.

10. AMENDMENT OF AGREEMENT

- 10.1. This Agreement may only be amended by a joint management agreement prepared in accordance with the *Fisheries Management Act 1994*.
- 10.2. Notwithstanding clause 10.1, the Parties to this Agreement acknowledge that the Management Plan may be amended from time to time in accordance with processes established by the Management Plan provided that the Management Plan continues to meet the objectives of this Agreement.

11. TERMINATION OF AGREEMENT

- 11.1. This Agreement may be terminated by agreement between the Parties to this Agreement.
- 11.2. This Agreement may be terminated by either party giving notice to the other party where the other party has breached the Agreement and has not rectified the breach within 28 days of receiving notice requiring it to do so.

12. DISPUTE RESOLUTION

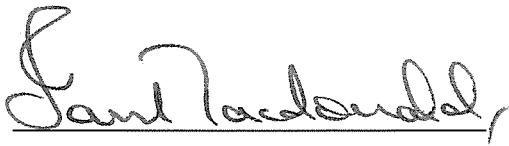
- 12.1 A Party claiming that a dispute has arisen in relation to the Agreement must notify the other Party giving details of the dispute.
- 12.2 The Parties must negotiate in good faith to resolve the dispute.
- 12.3 If the dispute is not resolved under clause 12.2 within 14 days (or longer period agreed between the Parties) from the date of notice of the dispute under clause 12.1 the dispute will be referred to the Premier for resolution.

13. RELATIONSHIP TO OTHER DOCUMENTS

- 13.1. This document should be read in conjunction with:
 - a) Report into the NSW Shark Meshing (Bather Protection) Program (Green *et al.* 2009); and
 - b) Management Plan for the NSW Shark Meshing (Bather Protection) Program.
- 13.2. In the event of any inconsistency between this Agreement and the documents in clause 13.1 this Agreement prevails.

SIGNED by

The Minister for Primary Industries



THE MINISTER FOR PRIMARY INDUSTRIES

Date: 17.08.2009

SIGNED by

The Director-General of the Department of Industry and Investment



THE DIRECTOR-GENERAL

Date: 14.08.2009

Annexure A

Management Plan

for the

NSW Shark Meshing

(Bather Protection) Program

August 2009



New South Wales
Government

Title: Management Plan for the NSW Shark Meshing (Bather Protection) Program

August 2009

Author: Fisheries Conservation & Aquaculture

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Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (August 2009). However, because of advances in knowledge, users are reminded of the need to ensure that information on which they rely is up to date and to check the currency of the information with the appropriate officer of Department of Industry and Investment or the user's independent advisor.

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DEFINITIONS

In this Plan:

“**Compliance Plan**” means a strategic operational plan that seeks to optimise compliance with this Plan by contract service providers.

“**Contract**” means a contract for the provision of services by a third party for the capture of sharks in the NSW Shark Meshing (Bather Protection) Program.

“**Contractor**” means the organisation which by the Contractor undertakes to provide the services required by the contract and, where the Contractor is an individual or a partnership, the expression shall include the personal representatives of that individual or of the partners as the case may be and the expression shall also include any person to whom the benefit of the contract may be assigned by the Contractor with the consent of DI&I.

“**CPUE**” means catch per unit of effort (e.g. sharks caught per 1000 net settings).

“**DECCW**” means the NSW Department of Environment, Climate Change and Water.

“**Fisheries Scientific Committee**” means the Fisheries Scientific Committee established under Part 7A of the *Fisheries Management Act 1994*.

“**JMA**” means the Joint Management Agreements for the NSW Shark Meshing (Bather Protection) Program made under section 221V of the *Fisheries Management Act 1994* and section 121 of the *Threatened Species Conservation Act 1995*.

“**Marine Mammals**” means all animals of the orders of Cetacea, Sirenia and Pinnipedia.

“**Marine Reptiles**” means animals of the family Cheloniidae and Dermochelyidae.

“**Marine Birds**” means animals of the orders of Procellariiformes, Pelecaniformes and Falconiformes, and animals of the family Laridae and Stercorariidae.

“**Meshing/meshings**” means the use of a net in the SMP in accordance with the terms of the contract.

“**Meshing season**” means the period from 1 September until 30 April of the next consecutive calendar year.

“**Non-target species**” means all vertebrate species that are not target species.

“**DI&I**” means the NSW Department of Industry and Investment.

“**Observer Program**” means the provision of employees to monitor SMP operations to quantify and maximise the accuracy of information arising from captures.

“**Parties to the Agreements**” means the Minister for Primary Industries, the Director-General of Department of Industry and Investment; and the Director-General of the Department of Environment, Climate Change and Water.

“**Protected Fauna**” has the same meaning as in the *National Parks and Wildlife Act 1974*.

“**Protected Fish**” means species of fish listed in Part 1 of the Table to clause 6 and Part 1 of the table to clause 7 of the *Fisheries Management (General) Regulation 2002*.

“**Scientific Committee**” means the Scientific Committee established under Part 8 of the *Threatened Species Conservation Act 1995*.

“**Services**” means, without limiting the generality of the expression, advisings (other than legal advisings), consultancies, installations and the performance of professional or trade operations of any kind.

“**SMP**” means the NSW Shark Meshing (Bather Protection) Program.

“Sub-Contractor” means a person who furnishes equipment or services to a Contractor operating in the SMP, either directly or through another sub-Contractor for use under a contract.

“Supervisor” means an accredited observer who has delegated authority from the Director-General of the Department of Industry and Investment to oversee a Contractor’s performance and act on behalf of DI&I.

“Target species” means whaler sharks (bull, dusky, bronze, blacktip, and spinner), tiger shark, white shark, mako (shortfin) shark, and broad-nosed sevengill shark.

“this Plan” means this document titled “Management Plan for the NSW Shark Meshing (Bather Protection) Program”.

“Threatened Species Scientific Committee” means the Threatened Species Scientific Committee established under the *Environment Protection and Biodiversity Conservation Act 1999*.

“Threatened Species” has the same meaning as in the *Fisheries Management Act 1994* and the *Threatened Species Conservation Act 1995*.

“Threatened species, populations and ecological communities” has the same meaning as in the *Fisheries Management Act 1994* and the *Threatened Species Conservation Act 1995*.

PART 1 INTRODUCTION

1. Name of plan

- (1) This plan is the Management Plan for the NSW Shark Meshing (Bather Protection) Program (hereafter "this Plan").

2. Date of commencement

- (1) This Plan will come into force on 1 September 2009.

3. Definition of the activity

- (1) The activity of shark meshing is defined herein as the placing of nets around beaches or other waters at the 51 beaches listed in Table 1 of this Plan to protect the public from sharks.
- (2) The activity is formally undertaken in NSW through the SMP. In general terms the SMP is a fishing activity comprising the placing of nets at 51 beaches between Stockton and South Wollongong to protect the public from sharks.
- (3) The SMP uses bottom-set synthetic filament mesh nets 150m in length and 6m in depth of 60cm mesh size that are set in a generally parallel direction off the beach, anchored in approximately 10m depth of water. The nets have a weighted bottom line (leadline) and a floated top line (floatline) and are identified by surface floats.
- (4) The SMP includes all activities by Contractors who set, haul, run, and clear the nets in accordance with requirements established by contract.
- (5) The SMP also includes all activities by DI&I associated with contract administration, compliance, supervision, observer programs, research programs, monitoring, and reporting.

4. Authority for the activity

- (1) Shark meshing activities carried out at the 51 beaches listed in Table 1 of this Plan and undertaken in accordance with the JMA and this Plan are authorised by JMA under the *Threatened Species Conservation Act 1995* and the *Fisheries Management Act 1994*.
- (2) Shark meshing activities are also undertaken in accordance with general provisions of the *Fisheries Management Act 1994* and the *Fisheries Management (General) Regulation 2002*.

5. Legislative context

- (1) Harming Threatened Species is an offence under the *National Parks and Wildlife Act 1974* and the *Fisheries Management Act 1994*. Activities authorised by, and done in accordance with, a JMA entered into under Part 7 of the *Threatened Species Conservation Act 1995* or Part 7A of the *Fisheries Management Act 1994* respectively provide a defence to prosecution for Threatened Species offences.
- (2) Harming Protected Fauna is an offence under the *National Parks and Wildlife Act 1974*. Activities authorised by, and done in accordance with, a JMA entered into under Part 7 of the *Threatened Species Conservation Act 1995* provide a defence to prosecution for protected fauna offences.

- (3) Taking or possessing Protected Fish is an offence under the *Fisheries Management Act 1994*. Activities authorised by, and done in accordance with, a JMA entered into under Part 7A of the *Fisheries Management Act 1994* provide a defence to prosecution for Protected Fish offences.
- (4) Death or injury to marine species following capture in shark control programs on ocean beaches is listed as a key threatening process under the *Threatened Species Conservation Act 1995*. The current shark meshing program in New South Wales waters is listed under the *Fisheries Management Act 1994* as a key threatening process.
- (5) DECCW and DI&I are required to develop strategies for managing each key threatening process. These strategies are required to be set out in Priorities Action Statements prepared under Part 5A of the *Threatened Species Conservation Act 1995* and Part 7A of the *Fisheries Management Act 1994*.

6. Proponent of the activity

- (1) The SMP is authorised by DI&I and DECCW through JMA. The SMP is managed by DI&I on behalf of the NSW Government and funded by NSW Treasury. Meshing operations are conducted by Contractors.
- (2) For the purposes of this Plan, the proponent of the activity is taken to mean DI&I.

7. Relationship to the *Environmental Planning and Assessment Act 1979*

- (1) For the avoidance of doubt, and in accordance with s.115RA of the *Environmental Planning and Assessment Act 1979*, the *Environmental Planning and Assessment Act 1979* does not apply to shark meshing that is the subject of a joint management agreement under the *Threatened Species Conservation Act 1995* and the *Fisheries Management Act 1994*.

8. Environmental assessment

- (1) The existing activity of shark meshing has been subject to an environmental assessment (Green *et al.* 2009).
- (2) The management provisions of this Plan have been designed to mitigate the environmental impacts of the activity as far as possible while still achieving the program aim.

9. Relationship to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

- (1) The threatening process 'Death or injury to marine species following capture in beach meshing (nets) and drum lines used in shark control programs' was nominated for listing as a key threatening process under the *Environment Protection and Biodiversity Conservation Act 1999*.
- (2) The Threatened Species Scientific Committee (TSSC) established under section 205 of the *Environment Protection and Biodiversity Conservation Act 1999* assessed the threatening process against the criteria in section 188(4) of the *Environment Protection and Biodiversity Conservation Act 1999*.
- (3) Following the assessment the TSSC recommended that the threatening process was not eligible for inclusion in the list of key threatening processes under section 183 of the *Environment Protection and Biodiversity Conservation Act 1999*.

- (4) After considering the TSSC's recommendation and advice the Minister decided that the threatening process was not eligible to be treated as a key threatening process under s188 of the *Environment Protection and Biodiversity Conservation Act 1999*.
- (5) An action that has, will have or is likely to have a significant impact on matters of national environmental significance may need approval under the *Environment Protection and Biodiversity Conservation Act 1999*. Section 43B of the *Environment Protection and Biodiversity Conservation Act 1999* provides that actions that are a lawful continuation of use of the land, sea or seabed that was occurring before 16 July 2000 are not subject to approval under the *Environment Protection and Biodiversity Conservation Act 1999*.
- (6) Approval under the *Environment Protection and Biodiversity Conservation Act 1999* for the SMP has not been sought on the basis that the SMP is a lawful continuation of use of the land, sea or seabed and is therefore covered by the continuing use exemption in section 43B of the *Environment Protection and Biodiversity Conservation Act 1999*.

PART 2 AIM, OBJECTIVES, PERFORMANCE INDICATORS & TRIGGER POINTS

10. Program aim

- (1) The aim of the SMP is to reduce the threat of shark attack within the area of operation of the program whilst minimising impacts on non-target species.
- (2) The operational means by which the program aim is pursued and continually refined are set out in this Plan.

11. Management Plan objectives

- (1) The objectives of this Plan are to:
 - a) Reduce the risk to humans from shark attack at beaches subject to the SMP, and, consistent with that objective:
 - b) Minimise the impact on non-target species and to ensure that the SMP does not jeopardise the survival or conservation status of threatened species, populations and ecological communities, or cause species that are not threatened to become threatened,
 - c) Minimise occupational health and safety risks to Contractors and agency personnel associated with implementing the SMP, and
 - d) Ensure that monitoring and reporting on the SMP is undertaken in a transparent manner.

12. Performance indicators and trigger points

- (1) The following performance indicators are to be used to determine the performance of this Plan in meeting its objectives:

Objective (a)

Performance indicator: Change in the number of human fatalities or serious injuries from shark attack,

- i) Trigger Point: 1 fatality or serious injury⁺ per meshing season on a meshed beach.

⁺ Serious injury means injuries from a shark attack that result in a threat to life or limb.

Objective (b)

Performance indicator: Change in the number of entanglements with non-target species and threatened species, populations and ecological communities in the SMP,

- i) Trigger Point: Entanglements of non-target species and Threatened Species over 2 consecutive meshing seasons exceed twice the annual average catch of the preceding 10 years for those species.

Objective (c)

Performance indicator: Change in the number of major or minor incidents reported by Contractors or observers⁺.

- i) Trigger Point: 1 major or minor incident.

⁺ Major incidents are incidents that result in 5 or more compensable days off work. Minor incidents are incidents that result in less than 5 days off work.

Objective (d)

Performance indicator: Extent to which the public reporting requirements are met.

- i) Trigger Point: Annual performance report submitted to the Parties to the Agreements by 31 July each year.

Note: Table 5 details the objectives to which these performance indicators relate and the methods for assessing the indicators, including trigger points.

13. Achievement of the objective

(1) The objectives of this Plan are to be achieved through the implementation of:

- a) Controls on the activity (Part 3),
- b) Observer Program (Part 4),
- c) Compliance Plan (Part 5),
- d) Strategic Research and Monitoring Programs (Part 6), and
- e) Performance assessment and reporting processes (Part 7).

PART 3 CONTROLS ON THE ACTIVITY

Division 1 – Contract management

14. Meshing activities to be managed by contract

- (1) Meshing activities in the SMP are to be undertaken by third party service providers (Contractors) in accordance with legally binding contracts with the Principal (State Contracts Control Board).
- (2) The development of each contract is to be overseen by the State Contracts Control Board in conjunction with DI&I.
- (3) The Principal's delegate is the Director-General of DI&I. The day-to-day functions of the Principal's delegate are sub-delegated to other officers of the Department, including observers and the Shark Meshing Supervisor.

15. Sub-contracts

- (1) Contractors may engage the services of sub-Contractors to supply goods or services associated with part or all of the SMP.
- (2) The Contractor must warrant that all personnel and sub-Contractors engaged in the provision of deliverables are appropriately qualified, competent and experienced.

16. Contractor's obligations

- (1) Contractors are required to comply with all conditions and requirements of the contract.
- (2) Contractors shall lodge a Bank Guarantee in an amount prescribed by DI&I as security for due performance.
- (3) Failure to comply with contract conditions constitutes a breach of contract.
- (4) The Contractor must at all times act in a lawful manner while providing services in the SMP including, without limitation, complying with all taxation legislation, privacy legislation, workers compensation and occupational health and safety requirements.
- (5) In providing the service the Contractor shall also comply with:
 - a) Any relevant Statutes, Regulations and By-Laws, and any Commonwealth, State, Territory or local authority;
 - b) Other legislative requirements; and
 - c) The requirement to provide information on any notification of breaches of any legislation (e.g. WorkCover NSW notifications).
- (6) The Contractor will provide DI&I with information and assistance relating to contract administration and management including, but not restricted to:
 - a) Timely provision of proposed shark meshing activities;
 - b) Details of the log of recorded daily shark meshing operations;
 - c) Timely provision of photographic images;
 - d) Biological samples as requested;
 - e) Notification of capture or entrapment of any shark or marine mammal or threatened or Protected Fish;
 - f) Environmental management;
 - g) Management of employees and industrial relations; and

- h) Compliance with and management of OHS requirements (WorkCover NSW).
- (7) Contractors are required to co-operate with any research and monitoring program authorised by DI&I where such activities are described in-writing and provided to the Contractor.

17. Effect of breach of contract

- (1) Breach of contract provisions constitute grounds for recoverable actions being instituted by the Principal. These actions include the right to terminate the contract and obtain services elsewhere.

18. Number of Contractors authorised to undertake the activity

- (1) A total of 1 Contractor may operate in each administrative region of the SMP outlined in Table 1.
- (2) Each Contractor may have assistants (deckhands) and each vessel will be allocated an observer to accompany the operation for a percentage of meshing operations.
- (3) Whilst the Contractor is engaged in shark meshing operations, no persons, apart from normal crew members and approved DI&I and DECCW personnel, will be permitted to be on board the vessel without the express written authority of DI&I.

Division 2 – Restrictions on waters, timing, gear and methods

19. Timing

- (1) The timing of the SMP is subject to the following controls:
 - a) Beach meshing activities undertaken as part of the SMP may only occur in the period from 1 September in any one year, until 30 April of the next consecutive calendar year.
 - b) During the meshing season the nets must be set in accordance with contract requirements and all applicable controls established by this Plan.
 - c) Despite clause 19(1)(a) above, on seasons commencing or concluding on a weekend, the nets may be set up to 2 days before 1 September or retrieved up to 2 days after 30 April. This variation is limited to seasons commencing on a weekend (2012 & 2013) and seasons concluding on a weekend (2010 & 2011) for the 5 year period prior to review of this Plan.

Note: Due to the requirement for each beach in the SMP to be meshed each weekend during the meshing season, nets may need to be set or retrieved prior to, or after the conclusion of, the meshing season in those seasons commencing or concluding on a weekend. This variation is required to ensure the nets are in place for the duration of the weekend period.

- (2) Where DECCW is of the opinion that the location and behaviour of an individual or group of individuals belonging to the family Balaenidae, Balaenopteridae or Dugongidae places it at risk of entanglement, DECCW may make a request to DI&I to delay or modify the setting of nets at specified beaches.
- (3) DI&I must consider any request made by DECCW under clause 19(2) and notify the public of any proposed delays or modifications prior to implementing any change. Public notification is to take the form of temporary signage at affected beaches for the duration of the delay or modification.

20. Beaches to which the SMP and this Plan applies

- (1) The SMP currently operates across 5 contract administrative regions from Stockton Beach (north of Newcastle) to South Wollongong Beach (Table 1). The operation of the SMP is limited to the beaches specified in Table 1.
- (2) The administrative regions in the SMP are:
- a) Newcastle
 - b) Central Coast
 - c) Sydney North
 - d) Sydney South
 - e) Illawarra
- (3) The number of administrative regions and their boundaries may change during the life of this Plan.

Table 1 – Administrative regions and beaches meshed in the SMP

Newcastle	Central Coast	Sydney North	Sydney South	Illawarra
1. Stockton	11. Lakes	22. Palm	37. Bondi	47. Coledale
2. Nobbys	12. Soldiers	23. Whale	38. Bronte	48. Austinmer
3. Newcastle	13. The Entrance	24. Avalon	39. Coogee	49. Thirroul
4. Bar	14. Shelly	25. Bilgola	40. Maroubra	50. North Wollongong
5. Dixon Park	15. Terrigal	26. Newport	41. Wanda	51. South Wollongong
6. Merewether	16. North Avoca	27. Mona Vale	42. Elouera	
7. Redhead	17. Avoca	28. Warriewood	43. North Cronulla	
8. Swansea-Blacksmiths	18. Copacabana	29. North Narrabeen	44. Cronulla	
9. Caves Beach	19. MacMasters	30. Narrabeen	45. Wattamolla	
10. Catherine Hill Bay	20. Killcare	31. Dee Why	46. Garie	
	21. Umina	32. Curl Curl		
		33. Harbord		
		34. Queenscliff		
		35. North Steyne		
		36. Manly		

21. Fishing gear specifications

- (1) Fishing gear used in the SMP must comply with specifications regulated by the *Fisheries Management (General) Regulation 2002* as summarised in Table 2.
- (2) Standardised mesh size of 60cm is to be used by all Contractors in the SMP.

Table 2 - Fishing gear specifications in the SMP

Gear/item	Specification
Floatline	150m of not less than 8mm diameter, synthetic rope with a breaking strain of not less than 900kg.
Leadline	150m of not less than 8mm diameter, synthetic rope with a breaking strain of not less than 900kg.
Floats	Gill net floats of not less than 10cm in diameter and 5cm thickness, or a float of equivalent buoyancy at not more than 5m apart.
Netting twine	Continuous synthetic filament with a breaking strain of not less than 60kg.
Mesh size ¹	Mesh size must be 60cm.
Mesh depth	So that the 'net height' is approximately 6m when set, nets with 60cm mesh size must not be less than 12 meshes deep
Hanging coefficient (floatline & leadline)	0.67 (33% slack hung) i.e. each 60m of net is hung into 40m of floatline or leadline.
Hanging coefficient (sidelines)	0.74 of the product of the mesh size and number of meshes deep of the net used.
Side rope length	5.33m (60cm mesh * 12 meshes deep)
Bridle	The bridle from each net to the anchors shall have sufficient slack to fish to its maximum depth.
Identification	Nets must be tagged at the surface with a minimum of 25cm diameter floats and clearly marked "Shark Net". The net must be identified by having securely attached, at or above water level, a tag with dimensions of at least 80mm by 25mm on which are legibly and durably displayed in capital letters the Contractor's name .

Note 1: Nets are to be measured in accordance with cl.53A of the NSW *Fisheries Management (General) Regulation 2002*.

22. Methods of use

- (1) For the purposes of this plan, the methods of deploying nets will be limited to 'hauling' and 'running' where:
 - a) 'Hauling' means a net deployed (shot from the vessel), set for at least the minimum required period (soak time) and then completely hauled back into the vessel.
 - b) 'Running' means a net deployed, set for at least the minimum required period then, and checked by lifting the headline progressively from the water sufficiently to ascertain if any sharks or non-target species are meshed, and then clearing the net and returning the net to the water in a continuous operation from end to end.
- (2) The position and method of setting nets, and the procedure in all matters affecting the efficiency of the meshing operations is subject to the direction of the Supervisor, who may also decide whether a meshing is counted as a meshing for the purposes of the SMP.

Note: The use of a net in the SMP is referred to as a 'meshing'.

23. Frequency of use

- (1) The frequency of use of nets in the SMP determines fishing effort and is subject to the following controls:
 - a) The number of meshings in respect of the beaches specified in the individual contract are calculated on the number of nets used [each being 150m in length].

- b) Only one net may be set at a time on any one beach unless otherwise authorised by this Plan.
- c) A meshing is considered completed after a net has been set continuously in the water for a minimum of 12 hours between 4pm on one day and sunrise the following day.
- d) Weather conditions permitting, set nets must be hauled, or run and cleared, after a period not exceeding 72 hours.
- e) Weather conditions permitting, set nets must be inspected by the Contractor within 72 hours of the previous inspection.
- f) During each inspection the Contractor must remove all catch and debris from the nets.
- g) Not more than 70% of the number of meshings specified for each beach can be completed in any half of a calendar month.
- h) At the completion of the allocated meshings for a month, all nets must be completely removed from the water until the commencement of the next month's operations.
- i) In addition to the number of specified weekday meshings, every weekend in the calendar month must have nets set as a minimum between sunrise on Saturday to sunset on Sunday, with nets hauled or run and cleared on Monday, weather permitting.

24. Vessels

(1) The following controls apply to vessels used in the SMP:

- a) Contractors are to nominate a vessel to be used in the SMP. The Contractor is required to use the nominated vessel in the performance of works under the contract unless the Contractor has obtained prior written notification to use a vessel other than the nominated vessel. A dinghy may be used as an ancillary to the main vessel to run the net.
- b) The nominated vessel must be in 'survey' in accordance with the requirements of NSW Maritime and must be maintained in a seaworthy condition at all times.
- c) The nominated vessel must be manned by sufficient crew to properly perform the contracted services and in abidance with maritime law.
- d) Sufficient equipment (as specified by maritime safety legislation) must be provided to cover all crew, including the observer and one other authorised person – whether on board the vessel or not, at all times.
- e) Nominated vessels must be capable of safely securing and transporting sharks or non-target species up to 3.5m in length.
- f) The following accommodation must be provided for the observer on the nominated vessel used in the provision of SMP services:
 - i) a fully enclosed marine type flushing toilet;
 - ii) a hand basin with connected running fresh water;
 - iii) adequate individual cabin seating with provision for writing;
 - iv) a suitably enclosed changing area.
- g) Nominated vessels must comply with the waste management and disposal protocols set out in clause 26 of this Plan.

Division 3 – Environmental protection provisions

25. Cleaning and maintenance

- (1) Nets must be kept in good condition and repair to the satisfaction of the SMP Supervisor.
- (2) The Contractor can be required to lay-out nets for inspection and measurement in a manner and at a place and time specified by the SMP Supervisor. These inspections may be required on up to three (3) separate occasions during the season of the SMP.
- (3) The waste management and disposal protocols established in clause 26(1) of this Plan must be complied with when disposing of waste arising from cleaning and maintenance operations.

Note: Nets are prone to fouling by marine organisms, seaweed, and anthropogenic marine debris. Nets are prone to damage from trawlers, storms and by entangled animals.

26. Waste management and disposal protocols

- (1) The following waste management and disposal protocols must be implemented by Contractors to minimise environmental and social impacts of the SMP:
 - a) No sharks, fish or other animal caught under the SMP (including skins, jaws, teeth, carcasses or any other portion thereof) are allowed to be dumped within 3 nautical miles of the NSW coastline unless otherwise authorised by this Plan. Any breach of this requirement is grounds for termination of a contract.
 - b) Carcasses disposed beyond 3 nautical miles of the NSW coastline must be weighted with an inert material sufficient to cause the carcass to sink to the bottom.
 - c) The management and disposal of waste matter derived from the meshing operations, including any encrusting organisms, marine algae and anthropogenic marine debris is the responsibility of the Contractor and must be disposed of in accordance with local waste management protocols defined by NSW Maritime or local government.
 - d) Contractor vessels must be fitted with toilets and waste holding tanks. Waste holding tanks are to be emptied at pump-out facilities wherever possible.

27. Non-target species by-catch reduction protocols

- (1) The following protocols apply to the setting of nets in the SMP to reduce interactions with non-target species:
 - a) Nets must not be set during the period from 1 May to 31 August each calendar year, subject to the provisions of clause 19(1)(c) of this Plan.
 - b) The setting of nets is subject to restrictions established under clause 19(2) of this Plan.
 - c) Nets must be set not more than 500m offshore (measured to the nearest land drying point), nor in water greater than 12m deep, and/or must be set at a position determined by the authorised DI&I representative as being appropriate for catching target species of sharks.
 - d) Nets must be deployed as a bottom-set net. No part of the net (other than that used for the purposes of marking the set gear) may be on the water surface.
 - e) Nets must be fitted with acoustic warning devices (pingers and whale alarms) during the meshing season. The Contractor must deploy active acoustic warning devices on the shark meshing nets as specified by contract arrangements and the SMP Supervisor.
 - f) Nets must be completely removed from the water at the completion of the allocated meshings for each month until the commencement of the next month's operations.

- g) Information resources regarding best-practice techniques for avoiding interactions with threatened and non-target species must be used by Contractors.
- h) Contractors must report any lost, damaged, stolen or over-set gear.

28. Release protocols

- (1) The following release protocols apply to maximise post-capture survival of non-target and certain target species:
 - a) Non-target species - All reasonable efforts must be made by the Contractor to safely and immediately release all non-target species (e.g. grey nurse shark) with least possible harm.
 - b) Target species - All living great white sharks must be immediately released provided it is safe to do so. For all other target species the Contractor must make a decision based on operator safety and the size and condition of the animal, as to whether it will be released.
 - c) Information resources prepared by DI&I and DECCW on species identification and release techniques (i.e. to maximise post-capture survival of non-target species) must be used by Contractors.
 - d) Contractors must disentangle, handle, treat and release any living marine mammal, marine bird or marine reptile in accordance with any relevant national or State guidelines where practical and safe to do so.
 - e) All live white sharks, and all marine reptiles must be tagged prior to release in accordance with approved training and safety controls.

29. Threatened and protected species arrangements

- (1) Contractors in the SMP must comply with the following measures for any Protected Fauna, Protected Fish, or Threatened Species that become entangled in the nets:
 - a) Contractors must immediately attempt to release any living Protected Fauna, Protected Fish, or Threatened Species that has been entangled in a net provided it is safe to attempt to do so.
 - b) Contractors must immediately advise the SMP Supervisor who will contact the Threatened Species Unit of DI&I and the Parks and Wildlife Group Regional Duty Officer of DECCW. Contractors must take a photographic image of any Threatened Species, Protected Fish or Protected Fauna taken in a net.
 - c) Contractors must disentangle, handle, treat and release any living marine mammal, marine bird or marine reptile in accordance with any relevant national or State guidelines where practical and safe to do so.
 - d) Contractors must retain all carcasses of dead white sharks and grey nurse sharks and deliver them to a local place nominated by the DI&I Shark Biologist or SMP Supervisor.
 - e) Contractors must record and report all Threatened Species and Protected Fauna and Protected Fish entanglements.

30. Contractor reporting requirements

- (1) Contractors must comply with the following reporting requirements:
 - a) Any Threatened Species entangled in a net is to be immediately reported to DI&I and Regional Duty Officer of DECCW (after taking any immediate action to minimise further harm).

- b) All sharks taken in the SMP must be reported to the DI&I Shark Biologist or SMP Supervisor within 24 hours. Information to be reported includes date and beach of capture, species, sex and approximate length. A photographic image must also be provided.
- c) The use of any additional technology or carrier devices that are implemented as part of this Plan.
- d) Contractors must submit catch data forms to the DI&I SMP Supervisor.

31. Landing arrangements

- (1) The following controls apply to the landing of target and non-target species taken in the SMP:
 - a) Sharks, fish or other animals caught under the SMP (including skins, jaws, teeth, carcasses or any other portion thereof) are not allowed to be landed anywhere in New South Wales unless otherwise authorised by this Plan.
 - b) The Contractor must retain and land all carcasses of dead white sharks and grey nurse sharks and deliver them to a local place nominated by the DI&I Shark Biologist or SMP Supervisor.
 - c) Contractors must remove and land any biological samples from captured animals as required by DI&I and deliver them to a local DI&I office or other place nominated by the DI&I Shark Biologist or SMP Supervisor.
 - d) Contractors must collect and land tissue samples as specified by DI&I or DECCW from dead or entangled marine mammals, marine birds and marine reptiles.

PART 4 OBSERVER PROGRAM

32. Purpose

- (1) The purpose of the Observer Program is to qualify the delivery of the services under contract and to quantify certain aspects of the activity including:
 - a) Contractor compliance with contract conditions⁺,
 - b) Certifying that the observed meshings meet contract requirements,
 - c) Data and sample collection,
 - d) Detailing catch of target and non-target species.

***Note: Other measures to optimise compliance with this Plan are incorporated in clause 37 Compliance Plan.**

33. Provision of observer

- (1) DI&I will provide an accredited observer under delegated authority from the Director-General of DI&I for each SMP region.
- (2) The observer must be on board the nominated vessel or dinghy used to haul or run the nets during the allocated period.

34. Allocated hours for observer

- (1) Each observer shall have a number of allocated hours per week. The number of allocated hours may vary between regions and over time subject to available resources.
- (2) Approved allocated hours for each region at the time of preparing this Plan were:
 - a) Newcastle contract: 14 hours per week
 - b) Central coast contract: 18 hours per week
 - c) Sydney north contract: 18 hours per week
 - d) Sydney south contract: 35 hours per week
 - e) Illawarra contract: 10 hours per week

Note: Approved allocated hours are subject to available funding. This may change over the operational life of this Plan.

35. Duties of observer

- (1) The duties of the observer include:
 - a) Observing the work involved in the setting, hauling or running of nets to ensure it is undertaken in accordance with all terms and conditions of the contract and this Plan,
 - b) Coordinating and performing the physical collection of biological samples for DNA analysis (or other projects),
 - c) Identifying shark species taken in net catches (cross-referencing with ID manual),
 - d) Maintaining a written logbook and photographic image record of all animals that are caught in the nets while observers are present,
 - e) Recording stomach contents of sharks, removal of shark heads and taking samples of shark vertebrae,
 - f) Liaising with the DI&I Shark Biologist regarding collection of fins and other samples,
 - g) Organising for the collection of sampled material for delivery to relevant end-point,

- h) Observing and verifying (by initialling the Contractor's log book) the meshings observed each day against those recorded by the Contractor,
- i) Signing the monthly logbook to certify accuracy of the observed meshings, and
- j) Keeping a record of acoustic warning devices (pingers and whale alarms) – identifying the number of devices which are operational/not-functioning, and date of battery replacement (including battery type), and provide that advice to the DI&I Shark Biologist.

36. Notification and determination of departure times

- (1) Contractors are to provide at least 24 hours notice to the observer of the proposed departure of the nominated vessel to undertake setting, hauling or running activities. The time of departure is to be determined by agreement between the Contractor and the observer.

PART 5 COMPLIANCE PLAN

37. Compliance Plan

- (1) A Compliance Plan will be developed by 30 April 2010.
- (2) The Compliance Plan is to establish a strategic approach to optimising compliance; including covert surveillance, 'spot checks' and audits to create an effective deterrent to non-compliant activity.
- (3) The Compliance Plan is to be developed using fisheries compliance operations methodology for optimising compliance by maximising voluntary compliance while creating effective deterrence to achieve the optimal level of compliance.

38. Audit and compliance checks

- (1) Audits and compliance checks of Contractor's operations may be conducted by authorised officers of DI&I at any time during the term of the contract.
- (2) DI&I may require from the Contractor any information with regard to ongoing compliance with statutory and contractual obligations.
- (3) Contractors must permit inspection of the Contractor's (or sub-Contractor's) premises, facilities and documents including, but not limited to operations manuals, procedure statements, correspondence and other relevant administrative records.

PART 6 STRATEGIC RESEARCH AND MONITORING PROGRAM

39. Purpose

- (1) The purpose of the Strategic Research and Monitoring Program is to provide information that will lead to continuous improvement in the operation of the SMP and in achieving the objectives of this Plan.

40. Program components

- (1) Research components of the program are described in Table 3, including:
 - a) Research topic,
 - b) Order of research components,
 - c) Description of the research project and expected outcomes, and
 - d) Identification of the lead agency.
- (2) Monitoring components of the program are described in Table 4, including:
 - a) Monitoring parameter,
 - b) Frequency of monitoring,
 - c) Description,
 - d) Data management, and
 - e) Review and reporting processes.

41. Reporting research and monitoring results

- (1) Outcomes and recommendations of the Strategic Research and Monitoring Program will be reported in annual performance reports prepared in accordance with Part 7 of this Plan. Table 4 identifies those parts of the monitoring component of the program that will be reported in the annual performance reports.
- (2) Recommendations of the annual performance report form the basis for amendments to this Plan in accordance with clause 50.
- (3) Research results may also be periodically reported and published in scientific journals.

42. Priorities and timeframes

- (1) Table 3 of this plan categorises research priorities into levels relevant to the risks identified through the environmental assessment process (refer to Clause 8) and provides information necessary to support the objectives of this Plan as follows:
 - a) Level 1 (Planning): Within first 12 months of commencement of this Plan.
 - i) Develop SMP research plan and identify budgetary requirements and funding sources.
 - b) Level 2 (Actions): Immediate and ongoing.
 - i) Research associated with ongoing actions undertaken to implement this Plan.
 - c) Level 3 (Applied research): As required to meet the objectives of this Plan.
 - i) Research requirements identified from the environmental assessment process to mitigate adverse impacts of the SMP.

43. Funding sources

- (1) The implementation of the programs within the SMP, including research and monitoring will need support by appropriate funding arrangements. The range of funding sources that exist and can be potentially accessed include NSW State Government funding, federally funded grant programs, and/or funding through Commonwealth agencies.
- (2) Similar research will be undertaken in adjoining states, particularly Queensland where the largest Australian shark control program is conducted, and internationally. Opportunities to conduct joint research programs with other partner agencies (including those conducting shark-related research) and to apply research results from other states will be actively pursued in order to utilise the funding available in NSW in the most cost-effective manner.

Table 3 - Research topics and components

1. Identify information gaps and research needs				
Research topic	Priority	Order of research components	Description of research project and expected outcomes	Lead agency
1. Review and report on research and information needs, funding requirements and possible sources of funding.	Level 1	<ol style="list-style-type: none"> 1. Categorise information gaps and research needs. 2. Identify research priorities, funding requirements and possible sources of funding. 3. Prepare a report 'SMP Research Resources and Strategic Direction' within the first 12 months of the operation of this Plan. 	<p>Addresses a number of ecological risks of the current shark meshing program as identified in the environmental assessment (EA) by:</p> <ul style="list-style-type: none"> • Identification and prioritisation of data gaps for the activity and its environmental impact, how these gaps will be filled and over what timeframe. • Establishing a proposed research budget and identifying possible future sources of future funding. • Setting a strategic research 'vision' that anticipates and identifies future financial resource implications of managing the SMP. • Identifies the future hardware and techniques that might be deployed e.g. use of Geographic Information System (GIS) techniques, acoustic telemetry studies, or satellite tagging etc. • Providing support for reviews of this Strategic Research and Monitoring Program and this Plan. 	<p>DI&I.</p> <p>Potential partners:</p> <p>QDPI&F, ARC, CSIRO Marine Research, Natal Sharks Board (South Africa) and any other relevant agencies or universities.</p>

Table 3 cont.

2. Data collection and review of existing data				
Research topic	Priority	Order of research components	Description of research project and expected outcomes	Lead agency
2.1 Review and refine data collection methods	Level 2	<ol style="list-style-type: none"> 1. Review data collection methods used in the SMP. 2. Develop refined catch data forms and identification resources. 3. Identify associated training programs for observers and Contractors. 	<p>Data collection methods include the use of catch reporting forms, observer observations, Contractor weekly/monthly returns and sampling (e.g. tissue and DNA).</p> <p>These data sources will be reviewed and refined to optimise data and sample collection opportunities.</p>	<p>DI&I.</p> <p>Potential partners: DECCW, QDPI&F and Natal Sharks Board.</p>
2.2 Review genetic samples to compare with reported species identification	Level 2	<ol style="list-style-type: none"> 1. Review shark genetic samples held by DI&I and cross-reference with reported species identification. 2. Identify associated training programs/resources for observers and Contractors. 	<p>To establish how accurate current records are and if there are any major indicators showing where better resources and training/sampling protocols should occur.</p> <p>Delineates the two main sources of identification of species – routine (phenotypic analysis) and genetic (DNA analysis) – and guides the development of identification resources and training protocols.</p>	<p>DI&I in conjunction with suitable genetics laboratories.</p>
2.3 Review data on temporal and spatial factors affecting the operation of the SMP	Level 2	<ol style="list-style-type: none"> 1. Review research being conducted by CSIRO Marine Research on white shark movements. 2. Review existing data on other species (e.g. tiger shark, bull shark). 3. Review existing data on spatial and temporal movements of non-target species. 	<p>Research can provide evidence for site fidelity, temporary residency and common pathways used by sharks and how this may be used to identify high-risk periods and hot spots (e.g. coastal migrations of white sharks in Australian waters).</p> <p>Research can provide spatial and temporal movements of non-target species (such as cetaceans and other marine mammals, marine reptiles and other species) to guide research needs and minimise interactions with non-target species through modifications to the SMP.</p>	<p>DI&I.</p> <p>Potential partners: CSIRO Marine Research, ARC & DECCW.</p>
2.4 Review data on shark interactions and beach usage	Level 2	<ol style="list-style-type: none"> 1. Access/review data collection by various organisations. 2. Review data on beach usage rates and future usage predictions. 3. Develop better links between agencies and develop systems to optimise collection and use data. 	<p>Various groups are currently collecting data on interactions with sharks and on beach use on an ad-hoc basis (e.g. Surf Life Saving organisations; Coastguard, Police, Taronga Zoo etc.).</p> <p>There needs to be better coordination of this information for use in shark-control risk assessments and to guide modifications to SMP. An example may be to develop a web-based reporting and data retrieval system accessible by all agencies.</p>	<p>DI&I.</p> <p>Potential partners: Surf Life Saving Organisations, Coastguard, NSW Police Force, Taronga Zoo - Australian Shark Attack File.</p>

Table 3 cont.

2. Data collection and review of existing data (cont.)				
Research topic	Priority	Order of research components	Description of research project and expected outcomes	Lead agency
2.5 Review effectiveness of fishing operations used in shark control programs.	Level 2	<ol style="list-style-type: none"> 1. Review NSW shark meshing net configurations. 2. Review the application of other shark control measures for use in NSW (e.g. drum lines). 3. Use outcomes to trial gear-related modifications of the SMP. 	<p>To develop the optimal application of fishing gear technology used in the SMP (giving regard to potential impacts on Threatened Species and non-target species and the variations of conditions experienced in NSW when compared to other programs).</p> <p>Progressively implement improvements in gear selectivity, where proven effective, and incorporate into future modifications in the SMP.</p> <p>Investigate and trial suspended nets (i.e. set ~1m off the bottom) to assess their ability to:</p> <ul style="list-style-type: none"> • further reduce the by-catch of non-target sharks and rays, • maintain the very low catch rate of marine mammals, and • reduce the incidences of interactions between bathers and target sharks. <p>Note: The use of baits and lures to attract sharks is currently not permitted by the terms of SMP contracts.</p>	<p>DI&I.</p> <p>Potential partners: QDPI&F & other agencies with expertise in shark control programs nationally and internationally.</p>
2.6 Develop methodologies for standardising fishing effort and analysing comparative CPUE data	Level 2	<ol style="list-style-type: none"> 1. Investigate the feasibility of standardising soak-times for shark nets. 2. Develop alternative approaches to standardised soak-times. 	<p>Accurate CPUE data is a keystone to gathering reliable information on the program through data arising from fishing effort, catches and gear selectivity over the history of the shark meshing program in NSW. Differences in setting regimes, locations fished, and gear specifications means that historic CPUE data are not comparable between the different Contractors, locations and timelines.</p> <p>Without linear and consistent data information it is difficult to determine with any certainty the effectiveness or impacts of the program. For example, it is already very difficult to compare the current data with the data from the 1970s because extra beaches have been added to the design. By using different methods at each of the current regions, the problem is further exacerbated.</p> <p>Due to factors outside the control of the Contractors (e.g. weather, sea conditions etc) and the difficulty and cost of standardising fishing gear and soak-times, accurate CPUE data may prove to be unachievable, in which case alternative measures must be developed to make reliable comparative analyses.</p>	<p>DI&I.</p>

Table 3 cont.

3. Establish/support collaborative research (e.g. CSIRO, other government agencies and Universities)				
Research topic	Priority	Order of research components	Short description of research project and expected outcomes	Lead agency
3.1 Research needs identified (e.g. environmental impacts of shark meshing).	Level 3	1. Distribution, abundance, biology and ecology of target species affected by the SMP. 2. Distribution, abundance, biology and ecology of non-target species affected by the SMP.	Research to guide modifications to the program to optimise the achievement of objectives of this Plan and the JMA related to minimising environmental impacts of the SMP.	DI&I. Potential partners: CSIRO Marine Research, ARC, DECCW, research institutions and Universities.
3.2 Establish DNA library of shark species taken in the SMP to improve accuracy of identification.	Level 3	1. Conduct collaborative research with relevant research institutions. 2. Develop SMP DNA library.	These analyses can provide significant information on the biology of sharks, including the degree of genetic structuring in a population, while inferences can be made from the data with respect to the residency of shark populations. Macquarie University are currently well-equipped for species identification using DNA analyses.	DI&I in conjunction with relevant research institutions.
3.3 Conduct scientifically-based shark attack risk assessment	Level 3	1. Compile data from research relating to identified high-risk elements. 2. Apply standard risk assessment model (i.e. AS/NZ: 4360).	Uses a recognised standard of risk assessment to apply current information (e.g. spatial, temporal, biological, oceanographic, shark behaviour, prey movements, beach usage and historic captures etc.) to form a predictive, scientifically rigorous risk assessment from which better application of bather safety measures can be developed.	DI&I. Potential partners: QDPI&F and other agencies with expertise in shark control programs nationally and internationally.
3.4 Conduct morphometrics on sharks and other species caught in the SMP.	Level 3	1. Identify need for morphometrics in meeting the needs of the SMP. 2. Include in research priorities document (1.1) if considered appropriate.	Morphometrics (biological shape analysis e.g. length/distance between physical features, shape, size, colour etc.) could support a number of identification resources and objectives of this Plan. Morphometrics may be used in future in image analysis software to identify sharks from digital photography. The data can also help: <ul style="list-style-type: none"> Identify sharks responsible for attacks Determine length/age estimates from samples (e.g. teeth). Predict how long it may be until a released target species (e.g. small white shark) may become a threat. Identify species in an advanced state of decomposition. 	By DI&I or research institutes as part of any research project where this data is required.

Table 4 – SMP Monitoring Program

Monitoring program				
Monitoring parameter	Frequency	Description	Data management	Review & reporting process
1. Shark Meshing Contractor Catch Report.	Weekly.	<p>Details all catches of target and non-target species taken in nets by each Contractor as submitted by the Contractor and authorised by the observer. Provides weekly data of: date, beach, species, sex, fork length, life status, ultrasonic, stomach contents, sample taken, number or pups, photo taken, wind direction/speed, water temp.</p> <p>Also includes data for marine mammals, reptiles and birds captured in nets and whether DI&I and DECCW were notified and disposal details of carcass/samples.</p>	DI&I collects and collates into monthly summary report and enters into database of target and non-target species.	<p>Reviewed by DI&I SMP Shark Biologist weekly.</p> <p>Reported through DI&I monthly Catch Summary Report.</p>
2. Shark Meshing DI&I Catch Summary Report.	Monthly from DI&I.	<p>Details all catches taken in nets by Contractors over each month of the season. Includes catch data for sharks, teleosts, marine mammals, reptiles and birds to help determine the mortality and species composition of target and non-target species catch and any increases in interactions with the SMP.</p>	<p>DI&I collates and sends to DECCW, FSC and SC.</p> <p>Supports alignment with TS recovery plans.</p> <p>Details of catches in SMP are made public.</p>	<p>Reviewed by DI&I Shark Biologist monthly.</p> <p>Reviewed by DECCW monthly.</p> <p>Reported through Annual Performance Report.</p>
3. Tagging program.	All captured live white sharks and marine turtles must be tagged and released by Contractors with tags supplied by DI&I & DECCW.	<p>Tagging of all live white sharks and marine turtles will provide vital data on recaptures and general biology, spatial and temporal movements. These data also supports Threatened Species recovery plans.</p>	Tagging data are entered into new field in SMP database.	<p>Reviewed by DI&I Shark Biologist monthly and as part of wider research projects relating to the SMP. Recaptures of tagged turtles to be reported to DECCW.</p> <p>Reported through Annual Performance Report.</p>
4. Routine DNA sampling and verification.	All dead animals sampled when captured by Contractors.	<p>Routine DNA sampling of all dead animals and certain species of live sharks will provide accurate identification and other information arising from genetic sampling (biology, distribution, movements etc) and will support research projects undertaken by DI&I or collaborative research.</p> <p>Will form base for DNA library of shark species taken in SMP.</p>	Genetic sampling material is sent for analysis for positive identification. Other capture details are also made available for further analysis by partner research agencies.	Reviewed by DI&I Shark Biologist monthly and reported in the Annual Performance Report and as part of wider research projects relating to the SMP.

Table 4 cont.

Monitoring program				
Monitoring parameter	Frequency	Description	Data management	Review & reporting process
5. Shark vertebral and other tissue samples	All dead sharks sampled when captured by Contractors.	<p>Sampling of vertebrae and tissues from dead sharks captured in the SMP provides data for age/growth analysis.</p> <p>Jaw collection from dead sharks will continue to support information and education opportunities.</p> <p>Photography will also be conducted of each specimen (all species) taken in the SMP.</p>	<p>Data are recorded and entered into database.</p> <p>Jaws kept at CFC.</p> <p>Photographs catalogued and held at CFC in image collection and made available to relevant agencies for information and analysis.</p>	Reviewed by DI&I Shark Biologist monthly and reported as part of wider research projects relating to the SMP.
6. Monitoring of all shark attacks.	As reported in NSW or monthly and sourced from relevant agencies.	<p>The Shark Report Log is used by SLSNSW to document shark attacks and sightings on NSW beaches. The log records all relevant details pertaining to each attack or incident (e.g. shark description and behaviour, weather, victims' details and injuries etc).</p> <p>Other agencies document shark attack details and these are generally submitted to the Australian Shark Attack File held by Taronga Zoo.</p>	<p>Data are submitted to Australian Shark Attack File.</p> <p>DI&I accesses Shark Report Log data and Australian Shark Attack File updates.</p>	<p>Reviewed by DI&I Shark Biologist monthly or on first becoming available.</p> <p>Attacks on SMP beaches reported through Annual Performance Report.</p>
7. Monitor technological advances in shark control measures.	As developed and sourced from relevant agencies.	Technological advances in shark control measures may emanate from agencies conducting shark control measures (e.g. QDPI&F, Natal Sharks Board and others). Reviewing reports on advancements, seminars and other opportunities to acquire information forms part of the role of the DI&I Shark Biologist.	Data are considered for application to SMP taking into account NSW conditions, likelihood of improving SMP and potential affects on Threatened Species.	<p>Reviewed by DI&I Shark Biologist monthly or on first becoming available.</p> <p>Reported through Annual Performance Report.</p>
8. Patterns of movements of non-target marine animals.	As developed and sourced from relevant agencies.	Understanding of the movements and biology of these species increases, better management of the SMP may be possible to mitigate adverse impacts.	Data are acquired from DECCW and relevant agencies by DI&I and are assessed during review of the SMP and considered when any modification of the program is required.	Data reviewed by DI&I and DECCW with recommendations for consideration in SMP modification, if necessary.

Table 4 cont.

Monitoring program				
Monitoring parameter	Frequency	Description	Data management	Review & reporting process
9. Population trends and patterns of movements of dangerous sharks and attack behaviour.	As developed and sourced from relevant agencies.	Data on trends of species of dangerous sharks provides obvious benefits for the SMP in relation to bather protection. These data can be used to help develop an 'encounter risk' in certain predictable areas and times. This may have ramifications for reducing unwanted interactions with dangerous sharks including minimising catch of non-target species and shark attack by identifying temporary hotspots and periods of higher than usual encounter risk.	Data are produced by DI&I and other agencies as part of collaborative research programs or other national and international research. DI&I assesses data during review of the SMP and considers when any modification of the program is required.	Reviewed by DI&I Shark Biologist monthly or on first becoming available. Reported through Annual Performance Report.
10. Patterns of recreational water contact activities in marine waters.	As developed and sourced from relevant agencies.	Data on trends and patterns of water contact activities may provide insight into existing and future risk areas for bather protection.	Data are produced by organisations such as SLSA and in government reports (e.g. SOE Report). DI&I assesses data during review of the SMP and considers when any modification of the program is required.	Reviewed by DI&I as part of the annual review of the SMP. Reported through Annual Performance Report.
11. Threatened Species recovery plan reviews.	Within 6 months of any report by relevant agency.	Threatened Species recovery plans are subject to periodic review to gauge the success of plans in achieving their objectives (e.g. recovery of secure wild populations) and may identify new or emerging threats to the species in question. An increase in the population of marine mammals and reptiles could result in an increased rate of interaction in the SMP. Any ongoing or new monitoring of interactions between shark meshing and marine mammals and reptiles will need to be cognisant of such changes as they relate to estimates of population size and distribution.	Data are acquired from DECCW and relevant agencies by DI&I and are assessed during review of the SMP and considered when any modification of the program is required. Data on annual level of Threatened Species by-catch in shark control activities are supplied to the Commonwealth Department of Environment, Water, Heritage and the Arts and recovery teams. Details of Threatened Species captured in SMP are made public.	Reviewed by DI&I as part of the annual review of the SMP. Reported through Annual Performance Report.

Table 4 cont.

Monitoring Program				
Monitoring parameter	Frequency	Description	Data management	Review & reporting process
12. Contractor compliance.	Annually or when major non-compliance is detected. Sourced from DI&I (Fisheries Compliance).	Compliance operations are undertaken periodically through on-the-spot audits and covert operations. Quality inspection forms are used to help deliver consistent compliance rate reports. Compliance is matched against trigger points/performance monitoring (e.g. compliance with contract provisions falls below 80%).	An annual Compliance Report provides data on compliance by the Contractors with contract requirements and this Plan.	Reviewed by DI&I as part of the annual review of the SMP. Reported through Annual Performance Report.
13. Monitor net locations by GPS.	Annually	Using hand-held GPS units observers will be able to accurately identify the exact setting locations of nets within the area of operation.	The exact location of shark meshing nets using GPS technology helps provide information in a spatial format that can be overlaid on other data sets to anticipate interactions with non-target species and improve reporting.	Reviewed by DI&I as part of the annual review of the SMP. Reported through Annual Performance Report.
14. Shark Meshing Program Annual Performance Evaluation	Annually by DI&I.	The goals and objectives of the JMA are critically reviewed annually against performance criteria and relevant trigger points set out in the Management Plan (including this Monitoring and Research Plan).	An assessment of the performance of the Management Plan is prepared by DI&I. Recommendations for modifications to the program are provided.	Submitted to the Directors-General of DI&I and DECCW by 31 July annually.
Glossary of agencies and institutions (Tables 3 & 4)				
ARC: Australian Research Council CFC: Cronulla Fisheries Centre CSIRO: Commonwealth Scientific and Research Organisation -Marine Research DECCW: Department of Environment, Climate Change and Water FSC: Fisheries Scientific Committee			QDPI&F: Queensland Department of Primary Industries and Fisheries SC: Scientific Committee SLSA: Surf Life Saving Australia SLSNSW: Surf Life Saving NSW SOE: State of the Environment Report	

PART 7 PERFORMANCE ASSESSMENT AND REPORTING

44. Purpose

- (1) The purpose of the performance assessment and reporting framework is to assess the performance of this Plan in achieving its objectives, and to communicate the results transparently.
- (2) Performance in achieving the objectives is to be determined against the performance indicators established in clause 11. Performance reporting is to be communicated by:
 - a) Annual performance assessment reports, and
 - b) Review reports.

45. Performance indicators

- (1) Performance indicators will be used to provide a tangible indication of whether the objectives of this Plan are being attained. The Strategic Research and Monitoring Program will gather information to allow the measurement of performance indicators.
- (2) The performance indicators and trigger points are detailed in Table 5.

46. Trigger points

- (1) The trigger points specify the point when a performance indicator has reached a level that suggests a potential problem with the activity that threatens the achievement of the management objectives.
- (2) Activation of a trigger point will initiate a formal review response. The review is to determine the suspected reasons for the tripping of the trigger point and whether any action is required.

47. Annual performance reports

- (1) An annual performance report is to be prepared by DI&I. The report is to:
 - a) Document progress in achieving management objectives by:
 - i) Reporting on progress in implementing the measures contained in this Plan.
 - ii) Assessing and reporting on each performance indicator,
 - iii) Identifying any trigger points that have been tripped,
 - iv) Identifying any overdue actions,
 - b) Document outcomes of:
 - i) The Compliance Plan,
 - ii) The Strategic Research and Monitoring Program, and
 - iii) The Observer Program.
 - c) Recommend any amendments to this Plan that may be required as a result of the performance of the SMP for the meshing year including:
 - i) The nature of the proposed change,
 - ii) The reason why the proposed change is required, and
 - iii) The effect of making the proposed change.

- (2) The annual performance report is the formal mechanism to identify tripped trigger points and overdue management actions that will be subject to formal review procedures and a review report. Remedial measures to address these issues will be recommended to the Directors-General of DI&I and DECCW through the review report.
- (3) The annual performance report will be submitted to the Parties to the Agreements, the Fisheries Scientific Committee and the Scientific Committee prior to 31 July each year.
- (4) The annual performance report is a public document. The performance report may be used by the Fisheries Scientific Committee and Scientific Committee to inform their annual review of the JMA and in formulating their advice of any deficiencies in the implementation of the JMA.
- (5) The SMP will be regarded as being managed within the terms of the Management Plan whilst any remedial measures associated with any unmet timeframes or triggered performance indicators are being considered through formal review processes.

48. Review reports

- (1) A review report must be prepared by DI&I if the annual performance report identifies that a trigger point has been tripped or target timeframes for the implementation of management actions have not been met.
- (2) A review is to be conducted and include consultation between DI&I and DECCW. In some circumstances the trip may be related to a performance indicator that affects broader natural resource management issues and will require consultation with other stakeholders.
- (3) The review report must investigate and identify the cause of the problem and make recommendations for remedial action. Specifically the review report must:
 - a) Identify what, if any, remedial actions or changes are required to adjust or return the performance indicator to an acceptable range within a specified timeframe, including any contingency or interim measures, or alternatively,
 - b) Identify what, if any, changes are required to the provisions of this Plan should the review recommend that they are otherwise inappropriate.
- (4) In respect of any proposed amendment to this Plan, the review report must identify:
 - a) The nature of the proposed change,
 - b) The reason why the proposed change is required, and
 - c) The effect of making the proposed change.
- (5) The review report is to be provided to the Parties to the Agreements, the Fisheries Scientific Committee and the Scientific Committee. The Parties to the Agreements must endorse the recommendations of the review report prior to their implementation.
- (6) Review reports are to be made publicly available.

Table 5 Performance indicators and trigger points

Objective	Performance Indicator	Trigger Point	Data Requirements and Availability
Reduce the risk to humans from shark attack at beaches subject to the SMP.	Change in the number of human fatalities and serious injuries from shark attack.	1 fatality or serious injury per meshing season on a meshed beach.	Shark Report Log (SLSNSW). Australian Shark Attack File (Taronga Zoo).
Minimise the impact on non-target species and to ensure that the SMP does not jeopardise the survival or conservation status of threatened species, populations and ecological communities, or cause species that are not threatened to become threatened.	Change in the number of entanglements with non-target species and threatened species, populations and ecological communities in the SMP.	Entanglements of non-target species and Threatened Species over 2 consecutive meshing seasons exceed twice the annual average catch of the preceding 10 years for those species.	Shark meshing Contractor catch reports. DI&I monthly catch summary reports. Annual performance report.
Minimise occupational health and safety risks associated with the SMP.	Changes in the number of major and minor incidents reported by Contractors or observers.	1 major or minor incident.	Contractor's monthly OHS performance report. OHS report incident notifications to WorkCover.
Ensure that monitoring and reporting on the SMP is undertaken in a transparent manner.	Extent to which the public reporting requirements are met.	Annual performance report submitted to the Parties to the Agreements prior to 31 July each year.	As established by Part 7 of this Plan.

PART 8 AMENDMENT AND REVIEW OF THIS PLAN

49. Review of this Plan

- (1) This operation of this Plan is to be reviewed:
 - a) Annually by performance assessment reports,
 - b) Periodically by review reports,
 - c) Following any review or amendment of the JMA that authorises the activity, and
 - d) At the end of the meshing season 5 years from the date of commencement of the JMA.

50. Circumstances in which this Plan may be amended

- (1) This Plan may be amended in response to any of the following circumstances:
 - a) A request from any of the Parties to the Agreements,
 - b) A recommendation of an annual performance report,
 - c) A recommendation of a review report,
 - d) A recommendation of the Fisheries Scientific Committee or Scientific Committee following an annual review of the performance of the Parties to the Agreements,
 - e) Following the review of a relevant recovery or threat abatement plan,
 - f) Following listing of a new threatened species, population or ecological community that may be detrimentally affected by the operation of the SMP.

51. Process to amend this Plan

- (1) Amendments to this Plan may only be made after all Parties to the Agreements have been notified of the proposed amendment. Notification is to include:
 - a) The nature of the proposed change,
 - b) The reason why the proposed change is required, and
 - c) The effect of making the proposed change.
- (2) For the purposes of amendments arising from recommendations of an annual performance report or review report, the notification requirements are deemed to have been met provided clauses 47(1)(c) and 48(4) have been complied with.
- (3) Proposed amendments are to be referred to the Scientific Committee and Fisheries Scientific Committee for comment and advice.
- (4) Following notification of proposed amendments, the concurrence of all Parties to the Agreements is required prior to the amendment taking effect (other than amendments under clause 52).
- (5) If any amendment to this Plan requires a variation to the Contracts between the Principal and third party service providers DI&I will use its best endeavours to obtain the consent of the Contractors and to implement the variations to the Contracts.
- (6) If a Contract is not varied as required to reflect the amendments to this Plan, any shark meshing operations conducted in accordance with the terms of that Contract and during the term of that Contract are considered to be conducted in accordance with this Plan for the purposes of the JMA and this Plan.

52. Special circumstances

- (1) Notwithstanding clauses 50 and 51 of this Plan, DI&I may amend aspects of this Plan that do not result in increases to the total effort of meshing operations, at any time.
- (2) DI&I is to notify DECCW and the Minister for Primary Industries prior to any such amendments being made. Notification is to include:
 - a) The nature of the proposed change,
 - b) The reason why the proposed change is required, and
 - c) The effect of making the proposed change.
- (3) Notification details listed in clause 52(2) are to be included in the next annual performance report.

Note: Periodic emergency or administrative amendments may be required during the life of this Plan. Examples include emergency response to shark attacks, or administrative changes to contract conditions not directly resulting in changes to the total effort of meshing operations.

53. Effect of an amendment to this Plan on the JMA

- (1) For the avoidance of doubt, any amendment to this Plan does not affect the operation or validity of the JMA.

PART 9 TRANSITIONAL PROVISIONS

54. Operation of existing contracts

- (1) Existing Contracts pursuant to the tender (0700208) *Provision of Shark Meshing Services between Newcastle and Wollongong Areas for Department of Industry and Investment* operate for the period 1 September 2007 to 30 April 2009 with the option for DI&I to extend each Contract by 3 x 1 year periods, concluding on 30 April 2012.
- (2) Implementation of this Plan will require a variation to the terms of existing Contracts. DI&I will use its best endeavours to obtain the consent of the Contractors and to implement the variations to the Contracts.
- (3) Where an existing Contract is not varied to reflect this Plan any shark meshing operations conducted in accordance with the terms of that existing Contract during the term of that Contract are considered to be conducted in accordance with this Plan for the purposes of the JMA and this Plan.

PART 10 REFERENCES

Green M., Ganassin C., and Reid D. 2009. *Report into the NSW Shark Meshing (Bather Protection) Program*. DPI, Orange.