



Review of **MarinePestPlan** 2018-2023

Version 1, March 2025



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Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment, and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

Acknowledgements

This report has been developed based on the contributions of industry and government stakeholders to the review of MarinePestPlan 2018-2023. The report has been endorsed by the Marine Pest Sectoral Committee.

Summary

[MarinePestPlan 2018-2023](#) was Australia's first national strategic plan for marine pest biosecurity. It aimed to improve Australia's management of marine pest biosecurity over five years. It was comprised of 29 activities across five objectives focusing on vector management, surveillance, preparedness and response, research and development, and stakeholder engagement.

The Plan was collaboratively developed and implemented by governments, marine industries, research organisations, and non-government organisations (NGOs) under the oversight of the Marine Pest Sectoral Committee. The implementation period of MarinePestPlan 2018-2023 ended on 30 June 2023, and a formal review of the Plan was undertaken.

This report presents the results of the MarinePestPlan 2018-2023 review. The review identifies the strengths, weaknesses, and opportunities for improvement across the full life cycle of MarinePestPlan 2018-2023 including development, implementation, outcomes, and considerations for future national strategic planning. The review presents information and perspectives gathered through a desktop review and targeted survey of marine pest biosecurity stakeholders involved with the plan's development and implementation.

The review found that MarinePestPlan 2018-2023 was successful in improving Australia's marine pest biosecurity system. Progress was made in all five objectives of the Plan (see [Section 5](#)), providing significant benefit across the biosecurity continuum. During the five-year implementation period, 24 of the 29 activities were completed, three were partially completed, and two did not commence (see [Appendix A](#) for details).

The Australian Government invested over \$3.5 million of direct funding to the implementation of MarinePestPlan 2018-2023. Industry, NGOs, research, and government representatives provided considerable in-kind investment, to deliver the outcomes of the Plan (see [Section 4.3](#)).

Stakeholder feedback identified priorities and opportunities for improving marine pest management in the future (see [Section 6](#) and [Section 7](#)). Stakeholders agreed that there is an ongoing need for national coordination of marine pest biosecurity, and that a successor MarinePestPlan should be developed to guide prioritisation of activities and set ambitious goals for improved management of marine pests.

Greater engagement and investment from all marine pest biosecurity stakeholders, especially non-government sectors, along with improved communication were common themes that could be considered in the development and implementation of a successor plan. Collaboratively developing and clearly articulating common goals in a successor plan would encourage more stakeholders to take on leadership in the implementation of the Plan and contribute to improved outcomes and return on investment.

[Section 7](#) along with the key findings throughout this report provide a guide to the development, implementation, and extension activities of the next MarinePestPlan.

Contents

Review of MarinePestPlan 2018-2023	i
Summary	iii
1 Introduction	6
2 The review process	7
2.1 Review aims	7
2.2 Review methodology	7
2.3 Survey participants	8
2.4 Privacy and confidentiality	8
3 Development of MarinePestPlan 2018-2023	10
3.1 Development process	10
3.2 Development workshops	11
3.3 Engagement in the development process	11
4 Implementation of MarinePestPlan 2018-2023	13
4.1 Roles and responsibilities	13
4.2 Monitoring and prioritisation	15
4.3 Resourcing	17
4.4 Communication.....	19
5 Outcomes of MarinePestPlan 2018-2023	21
Objective 1. Minimise the risk of marine pest introductions, establishment and spread	22
Objective 2. Strengthen the national marine pest surveillance system.....	23
Objective 3. Enhance Australia’s preparedness and response capability for marine pest introductions	24
Objective 4. Support marine pest biosecurity research and development	25
Objective 5. Engage stakeholders to better manage marine pest biosecurity	25
6 Future approaches for marine pest biosecurity	27
6.1 Development of a successor plan	27
6.2 Objectives, activities, and priorities for inclusion in a successor plan.....	28
7 Conclusion and the way forward	30
7.1 Cooperation and a sense of ownership	30
7.2 Communication at all stages to all stakeholders	31
7.3 Evolving threat landscape.....	31
7.4 Resourcing	32
Appendix A: Status and outcomes of MarinePestPlan 2018-2023 activities	33

Objective 1. Minimise the risk of marine pest introductions, establishment and spread	34
Objective 2. Strengthen the national marine pest surveillance system.....	35
Objective 3. Enhance Australia’s preparedness and response capability for marine pest introductions	38
Objective 4. Support marine pest biosecurity research and development	39
Objective 5. Engage stakeholders to better manage marine pest biosecurity	40
Appendix B: List of survey questions.....	42
Appendix C: List of organisations that attended the development workshops	45
Appendix D: Acronyms and abbreviations	47

1 Introduction

A nationally coordinated approach to marine pest biosecurity is essential to prevent or mitigate the negative impacts of marine pests. These impacts may be on trade, sustainability and productivity of aquaculture and fisheries, marine ecosystems and biodiversity, cultural values and Sea Country, social amenity and tourism.

[MarinePestPlan 2018-2023](#) was Australia's first national strategic plan for marine pest biosecurity. It was collaboratively developed by the Australian Government, state and Northern Territory governments, industry, research organisations, and non-government organisations (NGOs). MarinePestPlan 2018-2023 outlined a coordinated approach to strengthen Australia's capabilities to manage marine pests. The Plan was developed following the approach established by [AQUAPLAN](#) – Australia's national strategic plan for improving and managing aquatic animal health since 1998.

There were five objectives comprising 29 activities in MarinePestPlan 2018-2023, which aimed to strengthen critical areas of Australia's marine biosecurity system. The five objectives were:

- 1) Minimise the risk of marine pest introductions, establishment and spread
- 2) Strengthen the national marine pest surveillance system
- 3) Enhance Australia's preparedness and response capability for marine pest introductions
- 4) Support marine pest biosecurity research and development
- 5) Engage stakeholders to better manage marine pest biosecurity.

MarinePestPlan 2018-2023 concluded on 30 June 2023 and a formal review of the Plan was undertaken in 2023-2024. This review documents MarinePestPlan's achievements, identifies its strengths and weaknesses, and considers future approaches for managing marine pest biosecurity. At the time this review commenced, it was acknowledged by marine pest biosecurity stakeholders that there was an ongoing need for governments, marine industries, and non-government stakeholders to nationally coordinate their efforts to improve and manage marine pest biosecurity.

2 The review process

2.1 Review aims

The conclusion of MarinePestPlan 2018-2023 provided an opportunity to review Australia's first national strategic plan for marine pest biosecurity. The objectives of the review were to:

- 1) Document the achievements made through implementation of MarinePestPlan 2018-2023
- 2) Identify strengths and weaknesses of its development and implementation
- 3) Suggest opportunities to improve national strategic management of marine pest biosecurity.

The review addressed these objectives throughout five key phases of the MarinePestPlan 2018-2023 lifecycle:

- 1) Development – including the development process, stakeholder engagement and national endorsement
- 2) Implementation – including roles and responsibilities, monitoring and prioritisation, resourcing and communication
- 3) Outcomes and achievements – including the effectiveness of projects within MarinePestPlan's five objectives and significant outcomes and achievements of the Plan
- 4) Future approaches for marine pest biosecurity – including the need for a successor plan, and priority areas or activities to be included in a successor plan
- 5) Considerations for a successor plan – including cooperation, communication, the biosecurity threat landscape, and resourcing.

This review identifies the overall contributions of MarinePestPlan 2018-2023 to the marine pest biosecurity system in Australia. It will also guide the approach for development of a successor plan.

2.2 Review methodology

The Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) coordinated the review process and the Marine Pest Sectoral Committee (MPSC) provided oversight. MPSC is the government body responsible for coordination of Australia's marine pest risk management arrangements.

The review methodology included a desktop review of relevant documents and an online survey to collect stakeholder perspectives on development and implementation of MarinePestPlan 2018-2023.

The desktop component of the review included analysis of unpublished documents on the development of MarinePestPlan 2018-2023, public information such as progress reports, and information on financial contributions to the implementation of MarinePestPlan 2018-2023 activities. Information from the desktop review is incorporated throughout this document to provide context for the results of the stakeholder survey.

The stakeholder survey consisted of 30 questions covering the five phases listed above in [Section 2.1](#). Most questions employed a 5-level Likert rating scale, where respondents were asked to choose the answer that best corresponded to how they felt about the question (e.g., strongly disagree to

strongly agree, highly inappropriate to highly appropriate etc.). The remaining questions collected other forms of categorical data. The 5-level rating scale was compressed to a 3-level scale in this report to simplify interpretation of the quantitative data. All questions included the option to provide a free text response. Survey questions are included at [Appendix B](#).

The survey period was open for a total of six weeks and closed on 1 December 2023. Reminder emails were circulated to maximise survey participation.

Survey responses to categorical questions (e.g., Likert rating scale questions) are reported in percentages in Figures throughout this review. Percentages are rounded to the nearest whole number and may not always add up to 100%. Free text responses were used to determine the shared views and key themes among respondents and no individual comments are directly quoted. Free text responses containing common themes were prioritised for inclusion in the report.

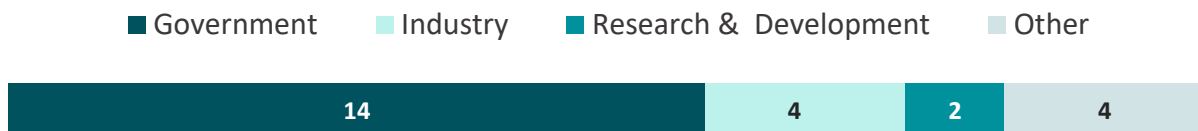
2.3 Survey participants

Survey invitees were identified based on being involved with either the development and/or implementation of MarinePestPlan 2018-2023. There was also the opportunity for the invitation to be forwarded to other relevant stakeholders. The following stakeholder groups were invited to participate in the survey via a direct email from the MPSC Secretariat:

- Marine industry operators (e.g., ports, marinas, shipping, seafood industries)
- Industry peak bodies & national associations (e.g., ports, marinas, shipping, recreational boaters, seafood industries, marine sciences)
- Australian Commonwealth, state and territory government staff
- Researchers & diagnosticians
- Individual experts in marine biosecurity
- Other sectors (e.g., community groups, NGOs, consultants).

A total of 24 complete and unique survey responses were received. Of these, 14 respondents were from government, four were from industry, two were researchers or diagnosticians, and four respondents were from other sectors (Figure 1).

Figure 1 Number of survey respondents for each sector group (% of respondents, n = 24)



2.4 Privacy and confidentiality

No personal or organisational information analysed in the desktop review has been included in this report. Participation in the survey was voluntary and no incentives were provided. The survey ensured that informed consent was given by those participating and respondents had the option to withdraw from the survey at any time up until when responses were submitted. Responses were confidential and personal information was automatically deidentified to protect the anonymity of respondents. No direct quotations from respondents have been included in the report to protect

anonymity. The survey invitation was emailed to stakeholders as blind carbon copies so that recipients were unable to identify other invitees. All survey information collected was handled in accordance with DAFF's privacy policy under the [Privacy Act 1998](#).

3 Development of MarinePestPlan 2018-2023

Key findings – development of MarinePestPlan 2018-2023

- Stakeholder workshops were an effective way to bring together marine pest biosecurity stakeholders from different sectors to identify common priorities for inclusion in the plan.
- Most respondents considered the level and methods of engagement throughout the development process as appropriate, with sufficient opportunity for consultation with marine pest biosecurity stakeholders. However, development of a successor plan would be further improved by greater involvement by non-government stakeholders.
- The outcomes of the development process should be more broadly communicated, particularly, how participant involvement in the workshops contributed toward development of the plan.

3.1 Development process

In December 2015, the [Review of National Marine Pest Biosecurity](#) was published. The review recommended that a national marine pest biosecurity strategy be developed to set a new direction for the national management of marine pests.

In April 2016, MPSC began work to develop Australia's first national strategy for marine pest biosecurity (MarinePestPlan 2018-2023). MPSC formed a task group with industry and government membership to lead the process. The task group developed a plan which outlined the need and scope for MarinePestPlan 2018-2023, principles for its development, a proposed plan format, and mechanisms for stakeholder engagement.

In June 2016, a workshop was held to identify the common desired outcomes, objectives, and activities for inclusion in MarinePestPlan 2018-2023. The workshop was attended by 42 marine pest biosecurity stakeholders representing industry peak bodies, research organisations, non-government organisations, and state, territory and Commonwealth governments.

The agreed objectives and activities from this first workshop were used to draft MarinePestPlan 2018-2023. In December 2016, a second development workshop was held and attended by 35 marine pest biosecurity stakeholders to seek feedback on the draft plan and confirm support for its objectives and activities (see [Appendix C](#) for list of organisations that attended the two development workshops). The final version of the Plan was provided to marine pest biosecurity stakeholders for endorsement.

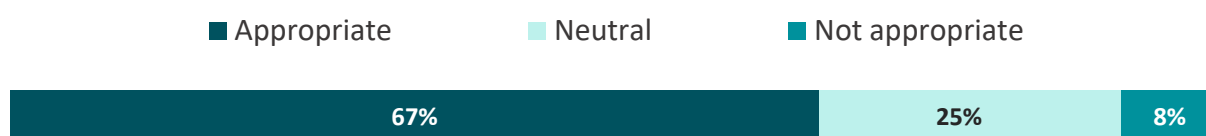
MarinePestPlan 2018-2023 was endorsed by MPSC in October 2017 and by the National Biosecurity Committee (NBC) in January 2018 and subsequently published on marinepests.gov.au.

Half (50%) of the review survey respondents were from organisations involved in the development of MarinePestPlan 2018-2023, while 29% were not involved in the plan’s development. The remaining respondents (21%) were unsure if their organisation was involved in the development of the Plan or did not wish to specify their organisation’s involvement.

3.2 Development workshops

Of the 50% of respondents whose organisation participated in the development workshops, most (67%) indicated that the workshops were appropriate in identifying priorities for inclusion in the Plan (Figure 2).

Figure 2 Appropriateness of development workshops in identifying MarinePestPlan 2018-2023 priorities (% of respondents, n = 12)



Most respondents whose organisation participated in the workshops commented that the workshops were valuable in bringing together stakeholders from different sectors to identify common priorities in marine pest biosecurity. A small number of respondents commented that participants could have been better informed on how their involvement in the workshops contributed toward development of the plan.

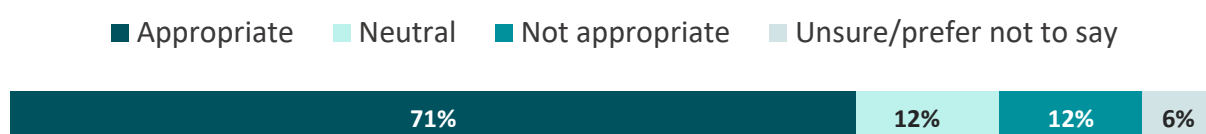
3.3 Engagement in the development process

Stakeholders had several opportunities to engage and participate in the development of MarinePestPlan 2018-2023 including:

- Attending the two development workshops mentioned above
- Participating in the task group that coordinated the development of MarinePestPlan 2018-2023
- Commenting on the draft plan
- Providing endorsement of the final plan.

Seventeen respondents were involved in at least one development activity for MarinePestPlan 2018-2023 (Figure 3). Of the respondents that participated in the development activities, most (71%) thought the level and methods of engagement throughout the development process were appropriate.

Figure 3 Appropriateness of MarinePestPlan 2018-2023 development activities for engaging stakeholders (% of respondents, n = 17)



Respondents commented that the opportunities and methods of engagement were appropriate, and that there was sufficient opportunity for consultation with stakeholders. However, as part of any successor plan, non-government stakeholders should be specifically targeted for engagement from the beginning and throughout the development process. Some respondents suggested that opportunities to be involved with the plan's development activities could have been advertised more broadly.

4 Implementation of MarinePestPlan 2018-2023

MarinePestPlan was implemented over a five-year period by marine pest biosecurity stakeholders from 2018 to 2023, with extension activities continuing into 2024. Implementation of MarinePestPlan 2018-2023 was overseen by MPSC, which includes government members and observers, as well as non-government, research, and industry partners. DAFF provided secretariat support for implementation of the plan, including:

- Coordinating biannual reporting of activity progress
- Developing the [National marine pest stakeholder engagement strategy](#)
- Coordinating the [MarinePestPlan 2018-2023 mid-term review](#).

This section addresses the implementation of MarinePestPlan 2018-2023 covering the following four areas: roles and responsibilities, monitoring and prioritisation, resourcing, and communication.

4.1 Roles and responsibilities

Key findings – roles and responsibilities

- MPSC was an appropriate group to bring together marine pest biosecurity stakeholders for coordinating and implementation of MarinePestPlan 2018-2023 activities.
- Stakeholder roles and responsibilities were clearly outlined in MarinePestPlan 2018-2023.
- A successor plan could be structured to better encourage non-government stakeholders to lead activities or participate more in the plan's implementation.

MPSC is the government body responsible for coordinating a national approach to Australia's marine pest biosecurity. Members of the committee comprise representatives from Commonwealth, state and Northern Territory government agencies. Observers from other government agencies, such as Department of Defence and the New Zealand Government, are also part of the committee. MPSC reports to the National Biosecurity Committee (NBC) which is a ministerial advisory committee that provides strategic leadership in managing national approaches to emerging and ongoing biosecurity policy issues across jurisdictions and sectors.

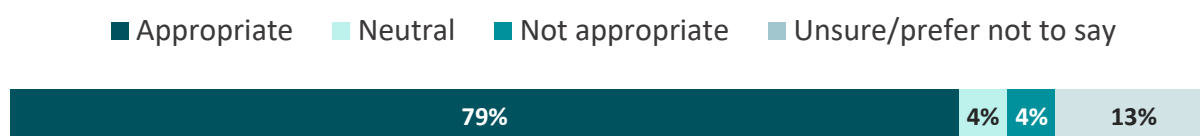
MPSC also includes partners, consisting of key stakeholders representing industry peak bodies, researchers, NGOs, and other non-government stakeholders who are involved with marine pest biosecurity. MPSC partners may also include some government representatives without elected member or observer status. MPSC partners are included in most committee communications and offered the chance to comment on policy documents in development, such as MarinePestPlan 2018-2023.

MarinePestPlan 2018-2023 was developed by an MPSC task group comprising representatives of industry, NGOs, researchers, and governments. The Plan was endorsed by governments through MPSC and the National Biosecurity Committee (NBC). MPSC led the development of MarinePestPlan 2018-2023 through extensive stakeholder consultation and coordinated its implementation in collaboration with marine industries and users of the marine environment.

During the development process, stakeholders agreed that MPSC would be responsible for coordinating the implementation of MarinePestPlan 2018-2023 in collaboration with marine industries, researchers, NGOs, and other users of the marine environment.

Most respondents (79%) agreed that MPSC was the most appropriate group to bring together marine pest biosecurity stakeholders to coordinate and implement MarinePestPlan 2018-2023 (Figure 4).

Figure 4 Appropriateness of MPSC for coordinating and implementing MarinePestPlan 2018-2023 (% of respondents, n = 24)



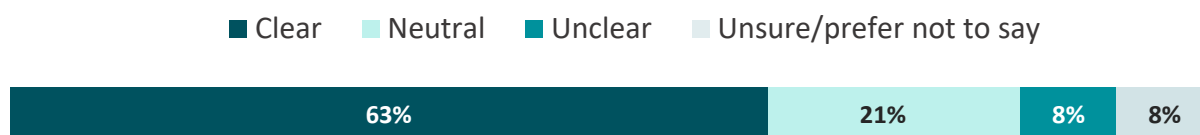
Most respondent comments supported MPSC leading the national implementation of MarinePestPlan 2018-2023. However, there was recognition from both government and industry respondents that not all stakeholders were engaged by MPSC in the implementation process and that greater involvement of non-government stakeholders should be a key goal in a successor plan.

Respondents were asked to identify more effective ways to coordinate implementation in a successor plan. Key suggestions from respondents are summarised below:

- MPSC was an appropriate organisation to coordinate implementation of MarinePestPlan 2018-2023 as all stakeholders could participate (as members, observers, or partners). However, other models, groups, or organisations to coordinate activities may be considered in a successor plan.
- While MPSC’s role in implementing MarinePestPlan 2018-2023 was appropriate, it would be beneficial to consider how industry and non-government stakeholders can be further engaged in the development and implementation of a successor plan.
- Improved communication, transparency, engagement, and coordination between stakeholders were highlighted as being key factors that would contribute to the successful implementation of a successor plan.

Stakeholder roles and responsibilities were identified in MarinePestPlan 2018-2023 including listing organisations responsible for leading the implementation of specific activities. Most respondents (63%) agreed that the responsibilities for each activity in the Plan were outlined clearly (Figure 5).

Figure 5 Clarity of responsibilities outlined for each activity in MarinePestPlan 2018-2023 (% of respondents, n = 24)



Respondents commented that too many activities were led by MPSC or the Australian Government, and that industry and non-government stakeholders could have been better engaged to lead or participate in more activities.

A number of respondents commented that the scope for delivering some activities was unclear because responsibilities changed as the activity progressed. There were comments that MPSC was usually consulted in cases when there was a lack of clarity, and activities led by MPSC task groups had defined responsibilities outlined in their respective terms of reference.

4.2 Monitoring and prioritisation

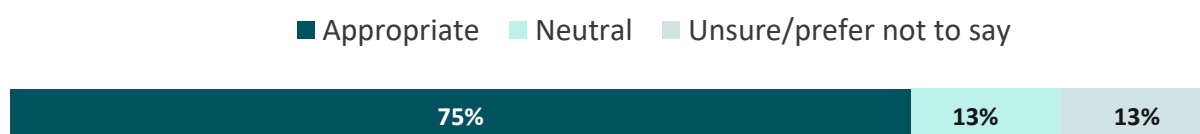
Key findings – monitoring and prioritisation

- MPSC was the most effective group to oversee monitoring and prioritise the plan’s activities.
- Biannual reporting by activity leads was an appropriate frequency to track the implementation progress of the plan.
- A successor plan would benefit from having a clear value proposition to further engage all stakeholders and foster a culture of shared ownership.
- Outcomes of a successor plan should be communicated through multiple mechanisms and be visible to all stakeholders.

Activity leads reported biannually to DAFF (as the progress reporting coordinator). This information was then collated, presented to the MPSC at biannual meetings, and published on marinepests.gov.au.

Most respondents (75%) thought that biannual reporting of MarinePestPlan 2018-2023 progress was appropriate (Figure 6).

Figure 6 Appropriateness of biannual reporting of MarinePestPlan 2018-2023’s progress (% of respondents, n = 24)



Respondents commented that biannual reporting was frequent enough to track the implementation progress and was not overly burdensome for those who created the reports. There were comments that the reports could be outcome-focused rather than process-focused, and recommendations that stakeholders are notified once the reports were published because websites are not regularly checked for updates.

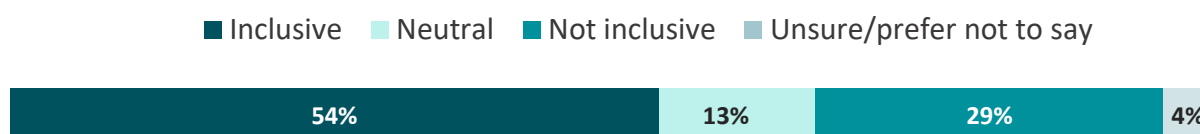
MPSC was responsible for monitoring and prioritising activities in MarinePestPlan 2018-2023. Most respondents (67%) thought that MPSC was the most effective group to monitor and prioritise the plan’s activities (Figure 7).

Figure 7 Effectiveness of the MPSC in monitoring and prioritising activities for MarinePestPlan 2018-2023 (% of respondents, n = 24)



Half of the respondents (54%) indicated that MPSC monitoring, reporting, and implementation process was inclusive of marine pest biosecurity stakeholders (Figure 8); however, over a quarter of respondents (29%) indicated that the MPSC process was not inclusive.

Figure 8 Inclusivity of marine pest biosecurity stakeholders in the MPSC monitoring, reporting, and implementation process (% of respondents, n = 24)



A higher proportion of non-government respondents (50%) thought the process was not inclusive compared to government respondents (14%). Respondents commented that it can be hard to maintain engagement with all stakeholder groups and that the level of involvement fluctuated throughout the life of the plan. Respondents suggested that a clear value proposition was needed to further engage all stakeholders including encouraging a sense of ownership in the development and implementation of the plan, for example, by having non-government organisations leading activities. Common priorities which foster ownership of activities by all stakeholders was considered an essential foundation for future monitoring and prioritisation of a successor plan.

Additional suggestions from respondents to improve the monitoring and prioritisation of MarinePestPlan 2018-2023 are summarised below:

- Appointing a plan coordinator to follow-up with activity leads and collate information into progress reports
- Establishing a group responsible for monitoring and review of the plan’s implementation
- Better engagement of non-government stakeholders in the monitoring and prioritisation process

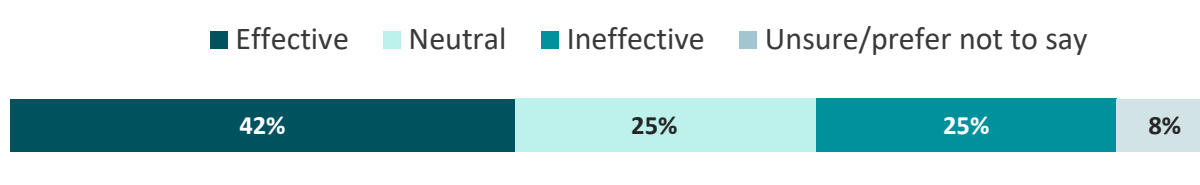
- Communicating the outcomes of completed activities through channels such as social media, webinars (e.g., AQUAPLAN activity webinars), and stakeholder surveys.

4.2.1 Mid-term review of MarinePestPlan 2018-2023

In October 2020, a [mid-term review](#) of MarinePestPlan 2018-2023 was conducted to document progress on activities, to guide prioritisation of incomplete activities, and to assess whether changes were needed for objectives or activities within the plan. The mid-term review was published on marinepests.gov.au in 2021. The mid-term review did not identify any activities for removal or significant changes to the scope of activities. The mid-term review identified that one additional activity should be added (Activity 2.9) to develop the [National Marine Pest Surveillance Work-Plan](#), to guide implementation of the [National Marine Pest Surveillance Strategy](#).

Less than half (42%) of respondents considered the mid-term review to be effective in tracking progress and prioritisation of MarinePestPlan 2018-2023 activities (Figure 9).

Figure 9 Effectiveness of the mid-term review for tracking progress and prioritisation of MarinePestPlan 2018-2023 activities (% of respondents, n = 24)



Of the respondents who thought the mid-term review was effective, comments highlighted that a mid-term review was necessary to allow for amendments to be made, to reprioritise activities to maintain strategic direction, and to evaluate implementation progress. Some respondents commented that they were unaware that the mid-term review document existed. Respondents who thought the mid-term review was ineffective did not provide comment.

4.3 Resourcing

Key findings – resourcing of MarinePestPlan 2018-2023

- MarinePestPlan 2018-2023 attracted over \$3.5 million in financial investment, however most respondents were not aware of the amount of funding the Plan had attracted.
- MarinePestPlan 2018-2023 attracted significant in-kind support from all stakeholder groups.
- Greater stakeholder engagement in a successor plan will improve stakeholder investment and achieve outcomes of common benefit.
- Increasing awareness of activity outcomes and recognition of task group member contributions could increase stakeholder organisation support of a successor plan.

MarinePestPlan 2018-2023 was designed to be a framework of agreed national priorities that was used to seek funding opportunities. The Plan was successful in attracting financial resources from

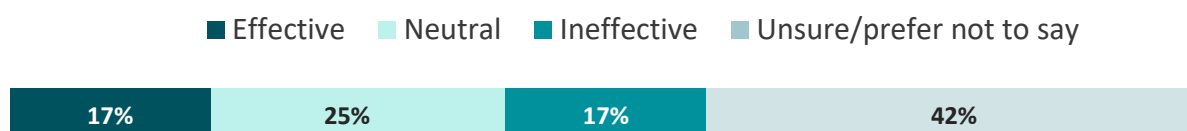
existing funding mechanisms throughout its implementation with DAFF contributing over \$3.5 million to the implementation of specific activities (Table 1).

Table 1 Estimated direct financial contributions to the development and implementation of MarinePestPlan 2018-2023

Development of MarinePestPlan 2018-2023	
Development workshops and plan publication	\$15,592
Implementation of MarinePestPlan 2018-2023	
Ob 1. Minimise the risk of marine pest introductions, establishment, and spread	\$1,380,280
Ob 2. Strengthen the national marine pest surveillance system	\$1,458,245
Ob 3. Enhance Australia's preparedness and response capability for marine pest introductions	\$306,245
Ob 4. Support marine pest biosecurity research and development	\$4,750
Ob 5. Engage stakeholders to better manage marine pest biosecurity	\$430,490
Total (estimate)	\$3,595,602

In contrast to the funding attracted (Table 1), few respondents (17%) thought that MarinePestPlan 2018-2023 was effective in attracting financial resources to help implement the agreed priorities (Figure 10) and most respondents were unsure or preferred not to answer.

Figure 10 Effectiveness of MarinePestPlan 2018-2023 in attracting financial resources to implement its activities (% of respondents, n = 24)



Some respondents commented that having a national plan of agreed priorities successfully attracted funding for implementation; however, it was recognised that most of the funding to implement MarinePestPlan 2018-2023 came from the Australian Government. Some respondents also acknowledged that they had little knowledge of the financial resources that MarinePestPlan 2018-2023 attracted, and this may indicate a lack of communication regarding the funding that was attracted to the plan. This may also explain why only 17% of respondents thought the Plan was successful in attracting funding when the Plan in fact attracted over \$3.5 million. The amount of funding attracted by MarinePestPlan 2018-2023 is comparable to [AQUAPLAN 2014-2019](#), which also attracted approximately \$3.5 million during its five-year implementation period (see Table 2 in the [AQUAPLAN 2014-2019 review report](#)).

Respondents' comments recognised that in-kind resources were important for implementation of MarinePestPlan 2018-2023 activities. The primary mechanism by which in-kind resources were applied to the implementation of MarinePestPlan 2018-2023 was primarily through MPSC task groups, which were established to progress certain activities. Over half of respondents (58%) supported the use of MPSC task groups as an effective means of progressing MarinePestPlan 2018-2023 activities (Figure 11).

Figure 11 Effectiveness of the MPSC task groups in progressing relevant activities (% of respondents, n = 24)



While respondents considered task groups to be effective for progressing specific activities, some commented that task group member contributions are not always recognised or supported by employers. Improved communication of MarinePestPlan 2018-2023 outcomes was suggested as a means of encouraging additional contributions among marine pest biosecurity stakeholders.

Some respondents commented that MarinePestPlan 2018-2023 could attract and coordinate further resources by:

- Greater cross-stakeholder engagement in the implementation of MarinePestPlan 2018-2023
- Aligning MarinePestPlan with broader strategic priorities for national biosecurity (e.g., National Biosecurity Strategy) which could help coordinate and streamline spending with other biosecurity sectors.
- Focusing more resources into preventing introduction and establishment of marine pests.

4.4 Communication

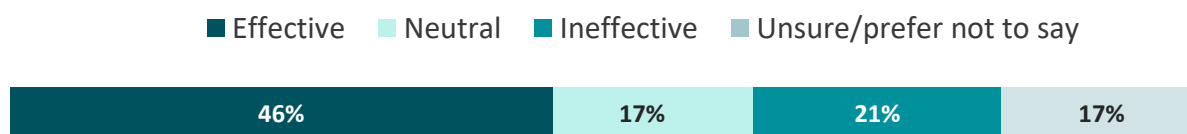
Key findings – communication of MarinePestPlan 2018-2023

- Communication on the implementation of MarinePestPlan 2018-2023 and its achievements was considered effective by less than a majority of stakeholders.
- Some communication mechanisms were preferred to foster inclusivity among stakeholders and effectively communicate updates (e.g., MPSC biannual meetings, web page updates).
- Improved communication should be a priority of a successor plan, including shared stakeholder responsibility for communication and a broader range of communication activities.

MPSC developed and led implementation of the [National Marine Pest Stakeholder Engagement Strategy](#) to guide collective engagement in MarinePestPlan 2018-2023.

Approximately half (46%) of respondents thought that the MPSC was effective at implementing the engagement strategy (Figure 12) and nearly a quarter of respondents thought that the MPSC was ineffective.

Figure 12 Effectiveness of implementation of the National Marine Pest Stakeholder Engagement Strategy (% of respondents, n = 24)



Respondents commented that the engagement strategy effectively identified the primary (e.g., activity progress reports and MPSC meetings) and secondary (e.g., updates on the marine pest website and media releases) engagement activities. Some respondents commented that few secondary engagement activities occurred. Several comments identified a lack of awareness of how MarinePestPlan 2018-2023 was implemented and the plan’s outputs, suggesting that engagement with some stakeholders had not been successful.

Over half (58%) of respondents identified that the MPSC Partner’s Workshops were the preferred communication method for receiving updates on MarinePestPlan 2018-2023. Activity updates published on marinepests.gov.au and email updates from the MPSC Secretariat were equal second communication method preferences (54% respectively).

Nearly half (46%) of respondents thought that the communication on the implementation and outcomes of MarinePestPlan 2018-2023 was effective (Figure 13) and one third of respondents were neutral.

Figure 13 Effectiveness of communication on the implementation and outcomes of MarinePestPlan 2018-2023 activities (% of respondents, n = 24)



Respondents’ suggestions to improve communication on MarinePestPlan 2018-2023 are summarised below:

- Increasing the visibility of MarinePestPlan 2018-2023 updates and achievements on marinepests.gov.au to make them easier to find.
- Encouraging marine pest biosecurity stakeholders to share MarinePestPlan 2018-2023 communication materials more widely within their networks.
- Implementing a national awareness campaign that includes some of the secondary engagement activities identified in the National Marine Pest Stakeholder Engagement Strategy.
- Maintaining the hybrid face-to-face and virtual meeting format for the MPSC events to enable inclusivity.

5 Outcomes of MarinePestPlan 2018-2023

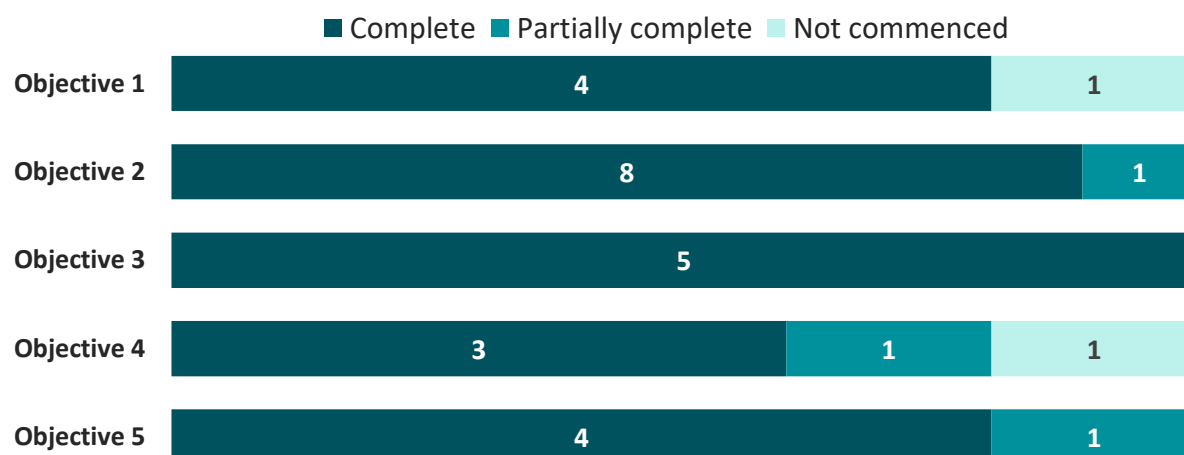
Key findings – outcomes and achievements of MarinePestPlan

- MarinePestPlan 2018-2023 was successful in achieving its overall outcomes, with 24 out of 29 activities completed across the five objectives.
- The Plan enabled cross-sectoral collaboration and setting national priorities to manage marine pest biosecurity.
- Despite the plan’s achievements, issues and gaps relating to marine pest biosecurity remain and require continued progress.
- Additional engagement throughout the lifecycle of the Plan will increase awareness, innovation, and cost efficiencies.

The desired outcome of MarinePestPlan 2018-2023 was to maintain Australia’s healthy and resilient marine environment and protect it from the threat of marine pests to support our economy and social amenity. The Plan aimed to contribute to this outcome by strengthening national marine pest biosecurity through its five objectives and 29 supporting activities.

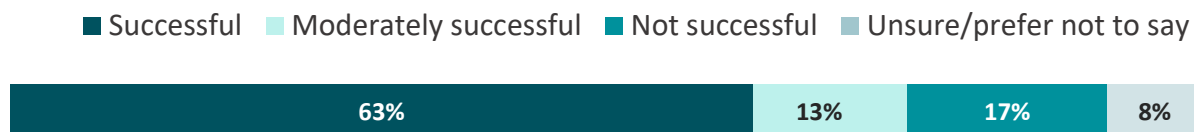
MarinePestPlan 2018-2023 had a high completion rate of activities for each objective (Figure 14). Of the 29 activities, 24 were completed, three were partially completed, and two did not commence. For details on the progress of all MarinePestPlan 2018-2023 activities for each objective, see [Appendix A](#).

Figure 14 Total number of MarinePestPlan 2018-2023 activities completed, partially completed, and not commenced for each objective (total activity n = 29)



Most respondents (63%) agreed that MarinePestPlan 2018-2023 was successful in achieving its overall desired outcome (Figure 15).

Figure 15 Respondent opinions on the overall success of MarinePestPlan 2018-2023 in achieving its desired outcome (% of respondents, n = 24)



Respondents were asked to provide any additional comments on whether they thought MarinePestPlan 2018-2023 was successful in achieving its overall desired outcome. Summarised responses highlighting positive outcomes of the Plan include:

- The Plan was successful overall as evidenced by the high number of completed activities across the plan's five objectives.
- MarinePestPlan 2018-2023 was a beneficial initiative, enabling collaboration and setting national priorities for marine pest biosecurity. It enabled coordination of marine pest activities across different stakeholder groups, including research, industry, and government.
- As the first national strategic plan of its kind, MarinePestPlan 2018-2023 did well to attract resources and complete most of its objectives without dedicated financial resources.
- The Plan established baselines and successful practices in numerous areas of marine pest biosecurity to build upon and progress.

Summarised responses highlighting areas of the Plan which could have been improved include:

- The Plan lacked the promotion and recognition that other similar national strategic plans have received. Communication of the overall outcomes and aims of the Plan could be improved.
- The Plan was largely government-focused and would benefit from broader stakeholder involvement.
- A more focussed effort on the mid-term review process to identify missing activities.

Objective 1. Minimise the risk of marine pest introductions, establishment and spread

Objective 1 aimed to improve national coordination and management of risk pathways and vectors (i.e., biofouling and ballast water) in Australia. Improved pathway and vector management would reduce the likelihood of marine pest introductions to Australia and limit their potential spread within Australia.

Objective 1 consisted of five activities (see [Appendix A](#)). Four activities were completed, and one (Activity 1.4) was not commenced. Activity 1.4 aimed to review the National Biofouling Management Guidelines for marine sectors. This activity was not commenced as it was contingent on the review of the International Maritime Organization (IMO) Biofouling Guidelines being completed beforehand.

Over half (63%) of the respondents indicated that the implementation of activities within Objective 1 was effective (Figure 16).

Figure 16 Overall effectiveness of activity implementation for Objective 1 (% of respondents, n = 24)



Significant outcomes of Objective 1 include implementation of the [International Convention for the control and Management of Ships’ Ballast Water](#) and implementation of [Australian biofouling management requirements](#). Implementation of ballast water and biofouling requirements for internationally arriving vessels are major developments in minimising the risk of marine pest introductions.

Respondents’ comments highlighted that the revision of the Biosecurity Act (2015), the ratification of the International Maritime Organization Ballast Water Convention, and the move towards coordinated biofouling management have assisted in reducing marine pest introductions. Several respondents commented that there is a lack of consistency for management of biofouling and in-water cleaning between jurisdictions.

Objective 2. Strengthen the national marine pest surveillance system

Objective 2 aimed to strengthen Australia’s marine pest surveillance system through active and passive surveillance. Effective surveillance programs and diagnostic services are fundamental to detecting marine pests, managing them and supporting regulatory decision-making.

Objective 2 consisted of nine activities (see [Appendix A](#)). Eight activities were completed, and one (Activity 2.8) was partially completed. Activity 2.8 aimed to perform an audit of marine pest surveillance activities and datasets relevant to Australia. This activity commenced and an audit of marine pests in Commonwealth waters was completed; however, audits in other jurisdictions were not completed.

Most of the respondents (67%) thought that the implementation of activities within Objective 2 was effective (Figure 17).

Figure 17 Overall effectiveness of activity implementation for Objective 2 (% of respondents, n = 24)



Significant outcomes of Objective 2 include the development and implementation of the [National Marine Pest Surveillance Strategy](#), which outlines national priorities and strategic direction for marine pest surveillance over five years (2021-2026). Additional significant outcomes includes the development of guidelines for [validation of molecular detection methods \(eDNA\) for marine pests](#), and the design and promotion of [education and awareness materials to engage observer groups in](#)

[passive surveillance of marine pests](#). Through Objective 2, Australia’s marine pest surveillance capability has improved (including for specific purposes such as early detection) and national institutional capability has been built.

Survey respondents commented that surveillance of marine pests has improved through the use of molecular diagnostics and robotics for early detection, and through the implementation of the Surveillance Strategy. There has also been an improvement in active surveillance programs within jurisdictions and increased stakeholder engagement via passive surveillance activities.

Some respondents’ comments suggested that there could be improved national coordination and funding contributions for surveillance at the jurisdiction-level, and an effort to reduce the complexity involved with surveillance programs.

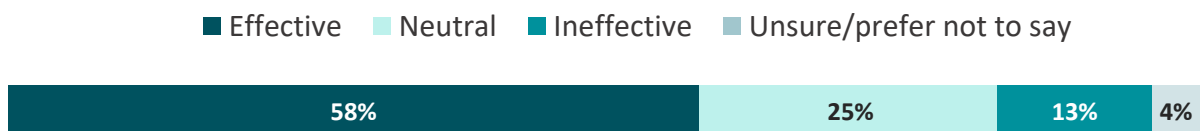
Objective 3. Enhance Australia’s preparedness and response capability for marine pest introductions

Objective 3 aimed to ensure stakeholders are prepared to respond to marine pest incursions by building Australia’s response capability. This included improving decision-making, contingency planning, and response education and training.

Objective 3 consisted of five activities (see [Appendix A](#)). All activities were completed.

Over half (58%) of the respondents indicated that the implementation of activities within Objective 3 was effective (Figure 18).

Figure 18 Overall effectiveness of activity implementation for Objective 3 (% of respondents, n = 24)



Significant outcomes of Objective 3 include updating the series of [marine pest response manuals](#) which have been used to directly assist in marine pest emergency responses (e.g., the Response manual for invasive marine crabs was tested during the incursion of Asian shore crab, *Hemigrapsus sanguineus*, in Victoria). Another significant outcome was the [guidelines for benefit-cost analysis](#) which was used to design a cost-benefit analysis for the response to the carpet sea squirt, *Didemnum vexillum*. Through this objective, two national marine pest response exercises were also implemented.

Respondents commented that significant progress has been made on the [emergency planning and response documents \(EMPPlan\)](#), and that the emergency response exercise program enhanced preparedness and response capability.

Some responses suggested that further work is required to improve response capability, such as exercises and training opportunities to enhance preparedness for marine pest incursions. A specific example provided was the length of time taken to initiate the carpet sea squirt (*D. vexillum*)

response and lessons learned from active responses that occurred during implementation of MarinePestPlan 2018-2023.

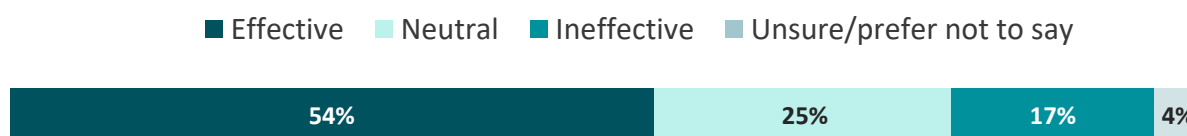
Objective 4. Support marine pest biosecurity research and development

Objective 4 aimed to improve the effectiveness of national marine pest biosecurity research through better coordination and collaboration of researchers and to address specific knowledge gaps to inform management of marine pests.

Objective 4 consisted of five activities (see [Appendix A](#)). Three activities were completed, one activity was partially completed (Activity 4.2), and one was not commenced (Activity 4.4). Activity 4.2 aimed to promote research coordination through the Marine Pest Research Network (MPRN). This activity was partially completed, and specific activities of the network are being progressed. Activity 4.4 aimed to make recommendations and implement measures to improve management of marine pest vectors and pathways. This activity did not commence as it was contingent on implementation of the Australian Biofouling Management Guidelines.

Over half (54%) of the respondents indicated that the implementation of activities within Objective 4 was effective (Figure 19).

Figure 19 Overall effectiveness of activity implementation for Objective 4 (% of respondents, n = 24)



Significant outcomes of Objective 4 include the review of Australia’s marine pest biosecurity R&D priorities, identifying the economic, environmental, and social impacts of marine pest in Australia, and assessing the effectiveness of current management options for biofouling in niche areas. Understanding the impacts of marine pests is crucial for developing cost-benefit analysis or management plans during marine pest responses. Having a marine pest research network is also advantageous for seeking out relevant expertise (i.e., taxonomists and diagnosticians, technology for surveillance and control, or groups undertaking marine pest research).

Some respondents commented that significant progress was made in some R&D areas such as technology development and that this should be advanced further through a successor plan, including pursuing public-private partnerships.

Objective 5. Engage stakeholders to better manage marine pest biosecurity

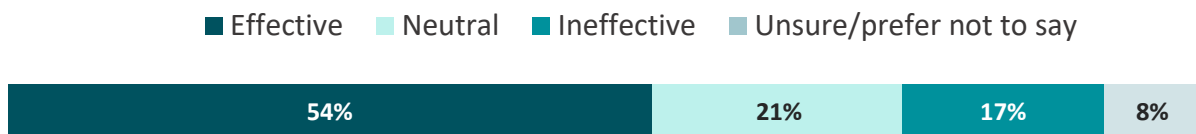
Objective 5 aimed to increase levels of communication, collaboration, and engagement among marine pest biosecurity stakeholders. Effective stakeholder engagement encourages trust and

transparency, clarifies roles and responsibilities for marine pest management, and fosters shared responsibility for national marine biosecurity.

Objective 5 consisted of five activities (see [Appendix A](#)). Four activities were completed, and one (Activity 5.3) was partially completed. Activity 5.3 aimed to deliver a targeted national campaign to improve awareness of marine pest risks, management actions, and shared responsibilities. This activity commenced but was put on hold because a survey to evaluate baseline levels of marine pest awareness is needed to effectively evaluate the awareness campaign.

Over half (54%) of the respondents indicated that the implementation of activities within Objective 5 was effective (Figure 20).

Figure 20 Overall effectiveness of activity implementation for Objective 5 (% of respondents, n = 24)



Significant outcomes of Objective 5 include the review, update, and maintenance of the [marine pests website](#), which has improved engagement through the provision of marine pest information and guidance resources to stakeholders. Evidence of this includes direct emails from stakeholders via the website, website traffic metrics, and visitors selecting ‘this webpage was helpful’ option. In addition, the [Analysis of the Australian marine pest network](#) was developed which assessed Australia’s marine pest biosecurity stakeholder network.

Respondents commented that industry workshops (e.g., shipping industry workshop with the International Maritime Organization) were an effective way to educate stakeholders on marine pest biosecurity issues and improving stakeholder awareness. In addition, engagement materials such as marine pest identification cards were developed.

For the remaining respondents, comments highlighted that additional engagement across the full value chain will increase awareness, innovation, and cost efficiencies.

6 Future approaches for marine pest biosecurity

Marine pests are an ongoing threat to Australia's marine environment, maritime industries, and social amenity. As a result, there is a strong, ongoing need for a nationally coordinated approach to marine pest biosecurity in Australia. As the first national strategy of its kind for marine pest biosecurity, MarinePestPlan 2018-2023 has guided marine pest programs across Australia and built a foundation from which further improvements can be made.

6.1 Development of a successor plan

Key findings – development of a successor plan

- 100% of survey respondents agreed that a successor plan to MarinePestPlan 2018-2023 should be developed.
- The successor plan should clearly outline its priorities and desired outcomes to maintain engagement with stakeholders, especially non-government stakeholders.
- All five objectives in the current MarinePestPlan 2018-2023 are relevant for inclusion in a successor plan; however, additional priority areas for inclusion could also be considered.

Respondents were asked if a successor plan to MarinePestPlan 2018-2023 should be developed. 100% of respondents (n = 24) agreed that a successor plan should be developed to continue national coordination of marine pest biosecurity in Australia.

Respondents provided their rationale for developing a successor plan, which are summarised below into key themes:

- MarinePestPlan 2018-2023 was very successful based on the number of activities completed and positive stakeholder response on its implementation, and a successor plan will help investors see a return on their investment.
- Marine pests remain a biosecurity threat to Australia and will require continued and nationally coordinated management through monitoring, surveillance, preparedness, research, and response capability.
- National coordination of marine pest management is crucial in the existing and evolving threat landscape. Increased global connectivity is increasing the risk of marine pest introductions, and climate change is potentially extending the range of marine pests into new habitats.
- Ongoing engagement and communication with all stakeholders are critical for marine pest management. A successor plan should highlight a shared vision and desired outcomes among stakeholders and allow stakeholders to have ownership of certain activities.

- A successor MarinePestPlan could be aligned to the [National Biosecurity Strategy](#) and consider leveraging other national initiatives such as [Catalysing Australia's Biosecurity](#).
- The successor MarinePestPlan may consider how it will outline the investment of financial resources and in-kind contributions. There will be changing demands and pressures during the life of a successor plan which may affect stakeholder priorities and available resources.

6.2 Objectives, activities, and priorities for inclusion in a successor plan

Respondents were asked to identify which of the five objectives within MarinePestPlan 2018-2023 could be considered for inclusion in a successor plan. A common theme across responses was that all five objectives remain relevant for managing marine biosecurity and there should be a focus on continuous improvement. Respondents' suggestions are summarised below into key themes:

- Vector management could be a primary priority because management options are limited once marine pests become established.
- Improving marine pest taxonomic capacity and capability (both morphological and molecular).
- Continuous improvement of response arrangements including response exercises.

Respondents were asked to provide additional marine pest biosecurity priorities, areas, or issues that could be included in a potential successor plan. A total of 14 unique responses were received. Respondents' suggestions for priorities to include in a potential successor plan are summarised below (Table 2).

Table 2 Priority areas for consideration in a successor MarinePestPlan, suggested by survey respondents

Priority area	Details
Climate change	Address impacts of climate change on the susceptibility to marine pest incursions and the spread of established marine pests. Consideration should be given to range-shifting native species and climate change impacts on marine pest incursions.
Control options	Better details on available control options and development of new eradication/control technology and tools.
Emergency response coordination	Clearer roles and responsibilities in marine pest response coordination
Financial support	More financial support for monitoring and management of marine pests and objectives within a successor plan. Consider coordinating funding and research.
Incorporating citizen science	Implementation of citizen science monitoring programs for marine pests to pair with active and passive surveillance programs.
Measuring plan outcomes	Measuring the outcome of plan activities which strengthen the marine pest biosecurity system will cultivate confidence that the Plan is delivering return on investment and thus encourage further investment.
Supporting technical expertise	Maintaining, supporting, and expanding expertise in marine taxonomic groups.
Surveillance tools	Improved molecular diagnostics through better reference sequence libraries, including related native species.
Vector management policy	Addressing gaps in vector management policy and approaches e.g., in-water cleaning activities and facilities.

Note: topics are sorted by alphabetical order.

7 Conclusion and the way forward

Key findings – the way forward

- Stakeholders should be involved throughout all stages of the successor plan to develop clear common goals and desired outcomes to foster ownership across stakeholders and support future investment.
- The development and outcomes of the successor plan should be communicated to all stakeholder groups consistently throughout the plan's life cycle.
- Current and emerging marine pest biosecurity risks should be identified during development of the successor plan in order to prioritise the plan's objectives.
- Activities in the successor plan could be designed to leverage financial and in-kind contributions where possible.

MarinePestPlan 2018-2023 was Australia's first national strategic plan for managing marine pest biosecurity. Over the five-year implementation period of MarinePestPlan 2018-2023, there has been significant progress in the management of marine pests in Australia (see [outcomes](#) for details). MarinePestPlan 2018-2023 has specifically facilitated progress in vector management, surveillance, emergency preparedness and response, research and development, and stakeholder engagement.

During this period, several exotic marine pests have been detected in Australia (e.g., carpet sea squirt, black scar oyster, and Asian shore crab) and there have been range expansions of established marine pests (e.g., Japanese kelp and white colonial sea squirt). Increased movements of international and domestic vessels, new shipping routes, and shifts in the marine environment amplify risks for marine pest incursions. Marine pest biosecurity management must continue to evolve to address the current and future risks that marine pests pose to Australia's blue economy, environment, and society.

This review of MarinePestPlan 2018-2023 has identified stakeholders' desire for a successor plan to support and improve marine pest biosecurity. Throughout 2024 and 2025, arrangements will be initiated for governments and non-government stakeholders to come together to develop a successor MarinePestPlan which will drive national strategic priorities for marine pest management and maintain the strong foundations laid by the first plan.

Through this review, respondents have commented on matters of importance to the future of marine pest biosecurity. The common themes and priority areas of relevance to development and implementation of a successor plan are expanded on below.

7.1 Cooperation and a sense of ownership

Effective management of marine pests must involve cooperation and investment from all relevant stakeholders to protect Australia's marine environment, economy, and social amenity. One of the dominant themes identified in this review was that MarinePestPlan 2018-2023 was largely

government focused, and stakeholder groups including industry (i.e., ports and shipping, marinas, aquaculture), researchers, environmental stakeholders and both government and non-government agencies could strive for greater cooperation in marine pest management.

Stakeholders could be encouraged to be involved in the development, implementation, and extension of a successor MarinePestPlan. Emphasis could be placed on creating a shared vision to foster a sense of ownership and the sharing of responsibilities among stakeholders. A successor plan should clearly outline the desired outcomes for each activity, which will encourage stakeholder investment.

7.2 Communication at all stages to all stakeholders

The review survey identified that engagement activities associated with MarinePestPlan 2018-2023 were not successful in effectively communicating to all relevant stakeholders. Some respondents commented that they were unaware of key MarinePestPlan 2018-2023 milestones or results of a completed activity.

More effective communication across all stakeholder groups should be incorporated early into the development of a successor MarinePestPlan and maintained throughout the plan's life cycle, including the plan's outcomes, achievements and extension activities. Specific communication approaches which could be considered include:

- Increasing the visibility of MarinePestPlan updates and achievements on marinepests.gov.au and notifying stakeholders when updates are published.
- Developing a MarinePestPlan communication and engagement strategy early in the development process with realistic milestones that can be achieved.
- Establishing a MarinePestPlan webinar series (similar to AQUAPLAN webinar series) that enables two-way communication on the progress and outcomes of the plan, including updates on specific activities or objectives.
- Sharing results and outcomes of MarinePestPlan activities through various communication channels, such as social media posts by relevant organisations, or as part of a national awareness campaign.

7.3 Evolving threat landscape

Increasing maritime trade, climate change, and the growth of Australia's blue economy present anticipated increased risks for the introduction, establishment, and spread of marine pests. However, innovative management technologies and the implementation of new regulations to manage vectors such as biofouling and ballast water present opportunities to better manage these risks. The MarinePestPlan 2018-2023 review identified that marine pest biosecurity management will continue to benefit from a nationally coordinated strategic approach.

The successor MarinePestPlan will drive national strategic priorities for marine pest management over the next five-year implementation period. Respondents commented that the five objectives outlined in the first MarinePestPlan are still relevant for inclusion in a successor plan. Current and emerging marine pest biosecurity risks should be identified during the development of a successor

plan, along with management approaches, which will help prioritise new objectives or activities for inclusion and support implementation.

7.4 Resourcing

MarinePestPlan 2018-2023 was successful in attracting more than \$3.5 million in funding from the Australian Government to support its implementation. The survey results indicate some stakeholders were unaware of the financial resources that were invested in MarinePestPlan 2018-2023 and better communication on funding should be considered as part of the successor MarinePestPlan. Seeking co-investment from other stakeholders along with aligning the successor plan with other relevant strategies and initiatives (e.g., [National Biosecurity Strategy](#)) may also enable coordinated resourcing across biosecurity sectors.

In-kind resourcing also played a critical role in the success of MarinePestPlan 2018-2023, such as using designated task groups formulated through MPSC to lead and progress specific activities. Survey respondents suggested that a successor MarinePestPlan could utilise in-kind contributions from a diversity of stakeholders, and activities could be designed to leverage both financial and in-kind resourcing where possible. In-kind contributions could also be recognised to demonstrate the benefits of organisational investment in the marine pest biosecurity system.

Appendix A: Status and outcomes of MarinePestPlan 2018-2023 activities

MarinePestPlan 2018-2023 had five objectives:

- 1) Minimise the risk of marine pest introductions, establishment and spread
- 2) Strengthen the national marine pest surveillance system
- 3) Enhance Australia's preparedness and response capability for marine pest introductions
- 4) Support marine pest biosecurity research and development
- 5) Engage stakeholders to better manage marine pest biosecurity.

Across these five objectives, there were 29 activities that focused on addressing specific issues across the marine pest biosecurity system. At the time of writing, 24 activities were complete, three were partially complete, and two had not commenced.

The achievements of the MarinePestPlan 2018-2023 activities are outlined in the Table below, within the context of the stated objectives.

Objective 1. Minimise the risk of marine pest introductions, establishment and spread

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
Activity 1.1 Implement nationally consistent domestic ballast water regulations under the <i>Biosecurity Act 2015</i>	Implementation of domestic ballast water regulations that align with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention). The domestic ballast water regulations aim to reduce the risk of spreading marine pests between Australian ports.	In 2017, amendments were made to the <i>Biosecurity Act 2015</i> , which enabled Australia to ratify the BWM Convention. Domestic ballast water management requirements have been fully implemented in line with the BWM Convention.	Complete	Continued monitoring of inspection and compliance rates for the domestic shipping industry, updates to the Ballast Water Risk Assessment Tool and reviewing same risk area policies.
Activity 1.2 Ensure the use of ballast water management systems in Australian waters meets accepted environmental standards	<p>Assess whether the use of proposed Ballast Water Management Systems (BWMS) pose a pollution risk to Australia's marine environment, population health, property or resources.</p> <p>Provide advice on how to prevent, mitigate and monitor impacts if unacceptable pollution risks are identified. Contribute to the International Maritime Organization's (IMO) BWMS approval process to improve management of pollution risks associated with the discharge of ballast water.</p>	<p>As a certification requirement, Australian flagged vessels that install a BWMS must undergo a commissioning test of sensors that monitor discharge water quality.</p> <p>Testing of ballast water from international vessels arriving in Australia has occurred and identified inconsistent compliance rates in effective treatment of entrained organisms in the >50 micron size class. These results have been presented to the IMO.</p> <p>Australia continues to support the work of the IMO to evaluate applications for approval of new BWMS's, to ensure systems meet the safety and environmental protection requirements.</p>	Complete	Working with the IMO to undertake a review of compliance testing under the BWM Convention.
Activity 1.3 Investigate regulatory options to manage biosecurity risks associated with fouling on vessels	Progress the development of a contemporary Regulation Impact Statement (RIS) for international and domestic management of vessel biofouling. The aim of the RIS is to facilitate development of cost-effective, risk-based biofouling requirements for Australia.	<p>The RIS was developed and provides policy options for Australian Government action to improve the regulation of biosecurity risks associated with marine biofouling on vessels arriving into Australian territory.</p> <p>Australian Government requirements to manage biofouling on international vessels arriving in Australia began 15 June 2022. Vessel operators are required to provide information on how</p>	Complete	The IMO are currently reviewing their Biofouling Guidelines and the IMO will ensure Australia's requirements and supporting legislation are consistent with the IMO's guidelines.

Review of MarinePestPlan 2018-2023

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
		biofouling has been managed prior to arriving in Australian territorial seas.		
Activity 1.4 Review the National Biofouling Management Guidelines for marine sectors and update as required	A review of the National Biofouling Management Guidelines to investigate the awareness, adoption and effectiveness of the guidelines within the different maritime sectors and assess their effectiveness in addressing the biosecurity risks associated with biofouling.	The review of the National Biofouling Management Guidelines was put on hold until after the IMO reviewed their international Biofouling Guidelines. Australia has contributed to the review of the IMO's guidelines.	Not commenced	Australia's National Biofouling Management Guidelines will be reviewed once the review of the international Biofouling Guidelines is finalised.
Activity 1.5 Investigate the benefits of an intelligence-gathering framework to monitor marine pest risk pathways and expand the International Biosecurity Intelligence System as appropriate	Assess the benefits and if appropriate, develop a marine pest sub-site on the International Biosecurity Intelligence System (IBIS). Provide marine pest biosecurity stakeholders with access to IBIS to gather intelligence and guide marine pest management.	A marine pest sub-site was developed on IBIS and provided to selected stakeholders to trial. It was decided that there was not a strong case for use of IBIS in intelligence gathering for marine pest biosecurity.	Complete	None planned.

Objective 2. Strengthen the national marine pest surveillance system

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
Activity 2.1 Develop a national marine pest surveillance strategy	Develop a marine pest surveillance strategy that outlines an agreed national approach to marine pest surveillance, including defining objectives and describing the different components and types of surveillance to meeting those objectives.	The National Marine Pest Surveillance Strategy was published in 2019. It was decided that a national marine pest surveillance work plan should be developed to guide implementation of the surveillance strategy.	Complete	The implementation period for the strategy is 2021-2026 to align with publication of the work plan.
Activity 2.2 Investigate Australia's current passive surveillance capability for marine pests and recommend possible improvements	Identify existing and potential observer groups, motivations for participating, skills, reporting pathways and recommend actions to improve passive surveillance coverage.	A report was produced identifying passive surveillance stakeholder groups, their reporting behaviours and motivations. The report was based on a combination of desktop research, surveys and interviews.	Complete	The report was used to inform the development of education and awareness materials for key observer groups (Activity 2.3).

Review of MarinePestPlan 2018-2023

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
Activity 2.3 Promote tailored education and awareness materials to engage marine pest observer groups in passive surveillance activities	Identify existing marine pest awareness materials and share them nationally to support the passive surveillance system. Where necessary, develop and promote additional awareness materials for key observer groups to encourage passive surveillance.	Existing marine pest awareness materials were compiled and published for use and adaptation. A gap analysis was completed in 2020 that identified observer groups that should be targeted with education and awareness materials including the ports, marinas, diver and aquaculture sectors. Materials were developed and distributed among these four sectors and a survey was conducted to assess the impact of the education and awareness resources. These materials are available on the marinepests website .	Complete	Stakeholder engagement and education activities will continue as part of the implementation of the National Marine Pest Surveillance Strategy.
Activity 2.4 Develop validation guidelines for marine pest molecular detection methods	Development of validation guidelines that will enable performance of fit-for-purpose detection methods that can be evaluated in a consistent manner.	Guidelines for development and validation of assays for marine pests were developed and published in 2018.	Complete	The guidelines have been used in the validation of assays for a range of marine pest species (see Activity 2.5)
Activity 2.5 Validate molecular detection methods (including sampling methodology) for selected high-priority marine pest species	Validation of marine pest molecular detection methods for high-priority marine pest species	Molecular assays have been developed and validated for the following marine pest species: <ul style="list-style-type: none"> • Asian date mussel (<i>Arcuatula senhousia</i>) • Asian green mussel (<i>Perna viridis</i>) • Asian kelp (<i>Undaria pinnatifida</i>) • Asian paddle crab (<i>Charybdis japonica</i>) • Black striped false-mussel (<i>Mytilopsis sallei</i>) • Brown mussel (<i>Perna perna</i>) • Carpet sea squirt (<i>Didemnum vexillum</i>) • Charru mussel (<i>Mytella strigata</i>) • European fan worm (<i>Sabella spallanzanii</i>) • European green shore crab (<i>Carcinus maenas</i>) • Harris mud crab (<i>Rhithropanopeus harrisi</i>) 	Complete	Validated assays are being used as part of marine pest surveillance programs around Australia. Additional validation work is being undertaken as part of the implementation of the National Marine Pest Surveillance Strategy.

Review of MarinePestPlan 2018-2023

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
		<ul style="list-style-type: none"> • New Zealand green-lipped mussel (<i>Perna canaliculus</i>) • New Zealand screw shell (<i>Maoricolpus roseus</i>) • Northern Pacific seastar (<i>Asterias amurensis</i>) • Pacific oyster (<i>Magallana gigas</i>) • Soft shell clam (<i>Mya japonica</i>) • White colonial sea squirt (<i>Didemnum perlucidum</i>) 		
Activity 2.6 Audit, maintain and share a database of marine pest identification capability	Complete an audit of Australia's marine pest identification capabilities including individual experts and laboratories and develop a database that can be shared with marine pest biosecurity stakeholders.	An audit was conducted and a database developed. The database is available on request from mpsc@aff.gov.au	Complete	None planned.
Activity 2.7 Review surveillance information management needs and ensure an appropriate information system is in place	Review users' marine pest surveillance information needs and determine a suitable information system to meet user requirements.	User needs were determined through stakeholder consultation and the National Introduced Marine Pest Information System (NIMPIS) was redeveloped to make the system fit-for-purpose in meeting the requirements of marine pest surveillance data generators and users.	Complete	NIMPIS may continue to be updated, including the uploading of new marine pest surveillance data and the review and update of marine pest species profiles that provide users with information to guide management.
Activity 2.8 Perform an audit of marine pest surveillance activities and datasets relevant to Australia	An audit of marine pest activities and data sets across Australia.	An audit of marine pest surveillance activities and data sets in Commonwealth waters has been completed and marine pest detections have been uploaded into NIMPIS.	Partially complete	An audit of surveillance activities and data sets in other Australian locations will be undertaken by the relevant organisations if/when resources become available.
Activity 2.9 Develop a Marine Pest Surveillance Strategy Work Plan	Development of a work plan to guide the implementation of the National Marine Pest Surveillance Strategy.	The National Marine Pest Surveillance Work Plan was published in 2021.	Complete	Implementation of the National Marine Pest Surveillance Strategy .

Objective 3. Enhance Australia's preparedness and response capability for marine pest introductions

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
Activity 3.1 Plan and implement a national program of marine pest emergency response exercises	Implement a national program of marine pest emergency response exercises to enhance and test preparedness capabilities.	Two national emergency response simulation exercises were held involving government biosecurity staff and marine pest biosecurity stakeholders.	Complete	None planned at this stage.
Activity 3.2 Develop a benefit-cost analysis framework to guide response efforts in the event of a nationally significant marine pest incursion	Develop guidelines on how to undertake a benefit-cost analysis for marine pest incursions. The guidelines will support applications for activation of the National Environmental Biosecurity Response Agreement (NEBRA) for nationally significant marine pest outbreaks.	Methodology to guide responses to marine pest incursions under the NEBRA was published in 2018.	Complete	The guidelines created under this activity have been used in the development of a cost-benefit analysis for the carpet sea squirt (<i>Didemnum vexillum</i>) response.
Activity 3.3. Identify marine pest emergency training needs	Identify gaps in national emergency response skills and capabilities not addressed by the marine pest response exercise program (Activity 3.1.).	A gap analysis was conducted based on the outcomes of the marine pest response exercise program (Activity 3.1.) and national stakeholder consultation. A marine pest emergency response training needs report was produced to inform the development of future training activities.	Complete	The report produced as part of this activity will be used to plan future emergency response training activities.
Activity 3.4 Review the national Emergency Marine Pest Plan framework	Review the Emergency Marine Pest Plan (EMPPPlan) framework and identify gaps and possible improvement to enhance Australia's emergency marine pest preparedness and response capabilities.	The EMPPPlan framework was reviewed and it was decided to develop a marine pest version of the Biosecurity Incident Management System manual .	Complete	None planned.
Activity 3.5 Plan and implement procedures to develop and update the EMPPPlan response manuals and related guidance materials	Review and update the (Rapid) Response Manuals so that they are fit-for-purpose to guide marine pest emergency responses.	The (Rapid) Response Manual series was reviewed and it was decided to update the manuals to focus on taxonomic groups rather than specific marine pest species. To date, two response manuals have been published using the new format: Response manual for invasive marine crabs and the generic Marine pest response manual.	Complete	Work continues on updating the Marine Pest Response Manuals series .

Objective 4. Support marine pest biosecurity research and development

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
Activity 4.1 Periodically review the national marine pest biosecurity research and development priorities	Review the National Priorities for Introduced Marine Pest Research and Development 2013-2023 to identify work that has been completed and gaps that should be addressed.	A review of marine pest R&D was undertaken based on desk-top analysis and consultation with marine pest researchers. A review report was presented to the Marine Pest Sectoral Committee and is available on request by contacting mpsc@aff.gov.au .	Complete	The finding of the review report will be considered as part of future marine pest research and development planning.
Activity 4.2 Promote research coordination through the national marine pest research network	Encourage coordination and communication of marine pest research through expansion of the Australian Marine Pest Research Network.	Expansion and formalisation of the research network has commenced through developing terms of reference for the network. The Marine Pest Research Network is investigating how to leverage the research network to improve research coordination and communication.	Partially complete	The MPSC will support the Marine Pest Research Network by setting strategic objectives for marine pest research in Australia.
Activity 4.3 Review the economic, environmental and social impacts of marine pests in Australia	Review the scientific literature on the impacts of marine pest in Australia and identify knowledge gaps.	Review of the recorded impacts of sixteen established marine pest species was undertaken. The review concluded that there is a notable lack of data on environmental, economic, or social impacts.	Complete	None planned.
Activity 4.4 Conduct risk analyses of marine pest vectors and pathways, and make recommendations for improved management	Collate contemporary information and conduct risk analyses of vectors and risk pathways for marine pests. The results of the risk analyses will support the development of risk-based management strategies.	None to date.	Not commenced	Risk analysis of marine pest vectors and pathways will be undertaken once regulations for biofouling have been implemented. A risk matrix for domestic journeys has been developed, which supports Ballast Water compliance.
Activity 4.5 Assess the effectiveness of current management options for biofouling in niche areas	Review the efficacy of biofouling management methods for niche areas to inform management of biofouling on vessels.	Public challenge seeking novel methods to treat biofouling in niche areas of commercial vessels with the winning proposal being considered for further development. Partnering with New Zealand Biosecurity in testing a framework for management of biofouling in internal niches and investigating the impact of biofouling on the operational performance of internal seawater systems.	Complete	Australia is contributing to the review of the IMO Biofouling Guidelines (see Activity 1.4).

Objective 5. Engage stakeholders to better manage marine pest biosecurity

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
Activity 5.1 Identify and build a profile of marine pest biosecurity stakeholders	Identify marine pest stakeholders including interlinking relationships and network structures. Identification of the stakeholder community will support implementation of MarinePestPlan 2018-2023.	A marine pest stakeholder network analysis was conducted to identify information and resource sharing relationships. The analysis involved engaging stakeholders through surveys and interviews and the development of a social network analysis. The published report identified the presence or absence of network structures, and their ability to support coordination, innovation, or collaboration.	Complete	None planned.
Activity 5.2 Develop a national stakeholder engagement strategy for MarinePestPlan 2018-2023 and the Marine Pest Sectoral Committee	Development of a National marine pest stakeholder engagement strategy to support implementation and communicate outcomes of MarinePestPlan2018-2023 and MPSC activities.	The National marine pest stakeholder engagement strategy was published in 2019.	Complete	Communication and engagement actions outlined in the strategy continue to be implemented.
Activity 5.3 Deliver a targeted national campaign to improve awareness of marine pest biosecurity risks, management actions and shared responsibilities	Improved awareness of marine pest biosecurity through a targeted campaign of high-risk and high-value stakeholder groups.	Planning for the national campaign has commenced, however implementation was postponed until a baseline assessment of stakeholder knowledge and participation in marine pest biosecurity is undertaken. This will enable improved assessment of the effectiveness of the national campaign in educating stakeholders and encouraging behaviour change.	Partially complete	The national campaign will be implemented under the National marine pest surveillance strategy, once a baseline assessment of stakeholder knowledge and participation rates has occurred.
Activity 5.4 Review, update and maintain the marinepests.gov.au website	Review the current and potential effectiveness of the Marine Pest Website in educating and supporting stakeholders in undertaking marine pest biosecurity activities.	Stakeholder feedback was sought through an online survey and in-depth interviews with a range of marine pest biosecurity stakeholders. This user feedback provided guidance in a complete restructure and upgrade of the Marine Pest Website which was launched in 2019.	Complete	The website continues to be updated to reflect the biosecurity landscape and as new marine pest biosecurity resources become available.

Review of MarinePestPlan 2018-2023

Activity number	Expected outcomes	Final outcomes	Status	Extension activities
<p>Activity 5.5 Establish an independent national marine pest network</p>	<p>Creation of an independent national marine pest network to facilitate greater coordination and collaboration among marine pest stakeholders.</p>	<p>Options for establishing a national marine pest network were investigated and informed by a social network analysis of Australia’s marine pest biosecurity stakeholders.</p> <p>The establishment of an independent network was not considered a priority and improved communication and engagement with marine pest biosecurity stakeholders was progress through other MarinePestPlan 2018-2023 activities.</p>	<p>Complete</p>	<p>None planned.</p>

Appendix B: List of survey questions

Consent to participate

Please indicate your consent below to participate in this survey.

Section 1: Development of MarinePestPlan 2018-2023

Question 1: Please select the sector that best represents you.

Question 2: Was your organisation involved in the development of MarinePestPlan 2018-2023?

Question 3: Two planning workshops were held in June and December 2016 with representatives from industry, government, and other non-government organisations to help identify priorities for inclusion in MarinePestPlan 2018-2023. How appropriate were these collaborative workshops to identify priorities for inclusion in MarinePestPlan 2018-2023?

Question 4: Stakeholders were provided several opportunities to participate in the development of MarinePestPlan 2018-2023. This included participation in any of the following activities: two planning workshops, the Marine Pest Sectoral Committee (MPSCP) National Marine Pest Strategy Task Group, providing comment on the draft plan, or endorsement of the final plan. How appropriate was this level of stakeholder engagement for the development of MarinePestPlan 2018-2023?

Section 2: Implementation of MarinePestPlan 2018-2023

2.1 Roles and responsibilities

Question 5: Stakeholders agreed that the Marine Pest Sectoral Committee (MPSC) would be responsible for coordinating the implementation of MarinePestPlan 2018-2023 in collaboration with marine industries and other users of the marine environment. Do you think MPSC was the most appropriate group for coordinating the implementation of MarinePestPlan 2018-2023?

Question 6: Do you have any suggestions for how implementation of MarinePestPlan 2018-2023 could be more effectively coordinated in the future?

Question 7: Responsibilities for specific MarinePestPlan 2018-2023 activities were agreed to during the plan's development and outlined in the plan. For each activity, the expected outcomes, project lead(s), and resource implications were identified. How clear were the responsibilities of each activity outlined in the plan?

2.2 Monitoring and prioritisation

Question 8: Activity leads reported biannually to the Australian Government Department of Agriculture, Fisheries and Forestry (as the report coordinator) on the progress of MarinePestPlan 2018-2023's 29 activities. This information was then collated, presented to MPSC, and published on marinepests.gov.au. How appropriate was the biannual reporting of the plan's progress?

Question 9: Monitoring and prioritisation of MarinePestPlan 2018-2023 activities were discussed at MPSC meetings held twice a year. How effective was using MPSC as the lead group to monitor and prioritise the plan's activities?

Question 10: Do you have any suggestions for an improved approach to reporting progress on the implementation of MarinePestPlan 2018-2023 projects?

Question 11: How inclusive was the MPSC monitoring, reporting, and implementation process for all marine pest biosecurity stakeholders?

Question 12: Do you have any additional suggestions for how marine pest biosecurity stakeholders could be better included in the monitoring, reporting, and implementation process?

Question 13: In October 2020, a mid-term review of MarinePestPlan 2018-2023 was conducted to document progress on activities, to guide prioritisation of incomplete activities, and to assess whether change was needed for objectives or activities within the plan. The mid-term review was published on www.marinepests.gov.au in 2021. How effective was the mid-term review for tracking progress and prioritisation of MarinePestPlan activities?

2.3 Resourcing

Question 14: MarinePestPlan 2018-2023 was intended to attract financial resources from existing funding sources throughout its implementation. How effective was MarinePestPlan 2018-2023 in attracting financial resources to help implement its agreed priorities?

Question 15: MPSC task groups were formed to support implementation of a range of activities in MarinePestPlan 2018-2023. How effective were MPSC task groups at progressing these activities?

Question 16: Do you have any suggestions on how to improve the attraction, allocation, and coordination of resources (either financial or in-kind) to implement MarinePestPlan 2018-2023 activities?

Section 3: Communication of progress and outcomes

Question 17: The Marine Pest Sectoral Committee (MPSC) developed the [National Marine Pest Stakeholder Engagement Strategy](#) to guide collective engagement on MarinePestPlan 2018-2023. Implementation of the Engagement Strategy was led by the MPSC. How effective was the implementation of the Engagement Strategy?

Question 18: Out of the options listed below, what are the top three communication methods your organisation preferred in order to receive updates on MarinePestPlan 2018-2023? Select your top three preferences.

Question 19: How effective was the communication on the implementation and outcomes of MarinePestPlan 2018-2023 activities?

Question 20: Do you have any suggestions for an improved approach to communicate updates on MarinePestPlan 2018-2023 activities?

Section 4: Outcomes and achievements of MarinePestPlan 2018-2023

Question 21: [MarinePestPlan 2018-2023](#) was Australia's first national strategic plan for marine pest biosecurity. The Plan outlined a coordinated approach to building Australia's capacity to manage the threat of marine pests over five years. In your opinion, how successful was MarinePestPlan 2018-2023 at achieving its overall desired outcome?

Question 22: There were five key objectives in MarinePestPlan 2018-2023. This question is related to Objective 1 – Minimise the risk of marine pest introductions, establishment and spread. How effective was the overall implementation of activities within Objective 1?

Question 23: There were five key objectives in MarinePestPlan 2018-2023. This question is related to Objective 2 – Strengthen the national marine pest surveillance system. How effective was the overall implementation of activities within Objective 2?

Question 24: There were five key objectives in MarinePestPlan 2018-2023. This question is related to Objective 3 – Australia’s preparedness and response capability for marine pest introductions. How effective was the overall implementation of activities within Objective 3?

Question 25: There were five key objectives in MarinePestPlan 2018-2023. This question is related to Objective 4 – Support marine pest biosecurity research and development. How effective was the overall implementation of activities within Objective 4?

Question 26: There were five key objectives in MarinePestPlan 2018-2023. This question is related to Objective 5 - Engage stakeholders to better manage marine pest biosecurity. How effective was the overall implementation of activities within Objective 5?

Question 27: What do you believe are the most significant overall outcomes or achievements from MarinePestPlan 2018-2023 (on a national marine biosecurity level and/or organisational level)?

Also, if you have any additional comments or feedback on specific activities within MarinePestPlan 2018-2023, you can include them here. Please include the activity number(s) in your response (refer to [MarinePestPlan 2018-2023](#) if required)

Section 5: Considerations for a successor strategy

Question 28: Do you think a successor strategy or plan to coordinate national marine pest biosecurity should be developed?

Question 29: MarinePestPlan 2018-2023 identified five key areas to strengthen Australia’s marine biosecurity system: 1) minimising risk of introduction and spread; 2) strengthening the surveillance system; 3) enhancing preparedness and response capability; 4) supporting research & development; 5) engaging stakeholders. Are there any objectives or activities from the current plan that should be considered for inclusion in a potential successor plan?

Question 30: Do you think there are any other marine pest biosecurity areas, issues or priorities that should be included in a potential successor strategy?

End of survey

This is the end of the survey. Before you submit your response, do you have any additional comments or feedback about MarinePestPlan 2018-2023 or this survey that you would like to share with us?

Appendix C: List of organisations that attended the development workshops

Organisation	Attended first workshop (Hobart)	Attended second workshop (Adelaide)
Aquenal	Yes	
ASD Diving	Yes	
Australian Antarctic Division	Yes	
Australian Institute of Marine Science		Yes
Australian Pearl Producers Association	Yes	
Australian Shipbuilding and Repair Group	Yes	
Biofouling Solutions	Yes	
Boating Industry Australia	Yes	Yes
BSE Maritime Solutions	Yes	
CoastCare	Yes	
Conservation Council of South Australia		Yes
Deakin University	Yes	Yes
Department of Agriculture and Fisheries, Queensland	Yes	Yes
Department of Agriculture, Fisheries and Forestry, Australian Government	Yes	Yes
Department of Energy, Environment and Climate, Victoria	Yes	Yes
Department of Industry, Tourism and Trade, Northern Territory	Yes	Yes
Department of Natural Resources and Environment, Tasmania	Yes	Yes
Department of Primary Industries and Regional Development, New South Wales	Yes	Yes
Department of Primary Industries and Regional Development, Western Australia	Yes	Yes
Department of Primary Industries and Regions, South Australia	Yes	Yes

Organisation	Attended first workshop (Hobart)	Attended second workshop (Adelaide)
Enzer Marine	Yes	
ES Link Services	Yes	
Flinders University		Yes
Great Barrier Reef Marine Park Authority	Yes	
Institute of Marine and Antarctic Studies	Yes	
Invasive Animals CRC	Yes	
James Cook University	Yes	
Marina Industries Association	Yes	
Marine Solutions	Yes	
Maritime Industry Australia	Yes	Yes
Minerals Council of Australia	Yes	Yes
National Aquaculture Council	Yes	
Northern Agricultural Catchment Council	Yes	
OceanWatch	Yes	Yes
Oysters Tasmania	Yes	
Petuna Seafoods	Yes	
PGM Environment	Yes	Yes
Ports Australia	Yes	
RecFish Australia	Yes	
Shipping Australia	Yes	
Southern Cross University	Yes	
Tasmanian Abalone Growers	Yes	
Tasmanian Salmon Growers Association	Yes	
Tasmanian Seafood Industry Council	Yes	
Tasports	Yes	Yes
University of Adelaide	Yes	
University of New South Wales	Yes	
Woodside Energy	Yes	
Yachting Australia	Yes	

Appendix D: Acronyms and abbreviations

Acronym/abbreviation	Definition
BWM	Ballast water management
BWMS	Ballast water management system
DAFF	Department of Agriculture, Fisheries and Forestry
eDNA	Environmental DNA
EMPPan	Emergency Marine Pest Plan
IBIS	International Biosecurity Intelligence System
IMO	International Maritime Organization
MPSC	Marine Pest Sectoral Committee
NBC	National Biosecurity Committee
NEBRA	National Environmental Biosecurity Response Agreement
NIMPIS	National Introduced Marine Pest Information System
NGOs	Non-government organisations
R&D	Research and development
RIS	Regulation impact statement