

FINAL

Recreational Fishers in the NT

Integrating recreational fisher experience and satisfaction into decision making

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In submitting this report, the researcher has agreed to FRDC publishing this material in its edited form.

Foreword

This comprehensive study on recreational Barramundi fishing in the Northern Territory represents a significant step forward in our understanding of fisher experiences, preferences, and satisfaction levels. The project addresses a critical gap in contemporary management practices, through the development of an evidence-based approach to understand and quantify recreational fisher social dimensions that could be incorporated into fishery harvest strategies.

Integrating social performance metrics into fisheries management is essential, especially in fisheries that have a significant recreational sector looking to optimise social and economic benefits. Recreational fishing is not just a popular pastime in the Northern Territory; it is a vital component of culture, economy, and identity. By gaining a deeper understanding of what drives recreational fisher satisfaction and behaviour, fisheries managers can be better equipped to make management decisions that go beyond the baseline of ensuring stock sustainability.

This study will benefit a wide range of stakeholders. Fisheries managers will gain valuable insights to inform more holistic and effective management strategies. It establishes a method for the recreational fishing community to have their experiences and preferences reflected in policy decisions. Tourism operators and local businesses that rely on recreational fishing will benefit from strategies that enhance client satisfaction and pave the way for potential increases in visitation or diversified offerings.

Key findings from this research include high overall satisfaction levels among NT barramundi fishers, the strong emphasis placed on conservation and environmental quality, and the variations in preferences and behaviours across different segments of the fishing community. The study also revealed important insights about communication preferences and willingness to participate in data sharing among the fishing community.

Based on these findings, I urge policymakers and fisheries managers to consider adopting a more integrated approach to management plans and harvest strategies that incorporates both biological indicators and fisher satisfaction metrics. Stakeholders across the recreational fishing sector should engage with these findings and actively participate in the ongoing dialogue about how to optimise fisheries management.

The outcomes of this research provide a robust framework for enhancing management practices, potentially leading to a more sustainable and satisfying recreational fishery. By implementing the recommendations outlined in this report, there is opportunity to set a new standard in recreational fisheries management, not just for the Northern Territory, but as a model for other jurisdictions.

This study represents an important step in the journey towards more sustainable, enjoyable and valued recreational fishing. I commend our research team for their thorough work and look forward to seeing how these insights will shape the future of Barramundi fishing in the Northern Territory.

Neil Howells Principal Researcher Partner, Hudson Howells

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We are deeply grateful to the Amateur Fishermen's Association of the Northern Territory (AFANT) and the Northern Territory Guided Fishing Industry Association (NTGFIA) for their active participation and support. Their knowledge of the local fishing community and assistance in engaging recreational fishers were essential to the success of this project.

Special thanks go to all the recreational fishers who participated in our surveys and focus groups. Their willingness to share their experiences, opinions, and time forms the backbone of this research.

We acknowledge the contributions of our research team members from Hudson Howells, Action Market Research, Fishwell Consulting, In-Depth Innovations and Power Stats. Their expertise in various aspects of the study, from survey design to data analysis, has been invaluable.

We would also like to thank the staff at various boat ramps and fishing locations across the Northern Territory who assisted with the intercept surveys. Their cooperation was crucial in gathering on-site data.

Finally, we express our gratitude to the peer reviewers who provided constructive feedback on our research methodology and findings, helping to enhance the quality and robustness of this study.

This project truly embodies the spirit of collaboration between researchers, fisheries managers, industry representatives, and the angling community. We are confident that the insights gained from this collective effort will contribute significantly to the sustainable management of recreational fishing in the Northern Territory.

Abbreviations

AFANT - Amateur Fishermen's Association of the Northern Territory ABS - Australian Bureau of Statistics FRDC - Fisheries Research and Development Corporation L12M - Last 12 Months MaxDiff - Maximum Difference Scaling NPS - Net Promoter Score NT - Northern Territory NTGFIA - Northern Territory Guided Fishing Industry Association Q - Question (e.g., Q1, Q2, etc.) Std. Dev. - Standard Deviation

Executive Summary

What The Report Is About

This report presents findings from a comprehensive study examining recreational Barramundi fishing experiences in the Northern Territory (NT), with the goal of integrating fisher satisfaction metrics into fishery harvest strategies. The research provides evidence-based recommendations for optimising management approaches while maintaining the long-term health of the fishery.

Background

Recreational fishing contributes approximately \$270 million annually to the NT economy and supports 2,500 FTE jobs. The Barramundi fishery is particularly significant, with Traditional, commercial, and recreational sectors all having important stakes. Recent policy changes, including the planned phase-out of commercial gillnetting by 2028, highlight the growing focus on recreational fishing. Historically, management has centred on commercial considerations, creating a need for better integration of recreational perspectives.

Aims/Objectives

The primary objective was to document an evidence-based approach for NT Fisheries to integrate recreational fisher experiences and satisfaction levels into fishery harvest strategies. Supporting objectives included:

- Conducting comprehensive literature review
- Collaborating with key stakeholders
- Developing detailed assessment methodology
- Conducting qualitative research
- Designing and implementing comprehensive survey instruments
- Providing pragmatic guidance for implementation

Methodology

The study employed a mixed-methods approach including:

- Literature review
- Stakeholder engagement through meetings and workshops
- Focus groups with recreational fishers
- Multi-mode survey implementation (face-to-face, online, telephone)
- MaxDiff analysis to determine relative importance of various fishing aspects
- Statistical analysis of satisfaction metrics

Results/Key Findings

Key findings include:

- High overall satisfaction with Barramundi fishing (mean score 7.75/10)
- Primary motivations: spending time with family/friends (68%), relaxation (67%), excitement (52%)
- Most important factors:
 - 1. Maintaining abundant Barramundi populations
 - 2. Environmental quality of fishing areas
 - 3. Enforcement of fishing regulations
 - 4. Ease of access to fishing spots
 - 5. Availability of Barramundi in preferred locations
- Regional variations in satisfaction, with Daly River scoring highest (8.33/10) and Darwin Harbour lowest (7.30/10)
- Strong preference for digital communication channels
- High willingness to share fishing information (mean score 6.71/10)

Implications for Relevant Stakeholders

For Fishery Managers:

- Opportunity to optimise social and economic benefits given the healthy fish stocks
- Focus on enhancing recreational experiences
- Requirements for improved communication about fishery health status

For Recreational Fishers:

- Better integration of their perspectives into management decisions
- Improved communication channels
- Enhanced focus on factors most important to their satisfaction

For Tourism Sector:

- Potential for growth based on high visitor satisfaction
- Need for infrastructure and access improvements
- Opportunity for enhanced visitor experiences

Recommendations

- 1. Develop integrated performance indicators combining biological metrics with satisfaction scores
- 2. Implement regular standardised satisfaction surveys
- 3. Establish a Harvest Strategy Working Group
- 4. Define clear decision rules linking satisfaction metrics to management actions
- 5. Create region-specific satisfaction targets
- 6. Implement real-time data collection systems
- 7. Establish formal review processes
- 8. Incorporate non-catch related factors into management strategies

Pragmatic Integration of Recreational Fisher Satisfaction Metrics

Implementation recommended through a two-tiered approach:

- 1. Immediate focus on catch-dependent factors within current management control
- 2. Long-term development of comprehensive satisfaction management including non-catch factors
- 3. Regular assessment and review cycles
- 4. Clear communication frameworks
- 5. Pilot testing in specific regions

Conclusion

The study provides a robust framework for integrating recreational fisher satisfaction into NT Barramundi fishery management while preserving the fishery's robust status. The findings offer practical pathways for implementation and potential application to other fisheries and jurisdictions. Success will require ongoing collaboration between managers, stakeholders, and the fishing community to balance diverse needs while optimising social and economic benefits.

Keywords

Recreational fishing, Barramundi, Northern Territory, Fisher satisfaction, Fishery management, Harvest strategy, Social dimensions, Conservation, MaxDiff analysis, Citizen science, Adaptive management, Fisheries sustainability, Fisher behaviour, Fishing tourism, Environmental quality, Digital communication, Stakeholder engagement, Fishery regulations, Catch and release, Ecosystem-based management

1. Introduction

Recreational fishing is an important activity in the Northern Territory, and its cultural, social, and economic significance is well-documented. According to the Northern Territory Government and reports from the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), recreational fishing is not only a major pastime but also a vital contributor to the region's economy and cultural identity. The Northern Territory's recreational fishing industry is estimated to contribute \$270 million annually to Territory GDP, supporting tourism and local businesses including 2,500 (FTE) jobs (https://www.frdc.com.au/sites/default/files/2023-07/northern_territory_rec_fishing_survey_-web.pdf).

The NT Barramundi fishery is particularly central to this impact, and it plays an important a role across Traditional, commercial, and recreational fishing sectors. Barramundi stocks consist of distinct sub-populations in each major catchment, a biological characteristic that requires tailored management approaches within each major river system / region. For Aboriginal communities in the NT, Barramundi has been a culturally important species and food source for millennia, managed sustainably through traditional knowledge and practices. In past decades, Barramundi has also been an important commercial species, providing NT restaurants and retail outlets with wild-caught fish. In, recent decades government has reduced commercial gillnetting (the only legal method of commercial harvest) and in 2024 announced a policy to phase out all commercial barramundi gillnetting by 2028.

The recreational and tourism sectors have seen the substantial growth over recent decades, with Barramundi cemented as an iconic sport fish targeted by both local fishers and tourists. With increased participation and reduced commercial harvest, recreational barramundi fishing has expanded significantly. There is an ongoing need to continually balance fishing pressures among the sectors with maintaining abundant Barramundi stocks and optimising returns to society.

Historically, the sustainable management of Barramundi stocks in the NT has focused predominantly on commercial considerations. With the expansion of commercial fishing and the introduction of monofilament gillnets, fishing pressures rose, impacting the sustainability of Barramundi populations. In response, mandatory logbooks and management plans were introduced to monitor and regulate fishing effort, and more broadly. Management has generally focussed on biological reference points such as biomass at maximum sustainable yield (B_{MSY}), and like elsewhere were largely designed with commercial objectives in mind, with minimal focus on recreational or Indigenous interests. Additionally, performance assessments were primarily based on commercial metrics, such as catch-per-unit-effort (CPUE), rather than experiential metrics.

With the contraction of commercial harvest and growth of recreational barramundi fishing, there has been increasing recognition of its value to the NT's economy and culture. In line with this (as well as for the protection of Threatened, Endangered and Protected Species), the NT implemented netting closures in river systems, as well as specific (resource sharing) closures in certain river systems and coastal areas to limit commercial fishing for Barramundi. These areas (e.g. Darwin Harbour, Bynoe Harbour, Shoal Bay and the Mary River), have effectively been designated as permitting only Traditional harvest, recreational fishing and tourism fishing. Some rules such as maximum size limits and gear restrictions have been introduced with the idea of optimising fishing experiences. These approaches have aimed for a balanced use of the resource, with reduced commercial fishing pressure generally resulting in healthier Barramundi stocks across the NT. Yet, fishery performance metrics have remained commercially focused at the jurisdictional scale, underscoring a need for a more inclusive, appropriate and scaled approach to incorporate recreational fishing metrics, especially in areas without relevant commercially derived data. Recognising this gap, the Northern Territory Department of Agriculture and Fisheries, working closely with key recreational stakeholders such as the Amateur Fishermen's Association of the Northern Territory (AFANT) and the Northern Territory Guided Fishing Industry Association (NTGFIA), highlighted the importance of incorporating social indicators and experiential performance metrics into fishery management. Based on their collective recommendations, the Barramundi fishery was chosen as a focused case study. This collaborative project—undertaken by Hudson Howells, Action Market Research, Fishwell, Power Stats, AFANT, and NTGFIA and commissioned by the Fisheries Research and Development Corporation (FRDC)—aims to understand the drivers and trends shaping recreational fishers' behaviours and satisfaction in the Northern Territory.

This study addresses the potential to integrate recreational fishers experiences and satisfaction into NT fisheries harvest strategies and/or management frameworks, providing actionable insights that align management with the needs and aspirations of the recreational fishing community and fishing tourism industry. By collecting and analysing data on recreational fishers' experiences and satisfaction, the project aimed to establish a foundation for NT Fisheries to align fishery management with the needs of recreational fishers, ensuring that the Barramundi fishery continues to thrive as a key resource and cultural asset.

It is important to note that the findings of this study specifically relate to the Barramundi fishery, a species known for its abundance in the NT, where there are strong Traditional fishing rights, as well as considerable focus on optimising outcomes for recreational fishing and fishing tourism. As such, the insights and management approaches outlined may not be directly transferable to other fisheries or jurisdictions where fish populations, competing sector interests, or ecological contexts differ significantly. These limitations are addressed in the 'Discussion and Implications' section of the report, providing guidance on the applicability of the findings to other contexts.

With over five years of focused experience in studying recreational fishing and consumer behaviour, the PI and lead researchers bring essential expertise to this project. This includes specialised skills in sampling techniques, survey development and implementation, market segmentation, and consumer behaviour modelling—all critical for accurately capturing and analysing the diverse motivations and satisfaction levels of recreational fishers. This recent experience has directly shaped both the methodology and the interpretation of findings, ensuring that the insights gained are robust, reliable, and relevant to the goals of sustainable fishery management. The team has brought a wealth of diverse fishery research, fishery management, and fishing industry knowledge spanning decades to the project.

At the time of preparing this report, the FRDC Project 2021-098, titled "Incorporating Aboriginal Perspectives into Fishery Management Review Processes, Using the Northern Territory Barramundi Fishery as a Case Study," was also underway. Our team reached out to one of the project investigators to provide an update on our own project. During this exchange, we discussed some preliminary insights from their work, noting that their project is currently paused.

To ensure comprehensive findings, a collaborative approach was adopted, bringing together the research team, NT Fisheries, and various stakeholders. This partnership enabled access to valuable data, expertise, and networks, fostering a well-rounded understanding of both the issues and opportunities in integrating recreational fisher experiences into fisheries management. This cooperative effort also ensured that findings and recommendations could be effectively shared and implemented, thereby enhancing the sustainability, enjoyment and benefits of recreational fishing in the Northern Territory.

2. Objectives

The key objective of this study was to document an evidence-based, pragmatic approach that can be used by NT Fisheries to integrate recreational fisher experiences and satisfaction levels into its fishery harvest strategies. This overarching objective was supported by several specific goals:

- 1. Conduct a comprehensive literature review to identify relevant documents, strategies, and reports related to recreational fisher experiences, satisfaction levels, and their integration into fishery harvest strategies.
- 2. Collaborate closely with NT Fisheries, AFANT, and other key stakeholders to determine the issues involved, select an appropriate fishery for a case study approach, and develop an optimal strategy for engaging with the recreational fishing sector.
- 3. Develop and document a detailed methodology for assessing recreational fisher experiences and satisfaction levels, tailored to the specific needs and context of the Northern Territory.
- 4. Conduct qualitative research, including focus groups with recreational fishers and additional stakeholders, to gain a deeper understanding of the factors influencing fisher experiences and satisfaction levels.
- 5. Design a comprehensive research instrument (survey) to quantitatively assess recreational fisher experiences and satisfaction levels, incorporating insights from the qualitative research and input from key stakeholders.
- 6. Implement the survey, targeting a representative sample of recreational fishers in the Northern Territory, and analyse the collected data to identify key trends, drivers, and opportunities for improvement.
- 7. Prepare a user-friendly report that presents the findings of the study and provides pragmatic guidance for NT Fisheries to integrate recreational fisher experiences and satisfaction levels into its fishery harvest strategies, including recommendations for implementation.

By achieving these objectives, the study aimed to provide NT Fisheries with the necessary information and tools to make informed decisions and optimise the management of fishery resources in the Northern Territory, ultimately benefiting both recreational and commercial fishers through improved harvest strategies and alignment between sectors.

3. Method

To achieve the objectives of this study, a comprehensive and collaborative approach was employed, involving a combination of literature review, stakeholder engagement, qualitative research, and quantitative surveying. The methodology was designed to ensure that the findings would be robust, relevant, and actionable for NT Fisheries in their efforts to integrate recreational fisher experiences and satisfaction levels into fishery harvest strategies.

- 1. Literature Review: A comprehensive literature review was conducted to identify and synthesise relevant documents, strategies, and reports related to recreational fisher experiences, satisfaction levels, and their integration into fishery harvest strategies. The findings of this review were used to inform the subsequent stages of the project and to provide context for the development of the research methodology.
- 2. Stakeholder Engagement: The research team worked in close collaboration with NT Fisheries, AFANT, NTGFIA and other key stakeholders throughout the project. An inception meeting was held in Darwin to discuss and agree upon the scope, goals, and expectations of the project, as well as to identify key issues, sensitivities, and additional background materials. The engagement process also involved confirming the Barramundi fishery for the case study approach and developing strategies for promoting the study and ensuring optimal participation from the recreational fishing sector. A stakeholder meeting with representatives from the NT recreational fishing sector was then held which aimed to inform the development of a questionnaire for the upcoming survey of recreational fishers.
- 3. Qualitative Research: Qualitative research, in the form of two focus groups, was conducted in Darwin in August 2023. The focus groups explored the experiences and satisfaction levels of recreational fishers, as well as pertinent issues related to recreational fishing in the Northern Territory. The insights gained from this qualitative phase were used to inform the development of the quantitative survey instrument.
- 4. Survey Design and Implementation: Based on insights from the literature review, stakeholder engagement, and qualitative research, a survey instrument was carefully designed to quantify the experiences and satisfaction levels of recreational fishers in the Northern Territory.

Multiple methods for ranking importance were evaluated by the research team, including Importance Ranking, Importance Rating, Discrete Choice Modelling, and Maximum Difference Scaling (MaxDiff). Ultimately, MaxDiff was selected for this study, with each method offering distinct advantages and challenges, detailed as follows:

Importance Ranking

Advantages: Simple to implement and understand, requiring participants to rank items based on perceived importance. It offers straightforward comparative insights among different items.

Disadvantages: Limited by its ordinal nature, it does not measure the degree of importance between ranked items, and participants may find it challenging to rank many items accurately.

Importance Rating

Advantages: Allows respondents to rate the importance of each item on a scale (e.g., 1 to 10), providing more granular insight into the degree of importance. It is easier for respondents to handle a large number of items and is familiar in survey formats.

Disadvantages: Susceptible to bias, such as scale bias, where participants rate all items similarly (e.g., high or low across the board). Ratings can also be influenced by cultural or personal tendencies toward certain numerical scales, potentially reducing differentiation among items.

Discrete Choice Modelling (DCM)

Advantages: Offers insights into real-world trade-offs by simulating choice scenarios, where respondents must choose between competing options. DCM captures preferences and values associated with each choice, which helps inform decision-making about what respondents value most.

Disadvantages: More complex to design and analyse; it requires significant cognitive effort from respondents, especially with larger item sets. DCM also demands extensive computational resources for data processing and model analysis.

Maximum Difference Scaling (MaxDiff)

Advantages: Allows respondents to indicate the most and least important items within a subset, which improves accuracy in assessing relative importance. MaxDiff effectively differentiates between items and mitigates the risk of scale bias by forcing respondents to make choices rather than simply rating each item.

Disadvantages: While less complex than DCM, MaxDiff still requires moderate cognitive engagement, which can lead to participant fatigue if the item list is extensive. Additionally, it requires more sophisticated analytical techniques than simple ranking or rating.

After consideration of these methods, MaxDiff was selected as the most suitable for this study. Its strength in accurately capturing the relative importance of various drivers and satisfaction factors made it an ideal choice for prioritizing the factors most influential in recreational fishers' satisfaction levels. The survey implementation used a multi-mode approach, including face-to-face interviews, online surveys, and telephone interviews, with a target of 400 completed interviews to ensure a representative sample of recreational fishers in the Northern Territory. Respondents were required to have fished recreationally in the Northern Territory within the past 12 months.

5. Data Analysis and Reporting: Upon completion of the survey, the collected data were analysed using a range of statistical techniques, including descriptive statistics, MaxDiff analysis, and segmentation based on fisher characteristics and preferences. The findings were synthesised into a comprehensive report, which included a detailed presentation of the results, as well as practical recommendations for NT Fisheries to integrate recreational fisher experiences and satisfaction levels into their fishery harvest strategies.

A draft report was presented to the advisory group for review and feedback, with the final draft report incorporating agreed changes. The final draft report was then submitted to FRDC for review. Feedback provided by the FRDC reviewer was then further considered by the advisory group and revisions made to the report before being finalised. The final report was then submitted to FRDC.

The final report was then presented to the advisory group and invited stakeholders in Darwin, ensuring that the outcomes of the study were effectively communicated to all relevant parties.

It has been proposed that additional funding be sought to hold a workshop in Darwin to progress how the findings of the project can best be integrated into the Barramundi management framework and/or harvest strategy and that a report of the workshop be produced to complement and better inform the adoption of this study.

4. Results

4.1 Literature Review

A literature review was undertaken in August 2023 by Ian Knuckey and Paul McShane, 2023. A copy of the literature review report is appended (Appendix 1 – Literature Review Report)

The literature review explored the potential for integrating social yield outcomes for recreational fishers into the development of a harvest strategy for the Northern Territory Barramundi fishery. It highlighted the importance of considering the diverse motivations and expectations of recreational fishers, which extend beyond simply catching and retaining fish.

The literature review revealed that recreational fishers can be broadly categorised into social, harvest, and trophy fishers, each with different priorities and expectations from their fishing experience. Fisher satisfaction was found to be a key driver of recreational fishing behaviour and is influenced by factors such as catch rate, size of fish caught, and social context. The review also noted that fisheries' managers can influence fisher satisfaction through regulations that affect catch rates and the availability of large fish, such as bag limits, size limits, and spatial management.

The negative impact of crowding and competition with other fishers on the recreational fishing experience was emphasised in the review, suggesting that harvest strategies that encourage the dispersal of fishing effort may be beneficial. The review also highlighted the unique characteristics of the Barramundi fishery in the Northern Territory, including the lack of significant conflict between recreational and commercial sectors, due in part to the extensive closures to commercial fishing.

The importance of engaging Indigenous communities and considering cultural fishing practices in the development and implementation of a Barramundi harvest strategy was also underscored. The review noted that education, outreach, and the use of technology such as smartphone apps can play a role in promoting sustainable fishing practices and gathering data to inform management decisions.

The literature review provided insights into the various management tools available to influence recreational fishing outcomes, such as bag limits, size limits (including slot limits), and spatial and temporal closures. It also discussed the potential benefits and challenges associated with each of these tools, as well as the importance of considering factors such as discard mortality and compliance when designing and implementing regulations.

Furthermore, the review highlighted the value of co-management approaches and stakeholder engagement in the development of recreational harvest strategies. This includes the involvement of recreational fishing organisations, Indigenous communities, and other key stakeholders in the decision-making process, as well as the establishment of appropriate monitoring and evaluation frameworks to assess the effectiveness of management interventions.

In conclusion, the literature review emphasised that a Barramundi harvest strategy focused on improving social yield outcomes for recreational fishers should prioritise management interventions that ensure satisfactory catch rates and the availability of large fish. The development of such a harvest strategy will require collaboration with key stakeholders and the establishment of appropriate monitoring programs to track performance indicators and inform adaptive management. By considering the diverse needs and expectations of recreational fishers, as well as the cultural and social context of the fishery, managers can work towards optimising the social and economic benefits derived from the Barramundi fishery while ensuring its long-term sustainability.

4.2 Stakeholder Engagement

A stakeholder meeting with representatives from the NT recreational fishing sector was held on August 22, 2023, at the offices of the Amateur Fishermen's Association of the Northern Territory (AFANT) in Darwin. A copy of the Stakeholder Group Findings Report is appended (Appendix 2 -Stakeholder Group Findings Report).

The summary of the main points discussed during the stakeholder meeting follows:

- 1. Advancements in technology: Participants acknowledged the significant impact of modern electronics on fishing strategies, particularly in targeting Barramundi. The widespread use of these technologies among both dedicated and casual fishers was noted, along with the evolving nature of fish behaviour in response to increased fishing pressure.
- 2. Fishing pressure and resource impact: The group highlighted the substantial pressure on fishery resources during events like the Barra Nationals and the influx of tourists, especially in popular areas such as the Daly River. Concerns were raised about overcrowding and its impact on the overall fishing experience. Access restrictions have led to the displacement of effort, resulting in heightened competition for the remaining accessible areas.
- 3. Regulations and policies: Opinions on fishing regulations varied among participants, with unanimous support for the upper size limit for Barramundi. Licensing emerged as a topic of debate, with suggestions to reinvest revenue from licenses into recreational fishing initiatives. Participants also expressed a desire for clearer communication from the NT Government regarding permissions required to access Aboriginal land and waters for recreational fishing.
- 4. Biodiversity, fish populations, and environmental concerns: The group recognised the importance of fish abundance for a satisfying fishing experience, discussing shifts in fish behaviour due to boat traffic and weather patterns. While fisheries management was credited for increasing fish abundance, concerns were raised about the perception of commercial fishing's impact. The need to address environmental challenges, such as sea level rise and climate change, was also highlighted.
- 5. Accessibility and infrastructure: Stakeholders emphasised the importance of accessibility to fishing destinations, expressing a desire for improved infrastructure in specific locations while maintaining the Territory's rugged appeal. The ability to access to rivers and intertidal waters overlying Aboriginal land was also a considerable concern for fishers.
- 6. NT policies and future considerations: Participants acknowledged the importance of welldefined policies in areas such as inshore fisheries and water management. The role of AFANT as a peak body representing recreational fishers was highlighted, along with the need for collaboration among major clubs to effectively voice concerns and ideas.
- 7. Overall satisfaction and reasons to fish: Satisfaction levels with recreational fishing in the NT varied among stakeholders, ranging from 6 to 8 on a scale of 1 to 10. The top three reasons for recreational fishing were catching large Barramundi, seeking adventure and unique experiences, and embracing the risks associated with fishing in the NT's dynamic environment.

Stakeholders also discussed various other issues, including the need to address feral animals and plants, preserve Darwin Harbour's integrity, balance environmental protection with access, allocate

resources fairly among sectors, support junior angling initiatives, negotiate access agreements, increase research efforts, and improve government communication about fisheries initiatives.

In conclusion, the stakeholder meeting provided valuable insights into the trends, challenges, and aspirations within the NT recreational fishing sector. The perspectives shared informed the development of the forthcoming survey questionnaire.

4.3 Qualitative Research

Two focus groups with casual and avid recreational fishers in the Northern Territory were held on August 22, 2023, at the offices of the Amateur Fishermen's Association of the Northern Territory (AFANT) in Darwin. A copy of the Participant Focus Groups Report is appended (Appendix 3 -Participant Focus Groups Report).

The summary of the main points discussed during the focus groups is as follows:

- 1. Overall fishing preferences: Barramundi was the favourite fish species to catch for most participants. Popular fishing spots included Darwin Harbour, Mary River, and Daly River. The majority of participants enjoyed fishing with others, typically friends and family, and tended to release some of their catch while keeping some for consumption.
- 2. Satisfaction with Barramundi fishing experiences: Participants found catching a few fish, getting out in nature, and the sense of community with friends and family to be the most satisfying aspects of their Barramundi fishing trips. Dissatisfaction stemmed from fishing pressure, overcrowding, size and bag limits, and restrictions on fishing locations.
- 3. Satisfaction with various aspects of fishing: Participants were most satisfied with current size and bag limits, the range of fish species available, and the number of fish caught in a single trip. They were least satisfied with the enforcement of fishing regulations, opportunities for their opinions to be considered in the development of harvest strategies, and the effectiveness of fishery management practices in maintaining healthy fish populations.
- 4. Importance of fishing elements: The environmental quality of fishing areas, the availability of fish species in preferred fishing spots, and existing recreational fishing regulations were considered the most important factors by participants. Less important factors included ease of access to fishing information and guidelines, ease of communicating with NT Fisheries, and opportunities to be involved in decision-making processes.
- 5. Overall satisfaction with recreational fishing in the NT: Participants rated their satisfaction between 5-10 on a scale of 1 to 10, with a mean score of 7.25. Accessibility to fishing, scenery, and the natural environment contributed to satisfaction, while overcrowding, restrictions on areas, and a desire for better enforcement of regulations were reasons for lower satisfaction ratings.
- 6. Suggestions for improvement: Participants suggested better management of fisheries sustainability, upgrades to boat ramp infrastructure, and greater certainty about future access to waterways as ways to improve their satisfaction with fishing in the NT.
- 7. Other comments: Participants discussed various topics, including the need for better policing of regulations, the impact of commercial fishing, the potential introduction of fishing licenses, declining fish numbers and sizes, challenges related to land rights and access, the role of technology in fishing, and the need for increased funding and management of the recreational fishing sector.

In conclusion, the focus group discussions provided valuable insights into the preferences, experiences, and satisfaction levels of casual and avid recreational fishers in the NT. The findings informed the development of the questionnaire for the upcoming survey, ensuring that it captured the specific aspects of the Barramundi fishery and the broader recreational fishing sector in the NT.

4.4 Survey Design and Implementation

Introduction

Undertaking a research activity in the Northern Territory is challenging given the diverse populations, remote communities and smaller populations available to sample. Our approach to address this challenge was to:

- Recognise at the outset the difficulties of sampling recreational fishers in the NT and design the survey accordingly.
- Be as flexible as possible by offering the respondent different ways to participate that suited them, including online (either from a computer or a device), or by telephone at a time that suited them.
- Have the support of key stakeholders in promoting the survey amongst their communities, providing these communities certainty that the research was legitimate and important for the Northern Territory.
- Where possible, target recreational fishers at the time and location closest to their fishing activity, by asking for their support in participating at the boat ramps of the key fishing regions.
- Use telephone calls to cater for households and respondents in the Northern Territory, that might be less tech-savvy, and less likely to be on social media, and non-members of fishing associations.
- Undertake an online survey using accredited research-only panels to maximise the number of completed interviews.
- Boost participation in the research by using a prize draw.

The combination of these elements has provided a robust sample size for in-depth data analysis, including for analysis to be undertaken within fishing segments.

A description of each method is provided below, inclusive of the survey timing, and the sample performance for each method. A schematic (on the following page) has been provided as a simple overview of the sample sources and how they relate to the main survey.

Schematic



Boat Ramp Intercept Recruitment Interviews

Boat ramp intercept recruitment interviews took place in the two most appropriate seasons within the study period, including the 2023 dry/build-up season, and the post wet season period in April/May 2024.

The boat ramp intercept recruitment interview was a quick 3-minute face-to-face interview undertaken by trained interviewers, inclusive of capturing the fisher's willingness to participate in the main interview and capturing their contact information. This information was then used to invite their participation in the main survey either online or via telephone.

The questionnaire for this activity included:

- A confirmation that the fisher had targeted barramundi.
- A capture of the region they fished.

- The number of barramundi caught and then released, and the number of barramundi caught for consumption.
- The size of the largest barramundi caught and then released, and the size of the largest barramundi caught for consumption.
- Satisfaction rating for their overall fishing experience, and their reasons for giving that rating.
- Satisfaction for their fishing specifically today, and their reasons for giving that rating.
- Respondent contact information to invite their participation in the main survey.

A copy of the questionnaire used for this activity is provided as Appendix 4 – Boat Ramp Intercept Survey Questionnaire.

These interviews were completed face-to-face, using a pen and paper version of the survey, and then data entered into an online version of the survey.

The boat ramp intercept surveys occurred at three fishery locations – Darwin Harbour, Mary River and Daly River. A total of 547 boat ramp intercept interviews was completed, with the following completed at each of the three fishery areas:

NT Fishery Area	Dry/Build-up Nov/Dec 2023	Post wet season Apr/May 2024	Total
Darwin Harbour	152	0	152
Mary River	0	186	186
Daly River	0	209	209
Total	152	395	547

Table 1 - Boat ramp intercept recruitment completions by location

Among the 547 who completed the boat ramp intercept interview, a total of 186 completed the main survey component, or a 34% full participation rate.

Among the fishery areas, the participation rate was:

NT Fishery Area	Total Number of Boat Ramp Intercept Completes	Total Number Who Also Completed Main Survey	Participation Rate
Darwin Harbour	152	57	37.5%
Mary River	186	67	36.0%
Daly River	209	62	29.7%
Total	547	186	34.0%

Table 2 - Number of main survey completions from boat ramp intercept recruitment

Overall, the recruitment from the boat ramp intercept interviews is a key source of the main survey completed interviews for this study, representing 35% of main survey completed interviews.

Of these that completed the main survey, 29 (15.6%) completed the main survey using an online self-complete method, and the remainder 157 (84.4%) completed the main survey via telephone with a trained interviewer.

Main Survey

The main survey was designed as a mixed methodology to provide respondents flexibility in completion, and increasing the overall sample size.

The main survey was open for completion from November 2023 to June 2024. Several sample sources and methods were used during this period, inclusive of:

Sample Source	Method Description
AFANT Landing Page (website)	Online survey link promoted on website, self-complete
AFANT Database promotion	Online survey link distributed by AFANT to its database of members, self-complete
AFANT social media	Online survey link promoted via AFANT's social media channels, self-complete
NTGFIA Database promotion	Online survey link promoted by NTGFIA members to promote to their individual databases, self-complete
Media promotion	Online survey link promoted via a Media release, self-complete
Barra Nationals	Online survey link promoted by Barra Nationals to its social media channels, self-complete
Boat Ramp Intercept Recruits	Initially offered an online survey to complete, with telephone interviews undertaken with non-responders to boost participation
Random Household Approach	A telephone survey approach to random households in the Northern Territory from purchased lists of phone numbers.
Online Research Only Panels	An online survey self-complete of NT residents from accredited online research only panels

Table 3 - Sample sources and methodology used

The questionnaire used for the main survey was a longer survey, with an average interviewing time of 35 minutes. The questionnaire included a series of key sections including:

- <u>Screening</u> to ensure the respondent was 18+, and had fished for Barramundi in the NT within the previous 12 months.
- <u>Barramundi Fishing Last 12 Months</u> a section to capture diagnostics about their Barramundi fishing in the last 12 months including frequency and locations.
- <u>Most Recent Barramundi Fishing Experience</u> a section to capture diagnostics relating to their most recent trip, including length, location, number and size of fish caught, purpose, techniques, other activities and species. This section also captures their satisfaction ratings, and the reasons for satisfaction.
- <u>MaxDiff</u> a section to undertake the best/worst scaling across 18 key statements.
- <u>Satisfaction Specifics</u> a section to measure the satisfaction of the 18 key statements

- <u>Promoters</u> a section to measure the Net Promoter Score and reasons.
- <u>Communication and Information</u> a section to capture diagnostics related to communication with NT Fisheries and AFANT, including recency, how best to receive information, types of information to receive, willingness to share information, method to provide information and fisheries management ratings.
- <u>Demographics</u> a section to capture demographic information, including boat ownership, gender, marital status, household status, Aboriginal or Torres Strait Islander status, living with disability status, occupation, education, income and culturally and linguistically diversity.

The questionnaire used for the main survey was hosted using an online survey tool, limesurvey. Each of the sample sources above were provided a separate survey link to enable analysis of the performance of each method. The telephone interviewing team used the same survey tool, so that data was captured centrally using the same survey tool enabling easy data merging and analysis.

Sample Source	Number of Completed Interviews	Percentage of Total Sample
AFANT Landing Page (website)	14	2.6%
AFANT Database promotion	24	4.5%
AFANT social media	6	1.1%
NTGFIA Database promotion	1	0.2%
Media promotion	56	10.6%
Barra Nationals	4	0.8%
Boat Ramp Intercept Recruits	186	35.1%
Random Household Approach	43	8.1%
Online Research only Panels	196	37.0%
Total Sample	530	100%

A total of 530 completed interviews was achieved from these sample sources. A breakdown of the number of completed interviews from each source is provided below:

 Table 4 - Number of completed interviews by each sample source

The total sample of n=530 completes provides a confidence interval of +/- 4.3% at 95% confidence when reporting on the total result.

Data Review and Preparation

Prior to the data being analysed, the raw data collected was thoroughly reviewed to check for the following:

Data checks performed	Result
Any duplicate responses?	Across all survey versions, a total of 585 completed interviews were captured. A total of 17 respondents were clearly duplicate responses via both their IP address and contact details provided matching. The first response by each respondent was included in the final outcome. The second completed response by each respondent was discarded. Note that duplicates were checked within each survey version and across survey versions.
Any obvious poor responders?	A total of 38 respondents were excluded from the final outcome due to responding to the survey too quickly, or obvious strings of responses to arrays/straight-lining answer, or provided junk verbatim responses. A combination of these elements was used to determine an obvious poor response.
Completeness and accuracy	Each question was tested to ensure the responses given matched the answers allowed by the questionnaire. All skip patterns were also tested to ensure the respondents required to provide an answer did so, and those that were required to skip did so. All data passed this test.

Table 5 - Data review and cleaning steps

The data was prepared in both SPSS format, and Excel format and sent to Power Stats for the MaxDiff analysis. Data cleaning, tabulation and analysis has been undertaken using a combination of SPSS statistical package, Excel and OfficeReports tabulation software. Verbatim questions have been thematically coded in Excel, with the coding merged into the SPSS file prior to analysis taking place.

Sampling

Given the diverse range of sample sources used for this study, different sample selection methods were used for each, overlayed with screening questions to ensure qualified respondents participated in the research. The different sample selection types for each of the sample sources in detailed below:

Sample Source	Sample Type	Sample Selection Method	Participation Method
AFANT Landing Page (website)	Any that access the AFANT website	Non-probability, using convenience sampling	Self-complete, online survey
AFANT Database promotion	Membership Database	Non-probability, using convenience sampling	Self-complete, online survey
AFANT social media	Social media promotion	Non-probability, using convenience sampling	Self-complete, online survey
NTGFIA Database promotion	Membership Database	Non-probability, using convenience sampling	Self-complete, online survey
Media promotion	Media promotion (radio, print media and social media)	Non-probability, using convenience sampling	Self-complete, online survey
Barra Nationals	Social media promotion	Non-probability, using convenience sampling	Self-complete, online survey
Boat Ramp Intercept Recruits	Those who have fished for Barramundi at selected boat ramps	Non-probability, using convenience sampling	Interviewer recruitment at boat ramp, and participation in main survey either via self- complete online survey, or telephone interview conducted by interviewer
Random Household Approach	Landline and Mobile- phone database	Probability sampling, using a simple random selection method	Telephone interview conducted by interviewer
Online Research only Panels	Web panel	Non-probability, using access panel sampling	Self-complete, via online survey

Table 6 - Sampling summary for each sample source

Screening Questions

Screening questions were used in the questionnaire to exclude certain respondents from the research. The screening criteria was applied to all sample sources and included:

- Checking if the respondent is aged 18 years or older. All those under the age of 18 were excluded from this research.
- For those who reside outside of the Northern Territory (via a postcode question), a confirmation that they visited the Northern Territory in the last 12 months. Those who have not visited the Northern Territory in the last 12 months were excluded from the research.

• Checking if the respondent recreationally fished for Barramundi in the Northern Territory in the last 12 months. Only those who indicated they have fished for Barramundi in the last 12 months were included in the research.

A respondent qualified for the research if they were aged over the age of 18 years, and had fished for Barramundi in the Northern Territory in the last 12 months at the time of the survey. A summary of the counts of those who disqualified for the research at each of these questions is provided below:

Disqualification Percentages	Under 18 years	Have not visited NT last 12 months	Have not fished for Barramundi in NT last 12 months	Total Disqualified	Qualification percentage
AFANT Landing Page (website)	3%	0%	0%	3%	97%
AFANT Database promotion	0%	0%	5%	5%	95%
AFANT social media	8%	0%	0%	8%	92%
NTGFIA Database promotion	0	0%	0%	0%	100%
Media promotion	1%	2%	4%	7%	93%
Barra Nationals	0%	0%	0%	0%	100%
Boat Ramp Intercept Recruits	2%	0%	2%	4%	98%
Random Household Approach	0%	0%	9%	9%	91%
Online Research only Panels	1%	3%	43%	47%	53%

Table 7 - Qualification proportions by each sample source

As to be expected, the targeted sample groups such as the association databases provided high levels of qualification, whereas the online research only panels recorded the lowest qualification percentages.

Prize Draw

To boost participation in the research, a prize draw was offered to all participants except for the research only panel participants.

The prize for the prize draw was sourced by David Ciaravolo (CEO, AFANT) and sponsored by Craig's Fishing Warehouse. The draw included a chance to win one of three prizes, including 2 x Shimano Curado 200HG Baitcast reels and 1 x Craig's Fishing Warehouse Blunt Force 6'2" 5-8kg Baitcast rod.

Respondents who were offered the prize draw were informed about the prizes as part of the survey introduction and given an opportunity to opt into the prize draw at the end of the survey, and to provide their preferred contact details at that time. The winners were selected at Action Market Research, Level 3 68 Grenfell Street, Adelaide, South Australia and provided to AFANT for announcement on 11 June 2024.

The inclusion of the prize draw assisted the survey in a few ways:

- By boosting survey participation this greatly assisted in obtaining a very robust sample size than could have otherwise been achieved.
- By assisting in highlighting duplicate responses the contact details captured as part of the prize draw were used to verify a unique response.

The research only panel participants were paid an incentive for their survey completion (a small amount, usually around \$5) and so were excluded from participating in the prize draw.

Margin of Error and Potential Sources of Bias

The margin of error at 95% confidence level is +/- 4.3% when reporting on the total outcome (n=530). Note that this is the margin of error that would apply if the sample was truly random.

For this survey there is clear potential for selection bias. This includes the sources of samples used in this survey which almost certainly selected different types of people:

- Those coming from any of the databases, such as AFANT members, are more likely to be current and avid fishers.
- The use of self-complete survey options could lead to some qualifying for the research to receive their incentive payment (in the case of the research only panels), or enter the prize draw (in the case for the other options).

In summary, combining the sample sources together assists in reducing the bias from any single sample source.

The responses captured are what people believe (or at least say), not necessarily what is true. The data cleaning steps undertaken have removed those who consistently provided poor answers throughout, however, it is impossible to prove whether a participant chose to do so for any individual question.

Segment Groups for Analysis

Data analysis and reporting has been undertaken using the following respondent groups:

- Total Respondents (n=530).
- Group 1: Resident Status, comparing:
 - NT Residents (n=447)
 - NT Visitors (n=83).
- Group 2: Fishing Association Status, comparing:
 - Fishing Association Members (n=130).
 - Non-Members (n=400).

- Group 3: Avidity, comparing:
 - Low Avidity, those who have fished for Barramundi for less than 10 days in the last 12 months (n=188).
 - Moderate Avidity, those who have fished for Barramundi for between 10-29 days in the last 12 months (n=177).
 - High Avidity, those who have fished for Barramundi for 30 or more days in the last 12 months (n=165).
- Group 4: Location Most Recently Fished, comparing:
 - Darwin Harbour region (n=134).
 - Mary River region (n=94).
 - \circ Daly River region (n=81).
 - Other locations (n=221).

Significance testing has been undertaken within each of the respondent groups with any significantly higher outcomes highlighted in bold and blue colouring on each of the tables, and any significantly lower outcomes highlights in orange. Testing for significance is undertaken using a column proportions test (Z-test) at 95% confidence, with a significant outcome determined by the p-value being less than 0.05. For testing significance of groups with 3 or more categories, the significance test comparison is of the category versus the combination of the other categories – so in the case for Group 3 where we have three categories (Low, Moderate and High), Low is tested against the combination of Moderate and High, Moderate is tested against the combination of Low and High, and High is tested against the combination of Low and Moderate.

For mean comparisons, a T-Test is used to determine significance. Testing for significance is undertaken at 95% confidence, with a significant outcome determined by the p-value being less than 0.05.

Measuring Satisfaction

A key aim of this research was to understand satisfaction in the context of the NT Barramundi fishery, and to provide a recommendation on what type of question(s) should be used for future research activities. This section explores the following elements and undertakes a series of tests to provide evidence as to the best way to measure satisfaction in the NT Barramundi Fishery:

- How to measure satisfaction including question design and wording, comparisons of the questions included in the research, comparison of the follow-up open ended questions, and anecdotal feedback.
- When to measure satisfaction including comparison of the seasons, and comparison of when the satisfaction questions are asked (boat ramp vs online/telephone survey).
- Satisfaction sample groups Comparison of satisfaction outcomes within each of the four respondent groups.
- A description of what satisfaction is and its component parts A regression analysis to determine which individual statements play the greatest role in satisfaction.

This section addresses each of these points, and provides a summary of how this has been approached in the research, and what the outcomes are.

How to measure satisfaction

Question Determination and Design

As part of the project inception meeting the Advisory Group discussed and agreed on two satisfaction questions to be included in the research. These being:

- <u>Overall Satisfaction:</u> Q17. Now let's reflect on your total Barramundi fishing experience. Thinking about this most recent Barramundi fishing experience, taking everything into account such as driving to the location, using the boat ramp and associated facilities, as well as fishing, how satisfied were you with your overall fishing experience? Please use a scale where 1 means 'Not at all satisfied' and 10 means 'Very satisfied'.
- <u>Fishing Specific Satisfaction:</u> Q20. Now, thinking only about fishing, how satisfied were you with your most recent Barramundi fishing experience? Please exclude all other aspects of your trip such as driving to the location, using the boat ramp and associated facilities. Please use a scale where 1 means 'Not at all satisfied' and 10 means 'Very satisfied'.

The two versions were included in the research to determine if there were any measurable differences in the responses. The Fishing Specific question was preferred to focus responses to encompass elements that are within Fisheries control and influence. The Overall Satisfaction question was included as is a simpler question for respondents to respond to.

For each question a 1 to 10 Likert scale has been used where 1 means 'Not at all satisfied' and 10 means 'Very satisfied'. This scale provides the following key benefits:

• Provides granularity and precision required for analysis purposes, allowing for a mean score to be generated that can be compared between sample groups using a T-test.

- Does not provide the respondent a mid-point, and ensures their response will fit either in the positive side, or the negative side of the scale.
- Is an easy scale for respondents to answer.

Each of the satisfaction questions was followed by open-ended questions to determine the respondents reasons for their satisfaction response. These open-ended questions were thematically coded using the same code frames, allowing for comparison to determine if there was any difference in the breadth of response between to the questions.

Anecdotal feedback was also sourced from the interviewing team to determine if respondents had any difficulty or issues in responding to either question.

Question comparisons

The mean score was used to compare the outcomes of each question. To determine if there was any statistically significant differences, a T-test was undertaken with the *p*-value outcome provided (a significant difference is determined if the p-value is less than 0.05 at 95% confidence):

Satisfaction Question Comparison	Q17. Overall Satisfaction	Q20. Fishing Specific Satisfaction			
Base	530	530			
Mean Score	7.75	7.62			
Standard Deviation	1.91	2.28			
Standard Error	0.08	0.10			
<i>p</i> -value	0.3209				

Table 8 - Comparison between overall satisfaction and fishing specific satisfaction

Overall, this result indicates there is no statistically significant difference between the two questions, and either question will generate a similar outcome.

The same test has been undertaken within each of the respondent groups used to segment the results for this research. The outcomes are below, with no significant differences found for these questions within any of the respondent categories.

Group 1: Resident Status

	NT Res	sidents	NT Visitors		
Summary	Q17. Overall Satisfaction	Q20. Fishing Specific Satisfaction	Q17. Overall Satisfaction	Q20. Fishing Specific Satisfaction	
Base	447	447	83	83	
Mean Score	7.68	7.50	8.08	8.23	
Standard Deviation	1.90 2.26		1.91	2.34	
Standard Error	0.09	0.11	0.21 0.26		
p-value	0.2	200	0.6	636	

Table 9 - Comparison of satisfaction questions within Group 1: Resident Status

Both NT Residents and NT Visitors report no statistically significant difference between the two questions.

Group 2: Fishing Association Status

	Mem	nbers	Non-Members		
Summary	Q17. Overall Satisfaction	Q20. Fishing Specific Satisfaction	Q17. Overall Satisfaction	Q20. Fishing Specific Satisfaction	
Base	130	130	400	400	
Mean Score	7.81	7.72	7.73	7.58	
Standard Deviation	1.76	2.01	1.95	2.37	
Standard Error	0.15	0.18	0.10	0.12	
p-value	0.7	182	0.3	533	

Table 10 - Comparison of satisfaction questions within Group 2: Fishing Association Status

Both Fishing Association Members and Non-members report no statistical difference between the two questions.

Group 3: Avidity

	Low A	vidity	Moderat	e Avidity	High Avidity	
Summary	Q17. Overall Satisfaction	Q20. Fishing Specific Satisfaction	Q17. Overall Satisfaction	Q20. Fishing Specific Satisfaction	Q17. Overall Satisfaction	Q20. Fishing Specific Satisfaction
Base	188	188	177	177	165	165
Mean Score	7.55	7.37	7.69	7.66	8.02	7.85
Standard Deviation	1.99	2.30	1.84	2.24	1.86	2.30
Standard Error	0.15	0.17	0.14	0.17	0.14	0.18
p-value	0.4118		0.8764		0.4613	

Table 11 - Comparison of satisfaction questions within Group 3: Avidity

All avidity levels report no statistical difference between the two questions.

Group 4: Region Most Recently Fished

Summary	Darwin Harbour		Mary River region		Daly River region		Other location	
	Q17	Q20	Q17	Q20	Q17	Q20	Q17	Q20
Base	134	134	94	94	81	81	221	221
Mean Score	7.30	7.12	7.76	7.63	8.33	8.21	7.80	7.70
Standard Deviation	2.12	2.30	1.76	2.11	1.75	2.26	1.83	2.30
Standard Error	0.18	0.20	0.18	0.22	0.19	0.25	0.12	0.16
p-value	0.50	085	0.6	532	0.6	975	0.6	150

Table 12 - Comparison of satisfaction questions within Group 4: Regions Most Recently Fished

All fishing regions report no statistical differences between the two questions.

Follow-up Open-ended questions

Immediately following the 10-point scale questions, open-ended questions to determine the reasons for their score were captured. These questions were:

- Q18. Why did you rate your overall satisfaction with your most recent Barramundi fishing experience that way?
- Q21. Why did you rate your satisfaction with your fishing that way?

In comparing the outcomes of these questions, we notice that the responses given to Q18 are more detailed and provided a greater breadth of reasoning, and includes fishing specific mentions. For Q21, the responses are more focused on the fishing specific mentions, and tend to exclude the broader detail.

The comparison of these questions is shown below, where the verbatim mentions have been thematically coded, and grouped into categories for analysis. Significant differences are highlighted in blue below, using column proportions (Z-test) at 95% confidence.

Reasons for Satisfaction Raring – Key Themes	Q18 – Reasons for Overall Experience Satisfaction	Q21 – Reasons for Fishing Specific Satisfaction
Base	530	530
Positive Mentions	73%	64%
Rules and Regulations Related comments	0%	0%
Fishing Specific comments	27%	32%
Infrastructure comments	21%	7%
Environment comments	21%	10%
Wellbeing / Social comments	25%	16%
Other positive comments	31%	22%
Negative Mentions	47%	41%
Rules and Regulations Related comments	1%	1%
Fishing Specific comments	29%	30%
Infrastructure comments	15%	4%
Environment comments	7%	5%
Wellbeing / Social comments	3%	2%
Other negative comments	6%	6%

Table 13 - Comparison of reasons for satisfaction

This table shows that at Q18 there is a broader set of reasons given for satisfaction, with significantly more positive mentions related to infrastructure, environment, and wellbeing / social related comments. Importantly, the proportion of fishing specific comments captured at Q18 is not statistically different when compared to Q21, indicating that the responses to the reasons for overall satisfaction question generate a more valuable and detailed response, while also capturing the fishing specific comments.

It is also important to note that the Fishing Specific satisfaction has gone part way in reducing the number of broader mentions, however it did not remove these entirely.

Anecdotal Interviewer Feedback

Anecdotal feedback from the interviewing teams indicated that the overall satisfaction question (Q17) was easier to answer for the respondent, whereas the fishing specific satisfaction question (Q20) on occasion required respondents to pause and segment their thinking, potentially disrupting questionnaire flow.

The 'How to measure satisfaction' Outcome and Recommendation

- To use a 1 to 10-point Likert scale design provides granularity and precision required, while it also being an easy question for respondents to answer.
- There were no statistically significant differences reported between the two satisfaction questions within any of the key respondent groups, indicating that either question will generate a similar outcome.
- When reviewing the data from the open-ended follow-up questions, we find that the detail provided in the follow-up questions immediately following the overall satisfaction question to be more detailed and captured a broader set of reasons for satisfaction, while still providing similar proportions of fishing specific comments when compared to the fishing specific follow-up question.
- Anecdotal feedback from the interviewing teams indicated that the overall satisfaction question (Q17) was easier to answer for the respondent.

On balance, our recommendation therefore is to use an *overall satisfaction* question for any future NT Barramundi fishery satisfaction measurement.

When to measure satisfaction

The research included two timing considerations:

- The season most recently fished in.
- How close to the fishing experience was the satisfaction question asked.

The season most recently fished in

Given the dramatic seasonal changes in the NT, an important consideration for this research was to determine whether the season most recently fished in impacts the satisfaction outcomes.

To determine any seasonal differences, we have undertaken a T-test comparing the mean outcomes for each of the two satisfaction questions (Q17 and Q20):

Q17. Overall Satisfaction	Tropical Summer/wet season (January to mid-March)	The run-off (mid- March to April)	The dry season (May to September)	The build-up (October to December)
Base	75	167	134	154
Mean Score	7.53	7.92	8.10	7.35
Standard Deviation	1.87	1.75	1.90	2.02

Table 14 - Overall satisfaction within season most recently fished

Using the overall satisfaction question, there is a significantly higher satisfaction outcome for those who most recently fished in the dry season, and a significantly lower satisfaction outcome for those who fished in the build-up. Note that the dry season was defined as May to September for the purposes of this survey. It is important to note that May is considered to be peak Barramundi fishing, and is typically when many of the fishing competitions are held, which could be a reason for the significant difference in satisfaction in these results.
Q20. Fishing Specific Satisfaction	Tropical Summer/wet season (January to mid-March)	The run-off (mid- March to April)	The dry season (May to September)	The build-up (October to December)
Base	75	167	134	154
Mean Score	7.65	7.66	7.76	7.42
Standard Deviation	1.93	2.29	2.39	2.35

Table 15 - Fishing Specific Satisfaction within season most recently fished

There are no significant differences between the seasons when using the fishing specific satisfaction question.

How close to the fishing experience was the satisfaction question asked

The boat ramp intercept recruitment survey included the two satisfaction questions in addition to the main survey. This enables analysis to compare:

- Those who completed the boat ramp intercept survey versus the main survey as two distinct sample groups; and
- Comparison of those who completed the boat ramp intercept recruitment and the main survey specifically.

Firstly the comparison of the Boat Ramp Intercept Survey and the Main Survey as two distinct sample groups:

Overall Satisfaction	Boat Ramp Intercept Survey	Main Survey
Base	544	530
Mean Score	8.21	7.75
Standard Deviation	1.47	1.91

Table 16 - Overall Satisfaction comparison between boat ramp intercept and main survey

Fishing Specific Satisfaction	Boat Ramp Intercept Survey	Main Survey
Base	542	530
Mean Score	5.88	7.62
Standard Deviation	2.69	2.28

 Table 17 - Fishing Specific Satisfaction comparison between boat ramp intercept and main survey

When comparing the outcomes of the two distinct surveys, a key difference in the satisfaction outcome emerges, where overall satisfaction is significantly higher at the time of the boat ramp survey when compared to the main survey, but fishing specific satisfaction is significantly lower at the time of the boat ramp survey when compared to the main survey.

Secondly, when matching the data from the boat ramp survey with their main survey response, the results for each of the satisfaction questions are as follows:

Overall Satisfaction	Boat Ramp Intercept Survey	Main Survey
Base	185	185
Mean Score	8.21	8.00
Standard Deviation	1.44	1.79

Table 18 - Overall Satisfaction timing comparison between those who completed boat ramp intercept and main survey

Fishing Specific Satisfaction	Boat Ramp Intercept Survey	Main Survey
Base	184	184
Mean Score	6.10	7.64
Standard Deviation	2.57	2.38

Table 19 - Fishing Specific Satisfaction timing comparison between those who completed both boat ramp intercept and main survey

When comparing those who specifically responded to each survey, a non-significant fall in satisfaction is recorded for the overall satisfaction question, however when comparing the fishing specific satisfaction scores, we notice a significant lift in their score, potentially linked to positive reflection on their fishing experience.

Outcome and Recommendation

Measuring satisfaction needs to consider both the time of the year the measurement is undertaken, and how close to fishers most recent fishing experience is the measurement. Consistency of this measurement will be important to reduce the impact of seasonal factors, and enable accurate trackability.

These results indicate that overall satisfaction is impacted by the season fished, with significantly higher overall satisfaction outcomes for the dry season, and significantly lower satisfaction outcomes for the build-up. Conversely fishing specific satisfaction is not impacted by the season fished, and provides a consistent measurement. The overall satisfaction question is clearly impacted by the season, and consideration needs to be given to undertaking this measurement at a consistent time of year.

Overall satisfaction is not impacted by how close the measurement is undertaken to a fishing experience; however, caution must be taken if using the fishing specific satisfaction measure as this records a significantly lower result at the boat ramp versus a post-experience survey. The fishing specific question is clearly impacted by the methodology, and consideration needs to be given to the methodology chosen if measuring fishing specific satisfaction.

From this there are two considerations to make relating to consistency:

- Can the measurement of satisfaction be made at a consistent time of year?
- Can the measurement of satisfaction be undertaken using a consistent methodology?

Our recommendation for measuring satisfaction with Barramundi fishing in the NT is to set a time of year for the measurement, and undertake this measurement timing consistently. Secondly, to use the overall satisfaction question in preference to the fishing specific satisfaction question to allow for the possibility of a mixed-methodology approach, including boat ramp intercept surveys.

Satisfaction Respondent Groups

This study was aimed at including those who have fished for Barramundi in the Northern Territory in the last 12 months. Within this broad definition there are several types of Barramundi fishers captured, and the analysis has been undertaken between these groups throughout this report.

The key groups to consider and their satisfaction scores are provided below, firstly using the Overall Satisfaction question:

Overall Satisfaction	Group 1: Res	sident Status	Group 2: Fishing Association Status		
	NT Residents	NT Visitors	Member	Non-Member	
Base	447	83	130	400	
Average (Mean)	7.68	8.08	7.81	7.73	

Table 20 - Overall satisfaction within Group 1 and Group 2

Overall Satisfaction	Group 3: Fishing Avidity				
	Low Avidity	Moderate Avidity	High Avidity		
Base	188	177	165		
Average (Mean)	7.55 7.69 8.02				

Table 21 - Overall satisfaction within Group 3

	Group 4: Region Most Recently Fished					
Overall Satisfaction	Darwin Harbour	Mary River	Daly River	Other Location		
Base	134	94	81	221		
Average (Mean)	7.30	7.76	8.33	7.80		

Table 22 - Overall satisfaction within Group 4

When comparing the Overall Satisfaction outcome among the different respondent groups, we see there is a significant difference in scores for:

- High Avidity respondents this group has significantly higher overall satisfaction than Low + Moderate Avidity.
- Those who have fished the Daly River region most recently this group has significantly higher overall satisfaction than the other regions.
- Those who have fished the Darwin Harbour region most recently this group has significantly lower overall satisfaction than the other regions.

If using the Overall Satisfaction question and undertaking a similar broad sampling approach, caution should be taken to not over-represent the areas with significant differences as it may skew the overall result.

Fishing Specific	Total	Group 1: Resident Status		Group 1: Resident Status		Group 2 Associati	: Fishing on Status
Satisfaction		NT Residents	NT Visitors	Member	Non-Member		
Base	530	447	83	130	400		
Average (Mean)	7.62	7.50	8.23	7.72	7.58		

 Table 23 - Fishing specific satisfaction within Group 1 and Group 2

Fishing Specific		Group 3: Fishing Avidity			
Satisfaction	Total	Low Avidity	Moderate Avidity	High Avidity	
Base	530	188	177	165	
Average (Mean)	7.62	7.37	7.66	7.85	

Table 24 - Fishing specific satisfaction within Group 3

Fishing Specific		Group 4: Region Most Recently Fished				
Satisfaction	Total	Darwin Harbour	Mary River	Daly River	Other Location	
Base	530	134	94	81	221	
Average (Mean)	7.62	7.12	7.63	8.21	7.70	

Table 25 - Fishing specific satisfaction within Group 4

When comparing the Fishing Specific Satisfaction outcome among these groups we see significant differences in the following:

- NT Visitors have a significantly higher fishing specific satisfaction score than NT Residents.
- Those who have fished the Daly River region most recently this group has significantly higher fishing specific satisfaction than the other regions.
- Those who have fished the Darwin Harbour region most recently this group has significantly lower fishing specific satisfaction than the other regions.

If using the Fishing Specific Satisfaction measurement and undertaking a similar broad sampling approach, caution should be taken to not over-represent the areas with significant differences as it may skew the overall result.

Outcome and Recommendation

Undertaking a broad sampling approach allows for suitably robust sample sizes to be collected. This research was limited to those who have fished for Barramundi in the NT in the last 12 months, and the sample sizes collected are broadly representative of those who have fished for Barramundi in the last 12 months.

The outcomes of this research act as the benchmark satisfaction results for any future satisfaction measurement. Any future measurement should match similar proportions of each respondent type to ensure comparability, or use statistical weighting to compare accurately. This can be done via the use of quotas, with both a minimum and maximum target set for each respondent type. This will ensure that the sample groups for future measurements have the same impact on the results as they do in this survey outcome.

A description of what Satisfaction is and its component parts

Fisher satisfaction is a multi-faceted construct, and is unique to the target fishery, in this case the Northern Territory Barramundi fishery. Informed by the desktop and qualitative research, the research team crafted a set of 18 satisfaction elements that have been included in the main survey in two ways:

- All 18 statements have been included in the MaxDiff design, enabling the research to inform which statements are more important to fishers relative to others.
- All 18 statements have been rated on the same 10-point scale used for the overall fishing experience, and fishing specific satisfaction ratings, allowing additional statistical analysis to be undertaken to determine which statements are more strongly correlated with each of the satisfaction ratings.

The 18 statements included in this research are:

- 1. The availability of Barramundi in your preferred fishing spots.
- 2. The existing recreational Barramundi fishing regulations in your area.
- 3. The range of other species available for you to catch.
- 4. The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations.
- 5. The ease of communicating with NT Fisheries and peak bodies such as AFANT (e.g. when you have a query about regulations, fish-size, bag limits, when and where you can or can't fish, catch-and-release regulations).
- 6. The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices.
- 7. Maintaining abundant Barramundi populations.
- 8. The enforcement of fishing regulations to protect Barramundi populations and their habitats.
- 9. The infrastructure provided for Barramundi fishing in the NT (e.g. boat ramps, fishing facilities).
- 10. The ease of access to your favourite Barramundi fishing spots (e.g. licenses to access, roads, tracks).
- 11. Barramundi fishing regulations that are clear and easy to understand.
- 12. Availability of facilities and amenities, such as clean restrooms, picnic areas, fish cleaning stations, and safe and secure parking at boat ramps.

- 13. The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.
- 14. The availability of large/trophy sized fish that you like to catch.
- 15. The number of other fishers in the fishing spots where you like to catch fish.
- 16. While accepting there are some risks associated with fishing (e.g. crocodiles, box jellyfish, remoteness, big tides and extreme weather), ensuring these risks are minimised as much as possible.
- 17. The ability to fish for Barramundi within your budget.
- 18. The consideration and respect shown to you by other fishers when you go fishing.

To determine which of these statements are more related to overall satisfaction and fishing specific satisfaction (i.e. which of these statements plays a greater role in each of the two satisfaction measures), we have undertaken regression analysis.

Regression is a set of statistical tests to estimate the relationship strength between variables. Using this method, we are able to determine the strength of relationship between each of the 18 individual satisfaction variables tested, with the overall satisfaction, and fishing specific satisfaction scores.

The tables below show two values:

- The individual R² value this is the strength of the relationship between the dependent variable (either Overall Satisfaction, or Fishing Specific Satisfaction), and the individual independent variable (one of the individual satisfaction elements).
- The adjusted R² value this is the combination of the independent variables and the combined strength of relationship with the dependent variable.

Using Q17 Overall Satisfaction as the dependent variable, the results are as follows. Note that this table is sorted from highest to lowest on the individual R² value, and the adjusted R² value is the result of adding on statement after statement to determine how well these statements as a group relate to overall satisfaction.

Predictors	Individual R ² value	Adjusted R ² value
Q24_1. The availability of Barramundi in your preferred fishing spots.	28.1%	28.1%
Q24_14. The availability of large/trophy sized fish that you like to catch.	18.2%	30.0%
Q24_15. The number of other fishers in the fishing spots where you like to fish.	17.4%	32.8%
Q24_7. Maintaining abundant Barramundi populations.	17.3%	33.4%
Q24_13. The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.	17.2%	34.3%
Q24_10. The ease of access to your favourite Barramundi fishing spots.	15.4%	35.9%
Q24_2. The existing recreational Barramundi fishing regulations in your area.	14.4%	36.4%
Q24_11. Barramundi fishing regulations that are clear and easy to understand.	12.8%	36.4%
Q24_17. The ability to fish for Barramundi within your budget.	12.3%	36.9%
Q24_9. The infrastructure provided for Barramundi fishing in the NT.	11.2%	36.8%
Q24_16. While accepting there are some risks associated with fishing.	10.6%	36.8%
Q24_6. The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices.	10.3%	36.7%
Q24_12. Availability of facilities and amenities, such as clean restrooms, picnic areas, fish cleaning stations, and safe and secure parking at boat ramps.	9.9%	36.6%
Q24_18. The consideration and respect shown to you by other fishers when you go fishing.	9.6%	37.0%
Q24_3. The range of other fish species available for you to catch.	9.3%	36.9%
Q24_8. The enforcement of fishing regulations to protect Barramundi populations and their habitats.	8.0%	37.0%
Q24_5. The ease of communicating with NT Fisheries and peak bodies such as AFANT.	7.0%	36.9%
Q24_4. The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations.	5.2%	37.0%

Table 26 - Overall Satisfaction regression versus 18 satisfaction statements

This indicates that the statements that play the greatest role in Overall Satisfaction, or best describe Overall Satisfaction are as follows:

- #1 The availability of Barramundi in your preferred fishing spots.
- #14 The availability of large/trophy sized fish that you like to catch.
- #15 The number of other fishers in the fishing spots where you like to fish.
- #7 Maintaining abundant Barramundi populations.
- #13 The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.
- #10 The ease of access to your favourite Barramundi fishing spots.

Beyond these statements, the adjusted R² value doesn't improve greatly, therefore the other statements do not add to the Overall Satisfaction result.

Overall, these 18 statements can explain 37.0% of Overall Satisfaction, with the remainder (63.0%) unexplained by these statements.

When overlaying this finding with the MaxDiff analysis, we can determine there are four of these statements that have a higher level of importance than the others:

- #1 The availability of Barramundi in your preferred fishing spots;
- #7 Maintaining abundant Barramundi populations;
- #10 The ease of access to your favourite Barramundi fishing spots; and,
- #13 The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.

Using Q20 Fishing Specific Satisfaction as the dependent variable, the results are as follows. Note that this table is sorted from highest to lowest on the individual R² value, and the adjusted R² value is the result of adding on statement after statement to determine how well these statements as a group relate to overall satisfaction.

Predictors	Individual R ² value	Adjusted R ² value
Q24_1. The availability of Barramundi in your preferred fishing spots.	29.2%	29.2%
Q24_14. The availability of large/trophy sized fish that you like to catch.	13.8%	29.5%
Q24_7. Maintaining abundant Barramundi populations.	11.9%	29.6%
Q24_13. The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.	11.2%	30.2%
Q24_2. The existing recreational Barramundi fishing regulations in your area.	11.0%	30.9%
Q24_15. The number of other fishers in the fishing spots where you like to fish.	9.3%	30.8%
Q24_3. The range of other fish species available for you to catch.	8.9%	30.7%
Q24_11. Barramundi fishing regulations that are clear and easy to understand.	8.4%	30.6%
Q24_10. The ease of access to your favourite Barramundi fishing spots.	7.8%	30.8%
Q24_8. The enforcement of fishing regulations to protect Barramundi populations and their habitats.	6.8%	30.8%
Q24_16. While accepting there are some risks associated with fishing.	6.6%	30.7%
Q24_4. The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations.	6.3%	30.6%
Q24_6. The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices.	6.1%	30.6%
Q24_12. Availability of facilities and amenities, such as clean restrooms, picnic areas, fish cleaning stations, and safe and secure parking at boat ramps.	3.6%	30.7%
Q24_5. The ease of communicating with NT Fisheries and peak bodies such as AFANT.	3.5%	30.9%
Q24_9. The infrastructure provided for Barramundi fishing in the NT.	3.5%	31.2%
Q24_18. The consideration and respect shown to you by other fishers when you go fishing.	3.4%	31.2%
Q24_17. The ability to fish for Barramundi within your budget.	3.2%	31.0%

Table 27 - Fishing Specific Satisfaction regression versus 18 satisfaction statements

This indicates that the statements that play the greatest role in Fishing Specific Satisfaction, or best describe Fishing Specific Satisfaction are as follows:

- #1 The availability of Barramundi in your preferred fishing spots.
- #14 The availability of large/trophy sized fish that you like to catch.
- #7 Maintaining abundant Barramundi populations.
- #13 The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.
- #2 The existing recreational Barramundi fishing regulations in your area.

Beyond these statements, the adjusted R² value doesn't improve greatly, therefore the other statements do not add to the Fishing Specific Satisfaction result.

Overall, these 18 statements can explain 31.0% of Fishing Specific Satisfaction, with the remainder (69.0%) unexplained by these statements.

When overlaying this finding with the MaxDiff analysis, we can determine there are three of these statements that have a higher level of importance than the others:

- #1 The availability of Barramundi in your preferred fishing spots;
- #7 Maintaining abundant Barramundi populations
- #13 The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.

Outcome and Recommendation

The analysis above helps to partially explain what recreational Barramundi fishers mean by Overall Satisfaction and Fishing Specific Satisfaction. While a large percentage of these scores remains unexplainable, being able to impact approximately a third of the score by targeting the descriptors that play the strongest part goes part way to helping to improve satisfaction.

This analysis shows there are four common statements across both Overall Satisfaction and Fishing Specific Satisfaction that play a major role in these scores. These statements are:

- #1 The availability of Barramundi in your preferred fishing spots.
- #14 The availability of large/trophy sized fish that you like to catch.
- #7 Maintaining abundant Barramundi populations.
- #13 The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.

The overall satisfaction measure can be influenced by a greater proportion of satisfaction statements and is better described by more statements that are highly important to recreational fishers, making this measurement a better measure to use.

Measuring Satisfaction Summary

The table below provides a summary of the two satisfaction question comparisons:

The Satisfaction Tests	Overall Satisfaction	Fishing Specific Satisfaction
How to measure	 No significant difference between the two questions Easier for respondents to answer Provides a greater depth of response to follow-up reasons for satisfaction rating questions 	 No significant difference
When to measure	 Impacted by seasonal factors Not impacted by when question is asked Allows for mixed-method data collection approach, BUT will need to undertake collection at consistent times 	 Not impacted by seasonal factors Is impacted by when the question is asked Be cautious of mixed-method data collection approach, BUT can undertake collection within all seasons.
Satisfaction within respondent groups	 Sig higher for Daly River Sig lower result for Darwin Harbour Sig higher result for High Avidity 	 Sig higher result for Daly River Sig lower result for Darwin Harbour Sig higher result for NT Visitors vs NT Residents
Understanding what Satisfaction is and its parts	 #1 The availability of Barramundi in your preferred fishing spots #14 The availability of large/trophy sized fish you like to catch #15 The number of other fishers in the fishing spots where you like to fish #7 Maintaining abundant Barramundi populations #13 The environmental quality of Barramundi fishing areas such as habitat health, and overall aesthetics #10 The ease of access to your favourite Barramundi fishing spots All 18 statements can explain 37% of the Overall Satisfaction score 	 #1 The availability of Barramundi in your preferred fishing spots #14 The availability of large/trophy sized fish you like to catch #7 Maintaining abundant Barramundi populations #13 The environmental quality of Barramundi fishing areas such as habitat health, and overall aesthetics #2 The existing recreational Barramundi fishing regulations in your area. All 18 statements can explain 37% of the Overall Satisfaction score All 18 statements can explain 31.0% of the Fishing Specific Satisfaction score.

The Overall Satisfaction question 'wins' on three out of the four tests, and our recommendation is that this is the question type used for future satisfaction measurement in the NT Barramundi Fishery.

4.5 Data Analysis and Reporting Summary Tables

The full set of research results analysed by Total, and by each of the four respondent groups can be found in Appendix 7 - Question by Question Analysis.

This section provides a series of high-level summary tables for all key question sections, highlighting the top mention (or highest percentage mention) for each question by each of the four respondent groups.

Screening Questions

This section of the questionnaire asks a series of questions to ensure specific groups were excluded from the research (i.e. those aged under 18 years, and those who have not fished in the NT in the last 12 months), and to capture the proportions of specific groups to determine representativeness.

This section includes the following questions:

S1. Age
S2. NT Resident Status
S3. Did you visit the NT in the last 12 months (only asked of those who reside outside the NT)
S4. Fishing Association Member Status
S5. Have you fished recreationally for Barramundi in the NT in the last 12 months?

Section Summary Tables

The summary tables below provides the top-mention (highest percentage mention) for each question in this section for each of the respondent groups.

Summary Table	Total	Group 1: Resident Status		Group 2: Fishing Association Status	
, i		NT Residents	NT Visitors	Member	Non-Member
S1. Age	25 to 34's	25 to 34's	35 to 44's & 55 to 64's	25 to 34's	25 to 34's
S2. NT Resident Status	NT Resident	NT Resident	NT Visitor	NT Resident	NT Resident
S3. Visit NT L12M	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)
S4. Fishing Association Member Status	Non- members	Non- members	Non- members	Yes, members	Non- members
S5. Fished recreationally for Barramundi L12M	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)

Table 28 - Barramundi Fishing Last 12 Months Summary by Group 1 and Group 2

Summary Table	Total	Group 3: Fishing Avidity			
Summary rable		Low Avidity	Moderate Avidity	High Avidity	
S1. Age	25 to 34's	25 to 34's	25 to 34's & 35 to 44's	35 to 44's	
S2. NT Resident Status	NT Resident	NT Resident	NT Resident	NT Resident	
S3. Visit NT L12M	Yes (100%)	Yes (100%)	Yes (100%) Yes (100%)		
S4. Fishing Association Member Status	Non- members	Non-members	Non-members	Non-members	
S5. Fished recreationally for Barramundi L12M	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	

Table 29 - Barramundi Fishing Last 12 Months by Group 3

Summary Table		Group 4: Region Most Recently Fished			
	Total	Darwin Harbour	Mary River	Daly River	Other Location
S1. Age	25 to 34's	35 to 44's	25 to 34's	35 to 44's	25 to 34's & 35 to 44's
S2. NT Resident Status	NT Resident	NT Resident	NT Resident	NT Resident	NT Resident
S3. Visit NT L12M	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)
S4. Fishing Association Member Status	Non- members	Non- members	Non- members	Yes, members	Non- members
S5. Fished recreationally for Barramundi L12M	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)

Table 30 - Barramundi Fishing Last 12 Months by Group 4

Barramundi Fishing Last 12 Months

This section of the questionnaire asks a series of questions to help describe the respondents Barramundi fishing over the last 12 months (L12M).

This section includes the following questions:

Q1. Estimated number of days fished for Barramundi last 12 months
Q2. Estimated number of different fishing trips targeting Barramundi undertaken last 12 months
Q3. Location fished for Barramundi in the last 12 months

Section Summary Tables

The summary tables below provides the top-mention (highest percentage mention) for each question in this section for each of the respondent groups.

Summary Table	Total	Group 1: Resident Status		Group 2: Fishing Association Status	
		NT Residents	NT Visitors	Member	Non-Member
Q1. Number of days fished L12M	25 days	26 days	20 days	33 days	23 days
Q2. Number of fishing trips L12M	14 trips	16 trips	5 trips	18 trips	13 trips
Q3. Location fished for Barramundi L12M	Darwin Harbour	Darwin Harbour	Daly River	Darwin Harbour	Darwin Harbour

Table 31 - Barramundi Fishing Last 12 Months Summary by Group 1 and Group 2

Summary Table	Total	Group 3: Fishing Avidity			
	Lov	Low Avidity	Moderate Avidity	High Avidity	
Q1. Number of days fished L12M	25 days	5 days	16 days	58 days	
Q2. Number of fishing trips L12M	14 trips	4 trips	10 trips	32 trips	
Q3. Location fished for Barramundi L12M	Darwin Harbour	Darwin Harbour	Darwin Harbour	Darwin Harbour	

Table 32 - Barramundi Fishing Last 12 Months by Group 3

		Group 4: Region Most Recently Fished			
Summary Table	Total	Darwin Harbour	Mary River	Daly River	Other Location
Q1. Number of days fished L12M	25 days	19 days	25 days	32 days	26 days
Q2. Number of fishing trips L12M	14 trips	12 trips	17 trips	13 trips	15 trips
Q3. Location fished for Barramundi L12M	Darwin Harbour	Darwin Harbour	Mary River	Daly River	Adelaide River

Table 33 - Barramundi Fishing Last 12 Months by Group 4

Most Recent Barramundi Fishing Experience

This section of the questionnaire asks a series of questions to help describe the respondents most recent Barramundi fishing trip. For the purposes of these questions, we defined the Barramundi trip as a fishing trip where the respondent targeted Barramundi but not necessarily caught any Barramundi.

This section includes the following questions:

Q4. Number of days fished during last Barramundi fishing trip
Q5. Location where the respondent undertook the majority of their fishing for Barramundi
Q6. Time of year/Season
Q7A. Number of Barramundi caught and released
Q7B. Number of Barramundi caught and kept for consumption
Q8A. Size of largest Barramundi caught and released
Q8B. Size of largest Barramundi caught and kept for consumption
Q9. Main purpose for fishing on that most recent Barramundi fishing day
Q10. Other purposes for fishing that day
Q9 & Q10. Total fishing purpose (Main + Other purposes)
Q11. Platform used for fishing
Q12. Fishing technique used
Q13. Type of live bait used
Q14. Undertake any additional fishing activities
Q15. Number of other people fishing with
Q16. Other types of fish caught while targeting Barramundi

Section Summary Tables

The summary tables below provides the top-mention (highest percentage mention) for each question in this section for each of the respondent groups.

Summary Table	Total	Group 1: Resident Status Group 2: Fishing Total Statu		ng Association tus	
		NT Residents	NT Visitors	Member	Non-Member
Q4. Number of days fished during last Barramundi fishing trip	1 day	1 day	6 or more days	6 or more days	1 day
Q5. Location where the respondent undertook majority of Barramundi fishing	Darwin Harbour	Darwin Harbour	Daly River	Daly River	Darwin Harbour
Q6. Time of year/Season	Run-off	Build-up	Run-off	Run-off	Run-off
Q7A. Number of Barramundi caught and released	4.89 fish	4.27 fish	8.22 fish	7.04 fish	4.21 fish
Q7B. Number of Barramundi caught and kept	1.07 fish	1.09 fish	1.00 fish	1.92 fish	0.81 fish
Q8A. Size of largest Barramundi caught and released	62.06cm	60.45cm	69.49cm	59.51cm	63.12cm
Q8B. Size of largest Barramundi caught and kept	66.45cm	66.11cm	68.12cm	64.85cm	67.16cm
Q9. Main fishing purpose	Spend time with family/ friends	Spend time with family/friends	For excitement	For excitement / spending time with family/ friends	Spend time with family/ friends
Q10. Other fishing purposes	For relaxation	For relaxation	For relaxation	For relaxation	For relaxation
Q9 & Q10 Combination. Total fishing purpose	Spend time with family/ friends	Spend time with family/ friends	Spend time with family/ friends	Spend time with family/ friends	Spend time with family/ friends
Q11. Platform used	A boat	A boat	A boat	A boat	A boat
Q12. Fishing technique used	Lure fishing	Lure fishing	Lure fishing	Lure fishing	Lure fishing
Q13. Type of live bait used (if used live bait)	Mullet	Mullet	Cherebin	Mullet / Prawns	Mullet
Q14. Additional fishing activities	Bottom fishing	Bottom fishing	Bottom fishing / Crab potting	Bottom fishing	Bottom fishing
Q15. Number of other people fishing with	Two others	One other	Two others	Two others	One or Two others
Q16. Other types of fish caught	Threadfin Salmon	Threadfin Salmon	Threadfin Salmon	Threadfin Salmon	Threadfin Salmon

 Table 34 - Most Recent Barramundi Fishing Experience Summary Table - Group 1 and Group 2

		Group 3: Fishing Avidity					
Summary Table	Total	Low Avidity	Moderate Avidity	High Avidity			
Q4. Number of days fished during last Barramundi fishing trip	1 day	1 day	1 day	1 day			
Q5. Location where the respondent undertook majority of Barramundi fishing	Darwin Harbour	Darwin Harbour	Darwin Harbour	Daly River or Mary River regions			
Q6. Time of year/Season	Run-off	Dry season	Build-up	Build-up			
Q7A. Number of Barramundi caught and released	4.89 fish	2.74 fish	4.34 fish	8.01 fish			
Q7B. Number of Barramundi caught and kept	1.07 fish	0.84 fish	1.21 fish	1.21 fish			
Q8A. Size of largest Barramundi caught and released	62.06cm	52.31cm	62.50cm	70.29cm			
Q8B. Size of largest Barramundi caught and kept	66.45cm	63.46cm	66.66cm	68.55cm			
Q9. Main fishing purpose	Spend time with family/ friends	Spend time with family/ friends	Spend time with family/ friends	Spend time with family/ friends			
Q10. Other fishing purposes	For relaxation	For relaxation	Spend time with family/ friends	For relaxation			
Q9 & Q10 Combination. Total fishing purpose	Spend time with family/ friends	Spend time with family/ friends	Spend time with family/ friends	For relaxation			
Q11. Platform used	A boat	A boat	A boat	A boat			
Q12. Fishing technique used	Lure fishing	Lure fishing	Lure fishing	Lure fishing			
Q13. Type of live bait used (if used live bait)	Mullet	Prawns	Mullet	Mullet			
Q14. Additional fishing activities	Bottom fishing	Bottom fishing	Bottom fishing	Bottom fishing			
Q15. Number of other people fishing with	Two others	Two others	One other	One other			
Q16. Other types of fish caught	Threadfin Salmon	Threadfin Salmon	Threadfin Salmon	Threadfin Salmon			

Table 35 - Most Recent Barramundi Fishing Experience Summary Table - Group 3

		Group 4: Region Most Recently Fished				
Summary Table	Total	Darwin Harbour	Mary River	Daly River	Other Location	
Q4. Number of days fished during last Barramundi fishing trip	1 day	1 day	1 day	6 or more days	1 day	
Q5. Location where the respondent undertook majority of Barramundi fishing	Darwin Harbour	Darwin Harbour	Mary River	Daly River	Other Location	
Q6. Time of year/Season	Run-off	Build-up	Run-off	Run-off	Build-up	
Q7A. Number of Barramundi caught and released	4.89 fish	2.31 fish	5.11 fish	6.55 fish	5.78 fish	
Q7B. Number of Barramundi caught and kept	1.07 fish	1.01 fish	0.79 fish	0.91 fish	1.30 fish	
Q8A. Size of largest Barramundi caught and released	62.06cm	45.45cm	74.66cm	71.57cm	60.01cm	
Q8B. Size of largest Barramundi caught and kept	66.45cm	65.53cm	67.49cm	65.39cm	66.65cm	
Q9. Main fishing purpose	Spend time with family/ friends	For relaxation	Spend time with family/ friends	For competition	Excitement / spend time with family/ friends	
Q10. Other fishing purposes	For relaxation	Spend time with family/ friends	For excitement	Spend time with family/ friends	For relaxation	
Q9 & Q10 Combination. Total fishing purpose	Spend time with family/ friends	For relaxation	Spend time with family/ friends	Spend time with family/ friends	For relaxation	
Q11. Platform used	A boat					
Q12. Fishing technique used	Lure fishing					
Q13. Type of live bait used (if used live bait)	Mullet	Prawns	Mullet	Cherebin	Mullet	
Q14. Additional fishing activities	Bottom fishing	Bottom fishing	No other activity	No other activity	Bottom fishing	
Q15. Number of other people fishing with	Two others	One other	One other	Two others	One other	
Q16. Other types of fish caught	Threadfin Salmon	Mud crabs	Threadfin Salmon	None	Golden Snapper	

Table 36 - Most Recent Barramundi Fishing Experience Summary Table - Group 4

Satisfaction With Most Recent Barramundi Fishing Experience

This section of the questionnaire asks a set of questions to determine overall satisfaction with the most recent fishing experience and to determine fishing specific satisfaction. Open-ended questions are used as follow-ups to both of these to determine the reasons for their rating and their ideas to improve their level of satisfaction given.

This section includes the following questions:

Q17. Overall satisfaction rating with fishing experience
Q18. Reasons for overall satisfaction
Q19. Top-of-mind ways to improve overall satisfaction
Q20. Satisfaction rating with fishing specifically
Q21. Reasons for fishing specific satisfaction
Q22. Top-of-mind ways to improve fishing specific satisfaction

Section Summary Tables

The summary tables below provides the average (mean) score for the two 10-point satisfaction questions within this section. For the coded question analysis, please see the individual question results.

Summary	Total	Group 1: Res	ident Status	Group 2: Fishing Association Status		
		NT Residents	NT Visitors	Member	Non-Member	
Q17. Overall Satisfaction (Avg.)	7.75	7.68	8.08	7.81	7.73	
Q20. Fishing Specific Satisfaction (Avg.)	7.62	7.50	8.23	7.72	7.58	

Table 37 - Satisfaction Summary by Group 1 and Group 2

Overall Satisfaction	Total	Group 3: Fishing Avidity				
		Low Avidity	Moderate Avidity	High Avidity		
Q17. Overall Satisfaction (Avg.)	7.75	7.55	7.69	8.02		
Q20. Fishing Specific Satisfaction (Avg.)	7.62	7.37	7.66	7.85		

Table 38 - Satisfaction Summary by Group 3

		Group 4: Region Most Recently Fished					
Overall Satisfaction	Total	Darwin Harbour	Mary River	Daly River	Other Location		
Q17. Overall Satisfaction (Avg.)	7.75	7.30	7.76	8.33	7.80		
Q20. Fishing Specific Satisfaction (Avg.)	7.62	7.12	7.63	8.21	7.70		

Table 39 - Satisfaction Summary by Group 4

Importance MaxDiff Statements

This section of the questionnaire asks a set of questions to determine how important various aspects of Barramundi fishing in the NT are to the respondent. The respondent was presented with a series of statement sets, with three statements on each screen at a time, and the respondent was to select which of these is the most important and which is the least important.

This section includes the following questions:

Q23. Importance MaxDiff Statements

Q23. Importance MaxDiff Statements

Question Reference	Importance Statement (Top 5 Highlighted)	Ranking
ltem 7	Maintaining abundant Barramundi populations.	100.0
Item 13	The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics.	90.0
Item 8	The enforcement of fishing regulations to protect Barramundi populations and their habitats.	63.3
Item10	The ease of access to your favourite Barramundi fishing spots (e.g., licenses to access, roads, tracks).	57.5
ltem 1	The availability of Barramundi in your preferred fishing spots.	57.4
Item 6	The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices.	53.6
Item 9	The infrastructure provided for Barramundi fishing in the NT (e.g., boat ramps, fishing facilities).	50.1
ltem12	Availability of facilities and amenities, such as clean restrooms, picnic areas, fish cleaning stations, and safe and secure parking at boat ramps	45.7
ltem 11	Barramundi fishing regulations that are clear and easy to understand.	32.3
Item 16	While accepting there are some risks associated with fishing, ensuring these risks are minimised as much as possible	22.2
Item18	The consideration and respect shown to you by other fishers when you go fishing.	22.1
ltem 14	The availability of large/trophy sized fish that you like to catch.	19.4
ltem 3	The range of other fish species available for you to catch.	14.8
ltem 17	The ability to fish for Barramundi within your budget.	11.7
ltem 2	The existing recreational Barramundi fishing regulations in your area.	8.6
Item 5	The ease of communicating with NT Fisheries and peak bodies such as AFANT.	4.2
ltem 15	The number of other fishers in the fishing spots where you like to fish.	2.7
Item 4	The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations.	0.0

Table 40 - MaxDiff Statements

Maximum Difference Scaling (MaxDiff)

Maximum Difference Scaling (MaxDiff) is an advanced survey technique used to measure the relative importance or preference of multiple items. In this study, MaxDiff was employed to determine the relative importance of various aspects of Barramundi fishing in the Northern Territory.

Respondents were presented with sets of statements and asked to select the most important and least important item in each set. Through repeated comparisons across multiple sets, MaxDiff enabled the calculation of a relative importance score for each item on a common scale.

The scores are presented on a scale where the most important item is given a score of 100. All other items are scored relative to this most important item. The magnitude of the difference between scores reflects how much more or less important items are relative to each other and to the most important item.

For example, "The environmental quality of Barramundi fishing areas" has a score of 90.0, meaning it is considered 90% as important as maintaining abundant Barramundi populations. An item with a score of 50.0 would be considered half as important as the top item, and so on.

This scaling allows for a clear understanding of the relative importance of each item, with lower scores indicating lower relative importance. The lowest scored item ("The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations") has a score of 0.0, indicating it is considered the least important relative to all other items.

Commentary on MaxDiff Results

The MaxDiff analysis reveals clear priorities among recreational Barramundi fishers in the NT:

- Fishery Health and Sustainability: The overwhelming importance placed on "Maintaining abundant Barramundi populations" (score 100.0) underscores the critical role of fishery sustainability in fisher satisfaction. This suggests that conservation efforts and sustainable management practices should be at the forefront of fishery policies. Fishers appear to understand that the long-term viability of their recreational activity depends on healthy fish stocks.
- 2. Environmental Quality: The high score for "The environmental quality of Barramundi fishing areas" (90.0) indicates that fishers highly value the overall ecosystem health and aesthetics of their fishing locations. This extends beyond just the presence of fish to include factors like water quality, habitat preservation, and scenic beauty. Management strategies should therefore consider broader environmental protection measures in addition to specific fish stock management.
- 3. Regulatory Enforcement and Access: The relatively high scores for "The enforcement of fishing regulations" (63.3) and "The ease of access to your favourite Barramundi fishing spots" (57.5) highlight a balance between resource protection and recreational opportunity. Fishers seem to appreciate strong enforcement to prevent overfishing or illegal practices, while also valuing convenient access to fishing areas. This suggests support for well-enforced regulations alongside initiatives to maintain or improve access to key fishing locations.
- 4. Fish Availability and Sustainable Practices: Scores for "The availability of Barramundi in your preferred fishing spots" (57.4) and "The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices" (53.6) further emphasise the importance of both immediate fishing success and long-term sustainability. This indicates

that fishers are likely to support management practices that ensure consistent fishing opportunities while preserving the resource for the future.

- Infrastructure and Amenities: The moderate importance placed on "The infrastructure provided for Barramundi fishing in the NT" (50.1) and "Availability of facilities and amenities" (45.7) suggests that while not top priorities, improvements in these areas would be appreciated. This could include enhancements to boat ramps, parking facilities, restrooms, and other supporting infrastructure.
- 6. Regulations and Communication: Lower scores for items related to understanding regulations (32.3), ease of communication with authorities (4.2), and involvement in decision-making (0.0) indicate that while these aspects are not unimportant, they are less critical to the overall fishing experience. However, the relatively low scores here might also suggest an opportunity for improvement in how regulations are communicated and how fishers are engaged in the management process.
- Social and Personal Factors: The low importance placed on "The number of other fishers in the fishing spots" (2.7) and "The consideration and respect shown to you by other fishers" (22.1) suggests that social interactions and crowding are not major concerns for most fishers. This could indicate that current levels of fishing pressure are generally acceptable, or that fishers value solitude and personal experience over social aspects of fishing.
- 8. Trophy Fishing and Economic Considerations: Surprisingly low scores for "The availability of large/trophy sized fish" (19.4) and "The ability to fish for Barramundi within your budget" (11.7) challenge some common assumptions about fisher motivations. This suggests that the overall experience of fishing, including the quality of the environment and the sustainability of the practice, is more important to most fishers than catching exceptionally large fish or minimising costs.

Implications for Fisheries Management

These results provide a clear hierarchy of priorities for fishery managers. In alignment with the objectives of the Act, efforts should primarily focus on maintaining healthy Barramundi populations and protecting the environmental quality of fishing areas. Strong but fair enforcement of regulations, combined with efforts to maintain or improve access to fishing spots, are likely to be well-received.

While infrastructure improvements would be appreciated, they are less critical than ecological factors. The relatively low importance placed on understanding regulations and involvement in decision-making processes suggests that current communication strategies may need review to better engage fishers in these aspects of fishery management.

The low priority given to social factors and trophy fishing suggests that management strategies focused on these aspects may have limited impact on overall fisher satisfaction. Instead, ensuring consistent opportunities to fish in healthy, well-maintained environments appears to be the key to fisher satisfaction in the NT Barramundi fishery.

These insights can help guide resource allocation, policy development, and communication strategies to best meet the needs and preferences of recreational Barramundi fishers in the Northern Territory.

Satisfaction Specifics

This section of the questionnaire asks a set of questions to determine how satisfied the respondent is with various aspects of Barramundi fishing in the NT. These are the same statements used in the MaxDiff analysis, allowing for an overlay of satisfaction and importance to be undertaken.

This section includes the following questions:

Q24. Satisfaction Statements

Section Summary Tables

The summary table below provides the average (mean) score for the 18 individual statements, sorted from highest to lowest based on the Total mean score.

C	Total	Group 1: Resident Status		Group 2: Fishing Association Status	
Summary	lotal	NT Residents	NT Visitors	Member	Non- Member
#11 - Barramundi fishing regulations that are clear and easy to understand	7.58	7.52	7.92	7.81	7.51
#13 - The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics	7.34	7.26	7.76	7.54	7.27
#16 - While accepting there are some risks associated with fishing, ensuring these risks are minimised as much as possible	7.31	7.24	7.70	7.23	7.34
#17 - The ability to fish for Barramundi within your budget	7.31	7.19	7.94	7.47	7.26
#2 - The existing recreational Barramundi fishing regulations in your area	7.28	7.27	7.39	7.34	7.27
#18 - The consideration and respect shown to you by other fishers when you go fishing	7.18	7.19	7.17	7.15	7.20
#3 - The range of other fish species available for you to catch	7.13	7.19	6.84	7.54	7.00
#6 - The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices	6.93	6.88	7.19	7.12	6.87
#9 - The infrastructure provided for Barramundi fishing in the NT	6.91	6.81	7.42	6.69	6.98
#1 - The availability of Barramundi in your preferred fishing spots	6.90	6.72	7.82	7.42	6.73
#7 – Maintaining abundant Barramundi populations	6.80	6.66	7.59	6.70	6.84
#10 – The ease of access to your favourite Barramundi fishing spots	6.70	6.60	7.23	6.54	6.75
#5 – The ease of communicating with NT Fisheries and peak bodies such as AFANT	6.61	6.50	7.22	6.97	6.49
#14 – The availability of large/trophy sized fish that you like to catch	6.56	6.37	7.60	7.11	6.38
#12 – Availability of facilities and amenities	6.50	6.40	7.02	6.62	6.47
#8 – The enforcement of fishing regulations to protect Barramundi populations and their habitats	6.44	6.35	6.90	6.30	6.48
#15 – The number of other fishers in the fishing spots where you like to fish	6.41	6.37	6.65	6.65	6.34
#4 – The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations	5.94	5.86	6.34	6.28	5.83

Table 41 - Satisfaction Specifics Mean Summary by Group 1 and Group 2

		Group 3: Fishing Avidity			
Overall Satisfaction	Total	Low Avidity	Moderate Avidity	High Avidity	
#11 - Barramundi fishing regulations that are clear and easy to understand	7.58	7.34	7.60	7.83	
#13 - The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics	7.34	7.25	7.42	7.35	
#16 - While accepting there are some risks associated with fishing, ensuring these risks are minimised as much as possible	7.31	7.26	7.37	7.31	
#17 - The ability to fish for Barramundi within your budget	7.31	7.21	7.34	7.39	
#2 - The existing recreational Barramundi fishing regulations in your area	7.28	7.29	7.37	7.19	
#18 - The consideration and respect shown to you by other fishers when you go fishing	7.18	7.09	7.34	7.12	
#3 - The range of other fish species available for you to catch	7.13	7.06	7.12	7.24	
#6 - The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices	6.93	7.14	6.98	6.64	
#9 - The infrastructure provided for Barramundi fishing in the NT	6.91	7.25	6.75	6.68	
#1 - The availability of Barramundi in your preferred fishing spots	6.90	6.80	6.76	7.16	
#7 – Maintaining abundant Barramundi populations	6.80	7.15	6.71	6.50	
#10 – The ease of access to your favourite Barramundi fishing spots	6.70	7.20	6.54	6.30	
#5 – The ease of communicating with NT Fisheries and peak bodies such as AFANT	6.61	6.46	6.84	6.53	
#14 – The availability of large/trophy sized fish that you like to catch	6.56	6.49	6.52	6.68	
#12 – Availability of facilities and amenities	6.50	6.66	6.44	6.39	
#8 – The enforcement of fishing regulations to protect Barramundi populations and their habitats	6.44	6.95	6.40	5.89	
#15 – The number of other fishers in the fishing spots where you like to fish	6.41	6.64	6.41	6.16	
#4 – The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations	5.94	6.02	6.10	5.67	

Table 42 - Satisfaction Specifics Mean Summary by Group 3

		Group 4: Region Most Recently Fished			
Overall Satisfaction	Total	Darwin Harbour	Mary River	Daly River	Other Location
#11 - Barramundi fishing regulations that are clear and easy to understand	7.58	7.26	7.55	7.85	7.69
#13 - The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics	7.34	6.98	7.60	7.46	7.40
#16 - While accepting there are some risks associated with fishing, ensuring these risks are minimised as much as possible	7.31	7.24	7.28	7.75	7.21
#17 - The ability to fish for Barramundi within your budget	7.31	7.21	7.15	7.60	7.33
#2 - The existing recreational Barramundi fishing regulations in your area	7.28	7.05	7.27	7.56	7.33
#18 - The consideration and respect shown to you by other fishers when you go fishing	7.18	6.99	6.94	7.31	7.36
#3 - The range of other fish species available for you to catch	7.13	7.04	7.07	6.93	7.29
#6 - The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices	6.93	6.87	6.69	6.94	7.07
#9 - The infrastructure provided for Barramundi fishing in the NT	6.91	7.04	6.93	7.22	6.70
#1 - The availability of Barramundi in your preferred fishing spots	6.90	6.39	6.85	7.64	6.95
#7 – Maintaining abundant Barramundi populations	6.80	6.63	7.00	7.04	6.73
#10 – The ease of access to your favourite Barramundi fishing spots	6.70	6.92	6.51	6.57	6.69
#5 – The ease of communicating with NT Fisheries and peak bodies such as AFANT	6.61	6.40	6.36	6.80	6.77
#14 – The availability of large/trophy sized fish that you like to catch	6.56	6.15	6.74	7.06	6.55
#12 – Availability of facilities and amenities	6.50	6.75	6.45	6.57	6.35
#8 – The enforcement of fishing regulations to protect Barramundi populations and their habitats	6.44	6.36	6.40	6.36	6.53
#15 – The number of other fishers in the fishing spots where you like to fish	6.41	6.39	6.23	6.59	6.43
#4 – The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations	5.94	5.66	5.52	6.01	6.26

Table 43 - Satisfaction Specifics Mean Summary by Group 4

Importance vs Satisfaction

When comparing the Satisfaction Mean score versus the Importance score, we can generate a quadrant that highlights areas that should be of greater focus for fisheries to focus on.

Importance vs Satisfaction	Satisfaction Score	Importance
#11 - Barramundi fishing regulations that are clear and easy to understand	7.58	32.3
#13 - The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics	7.34	90.0
#16 - While accepting there are some risks associated with fishing, ensuring these risks are minimised as much as possible	7.31	22.2
#17 - The ability to fish for Barramundi within your budget	7.31	11.7
#2 - The existing recreational Barramundi fishing regulations in your area	7.28	8.6
#18 - The consideration and respect shown to you by other fishers when you go fishing	7.18	22.1
#3 - The range of other fish species available for you to catch	7.13	14.8
#6 - The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices	6.93	53.6
#9 - The infrastructure provided for Barramundi fishing in the NT	6.91	50.1
#1 - The availability of Barramundi in your preferred fishing spots	6.90	57.4
#7 – Maintaining abundant Barramundi populations	6.80	100.0
#10 – The ease of access to your favourite Barramundi fishing spots	6.70	57.5
#5 – The ease of communicating with NT Fisheries and peak bodies such as AFANT	6.61	4.2
#14 – The availability of large/trophy sized fish that you like to catch	6.56	19.4
#12 – Availability of facilities and amenities	6.50	45.7
#8 – The enforcement of fishing regulations to protect Barramundi populations and their habitats	6.44	63.3
#15 – The number of other fishers in the fishing spots where you like to fish	6.41	2.7
#4 – The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations	5.94	0.0

Table 44 - MaxDiff Importance vs Satisfaction



Figure 1 – Importance vs Satisfaction Comparison Matrix

Using the mean satisfaction scores and the importance figures calculated from the MaxDiff analysis, we're able to group statements into categories for potential focus. To generate these groups, we have selected:

- A mean score of 7.00 as the delineator between a respondent fitting into 'High Satisfaction' (i.e. 7.00 or above) or 'Low Satisfaction' (i.e. below 7.00) side.
- Importance relative index score of 30 as the delineator between a respondent fitting into 'High Importance' (i.e. 30 or higher) or 'Low Importance' (i.e. below 30).

From this, four quadrants are generated including:

- The top left quadrant, being High Importance, Low Satisfaction the statements that fit into this category are those to potentially focus energy and resources to boost recreational fisher satisfaction.
- The top right quadrant being High Importance, High Satisfaction. These are the areas performing well, and given their high importance, need to be measured and watched and given their current focus and attention.
- The bottom left quadrant being Low Importance and Low Satisfaction. These are areas that are of low importance to recreational fishers, and investment to improve satisfaction will be better spent elsewhere.
- The bottom right quadrant being Low Importance and High Satisfaction. These are areas where no particular focus is required.

The statements that fit into the 'High Importance and Low Satisfaction quadrant are as follows. These are the key areas to focus energy and resources on to improve recreational fisher satisfaction.

High Importance and Low Satisfaction Statements	Satisfaction Score	Importance
#6 - The extent to which current recreational fishing rules and regulations promote sustainable Barramundi fishing practices	6.93	53.6
#9 - The infrastructure provided for Barramundi fishing in the NT	6.91	50.1
#1 - The availability of Barramundi in your preferred fishing spots	6.90	57.4
#7 – Maintaining abundant Barramundi populations	6.80	100.0
#10 – The ease of access to your favourite Barramundi fishing spots	6.70	57.5
#12 – Availability of facilities and amenities	6.50	45.7
#8 – The enforcement of fishing regulations to protect Barramundi populations and their habitats	6.44	63.3

Table 45 - High Importance and Low Satisfaction Statements

The statements that fit into the 'High Importance and High Satisfaction quadrant areas follows. These are the areas that are performing well, and given their high importance, need to be measured and watched, and allocated the same level of attention and resources.

High Importance and High Satisfaction Statements	Satisfaction Score	Importance
#11 - Barramundi fishing regulations that are clear and easy to understand	7.58	32.3
#13 - The environmental quality of Barramundi fishing areas, such as habitat health, and overall aesthetics	7.34	90.0

Table 46 - High Importance and High Satisfaction Statements

The statements that fit into the Low Importance and Low Satisfaction quadrant are as follows. These are the areas that have lower levels of satisfaction but are of low importance to recreational fishers, indicating that resources and effort are better placed elsewhere.

Low Importance and Low Satisfaction	Satisfaction Score	Importance
#5 – The ease of communicating with NT Fisheries and peak bodies such as AFANT	6.61	4.2
#14 – The availability of large/trophy sized fish that you like to catch	6.56	19.4
#15 – The number of other fishers in the fishing spots where you like to fish	6.41	2.7
#4 – The opportunity you have to be involved in the decision-making process regarding recreational Barramundi fishing rules and regulations	5.94	0.0

Table 47 - Low Importance and Low Satisfaction Statements

The statements that fit into the Low Importance and High Satisfaction quadrant are as follows. These are all the factors where recreational fisher satisfaction is high, and the level of importance is low. These elements need no particular focus, and your resources are better invested elsewhere.

Low Importance and High Satisfaction	Satisfaction Score	Importance
#16 - While accepting there are some risks associated with fishing, ensuring these risks are minimised as much as possible	7.31	22.2
#17 - The ability to fish for Barramundi within your budget	7.31	11.7
#2 - The existing recreational Barramundi fishing regulations in your area	7.28	8.6
#18 - The consideration and respect shown to you by other fishers when you go fishing	7.18	22.1
#3 - The range of other fish species available for you to catch	7.13	14.8

Table 48 - Low Importance and High Satisfaction Statements

Net Promoter Score (Recommendation)

This section of the questionnaire asks a set of questions to determine how likely the respondent would be to recommend Barramundi fishing in the NT. This question is used to determine the Net Promoter Score (NPS), and is followed by an open-ended question to determine reasons for their recommendation score.

The Net Promoter Score (NPS) is calculated by grouping respondents into categories based on their answer to a 10-point scale question. The three groups are classified as:

- Promoters (those who score a 9 or 10 on the 10-point scale) these are those who are more likely to talk pro-actively positively about their Barramundi fishing experience.
- Passives (those who score a 7 or 8 on the 10-point scale) these are those who are more likely to not talk either positively or negatively about their Barramundi fishing experience.
- Detractors (those who score a 6 or lower on the 10-point scale) these are those who are more likely to pro-actively talk negatively about their Barramundi fishing experience.

The NPS is calculated by subtracting the Detractors percentage from the Promoters percentage. This gives a score between +100 and -100. The closer the score to +100 the better the outcome, and conversely a score closer to -100 the worse the outcome.

This section includes the following questions:

Q25. Likelihood to Recommend Barramundi Fishing in the NT

Q26. Why did you rate your likelihood to recommend Barramundi fishing in the NT that way?

Section Summary Tables

The summary table below provides the average (mean) score and the Net Promoter Score outcome for each of the respondent groups.

Recommendation To	Total	Group 1: Resident Status		Group 2: Fishing Association Status	
		NT Residents	NT Visitors	Member	Non-Member
Average (Mean)	8.54	8.47	8.94	8.58	8.53
Net Promoter Score	+47	+43	+65	+49	+46

Table 49 - Net Promoter Score Summary by Group 1 and Group 2

Recommendation	Total	Group 3: Fishing Avidity			
Recommendation	Total	Low Avidity	Moderate Avidity	High Avidity	
Average (Mean)	8.54	8.34	8.49	8.84	
Net Promoter Score	+47	+39	+41	+61	

Table 50 - Net Promoter Score Summary by Group 3

Recommendation	Total	Group 4: Region Most Recently Fished				
		Darwin Harbour	Mary River	Daly River	Other Location	
Average (Mean)	8.54	8.07	8.77	8.96	8.58	
Net Promoter Score	+47	+28	+56	+62	+48	

Table 51 - Net Promoter Score Summary by Group 4
Communication and Information

This section of the questionnaire asks a set of questions regarding communication and information from NT Fisheries and AFANT.

This section includes the following questions:

Q27. Had any contact from NT Fisheries or AFANT in the last 12 months
Q28. Sought or obtained information from NT Fisheries or AFANT in the last 12 months
Q29. Level of contact enough for needs
Q30. Best method to receive information
Q31. Type of information to receive
Q32. Willingness to share information regarding their fishing with NT Fisheries
Q33. How best to provide fishing information to NT Fisheries

Q34. Agree/Disagree statements regarding the management of NT Barramundi fishery

Section Summary Tables

The summary tables below provides the top-mention (highest percentage mention) for each question in this section for each of the respondent groups.

Summary Table	Total	Group 1: Resident Status		Group 2: Fishing Association Status	
		NT Residents	NT Visitors	Member	Non-Member
Q27. Contact with NT Fisheries or AFANT	No contact with either	No contact with either	No contact with either	AFANT	No contact with either
Q28. Sought or obtained information from NT Fisheries or AFANT	Not sought or obtained information	Not sought or obtained information	Not sought or obtained information	Not sought or obtained information	Not sought or obtained information
Q29. Level of contact enough for needs – NT Fisheries	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right
Q29. Level of contact enough for needs – AFANT	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right
Q30. Best method to receive information	Social media	Social media	Social media	Social media	Social media
Q31. Type of information to receive	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations
Q32. Willingness to share information regarding fishing with NT Fisheries	Average (mean) 6.71	Average (mean) 6.71	Average (mean) 6.72	Average (mean) 7.48	Average (mean) 6.46
Q33. How best to provide fishing information to NT Fisheries	Smartphone app	Smartphone app	Smartphone app	Smartphone app	Smartphone app
Q34. Management of NT Barramundi Fishery – Highest Agreement	l can easily access information about Barramundi rules and regulations	I can easily access information about Barramundi rules and regulations	I can easily access information about Barramundi rules and regulations	I can easily access information about Barramundi rules and regulations	Barramundi fishing rules and regulations are easy to understand
Q34. Management of NT Barramundi Fishery – Highest Disagreement	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery

 Table 52 - Communication and Information Summary by Group 1 and Group 2

Summony Toblo	Total	Group 3: Fishing Avidity			
	TOtal	Low Avidity	Moderate Avidity	High Avidity	
Q27. Contact with NT Fisheries or AFANT	No contact with either	No contact with either	No contact with either	No contact with either	
Q28. Sought or obtained information from NT Fisheries or AFANT	Not sought or obtained information	Not sought or obtained information	Not sought or obtained information	Not sought or obtained information	
Q29. Level of contact enough for needs – NT Fisheries	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right	
Q29. Level of contact enough for needs – AFANT	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right	
Q30. Best method to receive information	Social media	Social media	Social media	Social media	
Q31. Type of information to receive	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	
Q32. Willingness to share information regarding fishing with NT Fisheries	Average (mean) 6.71	Average (mean) 6.04	Average (mean) 6.89	Average (mean) 7.30	
Q33. How best to provide fishing information to NT Fisheries	Smartphone app	Smartphone app	Smartphone app	Smartphone app	
Q34. Management of NT Barramundi Fishery – Highest Agreement	I can easily access information about Barramundi rules and regulations	Barramundi fishing rules and regulations are easy to understand	l can easily access information about Barramundi rules and regulations	l can easily access information about Barramundi rules and regulations	
Q34. Management of NT Barramundi Fishery – Highest Disagreement	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	

Table 53 - Communication and Information Summary by Group 3

	Total	Group 4: Region Most Recently Fished				
Summary Table		Darwin Harbour	Mary River	Daly River	Other Location	
Q27. Contact with NT Fisheries or AFANT	No contact with either	No contact with either	No contact with either	No contact with either	No contact with either	
Q28. Sought or obtained information from NT Fisheries or AFANT	Not sought or obtained information	Not sought or obtained information	Not sought or obtained information	Not sought or obtained information	Not sought or obtained information	
Q29. Level of contact enough for needs – NT Fisheries	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right	
Q29. Level of contact enough for needs – AFANT	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right	Amount of contact about right	
Q30. Best method to receive information	Social media	Social media	Social media	From signage at boat ramps	Social media	
Q31. Type of information to receive	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	Updates on Barramundi fishing regulations	
Q32. Willingness to share information regarding fishing with NT Fisheries	Average (mean) 6.71	Average (mean) 6.35	Average (mean) 6.61	Average (mean) 6.96	Average (mean) 6.88	
Q33. How best to provide fishing information to NT Fisheries	Smartphone app	Smartphone app	Smartphone app	Smartphone app	Smartphone app	
Q34. Management of NT Barramundi Fishery – Highest Agreement	l can easily access information about Barramundi rules and regulations	I can easily access information about Barramundi rules and regulations	Barramundi fishing rules and regulations are easy to understand	It is easy to comply with Barramundi fishing rules and regulations	I can easily access information about Barramundi rules and regulations	
Q34. Management of NT Barramundi Fishery – Highest Disagreement	I am kept up to date on the health status of the Barramundi fishery	l am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	I am kept up to date on the health status of the Barramundi fishery	

Table 54 - Communication and Information Summary by Group 4

Demographics

This section of the questionnaire asks a set of demographic questions.

This section includes the following questions:

Q36 Boat Ownership
Q37. Gender
Q38. Marital Status
Q39. Family composition
Q40. Children fish
Q41. Aboriginal or Torres Strait Islander status
Q42. Disability
Q43. Occupation
Q44. Education
Q45. Household income
Q46. Language other than English at home
Q47. Country of birth

Section Summary Tables

The summary tables below provides the key demographic information for each group.

Demographics	Total	Group 1: Resident Status		Group 2: Fishing Association Status	
Summary Table	Iotai	NT Residents	NT Visitors	Member	Non- Member
Boat ownership	Majority	Majority	Majority	Majority	Majority
	own a boat	own a boat	own a boat	own a boat	own a boat
	for	for	for	for	for
	recreational	recreational	recreational	recreational	recreational
	fishing	fishing	fishing	fishing	fishing
Gender	Majority	Majority	Majority	Majority	Majority
	Males	Males	Males	Males	Males
Marital Status	Majority	Majority	Majority	Majority	Majority
	Married	Married	Married	Married	Married
Family Composition	Couples	Couples	Couples	Couples	Couples
Do their children also fish?	Yes	Yes	Yes	Yes	Yes
Aboriginal or Torres Strait Islander Status	9%	9%	7%	9%	10%
Living with Disability	5%	6%	0%	6%	5%
Occupation	75%	76%	68%	73%	76%
	employed	employed	employed	employed	employed
Education	39%	40%	42%	43%	41%
	technical /	technical /	technical /	Bachelor /	technical /
	certificate /	certificate /	certificate /	Post-grad	certificate /
	diploma	diploma	diploma	degree	diploma
Household Income	41% \$150k	41% \$150k	37% \$150k	40% \$150k	41% \$150k
	or more	or more	or more	or more	or more
Language other than English at home	13% Yes	13% Yes	11% Yes	23% Yes	10% Yes
Country of birth	11% born	12% born	10% born	17% born	10% born
	overseas	overseas	overseas	overseas	overseas

Table 55 - Demographics Summary Table by Group 1 and Group 2

Demographics	Total	Group 3: Fishing Avidity			
Summary Table	i otar	Low Avidity	Moderate Avidity	High Avidity	
Boat ownership	Majority own a boat for recreational fishing	Majority do not own a boat	Majority own a boat for recreational fishing	Majority own a boat for recreational fishing	
Gender	Majority Males	Majority Female	Majority Males	Majority Males	
Marital Status	Majority Married	Majority Married	Majority Married	Majority Married	
Family Composition	Couples	Couples	Couples	Couples	
Do their children also fish?	Yes	Yes	Yes	Yes	
Aboriginal or Torres Strait Islander Status	9%	11%	10%	4%	
Living with Disability	5%	6%	6%	3%	
Occupation	75% employed	73% employed	80% employed	75% employed	
Education	39% technical / certificate / diploma	37% Bachelor / Post-grad degree	42% technical / certificate / diploma	42% technical / certificate / diploma	
Household Income	41% \$150k or more	36% Less than \$100k	39% \$150k or more	51% \$150k or more	
Language other than English at home	13% Yes	13% Yes	12% Yes	14% Yes	
Country of birth	11% born overseas	12% born overseas	12% born overseas	10% born overseas	

Table 56 - Demographics Summary Table by Group 3

Demographics Summary Table		Group 4: Region Most Recently Fished				
	Total	Darwin Harbour	Mary River	Daly River	Other Location	
Boat ownership	Majority own a boat for recreational fishing	Majority do not own a boat	Majority own a boat for recreational fishing	Majority own a boat for recreational fishing	Majority own a boat for recreational fishing	
Gender	Majority Males	Majority Males	Majority Males	Majority Males	Majority Males	
Marital Status	Majority Married	Majority Married	Majority Married	Majority Married	Majority Married	
Family Composition	Couples	Couples	Couples	Couples	Couples	
Do their children also fish?	Yes	Yes	Yes	Yes	Yes	
Aboriginal or Torres Strait Islander Status	9%	6%	7%	2%	13%	
Living with Disability	5%	5%	4%	2%	6%	
Occupation	75% employed	75% employed	82% employed	74% employed	73% employed	
Education	39% technical / certificate / diploma	38% Bachelor / Post-grad degree	39% technical / certificate / diploma	47% technical / certificate / diploma	41% technical / certificate / diploma	
Household Income	41% \$150k or more	38% \$150k or more	55% \$150k or more	42% \$150k or more	36% \$150k or more	
Language other than English at home	13% Yes	18% Yes	11% Yes	9% Yes	13% Yes	
Country of birth	11% born overseas	12% born overseas	12% born overseas	6% born overseas	13% born overseas	

Table 57 - Demographics Summary Table by Group 4

5. Discussion & Implications

5.1 Introduction

This comprehensive study of recreational Barramundi fishing in the Northern Territory (NT) provides valuable insights into fisher experiences, preferences, and satisfaction levels. The findings offer a multifaceted understanding of the current state of recreational fishing in the region and highlight several key areas for consideration in future management strategies.

In particular, the literature review findings underscore the significance of balancing ecological sustainability with the diverse motivations and expectations of recreational fishers. For the Northern Territory Barramundi fishery, recreational fishing offers substantial social and economic benefits, which have historically been challenging to integrate into management frameworks focused predominantly on biological indicators. Social yield objectives, as highlighted in this study, encompass both catch-related and non-catch experiences, such as the enjoyment of nature, relaxation, and the pursuit of trophy catches

This study builds upon these foundations, applying a social-ecological lens to identify drivers of satisfaction and behavioural trends among recreational Barramundi fishers in the NT. Insights into the preferences and priorities of different fisher segments reveal important nuances, supporting a more holistic, adaptive approach to fisheries management that addresses both biological and experiential aspects. By grounding this study in the existing literature, the research team has ensured that the implications and recommendations are well-aligned with evolving best practices in recreational fisheries management.

5.2 Satisfaction and Experience

Overall satisfaction with Barramundi fishing experiences in the NT is high, with mean satisfaction scores of 7.75 out of 10 for the overall experience and 7.62 for fishing-specific satisfaction. This indicates that the majority of fishers are more than just somewhat satisfied with their Barramundi fishing experiences. The high Net Promoter Score (NPS) of +47 further reinforces this positive sentiment, suggesting that many recreational fishers are likely to recommend Barramundi fishing in the NT to others.

Interestingly, there were no statistically significant differences between overall satisfaction and fishing-specific satisfaction across various demographic groups. This suggests that the broader experience of Barramundi fishing, including factors such as the natural environment and social aspects, contributes significantly to fisher satisfaction, rather than just the act of fishing itself.

The study revealed that spending time with family and friends (68%), relaxation (67%), and excitement (52%) are the primary motivations for Barramundi fishing in the NT. This hierarchy of motivations underscores the importance of considering social and experiential factors in fisheries management.

5.3 Fishery Health and Sustainability

The MaxDiff analysis revealed that maintaining abundant Barramundi populations is the most important factor for fishers (importance score of 100), followed closely by the environmental quality of fishing areas (importance score of 90). This strong emphasis on sustainability and conservation is encouraging and suggests that recreational fishers would be supportive of management measures aimed at protecting and enhancing Barramundi stocks and their habitats.

However, the relatively low satisfaction scores for "maintaining abundant (healthy) Barramundi populations" (6.80 out of 10) and "the availability of Barramundi in preferred fishing spots" (6.90 out of 10) indicate a potential mismatch between fisher expectations and their perceptions of the current state of the fishery. This discrepancy between the high importance placed on fish abundance and the lower satisfaction with current abundance levels presents a critical challenge for fishery managers. It suggests a need for either improved stock management strategies or better communication about the actual state of Barramundi populations to align fisher expectations with ecological realities. It could also reflect the limited availability of access points, challenges of fishing at popular locations, and potential effects of recreational or commercial fishing on localised catchability.

5.4 Infrastructure and Access

While infrastructure-related factors were not among the top priorities for fishers, there is significant room for improvement in this area. The satisfaction score for "the infrastructure provided for Barramundi fishing in the NT" was 6.91 out of 10, suggesting that while not critical, enhancements to boat ramps, parking facilities, and other amenities would be appreciated by fishers.

Ease of access to favourite fishing spots received a relatively low satisfaction score (6.70 out of 10), despite being ranked as moderately important in the MaxDiff analysis (importance score of 57.5). This suggests that improving access to popular fishing locations could significantly enhance the overall angling experience. The challenge for fishery managers will be balancing improved access with the need to protect sensitive habitats and prevent localised depletion in easily accessible areas.

Fishers have considerably less access to rivers and coastline in the Northern Territory than is the case in other parts of Australia. This is due to a smaller road network and vast areas of private land (pastoral and Aboriginal Land). The challenge of improving access is unlikely to fall within the remit of fishery managers and will need to be considered by other parts of government. Regardless, improving access is likely to improve fishing experiences.

5.5 Regulations and Enforcement

Recreational fishers reported high levels of satisfaction with the clarity and ease of understanding Barramundi fishing regulations (7.58 out of 10). This is a positive finding, as clear and understandable regulations are crucial for ensuring compliance. However, the lower satisfaction score for enforcement of fishing regulations (6.44 out of 10) suggests that there may be concerns about inadequate policing of the rules. This discrepancy between understanding and enforcement satisfaction highlights the opportunity for improved enforcement strategies.

The study also revealed that fishers perceive a need for better communication about the health status of the Barramundi fishery. This was the lowest-rated item in the agree/disagree statements, with only 40% of respondents agreeing that they are kept up to date on the fishery's health status. This finding underscores the importance of transparent and frequent communication from fishery managers to the fishing community.

5.6 Communication and Information Sharing

The findings indicate a strong preference for digital communication channels, with social media (53%) and smartphone apps (39%) being popular methods for receiving and providing information. This preference for digital platforms suggests that fishery managers should prioritise these channels for disseminating updates and collecting data from fishers, while managing limitations posed by the opt-in nature of such communications.

The willingness of fishers to share information about their fishing activities (mean score of 6.71 out of 10) presents a significant opportunity for managers to engage in citizen science initiatives and improve data collection on recreational fishing effort and catch. However, the challenge will be in designing useful, user-friendly data collection systems that encourage consistent participation without overly burdening fishers.

5.7 Regional Differences

The study revealed notable differences in satisfaction levels and fishing behaviours across different regions. For example, those who fished in Darwin Harbour reported lower overall satisfaction (7.30 out of 10) and catch rates compared to other regions, particularly the Daly River (8.33 out of 10). These regional variations highlight the need for a nuanced understanding of the factors influencing fisher satisfaction across different fishing regions. It is important to recognise that these differences may reflect not only variations in management approaches but also the inherently different stock sizes in different regions as well as experiences offered by diverse fishing environments, including the size and number of fish various catchments can sustain.

For example, the lower satisfaction reported in Darwin Harbour compared to the Daly River may stem from a combination of factors:

- 1. Environmental differences: Large rivers with floodplain connectivity like the Daly River, can naturally support bigger populations of larger barramundi than an urban coastal harbour, especially one without a major river system like Darwin Harbour.
- 2. Surroundings: The experience of fishing in an urban harbour environment versus a more remote river system can significantly impact fisher satisfaction, regardless of catch rates or management strategies.
- 3. Fishing pressure and crowding: More accessible areas like Darwin Harbour may experience higher fishing pressure, potentially leading to perceptions of overcrowding and/or resource depletion.
- 4. Expectations and fisher demographics: Different locations may attract fishers with varying expectations and experience levels, influencing overall satisfaction. For example people may expect less big barramundi in Darwin Harbour, or greater catch rates when fishing a remote location.
- 5. Access and facilities: The availability and quality of infrastructure and access points can differ significantly between urban and remote locations.

These insights suggest that tailored management approaches should consider not only the biological aspects of each fishing region but also the unique experiential factors that contribute to fisher satisfaction. This may involve:

- 1. Developing region-specific strategies that address both catch-related and non-catch-related factors influencing satisfaction.
- 2. Balancing efforts to maintain healthy fish populations with initiatives to enhance the overall fishing experience in each unique environment.
- 3. Considering the different recreational user groups and their expectations when designing management interventions and communications with regard to the fishing available in each area.

By acknowledging and addressing these complex, regional-specific factors, managers can work towards optimising fisher satisfaction across the diverse fishing environments of the Northern Territory.

5.8 Fisher Segmentation and Management Implications

The study's categorisation of fishers (e.g., NT Residents vs. NT Visitors, Fishing Association Members vs. Non-Members, and Low, Moderate, and High Avidity fishers) provides valuable insights for targeted management strategies.

NT Visitors, for instance, reported higher overall satisfaction (8.08 out of 10) compared to NT Residents (7.68 out of 10), and were more likely to fish for multiple days. This suggests that tourism-focused management strategies could capitalise on the positive experiences of visitors to promote the NT as a premier Barramundi fishing destination.

Fishing Association Members showed higher willingness to share information about their fishing activities (7.48 out of 10) compared to Non-Members (6.46 out of 10). This indicates that partnering with fishing associations could be a more effective way to implement citizen science initiatives and improve data collection.

High Avidity fishers reported catching and releasing larger Barramundi on average (70.29cm) compared to Low Avidity fishers (52.31cm). They also placed greater importance on factors like the availability of large/trophy sized fish. This suggests that management strategies aimed at maintaining a healthy population of large Barramundi could be particularly effective in satisfying this segment of dedicated fishers.

5.9 Implications for Adaptive Management

With high biomass levels for the target species and significant focus on catch-and-release fishing in the NT Barramundi fishery, there is a unique opportunity to optimise recreational fishing experiences. This favourable ecological status facilitates shifting some management focus from purely stock sustainability-oriented measures to those that can maximise social and economic benefits while maintaining the fishery's sustainability.

It is important to recognise that many fisheries face sustainability constraints, and modifying catchdependent factors through fishery controls is challenging and often contentious. However, in the case of the NT Barramundi fishery, the healthy state of the resource provides an opportunity to finetune management approaches to enhance fisher satisfaction without compromising ecological sustainability.

Given this context, the results of the study have several important implications for the adaptive management of the NT Barramundi fishery:

- Opportunity for Experience-Focused Management: With maintaining the biological sustainability of the fishery being a far from pressing concern, managers can prioritise enhancing the overall fishing experience in the pursuit of optimising returns to society through use of the resource. This may involve focusing on both catch-dependent factors (e.g., availability of trophy fish) and non-catch-dependent factors (e.g., access, facilities, crowding management).
- 2. Balancing Catch and Non-Catch Factors: While catch-related aspects remain important, the findings suggest that non-catch factors also significantly influence fisher satisfaction. Management strategies should aim to optimise both elements.

- 3. Tailored Regional Approaches: Given the variations in satisfaction across different fishing areas, location-specific management strategies may be particularly effective.
- 4. Adaptive Communication Strategies: With less pressure on resource conservation, there's an opportunity to focus communication efforts on enhancing fisher experiences and promoting responsible fishing practices.
- 5. Innovative Management Tools: The current state of the fishery allows for experimentation with novel management approaches that prioritise fisher satisfaction alongside traditional biological indicators.

By leveraging the current healthy state of the Barramundi fishery, managers have a unique opportunity to implement strategies that optimise the return to the community in terms of recreational fishing experiences and socio-economic benefits.

5.10 Management Implications:

- Regional Management: Given the variations in satisfaction levels and fishing behaviours across different regions (e.g., lower satisfaction in Darwin Harbour compared to the Daly River), managers could consider developing region-specific management plans/arrangements. This could involve tailored regulations, targeted habitat enhancement projects, or localised communication and outreach programs.
- Balancing Conservation and Access: The high importance placed on maintaining healthy Barramundi populations, coupled with the desire for easy access to fishing spots, presents a challenge for managers. Managers must strike a balance between accessible fishing opportunities and providing rewarding experiences for adventurous fishers. This balance is not so much about conservation in the traditional sense, as the Barramundi population is not currently under threat. Rather, it is about optimising the fishing experience while ensuring the continued health and sustainability of the fishery. This approach involves several key considerations:
 - 1. Population Management: While the Barramundi population is currently healthy, ongoing monitoring and management at suitable levels with remain crucial to maintaining this status in the long term. This includes ensuring that fishing pressures of all sectors do not negatively impact the abundance or size structure of the population, beyond tolerable limits.
 - 2. Access Management: As fishing participation grows, there's a need to manage access in a way that maintains the quality of the fishing experience. This might involve strategies to distribute fishing effort across different areas to prevent overcrowding in popular spots.
 - 3. Habitat Protection: Although stocks are currently healthy, protecting and enhancing fish habitats is the most important factor to maintain healthy Barramundi populations and overall fishing experiences.
 - 4. Fisher Education: Educating fishers about fishing locations and sustainable fishing practices can help maintain the health of the fishery while also enhancing the fishing experience through a sense of stewardship.
 - 5. Adaptive Management: Regularly assessing both fish populations and fisher satisfaction allows for timely adjustments to management strategies, ensuring that both biological and social objectives are met.

By focusing on these aspects, managers can work to optimise the recreational fishing experiences while ensuring that the Barramundi fishery remains healthy and productive for future generations. This approach recognises that in a well-managed fishery, enhancing fisher satisfaction and maintaining abundant fish populations are complementary rather than conflicting goals.

- Enforcement Strategies: The lower satisfaction with enforcement of regulations is a complex issue that warrants careful consideration. It is important to recognise that this dissatisfaction might stem from various factors including historical challenges resourcing fisheries compliance in the NT, recent changes from it being the responsibility of Water Police to the establishment of a dedicated Fisheries Compliance Unit and a gap during the announced transition. Additionally, not all satisfaction necessarily relates to actual enforcement levels. These factors could include:
 - 1. Perception vs. Reality: Fishers' perceptions of compliance may not accurately reflect actual compliance rates.
 - 2. Visibility of Enforcement: Low satisfaction could be due to a lack of visible enforcement activities.
 - 3. Communication Gap: There might be insufficient communication about enforcement efforts and their effectiveness.
 - 4. Normative Beliefs: Fishers' beliefs about others' compliance can significantly influence their own behaviour and satisfaction with enforcement.

Given these complexities, addressing enforcement satisfaction may require a multifaceted approach:

- 1. Assessment of Actual Compliance: Conduct studies to determine actual compliance rates with fishing regulations.
- 2. Perception Research: Investigate fishers' perceptions of compliance and enforcement to identify key areas of focus.
- *3.* Enhanced Communication: Develop strategies to better communicate about enforcement efforts and compliance rates.
- 4. Targeted Visibility: Consider increasing the visibility of enforcement activities in key areas or during peak times.
- 5. Community Engagement: Implement community-based programs that foster a culture of compliance and shared responsibility for fishery management.
- 6. Education Initiatives: Enhance education efforts about regulations and their importance to promote voluntary compliance.

Both the reality and perception of enforcement can be addressed, potentially improving satisfaction over and above the just increasing enforcement resources. This strategy recognises that enforcement satisfaction is not just about policing efforts, but also about communication, community engagement, and shaping normative beliefs within the angling community.

5.11 Communication and Outreach Implications:

- Digital Communication Strategies: The strong preference for digital communication channels among fishers implies that fishery managers should invest in developing robust social media strategies and mobile applications. This shift towards digital platforms may require additional resources and expertise in digital communication and app development.
- Transparency in Fishery Status Communication: The perceived lack of information about the status of the Barramundi fishery suggests a need for more transparent and frequent communication from managers. This could involve regular status reports, easily accessible online dashboards, or periodic community meetings to discuss the state of the fishery.
- Targeted Outreach: The segmentation of fishers (e.g., residents vs. visitors, high vs. low avidity) implies a need for targeted outreach strategies. This could involve developing different communication materials and channels for different fisher groups, potentially increasing the complexity and cost of outreach efforts.

5.12 Economic Implications:

- Tourism Development: The high satisfaction levels among NT visitors suggest potential for growth in fishing tourism. This could have positive economic implications for the region, but would require careful management to ensure that increased fishing pressure doesn't negatively impact the resource or the experience of local fishers.
- Infrastructure Investment: The moderate satisfaction with current infrastructure suggests that targeted investments in facilities such as boat ramps, parking areas, and amenities could enhance the overall angling experience. While this would require significant financial outlay, it could lead to increased participation and associated economic benefits.
- Technology Investment: The preference for digital communication and willingness to participate in data sharing implies a need for investment in technological infrastructure. This could include developing and maintaining apps, enhancing cellular coverage in popular fishing areas, and implementing systems for real-time data collection and analysis.

5.13 Social Implications:

- Community Engagement: The willingness of fishers to share information about their fishing activities presents opportunities for increased community engagement in fishery management. This could lead to more collaborative decision-making processes and potentially increase compliance with regulations.
- Recreational Value: The high importance placed on social aspects of fishing (spending time with family and friends, relaxation) underscores the significant social value of recreational fishing. This implies that maintaining and enhancing fishing opportunities could have broader social benefits beyond just the act of fishing itself.

5.14 Environmental Implications:

• Ecosystem-Based Fisheries Management (EBFM): The high importance placed on environmental quality by fishers supports the implementation of ecosystem-based management approaches. This could involve broader habitat protection measures and consideration of factors beyond just fish populations in management decisions.

• Citizen Science Opportunities: The willingness of fishers to share information presents opportunities for large-scale data collection on fish populations and environmental conditions. This could significantly enhance the ability to monitor and respond to environmental changes affecting the fishery.

5.15 Policy Implications:

- Regulatory Review: The high satisfaction with the clarity of fishing regulations, coupled with lower satisfaction in other areas, suggests the potential for a review of current policies. This could lead to the development of new policies that better align with fisher preferences while still meeting conservation objectives.
- Cross-Sector Collaboration: The complexity of managing recreational fishing while considering commercial and Indigenous fishing interests implies a need for policies that promote cross-sector collaboration and equitable resource allocation.
- Long-Term Planning: The study's findings highlight the need for long-term strategic planning for the Barramundi fishery. This could involve the development of a clear policy and multi-year management plan that incorporates regular assessment of fisher satisfaction and fish populations.
- In conclusion, the implications of this study are far-reaching and multifaceted. They highlight the need for an integrated approach to fishery management that considers biological, social, economic, and environmental factors. While implementing changes based on these findings may present challenges, it also offers significant opportunities to enhance the recreational fishing experience, ensure the long-term sustainability of the Barramundi fishery, and maximise the economic and social benefits of recreational fishing in the Northern Territory. The successful implementation of these implications will require ongoing collaboration between fishery managers, policymakers, the fishing community, and other stakeholders.

5.16 Conclusion

In conclusion, this comprehensive study focussed on recreational Barramundi fishing in the NT provides a nuanced understanding of fisher experiences, preferences, and behaviours. The findings offer valuable insights that can inform evidence-based, adaptive management decisions. By addressing the key areas identified in this research - from conservation and communication to infrastructure and enforcement - fishery managers have the opportunity to enhance recreational fishing experiences while ensuring the long-term sustainability of the Barramundi fishery. The challenge lies in balancing these diverse factors to create a resilient, satisfying, and ecologically sustainable recreational fishery for future generations.

The findings of this study have significant implications for various stakeholders, including fishery managers, policymakers, the fishing industry, and the broader community. These implications span across management practices, economic considerations, social aspects, and environmental conservation efforts.

6. Conclusion

This section should bring together all the results and objectives to give an overview of the key findings and outcomes.

6.1 Introduction

This extensive study of recreational Barramundi fishing in the Northern Territory has yielded a wealth of insights into recreational fisher experiences, preferences, and satisfaction levels. It successfully addresses the primary objective of documenting an evidence-based, pragmatic approach for NT Fisheries to integrate recreational fisher experiences and satisfaction levels into its fishery harvest strategies. The findings provide a robust foundation for evidence-based management of this important fishery, offering nuanced understanding across various dimensions of the recreational fishing experience.

6.2 Comprehensive Literature Review

The study began with a thorough literature review, which provided context for understanding recreational fisher experiences, satisfaction levels, and their integration into fishery harvest strategies. This review highlighted the importance of considering diverse motivations and expectations of recreational fishers, which extend beyond simply catching fish. The findings from the literature review informed the development of the qualitative and quantitative research phases.

6.3 Collaboration with Key Stakeholders:

The research team worked closely with NT Fisheries, AFANT, NTGFIA, and other key stakeholders to determine issues, select the Barramundi fishery for the case study, and develop optimal strategies for engaging with the recreational fishing sector. This collaborative approach ensured that the study was relevant and responsive to the needs of both managers and recreational fishers.

6.4 Detailed Methodology

The study successfully developed and implemented a robust methodology for assessing recreational fisher experiences and satisfaction levels, tailored to the specific needs and context of the Northern Territory. This included a mix of qualitative and quantitative methods, including focus groups, surveys, and advanced analytical techniques such as MaxDiff analysis.

6.5 Qualitative Research

Focus groups with recreational fishers and additional stakeholders provided deeper insights into the factors influencing fisher experiences and satisfaction levels. These qualitative insights informed the development of the quantitative survey and helped contextualise the survey results.

6.6 Comprehensive Research Instrument

The study developed a comprehensive survey instrument that effectively captured key aspects of the recreational fishing experience, fisher satisfaction, and preferences. The survey design incorporated insights from the literature review, the qualitative research and input from key stakeholders.

6.7 Survey Implementation and Data Analysis

The survey was successfully implemented, targeting a representative sample of recreational fishers in the Northern Territory. The data analysis revealed several key findings:

- High overall satisfaction with Barramundi fishing experiences (mean scores of 7.75/10 for overall experience and 7.62/10 for fishing-specific satisfaction).
- Primary motivations for fishing include spending time with family/friends (68%), relaxation (67%), and excitement (52%).
- High importance placed on maintaining abundant Barramundi populations and environmental quality of fishing areas.
- Variations in satisfaction and preferences across different fisher segments and fishing regions.
- Strong preference for digital communication channels among fishers.

6.8 User-Friendly Report with Pragmatic Guidance

This report presents the findings of the study in a clear and actionable format, providing pragmatic guidance for NT Fisheries to integrate recreational fisher experiences and satisfaction levels into its fishery harvest strategies. Key recommendations include:

- Focusing on conservation-oriented management strategies, given the high importance fishers place on fish abundance and environmental quality.
- Improving communication about the health status of the fishery and management decisions, utilising preferred digital channels.
- Considering targeted improvements in infrastructure and access to fishing spots to enhance overall satisfaction.
- Developing region-specific management approaches to address variations in fisher experiences and satisfaction across different areas.
- Implementing fisher segmentation strategies to cater to the diverse needs and preferences within the fishing community.
- Exploring opportunities for citizen science initiatives to improve data collection and engage fishers in the management process.

By achieving these objectives, the study has provided NT Fisheries with a comprehensive understanding of recreational fisher experiences and satisfaction levels, along with practical tools for integrating these insights into fishery harvest strategies. The findings highlight the complex interplay between biological, social, and management factors in shaping fisher satisfaction and behaviour.

This research offers a solid foundation for evidence-based decision-making in the management of the NT Barramundi fishery. It demonstrates how recreational fisher experiences and satisfaction can be systematically assessed and integrated into management strategies, potentially leading to more effective and widely accepted approaches.

Moving forward, the challenge lies in translating these insights into concrete management actions. It's crucial to recognise that the NT Barramundi fishery is in a unique position compared to many other fisheries. With high biomass levels for target species and a significant focus on catch-andrelease fishing, there is an opportunity to optimise recreational fishing experiences in ways that may not be feasible in fisheries facing sustainability challenges.

In this context, fishery managers have the opportunity to enhance the recreational fishing experience while maintaining the long-term sustainability of the Barramundi fishery. This can be achieved by addressing key areas identified in the research:

- 1. Catch-dependent factors: While the fishery is healthy, continued monitoring and management of fish populations remain essential. This includes:
 - o Maintaining abundant Barramundi populations
 - Ensuring availability of trophy-sized fish
 - Optimising catch rates within sustainable limits
- 2. Non-catch-dependent factors: With less pressure on resource conservation, there's more scope to focus on enhancing the overall fishing experience. This includes:
 - Improving infrastructure and access
 - Managing crowding at popular fishing spots
 - Enhancing the natural environment and scenery
- 3. Communication and education: Develop strategies to:
 - Inform fishers about the healthy state of the fishery
 - Promote responsible fishing practices
 - Manage expectations and enhance satisfaction
- 4. Adaptive management: Implement flexible strategies that can:
 - Respond to changes in fisher preferences over time
 - o Address regional variations in fishing experiences
 - Balance the needs of different fisher groups
- 5. Enforcement: While maintaining necessary regulations, focus enforcement efforts on enhancing the quality of the fishing experience rather than solely on conservation measures.

By leveraging the current healthy state of the Barramundi fishery, managers can implement strategies that optimise the return to the community in terms of recreational fishing experiences and socio-economic benefits. This approach recognises that in fisheries where biological sustainability is assured, there are both catch-dependent and non-catch-dependent factors that can be leveraged to enhance overall performance and fisher satisfaction.

The methodological approach developed in this study also provides a robust framework that could be adapted and applied to other recreational fisheries, both within Australia and internationally. As

such, this research not only meets its immediate objectives but also makes a significant contribution to the broader field of recreational fisheries science and management.

This comprehensive study has successfully bridged a critical knowledge gap by providing a detailed understanding of recreational Barramundi fisher experiences and satisfaction levels in the Northern Territory. The findings offer a robust foundation for the development and refinement of harvest strategies that align with the needs and expectations of recreational fishers while ensuring the long-term sustainability of the fishery.

The challenge now lies in translating these insights into effective management actions. By addressing the key areas identified in this research - from conservation and communication to infrastructure and enforcement - fishery managers have the opportunity to enhance the recreational fishing experience while ensuring the long-term sustainability of the Barramundi fishery. The integration of these findings into adaptive management practices will be crucial in creating a resilient, satisfying, and ecologically sustainable recreational fishery for future generations.

As recreational fishing continues to grow in popularity and economic importance, studies such as this one become increasingly vital. They provide the necessary data and insights to balance the often-competing demands of resource conservation, fisher satisfaction, and economic development. By demonstrating how fisher experiences and satisfaction can be systematically assessed and integrated into management strategies, this study makes a significant contribution to the field of recreational fisheries science and management.

Looking forward, the findings of this study open up several avenues for future research and management initiatives. These could include longitudinal studies to track changes in fisher satisfaction over time, more detailed investigations into the effectiveness of various management interventions, and exploration of innovative approaches to citizen science and fisher engagement. Additionally, the insights gained from this study could inform the development of similar research programs in other recreational fisheries, both within Australia and internationally.

In the context of increasing environmental pressures and growing demand for recreational fishing opportunities, the importance of evidence-based, adaptive management approaches cannot be overstated. This study provides a valuable roadmap for how such approaches can be developed and implemented, placing the Northern Territory at the forefront of innovative recreational fisheries management. By continuing to build on this foundation of knowledge and engagement with the angling community, managers can work towards ensuring that the NT Barramundi fishery remains a world-class recreational fishing destination for generations to come.

7. Recommendations

These following recommendations focus specifically on practically integrating recreational fisher satisfaction and experience metrics into NT Fisheries harvest strategies, addressing the core objectives of the study. They provide a framework for using the insights gained from this research to enhance the management of the Barramundi fishery in a way that balances ecological sustainability with fisher satisfaction. It is important to note that while this study has focused on the NT Barramundi fishery, the following recommendations can be considered across other species in the NT fishery and indeed across fisheries in other jurisdictions. The pragmatic integration of recreational fisher satisfaction metrics into harvest strategies is addressed in the following section of this report.

Develop Integrated Performance Indicators:

- Create composite indicators that blend biological metrics with fisher satisfaction scores. For example, a "Fisher Experience Index" could combine catch rates, fish size, and satisfaction ratings.
- Set specific thresholds for these indicators within the harvest strategy. For instance, if the Fisher Experience Index falls below 7 out of 10, it could trigger a review of current management measures.
- Ensure these indicators are sensitive to both short-term fluctuations and long-term trends in fisher satisfaction and fish populations.
- Regularly validate these indicators to ensure they accurately reflect both the state of the fishery and fisher experiences.

Implement Regular Satisfaction Surveys:

- Conduct standardised surveys annually, using the methodology developed in this study to ensure consistency and comparability of data over time.
- Include core questions on overall satisfaction, fishing-specific satisfaction, and key experience factors identified in the MaxDiff analysis.
- Incorporate seasonal surveying to capture variations in fisher experiences throughout the year, particularly during peak fishing periods like the run-off season.
- Develop a database to track satisfaction metrics over time, allowing for trend analysis and early identification of changes in fisher experiences.

Establish a Harvest Strategy Working Group:

- Form a diverse group including fishery managers, biologists, statisticians, and representatives from various recreational fisher segments (e.g., local clubs, tourism operators, casual fishers).
- Task the group with developing specific proposals for integrating satisfaction data into the harvest strategy, including defining decision rules and review processes.
- Hold regular meetings (e.g., quarterly) to review new data and discuss potential management implications.
- Ensure the group's discussions and recommendations are transparent, with summaries made available to the broader angling community.

Define Harvest Strategy Decision Rules:

- Develop a matrix of decision rules that link specific changes in satisfaction metrics to management actions. When considering how to respond to changes in fisher satisfaction, it is crucial to adopt a more nuanced and comprehensive approach. Rather than implementing blanket responses to overall satisfaction scores, the following process is recommended:
 - 1. Distinguish Between Satisfaction Factors: Clearly differentiate between catch-dependent factors (e.g., fish size, abundance) and non-catch-dependent factors (e.g., access, facilities, crowding) in satisfaction metrics.
 - 2. Establish Specific Triggers: Instead of using a single overall satisfaction score, set specific thresholds for different aspects of the fishing experience. For example:
 - o If satisfaction with fish size drops below a certain level
 - o If perception of fish abundance falls below a set threshold
 - o If satisfaction with access or facilities decreases significantly
 - 3. Investigate Root Causes: When a trigger is activated, conduct a thorough investigation to understand the specific reasons behind the decline in satisfaction. This could involve targeted surveys, focus groups, or stakeholder meetings.
 - 4. Consider Multiple Management Responses: Based on the identified issues, consider a range of potential management responses. These might include:
 - Adjusting bag limits or slot limits
 - Enhancing habitat or stocking programs
 - Improving access or facilities
 - Implementing education programs
 - o Addressing crowding through capacity management strategies
 - 5. Assess Ecological Implications: For any proposed changes, particularly those affecting catch limits or fishing pressure, conduct a thorough assessment of potential ecological impacts to ensure alignment with sustainability goals.
 - 6. Stakeholder Engagement: Engage the angling community and other stakeholders in the decision-making process. This could involve hosting a symposium to discuss the reasons behind satisfaction changes and potential management responses.
 - 7. Pilot and Evaluate: Where possible, implement changes on a trial basis in specific areas before broader application. Monitor the effects closely and adjust as necessary.
 - 8. Regular Review: Establish a regular review process to assess the effectiveness of any implemented changes and make further adjustments as needed.

This approach recognises that managing for satisfaction is complex and may require different strategies in different situations. It allows for targeted and effective management responses that address the root causes of declining satisfaction while ensuring the long-term sustainability of the fishery.

- Ensure these rules are flexible enough to account for natural variability in fish populations and fisher expectations.
- Clearly communicate these rules to the angling community to promote understanding and buy-in.

Integrate MaxDiff Analysis Results:

- Use the importance rankings to create a weighted satisfaction score that gives more influence on highly ranked factors in management decisions.
- Prioritise management actions that address the top-ranked factors. For instance, given the high importance of "maintaining abundant Barramundi populations," ensure that stock assessments and conservation measures are given significant weight in the harvest strategy.
- Regularly repeat the MaxDiff analysis (e.g., every 3-5 years) to track any changes in fisher priorities over time.

Develop Region-Specific Satisfaction Targets:

- Set distinct satisfaction targets for major fishing areas like Darwin Harbour, Daly River, and Mary River, reflecting the unique characteristics and challenges of each region.
- Incorporate these targets into regional management plans within the broader harvest strategy. For example, aim for an 8/10 satisfaction score in the Daly River region versus a 7/10 in the more heavily fished Darwin Harbour.
- Develop region-specific management responses when targets are not met, such as localised changes to bag limits or increased habitat restoration efforts.

Explore the Potential to Implement a Real-Time Data Collection System:

- Explore the potential to develop a user-friendly smartphone app that allows fishers to quickly rate their fishing experience and provide key data (e.g., catch information, location) after each trip. This could be done in association with a key stakeholder such as AFANT.
- Use push notifications to encourage regular reporting and provide immediate feedback to users.
- Incorporate gamification elements to incentivise consistent reporting, such as badges for frequent contributors or leaderboards for most active citizen scientists.
- Use this real-time data to provide monthly or quarterly updates to satisfaction metrics, allowing for more responsive management.

Establish a Formal Review Process:

- Implement an annual review cycle that assesses the effectiveness of incorporating satisfaction metrics into the harvest strategy.
- Include a comprehensive analysis of how satisfaction data influenced management decisions over the past year and the outcomes of those decisions.
- Use this process to refine the weighting of satisfaction metrics in decision-making and adjust thresholds as needed.

• Publish an annual report summarising the review findings and any resulting changes to the harvest strategy.

Incorporate Non-Catch Related Factors:

- Develop a holistic scoring system within the harvest strategy that includes non-catch related factors such as environmental quality, access to fishing spots, and quality of facilities.
- Create management levers that can address these factors, such as investing in boat ramp improvements or habitat restoration when satisfaction with these elements drops.
- Consider how improvements in non-catch areas can be used to enhance overall satisfaction. This approach recognises that fisher satisfaction is multifaceted and can be improved through various means, not just those related to catch.
- Collaborate with other government departments (e.g., parks and wildlife, infrastructure) to address these broader factors affecting fisher experiences.

Create a Communication Framework:

- Develop a structured communication plan that outlines how and when satisfaction data and resulting management decisions will be shared with the angling community.
- Implement regular updates through multiple channels including the fishing app, social media, and traditional media outlets.
- Create easily understandable infographics and summary reports that clearly show how fisher feedback is influencing management decisions.
- Establish a feedback loop where fishers can comment on how their input is being used, further refining the integration process.

Pilot Test the Integrated Approach:

- Select a specific region (e.g., Daly River) to implement a pilot program integrating satisfaction metrics into local management decisions.
- Run this pilot for a full year, carefully documenting the process, challenges, and outcomes.
- Conduct a thorough evaluation of the pilot, including surveys of both managers and fishers to assess the effectiveness and acceptability of the approach.
- Use the lessons learned from this pilot to refine the methodology before implementing Territory-wide.

These recommendations provide a comprehensive roadmap for NT Fisheries to practically integrate recreational fisher satisfaction and experience metrics into their harvest strategies. This approach ensures that management decisions are informed by both ecological data and the experiences of the angling community, potentially leading to more effective and widely accepted fishery management practices.

8. Pragmatic Integration of Recreational Fisher Satisfaction Metrics into Harvest Strategies

The Objects of the Northern Territory Fisheries Act 1988 (the Act) are:

- (a) to manage the aquatic resources of the Territory in accordance with the principles of ecologically sustainable development; and
- (ab) to protect the environment, people, and economy of the Territory from the introduction and spread of aquatic noxious species and diseases; and
- (ac) to acknowledge the rights and interests of Aboriginal people and resources of significance to Aboriginal people referred to in section 2B(1) (of the Act) and to promote opportunities for Aboriginal people to benefit economically from aquatic resources; and
- (b) to maintain a stewardship of aquatic resources that promotes fairness, equity, and access to aquatic resources by all stakeholder groups, including:
 - (i) Aboriginal people; and
 - (ii) the commercial fishing, aquaculture, and fishing tourism industries; and
 - (iii) amateur fishers; and
 - (iv) others with an interest in the aquatic resources of the Territory; and

(c) to promote the optimum utilisation of aquatic resources to the benefit of the community.

Further, Section 2B(2) of the Act, states:

"Unless expressly provided otherwise, nothing in this Act derogates or limits the right of Aboriginal people who have traditionally used the resources of an area of land or water in a traditional manner to continue to use those resources in that area in that manner."

Much of the recreational Barramundi fishing in the NT is undertaken on Aboriginal Land and/or Sea Country. The Blue Mud Bay High Court decision recognised Traditional Owners' rights to the intertidal zone on Aboriginal Land, affecting somewhere between 80-85% of the NT coastline. The practical outcome of this is that entry into waters over Aboriginal Land for a purpose such as fishing (either recreational or commercial) requires permission from the relevant land trust¹, except in areas that have entered into an agreement with the Government for open access.

In addition to the above, Australia is a signatory to and/or recognises various international instruments that guide how fisheries resources need to be managed with respect to Indigenous People. Putting the above into perspective, it is important that decisions regarding management of the Barramundi resource and development of harvest strategies that better reflect recreational expectations must have input from, and not undermine access to, Aboriginal stakeholders.

With this in mind, the following section suggests how Integration of Recreational Fisher Satisfaction Metrics may be integrated into Harvest Strategies

The integration of recreational fisher satisfaction metrics into fishery harvest strategies represents a significant advancement in recreational fisheries management. By combining biological indicators with

¹ Refer to the commentary by Lauren Butterly 'A decade on: What happened to the historic Blue Mud Bay case (and why is it in the news again)?' on AUSPUBLAW (20 June 2017) <u>https://auspublaw.org/2017/06/what-happened-to-the-historic-blue-mud-bay-case</u>

social dimensions, fisheries managers can create more comprehensive and responsive management frameworks. Analysis of importance versus satisfaction scores has revealed five key attributes that fishers value most. These attributes provide critical insights into fisher priorities and experiences, offering a unique opportunity to align management strategies with stakeholder expectations while ensuring the ecological sustainability of the fishery.

Top 5 Importance Attributes:

- 1. Maintaining abundant Barramundi populations (Importance: 100.0, Satisfaction: 6.80) Rationale: This is the most critical attribute for fishers, indicating that the health and abundance of the Barramundi population is paramount. The lower satisfaction score suggests a significant area for management focus.
- 2. The environmental quality of Barramundi fishing areas (Importance: 90.0, Satisfaction: 7.34) Rationale: Fishers place very high importance on overall environmental quality, including habitat health and aesthetics. The relatively high satisfaction score suggests current conditions are generally meeting expectations, but continued focus is necessary.
- 3. The enforcement of fishing regulations (Importance: 63.3, Satisfaction: 6.44) Rationale: This attribute has high importance but a lower satisfaction score, indicating a significant area for improvement. Effective enforcement is crucial for protecting Barramundi populations and their habitats.
- 4. The ease of access to favourite Barramundi fishing spots (Importance: 57.5, Satisfaction: 6.70) Rationale: Access to fishing spots is highly important to fishers, with room for improvement in satisfaction. This highlights the need to balance accessibility with conservation efforts.
- 5. The availability of Barramundi in preferred fishing spots (Importance: 57.4, Satisfaction: 6.90) Rationale: Closely related to overall population abundance, this attribute focuses on specific fishing locations. The gap between importance and satisfaction suggests a need for targeted management strategies.

A two-tiered approach to incorporating these insights into NT Fisheries harvest strategies is recommended.

Annual Satisfaction Evaluation:

Conduct yearly assessments of recreational fisher satisfaction for the top five importance attributes.

Implementation:

- Develop a standardised, concise annual survey focusing on satisfaction scores for these attributes. This can be incorporated into other surveys being conducted by NT Fisheries.
- Conduct surveys at consistent times each year, ideally coinciding with peak fishing seasons.
- Include open-ended questions to capture qualitative insights on reasons for changes in satisfaction noting that participating in the survey should not be onerous.

Periodic Importance Evaluation (every 3-5 Years):

Conduct a comprehensive study reassessing both importance and satisfaction using techniques like MaxDiff analysis.

Implementation:

- Use this study to reassess the ranking of importance attributes and identify emerging priorities.
- Align with strategic planning cycles to inform broader management adjustments.

Integration into Harvest Strategies:

- 1. Maintaining abundant Barramundi populations:
 - Establish quantifiable targets for population abundance.
 - Implement a traffic light system triggering management responses based on both population metrics and recreational fisher satisfaction scores.
- 2. Environmental quality of Barramundi fishing areas:
 - Develop an "Environmental Quality Index" combining scientific measures with recreational fisher perceptions.
 - Set minimum standards within the harvest strategy, triggering actions if the index falls below specified levels.
- 3. Enforcement of fishing regulations:
 - Establish an "Enforcement Effectiveness Score" combining quantitative data with recreational fisher satisfaction.
 - Set target levels, with provisions to adjust enforcement strategies if targets are not met.
- 4. Ease of access to favourite Barramundi fishing spots:
 - Develop an "Accessibility Index" considering physical access, legal access, and recreational fisher satisfaction.
 - Implement a rotational access system to manage pressure while maintaining overall access.
- 5. Availability of Barramundi in preferred fishing spots:
 - Create a "Hotspot Satisfaction Index" combining local abundance data with recreational fisher catch rates and satisfaction.
 - Incorporate adaptive spatial management, allowing flexible adjustment of regulations in specific areas.

Overall Strategy Integration:

- While the research suggests that a comprehensive approach considering all factors affecting fisher satisfaction would be ideal, it is recognised that such an approach may not be immediately practical within the current management framework. Therefore, a two-tiered approach is proposed:
 - 1. Immediate Implementation: Focus on Catch-Dependent Factors
 - It is recommended initially integrating satisfaction metrics that are directly related to catch and within the control of fishery managers. This could include:
 - Catch Rate Satisfaction: Monitor satisfaction with the number of fish caught.
 - Fish Size Satisfaction: Track satisfaction with the size of fish caught.
 - Species Diversity Satisfaction: Assess satisfaction with the variety of species available.
 - These metrics can be linked to management levers such as:

- Size limits
- Bag limits
- Seasonal closures
- Gear restrictions
- Stocking programs (not applicable to the Barramundi fishery)
- 2. Long-Term Vision: Comprehensive Satisfaction Management
 - While focusing on catch-dependent factors in the short term, the development of a longterm strategy for more comprehensive satisfaction management is recommended. This would involve:
 - Interagency Collaboration: Work towards a whole-of-government approach that can address non-catch factors like access, infrastructure, and environmental quality.
 - Data Collection: Continue to gather data on all satisfaction factors, both catch and non-catch related, to inform future management decisions.
 - Pilot Programs: Where possible, implement small-scale pilot programs that integrate both catch and non-catch factors, to demonstrate the value of a more comprehensive approach.
 - Implementation Strategy:
 - Establish Baseline: Conduct regular surveys to establish and monitor satisfaction levels for catch-dependent factors.
 - Set Targets: Develop specific, measurable targets for each satisfaction metric.
 - Link to Biological Indicators: Create a matrix that relates satisfaction metrics to biological indicators (e.g., fish abundance, size structure) and existing management tools.
 - Decision Rules: Develop clear decision rules for when and how to adjust management strategies based on changes in satisfaction metrics, always ensuring that biological sustainability is not compromised.
 - Regular Review: Implement an annual review process to assess the effectiveness of this approach and make necessary adjustments.
 - Stakeholder Communication: Clearly communicate this approach to stakeholders, emphasising that while non-catch factors are recognised as important, initial management responses will focus on catch-related aspects.
 - This pragmatic approach allows for the immediate integration of satisfaction metrics into harvest strategies while acknowledging the broader factors that influence overall fisher satisfaction. It provides a path forward that is within the current scope of fishery managers' responsibilities, while also setting the stage for more comprehensive management in the future

Reporting and Communication:

• Produce annual reports on satisfaction scores, comparing them to baseline importance rankings.

- Every 3-5 years, produce a comprehensive report reassessing both importance and satisfaction.
- Regularly communicate results to stakeholders, emphasising how their input influences management decisions.

This approach provides NT Fisheries with a robust, responsive system for integrating recreational fisher perspectives into harvest strategies. It balances the need for current data on fisher experiences with the stability required for effective long-term management planning. By systematically incorporating these social dimensions, managers can create more holistic strategies that not only ensure the biological sustainability of the Barramundi fishery but also maximise fisher satisfaction and engagement, leading to improved compliance and stronger stakeholder support for management decisions.

9. Extension and Adoption

The findings and recommendations from this comprehensive study on recreational Barramundi fishing in the Northern Territory will be extended and communicated to end users through multiple channels:

- 1. Stakeholder Presentations: The research team will conduct a presentation of the key findings and recommendations to NT Fisheries, AFANT, NTGFIA, and other key stakeholders. This presentation will provide an opportunity for direct engagement and discussion of the implications for fisheries management.
- 2. Public Report: The report will be made available on the FRDC, NT Fisheries, AFANT and NTGFIA websites. This will ensure broader accessibility of the research outcomes to the recreational fishing community.
- 3. Social Media Communication: Key insights summarising the study's findings will be shared through NT Fisheries, AFANT and NTGFIA social media channels, aligning with the identified preference for digital communication among fishers.
- 4. Fishing App Integration: Relevant findings and recommendations will be incorporated into the development or enhancement of fishing apps used by NT recreational fishers, potentially including features for real-time data collection and feedback.
- 5. Conference Presentations: Findings will potentially be presented at relevant fisheries management and recreational fishing conferences, both nationally and internationally, to share insights and methodologies with a wider audience.
- 6. Annual Fisheries Reports: Key findings and ongoing implementation efforts will be included in NT Fisheries' annual reports, ensuring continued visibility of the project's impact.
- 7. Media Engagement: Press releases and media interviews will be arranged to communicate key findings to the broader public through local media outlets.
- 8. Ongoing Consultation: The established Harvest Strategy Working Group will serve as an ongoing mechanism for extending and adopting the project's recommendations, ensuring continuous engagement with key stakeholders.

The adoption of the project outputs will be an ongoing process, with initial steps likely to include:

- Incorporation of satisfaction metrics into the next review of the Barramundi fishery harvest strategy.
- Development of a pilot program in a selected region (e.g., Daly River) to test the integration of satisfaction data into local management decisions.
- Enhancement of digital communication channels based on the study's findings on fisher preferences.
- Initiation of more regular and structured satisfaction surveys as part of NT Fisheries' data collection processes.

The full adoption of recommendations is expected to occur over several years, with ongoing evaluation and refinement based on stakeholder feedback and observed outcomes in the fishery.

10. Applicability to Other Fisheries & Jurisdictions

While this study has focused specifically on the Northern Territory's Barramundi fishery, many aspects of the methodology, findings, and recommendations have broader applicability to other recreational fisheries and jurisdictions. Particularly, the framework developed here for distinguishing between catch-dependent and non-catch-dependent factors in fisher satisfaction provides a robust template that can be adapted to assess and integrate fisher satisfaction into management strategies across diverse fisheries.

Key transferable elements include:

- 1. Mixed-method approach: The combination of qualitative focus groups, quantitative surveys, and advanced analytical techniques like MaxDiff analysis offers a comprehensive methodology for understanding fisher experiences and preferences. This approach can be readily adapted to other fisheries and regions.
- 2. Satisfaction metrics: The identification and measurement of key satisfaction drivers, both catchdependent and non-catch-dependent, provides a model for assessing fisher experiences in other recreational fisheries. While specific factors may vary, the overall approach to identifying and prioritising these elements is widely applicable.
- 3. Segmentation analysis: The study's examination of different fisher groups (e.g., residents vs. visitors, varying avidity levels) demonstrates the importance of recognising diverse stakeholder needs within a fishery. This segmentation approach can inform targeted management strategies in other jurisdictions.
- 4. Context-specific management: The study's recognition of the unique position of the NT Barramundi fishery with its high biomass levels and focus on catch-and-release underscores the importance of context-specific management approaches. While other fisheries may face different challenges, the principle of tailoring management strategies to the specific ecological and social context of each fishery is widely applicable.
- 5. Pragmatic implementation: The outlined approach for integrating satisfaction metrics into harvest strategies, focusing initially on factors within fishery managers' control, offers a practical model for other jurisdictions looking to incorporate fisher satisfaction into their management frameworks.
- 6. Digital engagement: The findings regarding fishers' preferences for digital communication channels and willingness to participate in data sharing are likely relevant across many modern recreational fisheries, informing outreach and citizen science initiatives.
- 7. Regional variation consideration: The study's recognition of regional differences in fisher experiences highlights the importance of localised management approaches, a principle applicable to many geographically diverse fisheries.
- 8. Non-catch related factors: The identification of environmental quality and access as key satisfaction drivers underscores the need for holistic management approaches in recreational fisheries beyond just fish stocks.
- 9. Adaptive management framework: The proposed system for regular assessment and integration of fisher satisfaction into management decisions provides a model for responsive, stakeholder-inclusive fisheries management. This adaptive management approach, while tailored to the NT Barramundi fishery, offers valuable insights for other recreational fisheries seeking to balance ecological sustainability with fisher satisfaction.

While specific findings related to Barramundi fishing may not directly translate to other species or regions, the overall approach to assessing and integrating recreational fisher satisfaction into management

strategies is highly transferable. Fisheries managers in other jurisdictions can use this study as a blueprint, adapting the methodologies and frameworks to suit their specific contexts and management challenges.

By applying these principles and approaches, other fisheries management agencies can work towards creating more responsive, stakeholder-inclusive management strategies that balance conservation needs with fisher satisfaction, ultimately leading to more sustainable and socially beneficial recreational fisheries.

The study's emphasis on distinguishing between catch-dependent and non-catch-dependent factors in satisfaction provides a particularly valuable framework for other fisheries. This approach allows managers to prioritise actions within their immediate control while also recognising and planning for broader factors that influence fisher satisfaction.

Moreover, the pragmatic approach to implementation outlined in this study offers a roadmap for other jurisdictions facing similar challenges in integrating satisfaction metrics into their management frameworks. By focusing initially on catch-dependent factors while working towards a more comprehensive long-term strategy, other fisheries can begin to incorporate fisher satisfaction into their management practices in a practical and achievable manner.

As recreational fishing continues to grow in popularity and economic importance globally, studies such as this one become increasingly vital. They provide the necessary data and insights to balance the oftencompeting demands of resource conservation, fisher satisfaction, and economic development. By demonstrating how fisher experiences and satisfaction can be systematically assessed and integrated into management strategies, this study makes a significant contribution to the field of recreational fisheries science and management, with lessons applicable far beyond the Northern Territory's Barramundi fishery.

11. Project Coverage

Media and social media coverage for project was as follows:

- Joint Media Release 09/11/23 NT Recreational Fishing Experience Survey Launches Today (sent to media NT outlets)
- AFANT Web News published 09/11/23: <u>https://afant.com.au/nt-recreational-fishing-experience-survey-launched-today/</u>
- Web page with link to the Survey: <u>https://afant.com.au/nt-recreational-fishing-experience-survey/</u>
- Interview with David Ciaravolo, recorded and played on radio news bulletins on Mix 104.9 & Hot 101 FM between 10/11/23 – 12/11/23
- Covered on AFTA News 10/11/23: (<u>https://afta.net.au/nt-recreational-fishing-experience-survey-launched/</u>)
- Facebook 09/11/23 and 24/04/24 with a reach of over 4,200 (<u>https://www.facebook.com/AmatuerFishermenNT/posts/pfbid02SxVZh2ptXEXNHrhGDwjnWgkWa9PcTqbcsAMkQMzQjkp6rchnEaYrg3wKdK3eD36tl</u>)
- Instagram 09/11/23 & 24/04/24 with a reach of over 500 (<u>https://www.instagram.com/stories/afant_official/3232025726614522690/</u>)
- AFANT LinkedIn post (<u>https://www.linkedin.com/feed/update/urn:li:activity:7128219999109857280</u>)
- Email Campaign 09/11/23 & 26/04/24 reaching over 2,300 accounts (<u>https://createsend.com/t/d-A26B331C966890CB2540EF23F30FEDED</u>)

Appendices

- Appendix 1 Literature Review Report
- Appendix 2 Stakeholder Group Findings Report
- Appendix 3 Participant Focus Groups Report
- Appendix 4 Boat Ramp Intercept Survey Questionnaire
- Appendix 5 Main Survey Questionnaire
- Appendix 6 Main Survey Tabulated Results
- Appendix 7 Question by Question Analysis