

Developing harvest strategies to achieve social, economic and ecological sustainability in multi-sector fisheries

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Coral Reef Fin Fish Fishery Management Objectives survey questionnaire

Coral Reef Fin Fish Fishery Harvest Strategy Options: Assessment against objectives survey questionnaire

Coral Reef Finfish Fishery Draft Harvest Strategy Options

Modified Status Quo (Baseline)

The modified status quo harvest strategy option has three components:

- **i) the Coral Trout Modified Status Quo**
- **ii) the Red Throat Emperor Modified Status Quo**
- **iii) the “Other Species” Modified Status Quo**

These each attempt to retain the valuable parts of the current management approach, while identifying and attempting to fill any gaps.

Coral Trout Modified Status Quo

For **Coral Trout**, the current formal stock assessment is retained, but the resulting global TAC is to be allocated between the commercial and recreational sectors, with the latter’s share translated to a bag limit. In interim years, a suite of indicators will be evaluated to collectively infer stock status, and possibly make adjustments to the TAC. This replaces the current use of nominal CPUE time series with standardised CPUE, plus a range of additional “lead” and “lag” indicators. Finally, environmental events can trigger overrides such as spatial management or spawning closures.

Summary:

Every 5 years:

- Undertake a formal, model-based stock assessment. This will yield a global total allowable catch (TAC). This is then split into a commercial TACC, and recreational bag limits.
- This requires that we review the respective recreational and commercial catches, so that we can meaningfully allocate the TAC between the sectors.

In interim years:

- Use a suite of empirical indicators in a multiple-indicator framework (for example, in a decision tree) that collectively infer stock status. The empirical indicators may include:
 - o Standardised commercial catch-per-unit effort (CPUE)
 - o Recreational CPUE
 - o Fishery-independent abundance
 - o Environmental health indicators
 - o “Lead” indicators (frequency of small fish; charter discards)
- The inferred stock status may result in proportional adjustments (with buffers) to TACC and recreational bag limits (or an alternative recreational control)
- In addition, and independent to the above, separate, environmental indicators may be monitored, and override triggers may be invoked that correspond to extreme environmental events, such as cyclones. Invoking these triggers may result in such measures as:
 - o Spatial management
 - o Spawning closures

As part of this harvest strategy, additional monitoring may include:

- Boat ramp surveys
- Quota price
- Beach price
- Lease price

Red Throat Emperor Modified Status Quo

Red Throat Emperor species are of most value to the recreational and charter sectors, and so management measures should be directed primarily at these sectors.

While there is a lack of understanding of stock status for red throat emperor due to limited data, its low-risk life-history justifies the modified status quo approach here described.

This strategy is underpinned by regular risk assessments, augmented by sets of triggers against a suite of empirical indicators. If the risk assessment returns a “harm” outcome, or one or more triggers are invoked, then an appropriate management response is triggered. Otherwise, status quo arrangements will apply.

If we obtain an updated formal red throat emperor stock assessment, then the use and choice of empirical harvest strategy indicators would be reviewed.

To address the current lack of data, this harvest strategy also includes a commitment to ongoing “banking” of biological samples or data, to establish a time series against a possible future analysis.

Summary

Annual, or 5-yearly risk assessments

The risk assessments are augmented by triggers against empirical indicators:

- if the risk assessment outcome = “harm”, or one or more triggers exceeded, management response triggered. Otherwise, status quo
- note that the empirical indicator triggers are needed less if the risk assessment is undertaken more frequently

The empirical indicators may include, or be derived from:

- a catch-based assessment (focusing on dedicated OS fishers only, to eliminate non-targeted confounding)
- identifying decreasing standardised CPUE (focusing on dedicated OS fishers only, to eliminate non-targeted confounding)
- identifying changes in discards
- identifying changes in age structure (though this data is currently unavailable)
- identifying big jumps in catch per year (e.g. if markets opened up)
- identifying repeated years of poor catch in the charter sector
- tracking changes in habitat/reef health/oceanographic effects

If an updated formal red throat emperor stock assessment is undertaken at any stage, then the suite of empirical indicators would be reviewed.

There is an additional ongoing commitment to “banking” biological samples or data. These could include otoliths, age/length samples (e.g. obtained from cameras mounted over the filleting table). Sampling methods would have to be practical and affordable, ideally enabling biological data to be obtained for all species.

“Other Species” Modified Status Quo

There are 13 **other species**, including 5 cod species, which were identified as “high risk” by an Ecological Risk Assessment, and as such, must be appropriately and explicitly managed within the harvest strategy.

This component is underpinned by a pragmatic, tiered approach, whereby the combined OS TACC is retained, unless a species is deemed “at risk”, whether as one of the 13 currently identified “high risk” species, or because its higher relative level of catch warrants species-specific management. Species-specific ITQs and triggers can then be invoked to manage the species accordingly.

It should be noted that the existing Green Zones and the current, conservative fishery management centred around coral trout, already provides a buffer in affording indirect protection to these species.

It is recommended that a cluster analysis should be undertaken to better understand species profiles within the OS category, to make monitoring and analysis more efficient. For example, it is useful to understand whether the species is caught with Coral Trout or not, whether it is a predominantly commercial or recreational species, or spatial catch patterns.

Summary

The OS modified status quo component comprises a tiered approach:

1. At the bottom tier, the current, combined OS TACC would be retained, but recreational catch would also be considered. The combined TACC may be adjusted if the total OS catch approaches or exceeds it, or if there are major species compositional changes in the catch. If the recreational catch cap is exceeded, bag limits and/or seasonal closures should be invoked.
2. The next-level tier corresponds to “at risk” species. This involves applying commercial caps and recreational bag limits to those 13 “high risk” species.
If these caps or bag limits are exceeded for any of those 13 species, OR if there any species whose catch exceeds a (pre-defined) proportion of the TACC, then a separate commercial ITQ will be applied to those species, and bag limits will be adjusted
3. A system of commercial triggers, based on empirical indicators, will also apply to species considered to be “at risk” (noting that CPUE may not be a useful indicator). These should be structured such that they would be invoked at catches below their corresponding ITQ value. If these triggers are reached, then management responses such as move-on provisions, decrementsations, or commercial trip limits may be invoked.

It is noted that TACCs or caps or catch may incite a “race to fish”. The 3rd tier commercial triggers described above should help mitigate against this, provided that appropriate indicators are monitored.

Recreational bag limits should possibly be set by weight instead of numbers to discourage high-grading.

How the harvest strategy addresses the triple bottom line objectives

- Ecological
 - o Catch limits applied to all sectors to limit total catch
 - o Regular assessments and use of indicators to identify any risks to the species
 - o Use of a 0.6B0 target reference point for stock rebuilding to ensure long term sustainability and resilience to environmental fluctuations
- Economic
 - o Use of a 0.6B0 target reference point as a proxy for B_{MEY} , at which point profits will be optimised
- Social
 - o Formal allocation between the commercial and recreational sectors to ensure relative stability in the fishery
 - o Any changes to TAC is applied equally to both sectors (maintaining equity).

Modified Status Quo PLUS a separate charter allocation

The harvest strategy is as per the Modified Status Quo, but with additional elements pertaining to the charter sector. These are not specific to any species, and pertain only to the charter operators. They acknowledge the charter sector’s objectives for how they would prefer to be managed.

These elements include treating the charter operators as a separate industry or sector, independent of the remaining recreational sector.

The most important requirements for charter operators are i) the availability of good quality fish, and ii) big enough bag limit for trips to be attractive to clients. A concern of charter operators would be if bag limits were to drop so low that their business was threatened. (Although it is likely that a stock status corresponding to such a reduction in recreational bag limits would also significantly impact the commercial sector, commercial operators have the option to consolidate, whereas charter operators would be put out of business).

Additionally, bag limits do not protect charter operators from an influx of new operators; however, having their own TAC and allocation would protect them.

Summary

This comprises

- A possession limit but no individual bag limit for charter operators.
- Controlling individual catch by charter clients through within-season changing of size limits.

Possession limits arrangements explicitly for the charter operators would achieve an implied TAC.

An additional rule would be that bait must be sustainably sourced.

To acknowledge the crossover with the recreational sector (given that charter clients are classed as recreational fishers), dockets or tags would be issued to recreational fishers on board.

How the harvest strategy addresses the triple bottom line objectives

- Ecological
 - o As in the modified status quo
- Economic
 - o As in the modified status quo
 - o A formal allocation to the charter sector (with vessel level quotas) enables the charter operates to better allocate their fishing effort to maximise their own profits
 - o Allows for autonomous adjustment in charter vessel industry to prevent build-up of excess capacity and erosion of profits in the sector
- Social
 - o Provides greater flexibility to recreational fishers using the charter services (with subsequent greater benefits)

Modified Status Quo PLUS environmental overrides

The harvest strategy is as per the Modified Status Quo, but with the additional option to uses “override” triggers to detect and respond to significant environmental change, be these long-term, such as climate change, or catastrophic, such as cyclones. The term “override” is used because the management response to such environmental changes can override other potential responses based on estimates of stock status. This directly addresses sustainability objectives by detecting and responding to changes or events that are not explicitly incorporated in most of the species-centric harvest strategy options.

When considering long-term effects, such as climate change, the key point is that the fishery may no longer be resilient to factors that have hitherto not been problematic. There is therefore a need to build in adaptivity to long-term changes.

Also, this is about being pre-emptive and responsive rather than reactive. Also, as our understanding of relationships (between, for example, climate and fisheries) improves, this will hopefully be more

directly addressed within stock assessments. But in meantime, this is about being pre-emptive in avoiding decline or promoting a more rapid recovery.

This should be flexible enough to be adaptive to incorporate new knowledge as this becomes available. i.e. build in appropriate review timeframes with this as an explicit purpose

Summary

A suite of indicators would be used to identify both isolated, catastrophic events, and to detect long-term “drift”. Against each of these two categories, trigger values would be used to invoke management responses.

In establishing indicators and triggers, the following points should be noted:

- o The strength and extent of cyclonic impacts are specific to each cyclone
- o Analysis of fleet dynamics responses to cyclones should be undertaken to inform appropriate management responses
- o Long-term bleaching/reef health/flooding needs to be tracked, and this is regionally specific
- o GBRMPA and science partners are happy to provide real-time habitat impact data

How the harvest strategy addresses the triple bottom line objectives

- Ecological
 - o As in the modified status quo
 - o Provides improved capacity to respond to short term environmental fluctuations, preventing potential overexploitation of species if conditions are adverse and a greater response is required than under the modified status quo.
- Economic
 - o As in the modified status quo
- Social
 - o As in the modified status quo

Modified Status Quo PLUS environmental overrides AND spatially explicit management.

This harvest strategy builds on that proposed as option 3, in that, in addition to the option for environmental overrides, there is the option to enable management measures to be spatially-specific, in accordance with the event or indicator that has triggered that response. Alternately, this could involve undertaking assessments on a region-specific basis, but management responses occurring at a fishery-wide level.

This option is not necessarily specific to any species and may be considered as a common approach across species, or as something to be invoked on a needs basis. It enables management to be responsive to local events or to localised depletion.

Note that this option is distinct from (does NOT include) having regional ITQs and TACs.

Summary

This option could involve

- Invoking management responses at spatially-temporally appropriate scales, given the event or indicator that has triggered the response. Forms of management measures could include regional temporary closures, or effort caps. At the same time, flexibility needs to be granted to fishers to enable them to accommodate local responses to events.
- Identifying spatially-explicit assessment regions, with region-specific indicators. If indicator trigger levels are reached, the overall TACC and bag limits could be reduced to reduce pressure on the stock.

Spatial management measures may have to consider what levels of flexibility may need to be afforded to industry, should measures excluded them from an area in which they frequently fish.

How the harvest strategy addresses the triple bottom line objectives

- Ecological
 - o As in the modified status quo
 - o Provides improved capacity to respond to short term environmental fluctuations, preventing potential overexploitation of species if conditions are adverse and a greater response is required than under the modified status quo.
 - o Allows for spatial variation in response in relation to an area specific impact (e.g. storm affects one part of the reef, coral bleaching events etc).
- Economic
 - o As in the modified status quo
- Social
 - o Spatial management also has social benefits in that spatial equity between regions can also be maintained (i.e. to ensure that all fishing effort moves to one area for example).

Modified Status Quo for Coral Trout and Red Throat Emperor, but with split TACs for “Other Species”

This option retains the modified status quo (as described in option 1) for Coral Trout, Red Throat Emperor, and most of the species within the “Other Species” category. However, under this option, 6 species currently within the “OS” basket would have their own individual ITQs. As stated, the remainder would be managed as per modified status quo approach for “Other Species” described in option (1) above. The six species are among those 13 identified as “high risk” from the Ecological Risk Assessment.

Summary

Individual ITQs would apply to the following species:

- 3 reds
- Stripeys
- Spangled
- Bar cod

The remainder of the OS species would be managed via the modified status quo approach described in option 1 above.

A key issue with increasing the number of species managed by ITQs is that the risk of discarding significantly increases, due to fishers attempting to reach their quota for certain species inadvertently catching other species whose quota they have already achieved. Species whose quota is reached such that this invokes changes in fisher behaviour (in attempting to actively avoid them while still seeking quota for other species), are termed “choke species”.

How the harvest strategy addresses the triple bottom line objectives

- Ecological
 - As in the modified status quo
 - Provides greater protection for individual species within the larger species basket.
- Economic
 - Provides ability for fishers to adjust their fishing businesses to better reflect their activity
- Social
 - As in the modified status quo

Modified Status Quo, but with the additional CT species explicitly considered

This option retains the modified status quo (as described in option 1) for Coral Trout, Red Throat Emperor, and the “Other Species” category. However, it would consider the various species of Coral Trout (CT) individually, as opposed to the current practice of lumping them together in a broad “coral trout” category. Under this option, we would consider the 5 coral trout + 2 other (different genus) species individually. The approach described for the Coral Trout Modified Status Quo would apply to data-rich coral trout species, but others would be managed under separate ITQs, while acknowledging these would not necessarily be underpinned by data-rich assessments.

This approach would use an ecological risk assessment as a first step, supplemented by empirical indicators, to identify individual species requiring explicit management.

Summary

As a first step, an Ecological Risk Assessment (ERA) will be used to identify species as susceptible to harm. Meaningful empirical indicators will be used to supplement the ERA, as per the **Red Throat Emperor Modified Status Quo** approach.

If a species is deemed to be susceptible to harm per the ERA, or at risk according to the empirical indicators, that species will be pulled out for management on an individual basis, as per the **OS Modified Status Quo** approach.

The **main coral trout species** captured would be (individually) subject to management described under the coral trout modified status quo component.

When considering the choice of empirical indicators, the following points are relevant:

- Monitoring dead vs alive Coral Trout as a time series should be undertaken not to invoke a decision rule, but to provide context in allowing managers to anticipate changes to the nature of the fishery.
- Commercial catch will need to be reported by species (as non-retained fish are not reported, logbooks may be changed to include discard reporting as a requirement).
- As the various Coral Trout species have different relative spatial distributions, catch compositions will vary spatially.

This approach could be rolled in with the Red Throat Emperor (RTE) Modified Status Quo approach, noting, though, that RTE availability increases after cyclones, so we would need to be mindful of this when increasing or reducing quota in any combined approach.

In order to implement a species-specific Coral Trout harvest strategy, there would be increased monitoring requirements around species-specific identification and reporting. Currently the only available data is from boat ramp surveys. Possible monitoring approaches include

- Voluntary recreational reporting
- Crowd fundraising? Frames? Via Tackle Shops?
- Data-banking – “Train the Trainers”

How the harvest strategy addresses the triple bottom line objectives

- Ecological
 - o As in the modified status quo
 - o Provides greater protection for individual species within the larger species basket.
- Economic
 - o Provides ability for fishers to adjust their fishing businesses to better reflect their activity
- Social
 - o As in the modified status quo

Participant Information

CSIRO, in collaboration with Queensland Fisheries, is currently surveying people involved with the Coral Reef Fin Fish Fishery to determine their preferences for different types of outcomes from a range of potential harvest strategies. A number of potential management objectives have been identified by a project working group, not all of which can be achieved through a harvest strategy. This study will focus only on those objectives that can be achieved through a harvest strategy, with other objectives having to be achieved through other management mechanisms.

What is involved?

As an individual identified as having a stake in the fishery, we would appreciate you providing us with information around your preferences for different management outcomes (defined in terms of the objectives identified). The survey consists of 2 sections, and takes around 15 minutes or less to complete. The survey is completely anonymous.

- Section 1: Asks some background questions about your involvement with the fishery
- Section 2: Asks for your opinions regarding the relative importance of the objectives that have been identified.

Participation and withdrawal

Participation in this study is completely voluntary and you are free to withdraw by stopping the survey at any time. Once submitted your answers are anonymised and will not be individually identifiable. As all answers are anonymous it is not possible to withdraw your responses once submitted.

Risks

Aside from giving up your time, there are no foreseeable risks associated with participating in this study. You are free to skip any questions you do not want to answer. If you have any concerns about any aspects of the study, please contact the project leader Dr Natalie Dowling or the survey co-ordinator Dr Sean Pascoe (see below for contact details).

Confidentiality

All individual information collected in this study is confidential and will be assigned a random code. The primary data will only be seen by members of our research team and will be stored in a secure area that is inaccessible to other individuals. Your information will only be used for research purposes.

Will I receive any payment for taking part in the study?

You will not receive any form of direct payment from CSIRO or the other project partners for taking part in this survey.

How will my information be used?

The information provided by you to the project team will be combined with other respondent's answers and statistically analysed to better understand how preferences vary in the fishery for different management outcomes. The results will not present any individual information. The information will also be used to prepare scientific reports and manuscripts for academic publication. Your personal information will not be identifiable at any stage in these publications.

How can I find out more about the study?

Please feel free to contact us at any time during the study. This study is being funded by the Fisheries Research and Development Corporation (FRDC) and CSIRO, with in-kind contributions from the other partners.

Ethical clearance and contacts

This study has been approved by CSIRO's Social Science Human Research Ethics Committee in accordance with the Australian National Statement on Ethical Conduct in Human Research. If you have any questions concerning your participation in the study feel free to contact the researchers involved. Alternatively any concerns or complaints about the conduct of the study can be raised with the Manager of Social Responsibility and Ethics on 07 3833 5693 or by email at csshrec@csiro.au.

Thank you for your help with this important research.

Sean Pascoe CSIRO Oceans and Atmosphere Tel: 07 3833 5966 Email: Sean.Pascoe@csiro.au	Natalie Dowling CSIRO Oceans and Atmosphere Tel: 03 6232 5148 Email: Natalie.Dowling@csiro.au
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Section 1 - Some basic questions about you

The aim of these questions are to establish what role you play in the fishery and your experiences with the fishery

1. How many years have you been involved with the coral reef fin fish fishery?

2. How many years have you been involved with the fishing industry in general?

* 3. What are your main interests in the fishery? (tick up to two boxes)

☐

Commercial fisher

☐

Processor/wholesaler/buyer

☐

Charter boat operator

☐

Conservation group representative

☐

Recreational fisher

☐

Fishery manager

☐

Quota owner

☐

Scientific/economic advice

☐

Other (please specify)

* 4. If you are a commercial fisher, roughly how much quota do you own and/or lease? (choose the option that is closest to your quota ownership. If not a commercial fisher choose "not applicable")

own 0-20% of quota
used

☐

own 20-40% of quota
used

☐

own 40-60% of quota
used

☐

own 60-80% of quota
used

☐

own 80-100% of
quota used

☐

Not applicable

☐

Section 2 - Preferences for different management objectives

The next set of questions ask about how important the different management objectives are to you.

A "hierarchy" of objectives has been developed, with the top level (broad) objectives consist of economic, social, environmental and governance objectives. Under each of these broad objectives are a set of more specific sub-objectives.

The following questions are designed to provide the information we need to derive the relative weights (i.e. the relative importance) of each of the objectives and sub-objectives. This will help managers and the project team develop harvest strategies that best meet your preferred outcomes.

If you are using a mobile device (e.g. phone) we suggest you turn it side-ways to see the full set of options on the screen.

Answering the survey questions

In each question, we ask you to tick one of the options that best represents how important you think each of objectives are for the coral reef fin fish fishery, ranging from "not very important" to "extremely important". You may also choose a category in between one of the listed importance levels (e.g. you might consider an objective to be somewhere between "somewhat important" and "moderately important" so would choose the option between the two.

There are no "right" or "wrong" answers. The aim of the survey is to determine how important these objectives are to different groups in the fishery. Some you may consider extremely important, others you may consider unimportant (or "not very important" as described in the questions). Different groups may have different views about how important these are, and different individuals within a group may also have very different views.

While all the objective identified are no doubt important (otherwise they would not be there), there is little benefit in just selecting "Extremely important" for all objectives. This effectively implies that all objectives are equally important. Some objectives will be more important to you than others (as indicated in your ranking), and we would like this relative importance to be reflected in your responses. As different harvest strategies may lead to better outcomes in some areas and worse in others, we want to ensure that the harvest strategy that works best from your perspective can be identified.

To force some element of choice in each case, we have limited the responses so that only one objective can be assigned a particular importance level in each set of objectives. For example, you can only assign "Extremely important" to one of the objectives, and must choose a different importance level for each of the others. If there are cases where you truly believe some of the objectives are equal, you may make a note of this in the comments section.

Broad objectives: Economic, Social, Environmental and Governance

The first set of comparison questions ask about how important you think the different **broad management objectives** are. The broad objectives consist of economic, social, environmental and governance objectives. As with the following questions, the options will be presented in a random order so that no project team preference is to be implied by the survey ordering.

A further breakdown of the objectives is presented in the following questions, but more broadly

- *Ensuring ecological sustainability* refers to ensuring that the stocks harvested by the commercial, recreational and charter sectors are sustainable, and also impacts on other fish species, habitats and the broader ecosystem is minimised;
- *Enhancing economic performance* means that commercial, recreational, charter and indigenous fishers are operating at an economically sustainable and obtaining the optimal level of benefits from the resource, and that local communities are also receiving economic benefits from the fishing activities;
- *Maximise social outcomes* means that the broader community is also benefiting from the industry (e.g. access to local seafood), as well as being satisfied with how the fishery is impacting on the community resources, and how benefits from the fishery are distributed;
- *Enhance management performance* means that the management system is such that all fishers are willing to comply with the harvest strategies in place to best achieve the broader social, ecological and economic objectives

* 5. Please rate on the scale below how important the following broad fisheries management objectives are to you. Tick one of the options that best represents how important you think each of these are for the coral trout fishery, ranging from "not very important" to "extremely important". You may also choose a category in between one of the listed importance levels (e.g. you might consider an objective to be somewhere between "somewhat important" and "moderately important" so would choose the option between the two).

	Not very important		Somewhat important		Moderately Important		Very important		Extremely important
Enhance fishery economic performance	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maximise social outcomes	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ensure ecological sustainability	☐	☐	☐	☐	☐	☐	☐	☐	☐
Enhance management performance	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice or add a comment? (Optional)

Economic objectives and sub-objectives

The next set of questions ask about how important you think different **economic objectives and sub-objectives** are. As with the previous set of comparisons, tick one of the options for each of the objectives presented, ranging from "not very important" to "extremely important". You may also choose a category in between one of the listed importance levels (e.g. you might consider an objective to be somewhere between "somewhat important" and "moderately important" so would choose the option between the two. The objectives to be considered are:

- Maximise commercial economic benefits: Combined profits for each of the following sectors: commercial fishery (both export and domestic market focused); charter industry; indigenous commercial sector
- Maximise the value of recreational fishers' experiences (including those on a charter): A measure of the value that recreational and charter fishers gain from their experiences (e.g. the value of going fishing to the recreational fisher). This is a social measure put into economic value terms.
- Maximise flow-on economic benefits to local communities: The economic activity generated in the regional community due to all fishing activities (e.g. local businesses who supply goods and services to commercial and recreational fishers)
- Minimise short-term (inter-annual) economic risks to the commercial, recreational and charter sectors: For example, the degree to which TACs or bag limits change may decrease from one year to the next
- Minimise costs of management associated with the harvest strategy: These include costs such as monitoring and undertaking assessments, as well as the costs of adjusting management controls

* 6. How important to you are the following
broad economic objectives?

	Not very important		Somewhat important		Moderately Important		Very important		Extremely important
Maximise <u>commercial</u> economic benefits	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maximise the value of <u>recreational fishers'</u> experiences	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maximise <u>flow-on</u> <u>economic benefits</u> to local communities	☐	☐	☐	☐	☐	☐	☐	☐	☐
Minimise inter-annual <u>economic risks</u>	☐	☐	☐	☐	☐	☐	☐	☐	☐
Minimise <u>costs of</u> <u>management</u> imposed by the harvest strategy	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

* 7. When trying to maximise commercial economic benefits, how important is it to you that this is achieved for each of the different commercial sectors?

	Not very important			Somewhat important			Moderately Important			Very important		Extremely important
Maximise Commercial fishing industry profits	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maximise Charter sector profits	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maximise Indigenous commercial benefits	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

Social objectives and sub-objectives

The next set of questions ask about how important you think different **social objectives and sub-objectives** are. As with the previous set of comparisons, tick one of the options for each of the objectives presented, ranging from "not very important" to "extremely important". You may also choose a category in between one of the listed importance levels (e.g. you might consider an objective to be somewhere between "somewhat important" and "moderately important" so would choose the option between the two. The main social objectives being considered are:

- Maximise equity between and within the recreational, charter, indigenous and commercial fishing sectors: This is about the level of satisfaction of all fishers around their allocations and access to the fishery;
- Improve social perceptions of the fishery (e.g. social licence to operate): This is about minimising adverse public perceptions around fishing practices and ensuring the positive aspects of fishing are well understood;
- Enhance the net social value to the local community from use of the resource: This is about ensuring supplies of local seafood and that benefits are equally realized across the state.

* 8. How important to you are the following broad **social** objectives?

	Not very important		Somewhat important		Moderately Important		Very important		Extremely important
Maximise <u>equity</u> between recreational, charter, indigenous and commercial fishing	☐	☐	☐	☐	☐	☐	☐	☐	☐
Improve <u>community perceptions</u> of the fishery (all sectors - commercial, recreational, charter and indigenous)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Enhance the net <u>social value to the local community</u> from use of the resource (e.g. access to local seafood)	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

* 9. When trying to improve community perceptions, how important is it to achieve the following sub-objectives?

	Not very important			Somewhat important			Moderately Important			Very important		Extremely important
<u>Minimise</u> adverse public perception around discard mortality	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
<u>Maximise</u> utilisation of the retained catch of target species	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
<u>Maximise</u> the perception that fishing positively benefits the broader community (i.e. through achieving social, economic and sustainability objectives)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

* 10. When trying to enhance the net social value to the local community, how important is it to achieve the following sub-objectives?

	Not very important			Somewhat important			Moderately Important			Very important		Extremely important
Increase access to local seafood (all species)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maximise (spatial) equity between regions or local communities (i.e. ensure that all regions/communities are treated equally)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

Environmental objectives and sub-objectives

The next set of questions ask about how important you think different **environmental objectives and sub-objectives** are. As with the previous set of comparisons, tick one of the options for each of the objectives presented, ranging from "not very important" to "extremely important". You may also choose a category in between one of the listed importance levels (e.g. you might consider an objective to be somewhere between "somewhat important" and "moderately important" so would choose the option between the two. The main objectives being considered are:

- Ensure resource biomass sustainability: This is about ensuring both an ecologically and economically sustainable level of biomass of the key target species;
- Ensure ecosystem resilience: This is about ensuring that the impacts of fishing on the broader ecosystem are minimised so that it is able to adapt to changing conditions;
- Minimise risk of localised depletion: This is about avoiding overfishing in particular areas and ensuring that particular areas of the fishery are not adversely affected by fishing.

* 11. How important to you are the following broad ecological sustainability objectives?

	Not very important		Somewhat important		Moderately Important		Very important		Extremely important
Ensure resource biomass <u>sustainability</u>	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ensure ecosystem <u>resilience</u> (i.e. the ability of the ecosystem to recover from adverse impacts)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Minimise risk of <u>localised depletion</u>	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

* 12. With respect to resource biomass sustainability, how important to you are the following sub-objectives?

	Not very important		Somewhat important		Moderately Important		Very important		Extremely important
<u>Biomass</u> of the key commercial and recreational species is at least 60% of their unfished level by 2020	☐	☐	☐	☐	☐	☐	☐	☐	☐
Minimise risk to <u>species not covered by quota</u> that are harvested in the fishery	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

* 13. With respect to ecosystem resilience, how important to you are the following sub-objectives?

	Not very important		Somewhat important		Moderately Important		Very important		Extremely important
Minimise <u>risk</u> to <u>bycatch</u> species	☐	☐	☐	☐	☐	☐	☐	☐	☐
Minimise <u>discard mortality</u> (e.g. of undersized target species, or from high-grading of target species)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Minimise <u>broader ecological risks</u> (e.g. habitats, food webs etc)	☐	☐	☐	☐	☐	☐	☐	☐	☐
Minimise risks to <u>threatened, endangered and protected species</u>	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

* 14. With respect to risk of localised depletion, how important to you are the following sub-objectives?

	Not very important		Somewhat important		Moderately Important		Very important		Extremely important
Minimise <u>risk to due to fishing</u>	☐	☐	☐	☐	☐	☐	☐	☐	☐
Minimise risk <u>in response to environmental event</u> (e.g. cyclone, climate change)	☐	☐	☐	☐	☐	☐	☐	☐	☐

Would you like to explain your choice? (Optional)

Thank you!

Thank you for completing the survey. The results will help the development of a harvest strategy that will improve the economic, social and ecological sustainability of the fishery.

15. If you would be willing to participate in a follow-on survey to see how objective preferences change during the implementation of the harvest strategy project please provide your email below.

16. If you would like to leave any other comments, please add these below

Participant Information

CSIRO, in collaboration with Queensland Fisheries, is currently surveying people involved with the Coral Reef Fin Fish Fishery to determine their preferences for different types of potential harvest strategies. A number of potential harvest strategy options have been identified in collaboration with the CRFFF Working Group aimed at achieving the set of objectives identified in an earlier survey.

What is involved?

As an individual identified as having a stake in the fishery, we would appreciate you providing us with information around your preferences for different harvest strategies. The survey consists of 2 sections, and takes around 25 minutes or less to complete. In addition, it is advisable that you familiarise yourself with the harvest strategies being proposed as well as the management objectives that have previously been examined.

- Section 1: Asks some background questions about your involvement with the fishery and working group
- Section 2: Asks for your expectations as to how different management options may perform in the fishery against the fishery objectives.

Participation and withdrawal

Participation in this study is completely voluntary and you are free to withdraw by stopping the survey at any time. Once submitted your answers are anonymised and will not be individually identifiable. As all answers are anonymous it is not possible to withdraw your responses once submitted.

Risks

Aside from giving up your time, there are no foreseeable risks associated with participating in this study. You are free to skip any questions you do not want to answer. If you have any concerns about any aspects of the study, please contact the project leader Dr Natalie Dowling or the survey co-ordinator Dr Sean Pascoe (see below for contact details).

Confidentiality

All individual information collected in this study is confidential and will be assigned a random code. The survey is completely anonymous. The primary data will only be seen by members of our research team and will be stored in a secure area that is inaccessible to other individuals. Your information will only be used for research purposes.

Will I receive any payment for taking part in the study?

You will not receive any form of direct payment from CSIRO or the other project partners for taking part in this survey.

How will my information be used?

The information provided by you to the project team will be combined with other respondent's answers and statistically analysed to better understand how preferences vary in the fishery for different management options. The results will not present any individual information. The information will also be used to prepare scientific reports and manuscripts for academic publication. Your personal information will not be identifiable at any stage in these publications.

How can I find out more about the study?

Please feel free to contact us at any time during the study. This study is being funded by the Fisheries Research and Development Corporation (FRDC) and CSIRO, with in-kind contributions from the other partners.

Ethical clearance and contacts

This study has been approved by CSIRO's Social Science Human Research Ethics Committee in accordance with the Australian National Statement on Ethical Conduct in Human Research. If you have any questions concerning your participation in the study feel free to contact the researchers involved. Alternatively any concerns or complaints about the conduct of the study can be raised with the Manager of Social Responsibility and Ethics on 07 3833 5693 or by email at csshrec@csiro.au.

Thank you for your help with this important research.

Sean Pascoe CSIRO Oceans and Atmosphere Tel: 07 3833 5966 Email: Sean.Pascoe@csiro.au	Natalie Dowling CSIRO Oceans and Atmosphere Tel: 03 6232 5148 Email: Natalie.Dowling@csiro.au
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Section 1 - Some basic questions about you

The aim of these questions are to establish what role you play in the fishery and your experiences with the fishery. The same questions were asked for the management objectives survey. As the earlier data were anonymous, we are unable to match up your responses from this survey with the previous survey (if you participated in the previous survey).

How many years have you been involved with the coral reef fin fish fishery?

How many years have you been involved with the fishing industry in general?

Which stakeholder group to you mostly represent (tick one box only)

☐

Commercial fisher

☐

Processor/wholesaler/buyer

☐

Charter boat operator

☐

Conservation group representative

☐

Recreational fisher

☐

Fishery manager

☐

Quota owner

☐

Scientific/economic advice

☐

Other (please specify)

Do you have a second role or interests in the fishery? (tick one box only)

☐

Commercial fisher

☐

Conservation group representative

☐

Charter boat operator

☐

Fishery manager

☐

Recreational fisher

☐

Scientific/economic advice

☐

Quota owner

☐

NA (no other interest)

☐

Processor/wholesaler/buyer

☐

Other (please specify)

Did you participate in the earlier working group discussions about the harvest strategy options?

☐ Yes

☐ No

Section 2 - Overview of the different management options

The next set of questions ask you to compare and assess a number of different management options. A separate document providing more detail on the management options has been sent as a separate attachment and it is advisable to have a copy of this handy when completing the survey.

The following questions are designed to provide the information we need to determine which management options are likely to work best over a range of different management objectives. This will help managers and the project team develop harvest strategies that provide the best outcomes to current and future commercial and recreational fishers, charter boat operators and the broader community.

The survey is best answered on a laptop or desktop computer. If you are using a mobile device (e.g. phone) we suggest you turn it side-ways to see the full set of options on the screen.

The options

Each management option presented has a number of different alternative components that affect how the harvest strategy may work. An outline of the different options to be considered is in the below table:

Species	Baseline (Modified Status Quo)	Alternative
Coral trout (CT)	Coral trout treated as a single group with one TAC; Formal stock assessment every 5 years; A range of indicators (e.g. commercial catch rates, recreational catch rates and others) used to adjust both commercial TACC and recreational bag limits in interim years.	The 5 coral trout species plus the 2 other species considered in the current coral trout group would be considered separately. Only the key species (identified using a risk assessment) will be managed using separate quotas. These species will be managed as per the baseline (i.e. stock assessment every five years; use of indicators)
Red Throat Emperor (RTE)	RTE treated as a single group with one TAC; A risk assessment is undertaken annually with identified triggers. If the trigger is exceeded then the TAC is adjusted	
Other species (OS)	Current combined TAC and ITQs retained for low risk species (Tier 1 species), but include also recreational catch in the TAC; Separate caps and bag limits be placed on high risk species (tier 2 species, 13 in total). Catch triggers to be used to invoke management responses such as move-on provisions, or commercial trip limits. Exceeding catch limits may result in ITQs being imposed on these species and bag limits reduced.	Apply separate TACs and ITQs to the six main OS species (3 reds, Stripeys, Spangled, Bar cod). Other species managed as per current management.
Other	Baseline	Alternative
Charter vessels	-	Separate TAC allocation for charter sector; Vessel possession limits (no individual bag limits) managed through the use of dockets or tags; Within-season size limits to control individual catches.
Use of environmental overrides	-	Modification to TACs, area closures etc. in response to short term events e.g. cyclones, coral bleaching; Consideration of longer term trends e.g. climate change
Spatially explicit control rules	-	Identify spatially explicit assessment regions, with region specific indicators and triggers; Invoke management responses at spatially appropriate scales.

In each of the following question, we ask you to indicate how you think the different options compare to the baseline option. In each case, the baseline option is modified by one (or more) of the alternative options. You will be asked if you believe that the modified option is likely to perform better or worse than the baseline option with respect to the different fisheries management objectives that have been identified for the fishery. In some cases, you might believe a modified option is better the baseline against one objective, but worse against another. There are no "right" or "wrong" answers.

Performance against **SUSTAINABILITY** objectives

The aim of this is to compare the alternative options to the baseline with respect to achieving the **SUSTAINABILITY** objectives below. Please indicate if you believe the alternative option is better or worse than the baseline in achieving the objective identified. A summary of the options is again given below.

Summary of the harvest strategy options

Whole-of-fishery harvest strategy option	SPECIES UNDER QUOTA					OTHER OPTIONS AND LEVERS		
	CT group quota	CT additional species quota	RTE status quo	OS group quota	OS species quota	Separate charter allocation	Environmental overrides	Spatially explicit control rules
Baseline option								
Baseline PLUS separate charter allocation								
Baseline PLUS environmental overrides								
Baseline PLUS spatially explicit control rules AND environmental overrides								
Baseline for CT and RTE, but with split TACs for OS								
Baseline for RTE and OS, but with the additional CT species explicitly considered								

Objective 1.1. Ensure resource biomass sustainability

Objective 1.1.1. Achieve BMEY by 2027 and BMSY by 2020 (or sooner) for the main commercial, charter and recreational species

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 1.1.2 Minimise risk to other harvested species not included in 1.1.1

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 1.2. Ensure ecosystem resilience

Objective 1.2.1 Minimise risk to bycatch species

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 1.2.2 Minimise discard mortality (of undersized target species, or from high-grading of target species)

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 1.2.3 Minimise broader ecological risks

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 1.2.3 Minimise risk to TEPS

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 1.3. Minimise risk of localised depletion

Objective 1.3.1 Minimise risk of localised depletion due to fishing

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 1.3.2 Minimise risk of localised depletion in response to environmental event (e.g. cyclone, climate change)

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Coral Reef Fin Fish Fishery Harvest Strategy Options: Assessment against objectives

Performance against **ECONOMIC** objectives

The aim of this is to compare the alternative options to the baseline with respect to achieving the **ECONOMIC** objectives below. Please indicate if you believe the alternative option is better or worse than the baseline in achieving the objective identified. A summary of the options is again given below.

Summary of the harvest strategy options

Whole-of-fishery harvest strategy option	SPECIES UNDER QUOTA					OTHER OPTIONS AND LEVERS		
	CT group quota	CT additional species quota	RTE status quo	OS group quota	OS species quota	Separate charter allocation	Environmental overrides	Spatially explicit control rules
Baseline option								
Baseline PLUS separate charter allocation								
Baseline PLUS environmental overrides								
Baseline PLUS spatially explicit control rules AND environmental overrides								
Baseline for CT and RTE, but with split TACs for OS								
Baseline for RTE and OS, but with the additional CT species explicitly considered								

Objective 2.1. Maximise total commercial economic benefits (i.e. the combined total for each of the individual sectors)

Objective 2.1.1. Commercial fishing industry profits

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 2.1.2 Charter sector profits

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 2.1.3 Indigenous commercial benefits

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 2.2. Maximise the (non-market) value to recreational fishers (from both individual and charter experience)

This is about the broader measures of utility – e.g. the experience of going fishing, strike rates, being in the fresh air and on the GBR, passing on a family tradition of commercial or charter fishing, tourists enjoying an experience and having fishing as a main holiday objective

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 2.3 Maximise flow-on economic benefits to local communities (from all sectors)

This is about the extent to which community livelihoods are linked to the fishery. This could direct (e.g. boat and tackle shops) or indirect (e.g. hotels accommodating recreational fishers; cafes or restaurants feeding commercial/rec/charter fishers, or tourists).

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 2.4 Minimise short term (inter-annual) economic risk

This is about minimising or buffering against volatility in the fishery, such that there is a certain level of inter-annual consistency and a known level of maximum tolerance, enabling better business planning.

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 2.5 Minimise costs of management associated with the harvest strategy: monitoring, undertaking assessments, adjusting management controls

This equates to the ability of management to respond in a timely manner to changing conditions, and that the harvest strategy is built such that it anticipates all possible scenarios. At the same time, there is a trade-off between management responsiveness and its associated cost.

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Performance against **GOVERNANCE/MANAGEMENT** objectives

The aim of this is to compare the alternative options to the baseline with respect to achieving the **GOVERNANCE** objective below. Please indicate if you believe the alternative option is better or worse than the baseline in achieving the objective identified. A summary of the options is again given below.

Summary of the harvest strategy options

Whole-of-fishery harvest strategy option	SPECIES UNDER QUOTA					OTHER OPTIONS AND LEVERS		
	CT group quota	CT additional species quota	RTE status quo	OS group quota	OS species quota	Separate charter allocation	Environmental overrides	Spatially explicit control rules
Baseline option								
Baseline PLUS separate charter allocation								
Baseline PLUS environmental overrides								
Baseline PLUS spatially explicit control rules AND environmental overrides								
Baseline for CT and RTE, but with split TACs for OS								
Baseline for RTE and OS, but with the additional CT species explicitly considered								

Objective 3.1 Maximise willingness to comply with the harvest strategy

Ensuring that the harvest strategy is accepted by all fishers in order to maximise compliance.

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Performance against **SOCIAL** objectives

The aim of this is to compare the alternative options to the baseline with respect to achieving the **SOCIAL** objectives below. Please indicate if you believe the alternative option is better or worse than the baseline in achieving the objective identified. A summary of the options is again given below.

Summary of the harvest strategy options

Whole-of-fishery harvest strategy option	SPECIES UNDER QUOTA					OTHER OPTIONS AND LEVERS		
	CT group quota	CT additional species quota	RTE status quo	OS group quota	OS species quota	Separate charter allocation	Environmental overrides	Spatially explicit control rules
Baseline option								
Baseline PLUS separate charter allocation								
Baseline PLUS environmental overrides								
Baseline PLUS spatially explicit control rules AND environmental overrides								
Baseline for CT and RTE, but with split TACs for OS								
Baseline for RTE and OS, but with the additional CT species explicitly considered								

Objective 4.1 Maximise equity between recreational, charter, indigenous and commercial fishing

Increase equitable access to the resource

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 4.2 Improve social perceptions of the fishery (i.e. social licence to operate) for all sectors (recreational, commercial, charter, indigenous)

Objective 4.2.1. Through sound fishing practices, minimise adverse public perception around discard mortality (compliance with size limits, environmental sustainability, and waste)

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 4.2.2. Maximise utilisation of the retained catch of target species

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 4.2.3 Maximise the potential for fishing (commercial, recreational and charter) to be perceived as a positive activity with benefits to the community

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 4.3 Enhance the net social value to the local community from use of the resource

Objective 4.3.1 Increase access to local seafood (all species)

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Objective 4.3.2 Maximise spatial equity between regions or local communities

This is about ensuring that a harvest strategy does not result in the majority of fishing effort being disproportionately expended in some regions relative to others.

	Much worse than baseline	Worse	Slightly worse	About the same as the baseline	Slightly better	Better	Much better than baseline
Baseline PLUS separate charter allocation	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline PLUS spatially explicit control rules AND environmental overrides	☐	☐	☐	☐	☐	☐	☐
Baseline for CT and RTE, but with split TACs for OS	☐	☐	☐	☐	☐	☐	☐
Baseline for CT, RTE, and OS, but with the additional CT species explicitly considered	☐	☐	☐	☐	☐	☐	☐

Thank you!

Thank you for completing the survey. The results will help the development of a harvest strategy that will improve the economic, social and ecological sustainability of the fishery.

If you would like to leave any comments about the survey or harvest strategies, please add these below