



SECOND BIGEYE TUNA MANAGEMENT WORKSHOP (BMW02)

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BIGEYE TUNA MANAGEMENT PROCEDURE AND HARVEST CONTROL RULE DESIGN

WCPFC-BMW02-2026-WP03

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SPC-OFP¹

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1 Introduction

The WCPFC harvest strategy workplan schedules the adoption of the bigeye tuna management procedure (MP) by the end of 2026 ([WCPFC, 2025](#)).

This report describes the proposed design of candidate bigeye MPs, including the designs of the candidate harvest control rules (HCRs) and builds on WCPFC-SC22-2026/MI-WP-03 ([Scott et al., 2026a](#)). Evaluations of candidate MPs are considered in BMW02-2026-WP05 ([SPC-OFP, 2026](#)).

The SSP was asked to evaluate a range of HCRs controlling the tropical longline (TLL) and tropical purse seine fleets, at different levels of TLL catch and/or effort and FAD closure length. It would be possible to achieve the same target reference point (TRP) under different combinations of TLL catch and/or effort and FAD closure period ([WCPFC, 2025](#)), so each MP consists of a continuum of HCRs all tuned to achieve the same stock status.

1.1 Spatial range of the bigeye management procedure

Three scenarios for the spatial range of longline fisheries managed through the bigeye MP were proposed at BMW01 for evaluation (Table 1). MPs corresponding to these scenarios, based on a single HCR design, were presented in WCPFC-SC22-2026/MI-WP-04 ([Scott et al., 2026b](#)). An additional spatial / fishery scenario was subsequently requested at SC22 in which the bigeye MP applied to longline fisheries across the WCPO, but was consistent with the existing Tropical Tuna Measure (TTM) which excludes catches of bigeye taken by SIDS flagged vessels among other measures. For the evaluations related to this additional request, the exclusion to SIDS flagged vessels was applied but other measures within the TTM were not.

Table 1: Spatial range and fishery scenarios of the bigeye management procedure.

Scenario	Fisheries managed through the bigeye MP
TLL including Hawaiian longline fleet	MP manages TLL (20°N to 10°S), including the portion of the Hawaiian longline fleet operating south of 20°N.
TLL excluding Hawaiian longline fleet	MP manages TLL (20°N to 10°S), excluding the portion of the Hawaiian longline fleet operating south of 20°N.
WCPO wide	All longline fisheries in the WCPO, including Hawaiian longline fleet.
WCPO wide excluding SIDS	All longline fisheries in the WCPO, excluding catches of bigeye taken by SIDS flagged vessels.

For the scenarios in which all longline fisheries in the WCPO are managed through the bigeye MP, including and excluding SIDS flagged vessels, the output of the MP must be a catch limit, rather than an effort limit, to avoid potential interactions with the South Pacific albacore MP (which sets a catch limit of South Pacific albacore for longline fisheries operating south of 20°S.)

1.2 Target reference points

Candidate MPs were designed to maintain the biological stock around a TRP on average. Three candidate TRPs for bigeye were specified at WCPFC21 at 1x, 0.94x and 1.06x the 2012-2015 average spawning biomass depletion (WCPFC, 2024). The Commission noted that these candidate TRPs may in future be specified as threshold targets for which associated probabilities of being ‘at or above’ would need to be specified. The probability associated with a threshold reference point describes the proportion of the simulations that are ‘at or above’ the reference point.

BMW01 agreed to evaluate two of the three WCPFC21 candidate TRP levels as target TRPs using a 50% probability formulation, i.e. treating the TRP as a typical point target. Additionally, the ‘lower’ TRP (0.94 x 2012-2015 average spawning biomass depletion) was to be considered with thresholds of 60% and 70%. The four agreed candidate TRPs that have been evaluated for BMW02 are therefore:

- 0.94 x 2012-2015 average spawning biomass depletion,
- 0.94 x 2012-2015 average spawning biomass depletion with a threshold of 60%,
- 0.94 x 2012-2015 average spawning biomass depletion with a threshold of 70%, and
- 1.06 x 2012-2015 average spawning biomass depletion.

2 Nuclear grid projections

To design an MP that sets the fishing opportunities for both longline fisheries and purse seine fisheries, a grid of projections under different levels of fishing was constructed called ‘the nuclear grid’. The nuclear grid demonstrates how different levels of future longline catch and FAD open periods impact the long-term depletion of the bigeye stock relative to the average spawning biomass between 2012 and 2015 ($SB/SB_{F=0, 2012-2015}$). Since each spatial scenario has different fisheries under the control of the MP, the nuclear grid results are different for each spatial scenario (Figure 6 to Figure 13).

All projections for the nuclear grid were run across the updated OM grid containing 1152 OMs following discussion at SC22 and are further detailed in BMW02-2026-WP02 (?). Variability was included in future recruitment through the application of randomly sampled recruitment deviates. Each of the OMs was projected a single time for each cell in the nuclear grid, so that each cell summarises the results of the stochastic projections across the entire OM grid.

The OMs were projected for 30 years with the future fishing level fixed. Each cell of the nuclear grid has different fixed catches for the longline fisheries managed through the bigeye MP, and a different purse seine FAD open period, consistent with the approach used in the TTM evaluations (WCPFC21-2024-34, Pilling et al., 2024). To ensure a sufficiently informative nuclear grid that would cover the range of stock status outcomes desired, a range of longline catches and FAD open periods were chosen for evaluations consistent with the pattern of recent FAD management decisions.

Fisheries not under the control of the bigeye MP were projected according to an assumed fishing level at fixed recent catch levels for evaluation purposes.

2.1 Fisheries managed by the BET MP

To produce the nuclear grid, FAD-associated purse seine fisheries were projected with a FAD open period ranging from 4.75 open months in EEZs to 12 open months in EEZs. A FAD open ratio of 9 / 7 between the EEZ and high seas periods was assumed to maintain, rounded to the nearest week (quarter month), e.g. a 9-month EEZ open period with a 7-month high seas open period. MP-controlled longline fisheries (described for each spatial scenario in Table 1) were projected with the total annual catch ranging from 0 tonnes to approximately double the average catch in 2019-2021 (80,000 - 100,000 tonnes depending on the spatial scenario).

2.2 Fisheries not managed by the BET MP

To perform the nuclear grid projections it is necessary to make assumptions about the future catch or effort of the fisheries that are not managed through the bigeye MP (summarised in Table 2 and Table 3), including those managed through other MPs. Note that the assumptions can change between the bigeye MP spatial scenarios. BMW01 agreed that fisheries not controlled directly by the bigeye MP should generally be assumed to remain at fixed recent catch levels for evaluation purposes.

Fisheries managed through the skipjack interim management procedure

The fisheries managed through the skipjack interim MP are: tropical purse seine; pole and line; and the domestic fisheries of Vietnam, Indonesia and the Philippines, excluding those operating in archipelagic waters.

For the nuclear grid projections it is assumed that the estimated future skipjack abundance is on the Hillary step of the skipjack HCR. The future effort or skipjack catch of these fisheries is then fixed at their skipjack MP baseline levels (CMM 2022-01, [WCPFC, 2022](#)).

Future pole and line fisheries effort is fixed at 2001-2004 average levels (Table 2; Figure 1), noting that recent effort has been lower than the 2001-2004 average level.

Total future purse seine effort is fixed at 2012 levels. This is divided between the FAD associated and unassociated (free-school) purse seine effort, depending on the future FAD open period in the nuclear grid projection. i.e. if FAD associated purse seine effort increases through an increase in the FAD open period, the free-school purse seine effort reduces correspondingly to maintain total purse effort at 2012 levels.

For domestic fisheries operating outside of archipelagic waters, the interim skipjack MP specifies the skipjack catch at the 2016-2018 average level. Here, the future effort of these fisheries is fixed at the 2016-2018 average level, including the fisheries operating in archipelagic waters (Figure 2).

Effort data is not always available for each domestic fishery in this time period. For those fisheries where the effort is unavailable, the fishing mortality in this time period estimated during the OM conditioning is used instead. The future fishing mortality of those fisheries is therefore consistent with that estimated in 2016-2018. Projecting on constant effort, or fishing mortality, instead of constant catch ensures that catches of bigeye taken by these fisheries do not become unsustainable if stock abundance decreases in the area in which they operate.

Due to uncertainty in the historical data for the domestic fisheries, additional sensitivity tests around these data will be conducted in the future.

Table 2: Future effort assumptions for the model fisheries in the operating models that are managed through the skipjack management procedure.

Fishery segment	Future fishing assumptions
Pole and line	Future effort fixed at average 2001-2004 average levels.
Purse seine	Total future effort fixed at 2012 levels. FAD associated and free-school distribution of total effort is set by nuclear grid.
Domestic	Future effort fixed at average 2016-2018 levels, including those operating in archipelagic waters.

Other longline fisheries

The future catch or effort of the longline fisheries depends on the bigeye MP scenario (Table 3).

The catches of South Pacific albacore taken by the southern longline are managed through the South Pacific albacore MP. In scenarios where the southern longline fishery is excluded from being managed through the bigeye MP, the future effort of this fishery is fixed at a level consistent with South Pacific albacore achieving the TRP under the adopted South Pacific albacore MP (effort approximately 10% higher than 2019-2021 levels, Figure 1) (SPC-OFP, 2025). Otherwise, the future bigeye catch of the southern longline fishery is set by the bigeye MP.

In scenarios where the Hawaiian longline fleet is excluded from being managed through the bigeye MP, including the component operating south of 20°N, the future catches of bigeye of this fleet are fixed at the level consistent with Table 3 in the TTM: 6554 mt per annum. If only the component of the Hawaiian longline fleet operating north of 20°N is excluded, the future bigeye catches of this fleet north of 20°N are fixed at a constant level of 60% of the 6554 mt per annum (3932 mt per annum), based on the average distribution of bigeye catches taken by the Hawaiian longline fleet in the years 2012-2015 (consistent with the TRP baseline year range, as requested by the USA) (Figure 3). The remainder of the Table 3 limit is subject to the MP.

In scenarios where the northern longline fishery is not managed through the bigeye MP, the future catches of the non-US northern longline fishery are fixed at their 2015-2024 average levels, i.e. a long-term average of 6700 mt per annum (Figure 4).

The historical TLL catches of bigeye, with and without the Hawaiian longline fishery, are shown in Figure 5 for reference, noting that the future bigeye catch of the TLL is set by the MP, depending on the scenario.

In the scenario in which the bigeye MP manages longline fisheries across the WCPO, excluding those of SIDS flagged vessels, the future catches of SIDS longline fisheries are fixed at their average 2015-2024 level (McKechnie et al., 2026). The total future catches of SIDS in each year is 10,200 mt pa, distributed across the northern, tropical and southern longline fisheries according to WCPFC-SC22-2026-SA-IP12: 800, 7800 and 1600 mt pa. respectively.

Table 3: Future bigeye catch and effort assumptions for the longline fisheries under the different bigeye management procedure assumptions.

Bigeye MP scenario	Southern longline	Hawaiian longline	Tropical longline	Non-US northern longline
TLL including Hawaiian longline fleet	Effort consistent with South Pacific albacore MP.	Catches of fleet operating north of 20°N fixed at 3932 mt p.a. Catches of fleet operating south of 20°N set by bigeye MP.	Catches set by bigeye MP.	Catches fixed at 2015-2024 average (approximately 6700 mt p.a.).
TLL excluding Hawaiian longline fleet	Effort consistent with South Pacific albacore MP.	Catches fixed at 6554 mt p.a.	Catches set by bigeye MP, excluding Hawaiian longline fishery.	Catches fixed at 2015-2024 average (approximately 6700 mt p.a.).
WCPO wide	Catches set by bigeye MP.	Catches set by bigeye MP.	Catches set by bigeye MP.	Catches set by bigeye MP.
WCPO wide excluding SIDS	Catches set by bigeye MP, excluding SIDS catch at 2015-2024 average (approximately 1600 mt p.a.)	Catches set by bigeye MP.	Catches set by bigeye MP, excluding SIDS catch at 2015-2024 average (approximately 7800 mt p.a.)	Catches set by bigeye MP, excluding SIDS catch at 2015-2024 average (approximately 800 mt p.a.)

3 Nuclear grid results

The long-term depletion of each projection was calculated based on spawning biomass in the WCPO (measured as $SB_{\text{latest}}/SB_{F=0}$, i.e. SB in year y relative to the average $SB_{F=0}$ in years y-10 to y-1). The number in each cell of the nuclear grid represents the median long-term depletion relative to

$SB/SB_{F=0, 2012-2015}$. So, a value of 1 indicates that the long-term depletion is equal to the average spawning biomass in 2012 to 2015. A value of 0.94 indicates that the long-term depletion achieves the lower TRP and a value of 1.06 indicates that the long-term depletion achieves the upper TRP. Notice different combinations of future longline catch and FAD open periods achieve the same level of depletion (same number in the cell).

In addition to the nuclear grids now being presented with values relative to the $SB/SB_{F=0, 2012-2015}$, the OMs that form the basis of the nuclear grid are also different to the grids of stock assessment models presented in 2023 and 2026, and different to the OMs presented at SC22. This means that the values of the TRPs, expressed as actual depletion values, will be different to those presented in past WCPFC reports.

Additionally, the nuclear grid results are different to those presented under previous TTM evaluations. This is partly because the grid of OMs is different, but also the assumptions underlying the grid are different, e.g. the assumptions made for future fishing levels of fisheries not managed through the bigeye MP.

The nuclear grids for all four spatial scenarios are shown in Figure 6 – Figure 13.

The threshold reference points are not easily interpreted from the numbers in the cells of the nuclear grid, so the cells are shaded with different colours to indicate when the thresholds of 50%, 60% and 70% are achieved, noting that having a 50% probability is equivalent to treating the TRP as a ‘point’ target. The colour of the cells is different depending on whether the lower TRP or upper TRP is being considered. For example, the difference between Figure 6 and Figure 7, which both show the results for the ‘TLL including Hawaiian longline fleet’ spatial scenario, is just the colour of the cells.

3.1 Limit reference point

The WCPFC has a requirement that any adopted harvest strategy must result in a probability of being above the limit reference point (LRP, a depletion level of 0.2) of at least 0.8. Since the OM grid was updated to have a similar range of terminal spawning biomass depletion values as the SC22 bigeye stock assessment report (Kim et al., 2026), as requested by SC22, the median terminal stock status of the projections has decreased (more depleted). Some of the OMs in the updated grid have terminal depletion values lower than the LRP.

Any projection in the nuclear grid that does not satisfy the requirement of an 80% probability of being above the LRP has been highlighted with a red border in the nuclear grid plots. These ‘out of bounds’ cells are very close to, and sometimes overlap, cells that have a 50% probability of being above the lower TRP.

4 Proposed harvest control rule designs

An MP comprises three components:

- Data collection,
- Estimation method, and
- Harvest control rule (HCR).

The data collection and estimation method for the proposed bigeye MP are discussed in detail in WCPFC-SC22-2026/MI-WP-02 ([Wickens et al., 2026](#)). This section describes the proposed HCR designs, following discussions at WCPFC22, BMW01 and SC22.

4.1 HCR pairs

Following discussions at WCPFC22 and BMW01, the proposed bigeye MP uses HCR pairs to set the fishing opportunities. Within an HCR pair, one HCR sets the catch of the longline fishery, and the other sets the FAD open period for the purse seine (PS) fishery. The nuclear grids guide the design of the HCR pairs.

SC21 and BMW01 supported a ‘Hillary step’ type of HCR, consistent with the adopted skipjack and South Pacific albacore HCRs. With this kind of HCR shape, the HCR output remains on the ‘step’ as the estimated stock status fluctuates over time around the TRP. The heights of the Hillary steps should therefore set the catch limit of the longline fisheries managed through the bigeye MP and the FAD open period that are consistent with achieving the agreed TRP in the long-term.

The nuclear grid shows what the future longline catch and FAD open period must be to achieve the agreed TRP in the long-term. Each cell of the nuclear grid that achieves the agreed TRP produces a combination of valid Hillary step heights. The FAD open period corresponding to the cell is the Hillary step height for the FAD HCR and the longline catch corresponding to the cell is the Hillary step height for the longline HCR.

However, different combinations of longline catch and FAD open period can achieve the same level of depletion. Therefore, the height of the Hillary step for the HCRs is not set at one particular fishing level. Every cell that achieves the agreed TRP gives rise to a pair of valid HCRs. Hence, the proposed bigeye MP comprises a continuum of pairs of HCRs: one that sets the fishing opportunities of the longline fishery, and one for the FAD associated purse seine fishery defined as the number of months the FAD fishery is open.

Each pair of HCRs aims to achieve the same outcomes in terms of long-term bigeye stock status, but under an alternative FAD open scenario. Pairs of HCRs allow for more or less longline fishing depending on the associated FAD open period, i.e. the shorter the FAD open period, the higher the longline catch of bigeye to achieve the same long-term stock outcome.

The shape of the HCRs when the estimated stock status is not on the Hillary step is described in

(?).

4.2 Arc of possibilities

The ‘arc of possibilities’ refers to the combinations of longline catch and FAD open period that produce cells in the nuclear grid that achieve the TRP. The heights of Hillary steps of valid HCR pairs will be consistent with the arc of possibilities - the combinations of the FAD open periods and longline catch limits that run along the probability boundaries.

For example, when the lower TRP is considered as a target (‘50% threshold’), the possible step heights run along the arc of the possibilities between the ‘50% threshold’ and ‘Below target’ areas (e.g. Figure 6). When the lower TRP is considered as a threshold target with a 60% probability of being at or above, the possible step heights run along the arc of possibilities between the ‘60% threshold’ and ‘50% threshold’ areas, etc.

The nuclear grids presented in the appendices can be used to inspect the relative impact of the MP-managed longline and FAD-associated purse seine fishing pressure on the long-term stock status.

4.3 Negotiations

Each time the MP is run the estimation method (EM) produces an estimate of stock status. Note, the estimate of stock status from the EM is not directly comparable to the TRP. Once the stock status is calculated, the pair of HCRs used to set the bigeye MP-managed longline catch/effort limit and the FAD open period during the following management period would then be negotiated by the Commission. Therefore, the proposed bigeye MP does not prescribe the FAD open period. Instead it can be a negotiated outcome each time the MP is run.

Assuming the pairs of HCRs are negotiated at the start of each management period they are effectively only used once before being potentially changed, i.e. the actual HCRs that are used to set the FAD open period and the longline catch/effort limit can change over time.

Each of the four bigeye MP spatial scenarios described in Table 1, and each of the candidate TRPs considered here (including those evaluated as threshold TRPs) require different candidate MPs, i.e. require different pairs of HCRs that will achieve the associated TRP in the long-term, for each candidate HCR design formulation. Given the number of bigeye MP spatial scenarios and candidate TRPs, designing and evaluating the required continuum of pairs of HCRs is not a trivial task.

4.4 HCR output and implementation

The output of the selected HCR pairs would be implemented through the Implementing CMM. The implementation and allocation arrangements for outputs of the bigeye MP remain matters for future discussion, noting that several CCMS have emphasised the need to ensure consistency with existing management systems and existing TTM arrangements (WCPFC, 2026).

BMW01 agreed that bigeye MP evaluations should proceed using longline catch limits as the longline output control and purse seine FAD closure period as the purse seine output control. To aid with the interpretation of results, the purse seine output control was converted to FAD open period for plots and tables. It was also noted that implementation may differ from the MP output; for example, although the MP output may be catch-based, some fisheries, including in PNA waters, may be implemented through effort based arrangements using an external process for setting effort levels.

The evaluations for the WCPO excluding SIDS scenario output a scalar that can be used with the existing TTM catch limits, as well an overall bigeye catch limit ([SPC-OFP, 2026](#)).

4.5 Meta-rules and constraints

BMW01 did not agree on specific meta-rules or constraints on the maximum change in fishing pressure between management periods. It was suggested that there may not be a need for constraints to be specified by the bigeye MP since allocation and implementation arrangements would ultimately involve negotiated outcomes. The role of meta-constraints may be clarified under Agenda Item 6 (operational and implementation arrangements). It may be possible to test specific meta-rules on a limited range of TRPs and bigeye spatial scenarios in the future.

Acknowledgments

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AI Declaration

No AI technologies were used in the preparation of this paper.

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Appendix: Future assumptions for fisheries

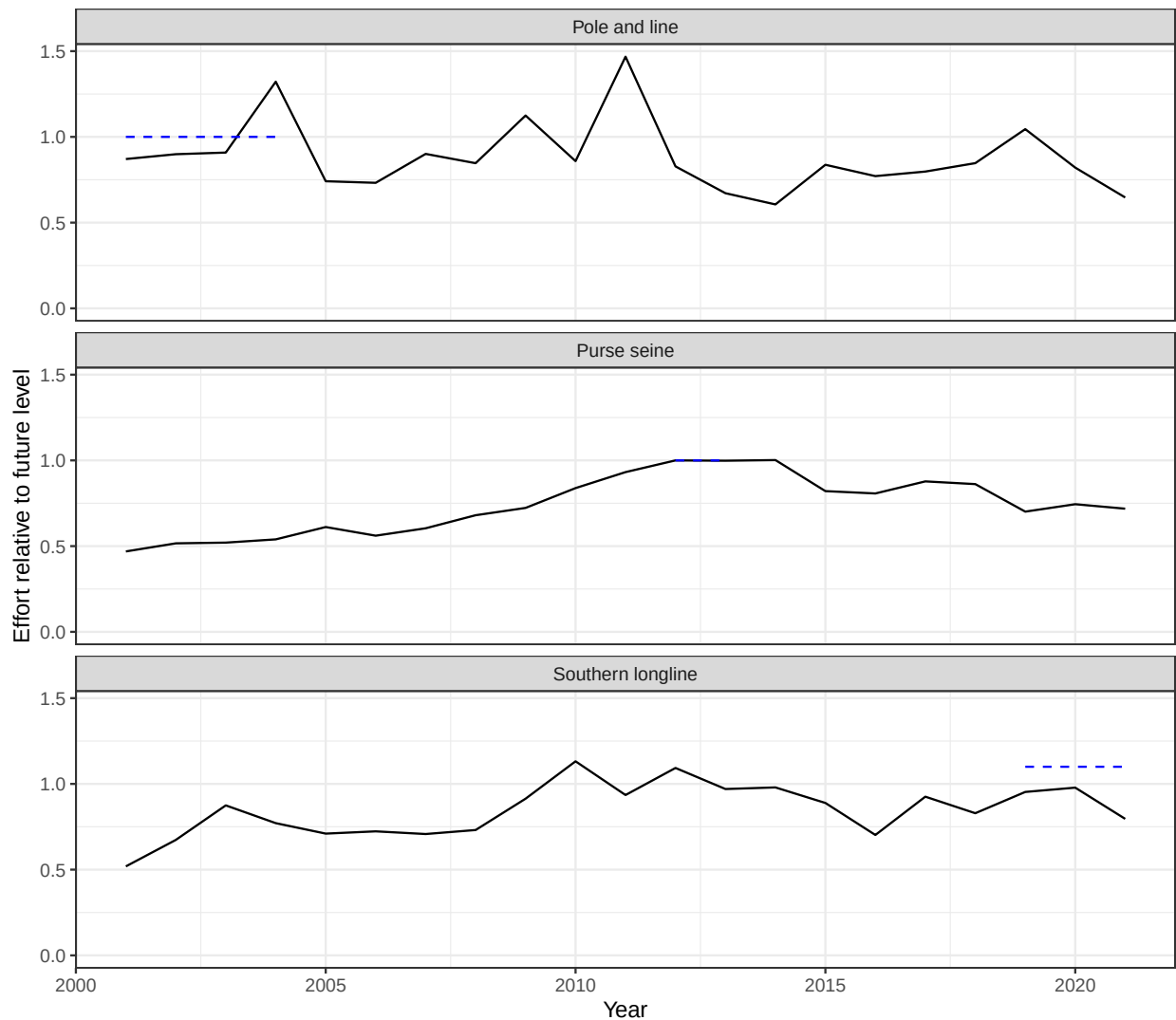


Figure 1: Time series of the effort of the pole and line, tropical purse seine and southern longline fisheries relative to their assumed future levels. The future relative effort of these fisheries is shown as the blue dashed line: pole and line, 2001-2004 average; purse seine, 2012; and southern longline, 2019-2021 average +10%, consistent with the South Pacific albacore MP. The southern longline future effort is only used in the scenarios in which this fishery is not managed through the bigeye MP.

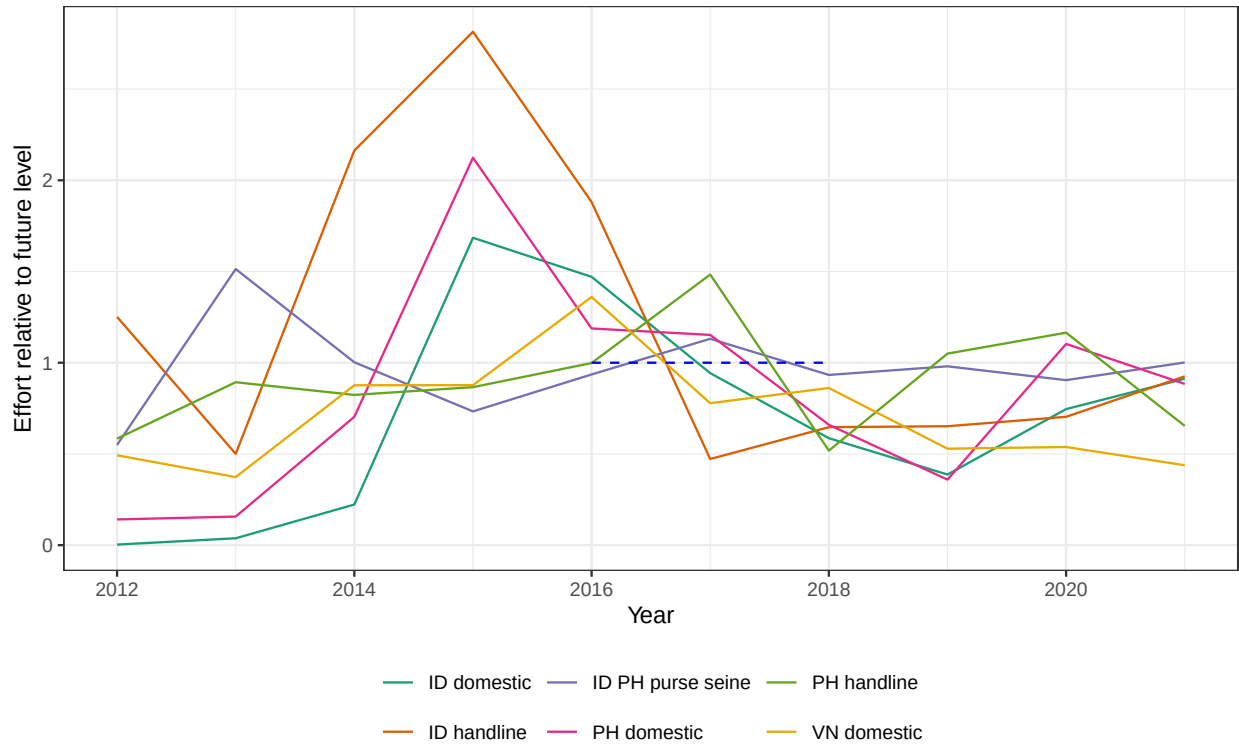


Figure 2: Time series of the effort of the domestic fisheries of Vietnam, Indonesia and the Philippines relative to their assumed future levels (2016-2018 average level, the blue dashed line).

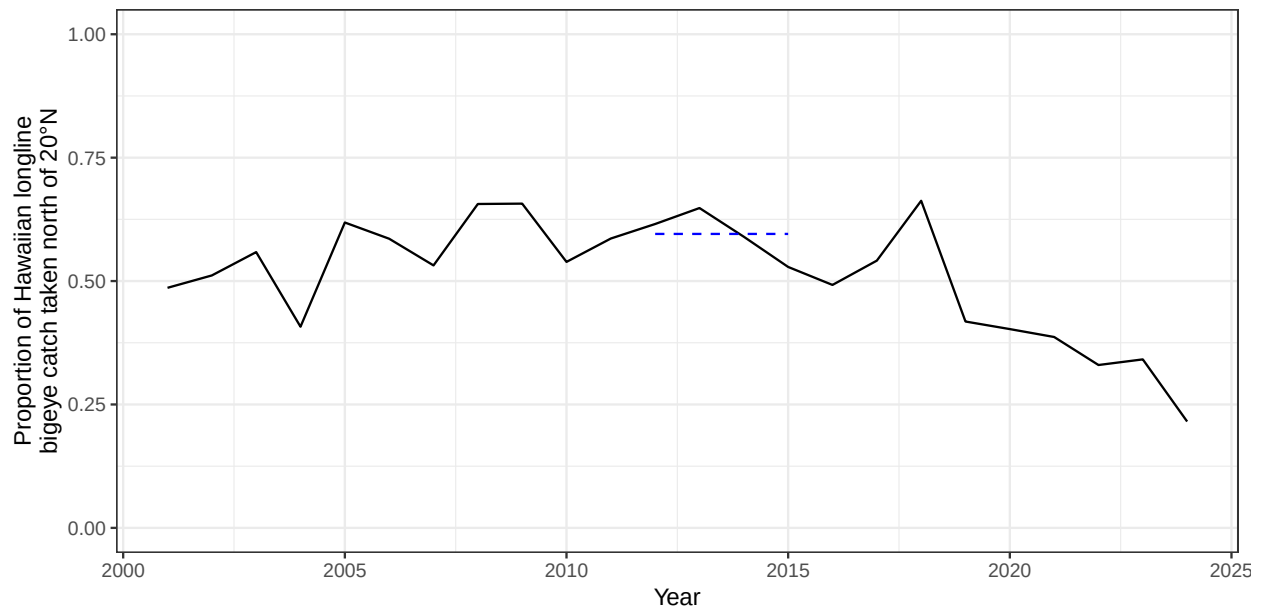


Figure 3: Time series of the proportion of bigeye catches taken by the Hawaiian longline fleet, north of 20°N. The average proportion in the years 2012-2015 (the blue dashed line) is used as the future proportion in the scenarios in which the northern longline fleet is not managed through the bigeye MP.

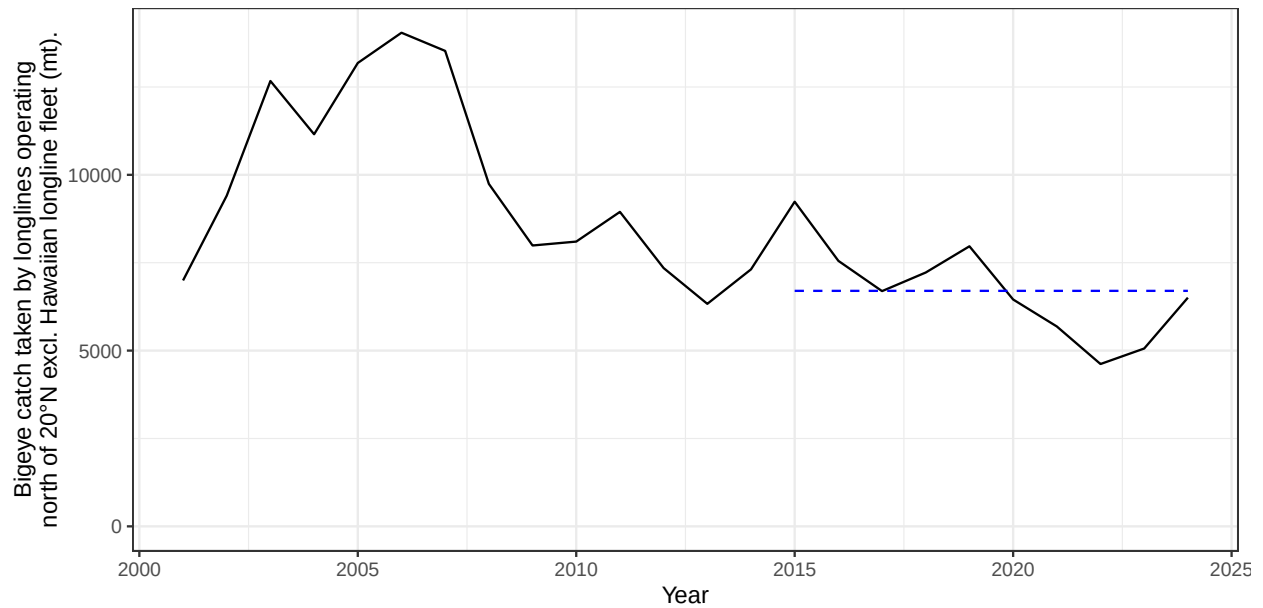


Figure 4: Time series of bigeye catches taken by the northern longline fleet, north of 20°N, excluding the Hawaiian longline fleet. The average catch in the years 2015-2024 (the blue dashed line) is used as the future catch in the scenario in which the northern longline fleet is not managed through the bigeye MP.

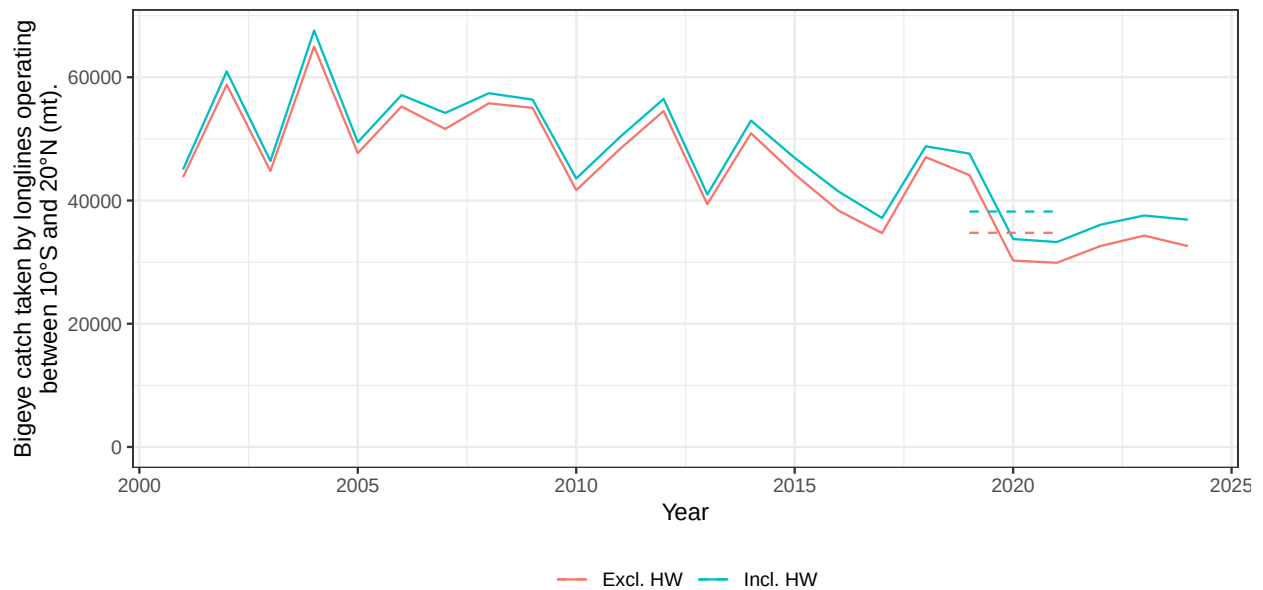


Figure 5: Time series of bigeye catches taken by the tropical longline fleet (operating between 10°S and 20°N), with and without the Hawaiian longline fleet. The average catch in the years 2019-2021 (the dashed lines) are shown for reference.

Appendix: Nuclear grid results

The following plots are the nuclear grid results for each of four bigeye MP spatial scenarios (Table 1). Each scenario has two nuclear grids with the probabilities of being above the lower and upper TRPs with thresholds of 50%, 60% and 70%.

The value in each cell of the nuclear grids is the median long-term depletion relative to the average depletion in 2012-2015, i.e. relative to the TRP so that a value of 0.94 is at the lower TRP and 1.06 at the upper TRP on average. Each cell is coloured according to the probability threshold. Cells with a red border are those in which the probability of being below the LRP is less than 80%.

The x-axes specify the FAD open period in months for the EEZ and the high seas. A ratio of 3 / 5 month closed (9 / 7 months open) is used throughout the analyses, leading to a minimum value of 4.75 months open in EEZs for 0 months open in the high seas.

Bigeye MP manages the TLL, including the Hawaiian longline fleet operating south of 20°N. Lower Target Reference Point.

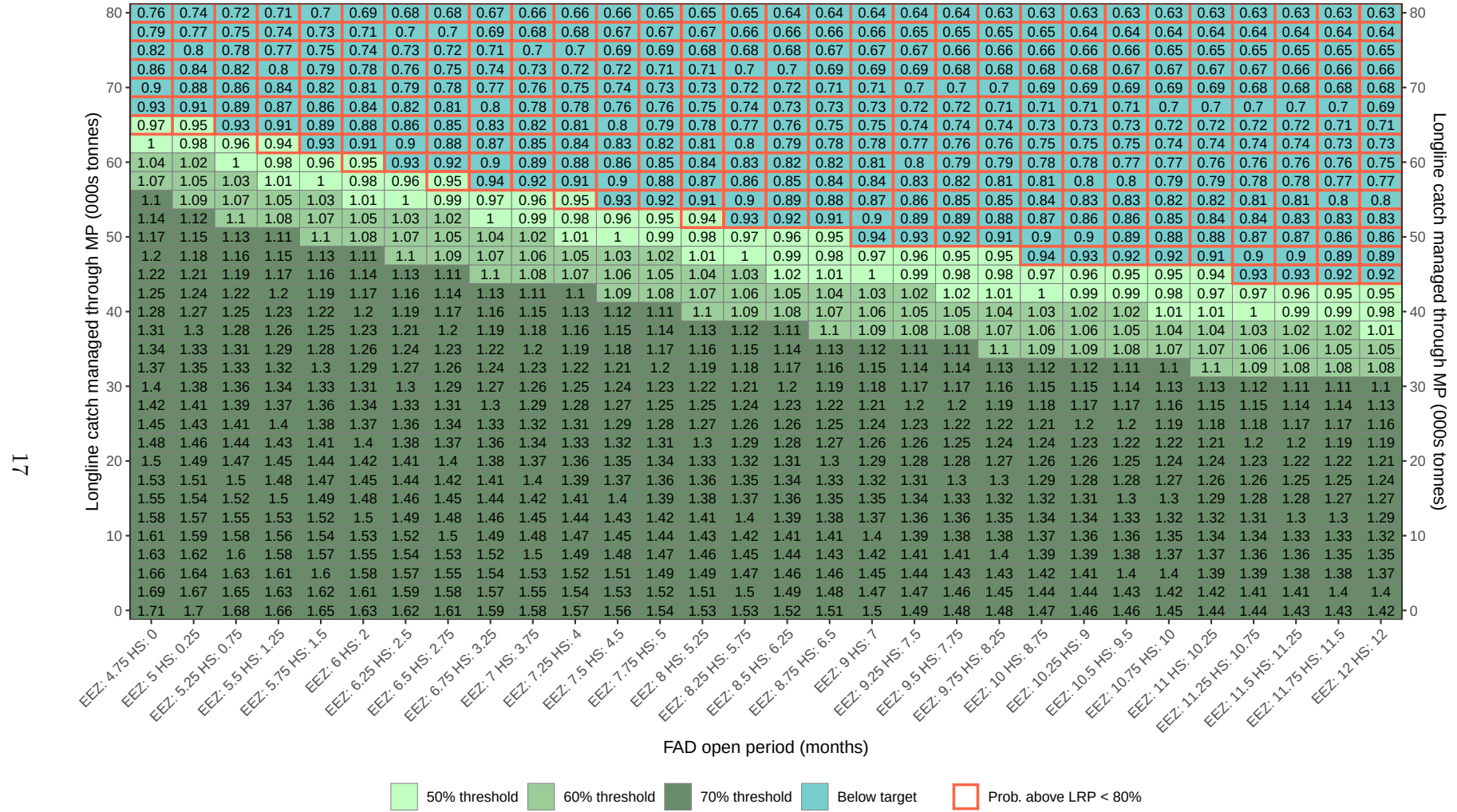


Figure 6: The long-term median spawning biomass depletion value relative to the average in 2012-2015 at each combination of FAD closure period and longline catch managed through the bigeye MP for the scenario in which the tropical longline, including the Hawaiian longline fleet operating south of 20°N, is managed through the bigeye MP. The colours indicate the probability of a cell being above the lower TRP with different thresholds. The cells with a red border indicate those that result in a probability of being above the LRP of less than 80%.

Bigeye MP manages the TLL, including the Hawaiian longline fleet operating south of 20°N. Upper Target Reference Point.

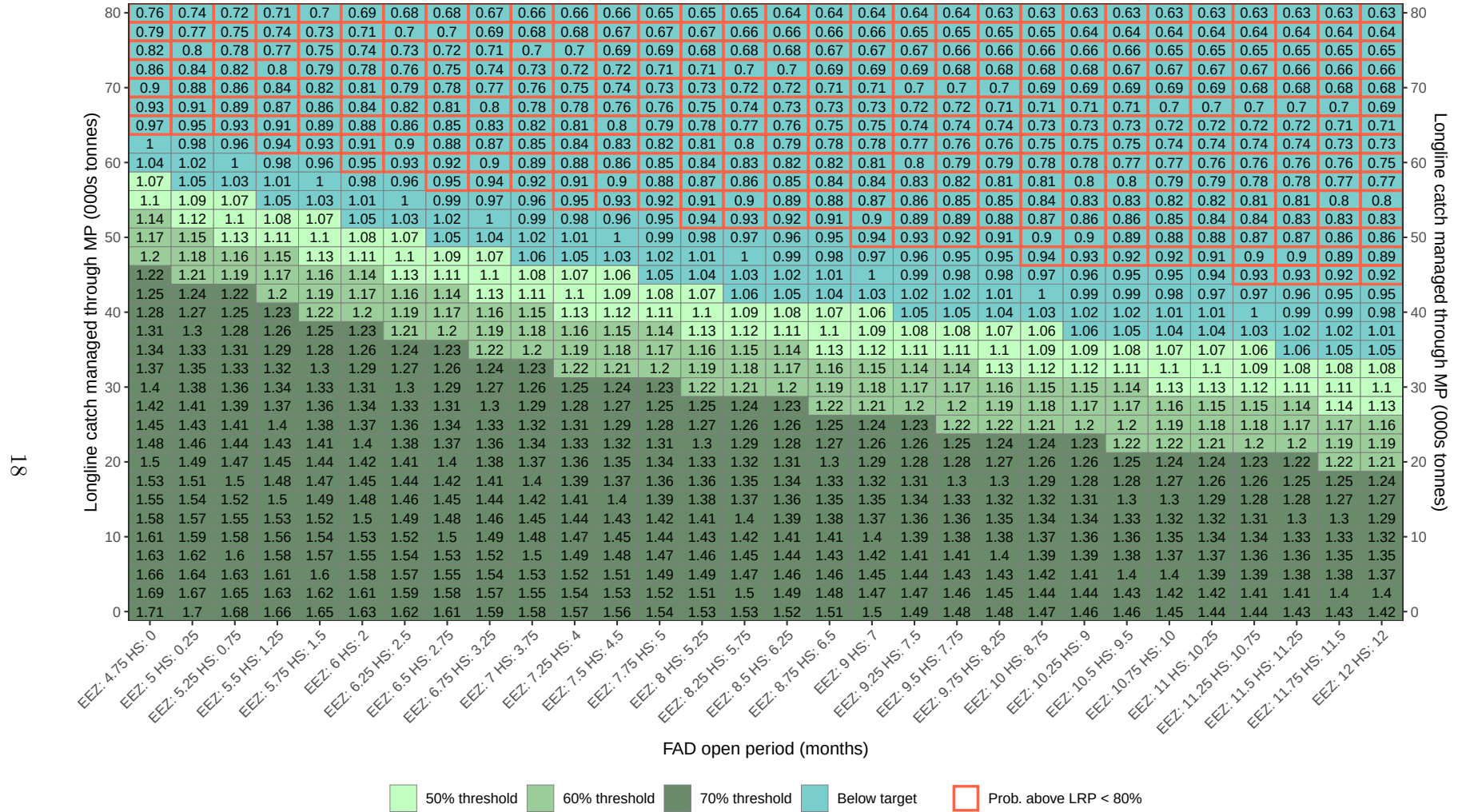


Figure 7: The long-term spawning biomass median depletion value relative to the average value in 2012-2015 at each combination of FAD closure period and longline catch managed through the bigeye MP for the scenario in which the tropical longline, including the Hawaiian longline fleet operating south of 20°N, is managed through the bigeye MP. The colours indicate the probability of a cell being above the upper TRP with different thresholds. The cells with a red border indicate those that result in a probability of being above the LRP of less than 80%.

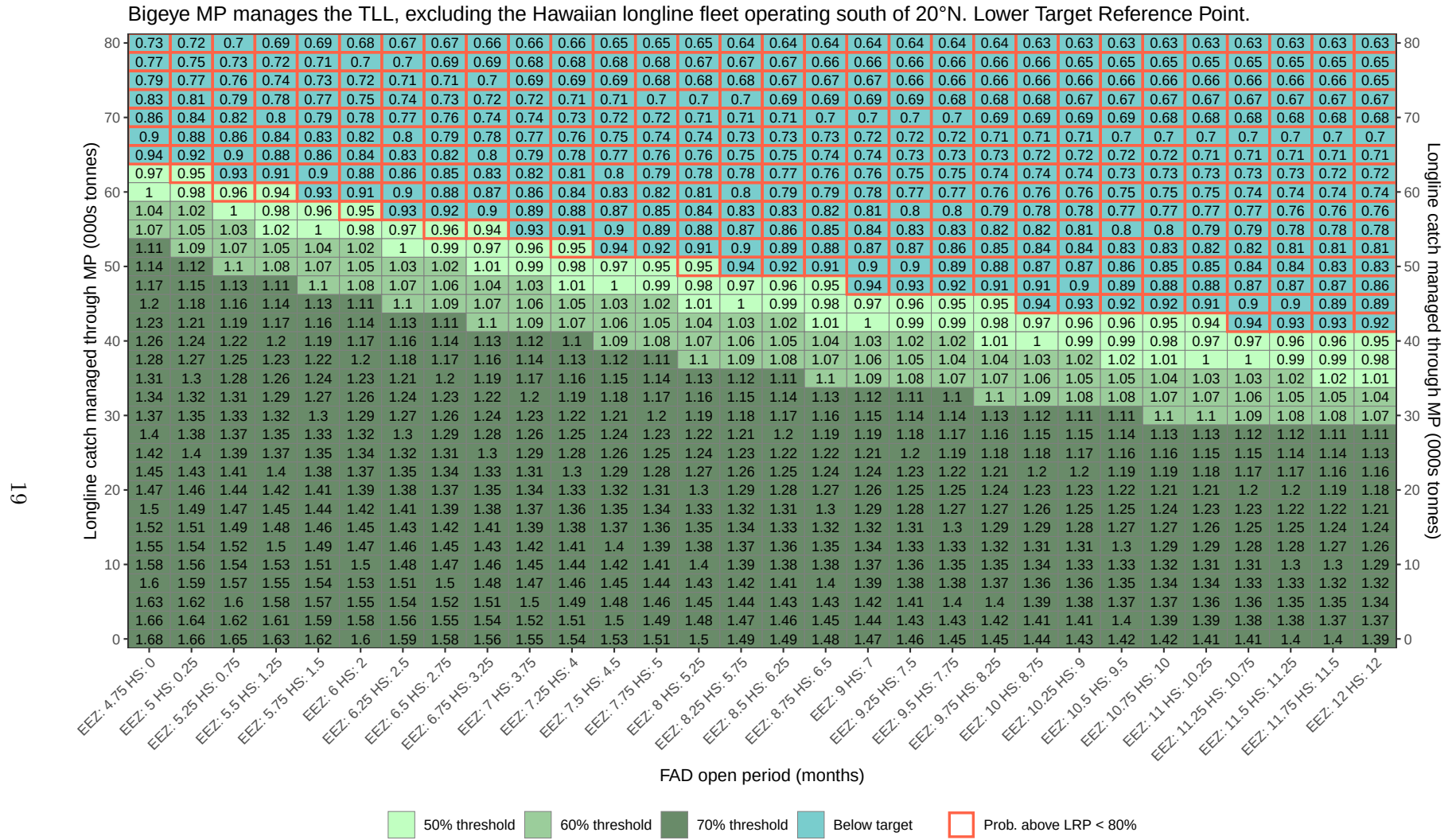


Figure 8: The long-term median spawning biomass depletion value relative to the average in 2012-2015 at each combination of FAD closure period and longline catch managed through the bigeye MP for the scenario in which the tropical longline, excluding the Hawaiian longline fleet operating south of 20°N, is managed through the bigeye MP. The colours indicate the probability of a cell being above the lower TRP with different thresholds. The cells with a red border indicate those that result in a probability of being above the LRP of less than 80%.

Bigeye MP manages the TLL, excluding the Hawaiian longline fleet operating south of 20°N. Upper Target Reference Point.

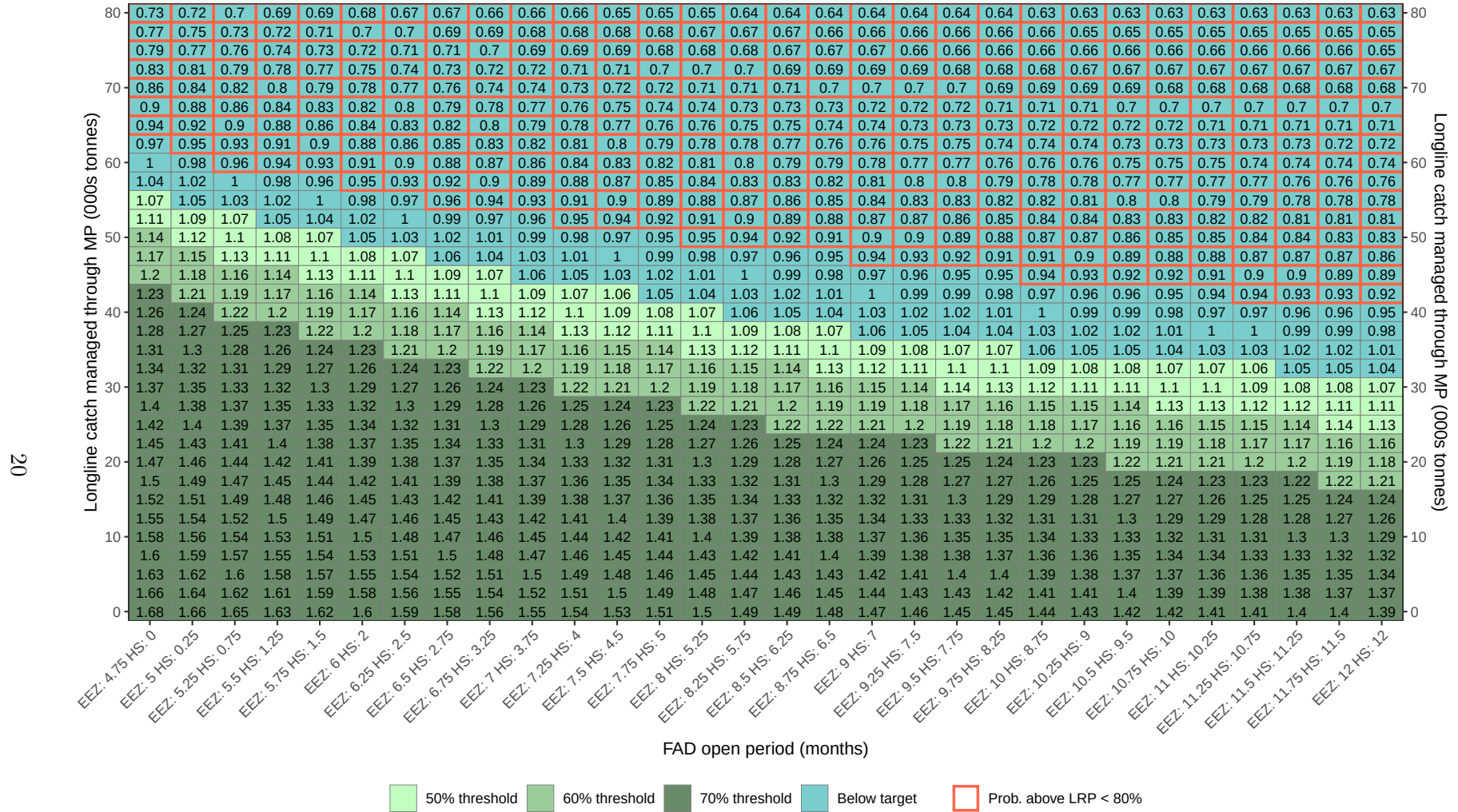


Figure 9: The long-term median spawning biomass depletion value relative to the average value in 2012-2015 at each combination of FAD closure period and longline catch managed through the bigeye MP for the scenario in which the tropical longline, excluding the Hawaiian longline fleet operating south of 20°N, is managed through the bigeye MP. The colours indicate the probability of a cell being above the upper TRP with different thresholds. The cells with a red border indicate those that result in a probability of being above the LRP of less than 80%.

Bigeye MP manages the longline fisheries in the WCPO. Lower Target Reference Point.

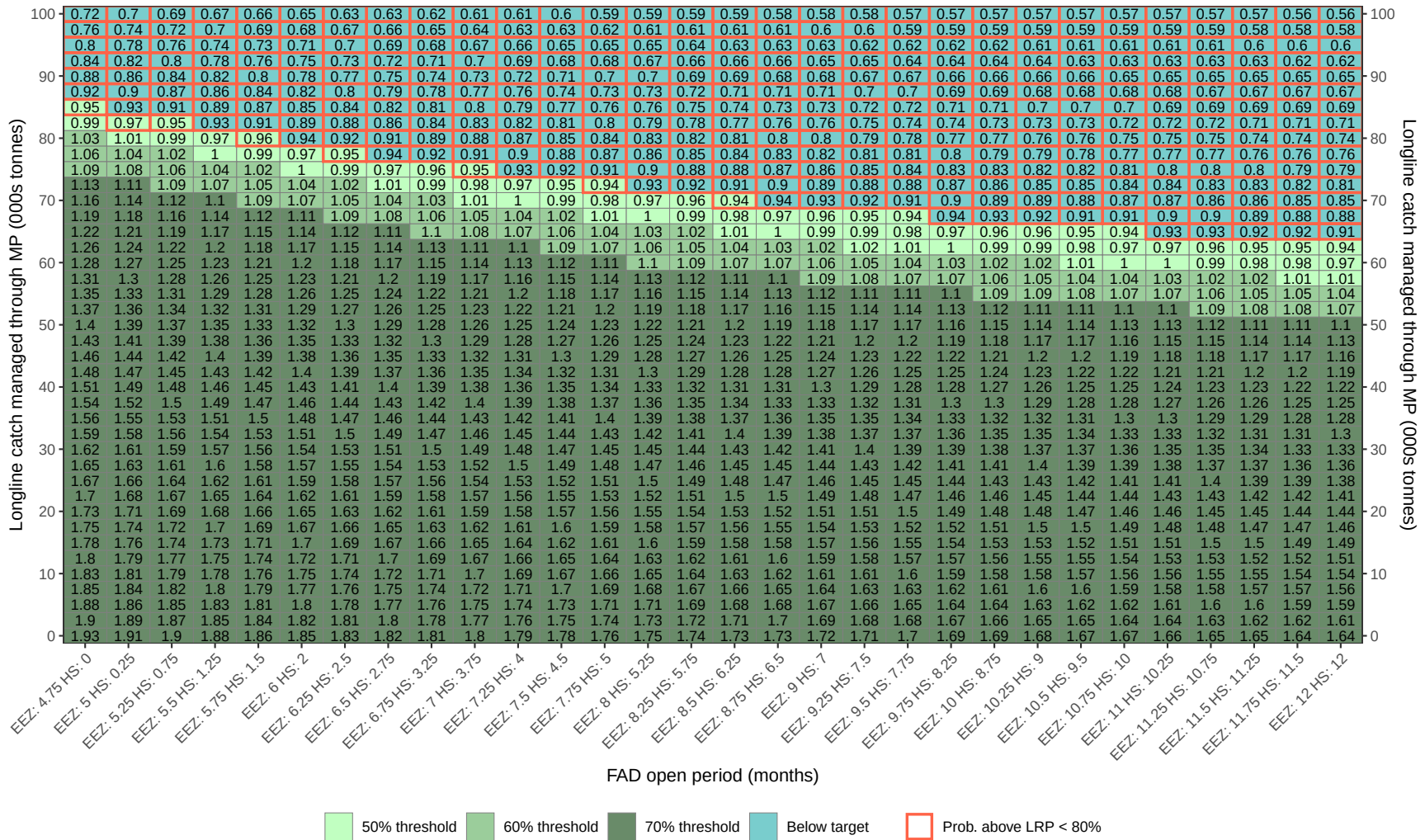


Figure 10: The long-term median spawning biomass depletion value relative to the average value in 2012-2015 at each combination of FAD closure period and longline catch managed through the bigeye MP for the scenario in which all longline fisheries in the WCPO are managed through the bigeye MP. The colours indicate the probability of a cell being above the lower TRP with different thresholds. The cells with a red border indicate those that result in a probability of being above the LRP of less than 80%.

Bigeye MP manages the longline fisheries in the WCPO. Upper Target Reference Point.

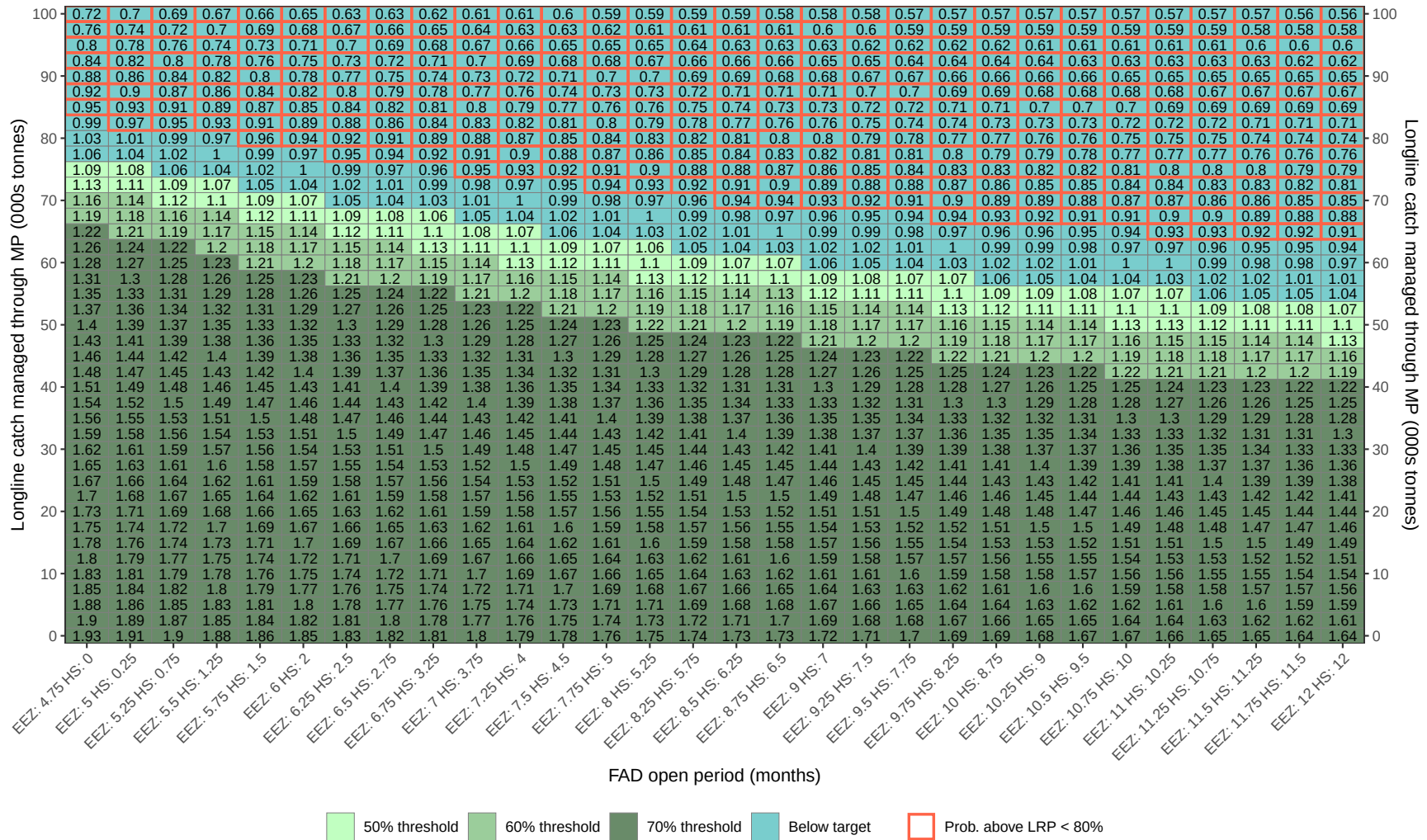


Figure 11: The long-term median spawning biomass depletion value relative to the average value in 2012-2015 at each combination of FAD closure period and longline catch managed through the bigeye MP for the scenario in which all longline fisheries in the WCPO are managed through the bigeye MP. The colours indicate the probability of a cell being above the upper TRP with different thresholds. The cells with a red border indicate those that result in a probability of being above the LRP of less than 80%.

Bigeye MP manages the longline fisheries in the WCPO excluding SIDS. Lower Target Reference Point.

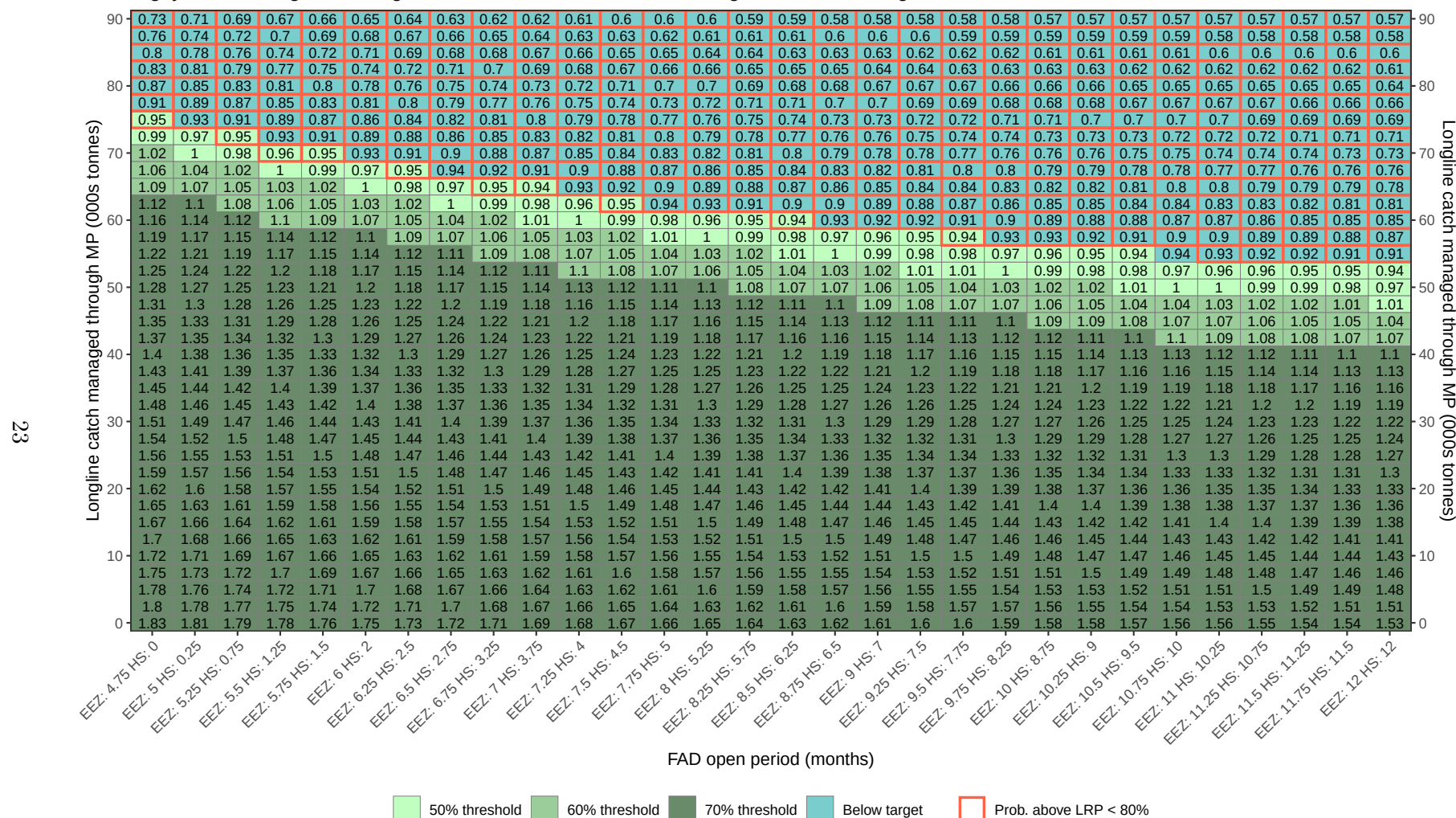


Figure 12

Bigeye MP manages the longline fisheries in the WCPO excluding SIDS. Upper Target Reference Point.

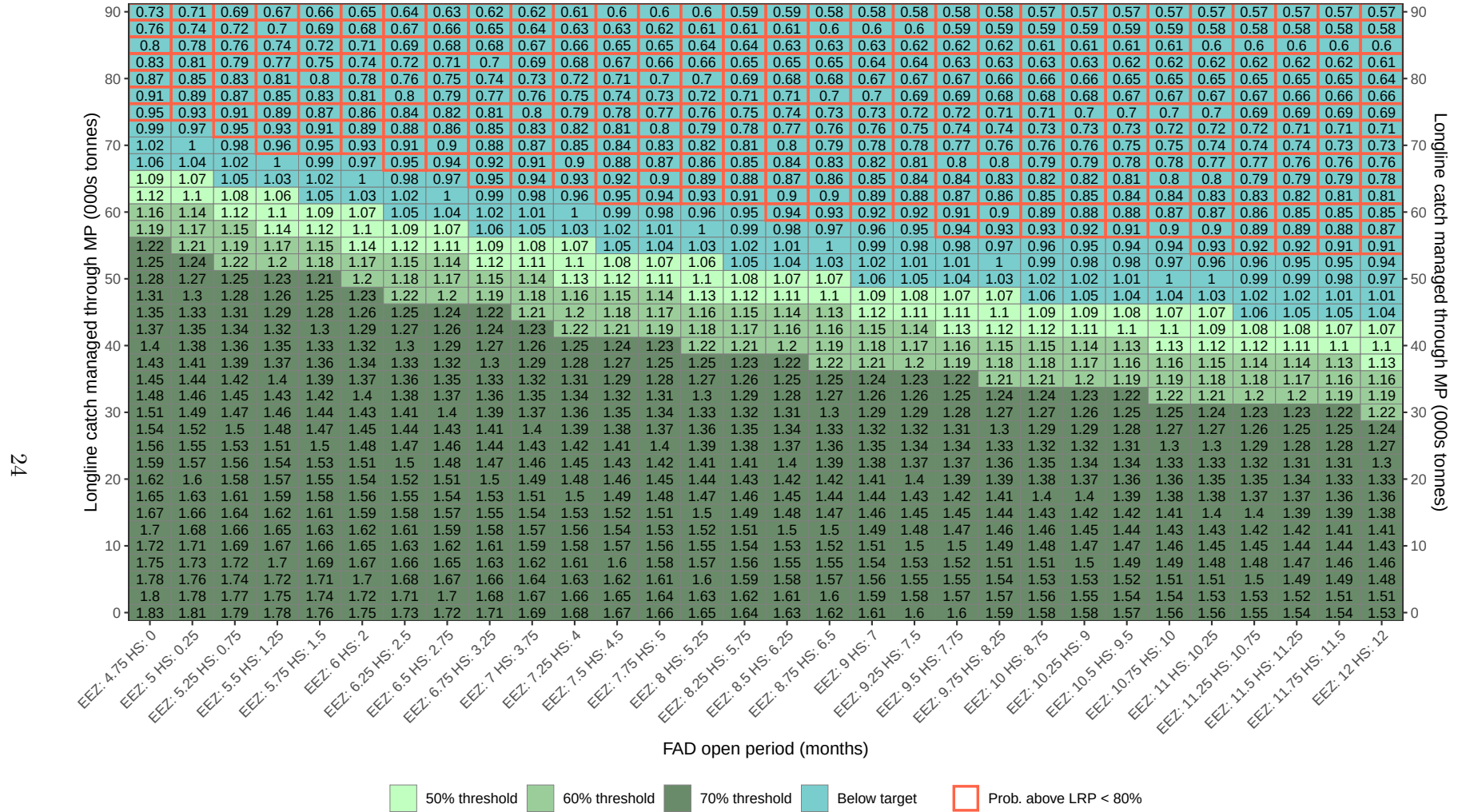


Figure 13: The long-term median spawning biomass depletion value relative to the average value in 2012-2015 at each combination of FAD closure period and longline catch managed through the bigeye MP for the scenario in which all longline fisheries in the WCPO are managed through the bigeye MP excluding SIDS. The colours indicate the probability of a cell being above the upper TRP with different thresholds. The cells with a red border indicate those that result in a probability of being above the LRP of less than 80%.