



Monitoring the Tasmanian East Coast Blacklip Abalone Stock Rebuild Final Report

Timed Swim Survey Results 2025
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Monitoring the Tasmanian East Coast Blacklip Abalone Stock Rebuild

IMAS Timed Swim Survey Results 2025

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1 Background

The Eastern Zone abalone fishery has experienced significant catch declines and fluctuating catch rates since the 1990s and in 2020, five abalone fishing blocks (16, 22, 23, 24 and 27) and sub-block 28A were closed to commercial fishing. As part of the closure, it was agreed that these blocks would be surveyed by IMAS under a no-take plan, with assistance from industry on site selection and field work, to determine the geographic extent of depletion and monitor the temporal recovery in stocks.

From 2020, a fishery independent timed swim survey has been conducted annually by IMAS enabling an assessment of abalone abundance across the broad spatial extent of the east coast closure. In summary, the timed swim survey method involves paired divers conducting a 10-minute timed swim on SSBA, counting and measuring all emergent abalone on a measuring slate, at approximately 60 sites in each closed block, derived from historical abalone fishery diver GPS logger data (2012-2019). Measured abalone are classified as legal (>140 mm) or sub-legal (<140 mm) and temporal changes in their abundance compared with baseline abundance determined in 2020.

An assessment of trends in abundance since 2020 has been used to evaluate the effectiveness of recovery efforts and to determine when it is appropriate to re-open the fishery. The criteria for reopening the closed blocks are based on several key performance indicators from the timed swim surveys. Key criteria include:

1. Increasing sub-legal and legal counts relative to the 2020 baseline.
2. Evidence of a widespread trend of increasing sub-legal and legal counts across the Block.
3. Evidence of multiple size classes particularly above the size limit.

This report outlines findings from timed swim surveys conducted by IMAS in 2025 and are assessed in regard to meeting the criteria for re-opening.

2 Data standardisation

2.1 Survey Design

Timed swim surveys have been the primary method used to assess abalone abundance within closed fishing blocks in the Eastern Zone abalone fishery of Tasmania. The methodology has also been applied to areas currently open to fishing as part of long-term monitoring and experimental reliability assessments. In all cases, data are evaluated independently at the block level, though the core survey protocol remains consistent across regions.

Within the context of the Eastern Zone closure program, the survey framework includes:

- Blocks surveyed: Six blocks included in the assessment
- Temporal coverage: Annual sampling conducted from 2020 through 2025 (June - October)
- Site density: Approximately 60 sites per block each year
- Spatial distribution: Sites stratified across subblocks within each block
- Sampling structure:
 - 15 fixed (reference) sites revisited annually
 - 45 randomly selected sites surveyed each year
- Survey protocol:
 - At each site, two divers perform a 10-minute timed swim
 - All emergent abalone encountered are counted and measured
 - Abundance is partitioned into sub-legal and legal categories

Given the complexity of the survey design, standardisation is essential to account for methodological biases and variability in diver performance. Key analytical questions include:

- Is abalone abundance changing over time?
- Do certain subblocks exhibit consistently higher productivity?
- Do diver-specific effects influence count outcomes?
- Does time of year influence counts?
- Is there interdependence between legal and sub-legal abundance?

To accommodate the characteristics of the data, a Generalised Linear Mixed Model (GLMM) was implemented using the glmmTMB package in R. The fitted model is specified as:

$$\begin{aligned} \text{size_class_A}_i &\sim \text{NB}(\mu_i, \theta) \\ \log(\mu_i) &= \underbrace{\beta_0 + \beta_1 \cdot \text{size_class_B}_i + \beta_2 \cdot \text{sampyear}_i}_{\text{Fixed effects}} \\ &\quad + \underbrace{u_{\text{diver_id}_i} + u_{\text{site}_i} + u_{\text{subblock}_i} + u_{\text{month}_i} + u_{\text{site:sampyear}_i}}_{\text{Random effects}} \end{aligned}$$

Zero-inflation: $\text{logit}(\pi_i) = \gamma_0$

3 Timed Swim Survey Results 2025

3.1 Sites Surveyed

In 2025 there were 312 sites surveyed across the closed Blocks over 27 field days (Table 3.1). Surveys were undertaken by seven divers comprising both IMAS research staff and commercial abalone divers (Table 3.2).

Table 3.1: Summary of sites surveyed by Block in 2025. Sites = number of sites surveyed; Days = number of sampling days; Sites_Day = average number of sites surveyed for each sampling day.

Blockno	Sites	Days	Sites_Day
16	59	5	11.8
22	56	5	11.2
23	58	6	9.7
24	60	4	15.0
27	59	4	14.8
28	20	3	6.7
Total	312	27	11.5

Table 3.2: Summary of IMAS staff dive statistics in 2025. Sites = number of sites surveyed; Blocks = number of Blocks surveyed; Days = number of sampling days.

Diver	Sites	Blocks	Days
AD	99	6	13
JF	97	6	12
JM	7	2	1
LT	111	5	14
PE	193	6	22
SA	29	3	3
SG	88	6	11

3.2 Overall Abundance - Criteria 1

Increasing legal and sub-legal counts relative to the 2020 baseline.

Abundance of legal sized abalone in 2025 was greater than in 2020, with the exception of Block 23 where abalone abundance has remained relatively stable over the past six years. Legal-sized abundance in the remaining blocks has generally been increasing at a rate of approximately 5-10% annually during that same period (2020-2025) (Figure 3.1; Figure 3.2). However, in 2025, legal-sized abundance declined in five of the six closed blocks (i.e. Blocks 16, 22, 23, 24 and 27).

Abundance of sub-legal sized abalone in 2025 is lower than in 2020, with the exception of Block 16 and 28 where abalone abundance is now higher (Figure 3.1; Figure 3.2). In Block 16, sub-legal sized abundance has been higher for the past five years however declined in 2025. In Block 28 sub-legal sized abundance in 2025 has continued to improve for the second consecutive year.

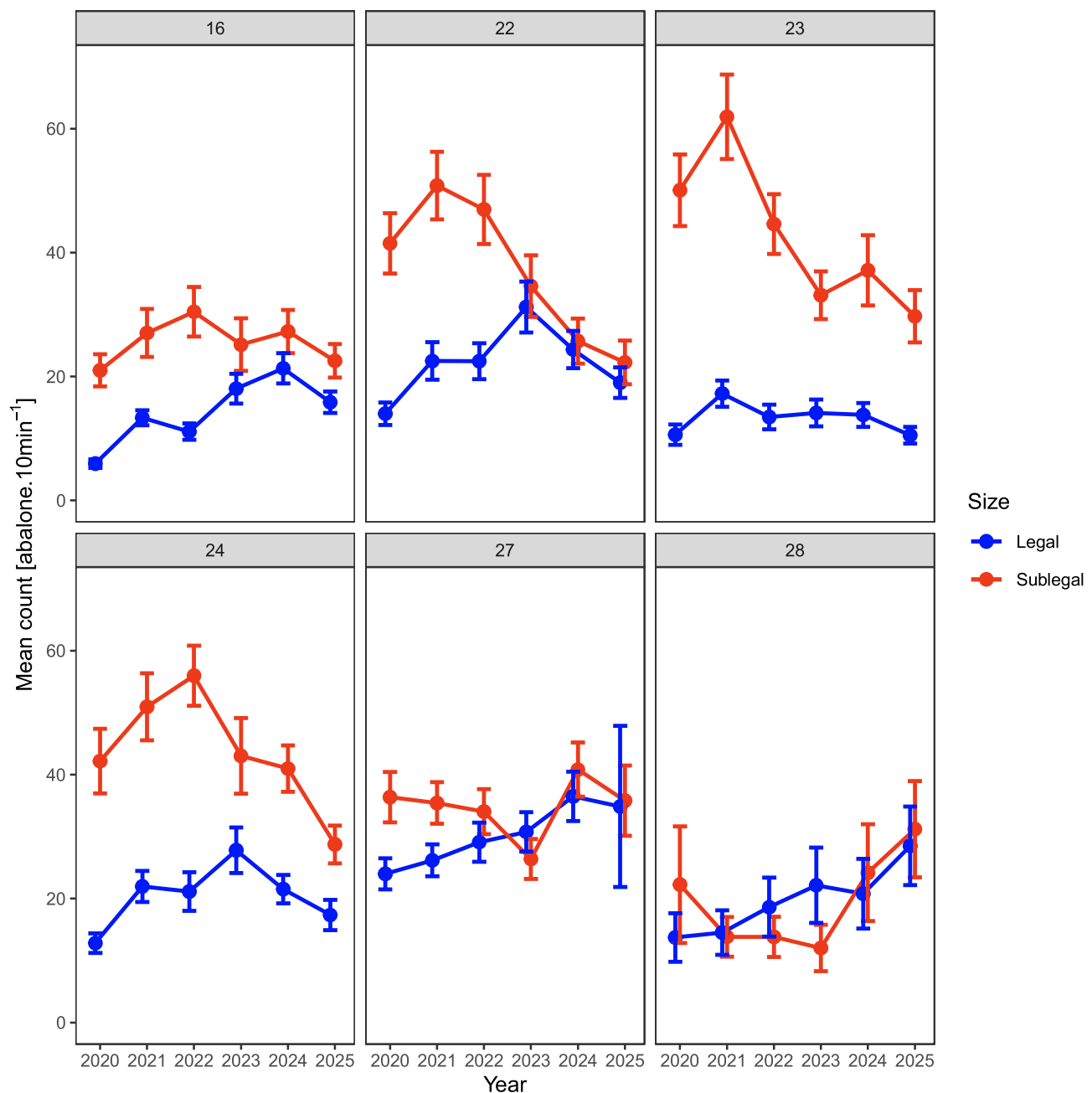


Figure 3.1: Average count of all legal (>140 mm) and sub-legal (<140 mm) abalone within 10 minutes between paired divers at each site within each block by year.

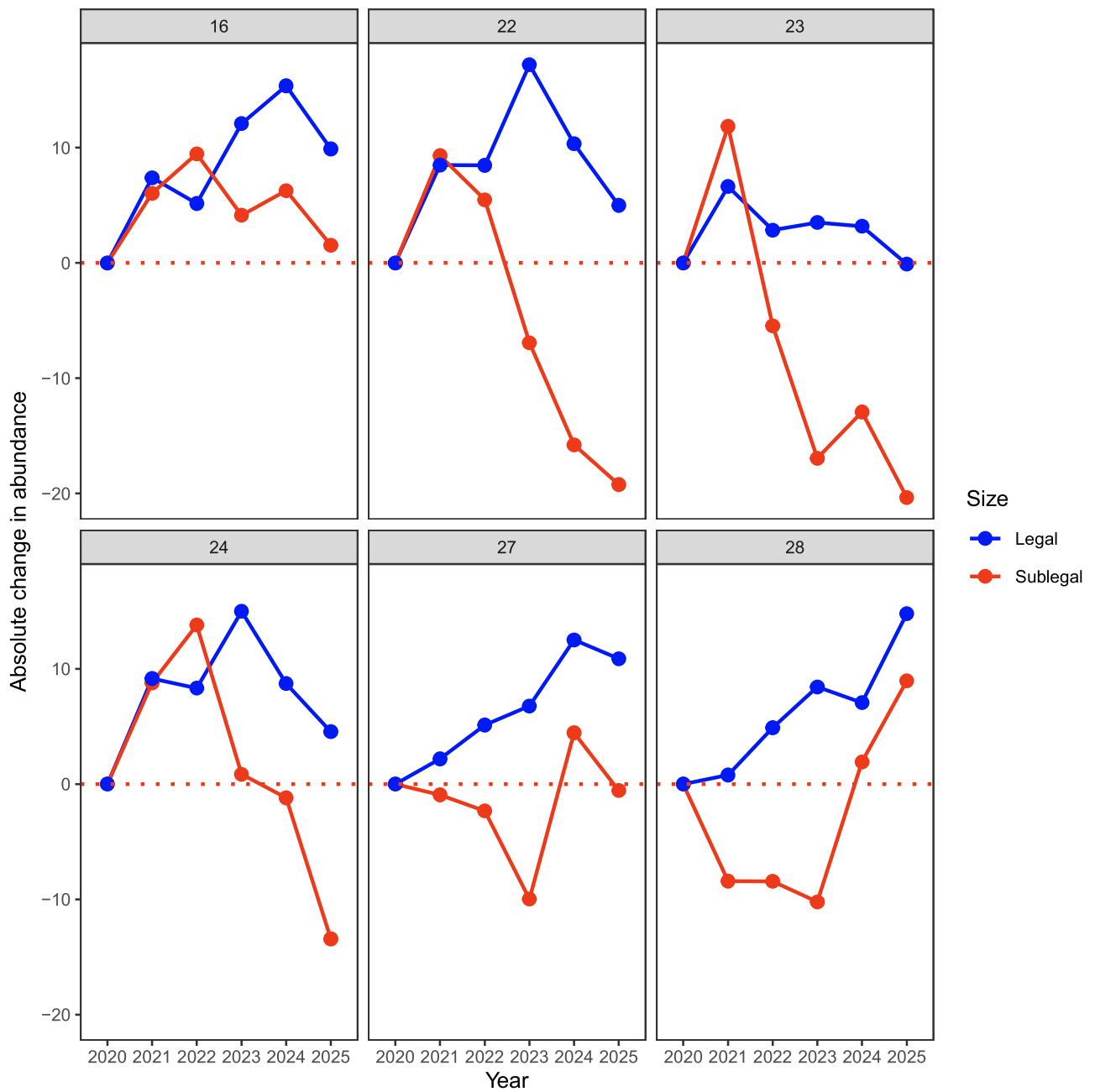


Figure 3.2: Absolute change in average abundance of all legal (>140 mm) and sub-legal (<140 mm) abalone counted within 10 minutes between paired divers at each site within each block and year to 2020 baselines.

3.3 Sub-block Abundance - Criteria 2

Evidence of a widespread trend of increasing sub-legal and legal counts across the Block.

In 2024, legal sized abundance declined across five of the six closed blocks and sub-legal sized abundance is lower in most blocks with the exception of Block 16 and 28. There are limited evidence across closed blocks of both legal and sub-legal sized abundance collectively increasing to indicate a trend of widespread improvement across each block.

Only block 16 has shown some stability in both legal and sub-legal sized abundance since 2020. Sub-legal sized abundance in Block 16 sub-blocks is higher in 2025 than in 2020 except for sub-blocks 16B and 16C where abundance of both size classes declined, and sub-legal sized abundance is lower than in 2020 (Figure 3.3).

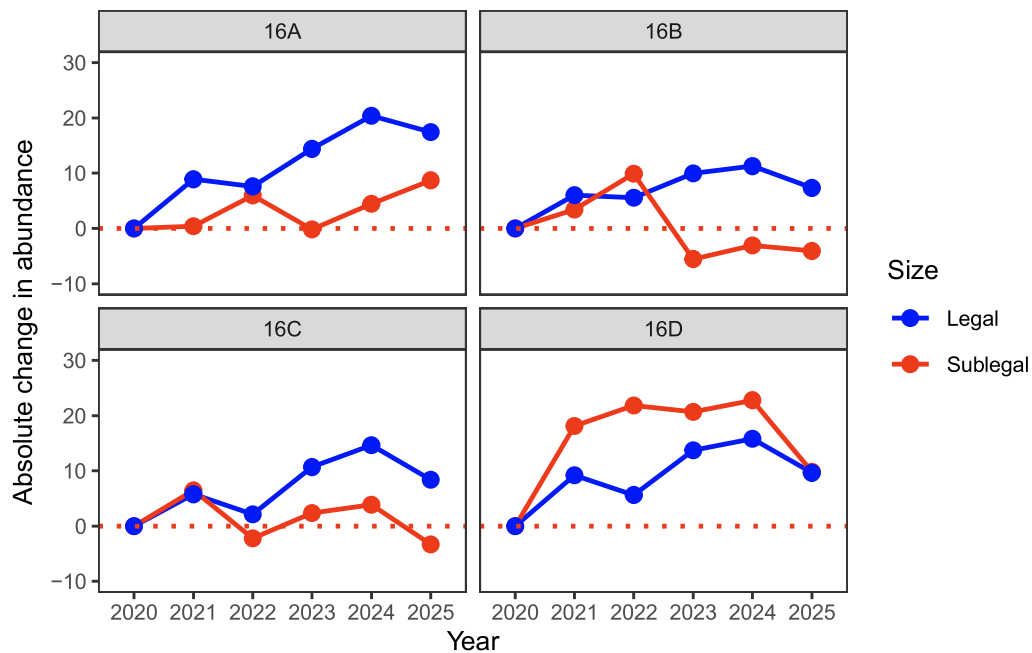


Figure 3.3: Absolute change in average abundance of all legal (>140 mm) and sub-legal (<140 mm) abalone counted within 10 minutes between paired divers at each site within each Block 16 sub-block and year to 2020 baselines.

3.4 Size Structure - Criteria 3

Evidence of multiple size classes particularly above the size limit.

Increasing the abundance of abalone above the legal size limit (140 mm) is critical for rebuilding adult spawning biomass and supporting future recruitment. Concurrently, evidence of rising sub-legal abundance, particularly among individuals under 120 mm, would indicate successful spawning and recruitment into the stock.

The 140–160 mm size class has consistently shown the highest abundance of legal-sized abalone, exceeding levels observed in 2020 (Figure 3.4). However, in 2025, this abundance declined across all blocks except Block 28. The 160–180 mm size class has generally increased over time, though it declined in most blocks in 2025. Despite this, its abundance remains higher than in 2020 across most areas. Abalone larger than 180 mm continue to be rare, with relatively stable abundance across blocks since 2020. These patterns, particularly the elevated legal-sized abundance, are consistent with reduced commercial fishing pressure, despite some ongoing recreational harvest.

Sub-legal abundance has been dominated by abalone in the 120–140 mm size class (Figure 3.5). This group declined in 2025 and now sits below 2020 levels in most blocks, with the exception of Blocks 16 and 28. Notably, only Block 28 showed an increase in this size class in 2025. The 100–120 mm size class exhibited mixed trends: stable or slightly higher abundance in Blocks 16, 27, and 28, but substantial declines elsewhere. Abalone under 100 mm remained generally stable or experienced minor declines, except in Block 27, where a marginal increase may suggest recent spawning recruitment. Overall, sub-legal abundances remain below 2020 levels, indicating limited juvenile recruitment across most blocks since the fishery closure.

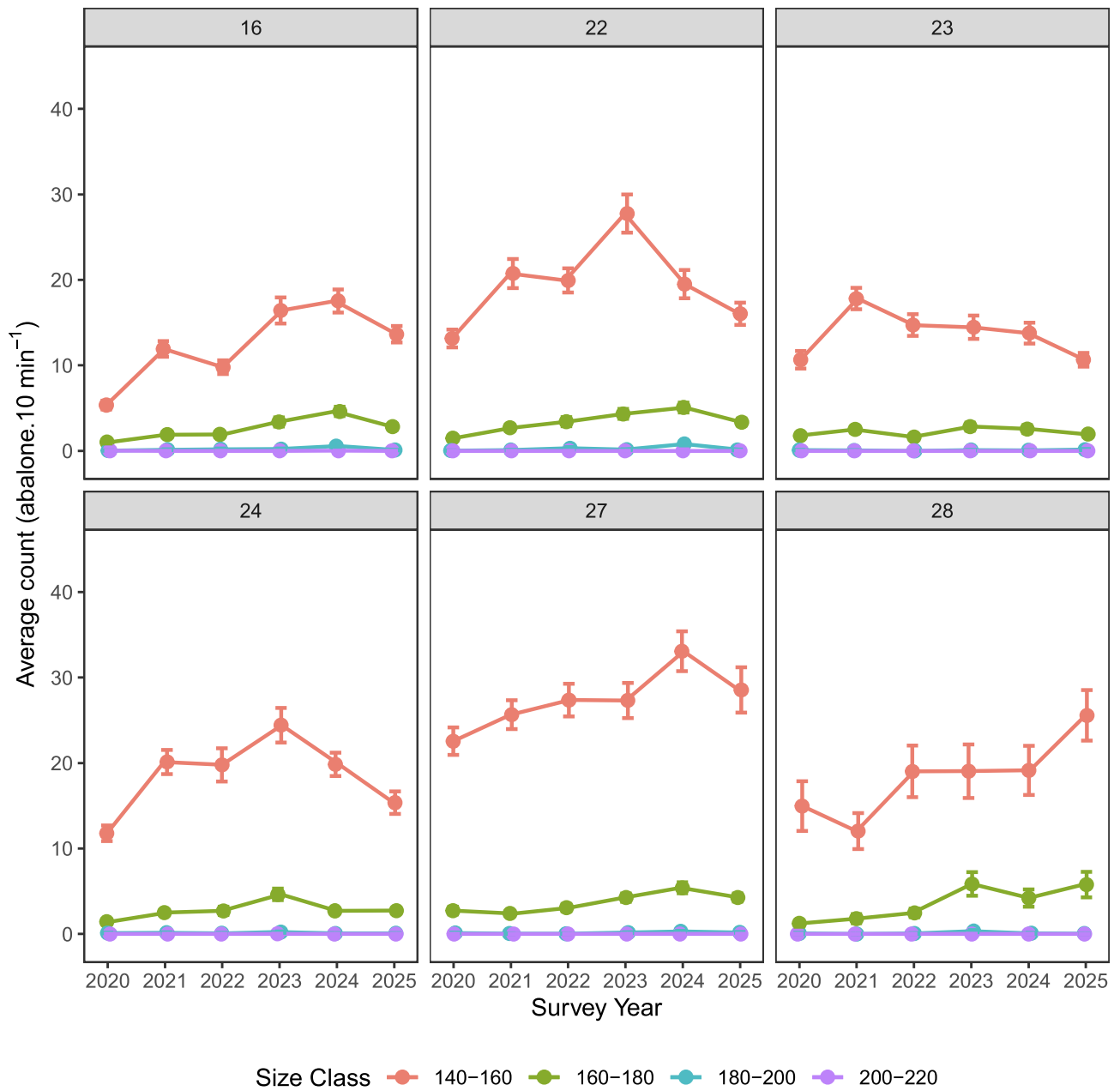


Figure 3.4: Average count of each legal abalone size class within 10 minutes between paired divers at each site within each block by year.

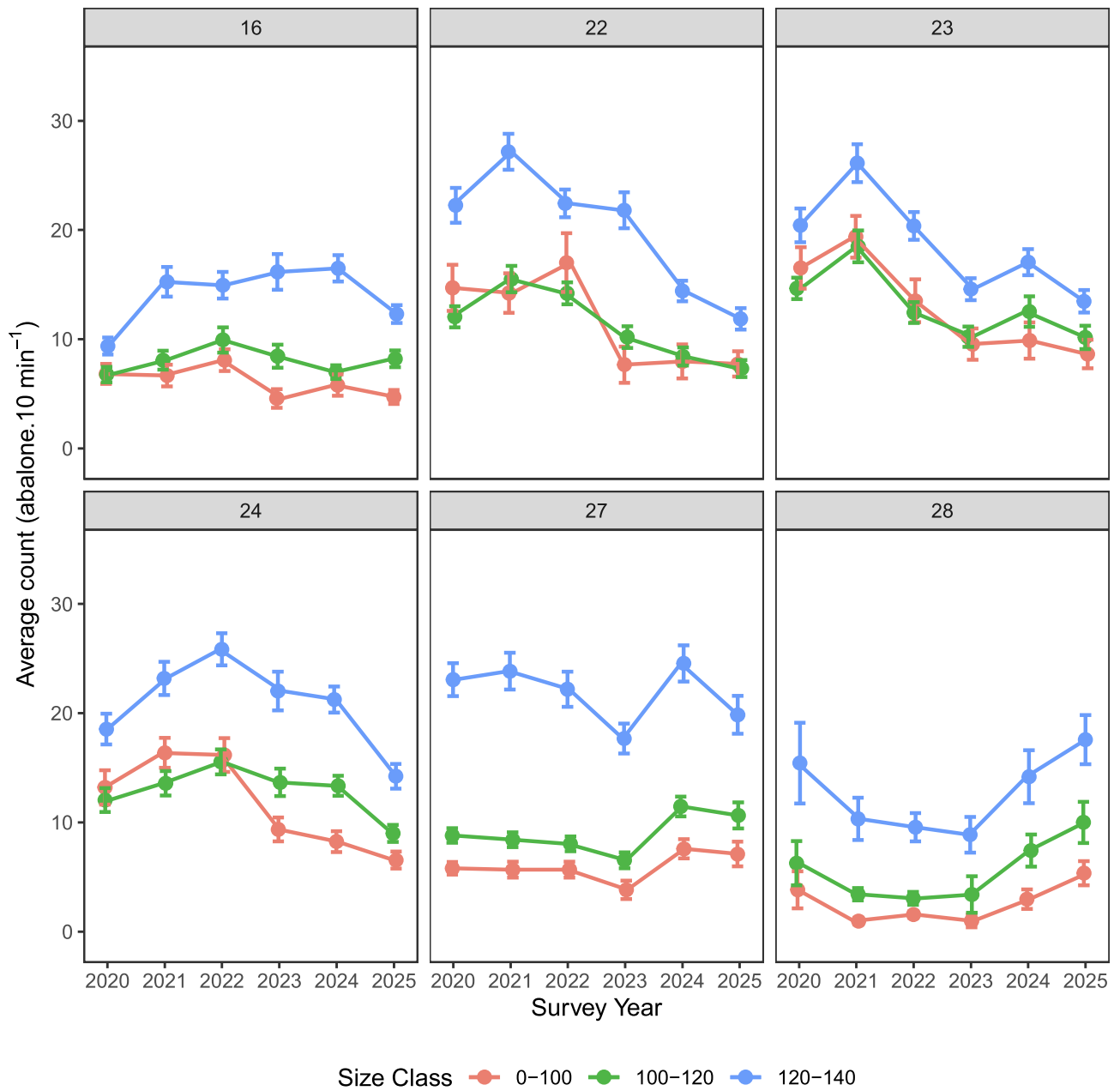


Figure 3.5: Average count of each sub-legal abalone size class within 10 minutes between paired divers at each site within each block by year.

3.5 Summary

Legal-sized abalone abundance in 2025 remains higher than in 2020 across most blocks, although signs of decline are evident in the most recent survey. Sub-legal abundance continues to be variable and generally lower than 2020 levels, with ongoing declines observed in all blocks except Block 28. Notably, Block 28 is the only area to show simultaneous increases in both legal and sub-legal size classes, suggesting a broader trend of improvement within that block.

Across the remainder of the closure, signs of recovery remain limited. The continued decline in sub-legal size classes indicates restricted spawning recruitment since the implementation of the closure. Maintaining and enhancing the abundance of existing legal-sized abalone (>140 mm) will be critical to rebuilding spawning biomass and supporting long-term stock recovery in the closed areas.

3.6 Recommendation

Results from the 2025 timed-swim survey indicate that the criteria for reopening closed blocks have not been met, except in Block 28. IMAS recommends that Blocks 16, 22, 23, 24, 27, and sub-block 28A remain closed to commercial abalone fishing in 2026. The timed-swim survey program should continue in alignment with the Draft Recovery Plan to assess progress against reopening criteria and validate whether recovery targets are being met.

Although Block 28 meets the reopening criteria, preliminary work under the Draft Recovery Plan suggests that any catch allocation would be limited to less than 1–2 tonnes. Further assessment is required to validate and test harvest strategies to ensure sustainability at these low catch levels. Given the six-year closure period, there is likely to be high interest in accessing abalone upon reopening, increasing the risk of concentrated fishing effort and substantial over-catch of a potentially small catch allocation.

Excessive effort often leads to catch overruns when catch allocations are low and subsequent declines in catch rates generally result the following year. There are notable examples of this in the Tasmanian Abalone Fishery the most recent being in Block 29 where substantial over-catch occurred in 2024, resulting in catch declines in 2025. Such patterns pose a significant risk to rebuilding efforts. For this reason, it is strongly recommended that sub-block 28A remain closed in 2026 until signs of recovery are evident across the broader East coast closure. A coordinated reopening of multiple blocks would help distribute fishing effort more evenly and reduce the risk of over-catch in any single block, particularly those with small allocations, thereby supporting sustainable recovery of the stock.