



# Victorian Recreational Rock Lobster Tagging Program Summary Report

2020

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# Executive Summary

The number of registered fishers in the rock lobster recreational tagging program increased between Season 1 (2017/18) and Season 2 (2018/19), whilst there was a decrease in the number of tags reported as 'used' in Season 2. The total reported catch in Season 1 was 3856 lobsters in the Eastern Zone and 4069 lobsters in the Western Zone. In Season 2 this declined to 3101 in the Eastern Zone and 3733 in the Western Zone. Converted to weight, Season 2 catches were similar in both zones with 6202kg in the Eastern Zone and 6346kg in the Western Zone. When compared to the commercial fishery, the recreational catch remains small in the Western Zone (under 3% of the TACC) whilst in the Eastern Zone it was 15.5% in Season 2. The high Eastern Zone percentage is influenced by the TACC reduction in Season 2 (from 59t to 47t). This will occur again in Season 3 as the TACC is reduced further to 40t.

Registered fishers are predominately centred around the coastal urban centres of Warrnambool, Queenscliff and Geelong, with the majority of tags used in both Seasons 1 and 2 occurring around these regional areas. Over 90% of the recreational catch was fished between November and April across the State in both Season 1 and Season 2. Data obtained in the recreational tagging program in Seasons 1 and 2 show a higher number of large lobsters in the Eastern Zone, while the Western Zone has a higher number of smaller lobsters, which supports anecdotal evidence from fishers. Over 54% of recreational fishers reported catch via the online App on the day of capture, although this decreased from the 2017/18 to the 2018/19 Season. The number of participants in the citizen science program has also increased between Season 1 and Season 2.

## Introduction

The Victorian Rock Lobster Fishery is based primarily on the Southern Rock Lobster, *Jasus edwardsii*, which is a high value and iconic species both in Australia and overseas. The fishery spans the length of the Victorian coast and supports both commercial and recreational rock lobster fisheries. It is the most valuable commercial wild catch fishery in Victoria, making it an important contributor to the State's economy.

Fishing for rock lobster is an important activity for many Victorians with access to harvesting occurring through snorkelling, diving or using hookah, or with the use of hoop nets. Unless exempt, a fisher must hold a Victorian Recreational Fishing Licence to take rock lobsters. The recreational catch is managed using daily bag limits, possession limits, minimum size limits and closed seasons. The recreational closed season and restrictions correspond with the commercial fishery. The number of rock lobster caught annually by the recreational sector has been a significant data gap for many years.

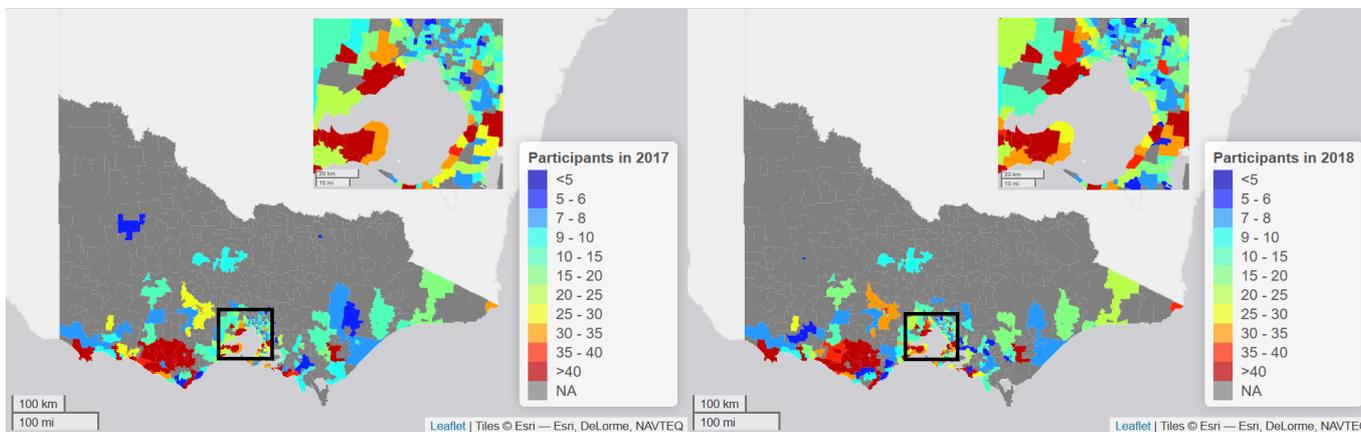
On 1 July 2017, the VFA implemented a three-year pilot program requiring all recreational fishers to tag the lobsters they catch and keep and report the use of tags. The objective of the program is to obtain an estimate of the annual recreational catch by using the number of tags used in that season to represent the number of rock lobsters removed from the stock and ascertain whether the actual catch is in line with the assumed notional catch share. Underpinning the concept is the requirement for recreational fishers to create an online account through which they order tags and report tags used through a smartphone app web portal. The tags are registered to individuals and the numbers used represent the number of rock lobsters caught in that year.

This summary report provides an overview of data collected through Season 1 (2017/18) and Season 2 (2018/19) of the program, and comparisons between the two seasons.

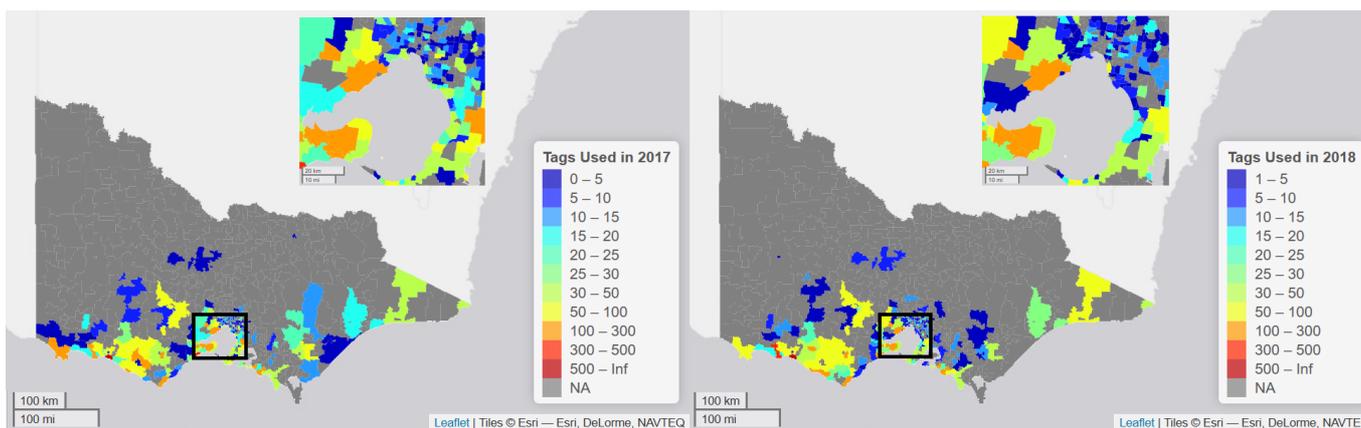
# Participation in the Tagging Program

Over 5000 recreational rock lobster fishers registered during Season 1 (2017/18), increasing to 5586 in Season 2 (2018/19). In both seasons, the majority of participants that reported the use of tags were based in the larger coastal centres of Portland, Warrnambool, Geelong, Mornington and San Remo. The highest number of registered participants are concentrated in the Warrnambool area (3280 postcode) which had 444 registrations in Season 1 and 447 in Season 2. This indicates that growth in registered fishers between Seasons 1 and 2 occurred outside this postcode area. It is important to note that a large number of participants are also based inland and travel to the coast to access the resource.

The highest number of tags used by registered participants in a postcode area occurred in Warrnambool (3280) in both seasons, decreasing from 896 in Season 1 to 857 in Season 2. The Geelong postcode area (3228) had the second highest number of tags used in Season 1 with 343 tags reported, this reduced to 295 in Season 2. Port Fairy postcode area (3284) had the second highest number of tags reported in Season 2 after increasing from 273 in Season 1 to 331 in Season 2.



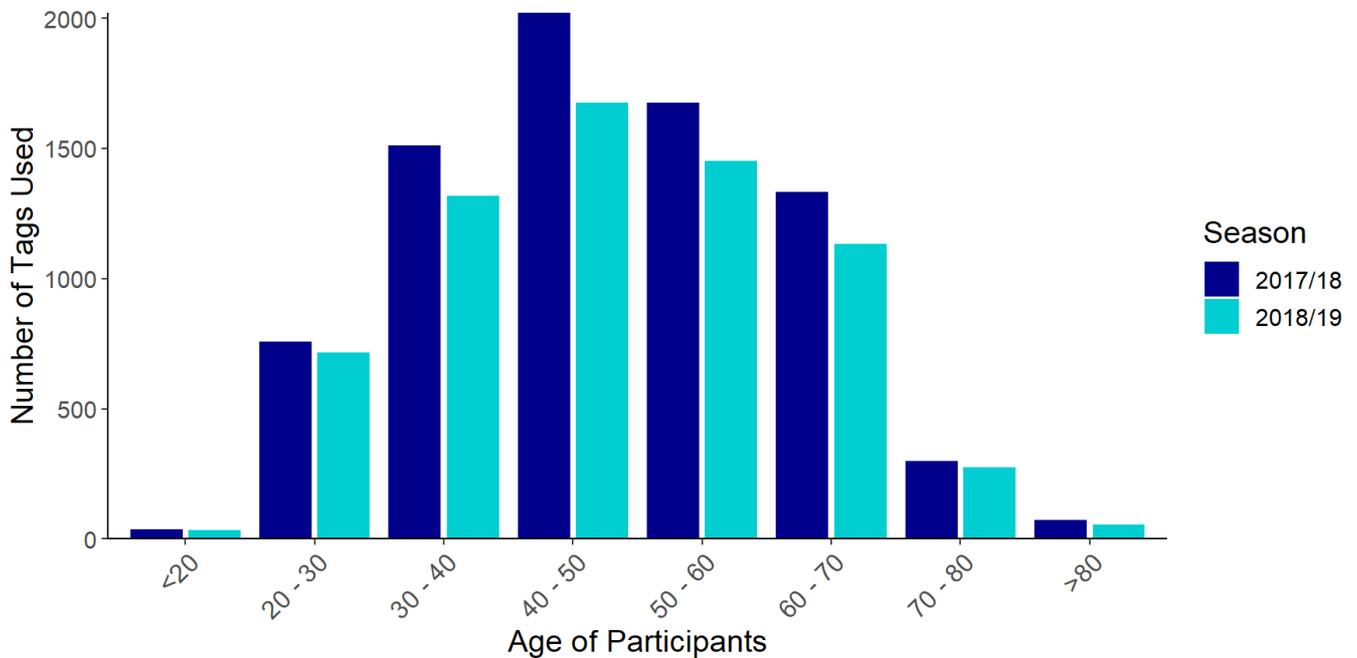
**Figure 1** Number of participants registered in Season 1 (2017/18) and Season 2 (2018/19) by the fishers' postcode in Victoria. Postcodes with less than 5 participants registered have been removed.



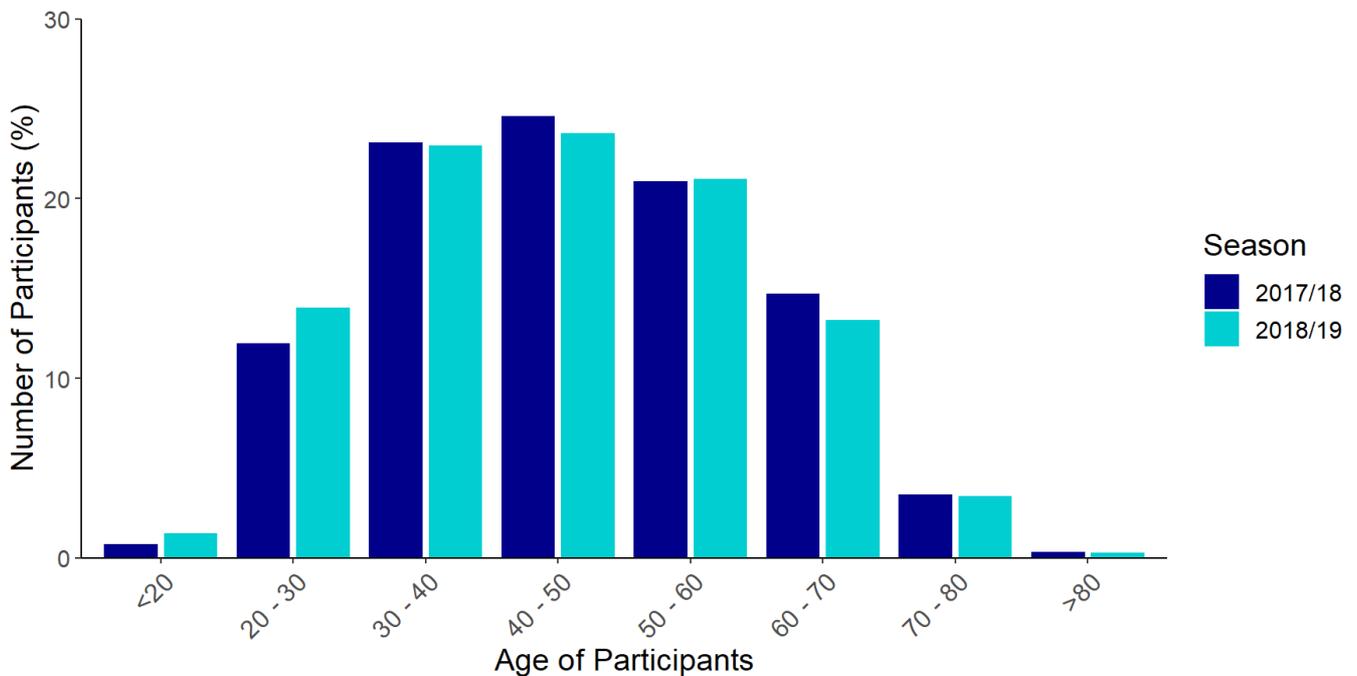
**Figure 2** Number of tags reported as used in Season 1 (2017/18) and Season 2 (2018/19) by the postcode of registered fishers' in Victoria. The number of tags used in postcodes with less than 5 participants registered have been omitted for confidentiality.

The majority of participants were in the 40 – 50 age range (24.6% in Season 1 and 23.7% in Season 2). The 20 – 30 age range had the greatest increase in registered fishers between Season 1 and Season 2 from 12% to 14%.

Registered participants in the 40 – 50 age range reported the highest number of 'used' tags used with over 2000 in Season 1 (2017/18) and 1600 in Season 2 (2018/19). Each age group reported less tags used in Season 2 compared to Season 1.

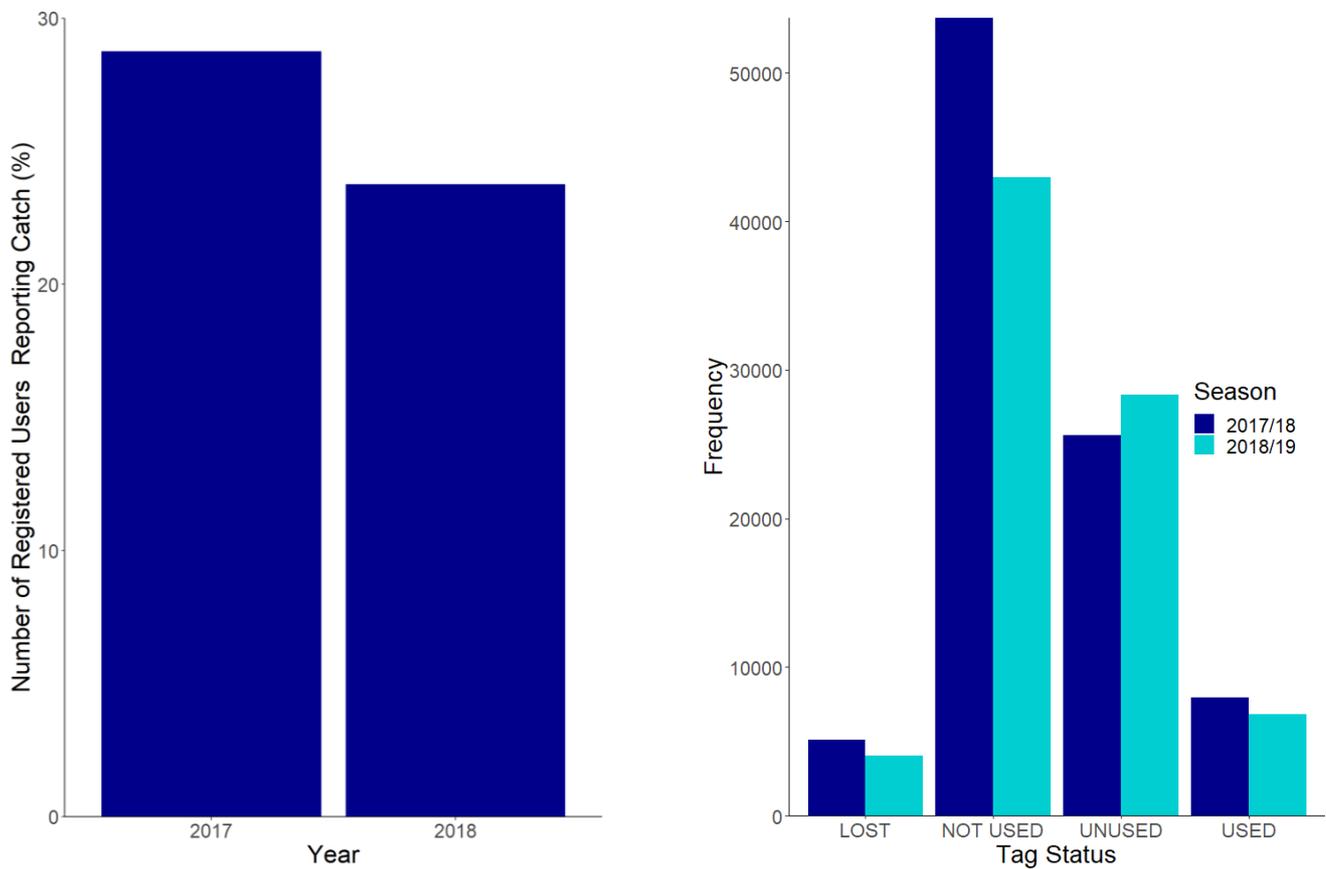


**Figure 3** The age demographics (grouped by decade) of registered fishers in the recreational tagging program in Season 1 (2017/18) and Season 2 (2018/19).



**Figure 4** The number of tags reported as 'used' by participants in each age demographic group in season 1 (2017) and season 2 (2018).

In Season 1, 29% of registered fishers reported catch. While the number of registered fishers increased in Season 2, the number of users who reported catch reduced to 24%. The number of tags reported as 'used' in Season 2 decreased 14% from Season 1. However, the number of tags issued also increased in Season 2 by 10%. The number of tags issued but reported as 'not used' by fishers decreased by 20%.



**Figure 5** The number of registered fishers that reported a catch in Season 1 (2017/18) and Season 2 (2018/19) as a percentage of total registered fishers (left). The number of tags reported as lost, not used, unused (right).

# Summary of Seasons 1 and 2

## Used tags

A total of 7925 southern rock lobster were caught by recreational rock lobster fishers during Season 1 (2017/18). This decreased to 6834 in Season 2 (2018/19). In the Eastern Zone, 3856 rock lobster were reported caught in Season 1, and 3101 in Season 2. In the Western Zone, 4069 rock lobster were reported caught in Season 1, and 3733 in Season 2. Approximately 91% of the annual catch occurred in the Eastern Zone between the months of November to April in Season 1, this increased to 93.6% in Season 2. In the Western Zone, approximately 91.8% of the annual catch occurred between the months of November to April in Season 1 and increased to 94.6% in Season 2.

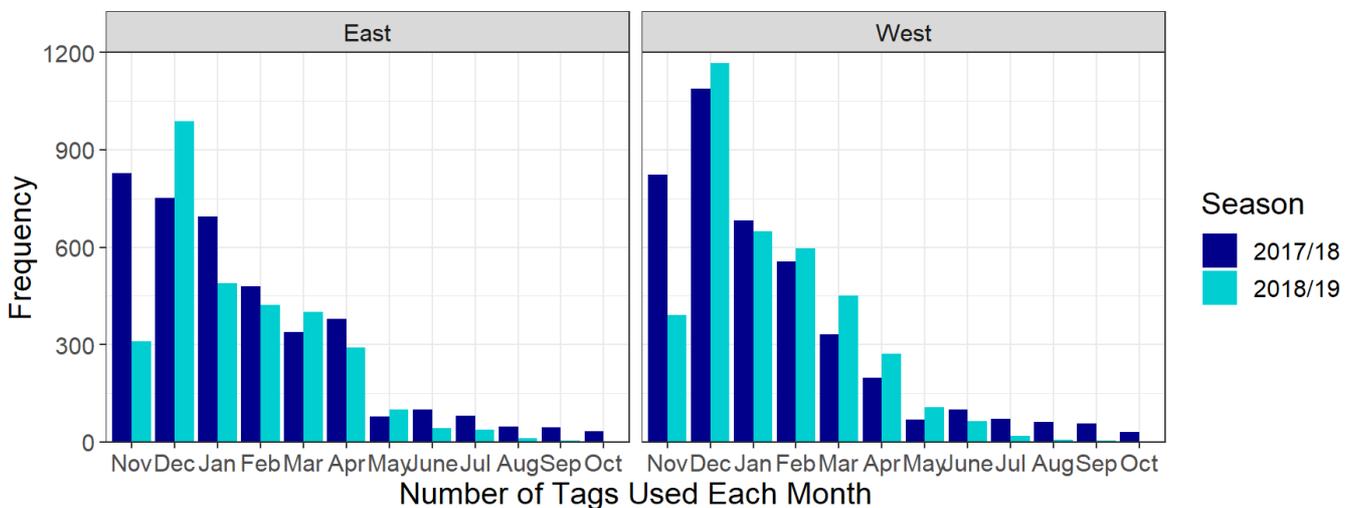
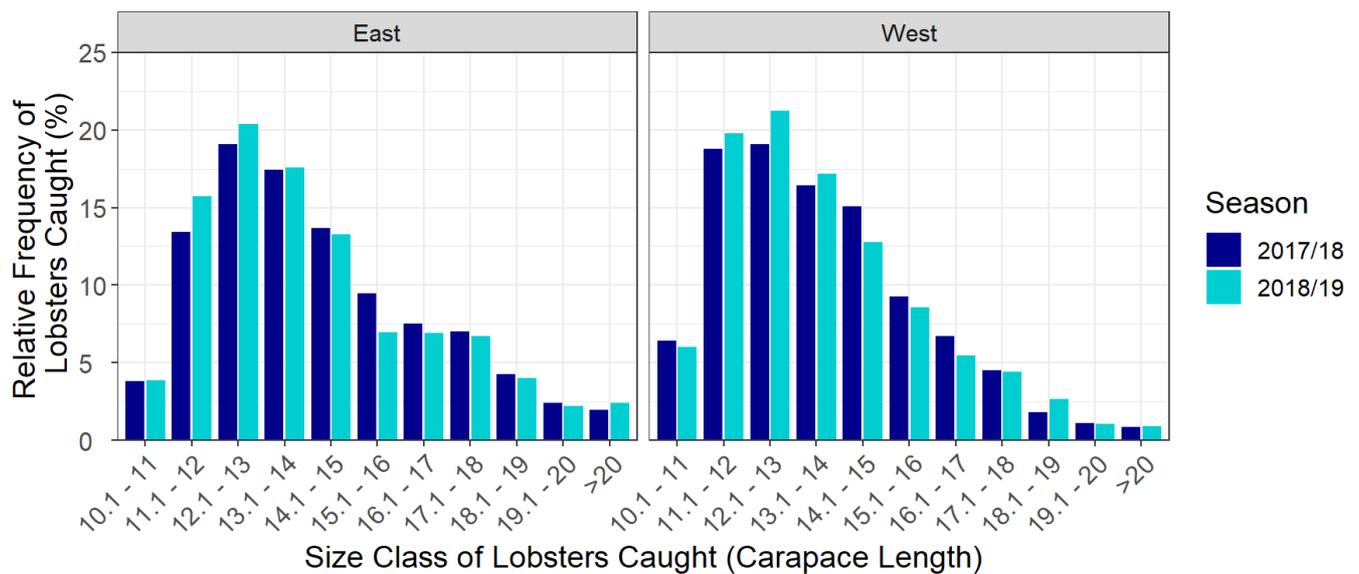


Figure 6 Number of tags used each month in the Eastern Zone (left) and Western Zone (right).

## Size class of lobsters caught

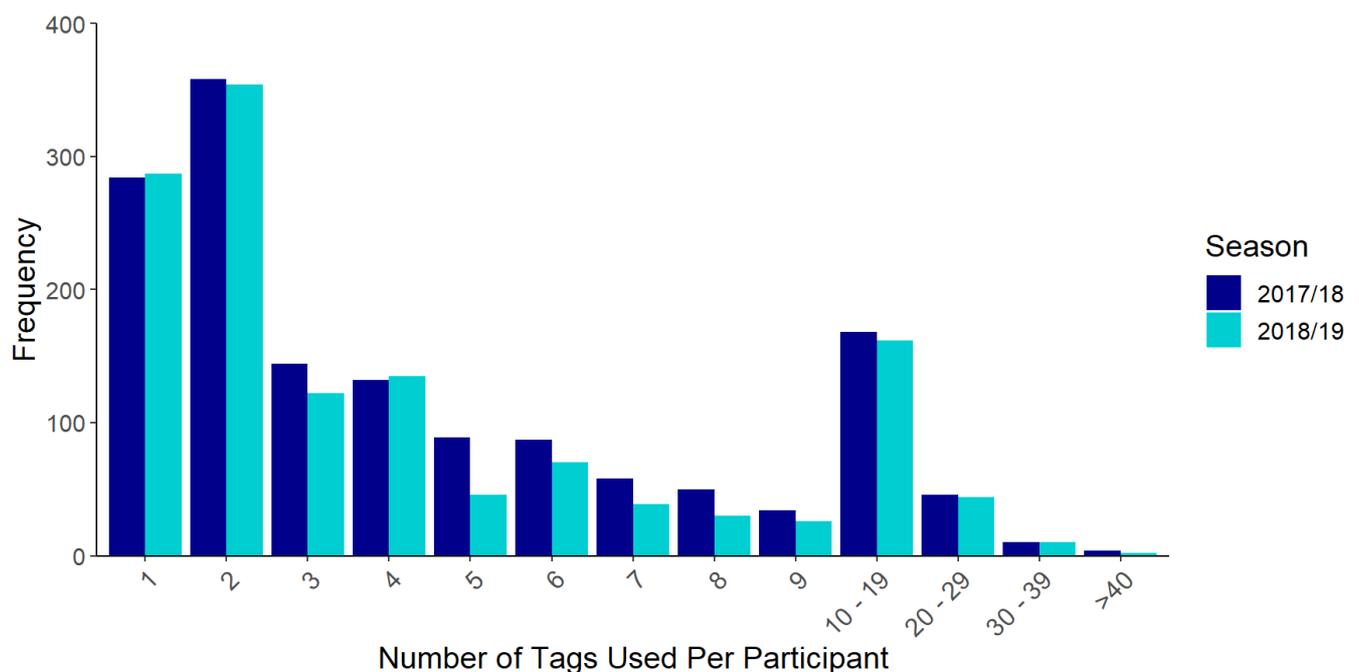
The carapace lengths (CL) of lobster recorded by recreational fishers during Season 1 (2017/18) and Season 2 (2018/19) were predominantly in the 11 to 15cm size class range (63.5% and 70% in the Eastern Zone, 69.4% and 71.0% in the Western Zone). In both Season 1 and Season 2, the Eastern Zone accounted for a greater number of larger lobster above 16cm CL than the Western Zone (23% and 22.3% compared to 15% and 14.6%). However, in both Seasons 1 and Seasons 2, the Western Zone accounted for a larger number of smaller lobster below 12cm CL than the Eastern Zone (25.2% and 25.8% compared to 17.2% and 19.5%). These findings support anecdotal information from recreational fishers in that they are observing less lobsters that are generally larger in size in the Eastern Zone, and greater numbers of smaller lobsters in the Western Zone. Known recruitment patterns that are largely driven from West to East are also supported by these findings.



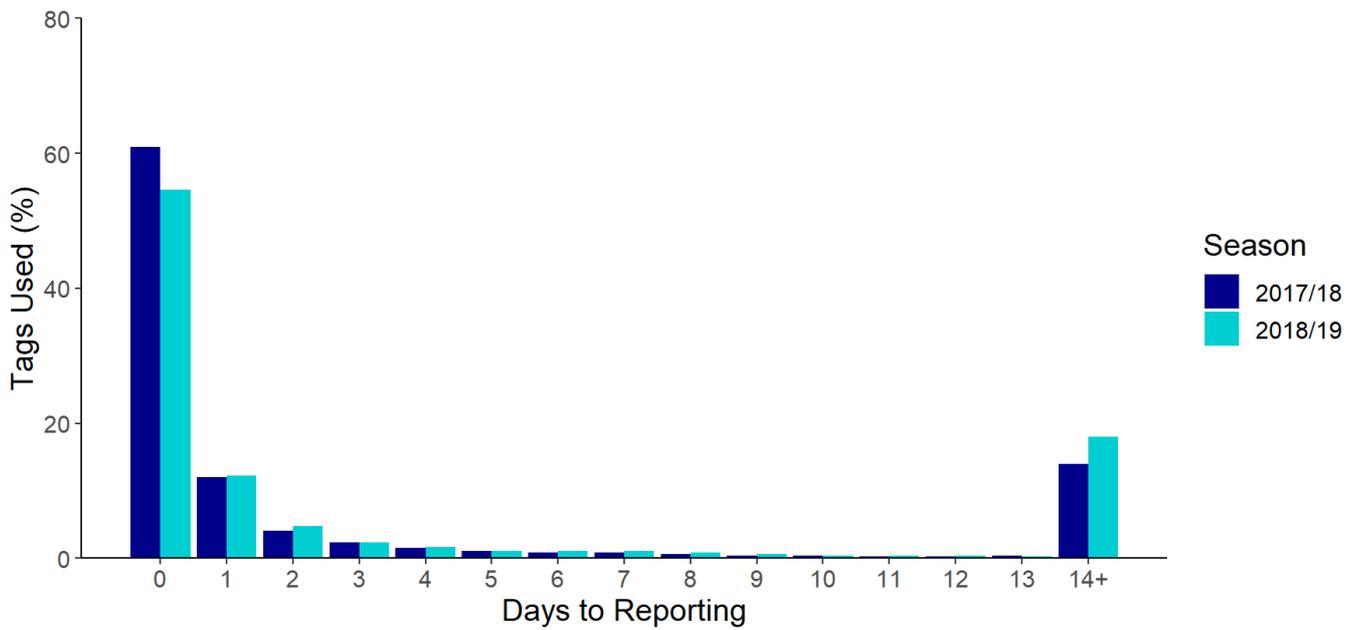
**Figure 7** The relative frequency (% annual total) of lobsters caught by size class (carapace length) in season 1 (2017) and season 2 (2018) in the Western and Eastern Zones.

### Frequency of tag use by participants and reporting rates

In Season 1 (2017/18) and Season 2 (2018/19), the majority of participants reported using 1 tag (284 in Season 1 and 287 in Season 2) or 2 tags (358 in Season 1 and 354 in Season 2). The majority of tags used were reported used via the online App on the day of capture. However, the number of participants reporting on the same day at capture decreased from 60.9% in the 2017/18 Season to 54.6% in the 2018/19 Season.



**Figure 8** The number of tags used by participants in Season 1 (2017/18) and Season 2 (2018/19).

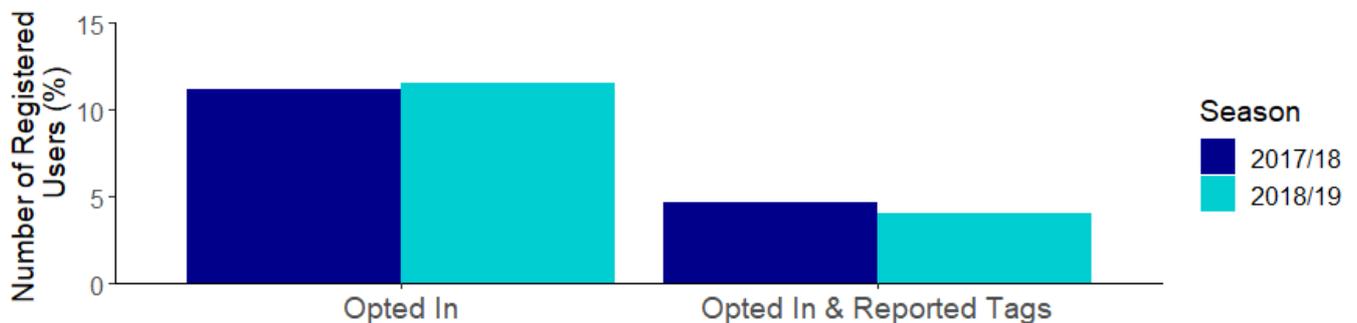


**Figure 9** The number of days between fishing (date caught) and the reporting of used tags (as percentage of annual total) by participants in Season 1 (2017/18) and Season 2 (2018/19).

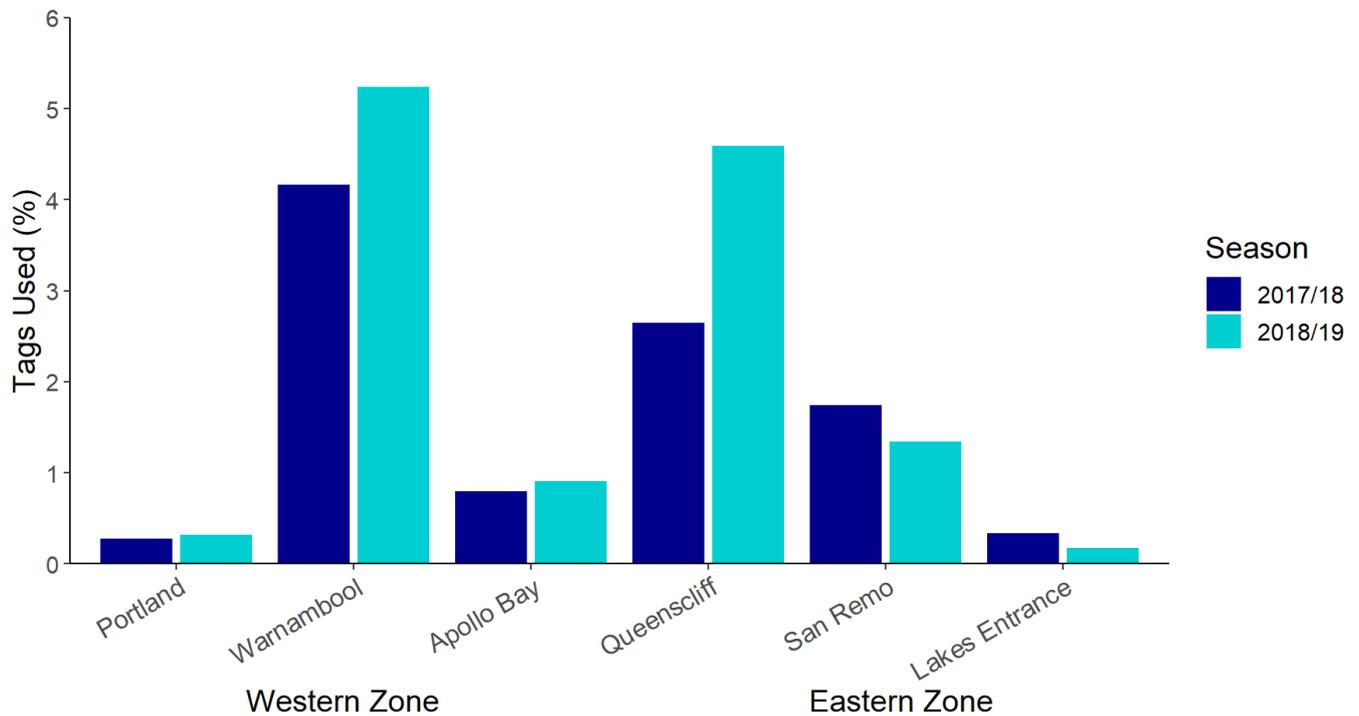
## Citizen Scientist Data

### Participation in the citizen science program

Over 11.2% of registered fishers opted in to provide additional data through the citizen science program in Season 1 (2017/18) and 11.6% in Season 2 (2018/19). The majority of catch from citizen science participants were located in the Warrnambool region for the Western Zone and the Queenscliff region for the Eastern Zone. The contribution of citizen scientists to the annual total of tags used increased in Warrnambool by 1% and Queenscliff by 2% between the 2017/18 and 2018/19 Seasons.



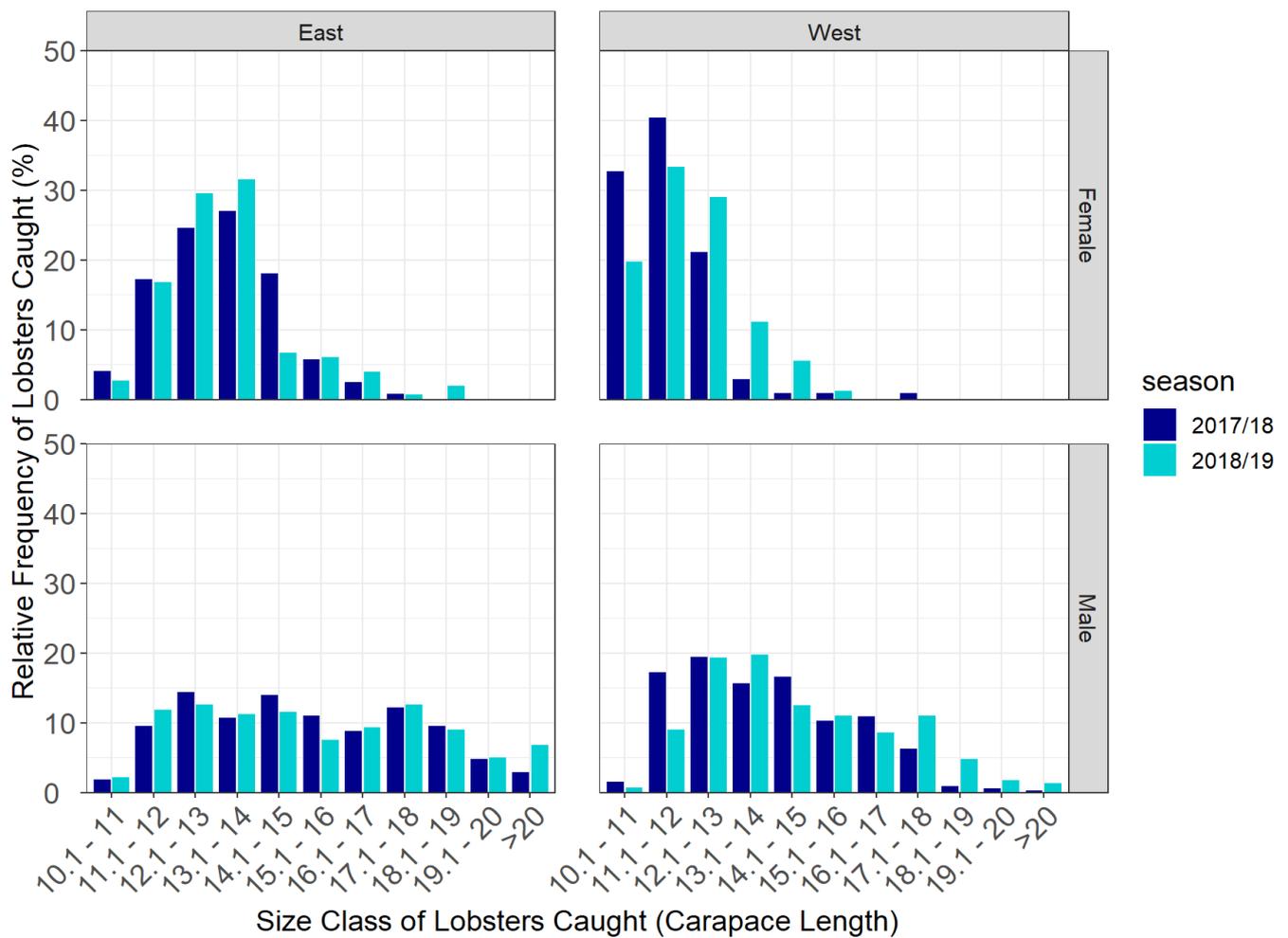
**Figure 10** The number of registered fishers (as percentage of total number of registered fishers) that have opted into the citizen science program (left) and the number of citizen scientists that have reported catch (right).



**Figure 11** The number of tags used by citizen scientists as percentage of total tags used by all participants in each region.

### Size class of lobster caught by citizen scientists

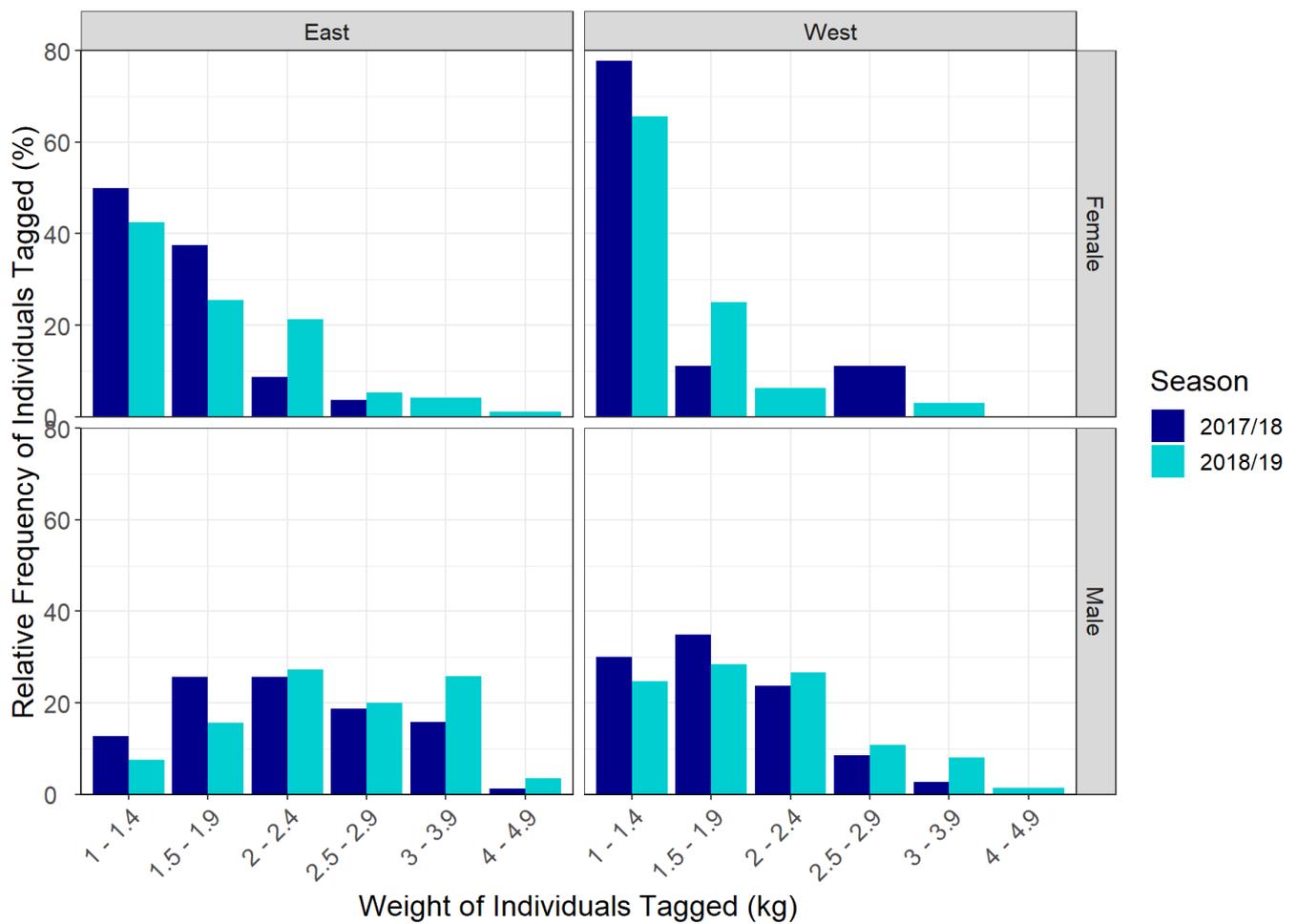
The majority of female lobsters caught had a CL less than 14cm in both the 2017/18 and 2018/19 Seasons (73% and 80%, respectively in the Eastern Zone and 96% and 93% respectively in the Western Zone). Males had a higher number of larger lobsters caught with a CL above 16cm in both the 2017/18 and 2018/19 Seasons (36% and 43%, respectively in the Eastern and in the Western Zone 19% and 27%, respectively). In the 2018/19 Season a higher proportion of large male lobsters were caught in both zones.



**Figure 12** The number of tags used (as percentage of annual total for that sex and Zone) by citizen scientists for each class size.

### Average weight of lobster caught by citizen scientists

In both the 2017/18 and 2018/19 Seasons, the majority of Female rock lobster caught by citizen scientists weighed less than 2kg in the Eastern (87.5% and 68.1% respectively) and Western (88.8% and 71.9%) Zones. Of the Male rock lobster caught by citizen scientists the majority weighed between 1.5 and 4 kgs in the Eastern (85.8% in Season 1 and 88.8% in Season 2) and Western (74.0% in Season 1 and 75.3% in Season 2) Zones.

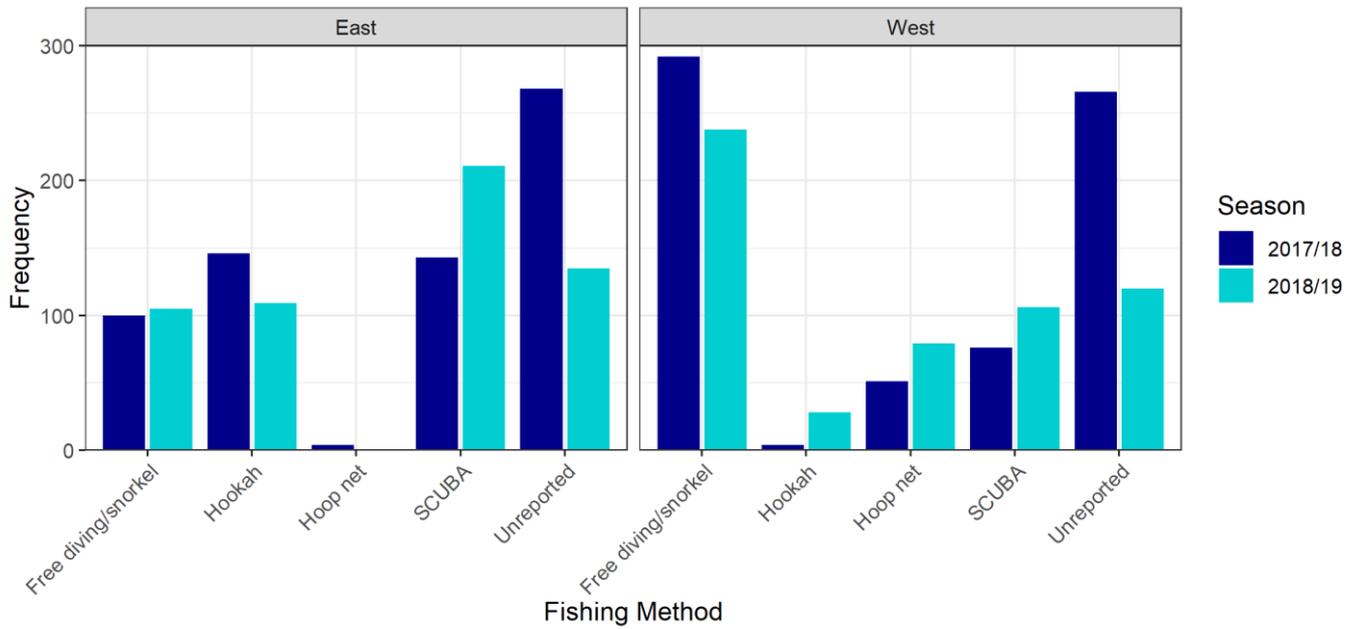


**Figure 13** The number of tags used (as percentage of annual total for each sex and Zone) by citizen scientists for each weight range of lobsters caught in season 1 (2017) and season 2 (2018) in the Eastern and Western Zones.

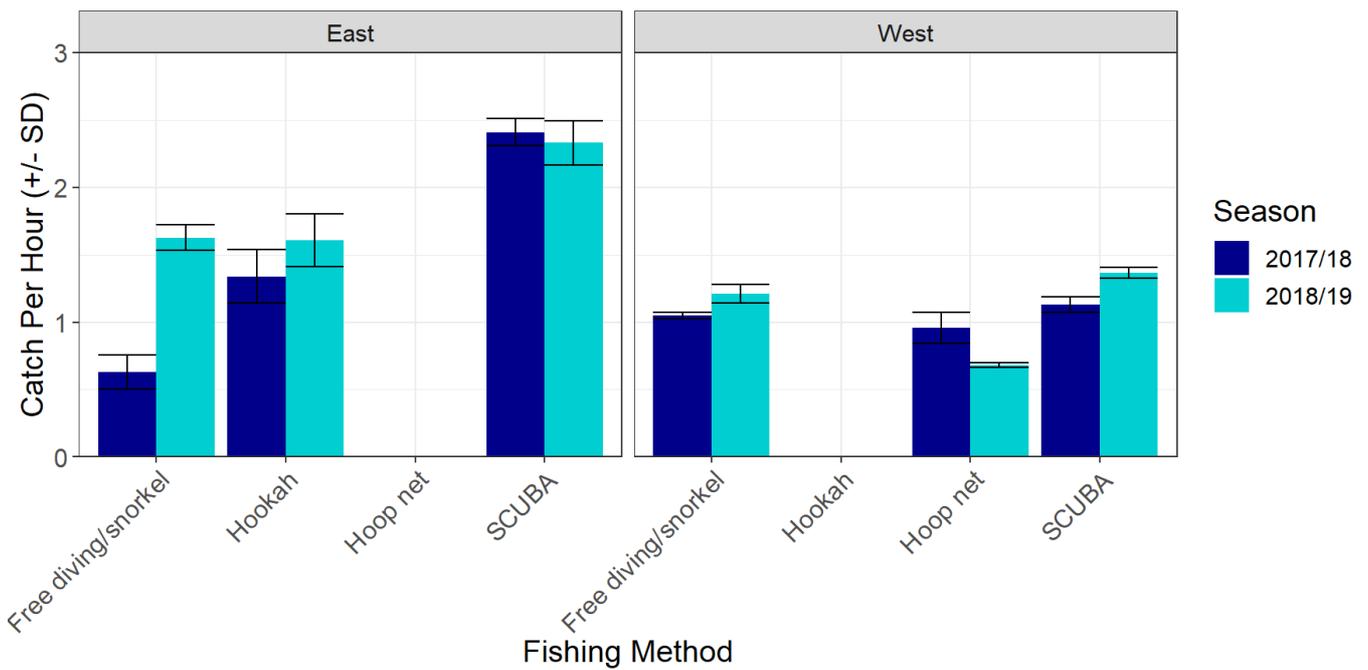
### Methods for targeting rock lobster

Free diving was the most popular method for targeting lobster in the Western Zone whilst SCUBA and Hookah were most popular in the Eastern Zone. In both Zones the level of reporting of the fishing method increased from Season 1 to Season 2.

In both seasons, scuba diving was the most effective method for targeting lobster in both Zones. Hoop netting was the least efficient method in the Western Zone. In the Eastern Zone, Hookah and free diving had similar catch rates, except for the first season in which free diving had a substantially lower catch rate. Note that CPUE is inflated due to the lack of reporting of fish events with no lobsters captured.



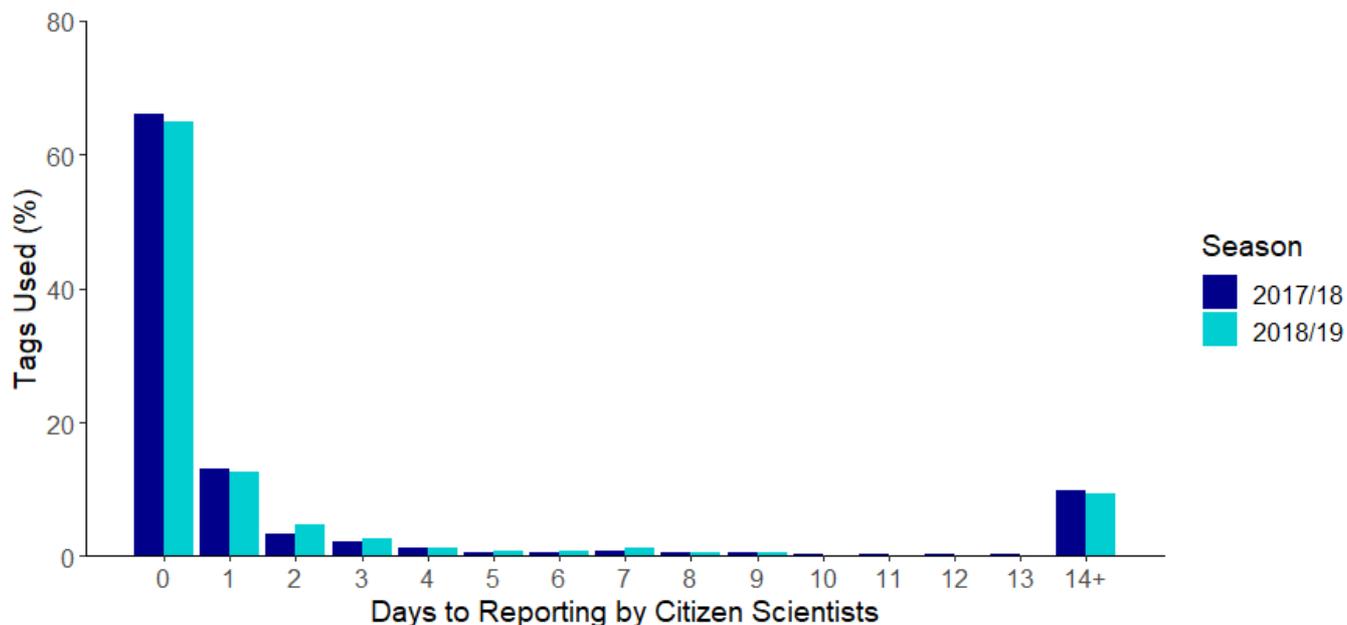
**Figure 14** The frequency of tags used by citizen scientists for each fishing method.



**Figure 15** The average catch per hour by citizen scientists for each fishing method. Hoop net in the Eastern Zone and Hookah in the Western Zone are omitted due to the low prevalence of these methods preventing meaningful CPUE calculation. Note – Catch rate is influenced by inability to record dive trips of zero catch.

## Reporting of lobster catch by citizen scientists

In Season 1 (2017/18) and Season 2 (2018/19), over 64% of lobster that were reported as used via the online App were reported on the day of capture. In Season 2, there was also a 0.3% decrease in the number of reports that occurred over 14 days since the day of capture. This provides a greater level of confidence in the reported data with an assumed increased accuracy of details relevant to reporting time lags.



**Figure 16** The number of days between fishing (date caught) and the reporting of used tags (as percentage of annual total) by citizen scientists in season 1 (2017) and season 2 (2018).

# Comparison of Seasons

**Table 1 Summary of comparisons between Season 1 and Season 2. Completeness is the number of complete records (reports) for the factor as a percentage of the total tags used either each year (2017,2018) or as a total of the tags used over the duration of the program.**

Factor	Program total	2017	2018
Participants		5092	5586
Weight Fished (kg)	Mean = 1.8	Mean = 1.7	Mean = 1.9
	East = 1.9	East = 1.8	East = 2.0
	West = 1.6	West = 1.6	West = 1.7
	11.0% completeness	10.8% completeness	11.2% completeness
Sex Fished	Male = 66.7%	Male = 71.5%	Male = 65%
	Female = 33.3%	Female = 28.5%	Female = 35.0%
	13.0% completeness	13.4% completeness	14.1% completeness
Length Fished (Carapace Length cm)	Mean = 13.5	Mean = 13.6	Mean = 13.5
	East = 13.8	East = 13.9	East = 13.7
	West = 13.2	West = 13.3	West = 13.2
	100% completeness	100% completeness	100% completeness
Zone Fished	100% completeness	100% completeness	100% completeness
Regional Location	13.6% completeness	13.2% completeness	14.1% completeness
Fishing Method	13.7% completeness	13.3% completeness	14.4% completeness
Victorian Fishers	99.3%	99.6%	99.1%
Catch per Hour (CPUE)	Mean = 1.4	Mean = 1.3	Mean = 1.5
	East = 1.7	East = 1.5	East = 1.9
	West = 1.1	West = 1.0	West = 1.1
Number Taken		East = 3856	East = 3101
		West = 4069	West = 3733
Weight Taken		East = 6940.8 kg	East = 6202.0 kg
		West = 6510.4 kg	West = 6346.1 kg
Weight Taken (% of TACC)		East = 11.8%	East = 15.5%
		West = 2.8%	West = 2.6%

# Evaluation of Citizen Science Program

**Table 2 Summary of the citizen science program. Completeness is the number of complete records (reports) for the factor as a percentage of the total tags used either each year (2017,2018) or as a total of the tags used over the duration of the program.**

Factor	Program total	2017	2018
Participants		570	647
Participants who used tags		236	224
Weight Fished (kg)	Mean = 1.8	Mean = 1.7	Mean = 1.9
	East = 2.0	East = 1.9	East = 2.0
	West = 1.7	West = 1.6	West = 1.7
	54% Completeness	48.5% Completeness	61.0% Completeness
Sex Fished	Male = 68.3%	Male = 61.7%	Male = 64.5%
	Female = 31.7 %	Female = 38.3%	Female = 35.5%
	68.2% Completeness	60.4% Completeness	77.5% Completeness
Length Fished (Carapace Length cm)	Mean = 13.7	Mean = 13.6	Mean = 13.7
	East = 14.0	East = 14.1	East = 14.0
	West = 13.4	West = 13.3	West = 13.6
	100% Completeness	100% Completeness	100% Completeness
Regional Location	100% Completeness	100% Completeness	100% Completeness
Fishing Method	68.2% Completeness	60.4% Completeness	77.5% Completeness
Victorian Fishers	99.6%	99.8%	99.3%

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# Informing the Annual Rock Lobster Stock Assessment

The annual stock assessment process has previously included a notional recreational catch share equivalent to five and ten percent of the commercial Total Allowable Commercial Catches (TACCs) for the Western Zone and Eastern Zone, respectively. Through the Recreational Rock Lobster Tagging Program, the VFA is now in a position to obtain an estimate of the annual recreational catch by using the number of tags used in each zone for that season, to represent the number of rock lobsters removed from the stock.

Data on the actual number of lobsters harvested by the recreational sector, combined with the known catch under the quota managed commercial fishery, is now used to inform stock assessments. This has resulted in the existing notional assumption of recreational catch that has fed into the Rock Lobster Stock Assessment model being replaced with actual numbers of lobster removed by the recreational sector, therefore improving the accuracy of annual biomass estimates and modelled future fishery trajectories.

Continuing to obtain accurate data on the total removal of rock lobster from the stock in Victoria is integral to managing a sustainable and healthy fishery into the future.

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## Compliance

The VFA has undertaken a state-wide initiative with Fisheries Officers collecting details when conducting an inspection of recreational rock lobster fishers to enable comparisons of data reported through the App. The details of date, location, carapace length, sex, weight, method and dive time are recorded. This has enabled Fisheries Officers to follow-up with inaccurate reporting and provide greater confidence in data collected through the program.

Fisheries Officers recorded the details of 189 recreational rock lobster inspections during Season 2 of the tagging program. An analysis of the reported tags has found that there were a range of discrepancies in relation to observations by Fisheries Officers and data reported through the RL Tag App. This included:

- tags remained as unreported or 'unused';
- tags were inaccurate due to incorrect date and/or length;
- tags were reported as 'Not used';
- tags were reported as 'Lost'.

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# Methods

This report is based on catch data reported for Season 1 (2017/18) and Season 2 (2018/19) to VFA until 14/02/2020.

To ensure the quality and robustness of the analysis some data filtering occurred. The following is a list of the filters and calculations that were applied to the data:

*Season-* preliminary data from the 2019/20 season was excluded from this analysis.

*Date fished-* In cases where the date fished occurred after the date that a used tag was reported, the data was excluded.

*Age of participants-* Participants who listed their age as less than 18 or over 100 were excluded from the analysis.

*Weight of catch-* the reported weights were excluded if less than 1 kg or more than 6 kg. There are some reported weights of 500 – 800 that are assumed to be measured in grams, however were excluded.

*Total weight Taken Estimates-* calculated from the mean weight of the citizen science data.

*Catch per hour (CPUE)-* calculated from the citizen science data.

*Days to report:* Measured as a count of the days from the date fished to date reported. All values over 14 days were allocated a greater than 14 days value.

*Personal data-* was excluded if there were less than 5 samples to de-identify the fishers, such as the postcode of registered users.

To calculate the total catch weight, the mean weights recorded by the citizen science program were applied to the weight in numbers from the overall dataset.



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