A message from Bec and Ross
So here we go, the results of the 2021

"Annual SealSpotter Challenge"

What was the challenge?

- To count as many pups and seals as we could in three weeks 9-31 May.
- To engage Citizen Scientists from across the globe

The opening of the Challenge this year coincided with an online event by the Royal Society of Victoria at Parliament House showcasing the project (https://youtu.be/LDZWEhIItBI).

Our two indicator sites, Seal Rocks, near Phillip Island in central Bass Strait, and The Skerries, near Mallacoota close to the Victorian border with New South Wales, were surveyed by drone in the 2020 breeding season and counted during the "Annual SealSpotter Challenge". We are now excited to present the results. To all who participated: thank you so much for your efforts.

For those keen to continue with additional survey counts, we have kept the portal open and loaded with new images. Additional surveys add to our understanding of the peak of pup births, allowing us to time the surveys to collect the most precise data. For those who prefer a brief burst of intensity, we look forward to our next collaboration during the 2022 SealSpotter Challenge.

Summary of participation:

- 187 Citizen Scientists contributed to the counts
- Participants were from 93 countries (compared to 37 in 2019)
- All continents were represented except Antarctica
- Users marked 124,800 seals in 9,280 images, providing a minimum of 10 replicate counts for each image
- Four drone surveys were completed, three at Seal Rocks and one at The Skerries.
- Citizen Scientists did a great job counting this year with 5 counting over 1,000 images. Amazing effort, thank you.
- To exclude unusual counts, we used all counts that were within 1.5 standard deviations of the median, averaged and summed for each image to provide the final result.

COLLABORATORS WITH IMAGE COUNTS > 1,000
Shakira, 3858
Terri H, 1471
Annette S, 1373
Lorraine, 1340
AL, 1286

Results

- Similar to previous seasons, the peak pupping (live + dead pups) occurred around 13 Dec at Seal Rocks (Figure 1) and this survey was used to compare pup numbers over time (Figure 2).
- Comparing the last four years at Seal Rocks, the highest pup count was observed in 2017, while 2020 had the highest adult-juvenile count (note we did not perform the adult-juvenile counts in 2017).
- The survey for the 2020 breeding season at The Skerries was performed 8 January 2021. This year's results were higher than 2019, but lower than 2017 and 2018 (Figure 3).
- 95% confidence intervals were small (good) and best for adult- juveniles that are easier to count, this is a great indication that our method is working really well.

Where to next for SealSpotter?

- We are still developing the method for determining a total estimate of seals entangled in marine plastic for each survey and site. The seals that have thin and embedded entanglements like fishing line are difficult to identify compared to those of more obvious materials like ropes and netting, so we are working through this hurdle.
- We purchased a new camera that has improved the image quality of recent surveys and are looking forward to using this system in the 2021 breeding season.

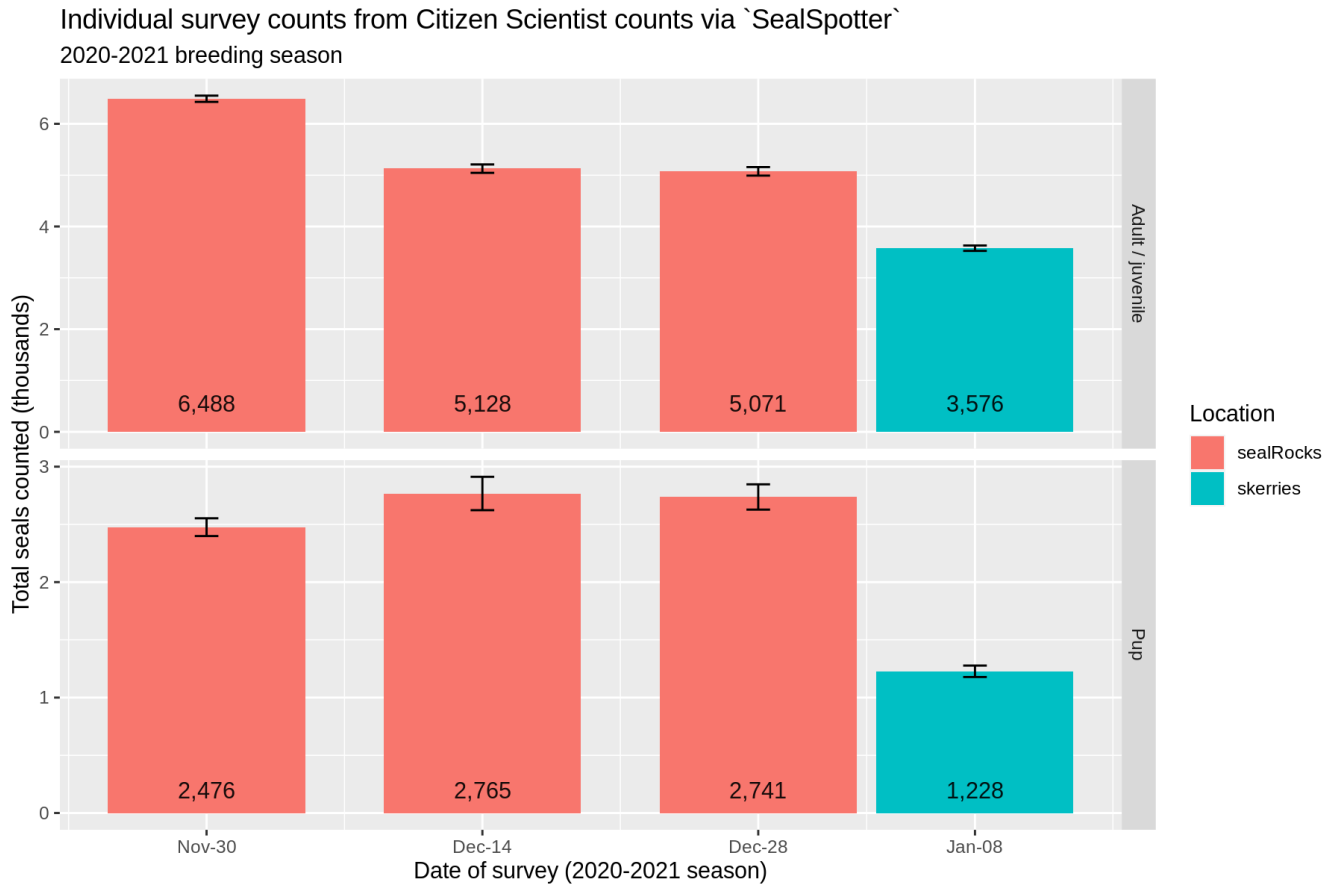

Figure 1. Citizen Scientist averaged counts for adult-juvenile (top) and pup (live + dead, bottom) Australian fur seals at Seal Rocks (red) and The Skerries (blue) for the 2019 breeding season counted during SealSpotter Challenge in May 2020. Error bars show 95% confidence intervals, calculated after extreme counts have been excluded.

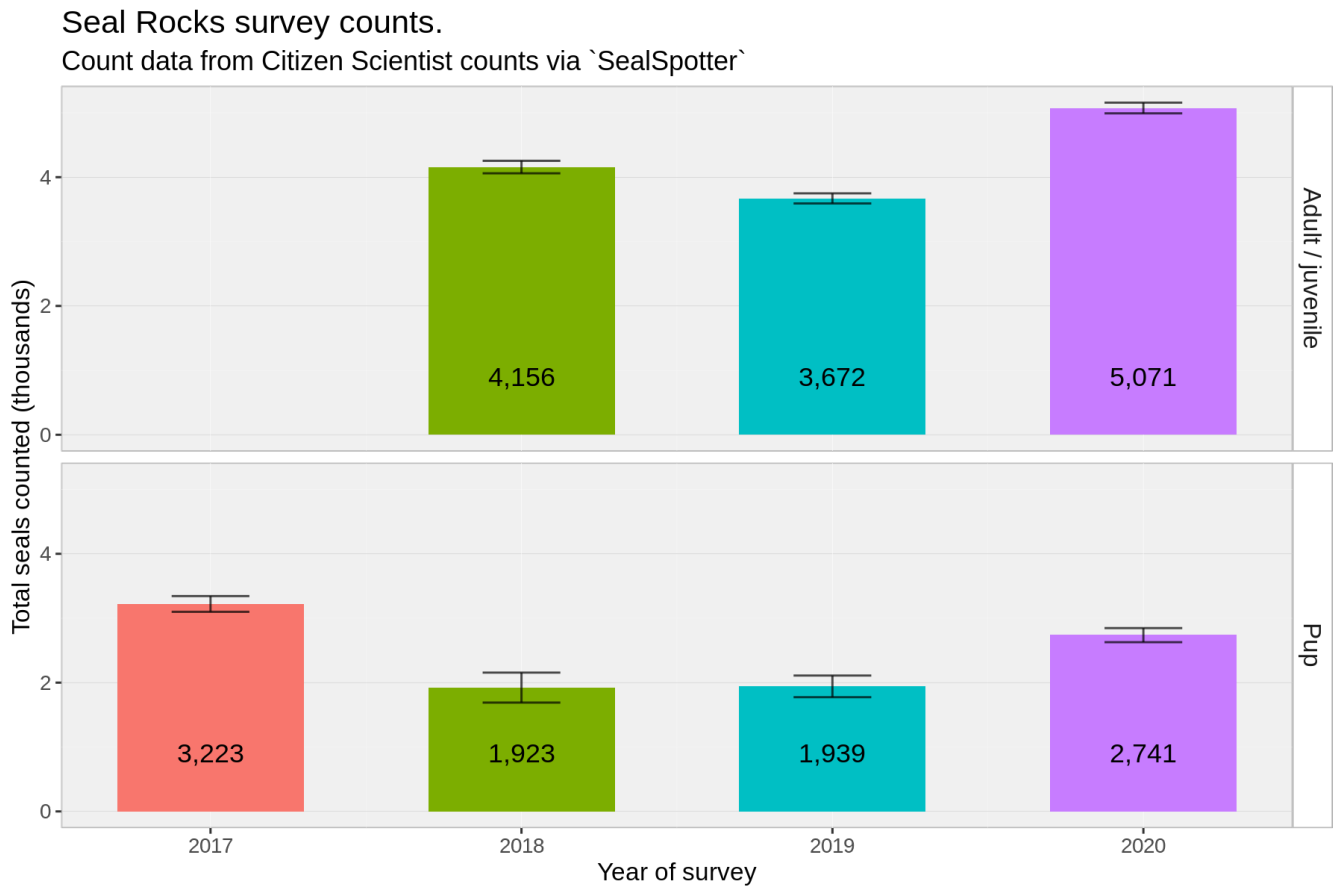

Figure 2. Comparison of Citizen Scientist counts for adult-juvenile (top) and pup (live + dead, bottom) Australian fur seals at Seal Rocks at mid-December over four breeding seasons (2017-2020). Error bars show 95% confidence intervals, calculated after extreme counts have been excluded.

What are the Australian fur seals up to at the moment?

Photo by Holly Baird, KinaDiving

The pups have moulted from their lanugo coat to their juvenile waterproof coat and are spending a lot of time in the water learning to forage in preparation for independence.

Females are leaving the colony to find food and returning when they can to feed their pups. At the same time, they are gaining weight with their developing pregnancies - with the pups due this coming December.

Males are out foraging to gain as much bulk as they can to be ready to fight for females in the coming breeding season.

SealSpotter helps win the Victorian Marine and Coastal Award 2020 for DISTINCTION IN BIODIVERSITY AND ECOSYSTEM CONSERVATION
Follow these links to view the detailed information and interviews: Seals as Ecosystem Sentinels.
https://www.marineandcoastalcouncil.vic.gov.au/news-and-events/victorian-marine-and-coastal-awards/2020/seals-as-ecosystem-sentinels; https://www.youtube.com/watch?v=Idi8DFPaT3A

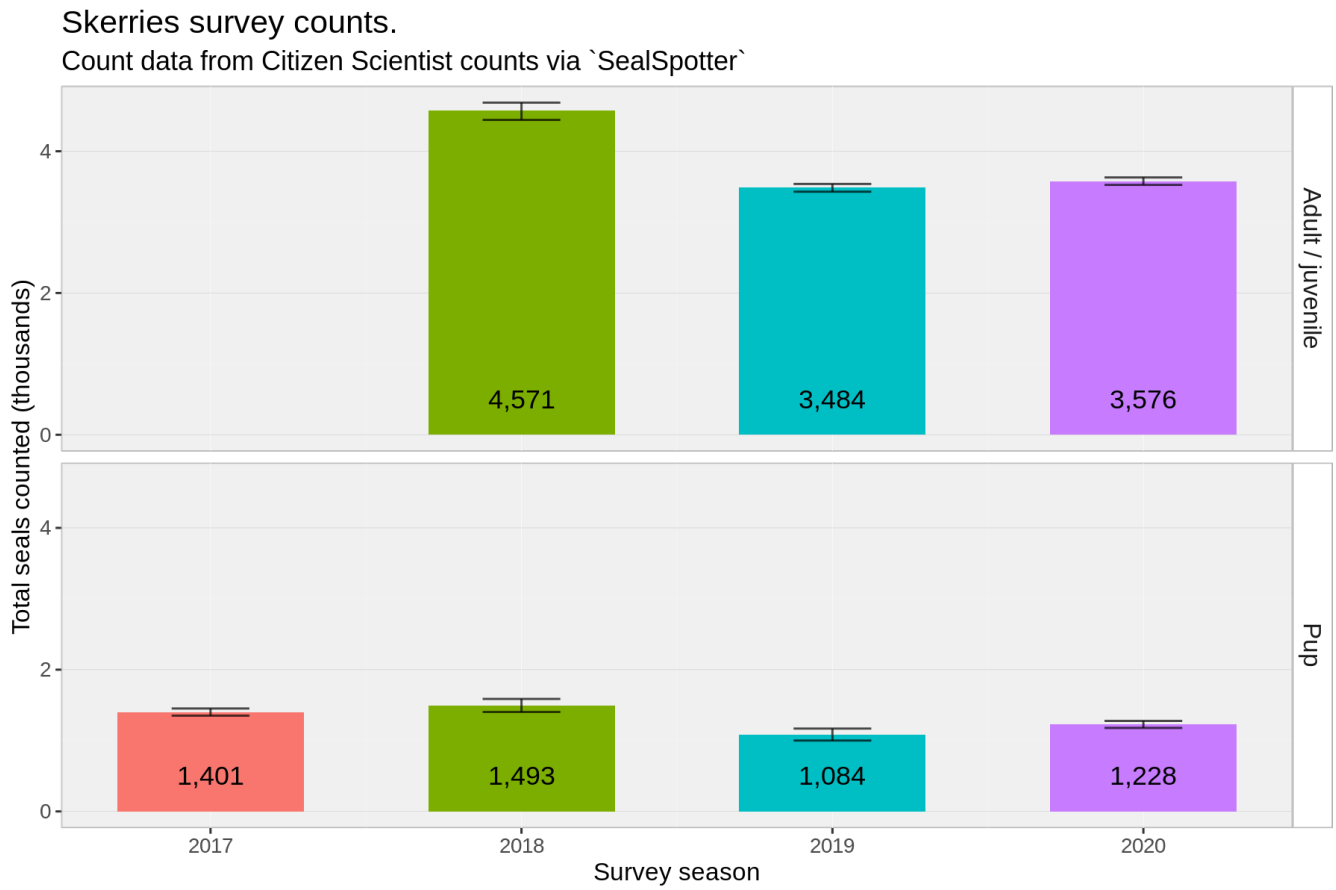

Figure 3. Comparison of Citizen Scientist counts for adult-juvenile (top) and pup (live + dead, bottom) Australian fur seals at The Skerries over four breeding seasons (2017-2020). Error bars show 95% confidence intervals, calculated after extreme counts have been excluded.

Recent research outcomes from SealSpotter

In collaboration with Monash University, we are using the images labelled by you to test whether computers can count the seals. This will not put you out of a job; the aim is to have machines help us focus the efforts of our Citizen Scientists better, so that we can maintain the quality of the counts and develop new and exciting investigations.

Thank you again for all your hard work. Please stay safe and continue counting if you want to, the portal is open. See you next year for the "Annual SealSpotter Challenge", June 4-19 2022.
Bec and Ross ☺, Conservation Department, Phillip Island Nature Parks