

2025 Summary

Juneau experiences a drop in visitors of just over 100,000 from 2024 and a reduction in the number of Discover Alaska's Whales science tours ("Disco"). This result pots pulled down by 24% over 2024. We continued to deploy crab pots as needed until we reached 10 "Discos" a day. We pulled crab pots on 803 trips from April 14 to October 6, 2025, from ten locations in Auke Bay. Protocol follows permit CF-25-066 issued by the Alaska Department of Fish and Game.

No European green crab was identified in 2025.

Project Locations

Four pots each were deployed off the east coastline of Coghlan and Portland Islands and two off Suedla Island in 2025, in the same location as previous years. (See Appendix 2 for their exact locations.)

Location	#pulls	#empty	%empty	Year	# pulls	% Δ
C1	98	33	34%	2013	24	
C2	95	13	14%	2014	185	771%
C3	70	1	1%	2015	375	203%
C4	51	10	20%	2016	418	111%
P1	106	21	20%	2017	441	106%
P2	102	16	16%	2018	541	123%
P3	77	13	17%	2019	562	104%
P4	51	10	20%	2021	75	13%
S1	89	19	21%	2022	806	1075%
S2	64	4	6%	2023	829	103%
Total	803	140	17%	2024	1053	127%
				2025	803	-24%

Procedure

We continue to use Willapa Marine Octagon Shrimp Pots, which the company customizes for us with four doors instead of one. The door latches are attached with biodegradable cotton cord. The cone openings into the pot are expanded to 6 inches to allow for the largest measured European green crab to enter. The pots are weighted with two two-foot #8 rebar rods. The pots are baited with "purple", large (8+ inch) frozen herring. Toward the end of the season, three worn out pots were replaced with standard "Dungie Pots".

The crab pots are deployed in 30 feet of water off ten specific locations on Coghlan, Portland and Suedla Islands. The line attached is 75 feet long which ensures that the crab pot will remain on the bottom and the two marked buoys remain floating on the surface regardless of the tidal exchange. Two red and white buoys are at the upper end of the line. They are marked with "Gastineau Guiding, 907-586-2666, European Green Crab Monitoring Project", the location code and our permit number.

The contents of the pot are placed in seawater in a dishpan. Using our own "Crab Pot Identification Guide", we attempt to identify each organism collected. Photographs are taken of each pot and all the contents are returned to the ocean, alive, in the spot collected. The only exception to the live release are some unidentified remains that were obviously eaten by other creatures in the pot. Data for each collection is included in a spreadsheet matched to the naturalist on board as well as the photographs taken.

2025 Subtidal Life Survey Results

The chart is organized from the most captured to the least captured.

The “grand total” is the total number of individuals we identified. Since each year has a different number of pulls, the number by itself is misleading as more pulls mean larger numbers. A better way to interpret the data is by the percent of pulls with each species and the average number of individuals per pull.

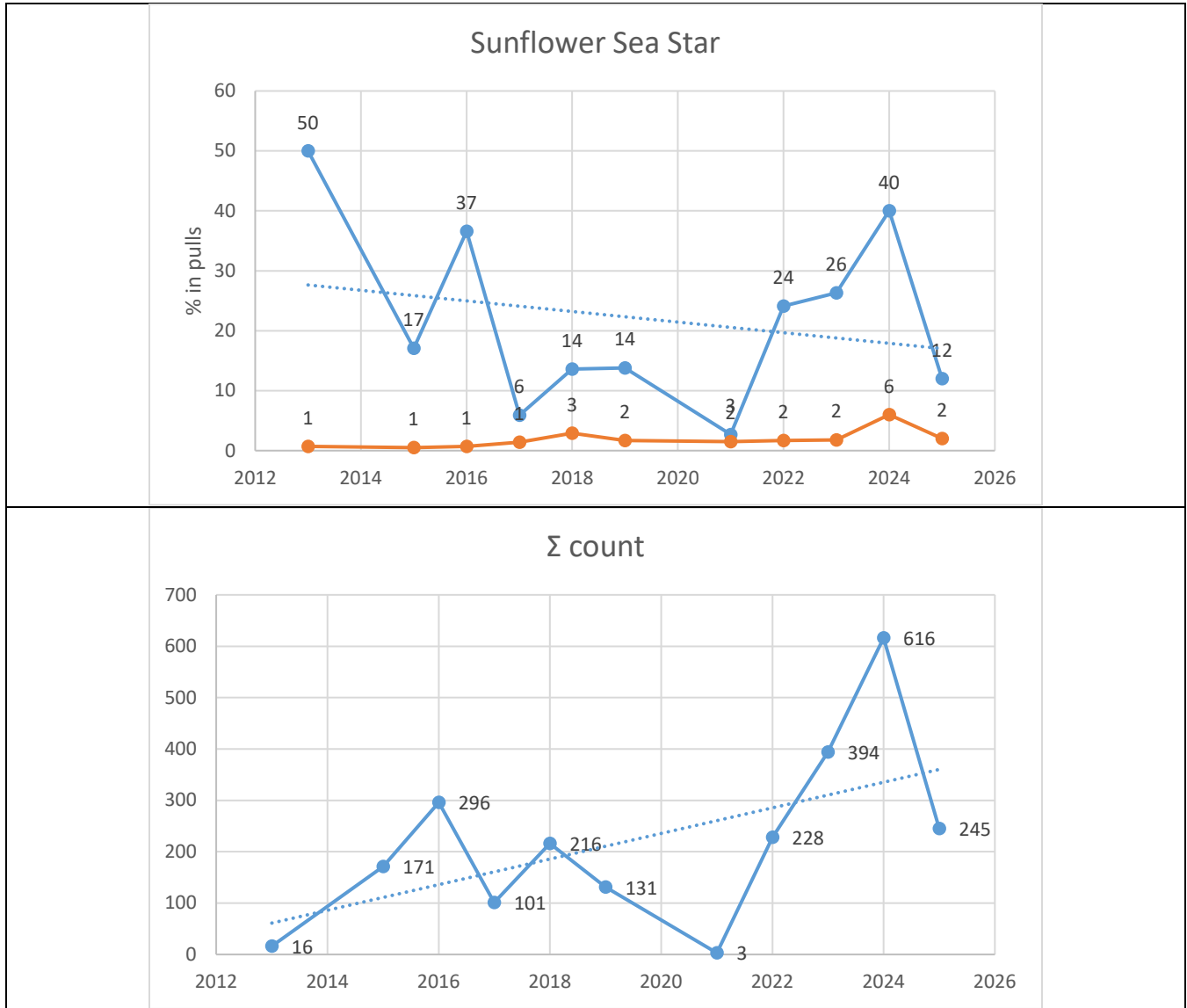
Species	Grand Total	Count in Pulls	% in Pulls	Ave # per pull
Green Sea Urchin	3657	189	24%	19
Wide-hand Hermit Crab	1126	304	38%	4
Lyre Crab	1007	246	31%	4
Red King Crab	654	24	3%	27
Sunflower Seastar	245	161	20%	2
Staghorn Sculpin	153	99	12%	2
Oregon Triton	115	34	4%	3
Snails-unidentified	115	64	8%	2
Mottled Seastar	95	77	10%	1
Helmet Crab	67	48	6%	1
Hairy Hermit Crab	42	13	2%	3
Yellow-fin Sole	32	21	3%	2
Red Hermit Crab	31	15	2%	2
Fish-unid	27	8	1%	3
Dungeness Crab	23	18	2%	1
Great Sculpin	21	17	2%	1
Crab-unid	20	13	2%	2
Sunstar Complex	15	13	2%	1
Unidentified	12	12	1%	1
Sea Cucumber	5	3	0%	2
Irish Lord	4	3	0%	1
Gunnel-unidentified	2	1	0%	2
Pollock	2	2	0%	1
Sea Pen-unidentified	2	2	0%	1
Blue Mussel	1	1	0%	1
Kelp Greenling	1	1	0%	1
Opalescent Nudibrach	1	1	0%	1
Pacific Cod	1	1	0%	1
Rockfish-unidentified	1	1	0%	1
Shrimp-unidentified	1	1	0%	1

Charts like this one are available on request for every year of our subtidal life survey.

Notable Observations

Sunflower Sea Star (*Pycnopodia helianthoides*)

Early in 2023 the National Oceanic and Atmospheric Administration (NOAA) began a study to determine if the sunflower sea star should be considered as “threatened” under the Endangered Species Act. Gastineau Guiding has been tracking the number of sea stars in Auke Bay since 2013 and this chart shows what our local population has been from then until now. The effect of sea star wasting disease (SSWD)—that arrived with the “Pacific Blob”—on the sunflower sea star is dramatic with a precipitous drop in their numbers. The blue represents the percent of pulls with sea stars and the orange the average number of sea stars per pull.



Our data shows that the sunflower sea star enjoyed a dramatic rebound in number of individuals from a deep low in 2021 to a high in 2024. 2025 brought a 27% decline in the percentage of pulls with sea stars, a 33% drop in the number of sea stars per pull and a 60% drop in the total number pulled. After enjoying three years of dramatic increase, 2025 brought an unexpected serious decline in all measures of the sunflower sea star.

During the collapse, the size of the sea stars dramatically decreased along with their numbers. In 2015 and 2016 many pulls had a 100+ cm sea star on the top of the crab pot with its stomach everted into the bait trap to eat

the herring. As many as six sea stars made it into the trap, some as large as 75 cm. In 2021 all 70 sea stars were under 25 cm across and were inside the pot. In 2022 most were over 25 cm diameter with a large number more than 50 cm diameter. For 2025 the size of sea stars remains the same as 2024 with about half of the individuals being over 50 cm diameter.

We began keeping track of skeletonized bait as sunflower sea stars is the most likely creature to be able to do this, and 188 pulls or 23% of pulls, had skeletonized bait without a sunflower sea star in the pot. The conclusion that our numbers are low as well as the average size based upon this seems reasonable. It appears that larger sunflower sea stars are becoming more common and this may well be the reason for this years sharp decline.

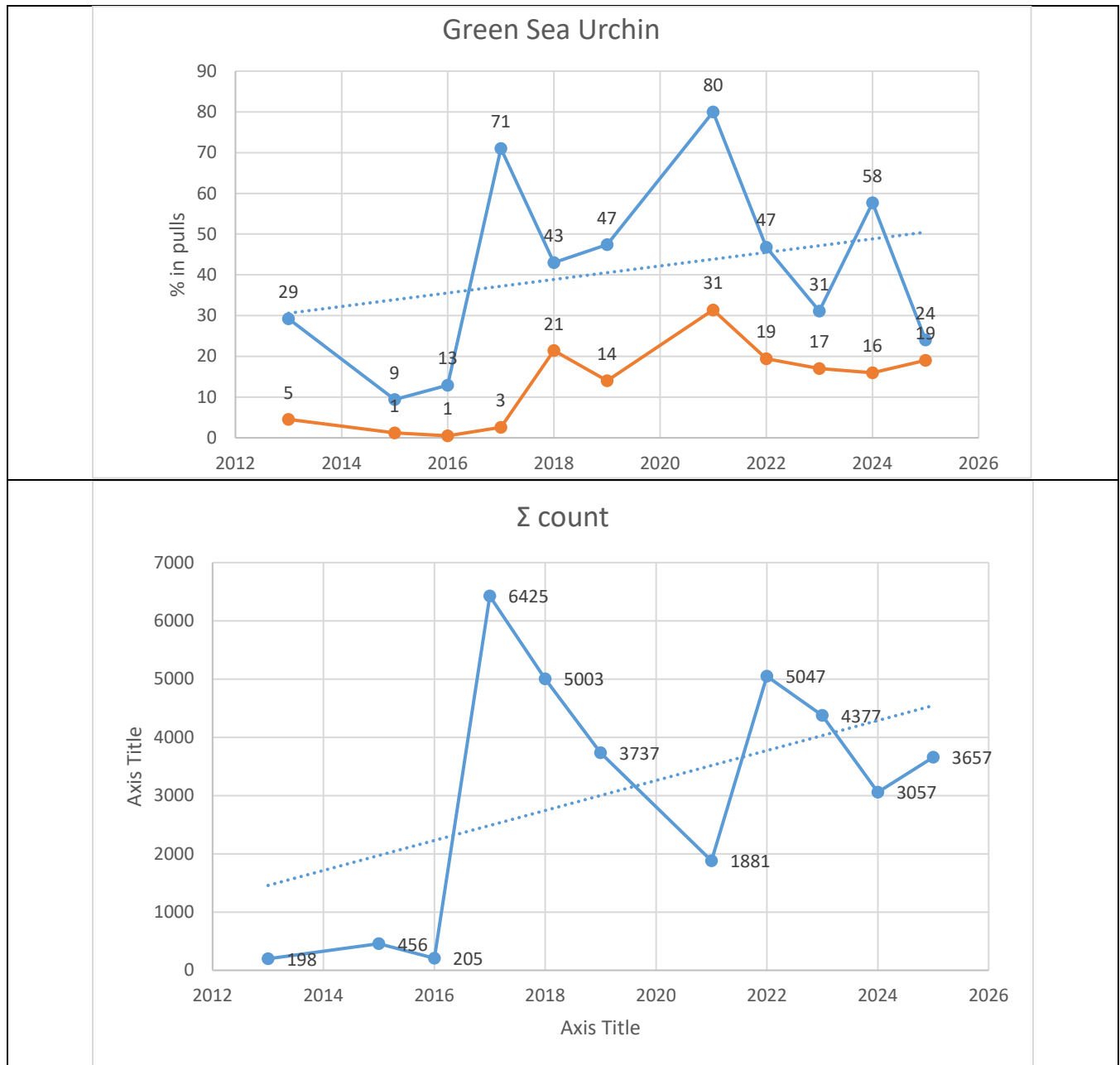
No whitish bloom has been observed on any since 2022.

Sea star wasting disease has been well documented from the nearshore waters from southern British Columbia to California, with only a small number of stations reporting from Southeast Alaska. This project is providing valuable information in a region not included in any of the recent reports. A copy of this report is being provided to C. D. Harvell, lead author of the 2019 article “Disease epidemic and a marine heat wave are associated with the continental-scale collapse of a pivotal predator (*Pycnopodia helianthoides*)” with the offer of providing the raw data underlying it as well as fisheries biologists with the Alaska Department of Fish and Game. It was also provided to Sadie Wright and Dayv Lowry of NOAA for the listing study.

Green Sea Urchin (*Strongylocentrotus droebachiensis*)

The expected inverse relation of the sunflower sea star on the green sea urchin continues to play out but proves complicated. Blue is the per cent of pulls with urchins and orange the average number of urchins per pull. The plot line of percentage of pulls with urchins continues to be up and down, but with a rising trend line. The number per pull for the last four years is essentially flat but with a small rise in 2025. The total count of urchins went up almost 20% with fewer pulls which make the trend line rise.

With the decline of a major predator, the sunflower sea star, the green sea urchin was free to expand its range and number with abandon as the graph clearly illustrates, but there is more going on.



With a healthy sunflower population from 2013 to 2016, the population of urchins was small and steady. As soon as the sunflower sea star declines, the green sea urchin population explodes in 2017. Yet it drops in 2018

then increases to a maximum in 2021. Here is where the total count is misleading as we only had 75 pulls that year.

In 2017 through 2019 we only estimated the number of urchins in the two northernmost pots off Portland Island as they were often completely full of urchins, probably 200+ individuals. Several pulls in 2021 had well over 100 urchins, but none filled the pot.

What is confusing in 2025 is the expected continued decline in total number, number per pull and percent of pulls with urchins has reversed! Their population is now increasing. Is this a direct relationship with this years decline in the numbers of sunflower sea star?

Since sea urchins are major consumers of kelp, particularly bull kelp (*Nereocystis luetkeana*), the very limited amount of it in the Juneau area is at risk. We are not quantifying the sightings of bull kelp floating on the surface of the water, but it remains high. This is presumably from sea urchin predation.

Sea otter (*Enhydra lutris*) was exterminated from Southeast Alaska by the Russians by 1867 and their recovery from the transplants to Sitka Sound depends upon healthy kelp forests. With urchins eating the kelp with abandon, it seems that our waters are in an ecological "catch-22" as otters are major predators of urchins. We are faced with too many urchins but not enough kelp to support the otter. Otter were spotted by our naturalists on 12 days in both 2023 and 2024, the highest ever.

Mottled Sea Star (*Evasterias troschelii*)

The effect of sea star wasting disease (SSWD) on the mottled sea star seems confused in Auke Bay.



What is curious about 2022 and continuing into 2023 is that both the percentage of pulls and the number of individuals per pull have dropped. This is especially concerning as none of the animals showed any visible sign of SSWD and is trending in the opposite direction of the sunflower sea star. It leads to the curious idea that the number of sunflower sea stars might limit the number of mottled sea star. 2024 showed a small increase in the percentage but a more dramatic than expected drop in the total number. 2025 saw an increase of 34% in the total number of mottled stars pulled yet a drop in the percentage of puts with them.

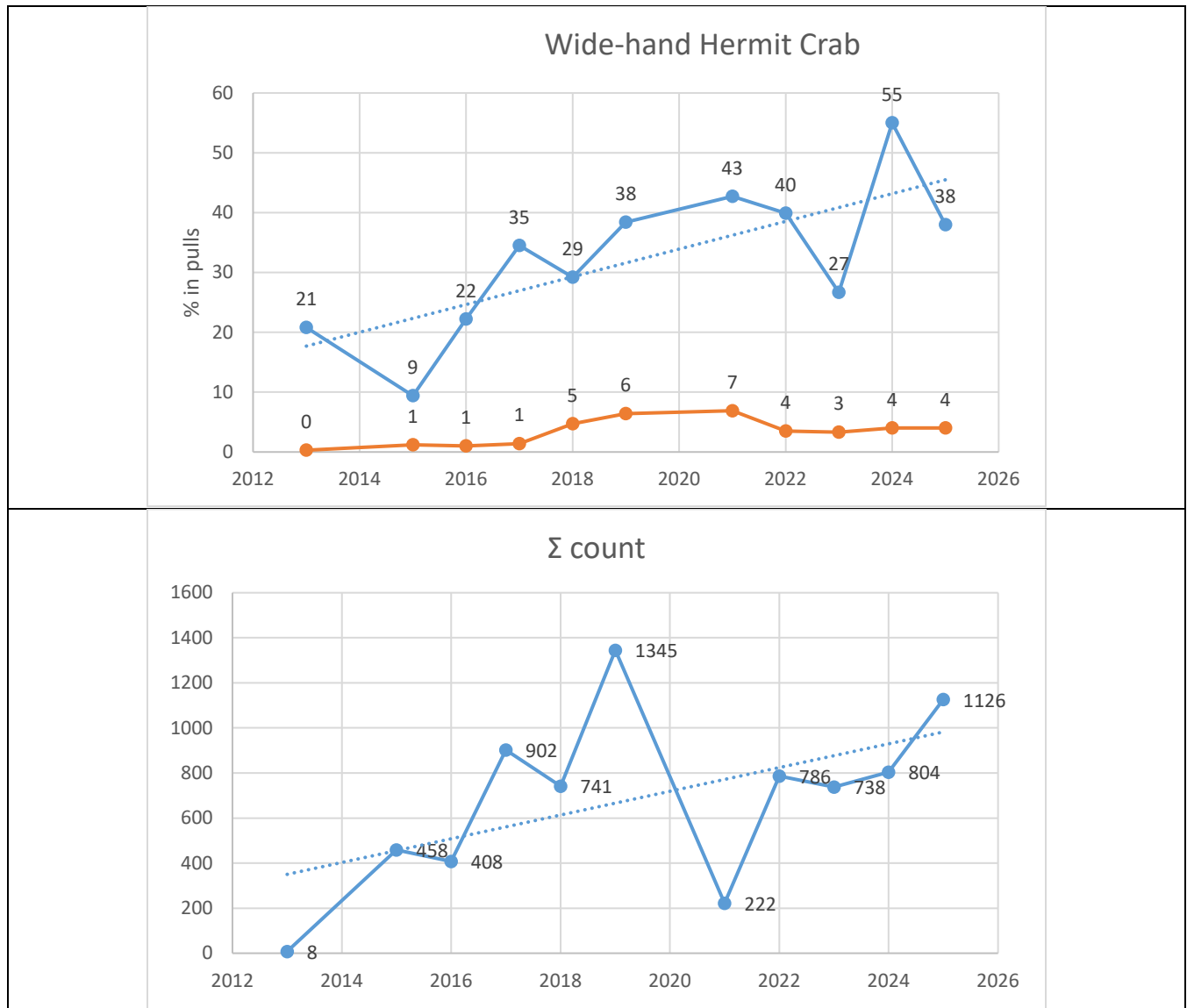
It may well be this species suffered from sea star wasting disease before we began our study and had already collapsed. Note the low numbers on both graph lines for 2013-2016.

No mottled sea star showed any sign of SSWD in any year.

Perhaps the tough-skinned mottled sea star is more resistant than the very soft-skinned sunflower sea star.

Wide-hand Hermit Crab (*Elassochirus tenuimanus*)

The graphs of wide-hand hermits probably reflects the natural vagaries of their population, with mostly years of increase and a few of decrease.



The anomalous and extreme drop in 2021 is the result of only 75 pots being pulled that year

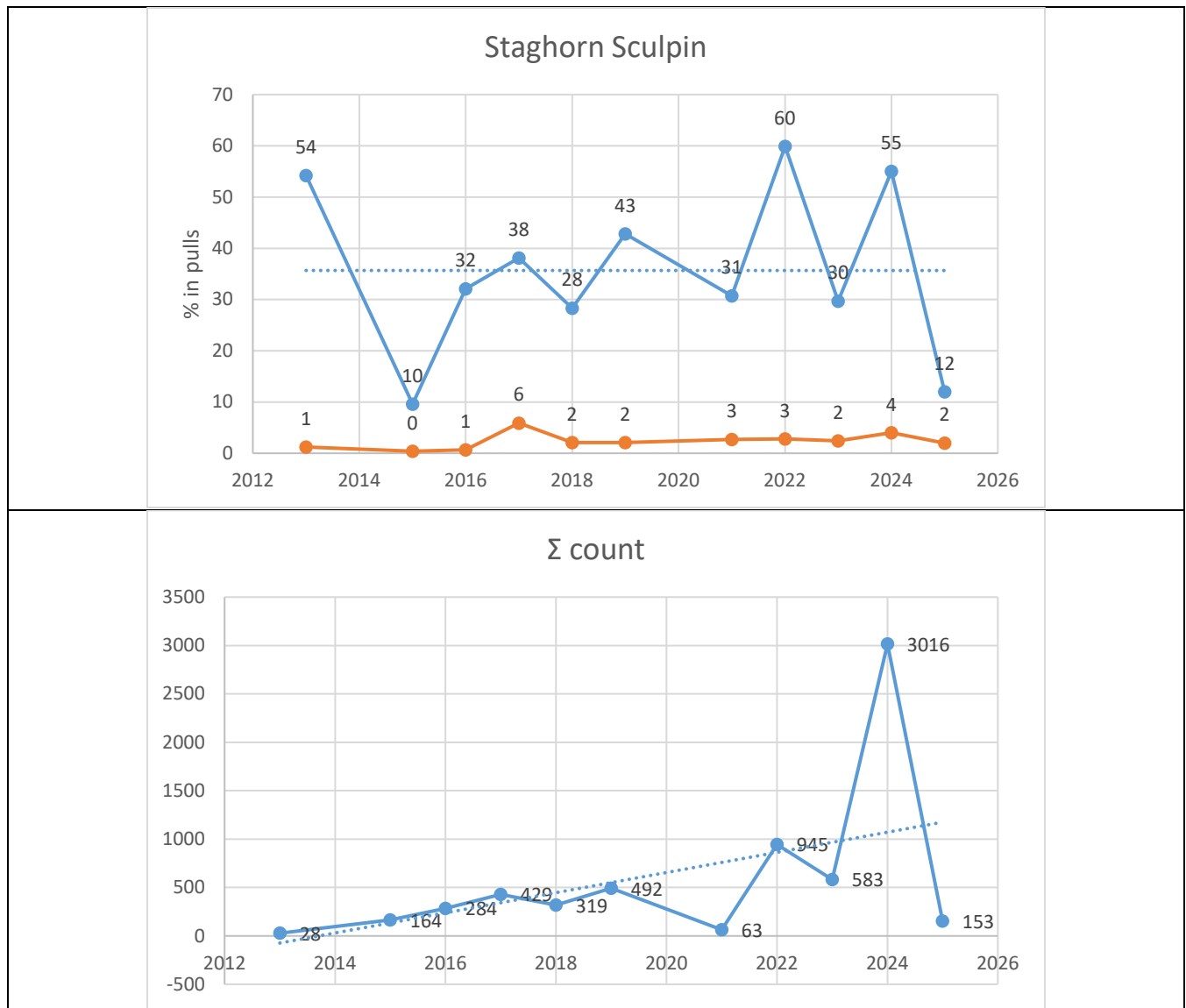
It is curious that in 2025 the percentage of pulls with crabs decline but the total count enjoyed an increase of 40%

The connection with the collapse of the sunflower sea star on them is undetermined, but the graph suggests a connection.

Staghorn Sculpin (*Leptocottus armatus*)

This fish has been a “staple” of our crab pot pulls. This fish is a top predator in the intertidal and subtidal range and capable of surviving in low tide pools and oxygen-deprived water.

The upper chart shows an interesting—and unexplained—pattern of an almost every-other-year pattern. Up one, down the next. The anomalous low in 2015 is also unexplained. The general trend line for percentage in pulls changes from gently upward to gently downward for 2025 and a dramatic 95% drop in total numbers pulled!



When comparing the upper graph to the total count, the extreme increase in the raw number of sculpin is greater than expected. The large drop in total count in 2021 is easily explained by the few pots pulled that year.

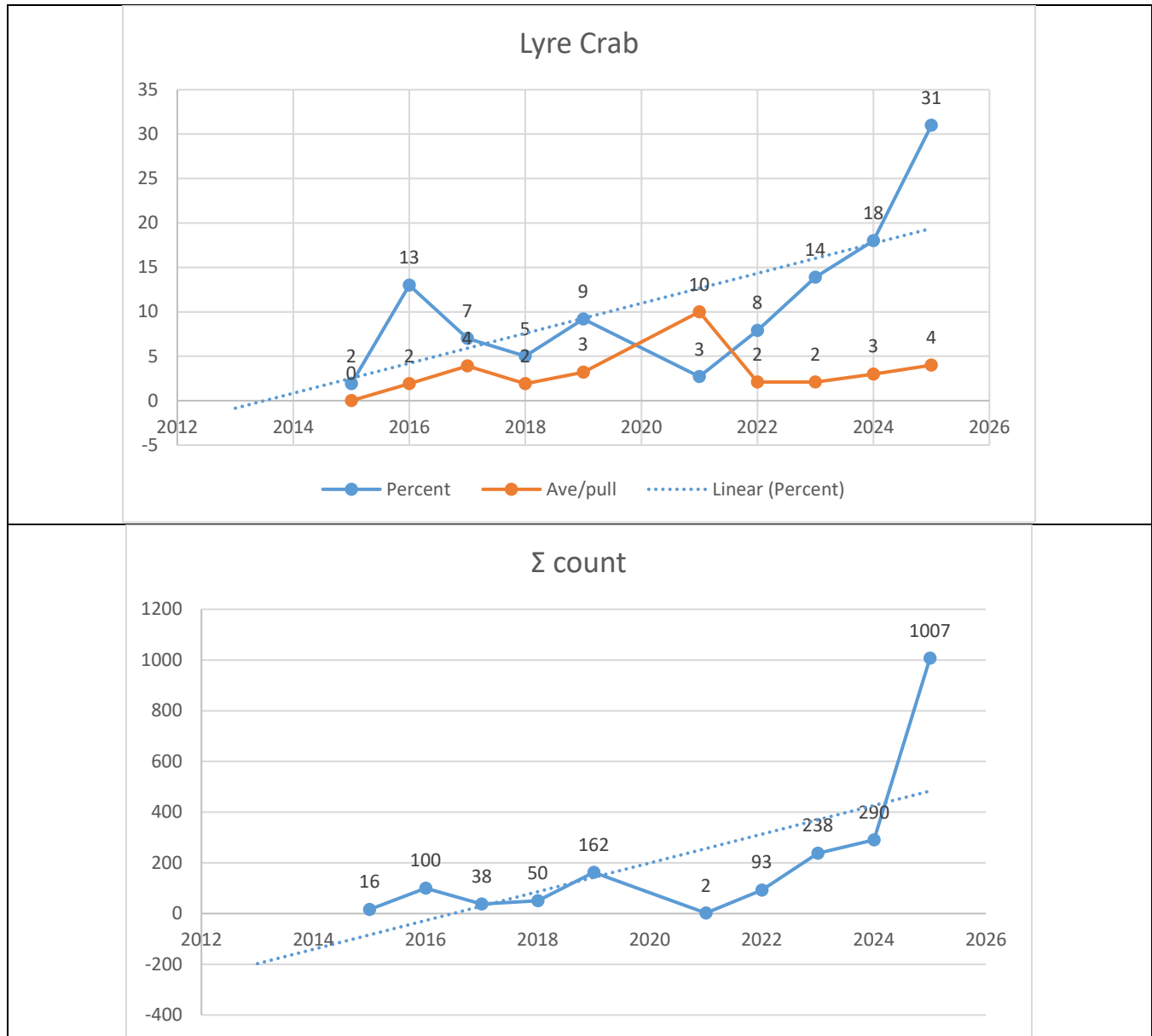
If we take the average increase per year—124%*—and project that on the 583 in 2023, the expected total for 2024 is 1,312 yet we pulled 2.3 times that amount! Then 2025 brings a precipitous decline of 95%. The trend line is still upwards, but dropped dramatically from 2024 and what now appears to be an anomalous increase. The only lower year, 2021, is explained by the very small number of pots pulled.

*This number is calculated by removing the anomalous years preventing a skewing of the result.

Lyre Crab (*Hyas lyratus*)

This common species from the Chukchi and Bering Seas south to Puget Sound is added to the summary because of its huge increase in numbers since 2021. Found from 9 to 640 meters deep, this species upper range is exactly where we sample.

This increase greatly exceeds expectations. The slope of the rise for both the percentage in pulls and the gross numbers are remarkably similar, the trend lines are nearly identical.



The increases in all three measures seems to exceed expectations with 2025 seeing a 25% increase in the percentage of pulls with lyre crabs and a very dramatic increase in total number of 250%

Other notable things

- **Sea pen:** for a species not normally considered mobile, we pulled up one each in two pulls!
- **Northern opalescent nudibranch:** from local divers, we know nudibranchs are somewhat common in our sampling zone, but until this year we'd never pulled one up.
- **Red King Crab:** This is a species we need to pay more attention to as its number exploded for 2025. With last year's deployment of two pots on Suedla Island, we began to collect red kings frequently. For 2026 we pulled up 654 individuals in 24 pot pulls for 31% of pulls and averaged 4 kings per pull. Most of them are small—3 cm across the carapace—juveniles. This species has increased enough in the Juneau area to have a nearly two week personal consumption crab opening. Our sampling shows lots of new king crabs and bodes well for the future

Conclusion

With the European green crab found closer to us in 2025, on Gravina Island and a report of carcasses being found on the beaches in Yakutat, our vigilance is more necessary than ever to detect this invasive species. It is interesting to learn the Metlakatla Indian Association in their monitoring of the crab on Annette Island switched from crab pots to shrimp pots as they are more effective at catching this crab.

Aside from the scientific value this sampling of shallow waters might have, the educational value to the guests of Gastineau Guiding is immense. This activity ranks with most guests as high as whale identification.



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October 10, 2025

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APPENDIX: Crab Pot Locations 2024

Coghlan 1	Portland 1
58°21.514' N	58° 20.455' N
134° 41.715' W	134° 44.673' W
Coghlan 2	Portland 2
58° 21.429' N	58° 20.148' N
134° 41.720' W	134° 44.233' W
Coghlan 3	Portland 3
58° 21.180' N	58° 20.073' N
134° 41.545' W	134° 44.150' W
Coghlan 4	Portland 4
58° 21.014' N	58°19.938' N
134° 41.498' W	134° 44.025' W
Suedla 1	Suedla 2
58°20.921' N	58°20.953' N
134°39.807' W	134°39.708' W

