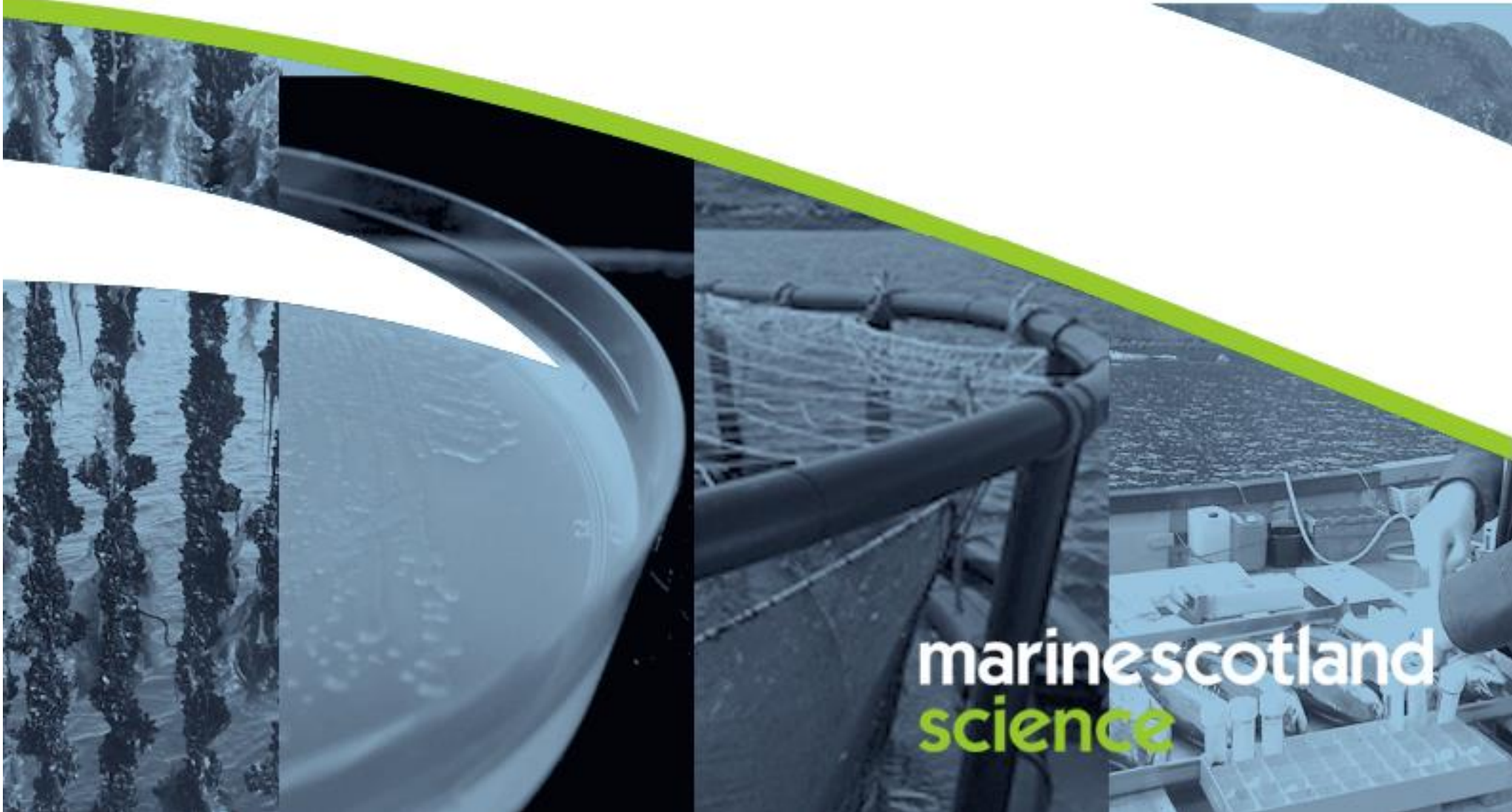


CMS, HSMI & PD – Scottish data 2019, 2020, 2021 & 2022



Scottish Government
Riaghaltas na h-Alba
gov.scot

Silvia Soares, Valentina Romano, Eann Munro & Stephen Ives



marine scotland
science

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Introduction

- Aquaculture is a very important industry for the Scottish economy and for food security.
- Atlantic salmon (*Salmo salar*) is the biggest and most valuable farmed fish in Scotland.
- Aquaculture helps to sustain economic growth particularly in the island and rural coastal communities of the north and west.
- Atlantic salmon aquaculture faces annual economic losses due to mortality and carcass downgrading.
- Cardiac viral diseases (CMS, HSMI & PD) are a significant contributor towards these economic losses.

Introduction

- CMS, HSMI and PD are responsible for mortality and morbidity among market sized fish.
- These diseases can also cause:
 - Reduced growth,
 - Downgrade of flesh quality
 - Decreased resilience due to secondary health issues.



Introduction

- **The three cardiac diseases CMS, HSMI and PD:**
 - Not emerging notifiable diseases
 - Marine Scotland does not have a regulatory obligation to control these diseases
 - Difficult to have access to production data related to mortality/morbidity.



Salmon Scotland: monthly mortality data

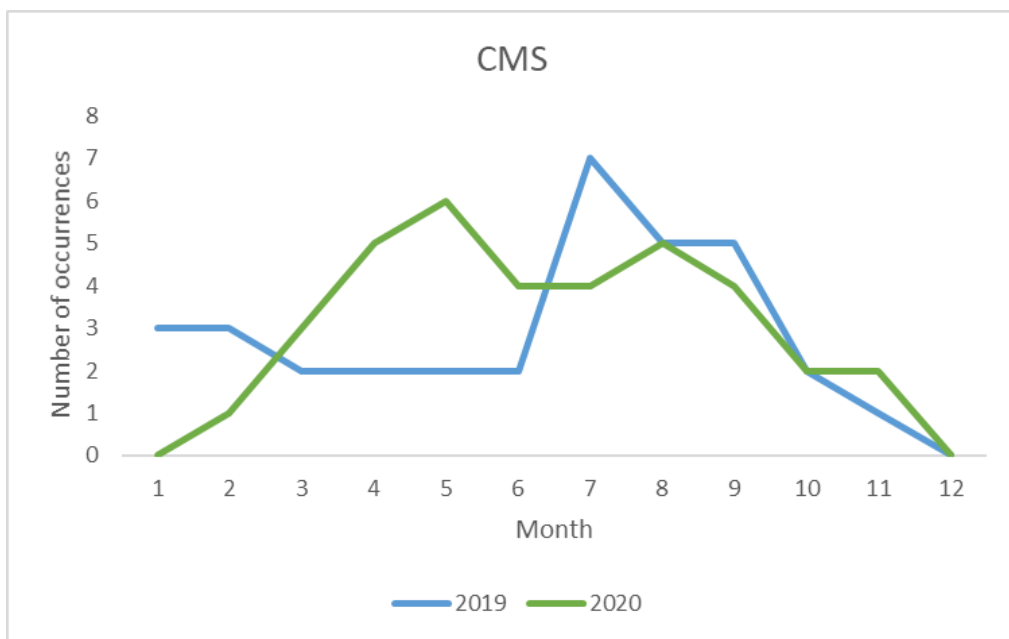
- Mortality data are published as monthly farm percentage averages by Salmon Scotland (<https://www.scottishsalmon.co.uk/reports>).
- Salmon Scotland data typically records information on mortality causes when monthly mortality percentage exceeds 3% and so this data is unlikely to include all occurrences of these diseases.

Salmon Scotland: monthly mortality data

- Metadata related to individual mortality events can be limited and often includes multiple causes, so assigning an accurate percentage mortality to a specific cause is difficult.
- Since March 2021, Salmon Scotland changed their reporting of mortality cause. Now all viral diseases (including CMS, HMSI & PD) are grouped under the heading 'Viral disease'.
- This limits the ability to conduct more detailed investigations on viral diseases based on mortality records.

Salmon Scotland: monthly mortality data

	2019			2020		
	Only	Multiple	Total	Only	Multiple	Total
CMS	24	10	34	12	26	38
HSMI	0	0	0	1	1	2
PD	8	19	27	6	15	21



	Mean consecutive months that a disease is reported at the same site	Number of sites
CMS	2.5	15
PD	3.2	6
CMS/PD	2.3	3

Salmon Scotland: monthly mortality data

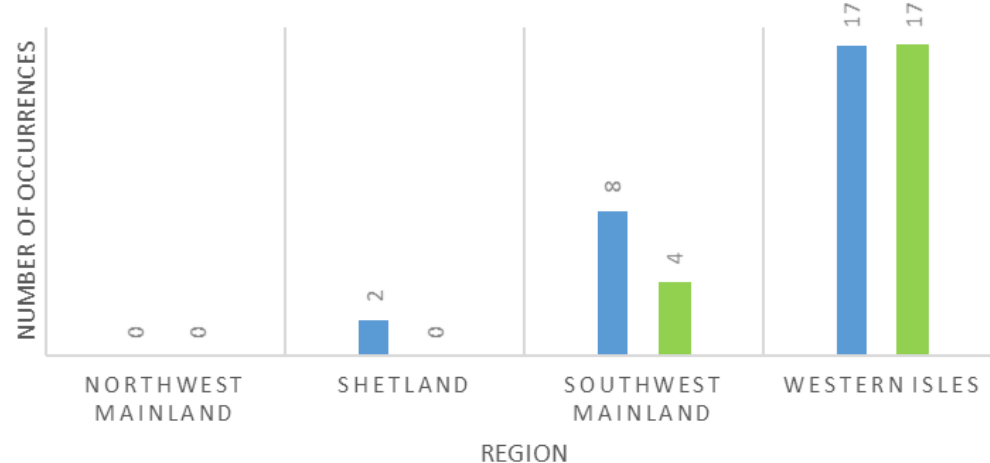
CMS

■ 2019 ■ 2020



PD

■ 2019 ■ 2020

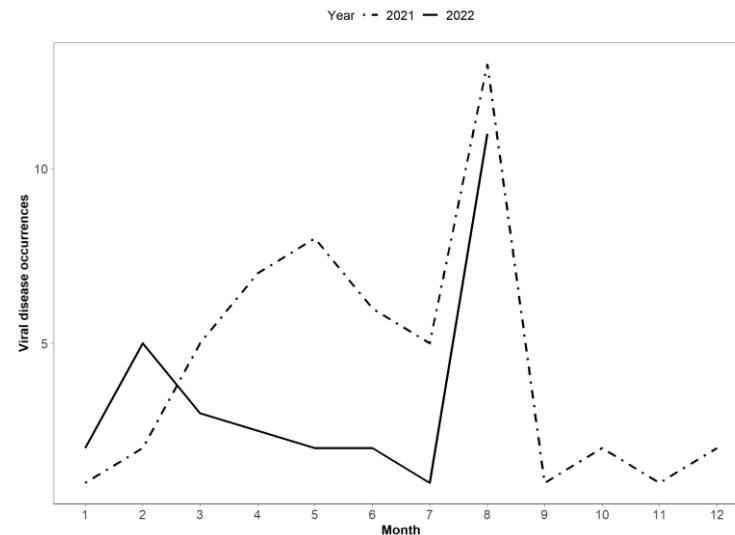
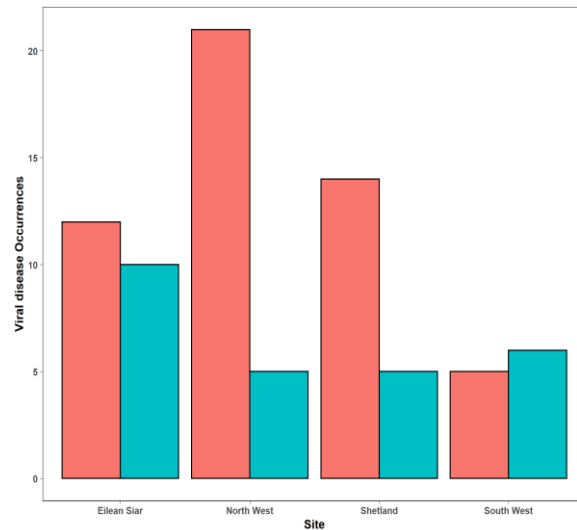


Salmon Scotland: monthly mortality data new data collection

	2021 (Jan-Mar)
PD	1
CMS	2
HSMI	0

	2021			2022		
	Only	Multiple	Total	Only	Multiple	Total
Viral disease	25	37	62	18	18	36
From February 2021						

Cardiac viral diseases						Viral diseases		
2019			2020			2021		
Only	Multiple	Total	Only	Multiple	Total	Only	Multiple	Total
32	29	61	19	42	61	25	37	62
						From February 2021		



CoGP Practice for Scottish Finfish Aquaculture mortality data

- As agreed at the Farmed Fish Health and Welfare Working Group Committee, extraordinary mortality events should be reported to the Marine Scotland, Fish Health Inspectorate.
- The industry accepted the recommendation.
- The criteria for seawater Atlantic salmon have now been adopted into the CoGP.
- This now is delivered in practice as a requirement of the Code of Good Practice (CoGP) for Scottish finfish aquaculture.

CoGP Practice for Scottish Finfish Aquaculture mortality data

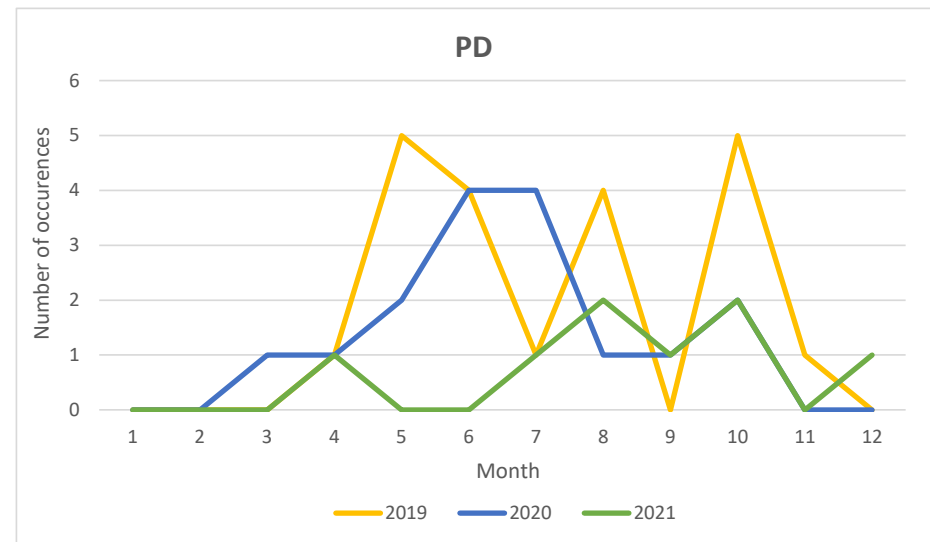
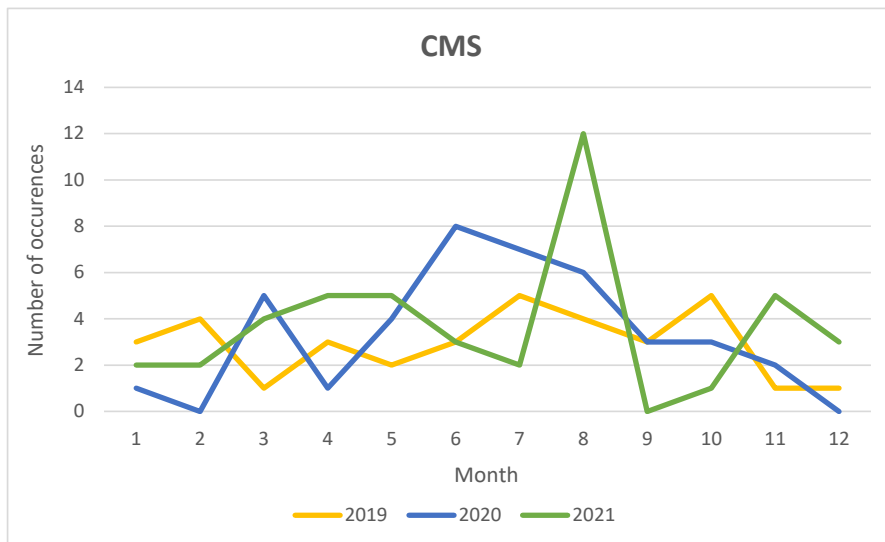
Mortality thresholds for reporting to the FHI

Site Average Weight	Weekly Mortality Maxima	5 Weekly Rolling Mortality Maxima	Species\Water type
<750g	1.5%	6%	A. salmon\SW
>750g	1.0%	4%	A. salmon\SW

- Metadata related to individual mortality events can be limited and often includes multiple causes, so assigning an accurate % mortality to a specific cause is difficult.

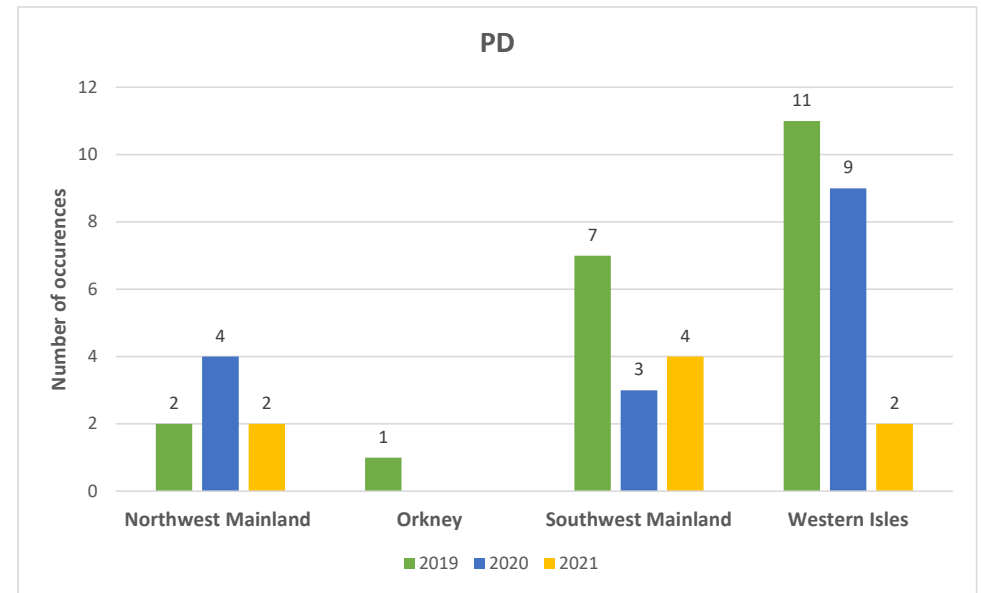
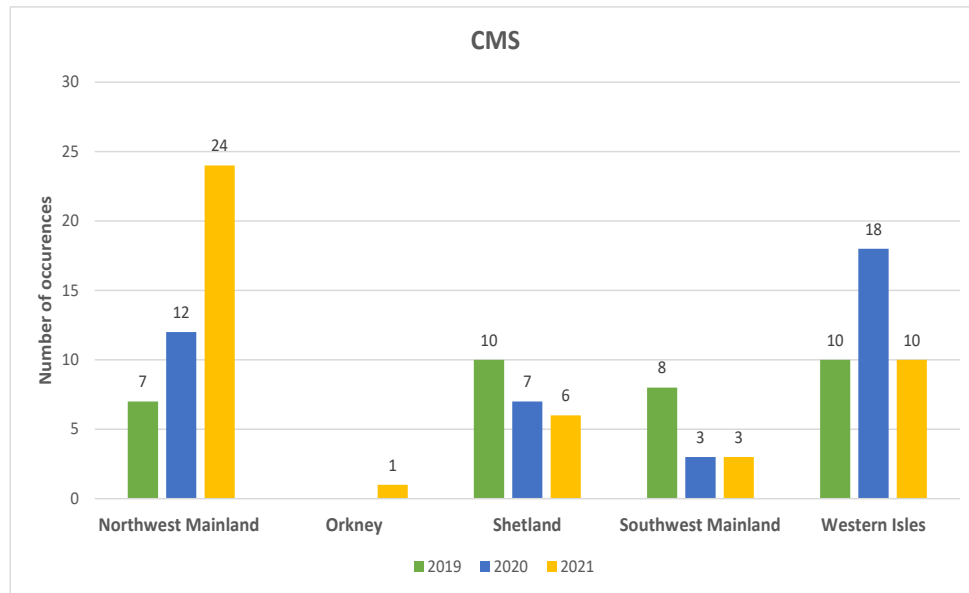
CoGP for Scottish Finfish Aquaculture mortality data

	2019			2020			2021		
	Only	Multiple	Total	Only	Multiple	Total	Only	Multiple	Total
CMS	21	14	35	14	26	40	12	32	44
HSMI	0	0	0	0	2	2	0	4	4
PD	10	11	21	1	15	16	3	5	8



Each occurrence is as a farm for a given month.

CoGP for Scottish Finfish Aquaculture mortality data



Summary

- Both data sets produced similar findings (2019 & 2020).
- Similar number of CMS cases (34-40) reported in both 2019 & 2020 with it also being reported in smaller fish (1.8kg) as well as harvest sized fish.
- A slight increase in CMS cases (44) in 2021 (only one data set).
- The number of CMS cases (24) doubled in Northwest Mainland in 2021.
- HSMI cases were quite steady with a small tendency of increase.

Summary

- Slight decrease in the number of PD related cases in 2020 and the tendency continue in 2021.
- Some geographical variation in the number of reported cases.



Thank you for your attention