Slhawt'/Herring Survey Report
Átl'ka7tsem/Howe Sound

Tem Lhawt' - Winter and Spring 2022

Left: Ch'emesh (herring eggs) laid on rushes in Skwelwil'em/Squamish Estuary. Photo M.VanOostdam
Right: Surveying spawn on rockweed (Fucus distichus) with Siam Smanit (chief mountain) in the background. Photo J.Herman

Research and report team:

Project Lead and Author of Report
Matthew Van Oostdam, Community Member and SD48 School Teacher

Átl'ka7tsem/Howe Sound Marine Stewardship Initiative
Fiona Beaty, Steering Committee Chair & PhD Candidate
Courtney Smaha, Project Director & MA Candidate
Bridget John, Program Manager & MSc Candidate
www.howesoundguide.ca

A project of MakeWay

Preface:

This project took place on the unceded territory of the Sḵwx̱wú7mesh Úxwumixw (Squamish Nation). Sḵwx̱wú7mesh territory spans from the village of X̱wáýx̱way in the south, to Ch'ḵw'elhp in the west up into the Tantalus Mountains. The territory goes north to Whistler and east to the drainage of the pitt river and south again toward the Indian Arm and the villages of the north shore, Eslhan and Xwmélts'stn.

Átl'ḵa7tsem is one of three Sḵwx̱wú7mesh place names for the ocean inlet that the town of Squamish is found within. Large rivers like the Squamish, Ch'iyáḵmesh, Mámxwem, Cheekeye, Sawa̓́7elt all flow past town and into the estuary. On the west side of Átl'ḵa7tsem past towering granite cliffs that feed into the water is the old village of Swiya̓́t, also known as the Woodfibre mill and town site where three notable creeks flow straight into Átl'ḵa7tsem.

In recent years, throughout this region, there has been a growing recognition that Pacific herring (*Clupea pallasii*) are present and play a vital role in this large ecosystem of relationships.

Opening thoughts from Charlene Williams:

"Tem lhaawt, means the time of Herring in Skwxwu7mesh, this amazing little fish and their Ch'eme'sh- herring eggs, were a staple in the diet of the Skwxwu7mesh since time immemorial. One of my elders shared with me that when we as Skwxwu7mesh are hosting our Potlatches, (the feasts where we gather, hold ceremony and share our wealth with the community), we are following the example of the generosity of the lhaawt and the salmon. I witnessed the gathering of our relatives in the animal kingdom last year when the lhaawt were spawning, and indeed it seemed to be a Potlatch of the animals; birds, seals, otters, and many others gathered to feast on the bounty of the lhaawt.
For at least three generations the lhaawt had all but disappeared from the waters of Atl'kitsem and until three years ago my children and I had never witnessed a herring spawn. We raise our hands in gratitude to all the amazing people who worked so diligently to clean and restore the waters of Atl'kitsem which has helped to bring the pulse of life back to our sacred waters. We raise our hands in gratitude to our Elders who insisted that we teach our mun mun- our children, about the importance of this little fish to our people and the ecosystem. Without their guidance we would not have set out to attempt a traditional harvest of Chemesh and be pleasantly surprised when IT WORKED! This excitement inspired even more youth and community to inquire about the lhaawt and begin conducting surveys of the spawn. This work of connecting with and telling the story of the lhaawt is such important work not only scientifically but to inspire our communities and give us hope that we can work to bring health back to our Mother Earth. Chen wanáxwstúmi" - Charlene Williams

Manager, Education Department
Squamish Nation - Squamish Valley Operation

Background:

The Átl'ka7tsem/Howe Sound Marine Stewardship Initiative (MSI) is a collaborative and community-led initiative whose goal is to build capacity to protect the human and natural values associated with Átl'ka7tsem/Howe Sound's marine environment in the face of growing anthropogenic pressures. The MSI is a project on MakeWay's shared platform.

To achieve its objective, the MSI creates and maintains decision-support tools that effectively arm local decision-makers and community groups with robust data and holistic information about the region's marine realm. One such tool is an online interactive map (known as the "Marine Reference Guide") and database that includes hundreds of data layers about Átl'ka7tsem's marine ecology, human activities, and vulnerability to anthropogenic pressures (e.g. climate change). This map visualizes areas of multi-use and potential conflict, and provides valuable baseline data at a regional scale.

In addition to creating decision-support tools, the MSI conducts research and monitoring activities to fill data gaps as identified in the Ocean Watch Report(s), and provides training and builds capacity within the community. As identified within the Ocean Watch Report (2020), "there is a lack of monitoring data on forage fish in Átl'ka7tsem/Txwnewu7ts/Howe Sound" (Miller, 2020, p. 20). Annually, the MSI seeks to fill data gaps associated with slhawt' (pronounced 'th-lao-t', the Skwxwú7mesh word for herring) distribution, as it is a key socio-ecological indicator, that arms decision-makers with data to ensure ecological health and cultural practices associated with these species are protected and maintained, now and into the future.

This report documents the results of the surveys, which took place during Tem Lhawt' (time of the herring), between the dates of February 16, 2022 to April 16, 2022**.** All data has been made publicly available in the Marine Reference Guide, available at howesoundguide.ca/map.

Regional context and socio-ecological value:

The Skwxwú7mesh Úxwumixw have lived in relationship with the Xay Temixw (sacred lands) since time immemorial. Their origins as a people come from stories on the land where their ancestors formed and appeared (Skwxwú7mesh Úxwumixw, 2022). Slhawt', not only support the local food web but are also a culturally significant fish to the Skwxwú7mesh. For Indigenous people throughout the north Pacific, herring provide a nutritious food source as a fish that is cooked, smoked or processed for its eggs on hemlock boughs or seaweed. Ch'em'esh, as the eggs are called in the Skwxwú7mesh sníchim (language), are a treasured treat for those who still eat them today.

The Department of Fisheries and Oceans (DFO) conducted studies on herring spawn abundance and sites from 1966 to 2001 (Fisheries and Oceans Canada, 2016). Since then, herring spawn presence has not been studied in a formal manner apart from reporting done by Ocean Watch in 2017 and 2020 and citizen science surveys conducted by John Buchanan

starting in 2010. DFO studies are done for stock assessment purposes and when compared with results from J. Buchanan they demonstrate an obvious gap in data along the northwest coast of Howe Sound (Fisheries and Oceans Canada, 2016).

Estimates from DFO state that herring spawn was most abundant in the 1960s and classifications for herring spawn habitat for Howe Sound were medium, minor and low (Fisheries and Oceans Canada, 2016). This occurrence may be in part due to the belief that although small herring spawns are significant for the ecosystem they are not valued for stock assessment purposes, where DFO surveys are prioritized.

In the past 150 years Átl'ka7tsem (Howe Sound) has undergone immense transformation due to large scale industry, resource extraction and pollution from the Britannia Mine. The air around Squamish was once pungent with the smells from the Woodfibre Pulp and Paper mill and many of the beautiful forests people wander through today are second growth following large-scale clear cuts and resource extraction. The transformation of Squamish continues as housing and manicured beaches rise up in the former locations of a chemical plant, log sorts, railway lines and infilled estuary channels. In spite of all this, the natural world grows and flourishes in the central estuary and the spit, a human built dyke has been "renovated" to allow salmon better access to the estuary nursery grounds.

Looking forward, one can observe a new squeeze on this landscape as shoreline developments for real estate and commercial use are increasingly approved. These transformations are a regional trend that are leading to the loss of shoreline and intertidal habitat. This leaves towns, such as Squamish, barricaded by hard armouring (e.g., large sheet pile walls, rip rap barriers, dykes) and shorelines filled with pilings hammered into the ground to prevent erosion. All one has to do is take a walk down the Mamquam Blind Channel or along any of the major waterways and wetlands in Squamish to see this loss of habitat. This change contributes to the loss and destruction of intertidal shoreline spawning habitat that is critical for Pacific herring (Clupea pallasii) to spawn and reproduce.

Image 1: Port Melon - Howe Sound Pulp and Paper Corporation - K.Brownie Photo

Survey methods:

The Slhawt' Survey Program was first initiated in January 2021. That winter and spring was the first time a consistent weekly survey was done to monitor for slhawt' (herring) spawn in Átl'ka7tsem/Howe Sound since the DFO studies completed in the 1970s.

The Slhawt' Survey Program: Searching for Slhawt' is a partnership between the Squamish Nation - Ta na wa Yúus ta Stitúyntsam̓ (Rights and Title Department), the Átl'ka7tsem/Howe Sound Marine Stewardship Initiative, the Átl'ka7tsem/Howe Sound Biosphere Region Initiative, Squamish Streamkeepers and St'a7mes School of School District 48.

Objectives of the study:

1) Document the spatial extent of slhawt' (C. pallasii) spawning in the North end of Átl'ka7tsem/Howe Sound
2) Determine the timing of C. pallasii spawning and peak spawning in the region.

Our goal with this data is to establish a long term dataset to track trends in slhawt' spawn distribution, abundance, and timing. Such a dataset will be useful for future studies of slhawt' in this region and provide a baseline to understand ecosystem responses to human impacts (e.g., development, resource extraction, and climate change).

Surveys collected the following information, according to methods developed by John Buchanan:

- Location of slhawt' spawn (marked with GPS points delineating the start and end, or if a point spawn the centre, horizontally across shoreline). A point spawn was a spawn event that was less than three meters across the shoreline.
- Density of slhawt' spawn (low, medium or high)
- Temperature of water (degrees Celsius)

Surveys were conducted at a total of 13 locations (see Figures 1 & 2). Sites were selected based on Skwxwu7mesh Traditional Ecological Knowledge, past findings by citizen scientist John Buchannan, studies and restoration work done by Squamish Streamkeepers, and other community observations and feedback. Adjustments to survey areas were made based on shoreline health, human access impacts and ease of access. Recommendations and community consultation was conducted in January during a volunteer information session held by Squamish Streamkeepers and the Marine Stewardship Initiative.

Two structured survey programs were implemented to collect slhawt' spawn data:

a.) **Land based estuary surveys**, February 16 – April 16, 2022
Five sites were monitored in the Squamish Estuary (see Figure 1). Land based surveys were conducted by a group of 20 volunteers, based on visual inspection of the shoreline. Volunteers were recruited and trained by the Squamish Stream Keepers (see Appendix 1 for a list of volunteers). In addition, opportunistic survey sites were visited, when convenient, outside of the planned sites.

b.) **Boat/Ocean based snorkel surveys**, February 16 – April 16, 2022
Boat based surveys covered eight sites throughout Átl'ka7tsem (see Figure 2). The ocean based sites were consistently surveyed, two to three times per week, by a team of four (see Appendix 1 for a list of surveyors), identifying spawn through snorkel surveys, accessing remote sites through the use of a 20ft Aluminum Center console vessel contributed by the Squamish Nation.

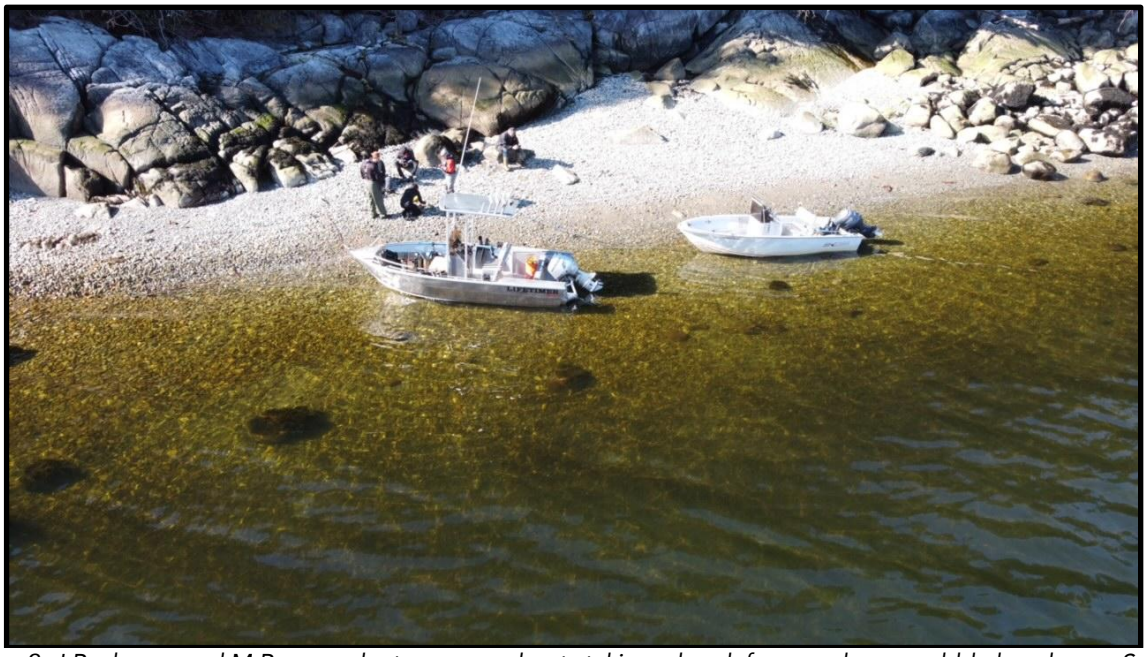


Image 2: J.Buchanan and M.Barrus volunteer survey boats taking a break from work on a cobble beach near Swiyat (Woodfibre). J.Buchanan photo.

Image 3: surveyors checking rock weed with light slhawt' spawn. M.Van Oostdam photo.

a.) Land based estuary surveys, February 16 – April 16, 2022

Five sites were monitored in the Squamish Estuary (see Figure 1). Land based surveys were conducted by a group of 20 volunteers, based on visual inspection of the shoreline. Volunteers were recruited and trained by the Squamish Stream Keepers (see Appendix 1 for a list of volunteers). In addition, opportunistic survey sites were visited, when convenient, outside of the planned sites.

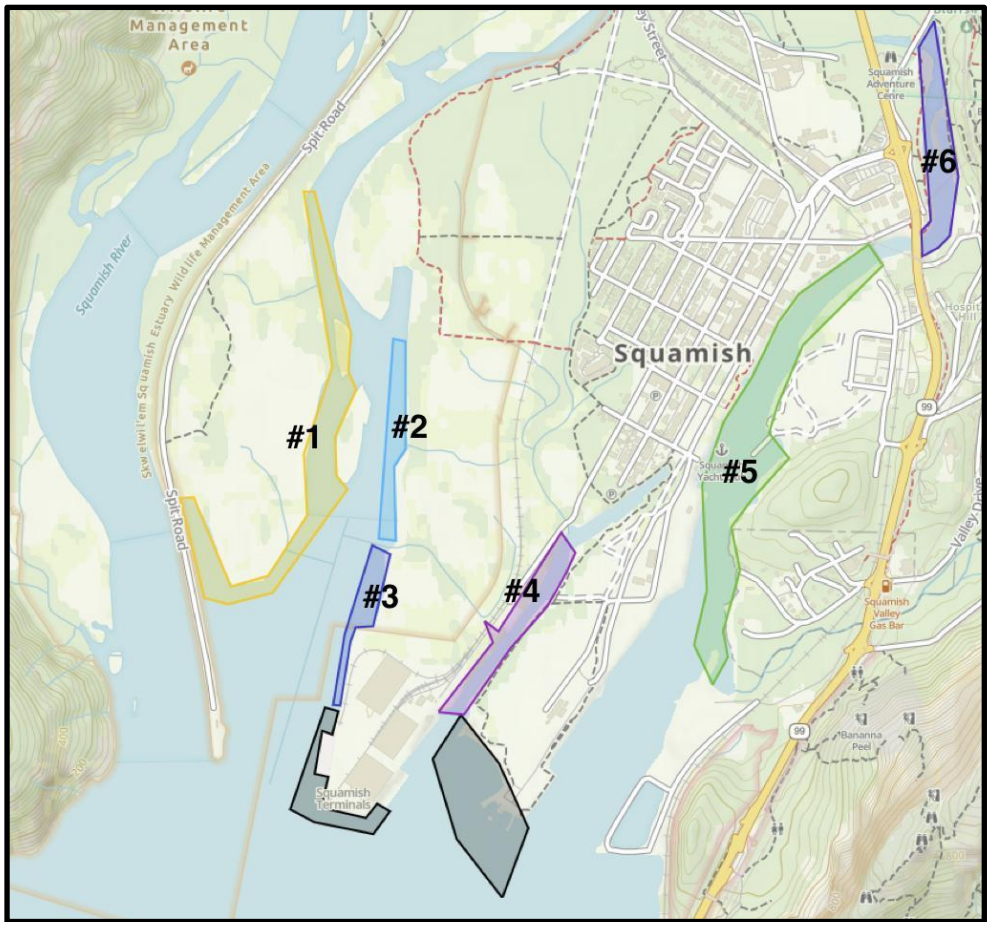


Figure 1. Estuary Survey Sites.
Note: Site #1 Skwelwil'em Estuary (Crescent Slough area), Site #2 Central Estuary Trail, Site #3 Squamish Terminals West Side, Site #4 Cattermole Slough, Site #5 Mamquam Blind channel, Site #6 suggested but not studied, the black marked area is the oceanfront development area that was surveyed as an opportunistic site only monitored when convenient. Map credit: howesoundguide.ca

b.) Boat/Ocean based snorkel surveys, February 16 – April 16, 2022

Boat based surveys covered eight sites throughout Átl'ka7tsem (see Figure 2). The ocean based sites were consistently surveyed, two to three times per week, by a team of four (see Appendix 1 for a list of surveyors), identifying spawn through snorkel surveys, accessing remote sites through the use of a 20ft Aluminum Center console vessel contributed by the Squamish Nation.

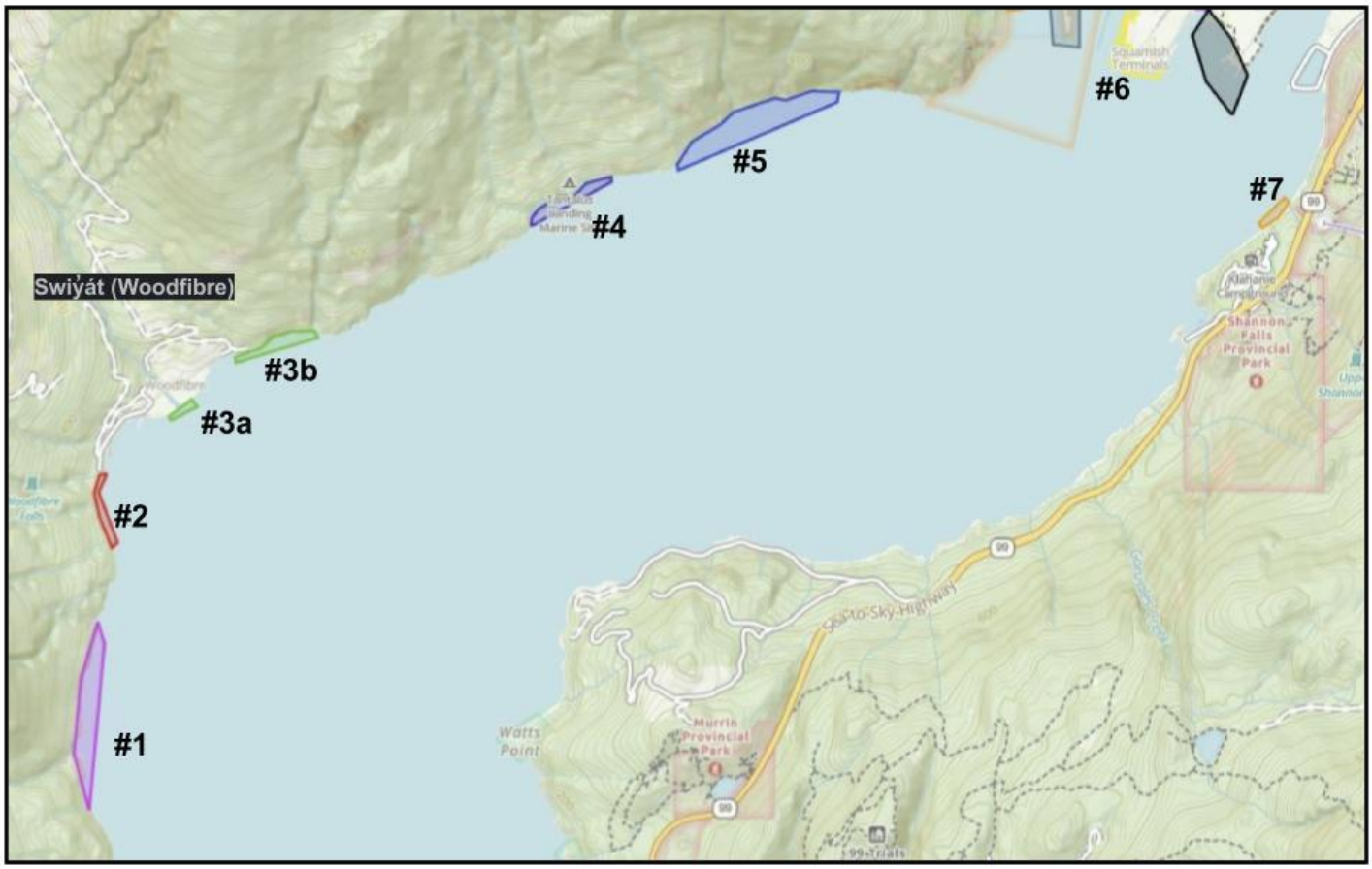


Figure 2. Ocean Based Survey Sites.
Note: Site #1 Foulger Creek, Site #2 Woodfibre Creek, Site #3 Swiyat a. and b., Site 4 Tantalus Landing, Site #5 Western Walls, Site #6 Squamish Terminals and Site #7 Shannon Falls.

Communication of Results During Research Season

Throughout the 2022 Survey Season from January to May results were shared on a weekly basis through custom made maps providing information on observations and findings. Figure 5 and 6 demonstrate how this study provides information to the public in a manner that is relevant and digestible to the community.

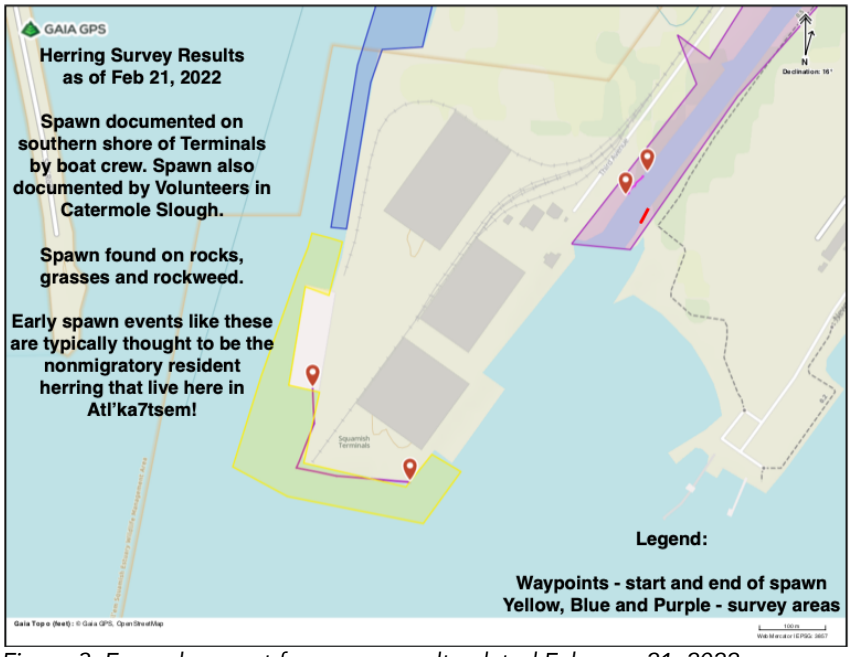


Figure 3. Example report for survey results, dated February 21, 2022

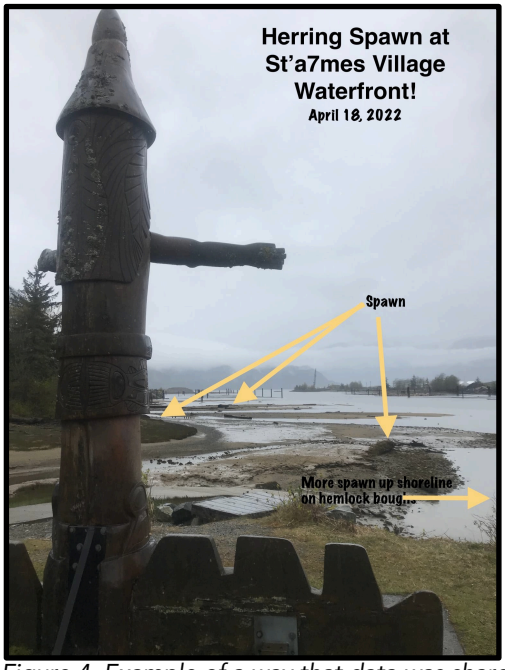


Figure 4. Example of a way that data was shared publicly during herring spawn survey season

Results

Survey Effort and Hours

Volunteer Streamkeepers and staff from the Marine Stewardship Initiative conducted approximately 118 slhawt' spawn surveys. The boat-based survey teams ranged from groups of two to four. The total 2022 season accumulated 477 hours of monitoring. Weekly survey hours were highest during the last two weeks of February and for most of the month of March (Fig 3). By April, volunteer hours dropped significantly showing a decrease in survey effort. Knowing this, for future studies it could be beneficial to strategically spread out volunteer survey efforts throughout the season to ensure more thorough monitoring throughout the entirety of the spawning season.

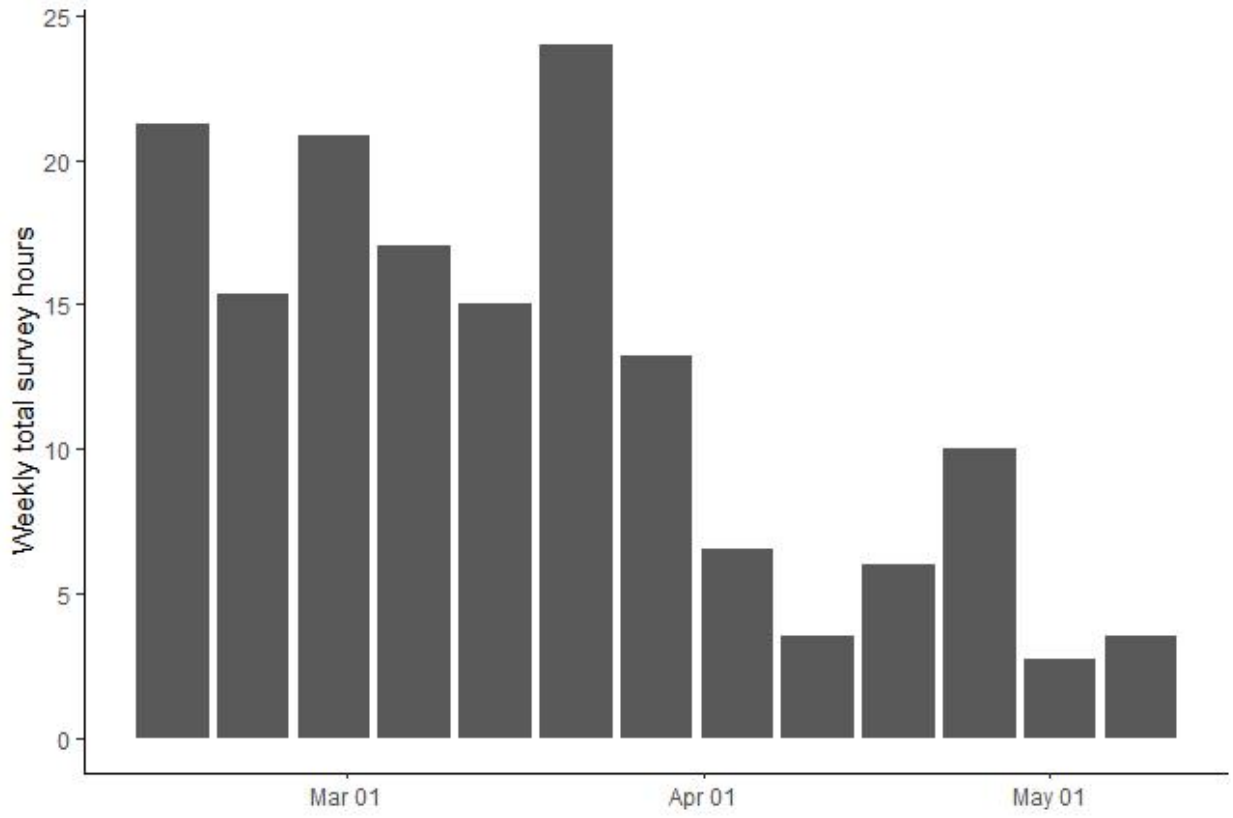


Figure 5. Survey Hours throughout 2022 project.
In Figure 5 the number of hours is shown on the Y-axis and the weeks are shown on the x-axis.

Survey sites visited in a given week.

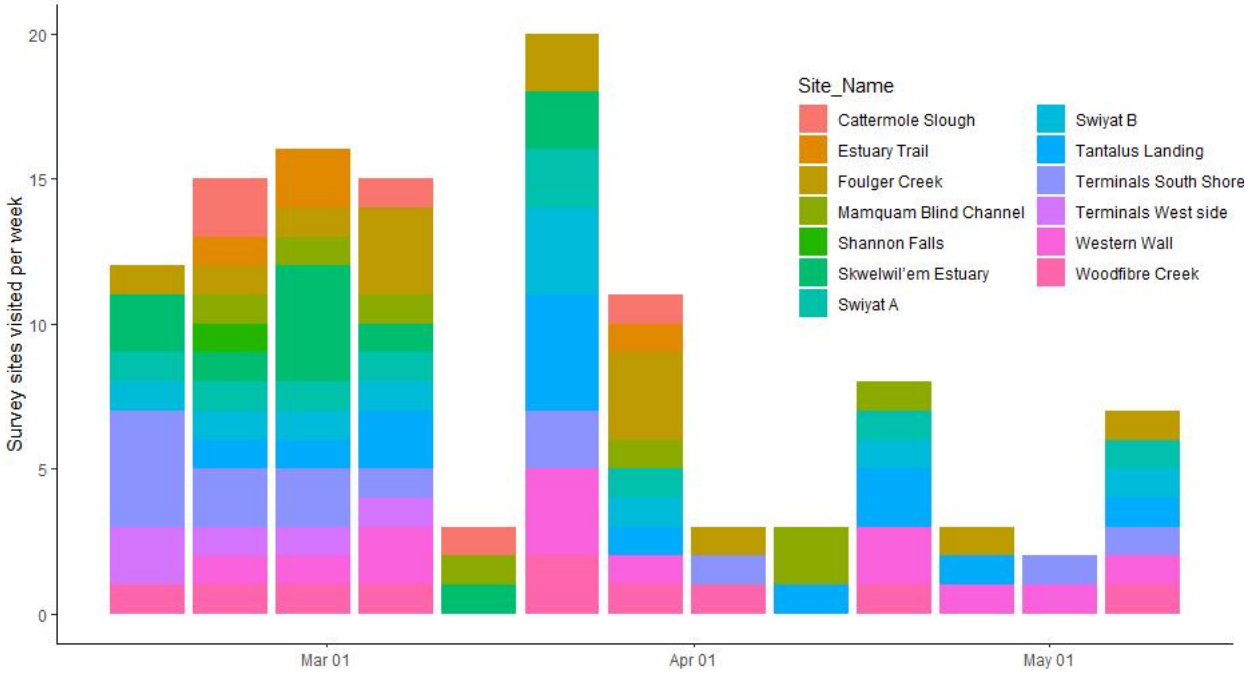


Figure 6. Survey site visits

This graph shows the number of survey sites visited in a given week. Some survey sites were visited more than once in a week. This is shown by doubling that colour in a column. The first week of surveys shows multiple visits to Terminals South Shore as there was a spawn being monitored along the riprap shoreline. The Foulger Creek - Woodfibre Creek (A and B) - Tantalus Landing - Western Wall survey sites were some of the most consistently visited throughout the season and at times they were monitored more than once a week. This was largely due to the fact that these sites were all part of the ocean surveys and monitored by the paid staff on the boat crew.

Slhawt' Spawn Survey Results and Highlights

Results are shown in Appendix 2 in Map form and are separated into two based on the two survey programs.

Land Based Estuary Survey Results
(See Appendix 2 for mapped data)

- In spite of the spit removal work that was taking place there were slhawt' spawns on either side and along multiple lengths of the spit in 2022. This is following the previous year's 2021 spawn event documented by Neil Baker (Squamish Nation) and MSI surveys that took place on March 9th, 2021 in the central estuary. This spawn event was documented on video, and was extensive enough to colour the water in the area.
- A spawn site at the northern end of the central estuary has been documented two years in a row showing slhawt' are actively traveling into this part of the estuary.
- Very little spawn was found in the shoreline/ocean construction site of the Oceanfront Development Project. A site that has historically had spawn events (Átl'a7tsem/Howe Sound Marine Stewardship Initiative, 2022).
- On March 4th, 2022 the Herring Ceremony at the St'a7mes Village waterfront took place. On April 18th two new survey volunteers set out to survey the Mamquam Blind Channel and discovered a large spawn event. The spawn covered pilings at the Harbour Authority marina up to 5mm thick, across the water along the reserve shoreline on rocks, grasses and bladderwrack. Most importantly this spawn also covered hemlock boughs that had been placed in the water by community members and children at St'a7mes School.

A small but early spawn event took place on January 18th on the western side of the Terminals before the study had begun.

Boat/Ocean Based Snorkel Survey Results
(See Appendix 2 for mapped data)

- First spawn event took place on March 25th, 2022 at Foulger Creek. Two guest Skwxwú7mesh Úxwumixw members attended the survey to share stories and teach about prawning and harvesting in the sound. When we arrived at the Woodfibre/Foulger shoreline there were several sea lions traveling up and down the shoreline appearing to dive repeatedly. At one point near the vessel the water was turning a milky color and sea lions were diving all around the boat. The following day the survey team did a snorkel survey of Foulger Creek and documented spawn extending from the site to Woodfibre Creek.

- Unlike past years there were no spawn events documented around Tantalus Landing or the Western Wall sites. In past years, concentrations of spawn were observed at freshwater outlets.
- Kwum Kwum (Defense Islands) and Furry Creek were monitored every few weeks as opportunistic sites, no spawn was observed.
- In Foulger Creek the survey team assisted Jonny Williams with planting a hemlock tree using an anchor and float system in the bay. This was in line with traditional ch'em'esh (herring roe) harvesting practices. During the March 25th spawn event a small amount of eggs on hemlock boughs was harvested and brought back to the community for food. Families, elders and youth came to collect a small amount of this delicacy that was distributed. Some ch'em'esh was also brought up to St'a7mes School and sent down to the Xwmélts'stn school. At St'a7mes school, students learnt from elders Cynthia Lewis and Eileen Lewis how to clean the eggs off hemlock boughs and ate them with baked bread, butter and dungeness crab also harvested by the survey team.

Image 4. Left - Racks of hemlock and cedar boughs being strung out at the St'a7mes waterfront during the welcoming of herring ceremony.
Image 5. Right - deceased herring found at spawn site.

There are three dot sizes representing results as well as the option to have no points marked. If a site was checked then the small dot is present. If spawn is found at a site the medium sized dot is marked. If a second spawn is found in that location the larger dot is shown. When no dot is present it shows that a site was not checked at all at that time. Cattermole Slough, Terminals South Shore and Mamquam Blind Channel were three sites that received two spawn events. From April 1st onwards this graph also shows how many of the sites were not visited consistently as there is no dot marking a completed survey. It is also clear that Shannon Falls was rarely checked and documented as it is blanks apart from one check.

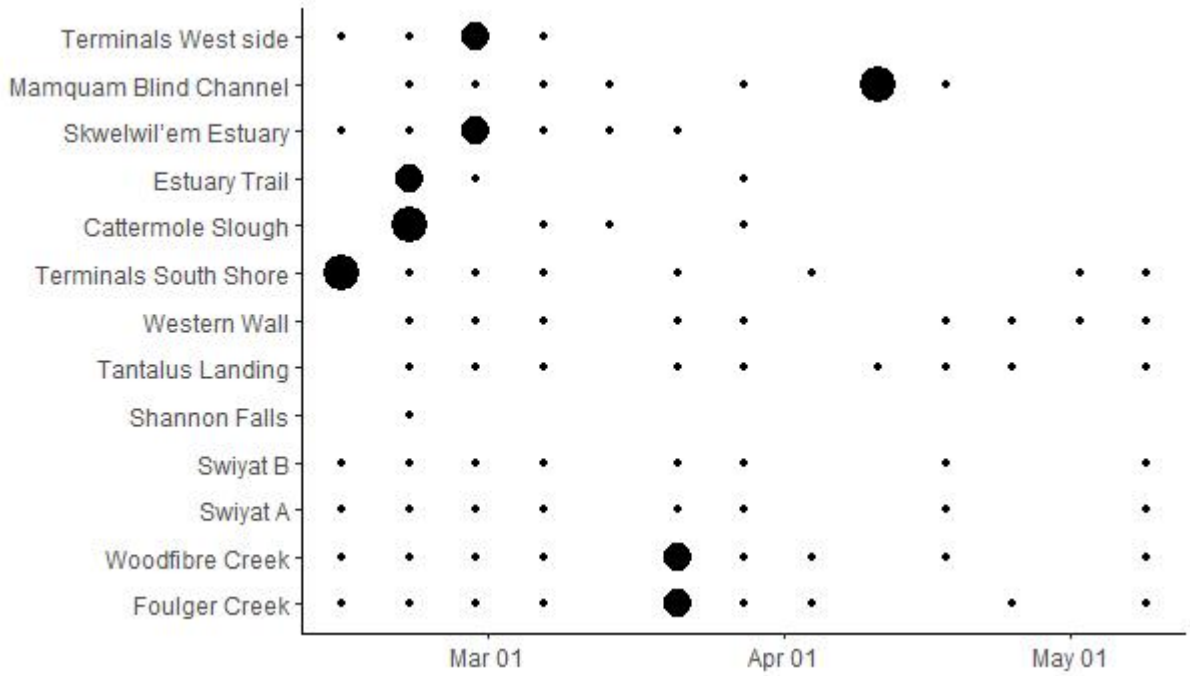
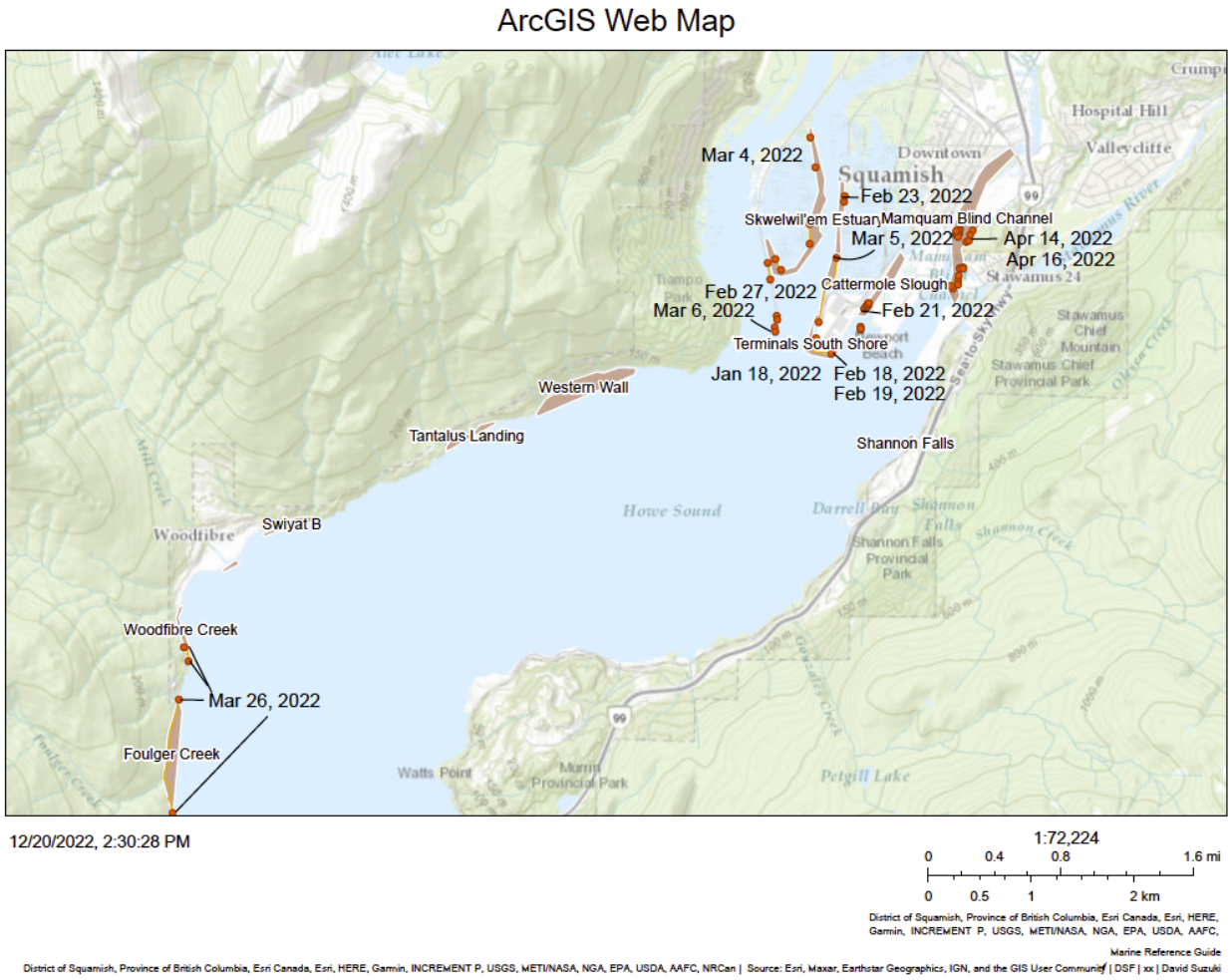


Figure 7. Gaant Graph depicting spawning activity across survey sites throughout the 2022 study.

There are three dot sizes representing results as well as the option to have no points marked. If a site was checked then the small dot is present. If spawn is found at a site the medium sized dot is marked. If a second spawn is found in that location the larger dot is shown. When no dot is present it shows that a site was not checked and we therefore do not know what was occurring in this survey site. This is a gap and area for improvement in the study. The sites along the y-axis are organized from North to South.

Spawn Events Timeline



Jan 18th, 2022 - First small spawn event documented on the western side of Squamish Terminals
Feb 18, 2022 - Terminals south shore spawn event
Feb 19, 2022 - Terminals south shore second spawn event
Feb 21,2022 - Cattermole Slough - small spawn event at south end of survey site (during pile driving on oceanfront side)
Feb 23, 2022 - Central Estuary -
Feb 27, 2022 - Cattermole Slough - second spawn event in same area
March 4, 2022 - Estuary Trail survey site - spawn found along steep bank in bladder wrack and shore grasses.
March 5, 2022 - Terminals West Side spawn event
March 6, 2022 - Skwelwil'lem Estuary (spit road area)
March 26, 2022 - Foulger Creek - Big spawn event reaching down to Woodfibre Creek as well.
April 14, 2022 - Mamquam Blind Channel Spawn event on both side of channel.
April 16, 2022 - Mamquam Blind channel secondary spawn expanding extent of surfaces eggs were found on.

An interesting observation that can be made based on the spawn events documented is that slhawt' came into the Skwelwil'lem Estuary and town of Squamish area in January, February and March to spawn. By the end of March there was then a big spawn along the Foulger Creek to Woodfibre Creek area. Almost three weeks later, there was then a big spawn event all along the Mamquam Blind Channel. This was the last documented spawn of 2022.

Further studies are recommended to understand what populations of slhawt' are spawning in these locations, and if resident slhawt' spawn at certain locations or times of year.

Image 6. Vivian Joseph skipping the survey boat.

Image 7. Herring spawn on rock weed.

Conclusion and next steps:

The goal of the Searching for Slhawt' project is to establish a long term dataset to track trends in slhawt' spawn distribution, abundance, and timing. During the 2022 spawning season, improvements were made to the methods, quantity of data collected, and quality of spawning delineation, when compared to surveys conducted in the 2021 survey year.

Four major observations were made during the 2022 survey year:

1) The first spawn event took place on January 18th, 2022, approximately one month prior to starting slhawt' surveys. This indicates that slhawt' monitoring and survey efforts should be commenced earlier in the season than initially recommended.
2) Spawn were observed to occur in low density, in close proximity to anthropogenic disturbances such as the spit removal, and Oceanfront Development project. Further research is needed to confirm this.
3) Similar to the trends captured by citizen scientist John Buchanan, Foulger Creek to Woodfibre Creek continue to be a major spawn site for slhawt'.
4) Volunteer surveying effort dropped off significantly in April and May after a large push of effort during the initial month. This tells us that we need to find a way to spread out survey efforts in order to sustain volunteer interest and efforts over a longer period of time.

It is recommended that surveying continue to be conducted throughout Átl'ka7tsem/Howe Sound, to monitor this important species, filling knowledge gaps associated with spawning activity of this ecologically and culturally important species.

Image 8: Harriet the Herring in rushes along a piece of shoreline with dried herring eggs in Cattermole slough.
Image 9: student at Aya7Ayulh Chet holding hemlock bough with ch'em'esh. M.Van Oostdam photos

Acknowledgements:

All of this work takes place with the understanding that generations of people have come before us and carried on knowledge and a relationship to this land. Kiyowil, Elder Bob Baker was one of the initial guides for this work along with the Squamish Nation Elders group who spoke with us so that our work is done correctly. We raise our hands in respect to honour those that came before us and those that will follow.

The MSI wishes to thank the many partnering organizations whose collaboration and support made this work possible. The Squamish Nation provided the project with access to their boat to conduct survey activities, Squamish Streamkeepers provided the project with coordination of volunteer efforts, volunteer supplies, and fuel for ocean based surveys, Rhonda O'Grady and the Squamish River Watershed Society, RUX provided the project with gear bags, Immenso Wetsuits provided snorkel survey gear, Mustang Survival provided the project with life jackets, Aya7Ayulh Chet brought youth and their energy to the project, the David Suzuki Foundation for their in-kind GIS and mapping contributions and to Arthur Bass for his data processing and analysis support. We are also grateful to those who provided funding for these surveys, including the West Vancouver Give Where you Live Campaign through the Átl'ka7tsem/Howe Sound Biosphere Region Initiative, Matthews West, RUX, and the Squamish Nation Culture Fund. Finally, we wish to thank all local governments in Átl'ka7tsem, as well as the region's residents, communities, and the First Nations for demonstrating the effective and proactive leadership and stewardship that is required to protect Átl'ka7tsem's critical and vulnerable marine species, such as slhawt'. Together we look forward to continuing to build our relationship with the land.

Image 10: Survey training day in 2021. Fiona Beaty photo.
Image 11: sampling of spawn with Douglas Swanston of NWSeacology for DFO pilot study. M.Van Oostdam photo.

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Sk□wx□wú7mesh Úxwumixw. (2022). *About our Nation*. https://www.squamish.net/about-our-nation/

Appendix 1

List of Herring Survey Volunteers and Staff

Our hands are raised in gratitude to all the volunteer surveyors and staff. This work would not be possible without the energy, time and passion that you bring forth to caring for this land.

Slhawt' Survey Staff:

- Jonny Williams, Myia Antone, and Vivian Joseph (Squamish Nation Marine Stewardship Initiative Survey Members)
- Courtney Smaha and Bridget John (Marine Stewardship Initiative)
- Nikita Wallia (GIS Analyst, David Suzuki Foundation)
- Zoe Blue (Lead volunteer coordinator Squamish Stream Keepers)
- John Buchanan (Local Citizen and Slhawt' Survey founder and mentor)

Slhawt' Survey Volunteers

- Patrick MacNamara
- Brandan MacDonald
- Sofie Vielfaure
- Sean Sweeney
- Emma Cummings
- Krystal Chin
- Teresa Rowley
- Pam Tattersfield
- Emily Wharin
- Sophie Vanderbanck
- Jessica Riquetti
- Alex Harris
- Michael Barrus
- Stephanie Perron
- Alison Wald and Spencer Fritschen
- Connor Ronayne

Volunteer Surveyors

Boat Survey Team

Welweltenaat Myia Antone

Vivian Joseph

Matthew Van Oostdam

Jonny Williams

Kieran Brownie (media professional)

Appendix 2

Herring spawn survey maps
February – May 2022

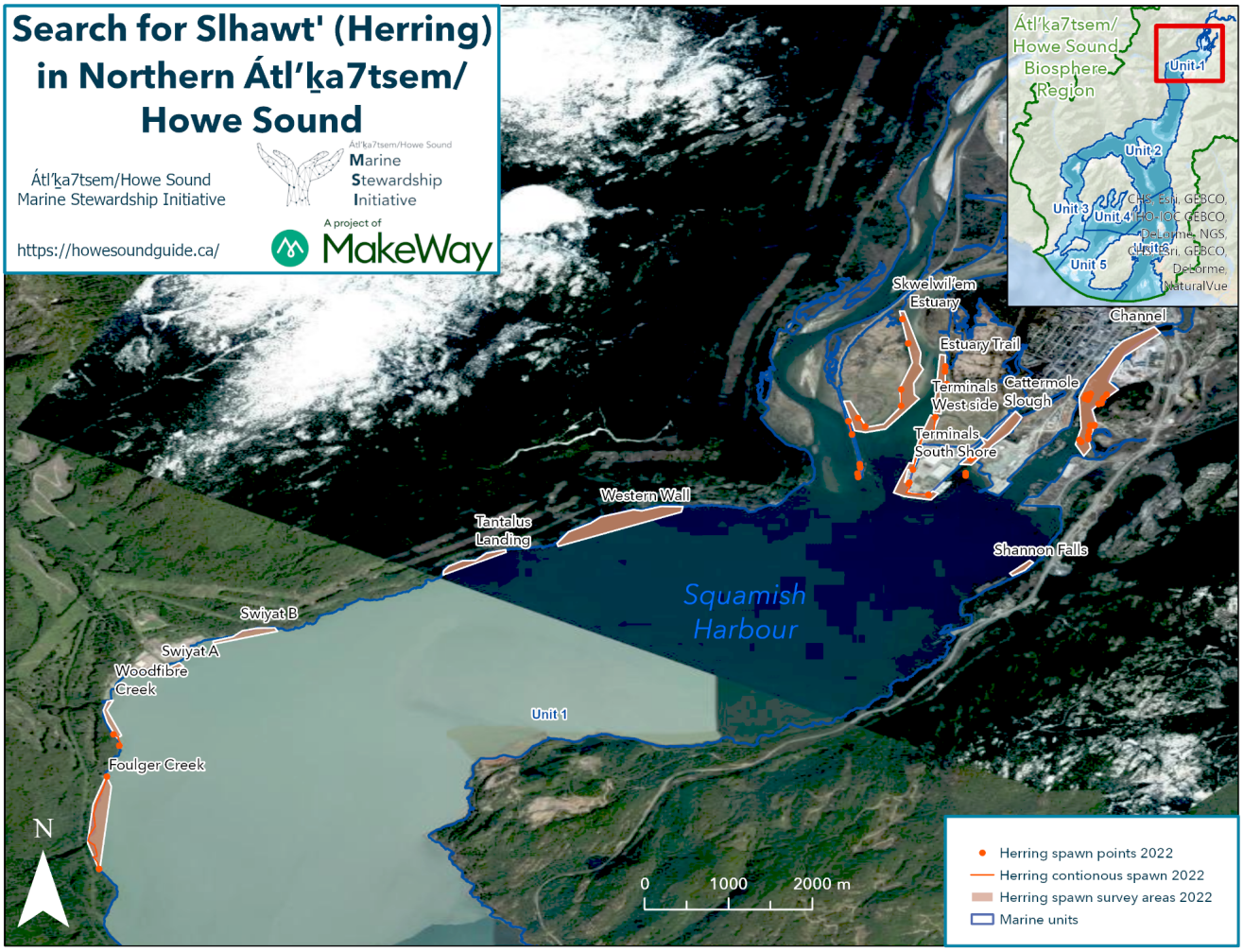

Figure 6. Documented spawn sites for the entire survey area 2022
Note: This map shows the survey sites from both the estuary and boat surveys. Orange dots represent herring spawn points less than 3m and orange dots connected by an orange line show a length of shoreline with continuous spawn.

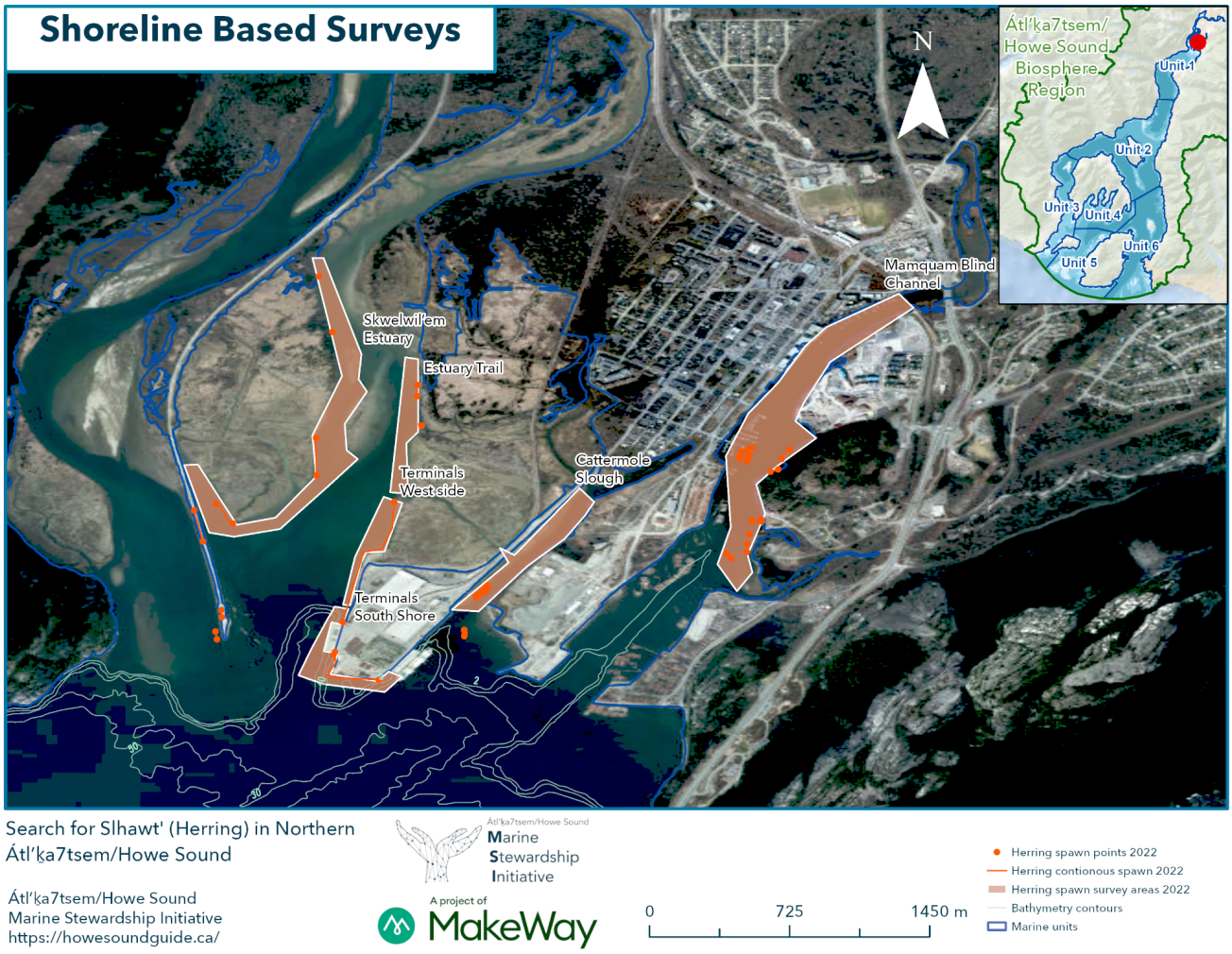

Figure 7. Results from Estuary (shoreline) Study Area 2022

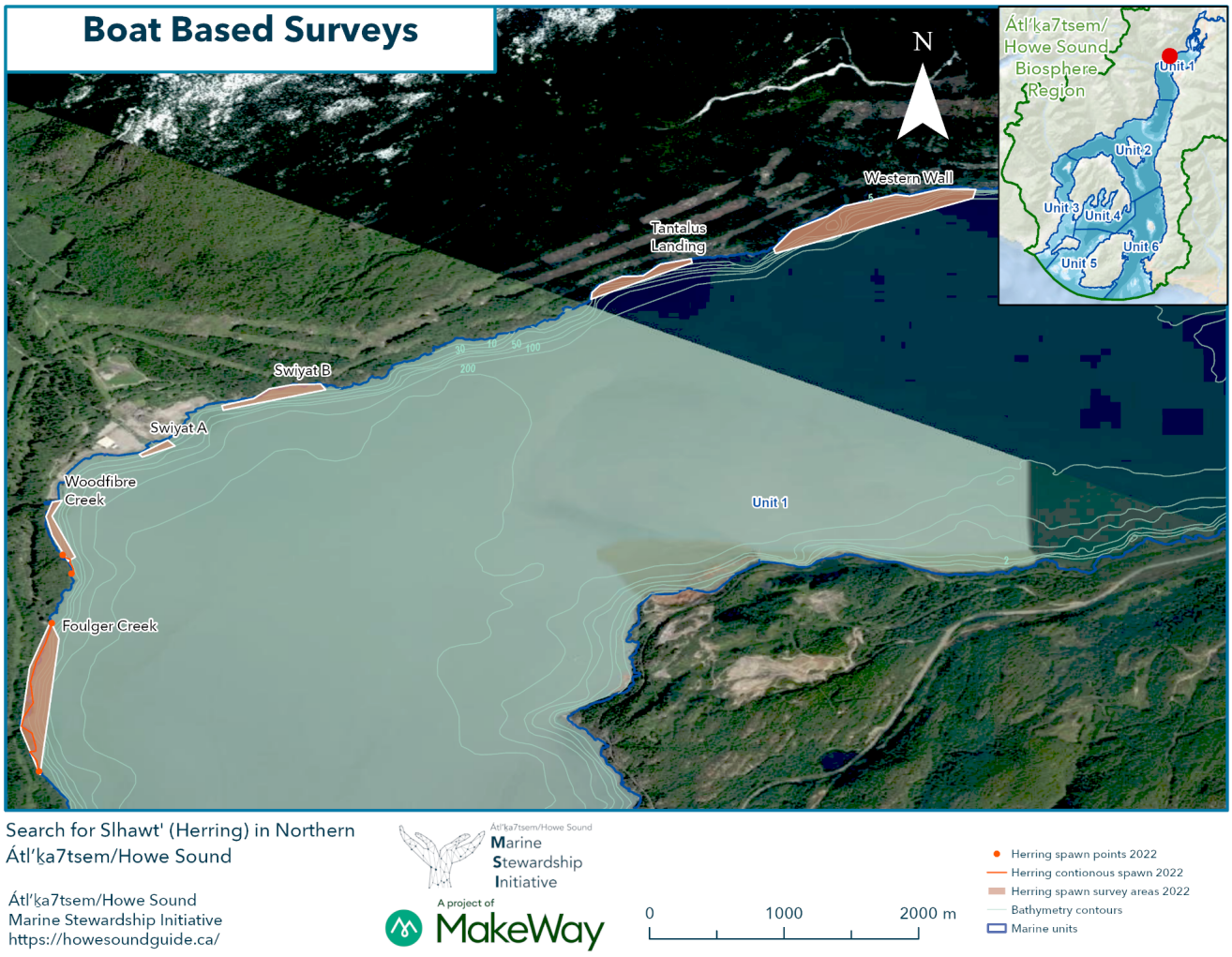

Figure 8. Results from Boat Based Study Area 2022

2021 Herring Spawn Map

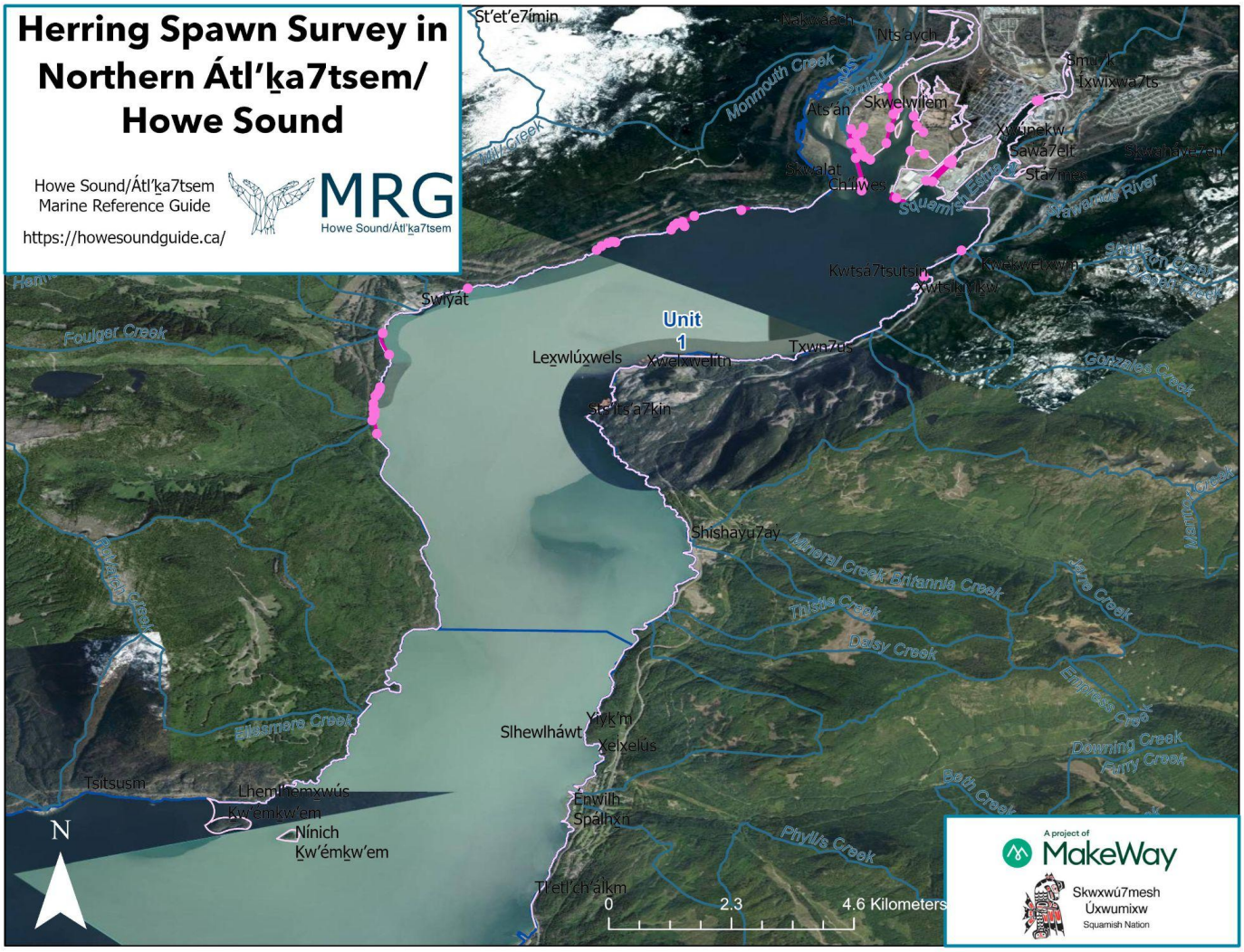

Figure 9. Results from Boat Based Study Area 2021

See you next season!

Image 10: After a long spring day of surveying we are reading for the warmth of the sun and to rest our legs after months of swimming the shore of Átl'ka7tsem.