Annual Report for the 2022 Port Moller Test Fishery

Date	S2	S4	S6	S8	S10	S12	S14	S16	S18	S20	S22	Mean Daily Catch Index (Stns 2-22)
10-Jun						2	32	0	2	0	0	6
11-Jun			0	0		79	2	4	0	2		12
12-Jun	0	2	8	7	0	16	2	0	4	2	0	4
13-Jun		0	87	19	2	44	0	7	2	0	8	17
14-Jun		0	2	52	70	134	38	0	0	0		33
15-Jun		0	13	42	0	74	65	0	10	0		23
16-Jun		0	0	82	247	100	0	0	4			54
17-Jun			323	118	114	213	75					169
18-Jun	0	3	27	36	156	41	0	0	0	2	4	24
19-Jun	0	5	0	252	194	24	0	48	4	0		53
20-Jun		7	111	16	47	0	3	46	2			29
21-Jun		40	204	45	120	48	6	63	120	3		72
22-Jun	8	0	50	41	4	26	18	38	84	0	0	24
23-Jun	30	0	155	62	4	25	31	0	9	125		44
24-Jun	0	0	123	238	16	92	7	75	0	0		55
25-Jun	9	3	81	261		25	0	96				68
26-Jun		0	0	8	3	0	3					2
27-Jun	0	0	8	4	4	0	0	82	3	0		10
28-Jun	0	5	3	45	2	4	0	116	90	0	13	25
29-Jun	0	3	3	0	0	0	0	113	18	0	0	12
30-Jun		8	0	3	16	0	198	198	38	42		56
1-Jul	0	5	31	2	55	0	0	344	3			49
2-Jul	8	36	62	0	2	0	25	237	141	17	0	48
3-Jul	0	3	0	0	0	0	0	170	27	23		22
4-Jul	0	7	18	0	0	0	0	31	131	16		20
5-Jul		4	19	0	0	0	0	18	102	50		22
6-Jul	3	0	0	10	0		32	71	68	78	10	27
7-Jul	3	5	2	12	25	5	32	15	21	0	9	12
8-Jul	16	8	6	0	13	3	34	4	0	0		8
9-Jul	46	10	2	16	73	9	68	21	104	14		36
10-Jul	18	0	3	10	30	27	32	14	24	3	0	15
11-Jul	209	0	29	116	21	35	19	20	58	11	11	48
12-Jul	0	6	13	30	32	8	0	14	0	4		11
13-Jul					17	7	12	0	4	3		7
14-Jul	6	11	0	35	14							13

Table header: **Daily Catch Index by Station** (Est. catch from the 200 fathom net if it had fished for 1 hr) | **Mean Daily Catch Index** — Best for assessing entry pattern this year

BBSRI

April 2023

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Prepared by

Scott W. Raborn[1] and Michael R. Link[2]

Prepared for

Bristol Bay Science and Research Institute
P.O. Box 1464
Dillingham, AK 99576
www.bbsri.org

Bristol Bay Fisheries Collaborative
www.bbsri.org/bbfc

and

Bristol Bay Regional Seafood Development Association
3705 Arctic Blvd, #1188
Anchorage, AK 99835
www.bbrsda.com

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[1] LGL Ecological Research Associates, Inc., 4103 South Texas Ave., Suite 211, Bryan, TX 77802
[2] Bristol Bay Science and Research Institute, P.O. Box 1464, Dillingham, AK 99576

Executive Summary

In 2022, the Port Moller Test Fishery (PMTF) operated from June 10 to July 14 using two research vessels—the R/V *Ocean Cat* and the R/V *Halfmoon Bay*. A total of 5,142 Sockeye were caught in 326 sets distributed across Stations 2-24 to provide the information used for inseason forecasting. An additional 64 sets at odd stations, three sets at Station 0, and two sets at Station -1 produced 1,717 Sockeye and helped to assess the patchiness of the migration past the test fishing transect. The test fishing effort in 2022 represents the greatest coverage in the history of the program; moreover, no days were missed due to weather or mechanical issues.

The email distribution list ended the season with 1,107 email addresses, up about 16% over 2021. The median time between sample collection and stock composition release to the distribution list was a single day during the 2022 season; the maximum lag time was only two days. The turnaround time for 2022 estimates was about two days faster than what has been observed since 2010. Over the entire season a total of 13 estimates were released (about four more than in previous years). The reduced turnaround time between genetic tissue collection at the PMTF and release of the stock composition estimates, as well as increased frequency and number of estimates for 2022 was due entirely to the onboard genetics lab that allowed genotyping to be done at sea.

On June 15 and June 22, we estimated the weights of the average Sockeye passing the test fishing transect to be 4.6 and 4.8 lbs, respectively. These estimates were slightly less than the 5.0 lbs reported for inshore catch by ADF&G in their season summary. The estimated age composition based on the PMTF reflected that of the inshore run reasonably well, although age-1.2 and 1.3 were generally under- and over-represented at the test fishery, respectively. Genetic samples taken at Port Moller were foretelling of the run's inshore stock composition.

The 2022 run was the largest on record coming in at 79 million with 50% of catch + escapement (C+E) occurring by July 4, the date we use to reference an "average" run timing. Run timings over the previous seven years (2015-2021) have been late (mean=4.3 days late; range=2-6). The seasonal pattern in this year's run was similar to 2021, but with higher peaks prior to the midpoint.

The pattern in catches across stations was unique for 2022 in that apparent shifts in passage rates occurred along the transect throughout the season. An inner mode centered on Station 8 was evident early on peaking during June 17-22, then dissipated by June 28 giving way to an outer mode centered on Stations 16 and 18 that began forming around June 23 and peaked on July 1-2. Catches were uniformly distributed across stations starting on July 10. The average Daily Index was based on Stations 2-22 and depicted three distinct peaks in the passage rate past the PMTF—June 17-25, 2nd = June 30-July 2, and 3rd = July 9-11—that corresponded to the shifts in catches across the transect.

The Daily Index was not indicative of the entry pattern for C+E. As such, our anticipation of run magnitude and timing was amiss. Four days of low catch indices during June 26-29, the dates when Port Moller usually peaks, failed to manifest as lulls in C+E days later. Seasonal shifts in the travel time (TT) between the test fishery and inshore may have washed out the highs and lows in the passage rate before they reached the commercial districts. However, low catches over four days at Port Moller should have been more pronounced inshore even with the mixing of fish across adjacent days if the test fishery was truly reflective of the passage rate. We feel the more likely explanation is that catchability unknowingly changed, which altered the return-per-index (RPI=the number of fish inshore that each catch index point at Port Moller represents). In other words, the passage rate increased more or less consistently and then subsided as the season progressed, but our ability to catch passing Sockeye probably changed throughout the season and at least declined during those four days especially across the inner stations.

Reasons for changes in catchability at the test fishery are difficult to isolate. Prior to 2018, we suspected that a primary cause was incomplete transect coverage. Before then, the outermost station fished was typically Station 10. Beginning with a pilot study in 2018 to assess the feasibility of covering the entire transect (Stations 2-22/24) with two boats, better coverage has been achieved especially in 2019. Missed consecutive days due to weather and mechanical problems hindered view of the passage rate during 2020 and 2021. The interpolated values for missed data did not fit the inshore C+E pattern in these years. However, the two vessels used in 2022 were able to cover the transect almost completely, and no days were missed entirely. Sampling odd stations in between the even stations used to create the Daily Catch Index showed that some bands of fish were missed occasionally, but the extent to which this caused bias remains unclear.

We favor the hypothesis that a change in fish behavior was the culprit. That is, fish passing the transect fluctuated in their susceptibility to the net by migrating deeper at times and/or exhibited milling behavior whereby they were less driven towards the spawning grounds. Seasonal differences in migration depth could have been influenced by environmental variables such as water temperature. Greater catches seemed to align with sea surface temperatures of 8-9 °C and subside at temperatures greater than this.

Recommendations for project scope in 2023:

- Continue to sample stations across the entire fishing transect as time and effort allow using two vessels large enough to stay on the fishing transect.

- Continue to sample beyond July 10 as run timing dictates.

- Stop recording data of limited value. These variables include whether salmon were caught in the top versus bottom of the net, air temperature, cloud cover, light intensity, effective net length, and sex of the fish.

- Randomize the starting point of the transect for each day and then systematically sample the stations at 10-mile separations. Such a design would eliminate any bias caused by consistent banding or patchiness across the transect without incurring additional bias or compromising precision. Starting points for each day should be determined prior to the season's start. For instance, Station 2 for each day would start anywhere from Station 1 to Station 3 minus one mile.

- Continue genotyping tissues at sea for generating stock composition estimates.

- Continue imaging salmon scales at sea.

- Assess the extent to which the standardized gillnet is missing deeper migrating salmon using side-scan sonar. In addition, a deeper net should be used to spot check the extent to which deeper fish are being missed when certain conditions are present (warmer water, calm seas, low wind, and greater water visibility).

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Introduction

The Port Moller Test Fishery (PMTF) has been conducted since 1967 with drift gillnets set at fixed stations offshore from Port Moller, Alaska (Figure 1; Randall 1977; Eggers and Fried 1984). Historically, the primary goal has been to predict run strength of Sockeye Salmon (*Oncorhynchus nerka*) traveling past Port Moller approximately one week prior to their arrival in the various terminal commercial fishing districts of Bristol Bay. The PMTF typically operates from around June 10 through July 10 each year, although the end date has been extended starting in 2019.

Results from the PMTF give Bristol Bay processors, fishermen, and the Alaska Department of Fish and Game (ADF&G) time to respond to suspected departures from the preseason forecasts. In addition, this information is used by fishermen when deciding which districts to fish and helps processors anticipate where among Bristol Bay fishing districts to assign their tendering capacity. Though the data from the PMTF is not the primary basis of decision making upon which the individual district fisheries are prosecuted, managers use it for an indication of overall and stock-specific run strength (composed of inshore commercial catch and escapement or "C+E").

This annual report describes the project's objectives, how the test fishery works, the results from 2022 including insights that affect the performance of the test fishery, and recommendations for the study design in the upcoming season. The annual report stems from our ongoing goal of adaptive management of the research protocols for the PMTF to improve the utility of the project. In these annual reports, we "show our work" for our technical peers, the 2,000+ individuals and over a dozen companies in the fishing industry who fund the project and use the data for their business decisions, and our future selves as we continue to learn. As such, the report attempts to provide information for readers from a range of backgrounds. It has been the vigilance of documenting the project on an annual basis that has led to several significant improvements in the design and execution of the project and, ultimately, to better information for fishery managers and those in the salmon industry.

Primary Information from PMTF

Historically, information from the test fishery is combined with other information gathered inshore (C+E) to provide five descriptors of the Sockeye Salmon run each year: (1) magnitude, (2) timing, (3) entry pattern, (4) stock composition, and (5) age composition. In addition to reporting these descriptors in 2022, for the first time we reported the estimated weight of the average Sockeye caught at the test fishery.

Run magnitude (abundance), stock and age compositions, and average weight are self-explanatory. Run timing (early or late) is defined by how the date on which 50% of the run has occurred inshore compared to the historical average over a specified time (or a set date such as July 4). Entry pattern refers to the shape of the distribution of the daily inshore run (defined as

C+E in Bristol Bay fishing districts) over time.

The spatial resolution of these descriptors can be district-specific or aggregated to represent the bay-wide run. Furthermore, forecasts of these descriptors can be "proximate" (i.e., pertaining to just the next several days) or "yearend" (pertaining to the remainder of the season's run). Proximate forecasts represent those fish thought to be between the PMTF and the commercial fishing districts (i.e., prior to being accounted for in the C+E). Proximate forecasts are based on the estimated travel time (TT) for Sockeye to travel between Port Moller and the districts and the estimated return-per-index (RPI; the number of fish inshore that each catch index point at the PMTF represents). RPI is estimated by comparing PMTF daily indexes to subsequent C+E lagged by the TT parameter.

The data informing us about these descriptors vary with respect to when they become available and their reliability. The chronological order of when they become available is as follows: (1) average individual weight, (2) age composition, (3) stock composition, (4) proximate run magnitude and entry pattern, (5) run timing, and (6) yearend run magnitude. Initial age compositions are typically released by ADF&G around June 20 (i.e., after the 5th or 6th PMTF sampling trip). This same timeline was true for stock composition estimates until the 2022 season when the onsite gene lab and two vessels provided enough samples to move the first release date up to June 16. The point at which proximate run magnitude and entry pattern estimates can be made varies by district. The Egegik and Nushagak-Wood Districts have the earliest run timing and begin to exhibit a more reliable relationship between PMTF catch indices and the inshore run around June 25 during early years, but sometimes as late as July 2 during late years. The Naknek-Kvichak District follows a few days later, and the Ugashik District later still. However, the Ugashik District is especially difficult given the long and more variable travel time between the fishing district and the escapement enumeration site. If few openers occur at the beginning of the season to produce district catches, then relating PMTF indices to eventual Ugashik C+E requires waiting on fish to show in the escapement. This phenomenon applies to other districts as well.

Run timing and yearend forecasts of magnitude are not available until catches at the PMTF have peaked and begun to decline. Knowing the peak day at Port Moller allows estimation of the earliness/lateness at the test fishery, which can then be used to estimate the run timing for C+E. Once the peak has occurred at Port Moller, sometimes the tail of the test fishing seasonal distribution can be projected and then used to forecast the remaining inshore run. Yearend forecasts are affected by any changes in the vulnerability of the run to capture at PMTF. Changes in the TT and/or especially RPI parameters after about June 30 can make accurate forecasting of proximate and yearend run magnitude difficult.

Objectives

The 2022 Port Moller test fishing project was managed by the Bristol Bay Science and Research Institute (BBSRI) in collaboration with ADF&G to achieve three main objectives.

1. Collect and report a variety of data useful for forecasting various descriptors of the run.

2. Inform stakeholder decisions by analyzing and interpreting these data to provide information in a timely manner.

3. Continue adaptive management of the PMTF by testing changes to gear and sampling protocols that could improve forecast accuracy without disrupting the standard data stream that stakeholders expect and rely upon, including in 2022:

   a. Sample some stations between the traditional stations to assess patchiness of the run along the test fishing transect.

   b. BBSRI and ADF&G, with financial support from industry combined resources to assess the feasibility of genotyping salmon tissues aboard the R/V *Ocean Cat* during the 2021 season. This practice was fully implemented for the first time during 2022 allowing a full characterization of its utility.

Methods

Study Area and Project Timing

Stations Fished

The PMTF samples at stations located along a transect from Port Moller to Cape Newenham, Bristol Bay, Alaska (Figure 1). Stations are 5 nm apart, with Station 1 being 30 nm offshore from Port Moller and Station 12 being 85 nm offshore. Since 1987, only even numbered stations have been fished during both the outbound and inbound trips. Through 2015, typically 5 stations were fished (Stations 2-10; Table 1). In 2016, Station 12 was added to the daily schedule. In 2017, seven stations were fished: Stations 2, 4, 6, 8, 10, 12, and 14 (35–95 miles from Port Moller). For the first time in the history of the project, Stations 16-24 were sampled in 2018 by a second vessel during a pilot study (Raborn and Link 2018). The results from this study motivated full-season funding of a second vessel, R/V *Ocean Cat* (a 93 ft [28.3 m] steel vessel), during 2019 and allowed sampling out to Station 24 regularly and even once at Station 26. Two vessels were also used during 2020 and 2021, but weather/mechanical days prevented full coverage of the transect throughout the entirety of the season during these years. During 2022, the transect was fully covered by the *Ocean Cat* and the R/V *Halfmoon Bay*.

Sampling of the inside stations (2-10/12) and outside stations (12/14-22) was typically alternated from one day to the next between vessels to minimize the potential for any unknown vessel/skipper effects on the data collected. On 24 separate days, some odd

numbered stations were sampled in addition to the even stations to assess patchiness across the transect.

Dates Fished

Most Bristol Bay Sockeye Salmon reach the fishing districts between the end of June and the middle of July, with the peak in the fishery typically occurring on or around July 5. Sockeye Salmon travel time from Port Moller to the Bristol Bay fishery usually takes about one week, so the standard PMTF has generally been from June 10 or 11 to July 10 or 11. Late runs and large catch indices at Port Moller through July 10 in recent years, motivated us to extend the end date in recent years (July 14 for the 2022 season).

Net Description

The PMTF standard net used from 2011 to 2019 consisting of four alternating 50-fathom shackles of 5⅛" (13.0 cm) and 4½" (11.4 cm) multi-strand mesh, 60 meshes deep, hung at a 2:1 ratio. Further information regarding net descriptions prior to 2011 and historical setup can be found in Nemeth et al. (2016). Based on our research from 2019, there was evidence that a greater portion of the run was passing underneath this net during particular weather conditions (e.g., calm seas, low wind, and greater water visibility). As such, we fished a deeper net starting in 2020—100-5⅛" meshes and 111-4½" meshes. All other net specifications remained the same. The fishing depth swept increased from ~6 m for the 60-mesh net to ~11 m for the deeper net used for 2020-2022.

Fish Sampling Protocol

Net Deployment and Retrieval

During standardized test fishing at each station, a single net was deployed. Drift gillnet sets lasted for an average of 27 min (range=16-80 min), and deployment was perpendicular to the migratory path of the salmon on the north-south axis (Helton 1991). Sets have been shorter in recent years than those prior to 2015 to reduce the possibility of net saturation from affecting the index. The extra time saved each day from switching to single, shorter sets allowed for the addition of extra stations to be sampled in recent years (see Appendix F in Link et al. 2019). Typically, it took 5-6 min to deploy the full length of the net. After setting the net, the vessel moved away while maintaining visual contact. To standardize effort among years, skippers, and vessels no attempt was made to hook or run the net to increase catch.

Data Recorded

Environmental variables measured included sea surface temperature (SST), Secchi depth (an index of water visibility), and wind velocity and direction. Times were recorded when the trailing buoy was deployed, when the net was fully set, when retrieval began, and when the net was fully in. Fish were identified to species and enumerated. Sockeye Salmon were sexed based on external morphology, measured for length (mid eye fork length—MEFL), individual weight

(during the first half of the test fishery) and sampled for age and genetic analysis (described below). The number of fish from each set was recorded as hitting the top 50% or bottom 50% of the net; those fish hitting the middle of the net whose designation was not certain were alternately assigned to top/bottom bins.

Station Indexes

Catches were converted to catch-per-unit-effort (CPUE; fish per 200 fathom hours) to adjust for small differences in fishing times among sets (larger catches take longer to pick and cause the net to fish longer). Mean fishing time (*MFT*) in minutes for each set was:

$$MFT = SI - FO + \frac{(FO-SO)+(FI-SI)}{2} \tag{1}$$

Where, *SO*=time of day the gillnet first entered water, *FO*=time the gillnet was fully deployed, *SI*=time the gillnet retrieval began, and FI=time the gillnet retrieval was completed. CPUE was calculated as number of fish caught divided by *MFT* and multiplied by 60 to provide fish per 200 fathom-hours.

Age and Stock Composition Estimates

Fish were sampled for stock composition analysis and age on the test fishery vessels' decks immediately following fishing at each station. For stock composition analysis, tissue samples were collected from Sockeye Salmon by clipping the pelvic fin. Tissues were placed into grid squares on individually barcoded preservation sheets and desiccated. Samples from the *Ocean Cat* were offloaded every other day onto the *Halfmoon Bay* for further processing within the onboard connex that was fabricated into a gene lab (see Appendix F for further details). Appendix B provides the 2022 stock composition estimates reported by ADF&G.

For age composition analysis, scales were removed from all Sockeye Salmon captured, whenever possible. Scales were aged according to European notation. Thus, numerals preceding the decimal refer to the number of freshwater annuli and numerals following the decimal refer to the number of marine annuli. Total age from time of egg deposition is the sum of these two numbers plus one to account for the first winter during incubation. Age estimations were made by ADF&G personnel in King Salmon using acetate impressions of scales under 10x magnification using a microfiche reader. These impressions were developed within the same connex used for the gene lab on the *Halfmoon Bay* (see the final update sent on July 14 [Appendix A] for more details on methodology). The 2022 age composition estimates reported by ADF&G for PMTF, inshore districts, and escapement projects are included in Appendix C.

The Daily Abundance Index

The Daily Abundance Index was developed from each day's station indexes. Two methods of calculating the daily abundance index have been used. See Raborn et al. (2011) for

a description of the "Traditional Index". Briefly, the Traditional Index used the sum of CPUE's from Stations 2-8 giving double weight to Station 8 to account for fish missed beyond that station. Beginning in 2011, the PMTF has used the "Replacement Index" (hereafter referred to as just "Daily Abundance Index" or "Daily Index"), which was simply the average index from Stations 2-10. With extensive coverage of the area offshore of the traditional stations starting in 2019, we also provided Daily Indices based on averages from two different groups of stations. First, the Daily Abundance Indices in the catch updates included the average from Stations 2-10 to provide continuity among annual reports since 2011. Second, we reported the average index across all stations, including the outer stations, as including these additional stations seemed to better describe the dynamics of the inshore run.

To account for stations not fished, missing station-date specific values had to be interpolated. Some hyper-technical methodology is required here as a simple linear interpolation for missed values from observed indices for adjacent days and stations does not fully utilize the information contained in the entire 2-dimensional dataset (i.e., time and space). Instead, we fit the observed index pattern across days and stations with a generalized additive model (GAM). Day-of-year and station number were covariates, and their interaction fit with the "gam" function in the R Package "mgcv" with default settings for thin plate regression splines. The observed raw catch of sockeye represented the response and was modeled with a Tweedie distribution. Log(MFT) was added to the model as an offset to provide output in terms of predicted indices, which were used as the interpolated values.

Run Timing

Defining run timing relative to past seasons is becoming a moving target in recent years with a series of later runs being observed 2015-2021. Thus, we did not attempt to adjust the baseline period on what constitutes the average. Instead, we defined early/late as the number of days before/after July 4 that 50% of C+E has been accounted for inshore.

Forecasting Based on the PMTF

Forecasts of age and stock composition were simply assumed to be equal to estimates observed at the PMTF through the most recent date[3]. Run timing forecasts are based on the earliness/lateness estimated at Port Moller and its relationship with historical run timings of previous inshore runs. We also sometimes provide forecasts that are independent of PMTF in our daily updates and interpretations[4].

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[3] Note that inseason estimates of district-specific stock composition from PMTF assume all later district catches to be local origin. Postseason estimates of actual stock-specific abundance provided by ADF&G are based on stock-specific harvests in the different districts. Differences will arise between in- and postseason stock composition estimates to the extent any stocks are caught in non-natal districts.

[4] Specifically, we compare historical C+E to date binned by annual run sizes and overlaid with the current year's C+E as a way of gauging run timing and magnitude independent of the PMTF.

Forecasting run magnitude with PMTF is more complicated. As with any test fishery, assumptions must be made about the proportion of the run that is exposed to the test fishery day-to-day, and/or year-to-year, and the proportion of this exposed run encountering the test net that is caught. Typically, an assumption is made that these proportions are generally constant across a season and among years. Neither assumption seems to have been the case with the historical PMTF project.

Historical forecasting method applied to Port Moller data used the historical relationship between cumulative indexes to date and resulting total runs from previous years' runs (see Appendices E and F in Raborn et al. 2011 for the evolution of forecast methods). The usefulness of such forecasts was marginal at best and occasionally led to wildly inaccurate forecasts of abundance and patterns of run arrival to the districts. This inaccuracy had several causes. Notable among them was interannual variation in run timing, which is not known in the current year until beyond the middle of the run. Even more problematic was the annual variability of the run's exposure to the PMTF, which appears to have been significant given half the run could have passed beyond the outer most station fished (mostly Station 10, but sometimes Station 12) during some years but not others. For instance, we estimated that as much as 68% of the run may have passed beyond Station 10 in 2018; 59% in 2019, 56% in 2020, 47% in 2021, and 53% in 2022. Moreover, for 2022 the catch pattern across the transect changed dramatically during the season.

At the end of the 2011 PMTF project, we began developing a model to forecast the yearend total run magnitude based on current-year PMTF indices only. Called the "daily projection model", it was based on only on information collected in the current season. Estimates of travel time (TT) between PMTF and inshore districts was estimated by fitting the daily PMTF indices to subsequent and appropriate C+E by simultaneously estimating the run-per-index (RPI) parameter. However, forecasting the total run for the year before early July proved to be unfeasible due to uncertainty in the tail of the PMTF.

In some years, such as 2019, we were able to report proximate forecasts of the inshore run magnitude for all stocks aggregated with the range in days determined by the TT parameter. In other years, we also provided district-specific proximate forecasts by parsing the Daily Catch Index across districts based on the stock composition estimates and then estimating their respective RPI and TT parameters separately. District-specific forecasts can be hindered in some years by coarse temporal resolution in the stock composition estimates. Sparse coverage of the station-day sampling matrix for 2020 and 2021 hindered our ability to produce quantitative proximate forecasts, even for the Bay as an aggregate. The greatest coverage of the station-day matrix was achieved during 2022; at least some sampling occurred every day and the majority of the transect was sampled nearly every day. Likewise, more frequent and timely stock compositions were produced in 2022 than ever before. As such, we made several proximate forecasts of magnitudes and entry patterns (see Results and Discussions regarding forecast accuracy).

Inseason Reporting of PMTF Information

Information from the PMTF was distributed regularly throughout the inseason using several methods. As has been the case for many years, the "daily catch updates" that summarized catches and indexes by station and the Daily Index were emailed to a distribution list usually on the same day that test fishing occurred (late fishing days can push some updates to early morning of the following day). Interpretations of these catches were provided in the body of these emails on some days as meaningful information changed or new insights were possible. Subscribers to the email distribution list are maintained from year-to-year and it is free to sign up via an email request to the authors of this report. Finally, BBSRI distributed ADF&G's genetic stock composition and age composition updates as they became available throughout the season. All project information sent by email, including the daily catch updates, interpretations, and age- and stock-composition estimates were also posted on the homepage of BBSRI's website (www.bbsri.org).

Many in the fleet often cannot receive emails when on the fishing grounds. Starting in 2020, a texting service was set up for recipients to receive an abbreviated summary of station indexes, stock composition estimates, and any important operational updates (e.g., weather or mechanical delays) to provide greater access to PMTF information. The texting service was provided free; a subscription required users to text "PMTF" to a 1-800 number.

Results and Discussion

In 2022, the Port Moller Test Fishery (PMTF) operated from June 10 to July 14 using two research vessels—the R/V *Ocean Cat* and the R/V *Halfmoon Bay*. A total of 5,142 Sockeye were caught in 326 sets distributed across Stations 2-24 to provide the information used for inseason forecasting. An additional 64 sets at odd stations, three sets at Station 0, and two sets at Station -1 produced 1,717 Sockeye and helped to assess the patchiness of the migration past the test fishing transect. The test fishing effort in 2022 represents the greatest coverage in the history of the program; moreover, no days were missed due to weather or mechanical issues.

Inseason Reporting of PMTF Information

All inseason update types were numbered in sequence through the season and are provided in Appendices A–C. ADF&G's daily and season summaries are provided in Appendices D and E. The email distribution list ended the season with 1,107 email addresses, up about 16% over 2021 (Table 2). Updates available via SMS texts continued to be highly valued by fishermen. The dates and times of dissemination of the PMTF updates are given in Table 3. We were successful in getting daily catch updates out quickly, and all but one was sent on the day of fishing.

The timeliness of the stock composition estimates is an important metric for the PMTF program, and in the past has been affected by coordination between vessels and several

logistical steps from moving tissues from the transect to a lab in Anchorage. Link et al. (2019) elaborate on factors affecting the timing of stock composition estimates and summarized the frequency and processing time from collection of samples to public release. This summary is updated in Table 4. The median time between sample collection and release to the distribution list was a single day during the 2022 season; the maximum lag time was only two days (Figure 2). The turnaround time for 2022 estimates was about two days faster than what has been observed since 2010.

To further compare the timing of stock composition estimates in 2022 to the previous seasons, we examined the cumulative numbers of stock composition estimates by date within each season (Table 5). In 2022, the first stock composition estimate was released on June 16, which was earliest release date on record. Furthermore, this first estimate covered a two-day window, whereas the first estimate in previous years typically combined four days rendering less resolution in their interpretations (Table 4). Five stock composition estimates had been released by June 26 compared with a median of three from 2010 to 2021. Over the entire season a total of 13 estimates were released (about four more than in previous years).

The reduced turnaround time between genetic tissue collection at the PMTF and release of the stock composition estimates, as well as increased frequency and number of estimates for 2022 was due entirely to the onboard genetics lab that allowed genotyping to be done at sea. Therefore, the logistical difficulties of transferring samples to the gene lab in Anchorage were removed entirely. The pilot study performed in 2021 (Raborn and Link 2022), proving the feasibility of and vetting the results from an onboard gene lab, resulted in the successful full-scale shift in methodology during 2022 for such a crucial aspect of this program. Stock composition at Port Moller continues to be the most reliable and arguably the most important information that the test fishery provides. The value of increasing the spatio-temporal resolution of these estimates and reducing the time between sample collection and reporting cannot be overstated. An added benefit of genotyping onboard was that the test boats did not have to deliver genetics samples to Port Moller every two days, which kept the crews on the fishing transect and improved spatio-temporal sampling coverage.

2022 Run Characterization and Performance of the PMTF

Table 6 summarizes our inseason interpretations of the run based on PMTF and is essentially a report card on the veracity of our predictions. This summary is an integral part of reporting results for quantifiable metrics that feed into our adaptive management of the project's study design.

Fish Weight, Age, and Stock Composition

On June 15 and June 22, we estimated the weights of the average Sockeye passing the test fishing transect to be 4.6 and 4.8 lbs, respectively. These estimates were slightly less than the 5.0 lbs reported for inshore catch by ADF&G in their season summary. Weights are not

recorded for the escapement, and the commercial fishery tends to target larger/older individuals. Weight sampling at the test fishery would have included all fish, regardless of their fate as catch or escapement, which may explain these discrepancies.

The estimated age composition based on the PMTF reflected that of the inshore run reasonably well, although age-1.2 and 1.3 were generally under- and over-represented at the test fishery, respectively (Figure 3).

To assess the accuracy of PMTF stock composition estimates, district C+Es were lagged backwards to the PMTF using a travel time (TT) parameter of seven days for all districts. In addition to TT, lag times between the enumeration sites (counting towers and Nushagak sonar) and the fishing districts were estimated as follows: 6 days for Ugashik, 1 day for Egegik, ~1 day for Naknek-Kvichak, and ~1 day for Nushagak-Wood.

Genetic samples taken at Port Moller were foretelling of the run's inshore stock composition (Figure 4). While the accuracy of these forecasts was sufficient to inform management and industry decisions, some error remained. The 2022 PMTF achieved the most comprehensive coverage of the test fishing transect than in any year prior (Table 7). This effort generated a pattern in the station-specific indices throughout the season, whereupon peak catches at Stations 8 and 10 through mid-June shifted to Stations 16 and 18 starting around June 26 before uniformly distributing across the transect on July 9 (Table 8). What error existed in the stock composition forecast lined up with this spatio-temporal shift in the index magnitude between the inner and outer stations (Figure 5). While all stocks can be present at any station, Ugashik and Egegik stocks favor the inner stations, while Nushagak-Wood stocks favor the outer stations. Naknek-Kvichak stocks can tend towards the middle stations. After June 26 when the inner station catches diminished, Ugashik and Egegik stocks were underrepresented while Nushagak-Wood stocks were overrepresented. Representation error for the Naknek-Kvichak stocks tended to bounce irrespective of the spatio-temporal pattern in catch indices. These results suggest that rather than the migration shifting offshore after June 26, some phenomenon caused catchability at the inner stations to decline. In other words, simply missing migrating salmon more at the inner stations than at the outer stations caused the trend in stock composition errors observed in Figure 5. This possibility also explains the general failure of the PMTF index (Stations 2-22) to match the entry pattern of the C+E (see below).

Run Magnitude, Entry Pattern, and Timing

The 2022 run was the largest on record coming in at 79 million with 50% of C+E occurring by July 4, the date we use to reference an "average" run timing. Run timings over the previous seven years (2015-2021) have been late (mean=4.3 days late; range=2-6). The seasonal pattern in this year's run was similar to 2021, but with higher peaks prior to the midpoint (Figure 6).

The pattern in catches across stations was unique for 2022 in that apparent shifts in passage rates occurred along the transect throughout the season (Table 8). An inner mode centered on Station 8 was evident early on peaking during June 17-22, then dissipated by June 28, giving way to an outer mode centered on Stations 16 and 18 that began forming around June 23 and peaked on July 1-2. Catches were uniformly distributed across stations starting on July 10. The average Daily Index was based on Stations 2-22 and depicted three distinct peaks in the passage rate past the PMTF—1st = June 17-25, 2nd = June 30-July 2, and 3rd = July 9-11—that corresponded to the shifts in catches across the transect (Figure 7).

The Daily Index was not indicative of the entry pattern for C+E. As such, our anticipation of run magnitude and timing was amiss. Four days of low catch indices during June 26-29, the dates when Port Moller usually peaks, failed to manifest as lulls in C+E days later. Seasonal shifts in the travel time (TT) between the test fishery and inshore may have washed out the highs and lows in the passage rate before they reached the commercial districts. However, low catches over four days at Port Moller should have been more pronounced inshore even with the mixing of fish across adjacent days if the test fishery was truly reflective of the passage rate. We feel the more likely explanation is that catchability unknowingly changed, which altered the return-per-index (RPI=the number of fish inshore that each catch index point at Port Moller represents). In other words, the passage rate increased more or less consistently and then subsided as the season progressed, but our ability to catch passing Sockeye probably changed throughout the season and at least declined during those four days especially across the inner stations.

Reasons for changes in catchability at the test fishery are difficult to isolate. Prior to 2018, we suspected that a primary cause was incomplete transect coverage. Before then, the outermost station fished was typically Station 10. Beginning with a pilot study in 2018 to assess the feasibility of covering the entire transect (Stations 2-22/24) with two boats, better coverage has been achieved especially in 2019. Missed consecutive days due to weather and mechanical problems hindered view of the passage rate during 2020 and 2021. The interpolated values for missed data did not fit the inshore C+E pattern in these years. However, the two vessels used in 2022 were able to cover the transect almost completely, and no days were missed entirely. Sampling odd stations in between the even stations used to create the Daily Catch Index showed that some bands of fish were missed occasionally, but the extent to which this caused bias remains unclear.

We favor the hypothesis that change in fish behavior was the culprit. That is, fish passing the transect fluctuated in their susceptibility to the net by migrating deeper at times and/or exhibited milling behavior whereby they were less driven towards the spawning grounds. Seasonal differences in migration depth could have been influenced by environmental variables such as water temperature (Figure 8). Greater catches seemed to align with sea surface temperatures of 8-9 °C and subside at temperatures greater than this. While we do not know if a thermocline was present at stations where catches dropped off unexpectedly,

Sockeye tend to be deeper in areas of strong thermal stratification and shallower in areas of weaker stratification (Quinn and Terhart 1987; Quinn et al. 1989). Helton (1991) linked seasonal changes in depth of capture at the PMTF during 1989 to changing vertical thermal structures as the thermocline developed in strength over the course of the summer.

Additional Research

Trade-offs between the range (distance from shore) and the spatial resolution among stations have existed since the inception of the PMTF. The distances are great relative to the amount of time available. Early in the history of the program, even-numbered stations were fished on the outbound trip and odd-numbered on the return trip. At some point, this was standardized to fish even-numbered stations daily. On occasion, we have seen patterns that strongly suggest the bands of fish passing PMTF may be patchy in a consistent manner for several days.

On three days during the 2019 season, we had the crews sample odd-numbered stations to see how these indexes compared to the adjacent stations typically sampled. While this endeavor was more or less an initial spot check, it did prove informative in showing how patchy or banded the run can be on a given day across the transect (Link et al. 2019). We repeated this exercise on four days during the 2020 and 2021 seasons. Catches from stations could be interpolated reasonably well from adjacent catches for some station-day combinations, but other days revealed that modes could be missed if only even or odd stations had been fished (Raborn and Link 2022).

Sixty-four odd stations were fished across 24 dates during 2022 (Figure 9). The results from this effort clearly show that the passage rate was different at some odd stations than what would have been interpolated from adjacent even stations.

If modes shift randomly enough across any 10-mile stretch (the distance between even or odd stations) from day to day, then the consistent systematic sampling scheme used currently should be unbiased. However, if distinct water masses form causing thermal and/or salinity structures or current patterns to remain constant for several days, then the run may become braided in a consistent manner. If so, the current stagnant systematic design would compromise unbiased inference regarding the passage rate. As such, our recommendation is that the systematic design should be maintained (i.e., stations are 10 miles apart on any given day), but the starting point of the transect should be randomized for each date. We have discussed this with colleagues for at least three years now. Our reticence in implementing a randomized starting point on each date has largely been due to a general resistance among some users for changes to the design of the program. This conservativism is understandable, but this change would be neutral at worse or an improvement in terms of assessing the run strength and inshore entry pattern.

Future Work and Recommendations

Consistent with the adaptive management approach to this project, we continue to examine our assumptions and search for ways of improving the test fishery on an annual basis. Below is the latest in this series of efforts to improve the test fishery performance. All our research to date suggests that most of the remaining forecast error comes from missing fish at the test fishery. We have shown that this occurs can from not sampling outer stations and from ending the test fishery too early. Testing a 100-mesh monofilament net in 2019 and using a deeper multi-filament net during 2021 has shown that we may under some conditions have missed varying proportions of the run passing beneath the 60-mesh net historically used. During the 2022 season, we strongly suspect that even the deeper net now being used still missed a substantial portion of the run across the inside stations. The odd stations sampled during 2019-2022 suggest that a strict nonrandom systematic sampling design may not be optimum for reducing bias in catch indices if the run becomes consistently braided for several days at a time. Our recommendations for 2022 revolve around these findings.

Continue Using Two Vessels to Cover Stations 2-22

The primary advantage from having two vessels has been that the entire transect was more likely to be sampled on a given day. The discovery of a large second mode of fish migrating past Port Moller further offshore during the last four years (2018-2021) calls into question the comparison of PMTF results across years and hinders our ability to explain forecast error even within years. The degree to which errors in the past occurred because fish were missed beyond the transect, because travel times changed inseason, and/or because environmental conditions changed catchability cannot be discerned. Only by sampling the entire transect can other reasons for forecast accuracy be examined.

Another advantage of having a two-vessel program is that entire days missed are much less likely than with a single-vessel program. The second vessel can at least partially sample the entire transect making interpolated values for missed stations on those days more accurate. To this end, vessels should be able to operate during "fishable" weather to the extent possible with the understanding that some conditions are too severe for any vessel to fish safely.

Finally, there are two aspects to bad weather that affect our station sampling coverage. First, there is wind and waves that are too great to fish safely. There is nothing that can be done to reduce this situation. Second, sometimes the windows of suitable weather to fish are very narrow without staying on the transect, and these windows are lost to long vessel travel times. The 2021 season was a good example of this. With the frequent storms the duration of the fishable weather windows was narrow. The areas where the smaller R/V *Pandalus* sought refuge (e.g., inside Port Moller inlet) were 4+ hours each way from the stations; thus, it took too long to return to the transect in time to fish before the next weather event arrived. The R/V *Pandalus*, at 68' (22m) is unable to stay on station and ride out weather as well as a larger

vessel, and this hindered its ability to fish at some critical times in 2021 (and in several previous seasons). Pairing the larger, more weather- and seas-tolerant R/V *Halfmoon Bay* with the R/V *Ocean Cat* contributed to the near complete coverage of the transect and no days being missed entirely during the 2022 season. We recommend that a similar vessel be used during 2023.

Continue to Extend the Test Fishery to at Least July 13 and Preferably July 15

For about a decade, it was difficult to retain the R/V *Pandalus* on the project beyond about July 8 or 9. Sustained late-season catches at Port Moller from 2014 to present made it difficult to determine the magnitude of the remaining tail of the run. Missing fishing days and not sampling the full transect at the end of the run when catches remain high is much more problematic than missing catches at the beginning of the season. The increased value of late-season data also applies to stock composition estimates. Depending on the run timing and magnitude, stock composition estimates from the last week of sampling can be much more valuable than the first set of estimates, which represent few fish and usually pool samples from June 10–15 (to have enough samples) thereby limiting their value. Although vessel retention through mid-July is less of a problem today than it used to be, this recommendation remains more as a reminder of the value of late-season fishing and that if a trade-off must be made, that should come from missing the first few days of the season (e.g., June 10-12) rather than the late-season period.

Stop Recording Data of Limited Value

Over time, various data have been collected at the PMTF because it may have proved useful in the future and was easily/quickly recorded. While a single variable may not be burdensome, many small tasks can effectively add up to a large task and unnecessarily tax the field crew. As such, we recommend dropping severable variables. For several years now, we have tried to keep track of the catch by whether it came from the top versus bottom half of the net. This task has proved to be difficult and the data it rendered was questionable. While we will continue to keep track of the catch by mesh size, no long will we record top versus bottom. Other variables are too subjective from person-to-person to be reliable or have limited value and should be dropped. These include air temperature, cloud cover, light intensity, effective net length, and sex of the fish.

Randomize the Starting Point of the Systematic Sampling of Stations for Each Day

The patchiness observed from the odd stations sampled during 2019-2022 suggests that the selection of stations sampled needs to be more random. While stations should remain evenly spaced (i.e., systematic) across the transect on a given day to maximize coverage of the entire migration, the starting point will be randomized. A random number between 0 and 10 will be drawn for each day preseason and made available in the project operation plan. The most inner station will still be called Station 2 but may occur along the transect anywhere from 32 nm (Station 1) to 42 nm (Station 3) from Port Moller. From there, Stations 4, 6, 8, etc. would

be spaced evenly 10 nm apart. This approach is recommended for transect sampling of marine mammals, which can form into nonrandom clusters, which we worry may happen with salmon at Port Moller (e.g., Thomas et al. 2007). Adjustment to the station selection scheme should help reduce bias from temporally consistent systematic patterns in salmon distribution without increasing noise in the Daily Catch Index.

Continue Genotyping Tissues at Sea for Generating Stock Composition Estimates

With the successful demonstration of the at-sea genotyping method, we recommend doing all analysis in 2023 onboard one of the two PMTF research vessels. During 2022, the need for duplicating samples for analysis in Anchorage, and more importantly, the need for one of the vessels to run samples to Port Moller every other day was eliminated. Remaining at sea freed up considerable vessel time and increased test fishing efforts. The GCL personnel in Anchorage will still produce the stock composition estimates and provide inseason technical support to the vessel personnel.

Continue Imaging Salmon Scales at Sea

Imaging scales at sea was a success during 2022 and should be continued going forward. Scales taken from fish sampled at PMTF have in the past been transported to King Salmon for aging, which required routine trips by one vessel into Port Moller. Satellite bandwidth during 2022 was sufficient to transmit digital images to King Salmon where they were read by the ADF&G scale readers. By doing so, we were able to keep both vessels on transect and continue to provide age composition from the PMTF catches.

Assess the Extent to Which the Standardized Gillnet is Missing Deeper Migrating Salmon

As previously discussed, it is likely that a substantial portion of the migration is passing beneath the standardized gillnet when certain conditions are present (warmer water, calm seas, low wind, and greater water visibility). This occurrence is not uniform across the transect and varies both within and among seasons. Side-scan sonar may help to identify when this phenomenon is occurring. Furthermore, we will try to spot check occasionally with a deeper net when it is suspected. This deeper net would be reduced to 100 fathoms in length but be twice as deep (22 m versus the standardized net's 11 m). Therefore, the total amount of net being deployed will be the same, only twice as deep and half as long.

Acknowledgments

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Tables

Table 1. Start and end dates for the PMTF by year, the number of days each station was fished, and the total station-days fished by year, 1987-2022.

Year	Start	End	0	2	4	6	8	10	12	14	16	18	20	22	24	26	Stations Sampled
1987	11-Jun	3-Jul		15	12	10	7										44
1988	11-Jun	5-Jul		19	19	17	16										71
1989	11-Jun	7-Jul		18	19	18	16										71
1990	11-Jun	5-Jul		18	19	19	16										72
1991	11-Jun	9-Jul		26	27	27	25	2									107
1992	11-Jun	9-Jul		20	23	23	19										85
1993	11-Jun	10-Jul		25	24	24	22										95
1994	11-Jun	9-Jul		26	26	26	26										104
1995	12-Jun	9-Jul		24	28	28	24	4									108
1996	12-Jun	8-Jul		26	26	26	26										104
1997	11-Jun	8-Jul		28	28	28	28										112
1998	12-Jun	9-Jul		26	27	27	26										106
1999	11-Jun	8-Jul		28	28	28	28	24	7								143
2000	10-Jun	8-Jul		20	23	28	28	28	10	3							140
2001	10-Jun	5-Jul		25	25	24	23	20									117
2002	10-Jun	9-Jul		30	30	30	30	30									150
2003	9-Jun	30-Jun		14	17	17	17	16									81
2004	10-Jun	9-Jul		18	27	29	29	27	12	1							143
2005	9-Jun	7-Jul		18	20	20	22	16	7								103
2006	10-Jun	9-Jul		18	26	24	24	25	6								123
2007	11-Jun	10-Jul		18	26	25	22	22	1								114
2008	10-Jun	8-Jul		11	19	25	24	20	5								104
2009	10-Jun	5-Jul		15	24	24	24	24	9								120
2010	10-Jun	7-Jul		25	26	25	25	23									124
2011	10-Jun	7-Jul		19	23	23	19	17									101
2012	10-Jun	8-Jul		24	24	25	26	26	2								127
2013	10-Jun	6-Jul		18	20	21	21	18									98
2014	10-Jun	10-Jul		26	26	27	27	25									131
2015	10-Jun	10-Jul		24	25	25	25	24									123
2016	12-Jun	12-Jul		26	27	27	27	24	24								155
2017	10-Jun	11-Jul		29	29	30	30	29	28	19							194
2018	10-Jun	11-Jul		13	25	27	27	27	28	28	26	11	8	5	2		227
2019	10-Jun	17-Jul		28	32	31	32	33	31	28	24	21	21	17	10	1	309
2020	12-Jun	13-Jul		10	15	18	24	24	24	20	17	15	10	6	2		185
2021	11-Jun	15-Jul		20	22	24	28	26	27	25	24	23	21	11	1		252
2022	10-Jun	14-Jul	3	22	31	32	33	34	33	34	32	31	28	12	4	1	330
Average, 1987-2016																	109
Average, 2017-2022																	250

Does not include odd stations fished in 2018-2022 or paired sets made at various stations in some years.

Table 2.   Number of recipients in the Port Moller Test Fishery email distribution list by known and unknown affiliation for 2017-2022.

	2017	2018	2019	2020	2021	**2022**	% change, 2021-22
Government							
ADF&G Research and Others	36	41	37	41	45	**44**	-2%
ADF&G Fishery Managers	8	7	7	9	10	**11**	10%
Other State Government	3	2	2	3	3	**3**	0%
Local Government	1	6	8	7	8	**7**	-13%
Federal Government	2	3	3	2	1	**3**	200%
Subtotal	50	59	57	62	67	**68**	1%
Industry							
Fishermen	69	223	393	465	525	**658**	25%
Processing	162	182	183	192	202	**215**	6%
Buyers	13	20	25	33	37	**39**	5%
Shippers	5	11	12	14	14	**12**	-14%
Other Industry	17	27	33	34	36	**41**	14%
Subtotal	266	463	646	738	814	**965**	19%
Other							
Non-ADF&G Scientists	28	35	45	47	50	**45**	-10%
Non-Governmental Org.	6	3	3	3	7	**4**	-43%
Media	12	8	3	7	7	**7**	0%
Subtotal	46	46	51	57	64	**56**	-13%
Known Affiliation	362	568	754	857	945	**1,089**	15%
Unknown affiliation*	132	84	5	22	12	**18**	50%
Grand Total	494	652	759	879	957	**1,107**	16%
Net increase, year-over-year		158	107	120	78	**150**	
% Increase, year-over-year		32%	16%	16%	9%	**16%**	

Table 3. Sampling dates and time of corresponding updates for four main types of inseason information from the Port Moller Test Fishery in 2022. Updates were sent by email to the distribution list and posted on BBSRI's website (www.bbsri.org).

Sampling Date	Catch Update #	Time (date) Catch Update emailed	Commentary on Run?	ADF&G Inseason Reports	
				Stock Composition	Age Comp.
10-Jun	1	9:55 PM			
11-Jun	2	7:10 PM	Yes		
12-Jun	3	6:04 PM			
13-Jun	4	7:56 PM	Yes		
14-Jun	5	10:26 PM	Yes		
15-Jun	6	9:11 PM	Yes		
16-Jun	7	11:09 PM		#1, 10:12 AM June 14-15	
17-Jun	8	7:30 PM			
18-Jun	9	5:47 PM		#2, 5:27 PM June 16-17	
19-Jun	10	8:23 PM			
20-Jun	11	7:21 PM		#3, 9:30 PM PM June 18-19	
21-Jun	12	6:01 PM			
22-Jun	13	6:41 PM	Yes	#4, 5:36 PM June 20-21	
23-Jun	14	11:22 PM			
24-Jun	15	8:14 PM	Yes	#5, 6:49 PM June 22-23	#1
25-Jun	16	4:45 PM	Yes		
26-Jun	17	4:03 PM			
27-Jun	18	6:50 PM		#6, 12:24 PM June 24-25	
28-Jun	19	8:14 PM	Yes		
29-Jun	20	9:16 PM	Yes		
30-Jun	21	10:44 PM			#2
1-Jul	22	7:07 PM		#7, 12:43 PM June 28-29	
2-Jul	23	8:12 PM	Yes		
3-Jul	24	8:44 PM		#8, 1:24 PM June 30-July 1	
4-Jul	25	12:09 AM (5-July)			#3
5-Jul	26	7:28 PM		#9, 12:04 PM July 2-3	
6-Jul	27	6:40 PM	Yes		
7-Jul	28	8:51 PM		#10, 2:27 PM July 4-5	
8-Jul	29	5:46 PM		#11, 6:07 PM July 6-7	#4
9-Jul	30	7:15 PM	Yes		
10-Jul	31	7:45 PM		#12, 10:07 PM July 8-9	#5
11-Jul	32	9:03 PM			
12-Jul	33	4:46 PM			
13-Jul	34	6:14 PM		#13, 7:13 PM July 10-11	#6
14-Jul	35	8:34 PM	Yes		

Table 4. Distribution of stock composition estimates within and among seasons, 2010-2022. Boxed areas denote sample dates; date within the box is date results were published, and the number in parentheses is the number of days after the last day of a given sample until the estimates were published.

Stock composition estimates by year (sample # — publication date — (days after last sample day)):

2010
- #1 June 21 (3)
- #2 June 23 (3)
- #3 June 25 (3)
- #4 June 27 (3)
- #5 June 30 (4)
- #6 July 2 (3)
- #7 July 4 (3)
- #8 July 6 (3)
- #9 July 8 (3)
- #10 July 10 (3)

2011
- #1 June 19 (3)
- #2 June 22 (3)
- #3 June 24 (3)
- #4 June 26 (3)
- #5 June 28 (3)
- #6 July 4 (3)
- #7 July 7 (3)
- #8 July 9 (2)

2012
- #1 June 21 (4)
- #2 June 24 (4)
- #3 June 24 (3)
- #4 June 26 (3)
- #5 June 30 (3)
- #6 July 2 (3)
- #7 July 4 (3)
- #8 July 6 (3)

2013
- #1 June 21 (4)
- #2 June 22 (3)
- #3 June 24 (3)
- #4 June 26 (3)
- #5 June 28 (2)
- #6 July 2 (4)
- #7 July 10 (3)

2014 — Early run
- #1 June 18 (3)
- #2 June 24 (3)
- #3 June 26 (3)
- #4 June 28 (3)
- #5 July 1 (2)
- #6 July 3 (2)
- #7 July 6 (3)
- #8 July 9 (4)

2015 — Late run
- #1 June 20 (3)
- #2 June 22 (3)
- #3 June 25 (4)
- #4 June 25 (2)
- #5 June 27 (3)
- #6 June 29 (3)
- #7 July 2 (3)
- #8 July 3 (2)
- #9 July 7 (3)
- #10 July 10 (2)

2016 — Late run
- #1 June 25 (3)
- #2 June 28 (5)
- #3 June 29 (3)
- #4 June 30 (2)
- #5 July 2 (2)
- #6 July 6 (4)
- #7 July 6 (2)
- #8 July 6 (1)
- #9 July 11 (3)
- #10 July 12 (3)

2017 — Late run
- #1 June 20 (3)
- #2 June 28 (3)
- #3 June 29 (2)
- #4 July 1 (2)
- #5 July 3 (2)
- #6 July 5 (2)
- #7 July 7 (2)
- #8 July 10 (2)

2018 — Late run
- #1 June 20 (3)
- #2 June 24 (4)
- #3 June 25 (3)
- #4 June 27 (2)
- #5 June 30 (3)
- #6 July 2 (3)
- #7 July 3 (2)
- #8 July 6 (3)
- #9 July 7 (2)
- #10 July 8 (1)

2019 — Late run
- #1 June 20 (2)
- #2 June 25 (3)
- #3 June 27 (3)
- #4 June 29 (3)
- #5 July 1 (3)
- #6 July 3 (3)
- #7 July 4 (2)
- #8 July 8 (2)
- #9 July 11 (3)
- #10 July 14 (3)

2020 — Late run
- #1 June 22 (2)
- #2 June 25 (2)
- #3 June 27 (2)
- #4 July 2 (2)
- #5 July 4 (1)
- #6 July 7 (3)
- #7 July 7 (2)
- #9 July 11 (2)

2021 — Late run
- #1 June 19 (3)
- #2 June 21 (3)
- #3 June 23 (3)
- #4 June 25 (3)
- #5 June 28 (3)
- #6 June 30 (3)
- #7 July 2 (3)
- #8 July 6 (2)
- #9 July 10 (2)
- #10 July 13 (2)

2022 — Late run
- #1 June 16 (1)
- #2 June 18 (1)
- #3 June 20 (1)
- #4 June 22 (1)
- #5 June 24 (1)
- #6 June 27 (2)
- #7 July 1 (2)
- #8 July 3 (2)
- #9 July 5 (2)
- #10 July 7 (2)
- #11 July 8 (1)
- #12 July 10 (1)
- #13 July 13 (2)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
No. estimates	10	8	8	7	8	10	10	8	10	10	8	10	13

Number of days from collection to estimates published

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Min	3	2	3	2	2	2	1	2	1	2	1	2	1
Max	4	3	4	4	4	4	5	3	4	3	3	3	2
Median	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	1.0
Avg	3.1	2.9	3.3	3.1	2.9	2.8	2.8	2.3	2.6	2.7	2.0	2.7	1.5

Table 5.   Cumulative number of stock composition estimates from PMTF by date, 2010-2021.

Date Run timing	2010 late	2011 early	2012 avg	2013 early	2014 early	2015 late	2016 late	2017 late	2018 late	2019 late	2020 late	2021 late	2022 avg	2010-2021 Min	Max	Median
16-Jun													1	0	0	
17-Jun													1	0	0	
18-Jun					1								2	1	1	1.0
19-Jun		1			1							1	2	1	1	1.0
20-Jun		1			1	1		1	1	1		1	3	1	1	1.0
21-Jun	1	1	1	1	1	1		1	1	1		2	3	1	2	1.0
22-Jun	1	2	1	2	1	2		1	1	1	1	2	4	1	2	1.0
23-Jun	2	2	1	2	1	2		1	1	1	1	3	4	1	3	1.0
24-Jun	2	3	3	3	2	2		1	2	1	1	3	5	1	3	2.0
25-Jun	3	3	3	3	2	4	1	1	3	2	2	4	5	1	4	3.0
26-Jun	3	4	4	4	3	4	1	1	3	2	2	4	5	1	4	3.0
27-Jun	4	4	4	4	3	5	1	1	4	3	3	4	6	1	5	4.0
28-Jun	4	5	4	5	4	5	2	2	4	3	3	5	6	2	5	4.0
29-Jun	4	5	4	5	4	6	3	3	4	4	3	5	6	3	6	4.0
30-Jun	5	5	5	5	4	6	4	3	5	4	3	6	6	3	6	5.0
1-Jul	5	5	5	5	5	6	4	4	5	5	3	6	7	3	6	5.0
2-Jul	6	5	6	6	5	7	5	4	6	5	4	7	7	4	7	5.5
3-Jul	6	5	6	6	6	8	5	5	7	6	4	7	8	4	8	6.0
4-Jul	7	6	7	6	6	8	5	5	7	7	5	7	8	5	8	6.5
5-Jul	7	6	7	6	6	8	5	6	7	7	5	7	9	5	8	6.5
6-Jul	8	6	8	6	7	8	8	6	8	7	5	8	9	5	8	7.5
7-Jul	8	7		6	7	9	8	7	9	7	7	8	10	6	9	7.0
8-Jul	9	7		6	7	9	8	7	10	8	7	8	11	6	10	8.0
9-Jul	9	8		6	8	9	8	7		8	7	8	11	6	9	8.0
10-Jul	10			7		10	8	8		8	7	9	12	7	10	8.0
11-Jul							9			9	8	9	12	8	9	9.0
12-Jul							10			9		9	12	9	10	9.0
13-Jul										9		10	13	9	10	9.5
14-Jul										10			13	10	10	10.0
# estimates	10	8	8	7	8	10	10	8	10	10	8	10	13	7	10	9.0

Table 6.   Substantive comments and predictions in the daily updates of the 2022 Port Moller Test Fishery.

Update #	Date sent	% of C+E remaining	Summary of commentary, analyses, and predictions	Did the prediction(s) come true?
2	11-Jun		Provided an explanation for how stocks have historically been separated across the fishing transect.	N/A
4	13-Jun		Presented results from fishing odd numbered stations and showed how sometimes modes are missed (e.g., Station 11).	N/A
5	14-Jun	100%	(1) Compared catches across stations to those in the previous four years to roughly gauge run timing/magnitude. Observed that 2022 catches were consistent with those expected given a larger/earlier run than recent years. (2) Discussed the implications to interpretation due to using a deeper net starting in 2020.	(1) Yes. The run was earlier and larger than recent years.
6	15-Jun	100%	Estimated the weight for the average fish caught at Port Moller to be ~4.6 lbs.	ADF&G's 2022 Season Summary reports the average weight = 5.1 lbs for harvested Sockeye.
13	22-Jun	98%	Updated the weight for the average fish caught at Port Moller to be ~4.8 lbs.	ADF&G's 2022 Season Summary reports the average weight = 5.1 lbs for harvested Sockeye.
15	24-Jun	93%	Noted again that this year's Daily Catch Index and C+E appearred in line with the preseason forecast; that is, a run either larger or a day or two earlier than last year's run of 68 million that came in two days late	Yes. The run showed an average run timing (albeit, 2-days earlier than last year) and was ~79 million.
16	25-Jun	92%	Reported that a 6-day travel time fit the data up to that point and that C+E should fluctuate between 1-2 million for the next several days, but could surge into the districts after a few days of holding outside.	No. The C+E fluctuated between about 2-4 million over the next five days.
19	28-Jun	81%	Estimated that C+E would total to about 7 million for June 28-July 1 and fluctuate daily around an average of ~1.8 million before dropping off on July 2 or 3.	No. The run totaled 12 million during this time, averaged 3 million per day, but did drop on July 2.
20	29-Jun	79%	Observed how PMTF catches during the first week were consistent with the magnitude of the preseason forecast, but fell short after that. Described several hyptheses as to why, but suggested that the run may be below forecast or bimodal in it's entry pattern.	No. The run was above forecast, and the entry pattern was not bimodal.
23	2-Jul	64%	Estimated a 9-day travel time; predicted that C+E would level out over the next few days and fall off by July 5.	No. C+E increased to over 4.5 million on July 4 and held steady at around 3.5 million during July 6-11 before beginning the descending tail on July 12.
27	6-Jul	43%	Estimated that C+E would total to about 14 million for July 6-11. Extending this forecast using the aggregate Daily Index showed C+E would total about 19 million for July 6-15 and fluctuate quite a bit.	No. The July 6-11 total was ~22 million; July 6-15 total was ~32 million. Expected fluctuation did not occur.

Table 7. Catch indices by station and date from the 2022 Port Moller Test Fishery, with those provided by the R/V *Ocean Cat* highlighted in blue; all others were sampled by the R/V *Halfmoon Bay*. The relative magnitude of the Daily Catch Index (mean indices across Stations 2-22) is indicated by green bars; interpolated values for missing station-date combinations were included in this calculation.

Date	S2	S4	S6	S8	S10	S12	S14	S16	S18	S20	S22	Mean Daily Catch Index (Stns 2-22)
10-Jun						2	32	0	2	0	0	6
11-Jun				0	0	79	2	4	0	2		12
12-Jun	0	2	8	7	0	16	2	0	4	2	0	4
13-Jun		0	87	19	2	44	0	7	2	0	8	17
14-Jun		0	2	52	70	134	38	0	0	0		33
15-Jun		0	13	42	0	74	65	0	10	0		23
16-Jun		0	0	82	247	100	0	0	4			54
17-Jun			323	118	114	213	75					169
18-Jun	0	3	27	36	156	41	0	0	0	2	4	24
19-Jun	0	5	0	252	194	24	0	48	4	0		53
20-Jun		7	111	16	47	0	3	46	2			29
21-Jun		40	204	45	120	48	6	63	120	3		72
22-Jun	8	0	50	41	4	26	18	38	84	0	0	24
23-Jun	30	0	155	62	4	25	31	0	9	125		44
24-Jun	0	0	123	238	16	92	7	75	0	0		55
25-Jun	9	3	81	261		25	0	96				68
26-Jun		0	0	8	3	0	3					2
27-Jun	0	0	8	4	4	0	0	82	3	0		10
28-Jun	0	5	3	45	2	4	0	116	90	0	13	25
29-Jun	0	3	3	0	0	0	0	113	18	0	0	12
30-Jun		8	0	3	16	0	198	198	38	42		56
1-Jul	0	5	31	2	55	0	0	344	3			49
2-Jul	8	36	62	0	2	0	25	237	141	17	0	48
3-Jul	0	3	0	0	0	0	0	170	27	23		22
4-Jul	0	7	18	0	0	0	0	31	131	16		20
5-Jul		4	19	0	0	0	0	18	102	50		22
6-Jul	3	0	0	10	0		32	71	68	78	10	27
7-Jul	3	5	2	12	25	5	32	15	21	0	9	12
8-Jul	16	8	6	0	13	3	34	4	0	0		8
9-Jul	46	10	2	16	73	9	68	21	104	14		36
10-Jul	18	0	3	10	30	27	32	14	24	3	0	15
11-Jul	209	0	29	116	21	35	19	20	58	11	11	48
12-Jul	0	6	13	30	32	8	0	14	0	4		11
13-Jul					17	7	12	0	4	3		7
14-Jul	6	11	0	35	14							13

Table 8. Predicted catch indices by station and date from the 2022 Port Moller Test Fishery based on a statistical predictive model (see Methods). The gradient of greater to lesser values is colored red to blue, repsectively.

Date	S2	S4	S6	S8	S10	S12	S14	S16	S18	S20	S22
10-Jun	1	2	5	8	10	10	7	4	2	1	1
11-Jun	1	2	7	13	17	15	10	5	2	1	1
12-Jun	1	3	10	21	28	25	14	6	3	1	1
13-Jun	2	5	16	35	48	40	19	7	3	1	1
14-Jun	3	7	24	57	77	59	26	9	3	2	1
15-Jun	3	10	35	86	109	77	32	11	4	2	1
16-Jun	4	13	48	114	132	84	35	13	5	3	2
17-Jun	4	15	60	134	135	79	34	15	7	3	2
18-Jun	5	18	71	142	122	65	31	17	9	5	2
19-Jun	5	20	80	143	103	51	27	19	13	7	3
20-Jun	6	23	88	140	86	41	25	23	19	10	4
21-Jun	6	25	95	135	74	34	25	28	28	16	6
22-Jun	7	26	96	126	64	30	25	36	40	22	8
23-Jun	6	24	87	109	54	28	27	44	50	26	8
24-Jun	5	20	69	84	43	25	28	50	55	26	7
25-Jun	4	14	48	59	32	21	28	53	54	22	6
26-Jun	3	10	31	39	23	18	29	56	51	18	4
27-Jun	2	7	21	26	17	16	30	61	52	15	3
28-Jun	2	6	15	18	13	15	32	71	58	15	3
29-Jun	3	6	13	14	11	14	36	88	71	17	3
30-Jun	3	6	11	12	10	14	41	108	91	22	4
1-Jul	4	7	11	10	9	14	44	124	113	30	5
2-Jul	5	7	10	9	8	13	42	124	123	37	7
3-Jul	6	7	9	7	6	11	35	105	113	38	8
4-Jul	6	7	8	6	6	9	28	78	89	35	8
5-Jul	7	7	7	6	5	8	22	56	65	29	8
6-Jul	7	7	7	6	6	9	20	43	48	23	7
7-Jul	10	9	8	8	8	11	20	36	38	20	7
8-Jul	15	12	12	11	12	15	23	34	34	19	8
9-Jul	23	18	18	18	19	23	28	34	30	18	8
10-Jul	32	26	26	27	27	29	31	31	24	15	8
11-Jul	38	31	32	32	31	30	27	23	17	10	6
12-Jul	34	29	30	29	26	23	19	14	10	6	3
13-Jul	25	22	23	21	18	14	11	8	5	3	2
14-Jul	16	14	15	14	10	8	6	4	2	1	1

Figures
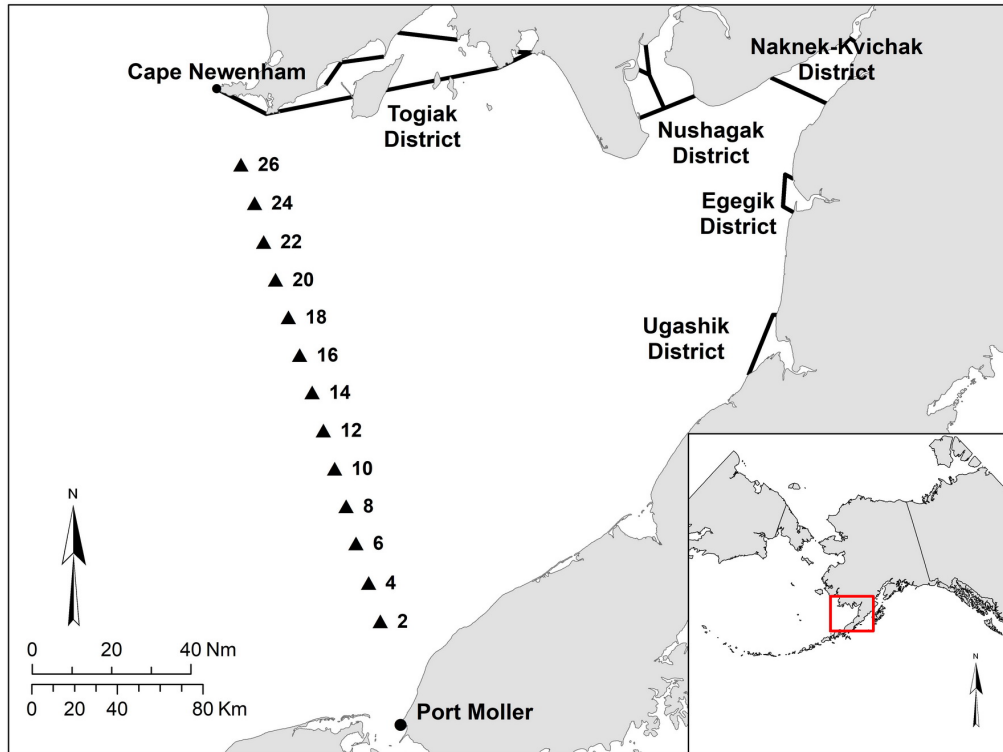
Figure 1. Map of the study area, showing the stations of the 2022 Port Moller Test Fishery and the locations of Bristol Bay fishing districts. Sockeye Salmon passing the test fishery stations take approximately six to nine days to reach the Bristol Bay fishing districts in typical years.
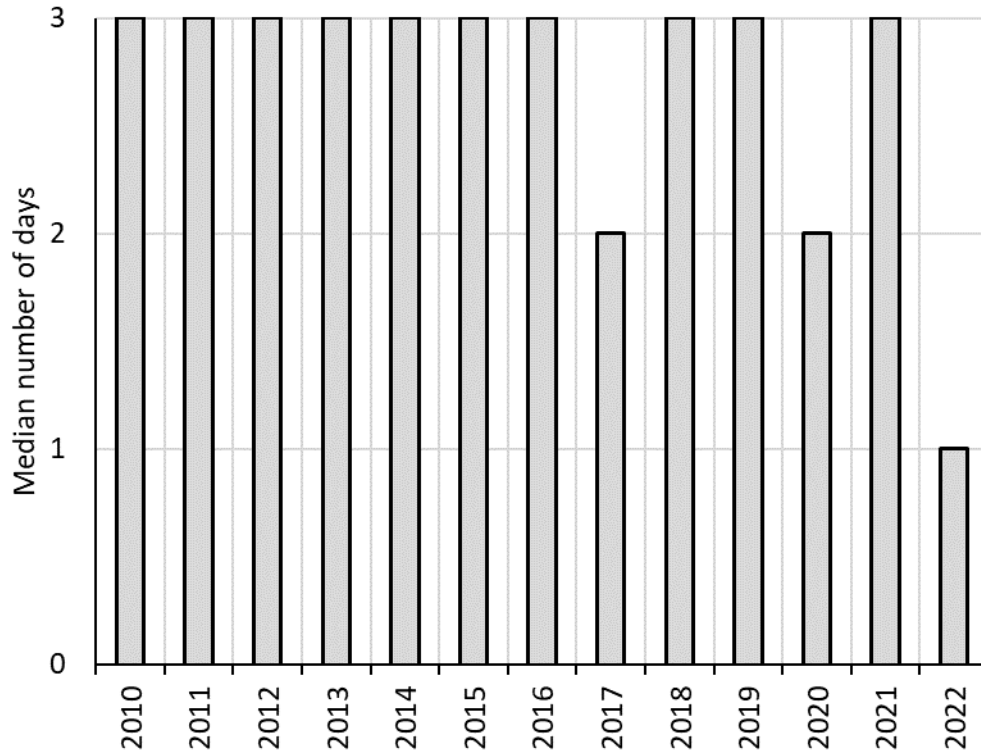
Figure 2.   The median number of days between the final date included in the inseason stock composition estimates and the release of those composition estimates from PMTF, 2010-2022.
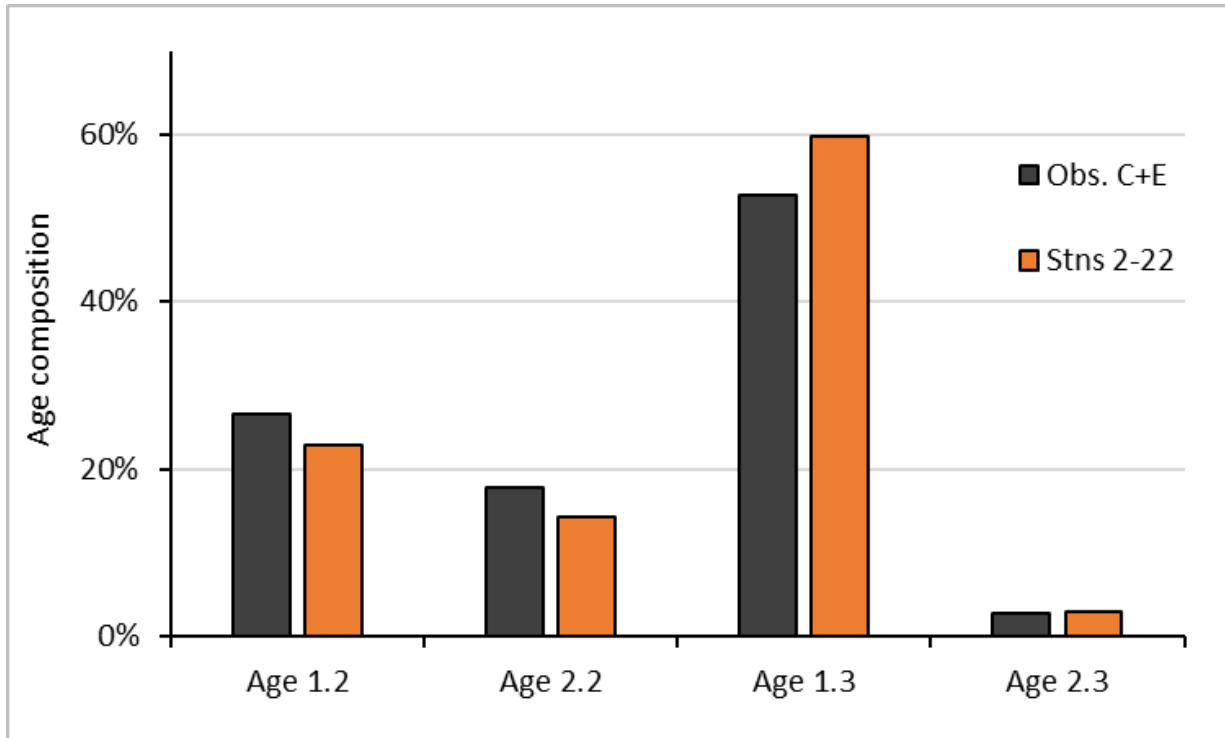
Figure 3.   Age composition for the observed C+E compared to that estimated from PMTF samples across the entire transect (Stns 2-22) in 2022.
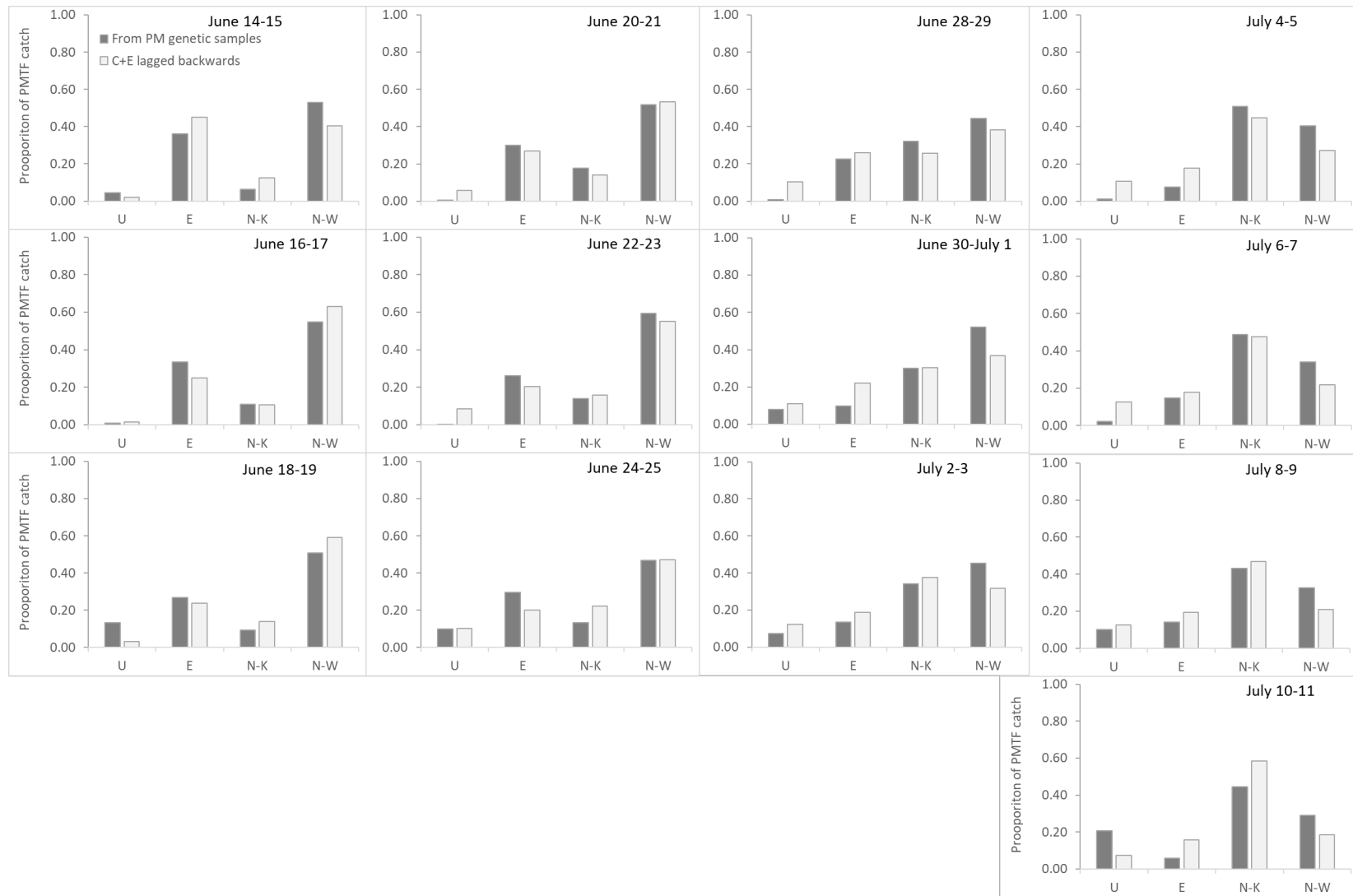
Figure 4. Stock composition by district based on catches from the PMTF compared to catch + escapement (C+E), 2022. Proportions for C+E were estimated from district runs lagged backwards to the PMTF using a travel time (TT) of seven days.
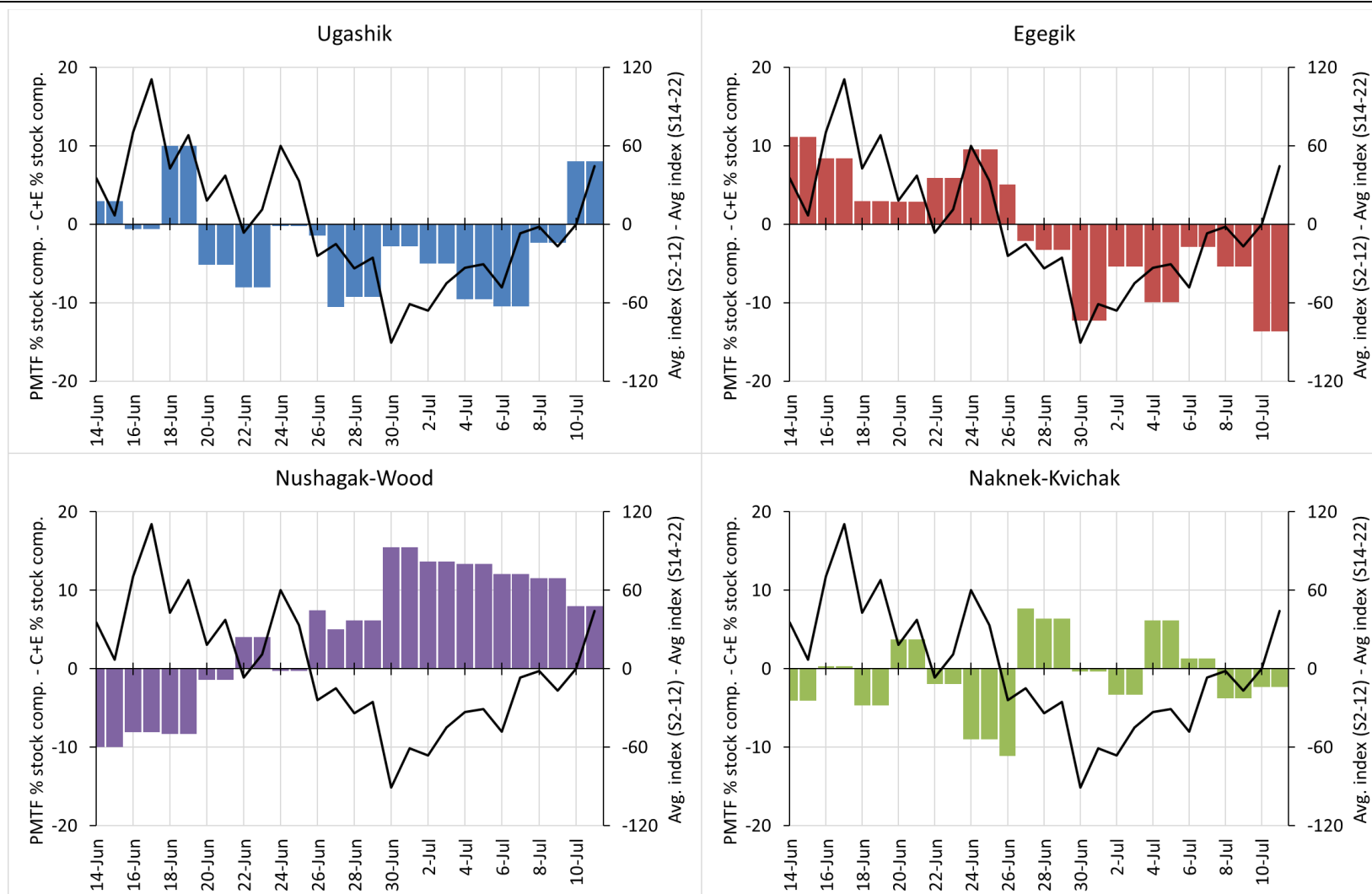
Figure 5.   Error (colored columns; left vertical axis) in the stock composition forecasts at Port Moller by district throughout the season versus the difference in average catch index magnitudes between the inner and outer stations (black line; right vertical axis).

Figure 6.   PMTF Daily Index and inshore catch + escapement (C+E) for 2011-2022. Gray area curve = observed C+E for historical years scaled to the left vertical axis; red columns = observed C+E for 2022. Black lines = respective Daily PMTF Catch Indices for each historical year; the red line = a 3-day moving average of the Daily Catch Index for 2022 based on Stations 2-22 (units for the daily indices are not shown, but all graphs are scaled the same). Catch Indices for years prior to 2018 represent the average catch-per-unit-effort (CPUE) across Stations 2-10. Furthermore, a shallower net (6 m deep) was used during 2011-2019; beginning in 2020 the net depth has been 11 m deep. Run timing for C+E was estimated by comparing each year's date when 50% of the run reached inshore to July 4. Blue vertical lines highlight July 4 for reference.
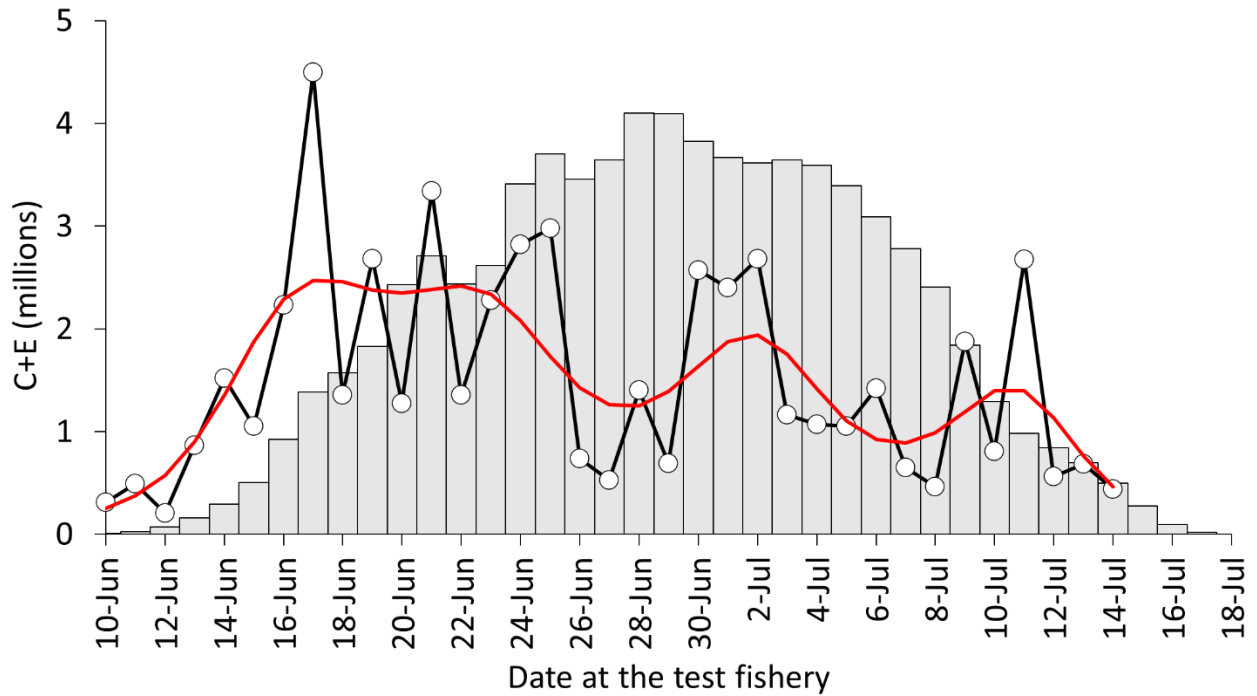
Figure 7.   Catch + escapement (grey columns) lagged backwards to the PMTF based on an average travel time of ~7 days. The black line depicts the average daily catch index (Stations 2-22), and the red line shows its predicted value from a statistical predictive model (see Methods). Note: scale for the catch indices is not shown.
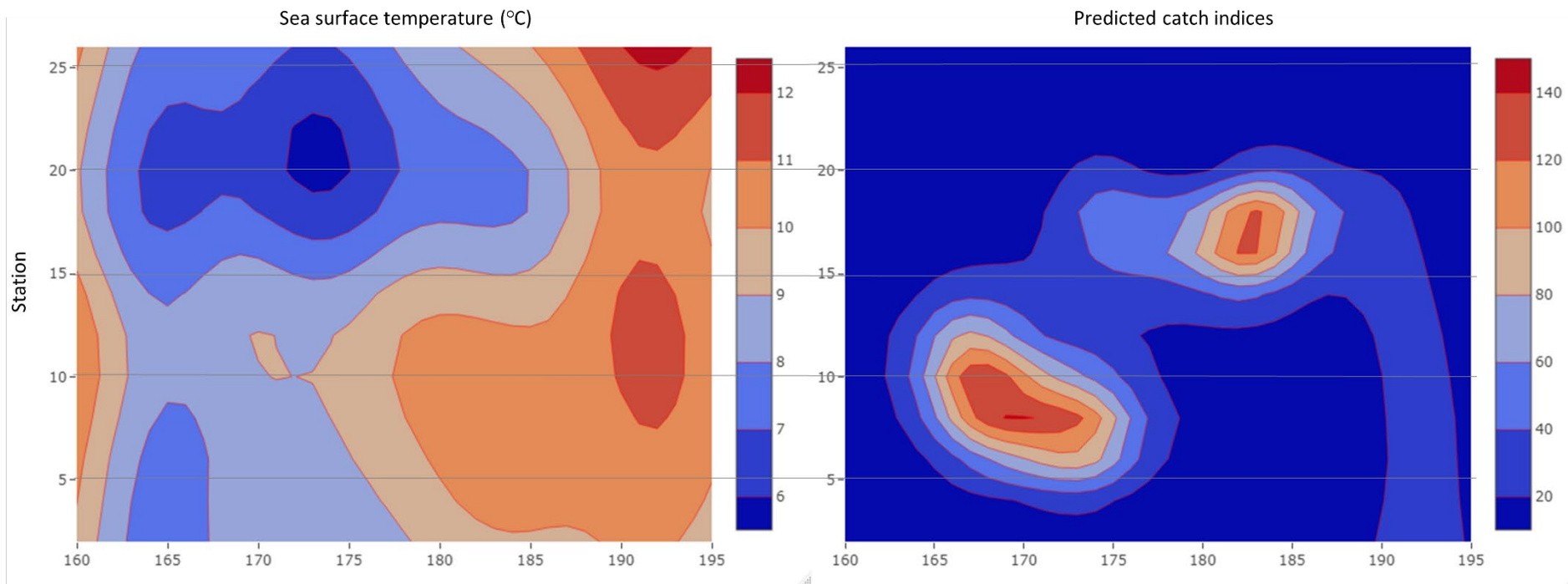
Figure 8. Heat maps of predicted sea surface temperatures and catch indices by station and date for the 2022 PMTF based predicted values from statistical predictive models (see Methods).
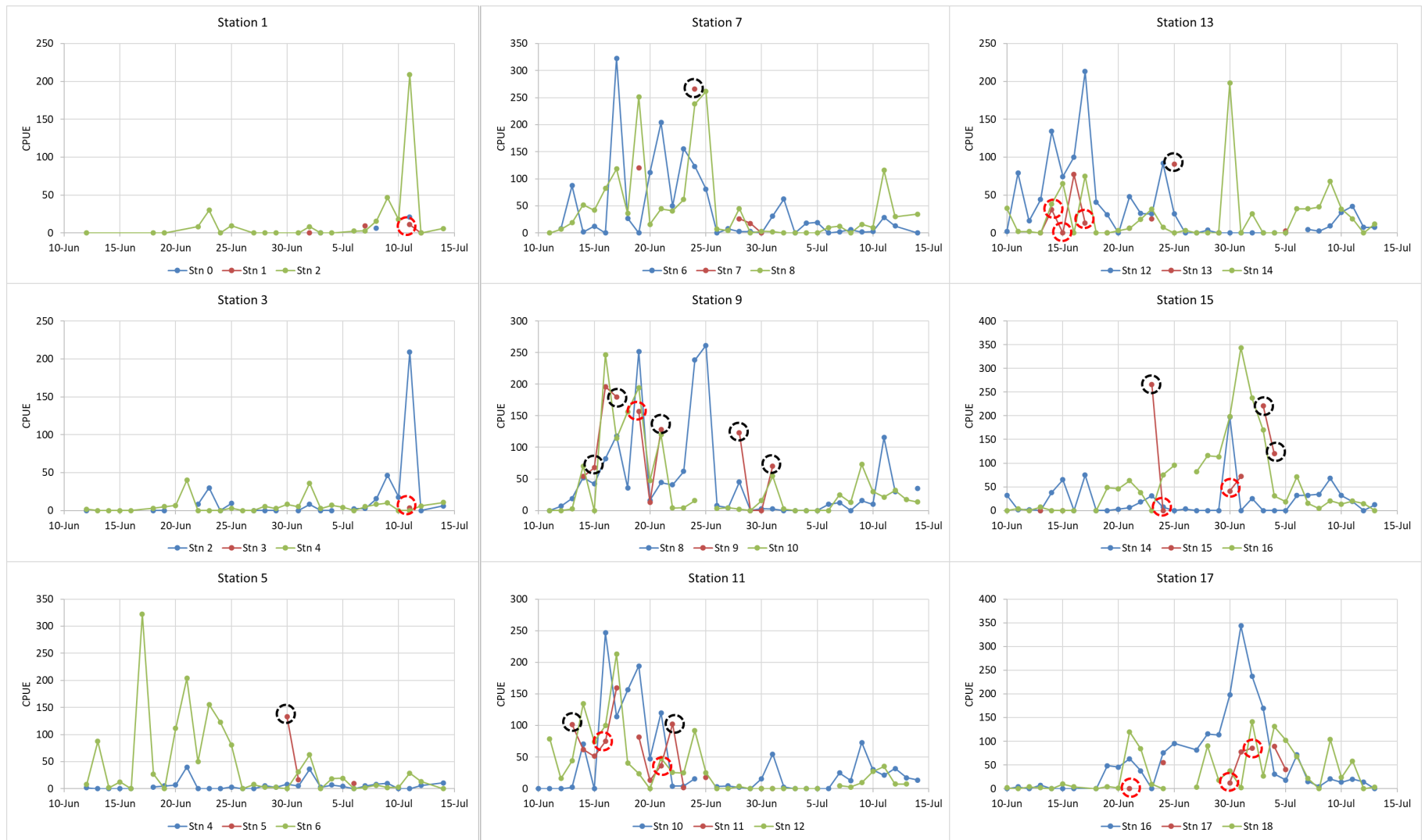
Figure 9. PMTF catch indices (CPUE) for odd-numbered and adjacent even stations fished during 2022. Major discrepancies for what was observed versus what would be expected based on interpolation between adjacent stations are circled.

Appendices

Appendix A

Catch updates and inseason interpretations for the Port Moller Test Fishery in 2022.

Each day's catch update contained a cover email plus the catch update table (if there was fishing), and sometimes relevant supporting tables and figures. For this appendix, the catch update tables sent through the season have been removed to reduce the size and duplication within the appendix.

Order of pages in this appendix:

1. BBSRI's final daily catch update table sent on July 14, 2022.
2. Catch update cover emails that contained additional information, and tables and figures that were not redundant with the final catch update.

From:	Scott Raborn
To:	Michael Link
Cc:	Scott Raborn
Subject:	PMTF Catch Update #35, July 14 2022
Date:	Thursday, July 14, 2022 5:34:22 PM
Attachments:	PMTF Catch Update #35 July 14 2022.pdf
	PMTF_RawData - July 14 2022.pdf
	Figure_1_DailyCatchIndexAndCE_2011-2022.pdf
	Acknowledgments PMTF 2022.pdf
	PMTF photo collage 2022.pdf
	Salmon Scale Imaging at sea final PMTF catch update_Final.pdf

Hi Everyone,

Attached is our final test fishing update for 2022. As expected, catches have wound down.

<u>Index by Station</u>

S2: 6
S4: 11
S6: 0
S8: 35
S10: 14

This project is a large team effort. Attached are acknowledgments for the 2022 project. Also attached, Michael has put together a small collection of photos from this year's project, and prepared a brief update on our collective efforts this year to age the PMTF catch without coming ashore to ship salmon scales.

Scott and Michael

Port Moller Test Fishery: Catch Update #35, 14 July 2022.

All updates sent by email are also posted online at www.bbsri.org

Date	S2	S4	S6	S8	S10	S12	S14	S16	S18	S20	S22	Best for comparison w/ prev years (Stns 2-10)	Best for assessing entry pattern this year (Stns 2-22)	Raw 4½" mesh	Raw 5⅛" mesh	Mean Length 4½" mesh	Mean Length 5⅛" mesh
10-Jun	1	2	5	8	10	2	32	0	2	0	0	5	6	14	5	498	562
11-Jun	1	2	7	0	0	79	2	4	0	2	1	2	9	1	53	501	527
12-Jun	0	2	8	7	0	16	2	0	4	2	0	3	4	8	14	529	528
13-Jun	2	0	87	19	2	44	0	7	2	0	8	22	16	58	91	514	531
14-Jun	3	0	2	52	70	134	38	0	0	0	1	25	27	73	94	514	524
15-Jun	3	0	13	42	0	74	65	0	10	0	1	12	19	49	37	501	521
16-Jun	4	0	0	82	247	100	0	0	4	3	2	67	40	117	143	497	523
17-Jun	4	15	323	118	114	213	75	15	7	3	2	115	81	233	220	513	534
18-Jun	0	3	27	36	156	41	0	0	0	2	4	44	24	45	74	504	518
19-Jun	0	5	0	252	194	24	0	48	4	0	3	90	48	125	148	507	532
20-Jun	6	7	111	16	47	0	3	46	2	10	4	37	23	86	35	505	533
21-Jun	6	40	204	45	120	48	6	63	120	3	6	83	60	149	159	505	534
22-Jun	8	0	50	41	4	26	18	38	84	0	0	20	24	85	28	519	530
23-Jun	30	0	155	62	4	25	31	0	9	125	8	50	41	94	128	520	529
24-Jun	0	0	123	238	16	92	7	75	0	0	7	75	51	109	152	513	535
25-Jun	9	3	81	261	32	25	0	96	54	22	6	77	54	115	120	516	536
26-Jun	3	0	0	8	3	0	3	56	51	18	4	3	13	3	1	488	533
27-Jun	0	0	8	4	4	0	0	82	3	0	3	3	10	23	15	515	526
28-Jun	0	5	3	45	2	4	0	116	90	0	13	11	25	58	69	521	531
29-Jun	0	3	3	0	0	0	0	113	18	0	0	1	12	31	29	528	529
30-Jun	3	8	0	3	16	0	198	198	38	42	4	6	46	111	141	514	534
1-Jul	0	5	31	2	55	0	0	344	3	30	5	19	43	118	130	516	527
2-Jul	8	36	62	0	2	0	25	237	141	17	0	22	48	162	136	524	525
3-Jul	0	3	0	0	0	0	0	170	27	23	8	1	21	82	58	513	531
4-Jul	0	7	18	0	0	0	0	31	131	16	8	5	19	49	54	511	520
5-Jul	7	4	19	0	0	0	0	18	102	50	8	6	19	58	30	514	520
6-Jul	3	0	0	10	0	9	32	71	68	78	10	3	26	51	89	513	516
7-Jul	3	5	2	12	25	5	32	15	21	0	9	9	12	33	31	515	524
8-Jul	16	8	6	0	13	3	34	4	0	0	8	9	8	24	15	512	531
9-Jul	46	10	2	16	73	9	68	21	104	14	8	29	34	105	100	516	529
10-Jul	18	0	3	10	30	27	32	14	24	3	0	12	15	48	39	517	527
11-Jul	209	0	29	116	21	35	19	20	58	11	11	75	48	121	162	518	526
12-Jul	0	6	13	30	32	8	0	14	0	4	3	16	10	32	21	513	536
13-Jul	25	22	23	21	17	7	12	0	4	3	2	22	12	12	7	500	527
14-Jul	6	11	0	35	14	8	6	4	2	1	1	13	8	21	9	521	534
Mean Stn Index	12	6	40	45	38	30	21	55	34	14	4		Total =	2503 (49%)	2637 (51%)	513	529

Red index values were estimated with a statistical model built upon the observed pattern across catch indices to date; thus, these values are subject to change as the season progresses.
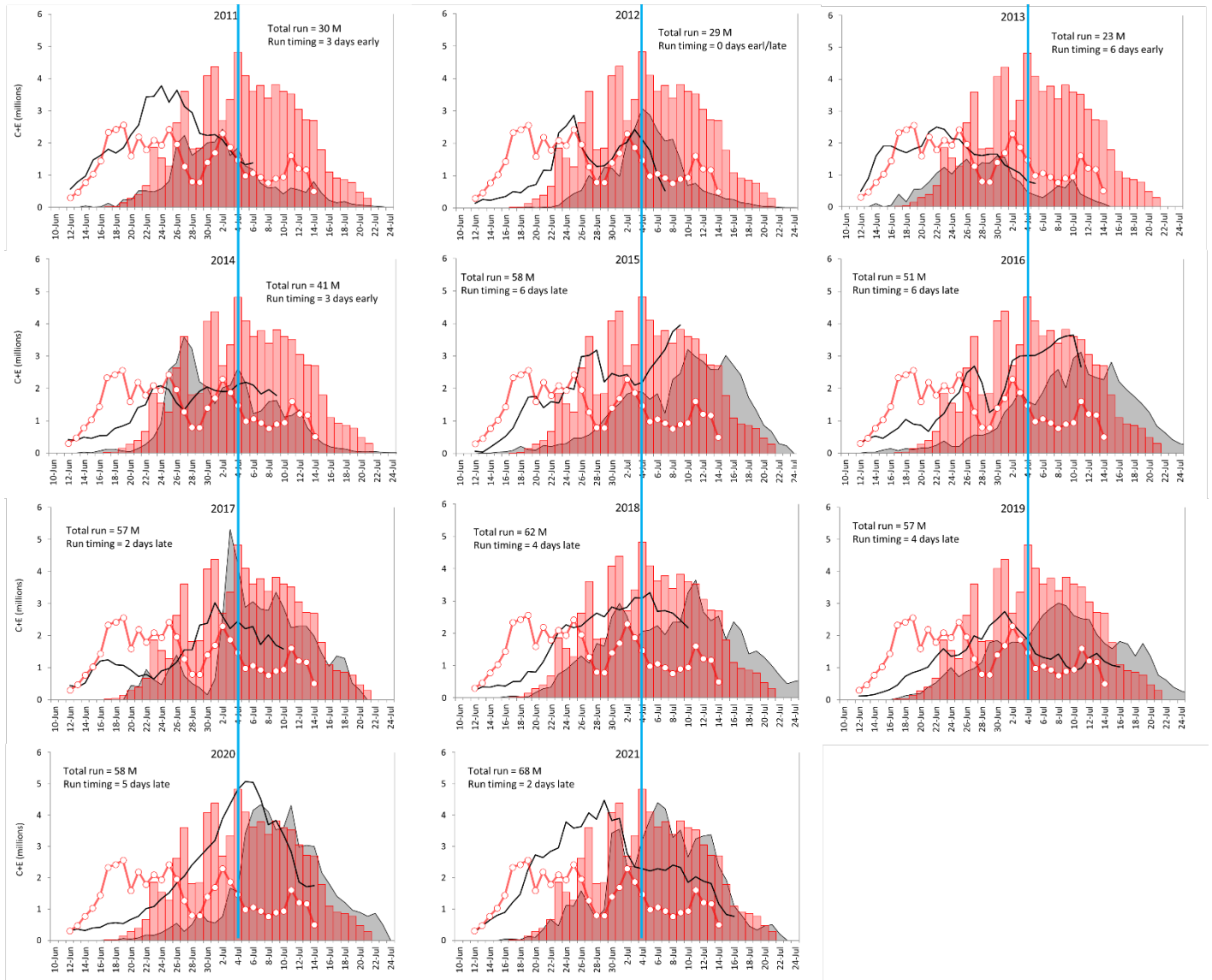
Figure 1. PMTF Daily Index and inshore catch + escapement (C+E) for 2011-2022. Gray area curve = observed C+E for historical years scaled to the left vertical axis; red columns = observed C+E for 2022. Black lines = respective Daily PMTF Catch Indices for each historical year; the red line = a 3-day moving average of the Daily Catch Index for 2022 based on Stations 2-22 (units for the daily indices are not shown, but all graphs are scaled the same). The green line shown for the 2021 panel reflects the 2022 Daily Catch Index without a moving average. Catch Indices for years prior to 2018 represent the average catch-per-unit-effort (CPUE) across Stations 2-10. Furthermore, a shallower net (6 m deep) was used during 2011-2019; beginning in 2020 the net depth has been 11 m deep. Run timing for C+E was estimated by comparing each year's date when 50% of the run reached inshore to July 4. Blue vertical lines highlight July 4 for reference.
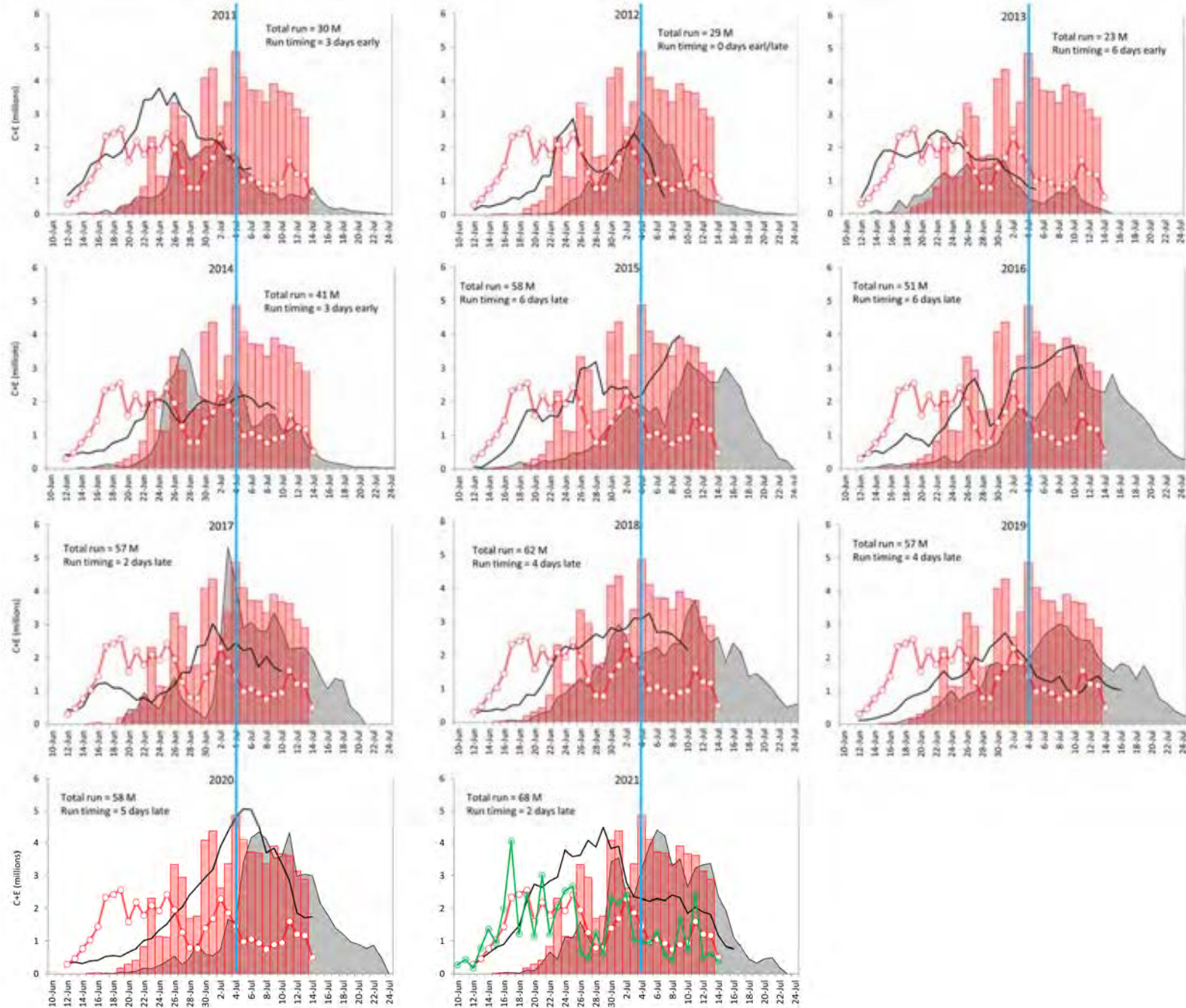
Acknowledgments, Port Moller Test Fishery, 2022

The Port Moller Test Fishery is dependent on many individuals. Here is the cast of characters in 2022. Thank you all.

R/V *Ocean Cat*, Robert Maw (owner and captain), Adam Maw (first mate); Zachary Butler and Mason Masuisui (deckhands). OC's fourth season at PMTF.

F/V *Halfmoon Bay*, Clayton Smith (captain); Chris Gonser (first mate), Justin Davis (engineer), Jared Sonti, deckhand. HMB operations support: Hunter Berns and Dan Martin. HMB's first season at PMTF.

BBSRI Fisheries Technicians, Bio-sampling and deck crew: Hayden Ulbrich, Eden Evans, Will Wrigley, Sam Harris, Donovan Hesselroth. At-sea genotyping: Natura Richardson.

Port Moller Shore Support: Steven Samuelsen (plant manager), Brenda Lanphere (office), Stefan (stockroom), Peter Pan Seafoods.

Dutch Harbor Shore Support: Mike and Kai Lloyd (Aleutian Expeditors). Office and yard staff, AML Dutch Harbor.

Stock Composition Estimates, Gene Conservation Laboratory, ADF&G
Tyler Dann (Lead), Elizabeth Lee (Lead-backup), Heather Hoyt (Lab Manager), Jodi Estrada (at-sea genotyping/in-lab support), Tela Barkley (in-lab support), and project support staff: Zach Pechacek, Erica Chenoweth, Tanya Johnson, Zac Grauvogel, Erin Dooley, Judy Berger, and Eric Lardizabal.

Logistics Support and Scale Aging
Jeff Regnart (BBSRI): vessel operations; project management; gillnet and gear procurement.
Bryan Nass (BBSRI), Dan Fong (Nikon Instruments): At-sea scale aging.
Stacy Vega and Diana Merlino (ADF&G), scale aging, age comp summaries.
Keggie Tubbs (BBSRI), Administration, HR, finance, and logistics.

Project gillnets: Vikki Garroutte-Simpson, LFS, Kenai.

Project Management, Data Analysis, Daily Email/Text Updates. Scott Raborn, Bryan Nass and Michael Link (BBSRI); Jordan Head (ADF&G).

A selection of photos from the Port Moller Test Fishery, 2022.

Compiled by Michael Link, July 14, 2022. *Photo credits when not Michael Link are noted within the figure captions.*

Figure 1. F/V *Halfmoon Bay* and the R/V *Ocean Cat*, PTMF Station 10, June 23, 2022. (Chris Gonser)

Figure 2. Justin Davis on the crane controls and Jared Sonti on the tag line as they load the genetics lab onto the deck of the F/V *Halfmoon Bay* at the light cargo dock at the Spit in Dutch Harbor, June 5, 2022.

Figure 3. Back deck of the *Halfmoon Bay* with the net reel in the foreground and the genetics lab and shelter deck for fish sampling in the distance, 5:00am, June 18, 2022.

Figure 4. Sunrise through wildfire smoke from SW Alaska. Ready to set at Station 20, *Halfmoon Bay*, June 15, 2022.

Figure 5. *Halfmoon Bay* picking up a shackle of gillnet from the *Ocean Cat* while at sea, June 13, 2022.

Figure 6. *Ocean Cat* leaving after dropping genetics tissue samples in a pelican case attached to two floats (right side, 1/3 way from the bottom of photo) as the *Halfmoon Bay* approaches for grappling the package, Station 12, June 23, 2022. (Zach Butler)

Figure 7. Natura Richardson grappling the tissue samples; view from the air (top), and view from back deck (bottom). (Zach Butler and Michael Link)

Figure 8. R/V *Ocean Cat*, June 18, 2022.

Figure 9. BBSRI crew Natura Richardson, Sam Harris, and Will Wrigley sampling fish on the *Halfmoon Bay*, June 22, 2022.

Figure 10. Natura Richardson (BBSRI) and Jodi Estrada (ADF&G) doing genetic lab analysis of the first of 13 genetics samples done at sea for the Port Moller Test Fishery, June 17, 2022.

Figure 11. The at-sea genetics and scale lab showing the Fluidigm EP1 (center, tall, blue), the Nikon microscope (just left of the computer screen), and the Knight heat press (right end of the bench).

Salmon Scale Imaging At-sea, Port Moller Test Fishery, 2022.

Prepared by Michael Link, July 14, 2022

Recall from our preseason update in May we mentioned that we were going to attempt to press, image, and transmit images of salmon scales from the F/V *Halfmoon Bay* (HMB) in 2022. The time and cost to take scales to land for shipping is high, and with the genetics to be done at sea, we needed to find a way to move them digitally. This is a quick update on the outcome of this study component.

Salmon are aged by first making a physical impression of a fish scale on a piece of acetate under heat and pressure. Under magnification, human scale "agers" can see patterns (circuli formed by ridges on the bony scale) that reveal the number of winters a fish has lived (annuli). Growth slows in the winter and circuli are more tightly packed. In Bristol Bay, there are four major age classes of adult sockeye salmon where fish have one or two winters in freshwater and 2 or 3 winters at sea. Because a fish spends is first winter as an egg in the gravel it does not have a scale; and therefore to determine the *total* age of a fish, one must add 1 year to the number of annuli (winters) shown in the scale. This might make more sense after viewing the scale images below.

The 2022 at-sea scale project was 100% successful. We were able to press and image over 3,000 sockeye salmon scales and send more than 1 GB of image data from the boat to the ADF&G age lab in King Salmon. Some who follow the inseason age information closely will have noticed this season that we were about a week later with age composition results than typical (i.e., results were available in late-June). This early delay was due in part to the at-sea scale efforts being a lower priority than the genetics results and because we encountered a couple of technical hurdles.

In 2022, we set out to press scales in a similar fashion to the way it has been done for decades. For imaging, high-speed throughput was essential; staffing and space are both limited on the vessel. With the help of Nikon Instruments and their image specialist (Dan Fong, Nikon, Seattle), we procured and customized an inverted microscope with a specialized camera and software system. The microscope was fitted with an automated table that was able to move the acetate quickly from one scale to the next under the camera-equipped microscope. Auto focus and other automated image processing procedures allowed our technicians to move through a couple of days of scale cards in under an hour.

Technical hurdles included some difficulties getting good clear presses of scales on acetate using the heat press; once we had time to focus on the challenge, the source was quickly identified and dealt with. Initial uploading of scale images was also a bit of a challenge. Again, we had to continue test fishing and had genetics stock composition estimates to produce, so we were delayed in addressing bandwidth for a few days. This issue was overcome by trying different approaches to file transfer and with the help of Hunter Berns (Bering North/HMB), who was able to dial-in adequate and dedicated high-speed internet with the KVH satellite system on the HMB. Once we had addressed these issues, scale images were arriving at the King Salmon lab faster than scale cards would have had we physically shipped scale cards via sea, air, and land as has been done in all years prior to 2022.

This effort was part of the PMTF at-sea genetics lab and therefore was funded by BBSRI, the Bristol Bay RSDA, and processors. Bryan Nass (BBSRI) spearheaded the entire effort beginning in the fall 2021. Bryan worked with Dan Fong (Nikon) to design hardware and software systems. Dan had been introduced to the scale ageing task by Rachel Ertz (ADF&G Cordova), which greatly accelerated our development timeline. Rachel had a vision of producing a high-speed scale aging system for salmon and

herring scales (a special thank you RE). Will Wrigley and Sam Harris (BBSRI) did all the vessel-based pressing, imaging, and transmission via the satellite connection. Cathy Tilly and Diana Merlino (ADF&G scale lab) aged all scales and were very helpful (and patient) throughout the 2022 season. Jordan Head and Stacy Vega (ADF&G research) have been extremely supportive of this effort from the first brainstorming meeting we had in late 2021. Finally, Greg Buck's vision and resourcefulness began all of this in 2006. Thank you all.

Below are images of four sockeye scales from the 2022 PMTF project. The first scale is shown as an image with no markings (Figure 1a) and then with dots depicting the freshwater (red) and marine (yellow) winters (Figure 1b). The other figures have just one image that contains the dots denoting the freshwater and marine annuli (Figures 2-4).

Figure 1a. Scale image from an age 1.2 sockeye from PMTF, Station 6, July 2, 2022.
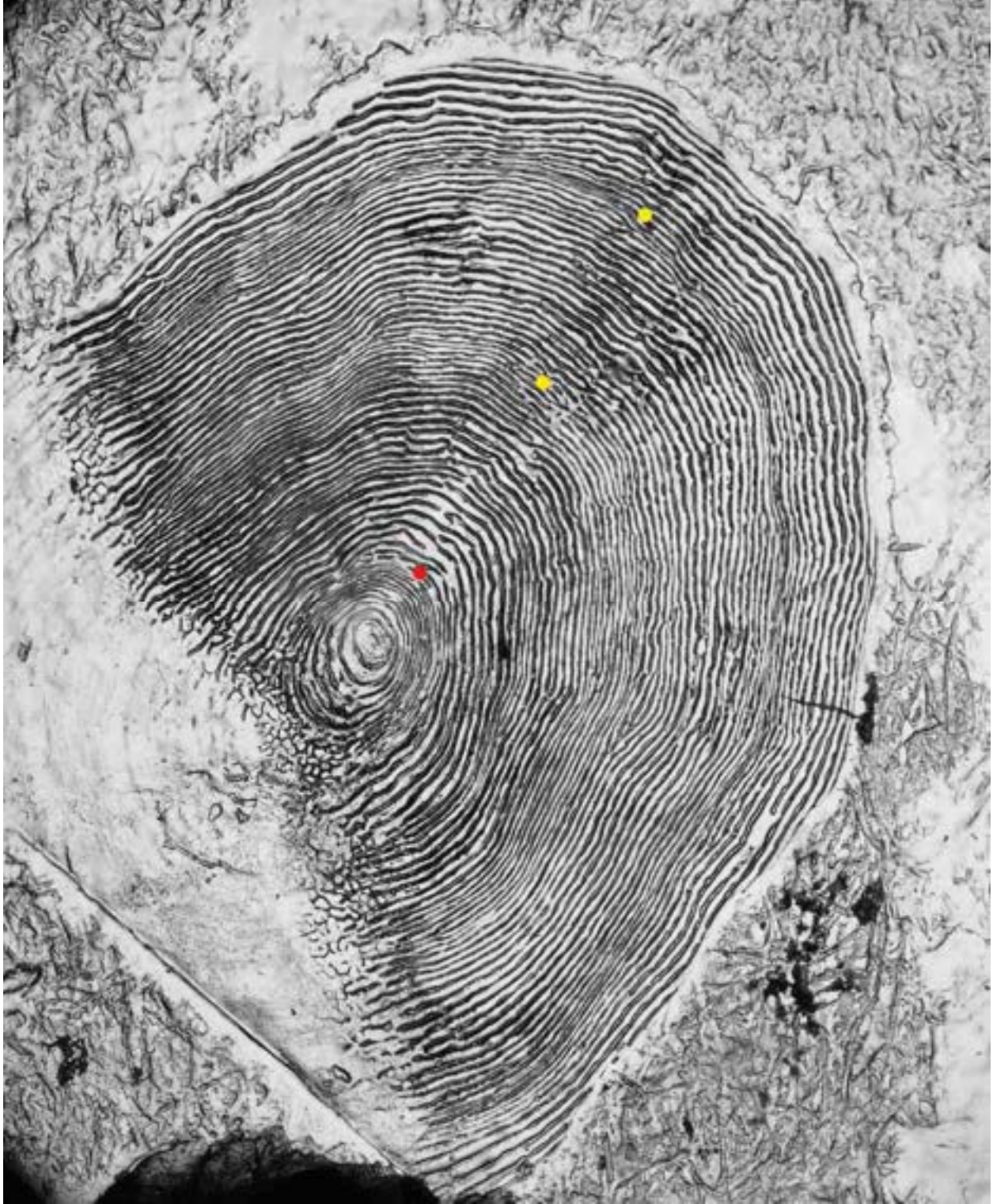
Figure 1b. Scale image from an age 1.2 sockeye from PMTF, Station 6, July 2, 2022. The red dot denotes the one winter spent in freshwater and the yellow dots denote the winters at sea. The growth outside of the final yellow dot is from growth that occurred since the winter of 2021-22. This fish is four years in total; its parents spawned in 2018.
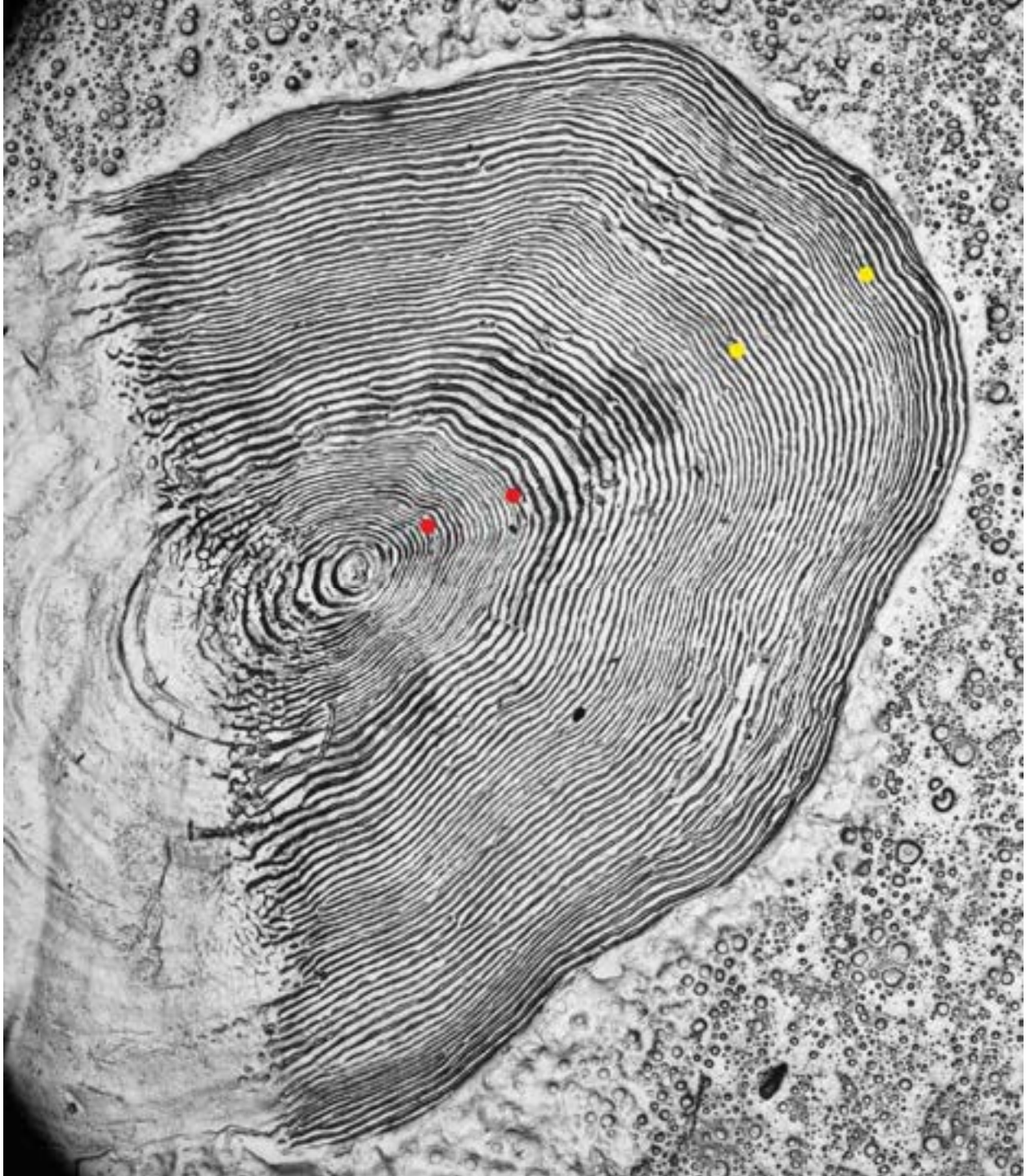
Figure 2. Scale image from an age 2.2 sockeye from PMTF, Station 12, June 18, 2022. As a juvenile, this fish spent two years rearing in a Bristol Bay nursery lake before going to sea. The fish was five years old; its parents spawned in 2017.
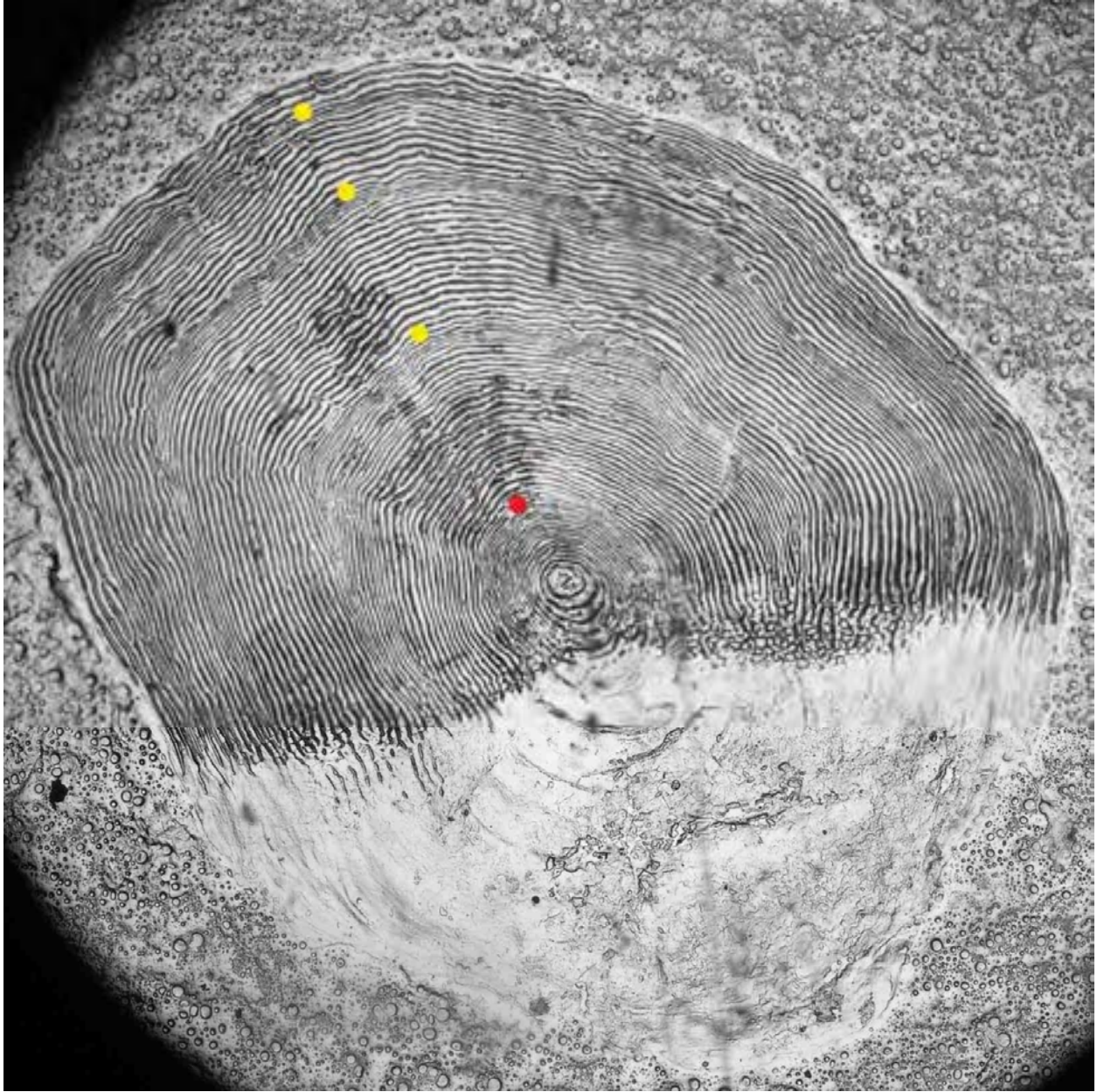
Figure 3. Scale image from an age 1.3 sockeye from PMTF, Station 4, June 20, 2022. The fish spent 3 years in the ocean, and would have been large (a "3-ocean" fish). It was five years of age; its parents spawned in 2017.
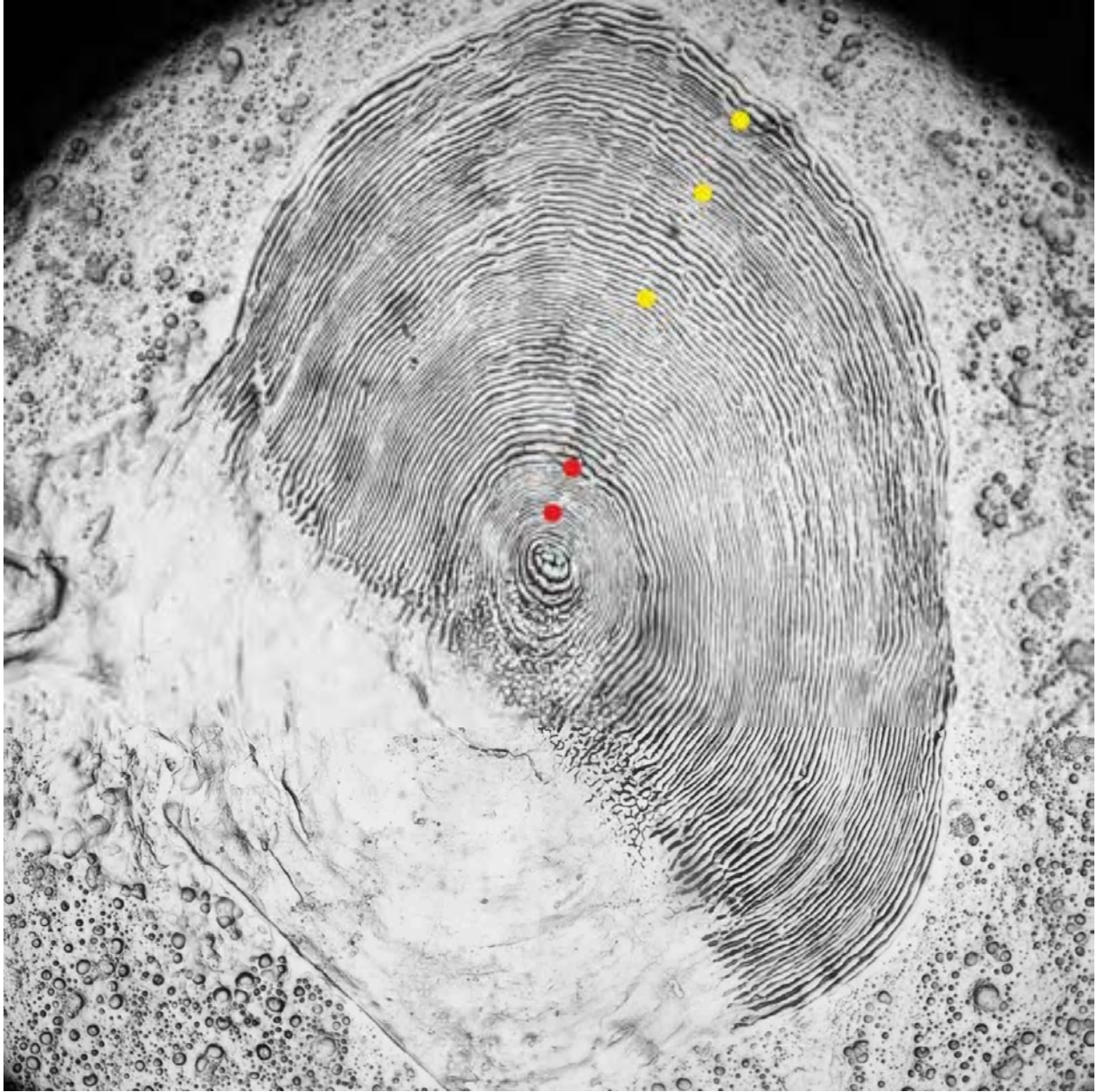
Figure 4. Scale image from an age 2.3 sockeye from PMTF, Station 8, July 7, 2022. The fish spent two years in freshwater and 3 years in the ocean (a "3-ocean" fish). It was six years of total age; its parents spawned in 2016.

Scott Raborn

From: Scott Raborn
Sent: Friday, June 10, 2022 9:55 PM
To: Michael Link
Cc: Scott Raborn
Subject: PMTF Catch Update #1, June 10, 2022

Hi Everyone,

Below are catch indices from the outer stations for the first PMTF Catch Update of the 2022 season. As a reminder, a catch index = estimated catch from the 200 fathom net if it had fished for one hour. In the coming days, we will attach a summary table of catch indices along with the raw data in pdf format.

The R/V *Halfmoon Bay* was able to get started yesterday (9-June) at Station 10, then continued to fish Stations 12-22 today. They will fish inward tomorrow, while the R/V *Ocean Cat* plans to start at Station 2 around midday and fish outward.

PMTF Stock Composition Status: Once enough genetic samples have been collected (~190 fish), the first stock composition estimate will be released for the dates and stations they represent. We will know more in a few days as to how that is shaping up.

Index by Station

S10: 0 (fished on 9-June)
S12: 2
S14: 32
S16: 0
S18: 2
S20: 0
S22: 0

Scott and Michael

To receive a brief summary of daily indexes by text message, Text the just the four letters PM TF to 833-612-1053 Be sure to spell PMTF correctly or it won't work. These shorter text updates go out about the time of, or shortly after the email updates go out.

Scott Raborn

Hi Everyone,

The *Halfmoon Bay* was able to fish Stations 8-20. The *Ocean Cat* was not able to get started today, but should be on transect tomorrow. Michael Link is currently on board the *Halfmoon Bay* smoothing out the sampling protocols and getting the two boats in sync.

Every year we get quite a few questions early on regarding how the various stocks correlate to catches at specific stations. The answer of course is not simple, but because stocks have started to segregate at this point in the migration there are patterns in the stock composition across stations. In short, Ugashik and Egegik stocks tend to migrate more through the inner stations (S2-S12), while the Nushagak and Naknek-Kvichak stocks favor the outer stations (S14-S22). Attached is a more detailed characterization of this phenomenon that we drafted during the 2020 season. Included in this document is a map of the Port Moller Stations and a comparison of stock compositions between inner and outer stations during early, middle, and late periods for the 2019 season.

PMTF Stock Composition Status: I misspoke last night about when exactly the first genetics will be run. The decision to run the first set of fish for genetics is made in consultation with the Department's gene lab, area staff, and is based on more than just reaching a cumulative catch of 190 fish. The first stock composition estimates will be released when an adequate sample size representing the first push of fish into the Bay have been caught. These criteria are generally met by about June 16. In 2022, this could be a day or two later, or possibly a bit earlier. Once the first set of estimates is run, we collectively strive to provide estimates for every following 2-day period through about the end of the first week of July.

Index by Station
S8: 0
S10: 0
S12: 79
S14: 2
S16: 4
S18: 0
S20: 2

Scott and Michael

To receive a brief summary of daily indexes by text message, Text the just the four letters PM TF to 833-612-1053 Be sure to spell PM TF correctly or it won't work. These shorter text updates go out about the time of, or shortly after the email updates go out.

How Station Catches Relate to Inshore Fishing Districts

Every year, many people want to know how station-specific catches at Port Moller relate to the inshore districts. We generally get questions like, "Which district or districts are fish at Station 10 headed for?". This is a simple and logical question, and utility of the test fishery would be greatly enhanced if there were a clear answer. Unfortunately, this is not the case as station-specific stock composition estimates are unavailable at the current level of sampling and funding. To establish station-specific estimates would require sampling stations multiple times per day with a 5-6 vessel effort and analyzing many more fish in the genetics lab. In a sense, it is a "million-dollar question" (a conservative cost projection at the least). However, we can provide a qualitative answer to this question given the current budget and logistical constraints.

All stocks are likely present at all stations, but there is a limit to the associations that can be made by station or narrow group of stations. A map of station locations is provided below (Figure 1), and a comparison of 2019 stock compositions across inner and outer stations for early, middle, and late periods that together accounted for 75% of the season's catch indices is given in Figure 2. Generalizations are that Egegik and Ugashik stocks are more likely to pass through the inner stations (Stations 2-12) than they are the outer stations (Stations 14-24). Nushagak District and Naknek-Kvichak stocks are more likely to pass through the outer stations.

Again, there are limits on this understanding and to the methods available. We must group station samples to obtain genetics results, and historical results prior to 2019 are largely limited to Stations 2-10 or 2-12. Therefore, the relative historical passage rate through Stations 14-18 by each stock is impossible to ascertain. We fished the far outers stations starting in 2019 and found significant numbers of Egegik fish; yet, this stock dominated the inner stations. The 2019 season had a large Egegik run, so a given stock's abundance relative to other stocks determines how much they might dominate a station or group of stations by day and by year.
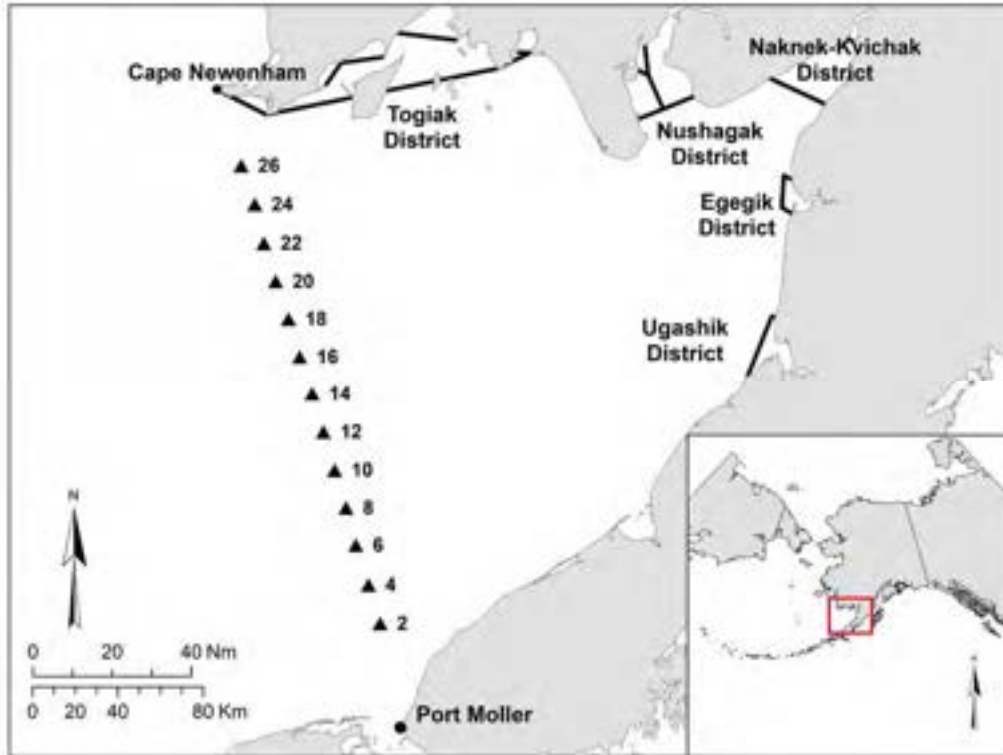
Figure 1. Map of the study area, showing the stations of the 2022 Port Moller Test Fishery and the locations of Bristol Bay fishing districts. Sockeye salmon passing the test fishery stations take approximately six to nine days to reach the Bristol Bay fishing districts in typical years.
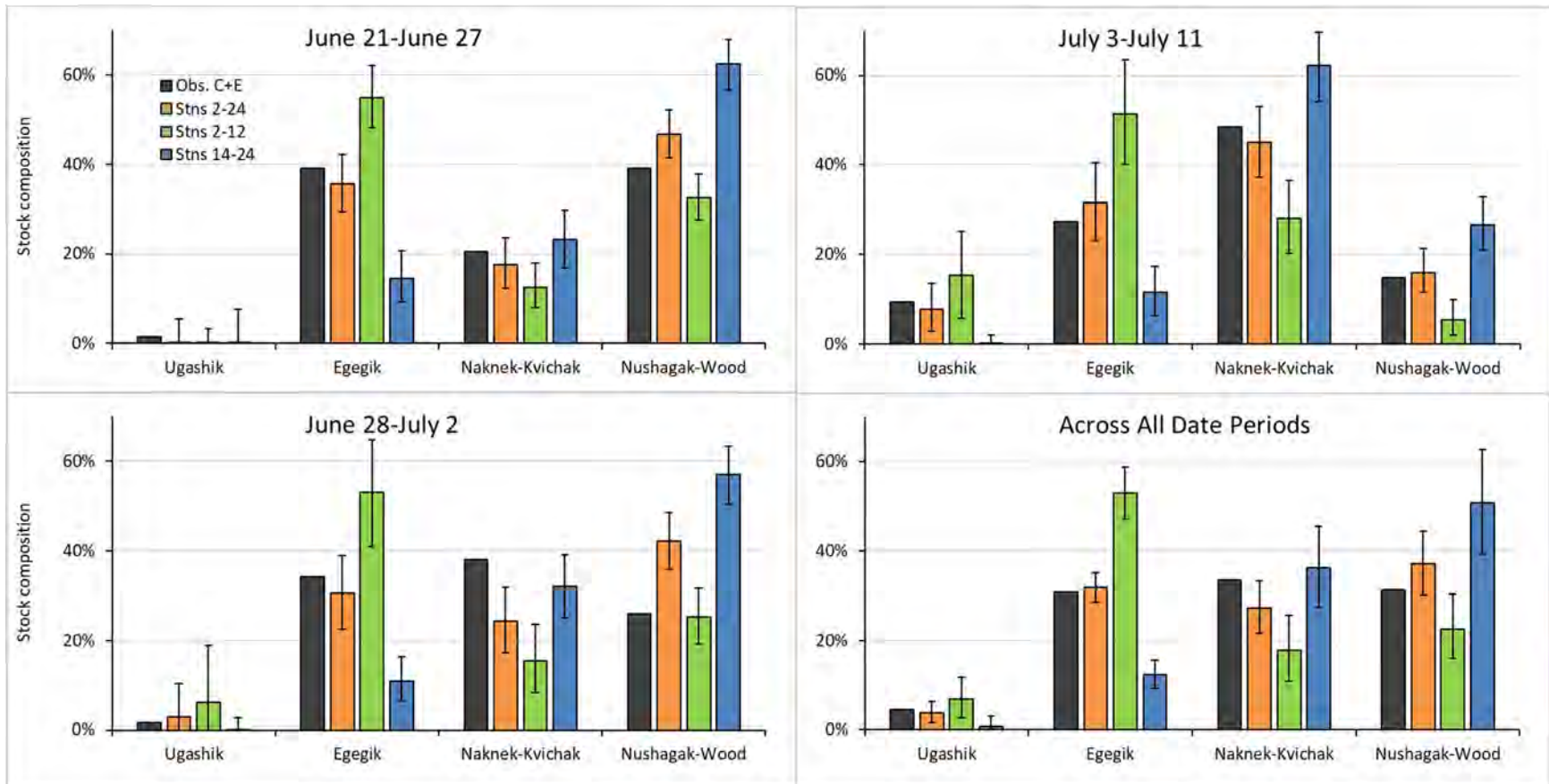
Figure 2. Postseason stock composition estimates from 2019 PMTF samples parsed by inner and outer station groupings, as well as the entire transect compared to catch + Escapement (C+E) lagged backwards to the test fishery by respective travel times. Early, middle and late periods (top and left panels) were chosen to reflect dates when the entire transect was sampled by two vessels (75% of season catch indices). Error bars represent 90% confidence intervals.

Hi Everyone,

Attached is tonight's catch update. Note the instructions below regarding text messaging. Also, in the coming days we will be reporting individual fish weights by mesh size once enough samples have been collected.

PMTF Stock Composition Status: No change in status.

Index by Station

S2: 0
S4: 2
S6: 8
S8: 7
S10: 0
S12: 16
S14: 2
S16: 0
S18: 4
S20: 2
S22: 0

Scott and Michael

To receive a *brief* summary of daily indexes by text message, text just the four letters "**PMTF**" to **833-612-1053.** Be sure to spell PMTF correctly or it won't work. These shorter text updates go out about the time of, or shortly after the email updates go out.

NOTE: If you subscribed for PMTF text summaries last season but are not receiving them, type "**unstop**" to the same number. That will restart your messages if you used "**stop**" last season. Unless you do this, texting "**PMTF**" as described above will not work.

Hi Everyone,

Attached is tonight's catch update along with the raw data file.

Now that the entire transect can be covered, we used extra sets to assess how banded the distribution might be on any given day; hence, the sampling of odd numbered stations. Motivation for this extra sampling comes from the stark changes in catch indices observed between adjacent even numbered stations on some days. The results from today showed that the mode at Station 12 extended at least to Station 11, and that sometimes modes are missed in between even numbered stations. The catches from odd stations will not be used for daily index calculation or stock composition estimates, and we will continue to prioritize coverage of the transect range. However, we will continue to make sets at odd numbered stations when time allows and report them in the summary below.

PMTF Stock Composition Status: The decision to run the first set of fish for genetics is made in consultation with the Department's gene lab, area staff, and is based on more than just reaching a cumulative catch of 190 fish. The first stock composition estimates will be released when an adequate sample size representing the first push of fish into the Bay have been caught. These criteria are generally met by about June 16. Once the first set of estimates is run, we collectively strive to provide estimates for every following 2-day period through about the end of the first week of July.

Index by Station

S4: 0
S6: 87
S8: 19
S10: 2
S11: 102
S12: 44
S13: 0
S14: 0
S15: 0
S16: 7
S18: 2
S20: 0
S22: 8

Scott and Michael

Hi Everyone,

Attached is tonight's catch update along with the raw data file. Note: when you subscribe to the texting service via *inReach*, your name or other information is automatically added to the "pmtf" or "unstop" message that you tried to send. As such, the system fails to add you and these have to be entered manually, which I am currently behind on. I apologize and will update that distribution list tomorrow.

There certainly seems to be a band of fish building around the center of the transect. To put this into context, we have also attached the final catch update tables for the four most recent years to facilitate comparison with this year's catch rates. Below each table we provide information that could be pertinent to the magnitude of catch indices on a given date-station-year combination. For instance, the indices at Station 12 seem substantially larger during recent days than in 2018 and 2019 for the same time period. While these two years were large runs (>55 million), they were both four days late. The preseason forecast of 75 million combined with an earlier run timing could be one explanation for the larger catches this year.

However, during 2018 and 2019 we were still using a test net that was 6 m deep. Beginning in 2020 (and continuing this year), we switched to a deeper net (11 m) while keeping everything else about the net the same. The deeper net sweeping more of the vertical water column would seem a plausible alternative explanation as to why catch indices are higher this year. However, we have found that most salmon are caught in the top half of the net during smaller catches. As catch rates increase, a greater proportion gets caught in the bottom half. The passage below is from our 2021 final report (Raborn and Link 2022):

"For the 2021 season, we categorized sets with total raw catches into bins of <50 (171 sets), 50-100 (23 sets), and >100 (14 sets); the percent of fish caught in the top half of the net were 75%, 71%, and 61%, respectively. Reasons why fish may pass deeper at times at the PMTF was tested and reviewed by Helton (1991). He postulated that increased passage rate may cause a greater portion of fish to swim deeper either due fish spreading more uniformly throughout the water column or due to initial fish caught in the top portion of the net spooking subsequent fish causing them to pass deeper and deeper as the net fills."

Regardless of the mechanism, the take home message is that at low passage rates the shallower nets used in 2018 and 2019 and the deeper nets used in 2020, 2021, and 2022 probably have the same efficiency and produce similar indices. The extent to which the deeper net's catch indices are greater than those from the shallower net should increase when passage rates are higher. Given a larger/earlier run this year compared to 2018 and 2019 one would expect higher indices for

Figure 1. Weight-length relationships based on data from the PMTF through June 15, 2022. Top panels are in English units; top right is based on pooled catches from both meshes. The bottom panel shows this relationship in metric units. The average length of fish by ocean age for the 2021 season is indicated by black arrows. Red arrows indicate the average weight of fish caught at the PMTF thus far (~4.6 lbs).

Hi Everyone,

Attached is tonight's catch update along with the raw data file. In the coming days, we should have enough data to begin interpolating for missed stations, which will help fill in the matrix and facilitate calculation of the Daily Catch Indices (averages across stations).

Tonight we report a first look at fish weights at Port Moller. Obtaining individual fish weights at sea can be tricky. The weights we were able to obtain (n=144 in total) were from handheld scales and were recorded during relatively calm seas. Thus, these data are approximate. Nevertheless, these results give a rough idea of the average weight for an individual Sockeye that can be expected inshore. This is the first year (to my knowledge) that weights have been reported from the PMTF, and we will see how well these predictions hold up. No fish have been aged yet, so we report the average lengths from the 2021 inshore run for ocean age-2 and -3 fish then regress weight from these lengths (about 4 and 5.5 lbs, respectively). Overall, the average fish caught in the PMTF thus far weighs ~4.6 lbs.

PMTF Stock Composition Status: The plan is to base our first stock composition estimates on catches from June 14 and 15. If all goes well, these results will be released in a day or two.

Index by Station

S4: 0
S6: 13
S8: 42
S9: 68
S10: 0
S11: 51
S12: 74
S13: 0
S14: 65
S15: 0
S16: 0
S18: 10
S20: 0

Scott and Michael

Figure 1. Weight-length relationships based on data from the PMTF through June 15, 2022. Top panels are in English units; top right is based on pooled catches from both meshes. The bottom panel shows this relationship in metric units. The average length of fish by ocean age for the 2021 season is indicated by black arrows. Red arrows indicate the average weight of fish caught at the PMTF thus far (~4.6 lbs).
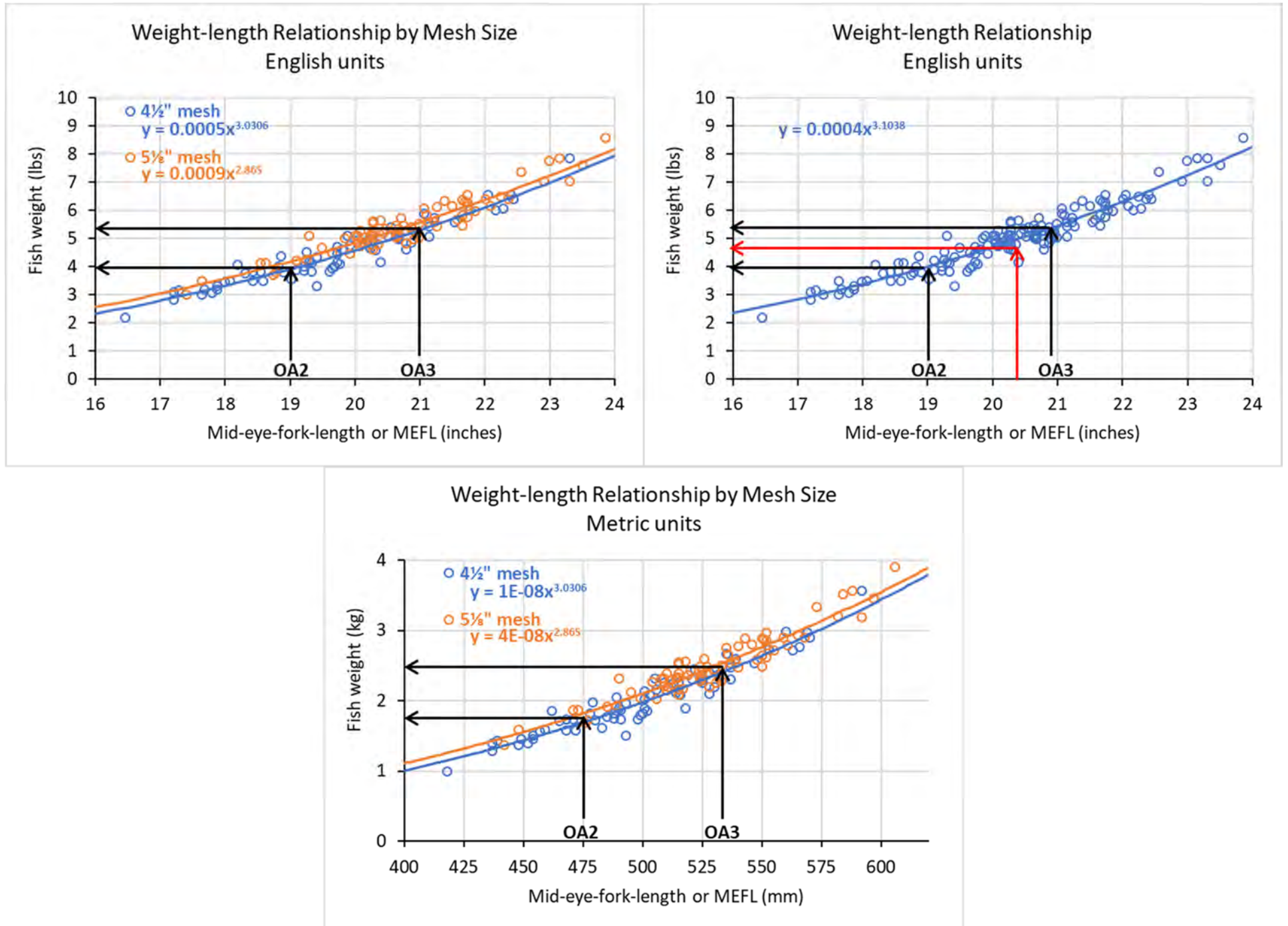
Michael Link

From:	Scott Raborn <raborn@lgl.com>
Sent:	Friday, June 17, 2022 7:30 PM
To:	Michael Link
Subject:	PMTF Catch Update #8, June 17 2022
Attachments:	PMTF Catch Update #8 June 17 2022.pdf; PMTF_RawData - June 17 2022.pdf

Attached is tonight's update. Rough seas earlier in the day hindered fishing. By the time bad weather subsided, the boats had committed to focusing on the center of the distribution observed thus far. Tomorrow, we will prioritize covering the entire transect.

I am still working on the interpolation model and will have it ready to fill in missed stations by tomorrow so that the Daily Catch Indices can be reported. For now, we will just note that these are large station indices for this early in the season.

PMTF Stock Composition Status: The onboard gene lab has what they need for the June 16 and 17 samples. If all goes well, these results may be released late tomorrow, but possibly Sunday.

Index by Station

S6: 323
S8: 118
S9: 180
S10: 114
S11: 159
S12: 325
S13: 13
S14: 75

Scott and Michael

Michael Link

From:	Scott Raborn <raborn@lgl.com>
Sent:	Saturday, June 18, 2022 5:47 PM
To:	Michael Link
Cc:	Scott Raborn
Subject:	PMTF Catch Update #9, June 18 2022
Attachments:	PMTF Catch Update #9 June 18 2022.pdf; PMTF_RawData - June 18 2022.pdf

Attached is tonight's update. The crews were able to cover the entire transect today (except for Station 22), and it seems the passage rate stalled a bit. It will be interesting to see if a dip occurs in the catch plus escapement in the days to come.

Please note an error in yesterday's catch update (#8). There was an entry error for Station 12's mean fishing time that falsely inflated the index. The correct value was supposed to be 29 min (not 19 min) resulting in an index of 213 (not 325), which is lower of course but still very high for this early in the season.

<u>PMTF Stock Composition Status</u>: The boats will fish toward each other tomorrow and should have enough samples in the onboard gene lab to begin the next stock composition estimate.

<u>Index by Station</u>

S2: 0
S4: 3
S6: 27
S8: 36
S10: 156
S12: 41
S14: 0
S16: 0
S18: 0
S20: 2

Scott and Michael

Michael Link

Attached is tonight's update. Turns out they did fish Station 22 yesterday evening, so note the minor change in the catch update table.

PMTF Stock Composition Status: Stock composition for June 18 and 19 should be available no later than tomorrow evening.

Index by Station

S2: 0
S4: 5
S6: 0
S7: 120
S8: 252
S9: 157
S10: 194
S11: 82
S12: 24
S13: 0
S14: 0
S16: 48
S18: 4
S20: 0

Scott and Michael

Scott Raborn

Attached is tonight's update.

PMTF Stock Composition Status: June 18 and 19 samples are being run now, and we expect results by morning.

Index by Station

S4: 7
S6: 111
S8: 16
S9: 13
S10: 47
S11: 13
S12: 0
S14: 3
S16: 46
S18: 2

Scott and Michael

Scott Raborn

Attached is tonight's update. Catch indices picked up today along the outside stations, an indication that Nushagak District stocks are building.

PMTF Stock Composition Status: June 20 and 21 samples have been collected by both boats, and hopefully the transfer of samples from the *Ocean Cat* to the *Half Moon Bay* will occur early this evening. If so, and processing goes well, we may have a stock composition estimate for these dates late tomorrow (June 22). Any hiccups would shift that timeline to early on June 23.

Index by Station

S4: 40
S6: 204
S8: 45
S9: 128
S10: 120
S11: 36
S12: 48
S13: 6
S14: 6
S16: 63
S17: 0
S18: 120
S20: 3

Scott and Michael

Attached is tonight's update.

Also attached is a figure with weight-length relationships updated through today. The two mesh sizes seemed to have converged to yield similar results with the increase in sample size. The average weight of a Sockeye caught in the test fishery thus far was ~4.8 lbs.

PMTF Stock Composition Status: The boats are at opposite ends of the transect tonight and will meet up tomorrow evening to exchange samples for June 22 and 23. We will try to maintain the schedule of stock composition releases every two days, which would be the day after the boats sample towards each other; however, expect a delay here and there because sometimes the transfer will not occur until the following morning.

Index by Station

S2: 8
S4: 0
S6: 50
S8: 41
S10: 4
S11: 103
S12: 26
S14: 18
S16: 38
S18: 84
S19: 57
S20: 0
S22: 0

Scott and Michael

Figure 1. Weight-length relationships based on data from the PMTF through June 22, 2022. The left panel shows these relationships by mesh size; the right panel pools all data. Red arrows indicate the average weight of fish caught at the PMTF thus far (~4.8 lbs).
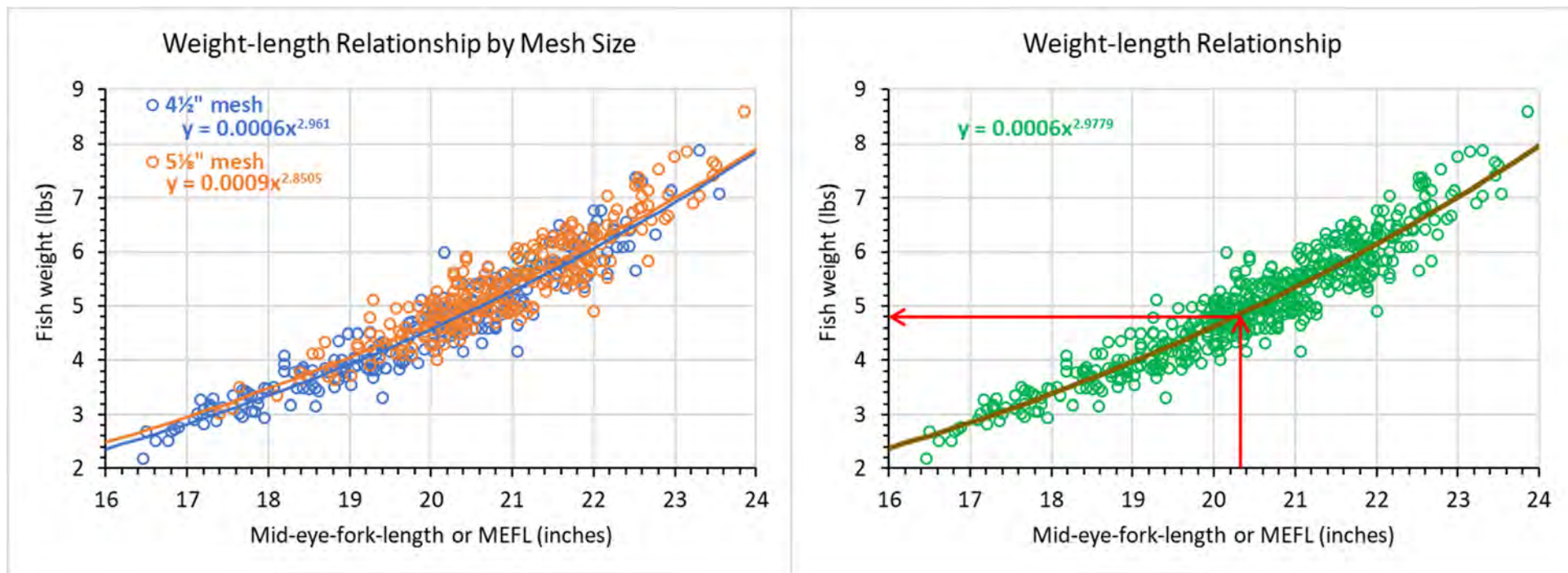
Scott Raborn

Attached is tonight's update.

PMTF Stock Composition Status: Genetic samples for June 22 and 23 are being processed, and the 5th stock composition for this season could be released late tomorrow (June 24), but possibly the following morning.

Index by Station

S2: 30
S4: 0
S6: 155
S8: 62
S10: 4
S11: 2
S12: 25
S13: 18
S14: 31
S15: 266
S16: 0
S18: 9
S20: 125

Scott and Michael

Attached is tonight's update along with a graph depicting historical PMTF Daily Catch Indices/catch plus escapement (C+E), as well as the first set of age composition estimates released by ADF&G.

So far, this year's Daily Catch Index and C+E appear in line with the preseason forecast; that is, a run either larger or a day or two earlier than last year's run of 68 million that came in two days late.

PMTF Stock Composition Status: The timeline for the next stock composition is uncertain due to weather. Hopefully, the data stream keeps flowing.

Index by Station

S2: 0
S4: 0
S6: 123
S7: 266
S8: 238
S10: 16
S12: 92
S14: 7
S15: 0
S16: 75
S17: 55
S18: 0
S20: 0

Scott and Michael

Attached is tonight's catch update. The boats were able to cover most of the test fishing transect before bad weather risked damaging the net at Station 10.

C+E dropped off a bit yesterday like the Daily Catch Index would suggest given a 6-day travel time (see Figures 1 attached). If this relationship holds, C+E should fluctuate between one and two million for the next several days. Another likely outcome would be if fish surged into the districts after holding outside for several days (similar to 2017 and 2021).

PMTF Stock Composition Status: Genetic samples for June 24 and 25 were successfully transferred to the onboard gene lab. However, rough seas hinder sampling processing. As such, a stock composition for these dates is not likely to be released before very late tomorrow (June 26) or Monday morning.

Index by Station

S2: 9
S4: 3
S6: 81
S8: 261
S10: Not fished due to weather
S11: 18
S12: 25
S13: 91
S14: 0
S16: 96

Scott and Michael

P.S. Michael made it to Port Moller last night after being onboard the HMB for over two weeks. So, a big THANK YOU to him for getting this year's operation off to a smooth start!

Attached is tonight's catch update.

Today's catches were down again at Port Moller. Low catch indices for a couple of days in a row are not completely out of the ordinary even for the large runs observed over the past seven years. However, three days in a row would be very strange, and we expect to see the indices bounce back in the next few days if the run is to reach the preseason forecast.

PMTF Stock Composition Status: The past two days (June 26 and 27) have produced only 38 fish, which is not enough to estimate stock composition. Hopefully, the next two days (June 28 and 29) will be more fruitful.

Index by Station

S2: 0
S4: 0
S6: 8
S8: 4
S10: 4
S12: 0
S14: 0
S16: 82
S18: 3
S20: 0

Scott and Michael

Attached is tonight's catch update along with the second set of age compositions released by ADF&G.

Catch indices at Port Moller have been far less than expected four days in a row now making the pattern in the Daily Catch Index for this season officially strange.

Port Moller catches were higher than normal during the first week of the test fishery, which was consistent with the magnitude of the preseason forecast (~75 million) and an average run timing (defined as 50% of the inshore run occurring on July 4). Catches during the second week failed to meet this expectation, and the last four days of very low catch indices have never been observed at Port Moller during what is typically the peak rate of passage at the test fishing transect. PMTF indices do not typically fall to this degree in the last 5-6 days of June.

We are achieving temporal and spatial (both vertical and horizontal) coverage that is unprecedented for any previous season in the test fishery. Yet, we are trying to make sense of these unexpected results and have considered several hypotheses.

(1) During this last week, Sockeye are suddenly migrating deeper than the net fishes. This is possible, but note that we are using a net considerably deeper than the first five decades of the test fishery. The net is 11 m deep compared to the historical net (2019 and prior) that was 6 m deep. Our skippers are on high alert to watch for reasons we might be missing fish (and whether there is any evidence fish are milling). They and our crews have been looking closely at the vertical location within the net that fish are being caught to signify something amiss. Further, we are looking for the any water temperature boundary (thermocline) that might suggest fish are traveling deep. We have not seeing anything on their depth sounders or temperature profiles to suggest this is the case. For historical context, we once encountered an unexpected lull in catches in early July 2019. At the time we tested a deeper 100-mesh net against the typical 60-mesh net being used for the test fishery. The 100-mesh then caught more fish, so clearly fish can run deeper than 60 meshes; how much deeper than 100 meshes we do not know. This event led to us to use a deeper net for the program starting in 2020 (100 meshes of 5⅛" and 111 meshes of 4½"). Note that most of the time the majority of fish we have caught in both the 60- and 100-mesh nets have been caught in the top 3 m.

(2) We are missing dense bands of fish between our traditional even-numbered stations. The crews are fishing as many stations as feasible, including odd stations, to ensure the likeliness of this possibility is at a minimum; today the crews fished 13 stations. Missing dense bands of fish is not likely the cause of the depressed indices, but sampling more of the transect cannot hurt. Our skippers are well aware of this concern and will continue to maximize the horizontal breadth and

frequency of stations fished.

(3) The run is simply bimodal through time (two peaks separated in time). It is possible that we are currently experiencing a lull in test catches in between the first and second peaks. If so, catches should build again very soon if a larger second mode of fish are still to come. We have little-to-no information to predict what will happened at Port Moller. We use Port Moller to predict what will happen inshore over the next week or so. We too hope that a wall of fish hits tomorrow or the next day at Port Moller making this hypothesis the most likely of all in this interpretation.

4) The run is under forecast to a nontrivial degree.

PMTF Stock Composition Status: The samples have been transferred from the OC to the HMB this evening. The next stock composition estimates from June 28 and 29 will likely be released either late tomorrow or early on July 1.

Index by Station

S2: 0
S4: 3
S6: 3
S7: 17
S8: 0
S9: 0
S10: 0
S12: 0
S13: 0
S14: 0
S16: 113
S18: 18
S20: 0
S22: 0

Scott and Michael

Attached is tonight's catch update.

Today's Daily Catch Index was similar to yesterday, and the outer band of fish appears to remain strong and centered on Station 16.

PMTF Stock Composition Status: Samples have been transferred from the *Ocean Cat* to the *Halfmoon Bay*. The next stock composition (June 30 and July 1) should be released late tomorrow or early July 3.

Index by Station

S2: 0
S4: 5
S5: 16
S6: 31
S8: 2
S9: 70
S10: 55
S11: 0
S12: 0
S14: 0
S15: 72
S16: 344
S17: 77
S18: 3

Scott and Michael

Attached is tonight's catch update.

Today's Daily Catch Index continues the uptick from the low indices for June 26-29 and is on parr with those observed prior to this drop off. Basically, Port Moller has rallied to an extent. The outer station component is still there, and the inner stations are up from yesterday as well.

We are now estimating about a 9-day travel time. Therefore, we expect C+E to bounce around for the next couple of days, then fall off by July 5 for a few days before rebounding by July 10. We hope to quantify this more tomorrow or the next day, but for now that is what we are comfortable with saying.

PMTF Stock Composition Status: The next stock composition (June 30 and July 1) will be released early tomorrow (July 3).

Index by Station

S1: 0
S2: 8
S4: 36
S6: 62
S8: 0
S10: 2
S12: 0
S14: 25
S16: 237
S17: 86
S18: 141
S20: 17
S22: 0

Scott and Michael

Attached is tonight's catch update.

<u>PMTF Stock Composition Status</u>: Samples for July 2 and July 3 have been transferred to the onboard gene lab, and our goal is to release the stock composition for these dates by the morning of July 5.

<u>Index by Station</u>

S0: 0

S2: 0

S4: 3

S6: 0

S8: 0

S10: 0

S12: 0

S14: 0

S15: 221

S16: 170

S18: 27

S20: 23

Scott and Michael

Attached is tonight's catch update.

Obviously, things have slowed down at the PMTF. Catches have been virtually zero from Stations 2-14 for the last two days. The band of Sockeye offshore at Stations 14-18 has redistributed a bit but has also abated.

Over the last several days, the *Ocean Cat* has fished the offshore stations during a substantial tide differential, while tides experienced inshore by the *Half Moon Bay* were less so. Concurrent with this observation were noticeable differences in catch rates between the outer and inner stations (greater and lesser, respectively). As such, the *Half Moon Bay* delayed fishing Stations 2-6 today until the greatest tide differential occurred inshore. Low catches at these inner stations today would not refute the influence of tide, but a dramatic increase in catches would cause us to take pause and consider the effect of tide further this season. Tidal effect has been something we have chased for years, but too many confounding influences prevented us from testing this phenomenon. Increased spatial and temporal coverage this season facilitates such endeavors. We will continue to test potential influences on catch rates to the extent that consistent sampling within season is not compromised.

PMTF Stock Composition Status: The stock composition for July 2-3 samples should be released in the morning.

Index by Station

S2: 0
S4: 7
S6: Will be reported tomorrow.
S8: 0
S10: 0
S12: 0
S14: 0
S15: 120
S16: 31
S17: 89
S18: 131
S20: 16

Scott and Michael

Attached is tonight's catch update.

PMTF Stock Composition Status: Our goal is to release the next stock composition (samples from July 4-5) by the morning of July 7.

Index by Station

S4: 4
S6: 19
S8: 0
S10: 0
S12: 0
S13: 2
S14: 0
S16: 18
S17: 40
S18: 102
S20: 50

Scott and Michael

Attached is tonight's catch update.

The Daily Catch Index has been consistent since July 3. Although catches in recent days have been down from the June 30-July 2 uptick, they indicate that the passage rate has not diminished entirely.

Catch plus escapement (C+E) was over 4.5 million on July 4, down a bit from that yesterday, and based on anecdotal sources probably dropped considerably today. This lull in C+E corresponds to that observed at Port Moller during June 26-29 given a 9-10 day travel time, and if so may remain for a couple of days before another mode in C+E begins by July 10. In Figure 2 (attached), we show the forecasts for each district and for the inshore run as a whole over the coming days. For July 6-11 we predict C+E will total ~14 million Sockeye; for July 6-15, C+E is estimated to total ~19 million and fluctuate quite a bit across these days.

PMTF Stock Composition Status: The next stock composition (samples from July 4-5) should be available tomorrow (July 7).

Index by Station

S2: 3
S4: 0
S5: 9
S6: 0
S8: 10
S10: 0
S12: Not fished
S14: 32
S16: 71
S18: 68
S20: 78
S22: 10

Scott and Michael

Figure 2. Forecasted (salmon colored area curve) and observed inshore catch + escapement (C+E) for 2022. Observed catch is given by light gray bars; "observed" escapement (dark bars) for recent days was approximated as it had to be lagged backwards from the enumeration sites for each district. Travel time between Port Moller and the inshore Bay as a whole was estimated to be 9.5 days (Ugashik≈9.4, Egegik=10.1, Naknek-Kvichak=10.1, and Nushagak-Wood=9.4). Adding together district-specific projected C+E for July 6-11 totals to about 13.8 million averaging 2.3 million per day (top right panel). For the Bay modeled as a whole (bottom right panel) projected C+E totals to 19.3 million for July 6-15 averaging 1.9 million per day.

Attached is tonight's catch update.

The crews were able to cover the entire transect today and then some fishing all the way from **Station -1** to Station 24. The highest index today came from Station -1, which was just 3 miles offshore from Port Moller. However, the stock composition of this catch will remain unknown, and local stocks could make up a good proportion. Regardless, catches diminished out from there to Station 6, which suggests that a major band of fish was not passing through the innermost stations.

PMTF Stock Composition Status: Our goal is for the next stock composition (samples from July 6-7) to be available by July 9.

Index by Station

S-1: 34
S1: 10
S2: 3
S4: 5
S6: 2
S8: 12
S10: 25
S12: 0
S14: 32
S16: 15
S18: 21
S20: 0
S22: 9
S24: 2

Scott and Michael

Michael Link

From:	Scott Raborn <raborn@lgl.com>
Sent:	Friday, July 8, 2022 5:46 PM
To:	Michael Link
Cc:	Scott Raborn
Subject:	PMTF Catch Update #29, July 8 2022
Attachments:	PMTF Catch Update #29 July 8 2022.pdf; PMTF_RawData - July 8 2022.pdf; Figure_1 _DailyCatchIndexAndCE_2011-2022.pdf

Attached is tonight's catch update.

Winding Down the 2022 PMTF: We have begun internal discussions about when to demobilize the project. The *HMB* will likely leave a day or two before the *OC*, but both vessels will fish through at least tomorrow (July 9).

PMTF Stock Composition Status: The 11th stock composition for July 6-7 released today may have been the final for the season unless catches really pick up tomorrow.

Index by Station

S0: 6
S2: 16
S4: 8
S6: 6
S8: 0
S10: 13
S12: 3
S14: 34
S16: 4
S18: 0
S20: 0

Scott and Michael

Michael Link

From: Michael Link
Sent: Saturday, July 9, 2022 7:15 PM
To: Scott Raborn
Cc: Michael Link
Subject: PMTF Catch Update #30, July 9 2022
Attachments: PMTF Catch Update #30 July 9 2022.pdf; PMTF_RawData - July 9 2022.pdf

Attached is tonight's catch update.

Catches picked up today and the distribution of fish across the transect was wider than it has been of late. Station 2 had its biggest index of the season and station 4 its biggest in over two weeks.

The increase in catches today could be caused by an uptick in fish passage and/or a change in the vulnerability of the run to the test fishery. We know that both can contribute to late-season bumps in the index.

As noteworthy an aspect about today's results is that enough fish were caught over yesterday and today to enable the 12th set of stock composition estimates of 2022. Like the prior 11 sets of estimates this season, the set from July 8-9 should paint an accurate picture of where fish passing Port Moller are going to arrive in about a week. This could be the last set for 2022 but we will need to see what the fish passage does over the next couple days to make a final decision.

The crews on the Ocean Cat and Halfmoon Bay did an another amazing job out there today. They have been working long days every day since late May; we are lucky to have such a great team on the water.

PMTF Stock Composition Status: Our collective goal for the 12th set of stock composition estimates for fish caught on July 8-9 is late tomorrow night (Sunday) or by the morning of July 11th (Monday).

Index by Station

S-1: 0 (station minus 1)
S2: 46
S4: 10
S6:   2
S8:   16
S10: 73
S12: 9
S14: 68
S16: 21
S18: 104
S20: 14

Michael and Scott

Attached is tonight's catch update.

PMTF Stock Composition Status: To be determined.

Index by Station

S2: 18
S4: 0
S6: 3
S8: 10
S10: 30
S12: 27
S14: 32
S16: 14
S18: 24
S20: 30
S22: 0
S24: Not fished
S26: 0

Scott and Michael

Michael Link

Attached is tonight's catch update. Note the large index at Station 2. Late season vulnerability may have changed, so it is difficult to say what high indices represent at this point. It probably means that the run will not taper dramatically.

PMTF Stock Composition Status: To be determined.

Index by Station

S0: 21
S1: 11
S2: 209
S3: 4
S4: 0
S6: 29
S8: 116
S10: 21
S12: 35
S14: 19
S16: 20
S18: 58
S20: 11
S22: 11
S24: 2

Scott and Michael

Michael Link

Attached is tonight's catch update. The *Half Moon Bay* finished the season strong today fishing south and covering Stations 10-1. The *Ocean Cat* will cover the outer stations tomorrow and finish on July 14 after covering the inner stations.

Full acknowledgments will follow in the next day or so, but for now many thanks to both captains and their crews for helping to make this PMTF season happen!

PMTF Stock Composition Status: A final stock composition will be released for July 10-11 and should be available on July 14.

Index by Station

S1: 0
S2: 0
S4: 6
S6: 13
S8: 30
S10: 32
S12: 8
S14: 0
S16: 14
S18: 0
S20: 4

Scott and Michael

Michael Link

Attached is tonight's catch update.

PMTF Stock Composition Status: Done for the year.

Index by Station

S10: 17
S12: 7
S14: 12
S16: 0
S18: 4
S20: 3

Scott and Michael

Appendix B

ADF&G inseason stock composition estimates for the Port Moller Test Fishery, 2022.

Estimates by Sample Dates
Stock Comp #1: June 14-15
Stock Comp #2: June 16-17
Stock Comp #3: June 18-19
Stock Comp #4: June 20-21
Stock Comp #5: June 22-23
Stock Comp #6: June 24-25
Stock Comp #7: June 28-29
Stock Comp #8: June 30-July 1
Stock Comp #9: July 2-3
Stock Comp #10: July 4-5
Stock Comp #11: July 6-7
Stock Comp #12: July 8-9
Stock Comp #13: July 10-11

Everyone,

Attached is the 1st stock composition estimate from ADF&G for the 2022 Port Moller Test Fishery.

Stock Composition (Stations 4-20 from June 14-15):

Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	0.4%	0.0%	2.0%
Ugashik	4.3%	0.0%	20.0%
Egegik	35.5%	21.7%	45.7%
Naknek	0.7%	0.0%	4.9%
Alagnak	0.1%	0.0%	0.3%
Kvichak	5.5%	0.3%	11.7%
Nushagak	34.0%	26.1%	42.0%
Wood	16.7%	10.2%	24.2%
Igushik	1.3%	0.0%	7.4%
Togiak	0.1%	0.0%	0.5%
Kuskokwim	1.5%	0.0%	5.0%

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
June 14–15, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 14–15, 2022. A total of 253 fish were sampled and 190 were analyzed (187 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	0.4%	0.0%	2.0%
Ugashik	4.3%	0.0%	20.0%
Egegik	35.5%	21.7%	45.7%
Naknek	0.7%	0.0%	4.9%
Alagnak	0.1%	0.0%	0.3%
Kvichak	5.5%	0.3%	11.7%
Nushagak	34.0%	26.1%	42.0%
Wood	16.7%	10.2%	24.2%
Igushik	1.3%	0.0%	7.4%
Togiak	0.1%	0.0%	0.5%
Kuskokwim	1.5%	0.0%	5.0%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 14–15, 2022 (All Stations).
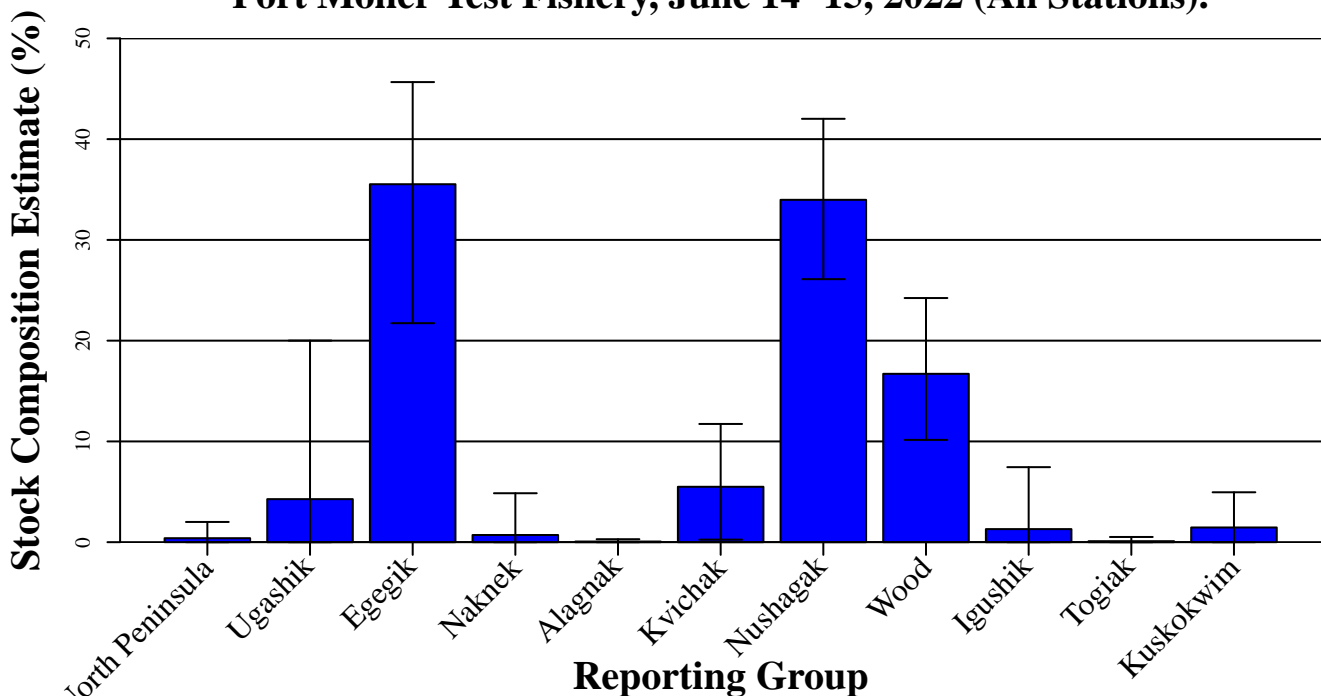
The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Michael Link

Everyone,

Attached is the 2nd stock composition estimate from ADF&G and BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery.

We have also included a figure showing each stock's historical catch plus escapement (CE) by date (years 2012-2021) to illustrate previous stock arrival patterns inshore. It helps if you can look at the two documents side by side. For example, last year the Nushagak Stock made up a substantial portion of the CE, which corresponded to a strong showing early on at Port Moller (apologies for the color schemes being different between the two documents). For the 2019 and 2020 season, the Nushagak Stock made up less of the run, as well as the Port Moller stock compositions. Similarly, the Wood River Stock dominated the run in 2018, but less so in the following years; the Port Moller stock composition estimates picked these signals well. So far stock compositions show Nushagak and Egegik Districts will contribute substantially to this year's run, which is consistent with the preseason forecast

Stock Composition (Stations 4-20 from June 16-17):

	Stock Composition Estimate	90% Confidence Intervals	
Reporting Group		Lower	Upper
North Peninsula	1.1%	0.0%	5.3%
Ugashik	0.8%	0.0%	5.7%
Egegik	32.7%	22.8%	41.2%
Naknek	0.4%	0.0%	2.3%
Alagnak	0.6%	0.0%	5.0%
Kvichak	9.6%	3.6%	16.0%
Nushagak	22.6%	13.1%	35.6%
Wood	20.3%	11.8%	30.6%
Igushik	10.7%	0.0%	20.9%
Togiak	0.1%	0.0%	0.8%
Kuskokwim	1.0%	0.0%	4.5%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
June 16–17, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 16–17, 2022. A total of 507 fish were sampled and 190 were analyzed (188 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	1.1%	0.0%	5.3%
Ugashik	0.8%	0.0%	5.7%
Egegik	32.7%	22.8%	41.2%
Naknek	0.4%	0.0%	2.3%
Alagnak	0.6%	0.0%	5.0%
Kvichak	9.6%	3.6%	16.0%
Nushagak	22.6%	13.1%	35.6%
Wood	20.3%	11.8%	30.6%
Igushik	10.7%	0.0%	20.9%
Togiak	0.1%	0.0%	0.8%
Kuskokwim	1.0%	0.0%	4.5%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 16–17, 2022 (All Stations).
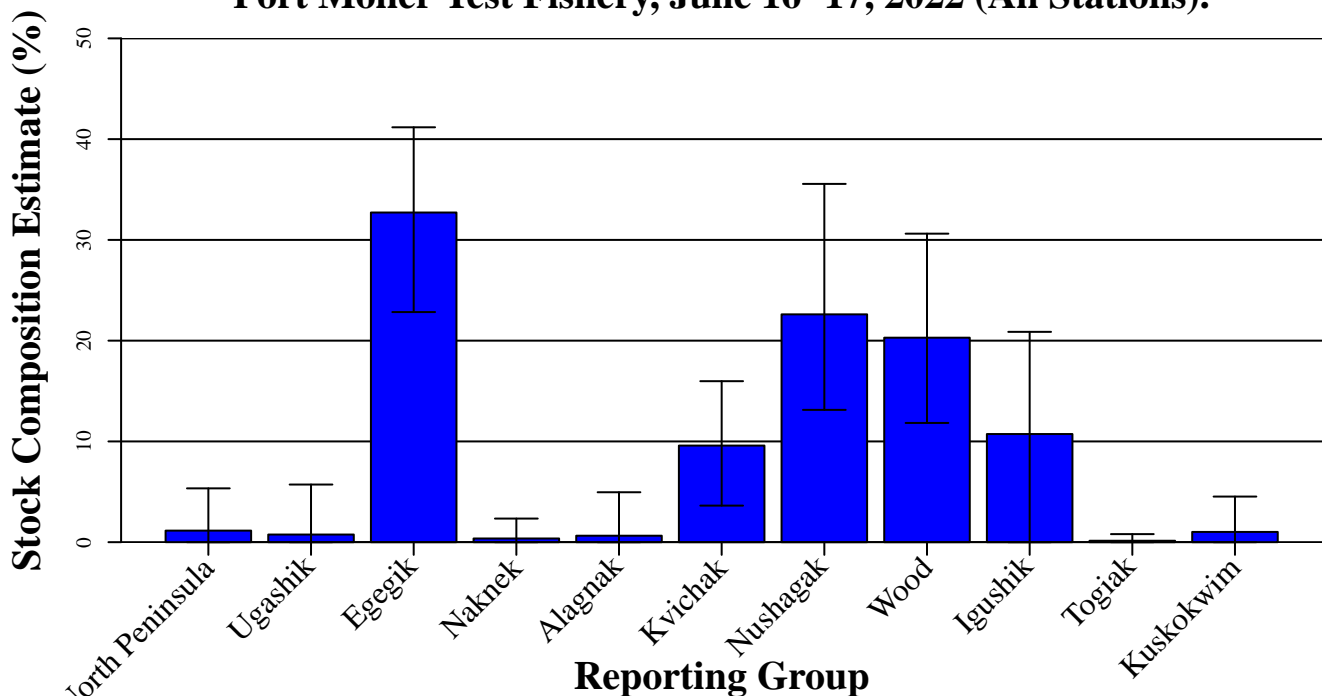
The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Figure showing stacked area plots of Catch + escapement of Sockeye Salmon (millions) versus Day of the year, faceted by year (2012–2021), colored by Stock: Egegik, Ugashik, Kvichak, Naknek, Alagnak, Wood, Nushagak, Igushik, Togiak.

Scott Raborn

From: Scott Raborn
Sent: Monday, June 20, 2022 9:30 PM
To: Michael Link
Cc: Scott Raborn
Subject: PMTF Stock Comp. Estimate #3—samples from June 18-19, 2022
Attachments: PM genetics inseason 6.18-19.2022.pdf; PMTF_DailyIndex_ByDistrict.pdf

Everyone,

Attached is the 3rd stock composition estimate from ADF&G and BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also, we have attached a figure showing these results weighted by the magnitude of the indices they represent. Once catch and escapement are reported we will add this information to the figure.

Stock Composition (Stations 2-22 from June 18-19):

Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	2.0%	0.0%	6.7%
Ugashik	12.9%	0.0%	22.4%
Egegik	26.1%	17.2%	39.3%
Naknek	2.2%	0.0%	6.1%
Alagnak	1.5%	0.0%	8.7%
Kvichak	5.4%	0.7%	10.7%
Nushagak	32.8%	24.1%	41.4%
Wood	16.3%	9.5%	23.7%
Igushik	0.4%	0.0%	2.9%
Togiak	0.1%	0.0%	0.4%
Kuskokwim	0.3%	0.0%	1.8%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
June 18–19, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 18–19, 2022. A total of 315 fish were sampled and 190 were analyzed (182 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	2.0%	0.0%	6.7%
Ugashik	12.9%	0.0%	22.4%
Egegik	26.1%	17.2%	39.3%
Naknek	2.2%	0.0%	6.1%
Alagnak	1.5%	0.0%	8.7%
Kvichak	5.4%	0.7%	10.7%
Nushagak	32.8%	24.1%	41.4%
Wood	16.3%	9.5%	23.7%
Igushik	0.4%	0.0%	2.9%
Togiak	0.1%	0.0%	0.4%
Kuskokwim	0.3%	0.0%	1.8%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 18–19, 2022 (All Stations).

The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Everyone,

Attached is the 4th stock composition estimate from ADF&G and BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also, we have attached a figure showing these results weighted by the magnitude of the indices they represent. Catch and escapement will be added to the figure next time.

Stock Composition (Stations 4-20 from June 20-21):

	Stock Composition Estimate	90% Confidence Intervals	
Reporting Group		Lower	Upper
North Peninsula	1.1%	0.0%	4.4%
Ugashik	0.6%	0.0%	3.7%
Egegik	28.9%	21.1%	36.8%
Naknek	2.5%	0.0%	8.8%
Alagnak	0.2%	0.0%	1.4%
Kvichak	14.4%	8.4%	21.1%
Nushagak	37.1%	28.4%	45.9%
Wood	13.0%	6.9%	20.1%
Igushik	0.1%	0.0%	0.6%
Togiak	0.3%	0.0%	2.1%
Kuskokwim	1.8%	0.0%	6.1%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
June 20–21, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 20–21, 2022. A total of 383 fish were sampled and 190 were analyzed (186 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	1.1%	0.0%	4.4%
Ugashik	0.6%	0.0%	3.7%
Egegik	28.9%	21.1%	36.8%
Naknek	2.5%	0.0%	8.8%
Alagnak	0.2%	0.0%	1.4%
Kvichak	14.4%	8.4%	21.1%
Nushagak	37.1%	28.4%	45.9%
Wood	13.0%	6.9%	20.1%
Igushik	0.1%	0.0%	0.6%
Togiak	0.3%	0.0%	2.1%
Kuskokwim	1.8%	0.0%	6.1%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 20–21, 2022 (All Stations).

The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Scott Raborn

Everyone,

Attached is the 4th stock composition estimate from ADF&G and BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also, we have attached a figure showing these results weighted by the magnitude of the indices they represent. Catch and escapement will be added to the figure next time.

Stock Composition (Stations 4-20 from June 20-21):

Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	1.1%	0.0%	4.4%
Ugashik	0.6%	0.0%	3.7%
Egegik	28.9%	21.1%	36.8%
Naknek	2.5%	0.0%	8.8%
Alagnak	0.2%	0.0%	1.4%
Kvichak	14.4%	8.4%	21.1%
Nushagak	37.1%	28.4%	45.9%
Wood	13.0%	6.9%	20.1%
Igushik	0.1%	0.0%	0.6%
Togiak	0.3%	0.0%	2.1%
Kuskokwim	1.8%	0.0%	6.1%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
June 20–21, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 20–21, 2022. A total of 383 fish were sampled and 190 were analyzed (186 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	1.1%	0.0%	4.4%
Ugashik	0.6%	0.0%	3.7%
Egegik	28.9%	21.1%	36.8%
Naknek	2.5%	0.0%	8.8%
Alagnak	0.2%	0.0%	1.4%
Kvichak	14.4%	8.4%	21.1%
Nushagak	37.1%	28.4%	45.9%
Wood	13.0%	6.9%	20.1%
Igushik	0.1%	0.0%	0.6%
Togiak	0.3%	0.0%	2.1%
Kuskokwim	1.8%	0.0%	6.1%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 20–21, 2022 (All Stations).

The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Scott Raborn

Everyone,

Attached is the 5th stock composition estimate from ADF&G and BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery.

Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E) to date. Upon first glance, this figure would seem to indicate that the travel time (TT) between Port Moller and the inshore districts is about six days. If this TT estimate is correct, and the magnitude of the catch indices is reflective of the passage rate, we should expect C+E to decline or at least stabilize for the next few days. However, it is very early in the season to be forecasting based on Port Moller catches even though we have had excellent coverage across stations and days thus far. More days of C+E are needed to tune the Port Moller signal to the inshore run. The TT could easily be longer, say seven days, which would mean C+E would have increased today and hold steady at a higher level for the next several days. Longer TTs push C+E in the coming days even higher. All we can do is wait and see.

Stock Composition (Stations 2-22 from June 22-23):

Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	0.5%	0.0%	2.4%
Ugashik	0.4%	0.0%	3.0%
Egegik	25.8%	19.3%	32.6%
Naknek	0.5%	0.0%	3.2%
Alagnak	0.3%	0.0%	2.1%
Kvichak	13.0%	8.2%	18.3%
Nushagak	36.2%	27.5%	44.8%
Wood	18.2%	8.7%	27.0%
Igushik	4.0%	0.0%	14.9%
Togiak	0.3%	0.0%	1.5%
Kuskokwim	0.9%	0.0%	5.7%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
June 22–23, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 22–23, 2022. A total of 329 fish were sampled and 190 were analyzed (185 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	0.5%	0.0%	2.4%
Ugashik	0.4%	0.0%	3.0%
Egegik	25.8%	19.3%	32.6%
Naknek	0.5%	0.0%	3.2%
Alagnak	0.3%	0.0%	2.1%
Kvichak	13.0%	8.2%	18.3%
Nushagak	36.2%	27.5%	44.8%
Wood	18.2%	8.7%	27.0%
Igushik	4.0%	0.0%	14.9%
Togiak	0.3%	0.0%	1.5%
Kuskokwim	0.9%	0.0%	5.7%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 22–23, 2022 (All Stations).

The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Scott Raborn

Everyone,

Attached is the 6th stock composition estimate from ADF&G and BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery.

Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E).

Stock Composition (Stations 2-20 from June 24-25):

Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	4.5%	0.0%	10.7%
Ugashik	9.6%	0.0%	20.9%
Egegik	28.3%	17.9%	39.2%
Naknek	0.3%	0.0%	2.1%
Alagnak	0.6%	0.0%	4.0%
Kvichak	11.7%	5.7%	18.2%
Nushagak	35.1%	26.0%	43.9%
Wood	7.9%	0.9%	15.3%
Igushik	1.7%	0.0%	9.4%
Togiak	0.1%	0.0%	0.4%
Kuskokwim	0.4%	0.0%	2.1%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
June 24–25, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 24–25, 2022. A total of 421 fish were sampled and 190 were analyzed (189 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	4.5%	0.0%	10.7%
Ugashik	9.6%	0.0%	20.9%
Egegik	28.3%	17.9%	39.2%
Naknek	0.3%	0.0%	2.1%
Alagnak	0.6%	0.0%	4.0%
Kvichak	11.7%	5.7%	18.2%
Nushagak	35.1%	26.0%	43.9%
Wood	7.9%	0.9%	15.3%
Igushik	1.7%	0.0%	9.4%
Togiak	0.1%	0.0%	0.4%
Kuskokwim	0.4%	0.0%	2.1%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 24–25, 2022 (All Stations).
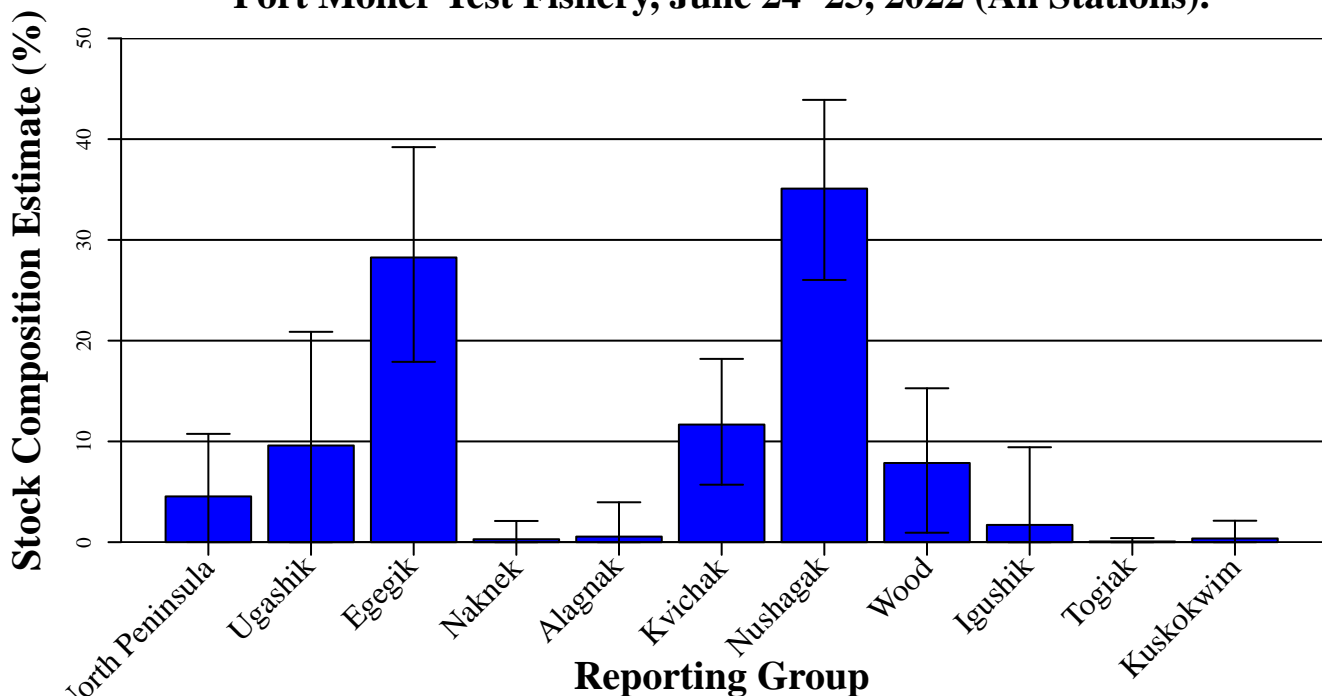
The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Everyone,

Attached is the 7th stock composition estimate from ADF&G and BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery.

Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E).

Stock Composition (Stations 2-22 from June 24-25):

| Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	1.1%	0.0%	4.6%
Ugashik	0.9%	0.0%	5.8%
Egegik	22.1%	14.0%	30.2%
Naknek	6.6%	0.6%	12.6%
Alagnak	0.1%	0.0%	0.2%
Kvichak	24.6%	17.4%	32.2%
Nushagak	31.0%	23.6%	38.6%
Wood	12.2%	6.5%	18.7%
Igushik	0.3%	0.0%	2.2%
Togiak	0.7%	0.0%	2.5%
Kuskokwim	0.4%	0.0%	2.1%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
June 28–29, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 28–29, 2022. A total of 187 fish were sampled and 187 were analyzed (186 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	1.1%	0.0%	4.6%
Ugashik	0.9%	0.0%	5.8%
Egegik	22.1%	14.0%	30.2%
Naknek	6.6%	0.6%	12.6%
Alagnak	0.1%	0.0%	0.2%
Kvichak	24.6%	17.4%	32.2%
Nushagak	31.0%	23.6%	38.6%
Wood	12.2%	6.5%	18.7%
Igushik	0.3%	0.0%	2.2%
Togiak	0.7%	0.0%	2.5%
Kuskokwim	0.4%	0.0%	2.1%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 28–29, 2022 (All Stations).
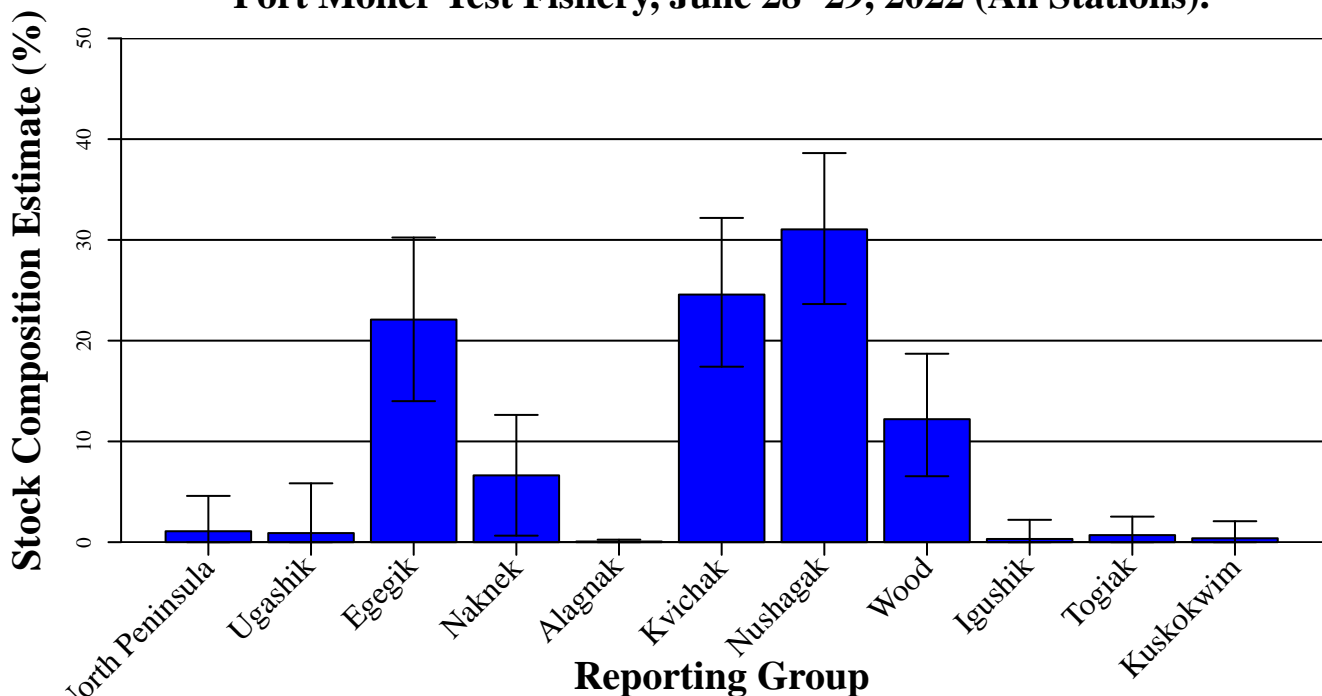
The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Everyone,

Attached is the 8th stock composition estimate from ADF&G and the BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E).

These results provide a good answer to a good question. Which districts relate to which stations at Port Moller? We get this question a lot, but the answer is not simple. Egegik and Ugashik stocks tend to favor the inner stations (S2-S12) and the Nushagak District and Naknek-Kvichak District stocks the outer stations (S14-S22). However, all stocks can be present at all stations. For this stock composition, 87% of the sample came from Stations 12-20 and 37% came from just Station 16 on July 1. Yet, Ugashik and Egegik made up 8% and 10% of the composition.

Stock Composition (Stations 2-20 from June 30-July 1):

| Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	0.4%	0.0%	2.0%
Ugashik	8.0%	3.4%	13.2%
Egegik	9.8%	4.1%	16.5%
Naknek	1.0%	0.0%	5.1%
Alagnak	2.9%	0.0%	9.1%
Kvichak	25.8%	18.5%	33.3%
Nushagak	28.1%	18.3%	38.7%
Wood	23.4%	14.7%	32.4%
Igushik	0.3%	0.0%	1.7%
Togiak	0.1%	0.0%	0.6%
Kuskokwim	0.3%	0.0%	1.6%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
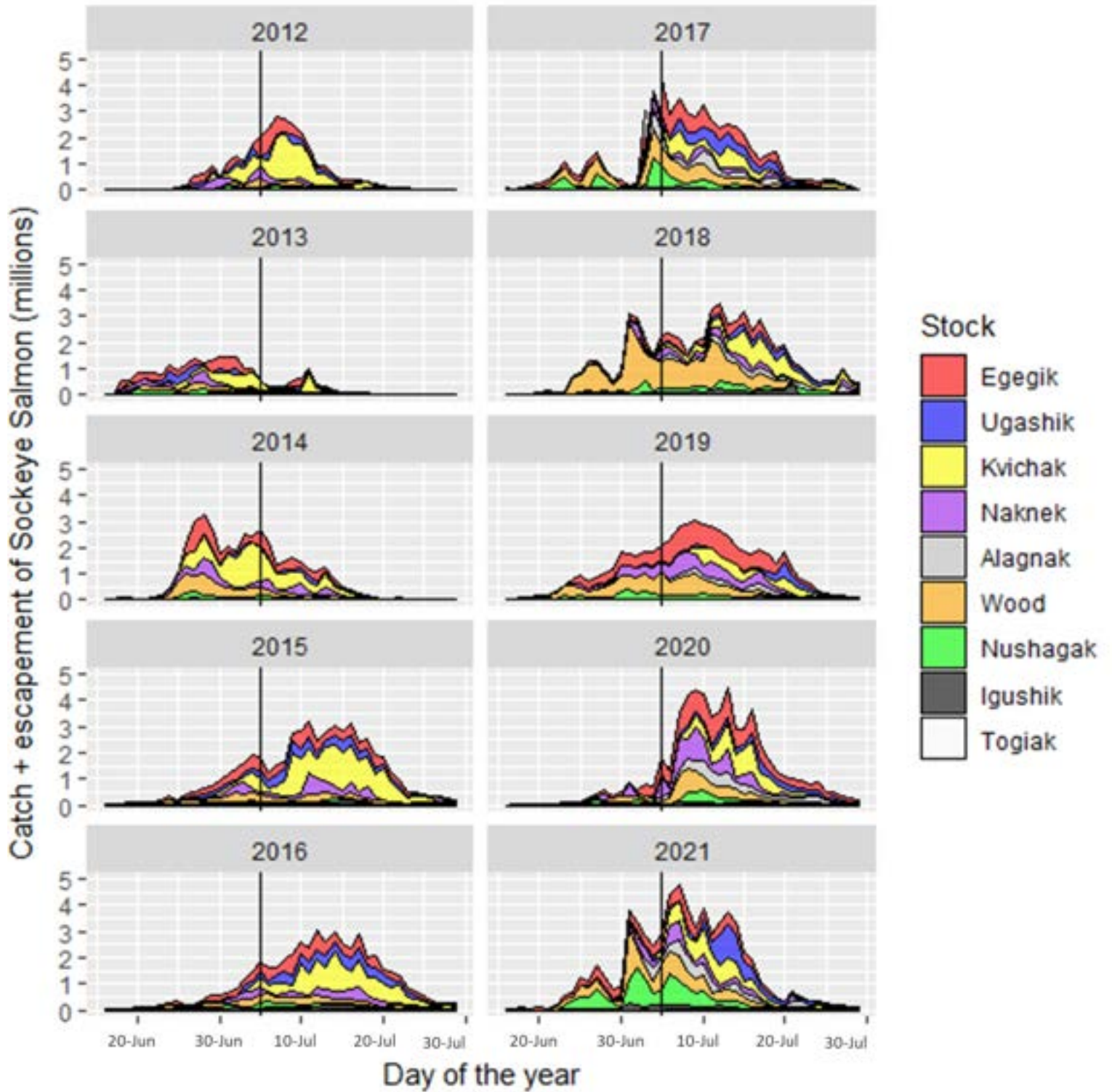## June 30–July 1, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for June 30–July 1, 2022. A total of 369 fish were sampled and 190 were analyzed (189 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	0.4%	0.0%	2.0%
Ugashik	8.0%	3.4%	13.2%
Egegik	9.8%	4.1%	16.5%
Naknek	1.0%	0.0%	5.1%
Alagnak	2.9%	0.0%	9.1%
Kvichak	25.8%	18.5%	33.3%
Nushagak	28.1%	18.3%	38.7%
Wood	23.4%	14.7%	32.4%
Igushik	0.3%	0.0%	1.7%
Togiak	0.1%	0.0%	0.6%
Kuskokwim	0.3%	0.0%	1.6%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, June 30–July 1, 2022 (All Stations).

The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Everyone,

Attached is the 9th stock composition estimate from ADF&G and the BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E). Finally, the latest age composition estimates are reported.

Stock Composition (Stations 2-22 from July 2-3):

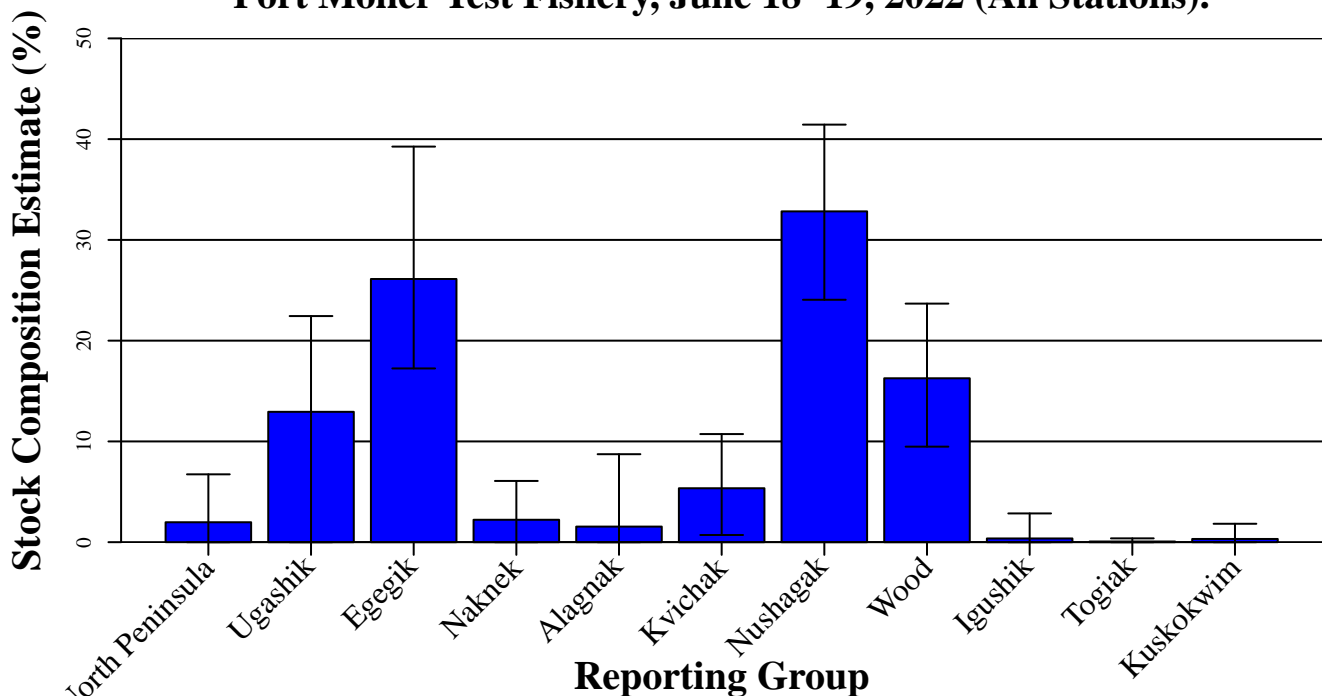| Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	0.8%	0.0%	3.4%
Ugashik	7.0%	0.0%	17.1%
Egegik	13.0%	4.5%	23.3%
Naknek	8.3%	2.0%	15.5%
Alagnak	0.8%	0.0%	4.7%
Kvichak	24.1%	17.2%	31.1%
Nushagak	31.6%	23.6%	39.5%
Wood	11.7%	5.5%	18.6%
Igushik	0.7%	0.0%	4.7%
Togiak	0.5%	0.0%	2.4%
Kuskokwim	1.7%	0.0%	5.3%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
July 2–3, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for July 2–3, 2022. A total of 364 fish were sampled and 190 were analyzed (190 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	0.8%	0.0%	3.4%
Ugashik	7.0%	0.0%	17.1%
Egegik	13.0%	4.5%	23.3%
Naknek	8.3%	2.0%	15.5%
Alagnak	0.8%	0.0%	4.7%
Kvichak	24.1%	17.2%	31.1%
Nushagak	31.6%	23.6%	39.5%
Wood	11.7%	5.5%	18.6%
Igushik	0.7%	0.0%	4.7%
Togiak	0.5%	0.0%	2.4%
Kuskokwim	1.7%	0.0%	5.3%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, July 2–3, 2022 (All Stations).

The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Everyone,

Attached is the 10th stock composition estimate from ADF&G and the BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E).

Stock Composition (Stations 2-20 from July 4-5):

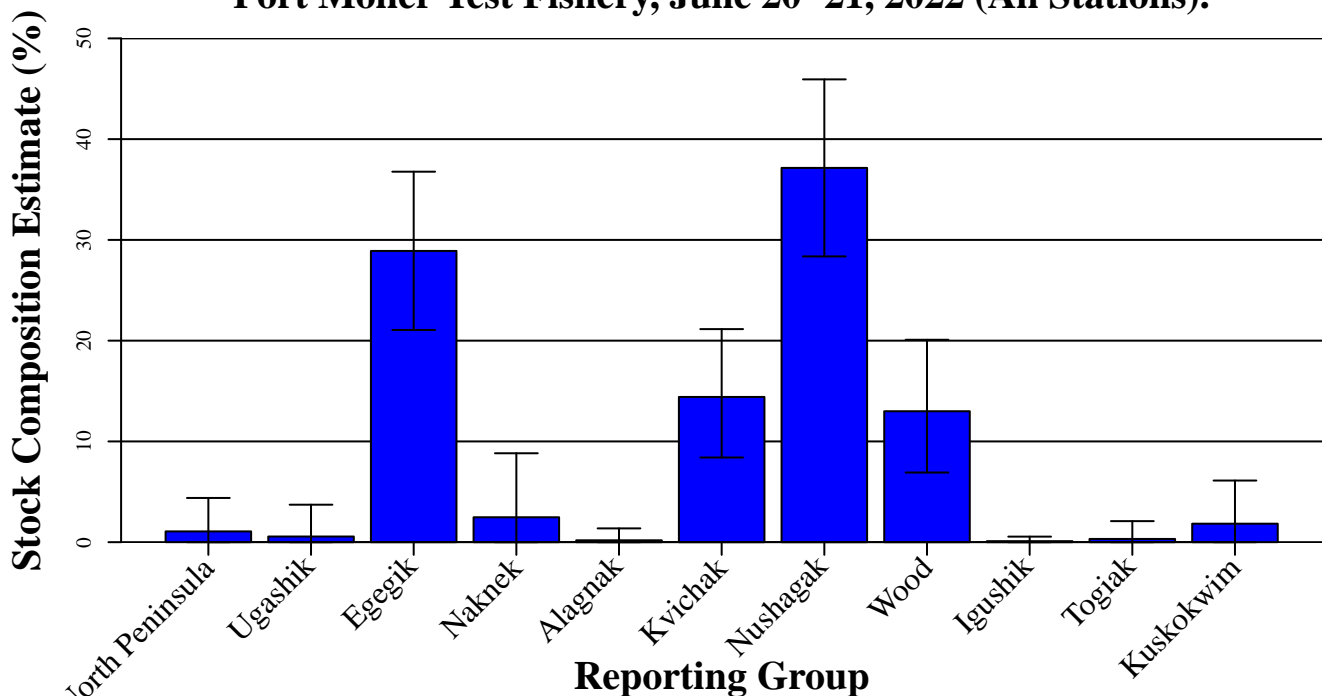| Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	0.8%	0.0%	3.8%
Ugashik	1.0%	0.0%	5.3%
Egegik	7.5%	3.7%	12.1%
Naknek	7.3%	2.9%	12.8%
Alagnak	13.0%	4.2%	20.7%
Kvichak	29.5%	21.8%	37.4%
Nushagak	21.8%	14.0%	30.7%
Wood	17.0%	10.1%	24.0%
Igushik	0.9%	0.0%	6.5%
Togiak	0.7%	0.0%	2.6%
Kuskokwim	0.7%	0.0%	3.1%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
July 4–5, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for July 4–5, 2022. A total of 249 fish were sampled and 190 were analyzed (186 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	0.8%	0.0%	3.8%
Ugashik	1.0%	0.0%	5.3%
Egegik	7.5%	3.7%	12.1%
Naknek	7.3%	2.9%	12.8%
Alagnak	13.0%	4.2%	20.7%
Kvichak	29.5%	21.8%	37.4%
Nushagak	21.8%	14.0%	30.7%
Wood	17.0%	10.1%	24.0%
Igushik	0.9%	0.0%	6.5%
Togiak	0.7%	0.0%	2.6%
Kuskokwim	0.7%	0.0%	3.1%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, July 4–5, 2022 (All Stations).

The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Reported as of: July 7, 2022
11:00 AM

Michael Link

Everyone,

Attached is the 11th stock composition estimate from ADF&G and the BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E). Finally, the latest age composition estimates are reported.

Stock Composition (Stations 2-22 from July 6-7):

Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	0.2%	0.0%	1.1%
Ugashik	2.2%	0.0%	9.4%
Egegik	14.8%	8.0%	21.8%
Naknek	10.6%	3.8%	18.1%
Alagnak	4.3%	0.0%	10.3%
Kvichak	33.5%	25.6%	41.6%
Nushagak	15.2%	8.5%	22.5%
Wood	16.1%	8.7%	23.5%
Igushik	2.5%	0.0%	9.7%
Togiak	0.4%	0.0%	2.0%
Kuskokwim	0.2%	0.0%	1.3%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
July 6–7, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for July 6–7, 2022. A total of 203 fish were sampled and 190 were analyzed (190 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	0.2%	0.0%	1.1%
Ugashik	2.2%	0.0%	9.4%
Egegik	14.8%	8.0%	21.8%
Naknek	10.6%	3.8%	18.1%
Alagnak	4.3%	0.0%	10.3%
Kvichak	33.5%	25.6%	41.6%
Nushagak	15.2%	8.5%	22.5%
Wood	16.1%	8.7%	23.5%
Igushik	2.5%	0.0%	9.7%
Togiak	0.4%	0.0%	2.0%
Kuskokwim	0.2%	0.0%	1.3%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, July 6–7, 2022 (All Stations).

The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Everyone,

Attached is the 12th stock composition estimate from ADF&G and the BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E). Finally, the latest age composition estimates are reported.

Stock Composition (Stations 2-20 from July 8-9):

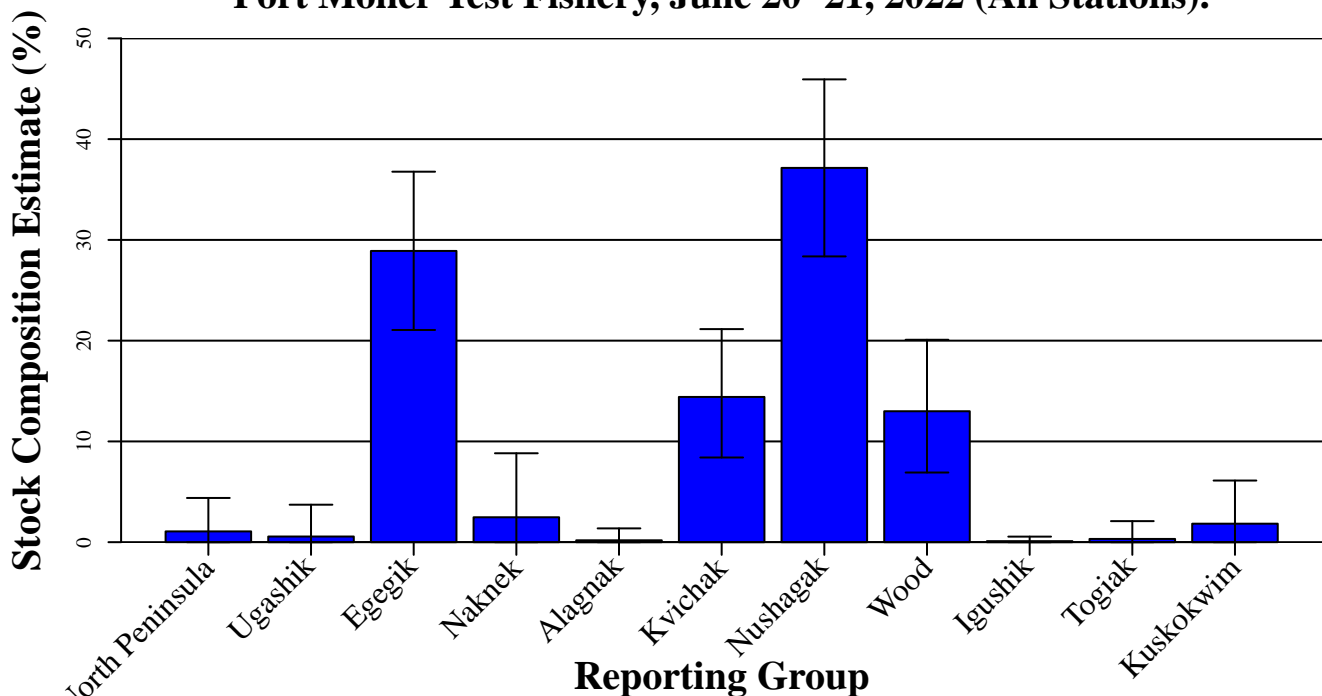| Reporting Group	Stock Composition Estimate	90% Confidence Intervals Lower	Upper
North Peninsula	1.6%	0.0%	4.9%
Ugashik	9.6%	0.0%	26.5%
Egegik	13.2%	0.0%	25.5%
Naknek	15.7%	8.4%	22.9%
Alagnak	13.2%	6.4%	20.7%
Kvichak	11.5%	3.7%	19.1%
Nushagak	17.9%	9.3%	27.4%
Wood	1.3%	0.0%	5.9%
Igushik	11.3%	5.7%	17.7%
Togiak	3.6%	1.0%	7.0%
Kuskokwim	1.1%	0.0%	4.2%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
July 8–9, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for July 8–9, 2022. A total of 247 fish were sampled and 190 were analyzed (190 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	1.6%	0.0%	4.9%
Ugashik	9.6%	0.0%	26.5%
Egegik	13.2%	0.0%	25.5%
Naknek	15.7%	8.4%	22.9%
Alagnak	13.2%	6.4%	20.7%
Kvichak	11.5%	3.7%	19.1%
Nushagak	17.9%	9.3%	27.4%
Wood	1.3%	0.0%	5.9%
Igushik	11.3%	5.7%	17.7%
Togiak	3.6%	1.0%	7.0%
Kuskokwim	1.1%	0.0%	4.2%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, July 8–9, 2022 (All Stations).
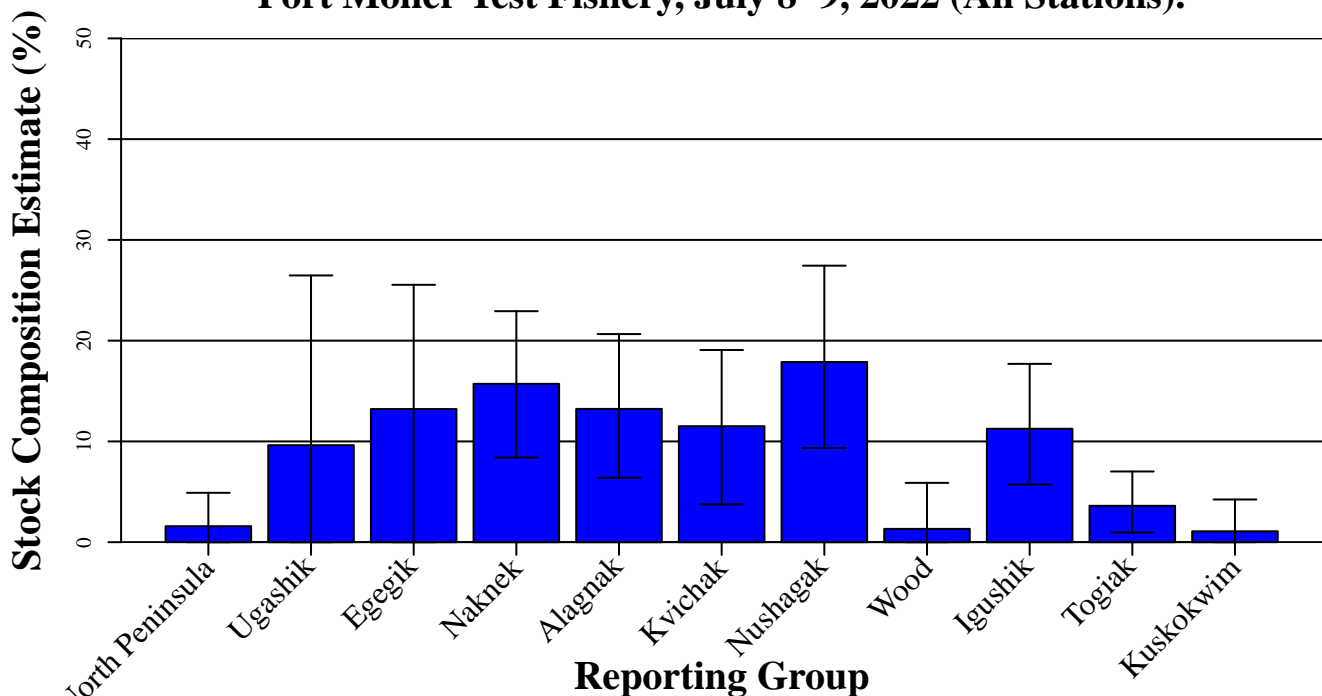
The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

From:	Scott Raborn <raborn@lgl.com>	
Sent:	Wednesday, July 13, 2022 4:14 PM	
To:	Michael Link	
Cc:	Scott Raborn	
Subject:	PMTF Stock Comp. Estimate #13—samples from July 10-11, 2022	
Attachments:	PM genetics inseason 7.10-11.2022.pdf; PMTF_DailyIndex_ByDistrict.pdf; BB_Age Comp_6_7-13.pdf	

Everyone,

Attached is the 13th stock composition estimate from ADF&G and the BBSRI At-Sea Genetics Program for the 2022 Port Moller Test Fishery. Also attached is a figure showing these results weighted by the magnitude of the indices they represent along with catch plus escapement (C+E). Finally, the latest age composition estimates are reported.

Stock Composition (Stations 2-22 from July 10-11):

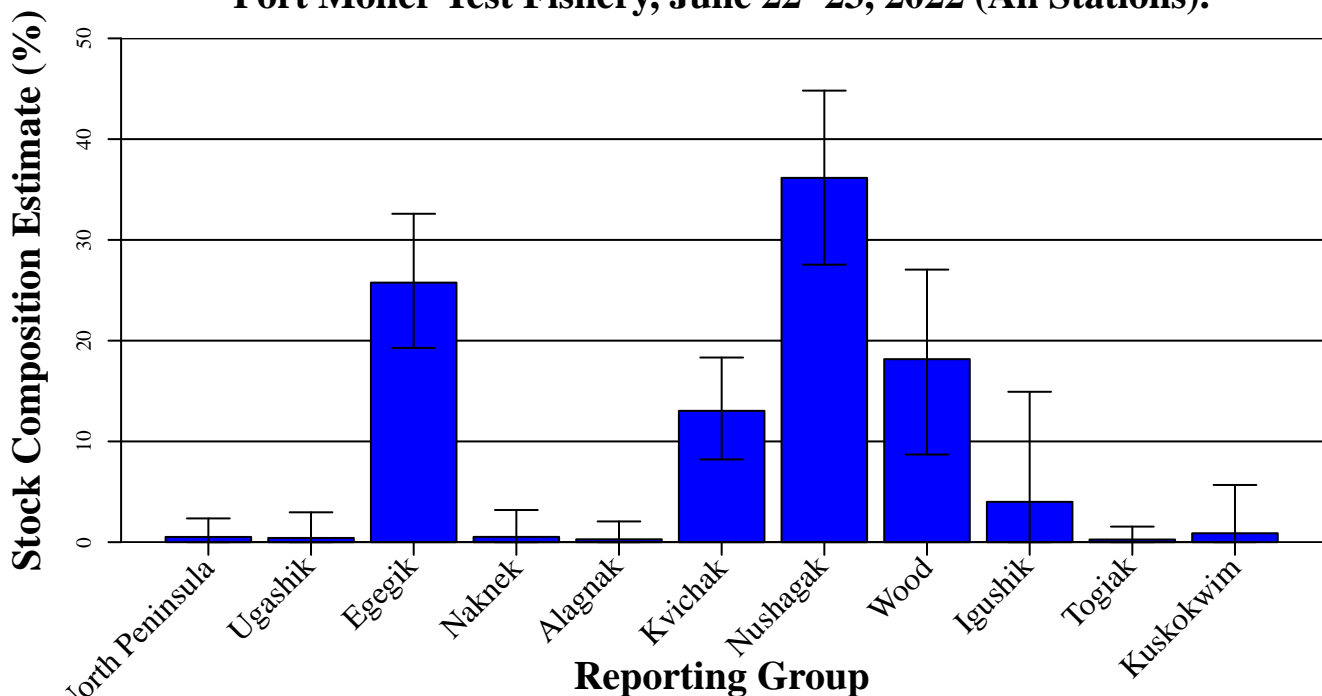|	Stock Composition Estimate	90% Confidence Intervals	
Reporting Group		Lower	Upper
North Peninsula	5.4%	2.0%	9.6%
Ugashik	18.8%	5.4%	29.1%
Egegik	5.3%	0.0%	19.1%
Naknek	9.8%	5.4%	15.1%
Alagnak	9.2%	3.9%	15.8%
Kvichak	21.6%	14.6%	29.4%
Nushagak	17.4%	10.7%	24.5%
Wood	5.4%	0.0%	12.6%
Igushik	3.6%	0.0%	9.8%
Togiak	2.3%	0.1%	4.8%
Kuskokwim	1.2%	0.0%	4.9%

Scott and Michael

Bristol Bay Sockeye Salmon Fishery

Port Moller Sockeye Salmon Stock Composition Summary
July 10–11, 2022 – All Stations

Genetic stock composition estimates for sockeye salmon from the Port Moller Test Fishery for July 10–11, 2022. A total of 353 fish were sampled and 190 were analyzed (189 had adequate data to include in the analysis).

Reporting Group	Stock Composition Estimate	90% Confidence Intervals	
		Lower	Upper
North Peninsula	5.4%	2.0%	9.6%
Ugashik	18.8%	5.4%	29.1%
Egegik	5.3%	0.0%	19.1%
Naknek	9.8%	5.4%	15.1%
Alagnak	9.2%	3.9%	15.8%
Kvichak	21.6%	14.6%	29.4%
Nushagak	17.4%	10.7%	24.5%
Wood	5.4%	0.0%	12.6%
Igushik	3.6%	0.0%	9.8%
Togiak	2.3%	0.1%	4.8%
Kuskokwim	1.2%	0.0%	4.9%

Genetic Stock Composition Estimates for Sockeye Salmon Captured in the Port Moller Test Fishery, July 10–11, 2022 (All Stations).
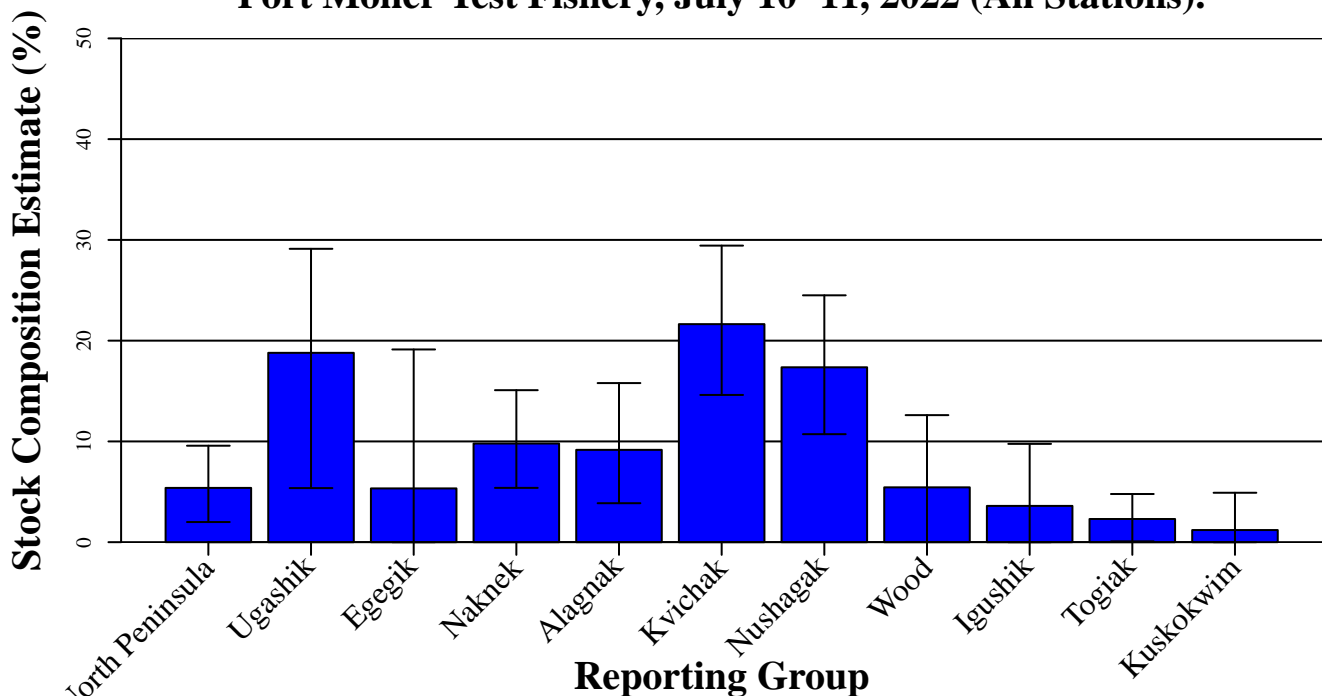
The genetic analysis was completed by the Alaska Department of Fish and Game, Division of Commercial Fisheries, Gene Conservation Laboratory.

Port Moller Test Fishery 2022
Catch Per Unit of Effort by Date and Station
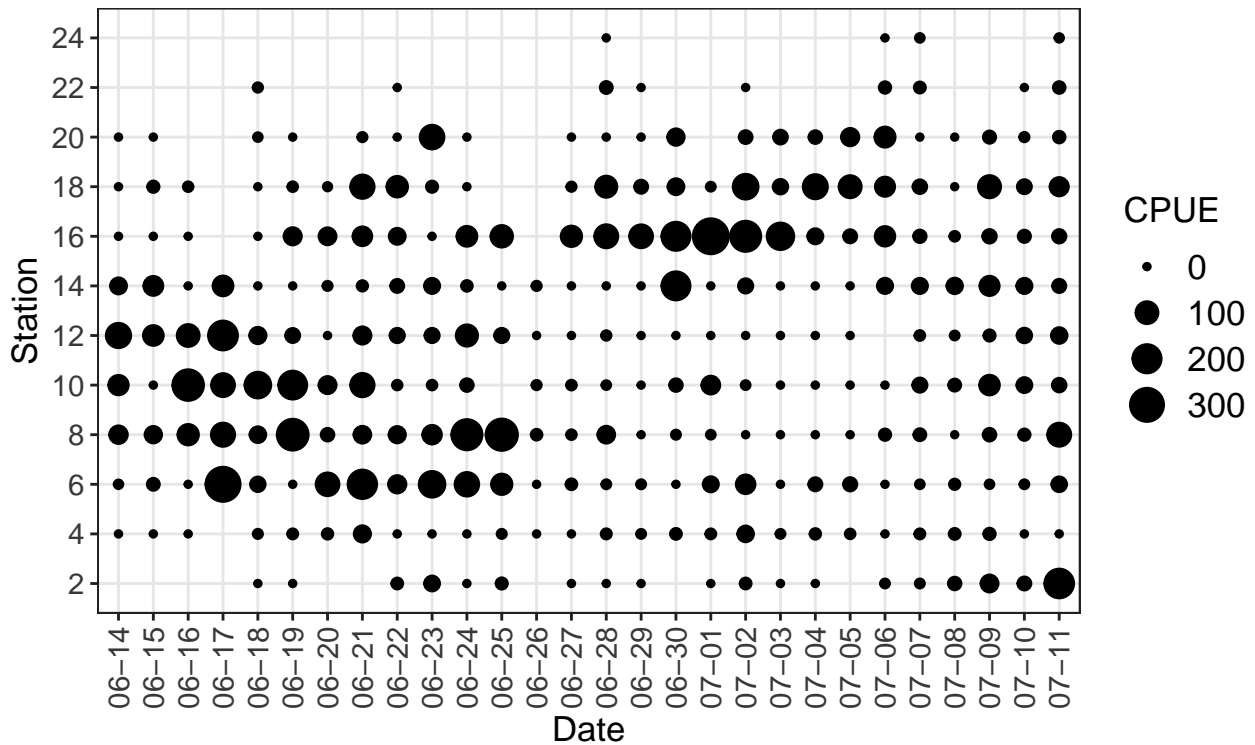
Number of Genetic Samples Analyzed by Date, Station, and Estimate Release Number
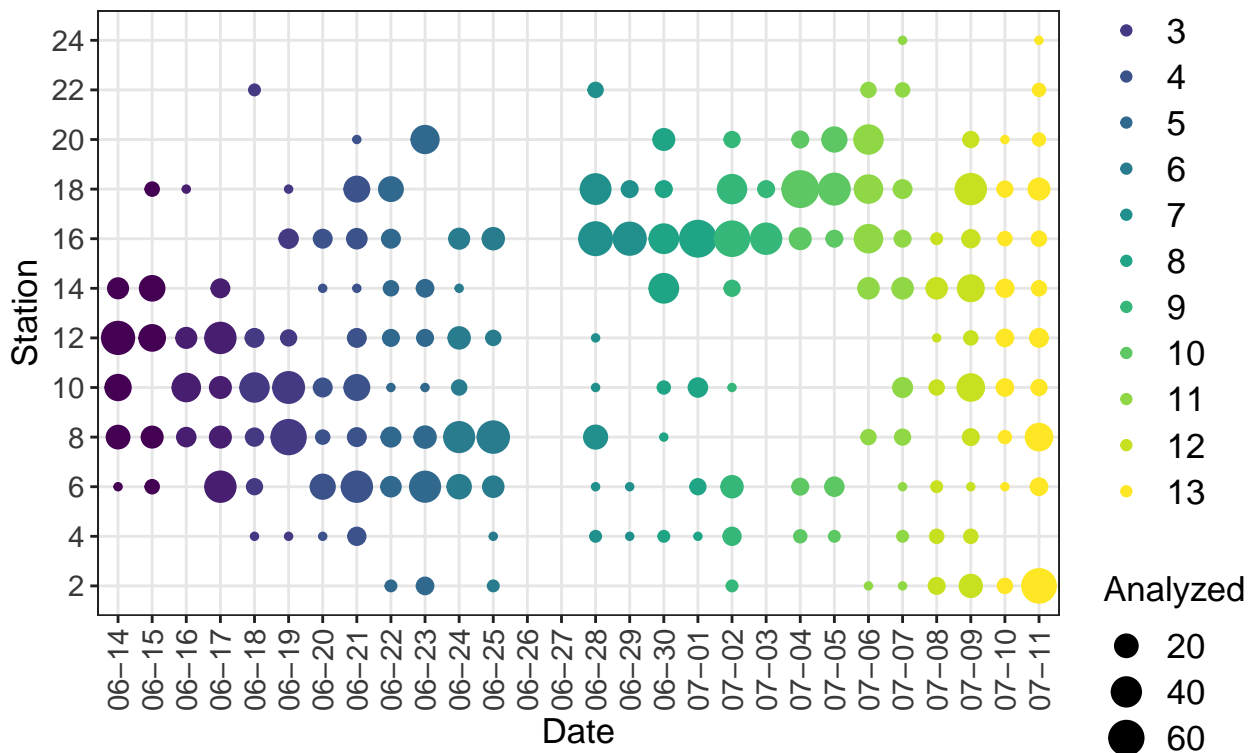
Historical Comparison of Stock Composition Estimates
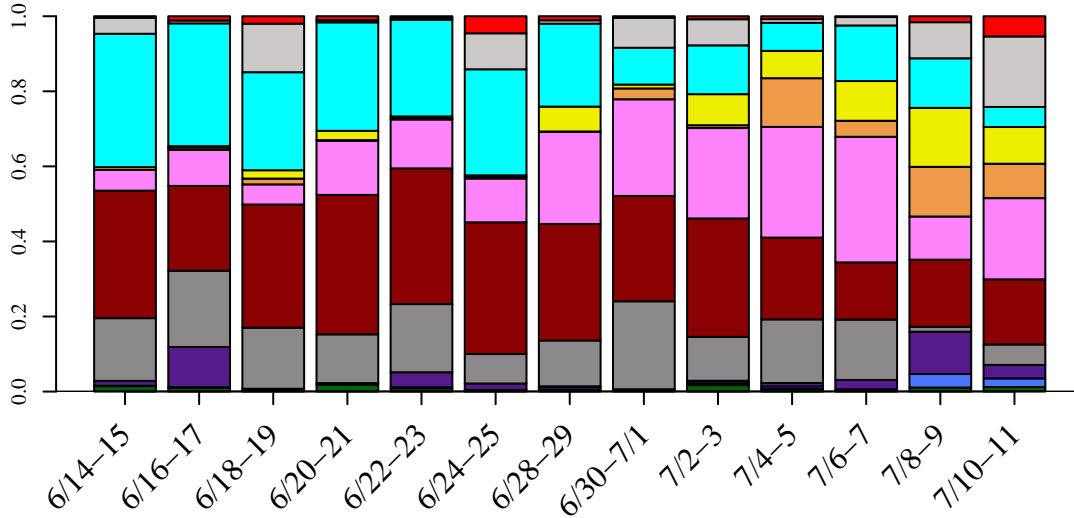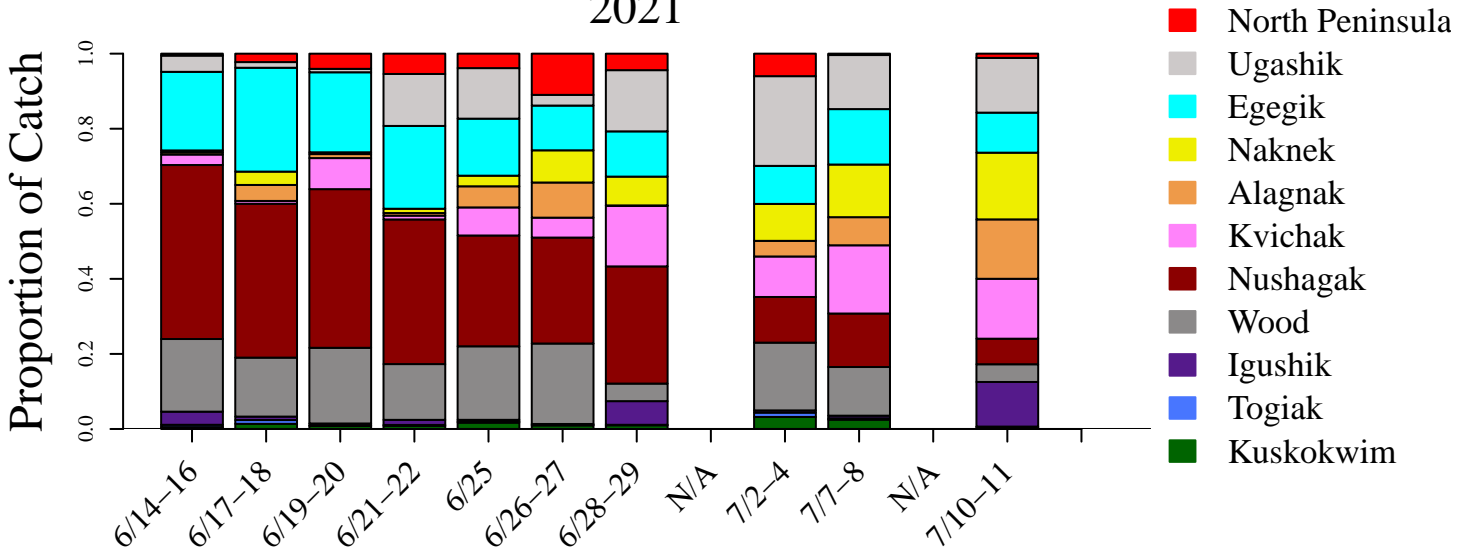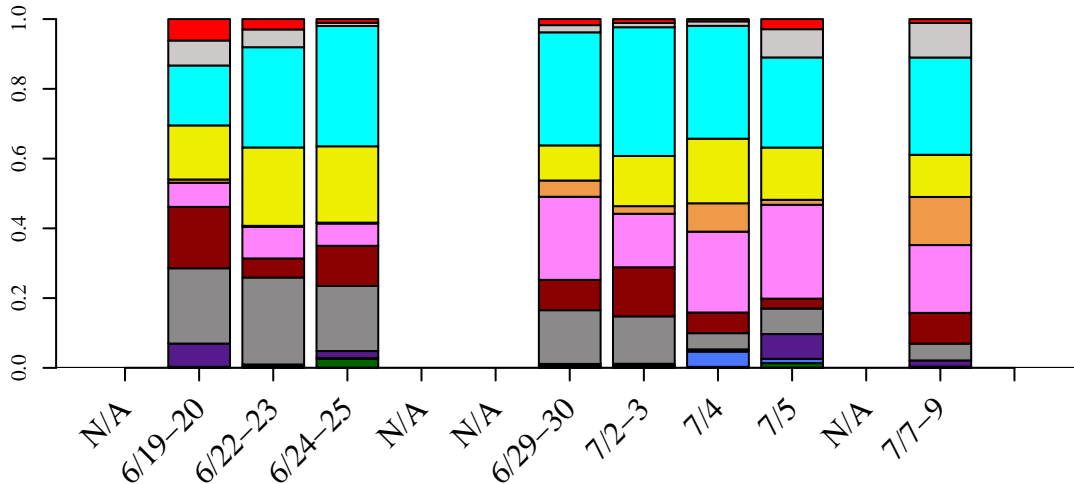
Historical Comparison of Stock Composition Estimates

Historical Comparison of Stock Composition Estimates
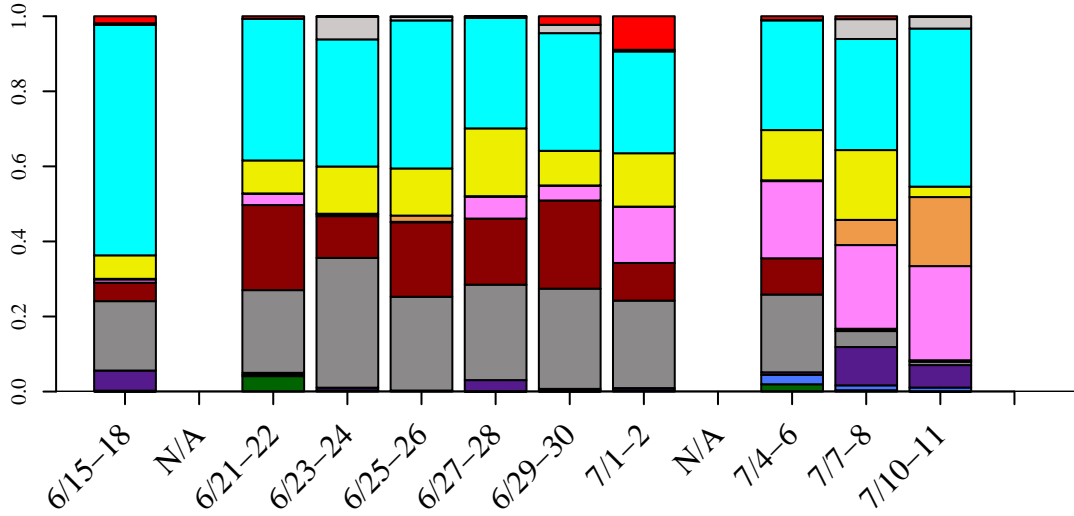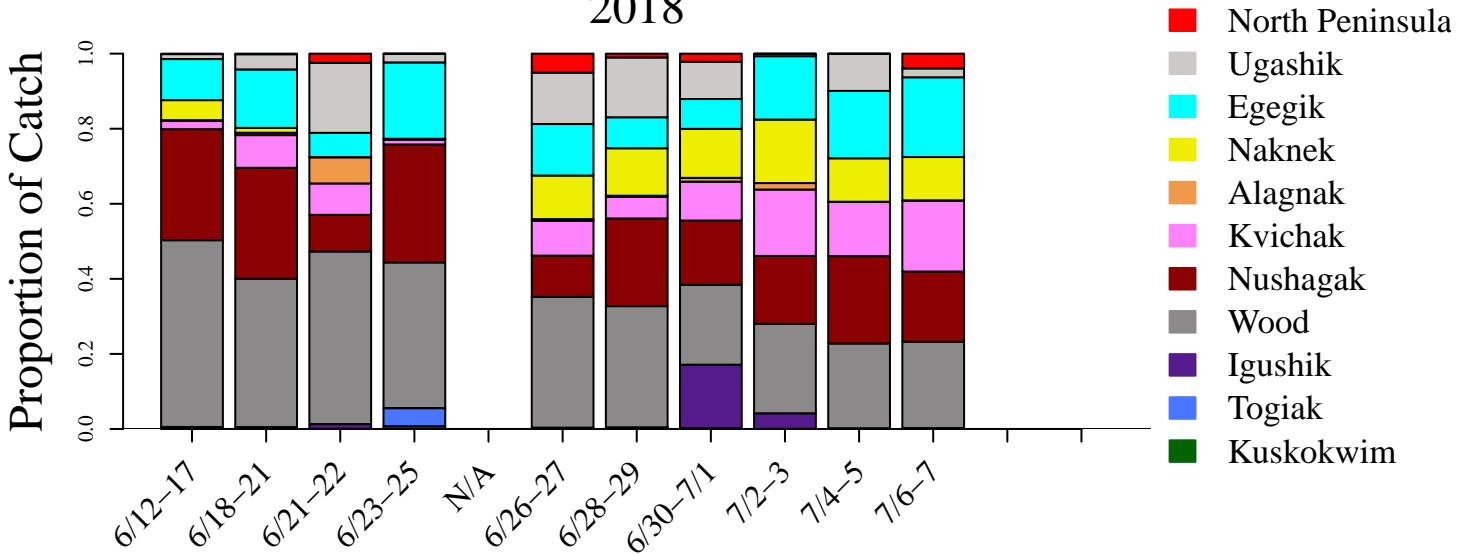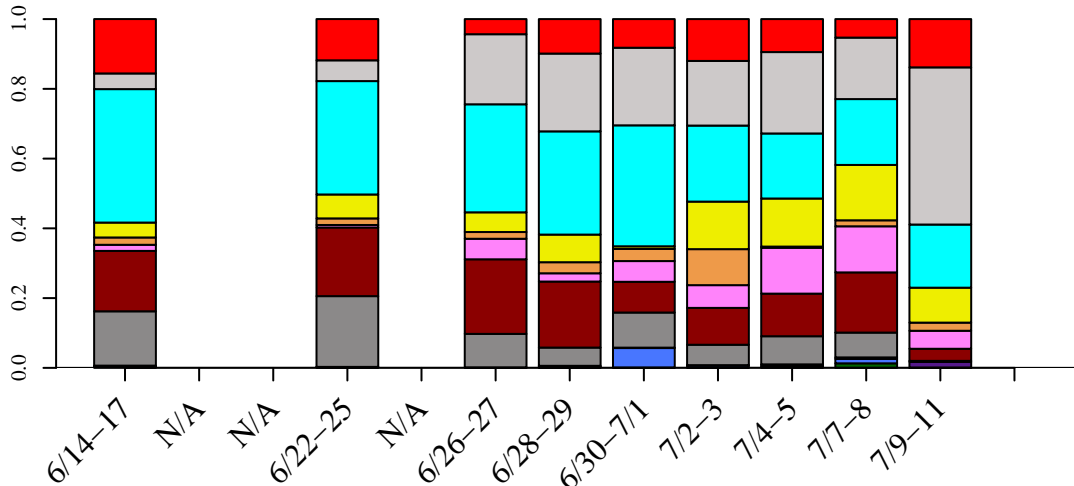
Historical Comparison of Stock Composition Estimates

2013

2012

Proportion of Catch

Legend:
- North Peninsula (red)
- Ugashik (light grey)
- Egegik (cyan)
- Naknek (yellow)
- Alagnak (orange)
- Kvichak (pink)
- Nushagak (dark red)
- Wood (grey)
- Igushik (purple)
- Togiak (blue)
- Kuskokwim (green)
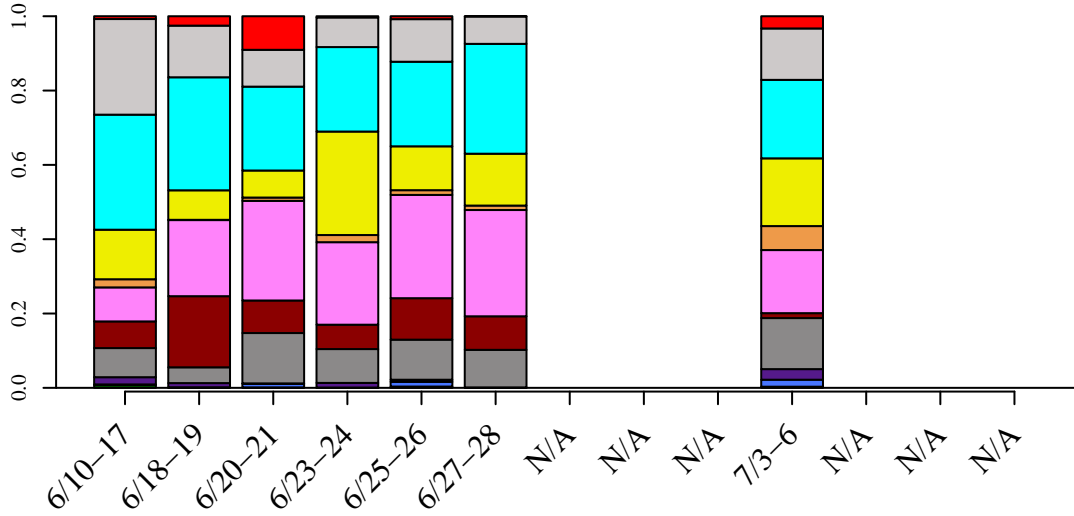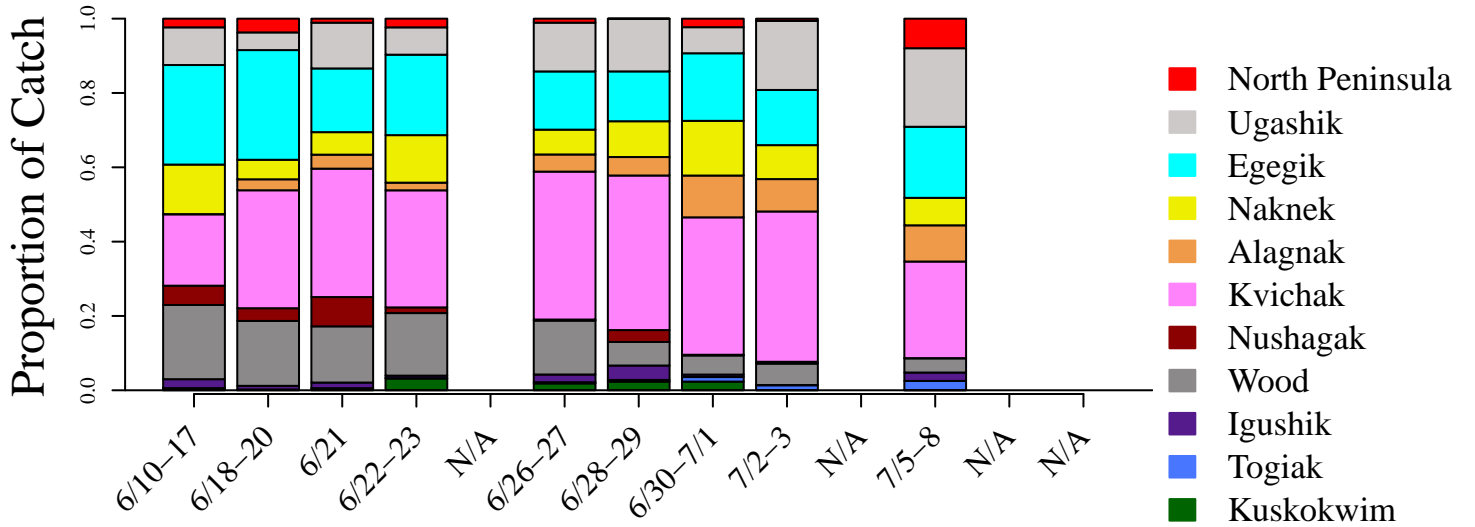
2011

Date

Historical Comparison of Stock Composition Estimates
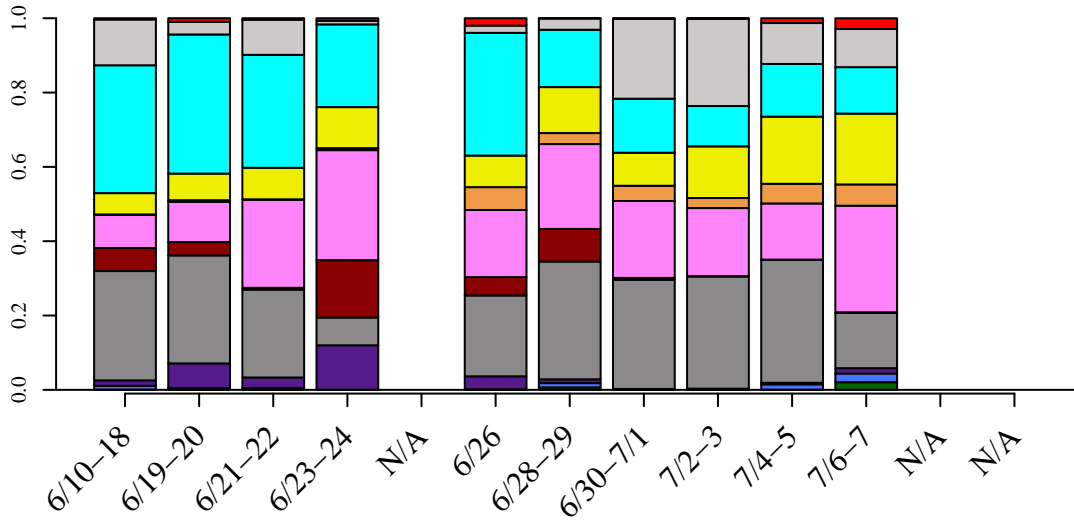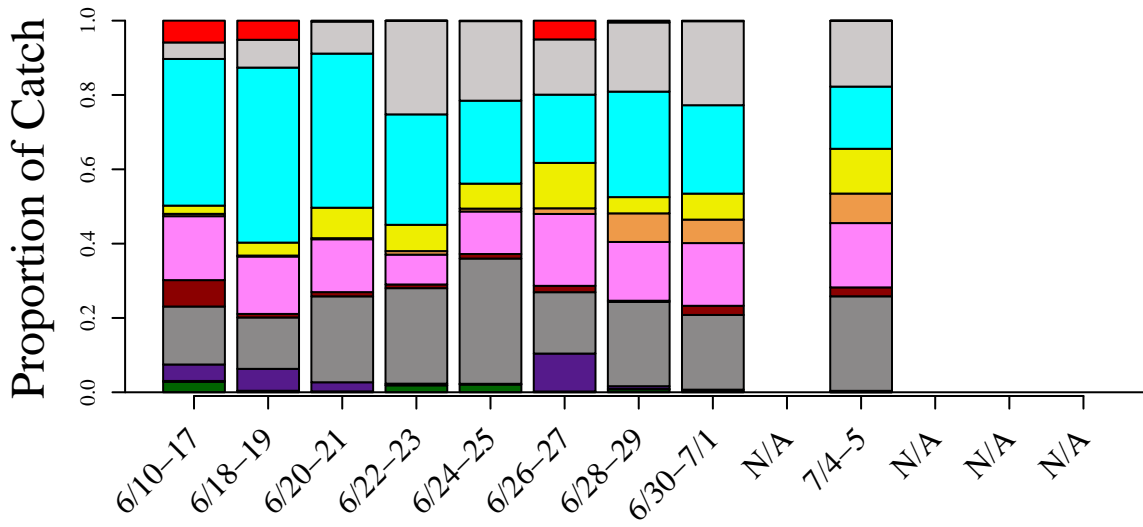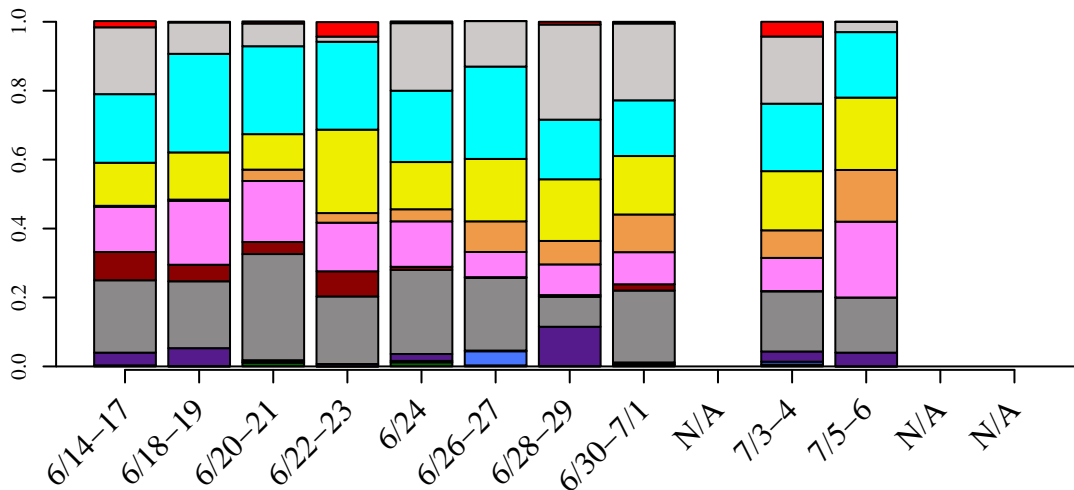
Figure 1. The 2022 Port Moller Daily Catch Index (averaged from Stations 2-22) parsed by district based on genetic stock composition estimates (colored stacked area curves scaled to the left vertical axis). Observed C+E (colored stacked columns) is also parsed by district and scaled to the right vertical axis. Colors are the same for both times series of data (stacked curves and columns).
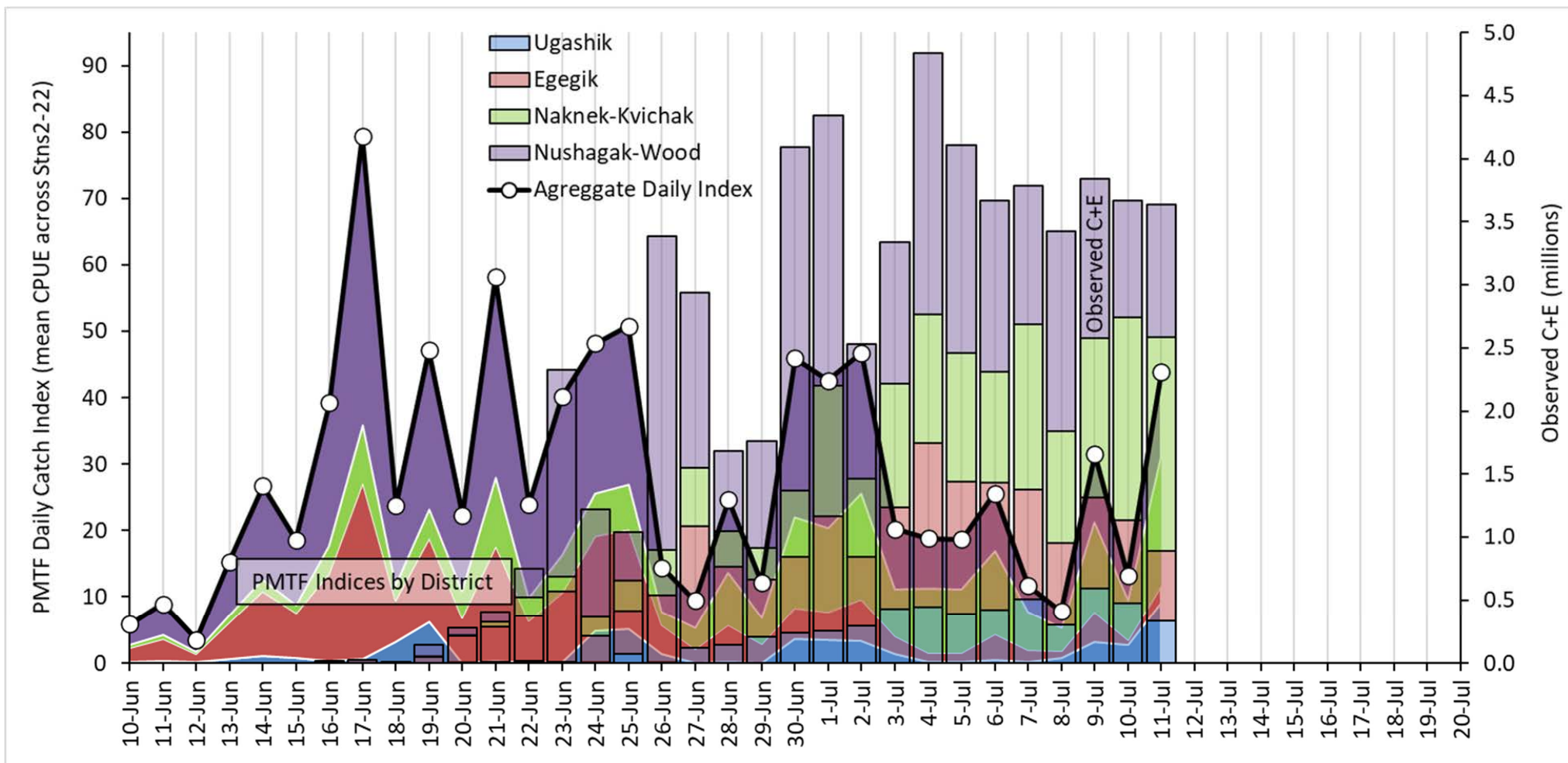
Appendix C

ADF&G inseason age composition estimates for the Port Moller Test Fishery,
inshore districts, and escapement projects, published July 18, 2022.

Bristol Bay Salmon Fishery
Age Composition Summary - Sockeye Salmon

Date run: 7/18/2022

		Period Start	Period End	Samples	Index	11	21	12	22	03	13	23	14
Egegik District	*Egegik District Harvest*	6/20/2022	6/21/2022	411	397,492			28.71%	30.41%		38.69%	2.19%	
		6/22/2022	6/23/2022	414	718,566			29.23%	38.65%		30.19%	1.93%	
		6/24/2022	6/25/2022	367	422,803			18.53%	41.42%		35.69%	4.09%	0.27%
		6/26/2022	6/27/2022	413	1,358,544			19.13%	50.85%		27.36%	2.66%	
		6/28/2022	6/29/2022	437	993,067			21.51%	45.31%		28.38%	4.58%	0.23%
		6/30/2022	7/1/2022	370	1,425,703			15.68%	40.27%		38.92%	5.14%	
		7/2/2022	7/3/2022	428	1,241,229			13.55%	46.96%		34.35%	5.14%	
		7/4/2022	7/4/2022	176	1,192,937			11.36%	41.48%		41.48%	5.68%	
		7/5/2022	7/6/2022	434	1,843,743			20.97%	47.00%		29.49%	2.53%	
		7/8/2022	7/9/2022	413	1,222,002			18.16%	45.04%		31.72%	5.08%	
		7/10/2022	7/11/2022	417	1,105,565			14.15%	41.73%		36.93%	6.95%	0.24%
		7/13/2022	7/14/2022	380	849,353			25.26%	49.21%		21.32%	4.21%	
		7/15/2022	7/15/2022	213	403,775			30.99%	55.40%		10.33%	3.29%	
	Egegik District Harvest Total							20.58%	43.85%		31.44%	4.06%	0.06%
	Egegik River Escapement	6/19/2022	6/23/2022	229	125,874	0.44%	0.87%	53.28%	27.95%		16.16%	1.31%	
		6/25/2022	6/26/2022	262	240,378		1.15%	55.34%	30.15%		12.21%	1.15%	
		6/29/2022	6/29/2022	142	48,138	0.70%	9.86%	52.11%	29.58%		7.75%		
		7/3/2022	7/5/2022	296	183,702	0.34%	2.70%	46.28%	37.50%		11.49%	1.69%	
	Egegik River Escapement Total					0.32%	2.91%	51.45%	31.86%		12.27%	1.18%	
Naknek-Kvichak District	*Alagnak River Escapement*	7/4/2022	7/7/2022	109	328,704			22.02%	6.42%		65.14%	6.42%	
	Alagnak River Escapement Total							22.02%	6.42%		65.14%	6.42%	
	Kvichak River Escapement	6/25/2022	6/28/2022	117	149,394			70.09%	15.38%		14.53%		
		7/4/2022	7/6/2022	368	462,474			51.63%	20.11%		26.63%	1.63%	
		7/7/2022	7/8/2022	298	607,650			52.35%	20.47%		26.51%	0.67%	
		7/9/2022	7/10/2022	250	518,730			55.20%	15.60%		28.40%	0.80%	
	Kvichak River Escapement Total							54.79%	18.59%		25.65%	0.97%	
	Kvichak Section Harvest - Set	7/5/2022	7/5/2022	182	110,388			31.87%	17.03%		48.90%	2.20%	
		7/7/2022	7/7/2022	206	122,489			38.83%	19.90%		39.32%	1.46%	
		7/10/2022	7/11/2022	387	201,521			32.30%	15.50%		47.80%	4.13%	0.26%
	Kvichak Section Harvest - Set Total							33.94%	17.03%		45.81%	2.97%	0.13%
	Naknek River Escapement	6/23/2022	6/26/2022	157	121,050			66.24%	9.55%		22.29%	1.91%	
		6/28/2022	6/29/2022	123	72,156	0.81%		67.48%	14.63%		13.82%	3.25%	
		7/1/2022	7/4/2022	316	377,886	0.32%		59.49%	12.66%		24.37%	2.85%	0.32%
		7/9/2022	7/10/2022	108	184,338		0.93%	40.74%	14.81%		38.89%	4.63%	
		7/11/2022	7/12/2022	95	316,494			29.47%	10.53%		50.53%	9.47%	
	Naknek River Escapement Total					0.25%	0.13%	55.94%	12.39%		27.41%	3.75%	0.13%
	Naknek Section Harvest - Set	6/22/2022	6/24/2022	421	62,466			45.13%	9.03%		44.66%	0.95%	
		7/5/2022	7/6/2022	431	160,852			35.27%	9.51%		52.20%	3.02%	
		7/14/2022	7/14/2022	205	103,627			31.22%	20.98%		41.95%	5.85%	
	Naknek Section Harvest - Set Total							38.41%	11.54%		47.21%	2.74%	
	Naknek-Kvichak District Harvest - Drift	6/24/2022	6/25/2022	352	229,909			25.00%	11.08%		55.97%	7.95%	
		6/27/2022	6/27/2022	126	211,821			34.92%	16.67%		44.44%	3.17%	0.79%
		6/29/2022	6/30/2022	418	389,293			22.49%	26.56%		47.13%	3.83%	
		7/2/2022	7/3/2022	384	766,687			31.25%	14.84%		51.30%	2.60%	
		7/7/2022	7/8/2022	568	889,406			27.64%	13.20%		55.99%	3.17%	
		7/10/2022	7/11/2022	348	1,474,804			22.41%	17.82%		55.46%	4.31%	
		7/12/2022	7/13/2022	636	1,322,567			25.79%	18.40%		51.26%	4.56%	
		7/14/2022	7/15/2022	426	1,317,333			26.53%	23.00%		45.07%	5.16%	0.23%
		7/16/2022	7/16/2022	203	225,729			26.11%	28.08%		39.41%	6.40%	
	Naknek-Kvichak District Harvest - Drift Total							26.32%	18.41%		50.74%	4.48%	0.06%

		Period Start	Period End	Samples	Index	11	21	12	22	03	13	23	14
Nushagak District	*Igushik River Escapement*	6/30/2022	6/30/2022	40	14,982			7.50%			92.50%		
		7/3/2022	7/4/2022	51	31,080			3.92%			94.12%	1.96%	
	Igushik River Escapement Total							*5.49%*			*93.41%*	*1.10%*	
	Nushagak District Harvest	6/23/2022	6/25/2022	841	1,013,016			12.84%	2.62%		82.40%	1.90%	0.24%
		6/26/2022	6/26/2022	445	1,011,909			18.65%	7.19%		72.36%	1.12%	0.67%
		6/27/2022	6/29/2022	608	1,641,369			20.23%	3.95%		74.01%	1.48%	0.33%
		6/30/2022	6/30/2022	602	2,293,855			20.93%	7.81%		67.77%	2.99%	0.50%
		7/1/2022	7/2/2022	751	2,463,767			22.24%	7.59%	0.13%	66.98%	2.66%	0.40%
		7/3/2022	7/4/2022	669	2,508,028			24.66%	7.92%		66.22%	0.90%	0.30%
		7/5/2022	7/6/2022	667	1,980,078			25.19%	7.05%		66.57%	1.05%	0.15%
		7/7/2022	7/8/2022	449	1,933,283			19.60%	7.80%		70.82%	1.56%	0.22%
		7/9/2022	7/10/2022	474	1,394,248			20.68%	27.00%		45.36%	5.91%	1.05%
		7/11/2022	7/12/2022	430	1,146,965			27.21%	15.81%		54.19%	2.79%	
	Nushagak District Harvest Total							*20.94%*	*8.64%*	*0.02%*	*67.87%*	*2.16%*	*0.37%*
	Nushagak River Escapement	6/6/2022	6/17/2022	85	22,519			16.47%	1.18%		80.00%	1.18%	1.18%
		6/18/2022	6/22/2022	427	252,478	0.23%		11.71%	2.34%		84.78%	0.47%	0.47%
		6/24/2022	6/26/2022	364	807,764			12.64%	3.02%		83.79%		0.55%
		6/27/2022	6/27/2022	122	806,837			10.66%	0.82%		86.07%	0.82%	1.64%
		6/28/2022	7/1/2022	438	432,303			11.64%	0.46%		87.21%	0.23%	0.46%
		7/2/2022	7/4/2022	282	233,146			17.02%	2.48%		79.43%		0.71%
		7/5/2022	7/7/2022	347	289,905			16.71%	3.17%		78.96%		1.15%
	Nushagak River Escapement Total					*0.05%*		*13.56%*	*2.08%*		*83.29%*	*0.24%*	*0.73%*
	Nushagak Section Harvest - Set	6/28/2022	6/28/2022	193	115,061			22.80%	5.18%		69.43%	1.55%	1.04%
		7/9/2022	7/10/2022	413	199,852			29.54%	14.29%		54.48%	1.21%	0.48%
	Nushagak Section Harvest - Set Total							*27.39%*	*11.39%*		*59.24%*	*1.32%*	*0.66%*
	Wood River Escapement	6/22/2022	6/25/2022	179	644,166			58.10%	5.59%		35.20%	0.56%	0.56%
		6/27/2022	6/28/2022	163	662,148			65.03%	8.59%		25.77%	0.61%	
		7/2/2022	7/7/2022	483	807,048			67.49%	9.52%		21.74%	1.24%	
	Wood River Escapement Total							*64.97%*	*8.48%*		*25.45%*	*0.97%*	*0.12%*
	Wood River SHA Harvest	6/28/2022	6/28/2022	179	12,066			21.79%	9.50%		68.72%		
		7/2/2022	7/2/2022	221	32,969			52.49%	11.76%		34.84%	0.90%	
		7/5/2022	7/5/2022	220	43,794			41.82%	7.27%		48.18%	2.27%	0.45%
		7/8/2022	7/8/2022	230	46,830			41.74%	27.83%		29.13%	1.30%	
		7/11/2022	7/13/2022	430	107,655			35.81%	19.30%		43.72%	0.93%	0.23%
	Wood River SHA Harvest Total							*38.83%*	*16.09%*		*43.83%*	*1.09%*	*0.16%*
Port Moller	*Port Moller Test Fishery*	6/10/2022	6/10/2022	14	5			14.29%	50.00%		28.57%	7.14%	
		6/11/2022	6/11/2022	59	9			15.25%	5.08%		79.66%		
		6/12/2022	6/12/2022	12	4			16.67%	8.33%		75.00%		
		6/13/2022	6/13/2022	127	15	1.57%		18.11%	10.24%		70.08%		
		6/14/2022	6/14/2022	150	27			23.33%	9.33%		67.33%		
		6/15/2022	6/15/2022	75	19			33.33%	10.67%		56.00%		
		6/16/2022	6/16/2022	153	40			20.26%	18.95%		58.82%	1.96%	
		6/17/2022	6/17/2022	300	80			18.00%	9.33%		70.67%	2.00%	
		6/18/2022	6/18/2022	90	24			27.78%	15.56%		56.67%		
		6/19/2022	6/19/2022	173	48			19.65%	19.65%		52.02%	8.67%	
		6/20/2022	6/20/2022	107	23			21.50%	8.41%		69.16%	0.93%	
		6/21/2022	6/21/2022	236	61			25.85%	14.83%		58.05%	0.42%	0.85%
		6/22/2022	6/22/2022	96	24			20.83%	9.38%		68.75%	1.04%	
		6/23/2022	6/23/2022	191	41			14.14%	14.14%		67.54%	3.14%	1.05%
		6/24/2022	6/24/2022	235	51			17.02%	10.64%		65.96%	6.38%	
		6/25/2022	6/25/2022	146	54			16.44%	8.90%		73.97%	0.68%	
		6/26/2022	6/26/2022	4	9			25.00%	25.00%		50.00%		
		6/27/2022	6/27/2022	37	10			32.43%	10.81%		56.76%		
		6/28/2022	6/28/2022	113	25			18.58%	11.50%		65.49%	4.42%	
		6/29/2022	6/29/2022	52	12			25.00%	28.85%		42.31%	3.85%	
		6/30/2022	6/30/2022	197	47			18.27%	15.74%		60.41%	5.08%	0.51%
		7/1/2022	7/1/2022	118	43			18.64%	16.10%		62.71%	2.54%	
		7/2/2022	7/2/2022	202	48			23.76%	7.43%		60.89%	6.93%	0.50%
		7/3/2022	7/3/2022	132	21			33.33%	12.88%		53.03%	0.76%	
		7/4/2022	7/4/2022	88	19			29.55%	17.05%		53.41%		

		Period Start	Period End	Samples	Index	Age 11	21	12	22	03	13	23	14
Port Moller	*Port Moller Test Fishery*	7/5/2022	7/5/2022	139	19			18.71%	24.46%		50.36%	5.76%	0.72%
		7/6/2022	7/6/2022	128	25			45.31%	12.50%		39.84%	1.56%	0.78%
		7/7/2022	7/7/2022	60	11			28.33%	23.33%		46.67%	1.67%	
		7/8/2022	7/8/2022	40	8			22.50%	20.00%		55.00%	2.50%	
		7/9/2022	7/9/2022	182	34			25.82%	19.78%		48.90%	5.49%	
		7/10/2022	7/10/2022	81	15			27.16%	20.99%		46.91%	4.94%	
		7/11/2022	7/11/2022	239	48			28.03%	16.74%		49.79%	4.60%	0.84%
		7/12/2022	7/12/2022	38	10			28.95%	21.05%		47.37%		2.63%
	Port Moller Test Fishery Total					*0.05%*		*22.80%*	*14.25%*		*59.57%*	*3.04%*	*0.27%*
Togiak District	*Togiak District Harvest - Mixed*	7/6/2022	7/8/2022	469	38,363			12.58%	1.49%	0.21%	82.30%	0.85%	2.56%
	Togiak District Harvest - Mixed Total							*12.58%*	*1.49%*	*0.21%*	*82.30%*	*0.85%*	*2.56%*
Ugashik District	*Ugashik District Harvest*	6/27/2022	6/28/2022	379	253,421			5.28%	8.18%		81.27%	5.28%	
		7/1/2022	7/2/2022	202	484,435			11.39%	17.33%		63.86%	7.43%	
		7/3/2022	7/4/2022	410	666,968			11.95%	30.73%		53.66%	3.66%	
		7/5/2022	7/6/2022	402	550,235			18.66%	11.19%		65.67%	4.48%	
		7/7/2022	7/8/2022	292	512,502			12.67%	21.58%		62.67%	3.08%	
		7/9/2022	7/9/2022	194	526,266			10.82%	10.31%		75.26%	3.61%	
		7/11/2022	7/12/2022	163	570,490			31.90%	19.02%		41.10%	7.98%	
		7/13/2022	7/14/2022	390	717,278			22.05%	22.05%		48.46%	7.44%	
	Ugashik District Harvest Total							*14.93%*	*17.97%*		*61.92%*	*5.18%*	
	Ugashik River Escapement	7/2/2022	7/5/2022	130	143,172			13.85%	12.31%		71.54%	2.31%	
		7/7/2022	7/8/2022	257	251,436	0.39%		22.18%	7.00%		66.93%	3.50%	
		7/10/2022	7/11/2022	225	302,406	0.44%		22.22%	9.33%		65.78%	2.22%	
		7/13/2022	7/13/2022	69	145,602	1.45%	1.45%	17.39%	10.14%		69.57%		
	Ugashik River Escapement Total					*0.44%*	*0.15%*	*20.12%*	*9.10%*		*67.69%*	*2.50%*	
Sockeye Salmon Total						**0.03%**	**0.09%**	**26.40%**	**17.82%**	**0.01%**	**52.55%**	**2.85%**	**0.24%**

Appendix D

The 33 ADF&G daily run summaries for Bristol Bay in 2022.

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Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 06/19/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**0**	**0**	**0**	**0**	**0**	**0**
	Ugashik River			0	0	0	
	Egegik	**44,057**	**195,473**	**29,616**	**49,200**	**0**	**244,673**
	Egegik River			29,616	49,200	0	
	Naknek-Kvichak	**0**	**889**	**0**	**0**	**0**	**889**
	Alagnak River			0	0	0	
	Kvichak River			0	0	0	
	Naknek River			0	0	0	
Bristol Bay West	**Nushagak**	**0**	**0**	**116,142**	**183,963**	**0**	**183,963**
	Igushik River			0	0	0	
	Nushagak River			72,252	115,599	0	
	Wood River			43,890	68,364	0	
	Togiak	**0**	**0**	**0**	**0**	**0**	**0**
	Togiak River			0	0	0	
Bristol Bay Totals:		**44,057**	**196,362**	**145,758**	**233,163**	**0**	**429,525**

Sockeye per Drift Delivery for: June 19

	Sockeye per Delivery
Ugashik	
Egegik	209
Naknek-Kvichak	
Nushagak	
Togiak	

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/16/2022	44	127
6/17/2022	80	207
6/18/2022	24	231
6/19/2022	48	279

Registrations as of: June 20 09:00 AM- and - June 22 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	230	249	181	196	50	53
Naknek-Kvichak	27	32	25	30	2	2
Nushagak	267	426	209	329	58	97
Togiak	16	17	16	17		
Ugashik	16	23	14	18	2	5
Grand Total	**556**	**747**	**445**	**590**	**112**	**157**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 06/20/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**6,000**	**6,721**	**0**	**0**	**0**	**6,721**
	Ugashik River			0	0	0	
	Egegik	**172,000**	**367,473**	**6,228**	**55,428**	**0**	**422,901**
	Egegik River			6,228	55,428	0	
	Naknek-Kvichak	**440**	**1,329**	**246**	**246**	**0**	**1,575**
	Alagnak River			0	0	0	
	Kvichak River			0	0	0	
	Naknek River			246	246	0	
Bristol Bay West	**Nushagak**	**0**	**0**	**96,849**	**280,812**	**0**	**280,812**
	Igushik River			0	0	0	
	Nushagak River			75,159	190,758	0	
	Wood River			21,690	90,054	0	
	Togiak	**0**	**0**	**0**	**0**	**0**	**0**
	Togiak River			0	0	0	
Bristol Bay Totals:		**178,440**	**375,523**	**103,323**	**336,486**	**0**	**712,009**

Sockeye per Drift Delivery for: June 20

	Sockeye per Delivery
Ugashik	424
Egegik	697
Naknek-Kvichak	68
Nushagak	
Togiak	

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/17/2022	80	207
6/18/2022	24	231
6/19/2022	48	279
6/20/2022	0	0
	22	301

Registrations as of: June 21 09:00 AM- and - June 23 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	249	251	196	198	53	53
Naknek-Kvichak	35	36	33	34	2	2
Nushagak	379	445	296	342	83	103
Togiak	17	17	17	17		
Ugashik	24	24	18	18	6	6
Grand Total	**704**	**773**	**560**	**609**	**144**	**164**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 06/21/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	12,000	18,538	0	0	0	18,538
	Ugashik River			0	0	0	
	Egegik	226,000	593,011	3,960	59,388	17,000	669,399
	Egegik River			3,960	59,388	17,000	
	Naknek-Kvichak	14,000	15,470	1,026	1,272	0	16,742
	Alagnak River			0	0	0	
	Kvichak River			0	0	0	
	Naknek River			1,026	1,272	0	
Bristol Bay West	**Nushagak**	0	0	65,177	345,989	0	345,989
	Igushik River			0	0	0	
	Nushagak River			40,469	231,227	0	
	Wood River			24,708	114,762	0	
	Togiak	165	332	0	0	0	332
	Togiak River			0	0	0	
Bristol Bay Totals:		252,165	627,351	70,163	406,649	17,000	1,051,000

Sockeye per Drift Delivery for: June 21

	Sockeye per Delivery
Ugashik	713
Egegik	704
Naknek-Kvichak	1,090
Nushagak	
Togiak	8

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/18/2022	24	231
6/19/2022	48	279
6/20/2022	22	301
6/21/2022	60	361

Registrations as of: June 22 09:00 AM- and - June 24 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	279	283	219	222	60	61
Naknek-Kvichak	42	55	40	50	2	5
Nushagak	496	513	381	395	115	118
Togiak	18	18	18	18		
Ugashik	25	26	19	20	6	6
Grand Total	860	895	677	705	183	190

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- Bristol Bay Daily Run Summary -

through 06/22/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	16,000	34,292	0	0	0	34,292
	Ugashik River			0	0	0	
	Egegik	295,000	887,965	35,730	95,118	0	983,083
	Egegik River			35,730	95,118	0	
	Naknek-Kvichak	101,000	116,504	26,778	28,050	0	144,554
	Alagnak River			0	0	0	
	Kvichak River			0	0	0	
	Naknek River			26,778	28,050	0	
Bristol Bay West	**Nushagak**	0	0	75,864	421,853	0	421,853
	Igushik River			0	0	0	
	Nushagak River			43,770	274,997	0	
	Wood River			32,094	146,856	0	
	Togiak	309	641	0	0	0	641
	Togiak River			0	0	0	
Bristol Bay Totals:		412,309	1,039,402	138,372	545,021	0	1,584,423

Sockeye per Drift Delivery for: June 22

	Sockeye per Delivery
Ugashik	659
Egegik	981
Naknek-Kvichak	1,127
Nushagak	
Togiak	15

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/19/2022	48	279
6/20/2022	22	301
6/21/2022	60	361
6/22/2022	24	385

Registrations as of: June 23 09:00 AM- and - June 25 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	313	320	245	251	68	69
Naknek-Kvichak	106	132	93	117	13	15
Nushagak	869	919	638	673	231	246
Togiak	19	19	19	19		
Ugashik	31	31	25	25	6	6
Grand Total	1,338	1,421	1,020	1,085	318	336

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- Bristol Bay Daily Run Summary -

through 06/23/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**10,000**	**43,758**	**0**	**0**	**0**	**43,758**
	Ugashik River			0	0	0	
	Egegik	**424,000**	**1,311,890**	**50,340**	**145,458**	**15,000**	**1,472,348**
	Egegik River			50,340	145,458	15,000	
	Naknek-Kvichak	**78,000**	**194,983**	**48,762**	**76,812**	**0**	**271,795**
	Alagnak River			0	0	0	
	Kvichak River			1,176	1,176	0	
	Naknek River			47,586	75,636	0	
Bristol Bay West	**Nushagak**	**832,000**	**850,334**	**213,103**	**634,956**	**0**	**1,485,290**
	Igushik River			0	0	0	
	Nushagak River			111,853	386,850	0	
	Wood River			101,250	248,106	0	
	Togiak	**500**	**1,259**	**0**	**0**	**0**	**1,259**
	Togiak River			0	0	0	
	Bristol Bay Totals:	**1,344,500**	**2,402,224**	**312,205**	**857,226**	**15,000**	**3,274,450**

Sockeye per Drift Delivery for: June 23

	Sockeye per Delivery
Ugashik	362
Egegik	805
Naknek-Kvichak	508
Nushagak	964
Togiak	90

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/20/2022	23	294
6/21/2022	61	355
6/22/2022	24	379
6/23/2022	42	421

Registrations as of: June 24 09:00 AM- and - June 26 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	339	339	268	269	71	70
Naknek-Kvichak	136	164	120	145	16	19
Nushagak	960	981	704	724	256	257
Togiak	21	21	21	21		
Ugashik	32	32	26	26	6	6
Grand Total	1,488	1,537	1,139	1,185	349	352

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- Bristol Bay Daily Run Summary -

through 06/24/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	400	44,312	0	0	0	44,312
	Ugashik River			0	0	0	
	Egegik	107,000	1,418,531	59,820	205,278	60,000	1,683,809
	Egegik River			59,820	205,278	60,000	
	Naknek-Kvichak	78,000	273,390	15,186	91,998	50,000	415,388
	Alagnak River			0	0	0	
	Kvichak River			6,336	7,512	50,000	
	Naknek River			8,850	84,486	0	
Bristol Bay West	**Nushagak**	394,000	1,249,163	798,671	1,433,627	0	2,682,790
	Igushik River			0	0	0	
	Nushagak River			509,999	896,849	0	
	Wood River			288,672	536,778	0	
	Togiak	1,000	2,296	0	0	0	2,296
	Togiak River			0	0	0	
Bristol Bay Totals:		580,400	2,987,692	873,677	1,730,903	110,000	4,828,595

Sockeye per Drift Delivery for: June 24

	Sockeye per Delivery
Ugashik	78
Egegik	344
Naknek-Kvichak	720
Nushagak	362
Togiak	114

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/21/2022	61	355
6/22/2022	24	379
6/23/2022	42	421
6/24/2022	52	473

Registrations as of: June 25 09:00 AM- and - June 27 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	343	352	271	276	72	76
Naknek-Kvichak	175	203	152	177	23	26
Nushagak	983	995	727	738	257	258
Togiak	26	26	26	26		
Ugashik	37	38	30	31	7	7
Grand Total	1,564	1,614	1,206	1,248	359	367

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 06/25/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	70,000	114,300	0	0	0	114,300
	Ugashik River			0	0	0	
	Egegik	316,000	1,734,113	131,754	337,032	180,000	2,251,145
	Egegik River			131,754	337,032	180,000	
	Naknek-Kvichak	184,000	457,438	66,468	158,466	60,000	675,904
	Alagnak River			0	0	0	
	Kvichak River			47,778	55,290	60,000	
	Naknek River			18,690	103,176	0	
Bristol Bay West	**Nushagak**	112,000	1,361,432	437,384	1,871,011	0	3,232,443
	Igushik River			0	0	0	
	Nushagak River			215,234	1,112,083	0	
	Wood River			222,150	758,928	0	
	Togiak	0	2,299	0	0	0	2,299
	Togiak River			0	0	0	
Bristol Bay Totals:		682,000	3,669,582	635,606	2,366,509	240,000	6,276,091

Sockeye per Drift Delivery for: June 25

	Sockeye per Delivery
Ugashik	2,481
Egegik	1,057
Naknek-Kvichak	856
Nushagak	163
Togiak	

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/22/2022	24	379
6/23/2022	42	421
6/24/2022	52	473
6/25/2022	89	562

Registrations as of: June 26 09:00 AM- and - June 28 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	344	350	273	275	71	75
Naknek-Kvichak	197	229	173	199	25	31
Nushagak	978	980	724	727	256	254
Togiak	26	26	26	26		
Ugashik	38	40	31	32	7	8
Grand Total	1,583	1,625	1,227	1,259	359	368

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- Bristol Bay Daily Run Summary -

through 06/26/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	0	113,882	0	0	0	113,882
	Ugashik River			0	0	0	
	Egegik	444,000	2,178,334	108,624	445,656	0	2,623,990
	Egegik River			108,624	445,656	0	
	Naknek-Kvichak	243,000	711,857	59,676	218,142	50,000	979,999
	Alagnak River			0	0	0	
	Kvichak River			13,752	69,042	50,000	
	Naknek River			45,924	149,100	0	
Bristol Bay West	**Nushagak**	1,270,000	2,631,604	261,205	2,132,216	0	4,763,820
	Igushik River			2,580	2,580	0	
	Nushagak River			82,531	1,194,614	0	
	Wood River			176,094	935,022	0	
	Togiak	0	2,299	0	0	0	2,299
	Togiak River			0	0	0	
Bristol Bay Totals:		1,957,000	5,637,976	429,505	2,796,014	50,000	8,483,990

Sockeye per Drift Delivery for: June 26

	Sockeye per Delivery
Ugashik	
Egegik	1,034
Naknek-Kvichak	861
Nushagak	986
Togiak	

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/23/2022	42	421
6/24/2022	52	473
6/25/2022	62	535
6/26/2022	14	549

Registrations as of: June 27 09:00 AM- and - June 29 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	350	350	275	275	75	75
Naknek-Kvichak	219	259	193	223	27	37
Nushagak	974	973	724	723	251	251
Togiak	26	26	26	26		
Ugashik	42	50	34	40	8	10
Grand Total	1,611	1,658	1,252	1,287	361	373

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- Bristol Bay Daily Run Summary -

through 06/27/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**123,000**	**236,882**	**1,722**	**1,722**	**0**	**238,604**
	Ugashik River			1,722	1,722	0	
	Egegik	**914,000**	**3,092,612**	**24,966**	**470,622**	**180,000**	**3,743,234**
	Egegik River			24,966	470,622	180,000	
	Naknek-Kvichak	**317,000**	**1,028,455**	**97,764**	**315,906**	**100,000**	**1,444,361**
	Alagnak River			0	0	0	
	Kvichak River			4,236	73,278	100,000	
	Naknek River			93,528	242,628	0	
Bristol Bay West	**Nushagak**	**884,000**	**3,515,671**	**1,204,253**	**3,336,469**	**0**	**6,852,140**
	Igushik River			13,194	15,774	0	
	Nushagak River			806,837	2,001,451	0	
	Wood River			384,222	1,319,244	0	
	Togiak	**1,300**	**3,599**	**0**	**0**	**0**	**3,599**
	Togiak River			0	0	0	
Bristol Bay Totals:		**2,239,300**	**7,877,219**	**1,328,705**	**4,124,719**	**280,000**	**12,281,938**

Sockeye per Drift Delivery for: June 27

	Sockeye per Delivery
Ugashik	2,418
Egegik	1,677
Naknek-Kvichak	1,028
Nushagak	1,056
Togiak	58

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/24/2022	51	471
6/25/2022	54	525
6/26/2022	9	534
6/27/2022	10	544

Registrations as of: June 28 09:00 AM- and - June 30 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	349	352	274	277	75	75
Naknek-Kvichak	243	272	213	234	31	39
Nushagak	966	962	720	718	247	245
Togiak	27	27	27	27		
Ugashik	46	64	36	50	10	14
Grand Total	**1,631**	**1,677**	**1,270**	**1,306**	**363**	**373**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 06/28/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**130,000**	**366,943**	**2,544**	**4,266**	**0**	**371,209**
	Ugashik River			2,544	4,266	0	
	Egegik	**578,000**	**3,670,878**	**94,086**	**564,708**	**120,000**	**4,355,586**
	Egegik River			94,086	564,708	120,000	
	Naknek-Kvichak	**181,000**	**1,209,289**	**137,562**	**453,468**	**150,000**	**1,812,757**
	Alagnak River			0	0	0	
	Kvichak River			83,628	156,906	150,000	
	Naknek River			53,934	296,562	0	
Bristol Bay West	**Nushagak**	**400,000**	**3,915,771**	**507,413**	**3,843,882**	**0**	**7,759,653**
	Igushik River			14,202	29,976	0	
	Nushagak River			215,285	2,216,736	0	
	Wood River			277,926	1,597,170	0	
	Togiak	**3,000**	**6,566**	**0**	**0**	**0**	**6,566**
	Togiak River			0	0	0	
Bristol Bay Totals:		**1,292,000**	**9,169,447**	**741,605**	**4,866,324**	**270,000**	**14,305,771**

Sockeye per Drift Delivery for: June 28

	Sockeye per Delivery
Ugashik	2,571
Egegik	1,075
Naknek-Kvichak	447
Nushagak	357
Togiak	53

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/25/2022	54	525
6/26/2022	9	534
6/27/2022	10	544
6/28/2022	25	569

Registrations as of: June 29 09:00 AM- and - July 01 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	345	368	272	293	73	75
Naknek-Kvichak	258	277	224	240	35	38
Nushagak	926	929	686	688	241	242
Togiak	27	27	27	27		
Ugashik	55	97	43	73	12	24
Grand Total	**1,611**	**1,698**	**1,252**	**1,321**	**361**	**379**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 06/29/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**167,000**	**534,303**	**810**	**5,028**	**0**	**539,331**
	Ugashik River			810	5,028	0	
	Egegik	**415,000**	**4,085,663**	**48,138**	**612,846**	**50,000**	**4,748,509**
	Egegik River			48,138	612,846	50,000	
	Naknek-Kvichak	**170,000**	**1,379,481**	**123,942**	**577,410**	**30,000**	**1,986,891**
	Alagnak River			21,588	21,588	0	
	Kvichak River			84,132	241,038	30,000	
	Naknek River			18,222	314,784	0	
Bristol Bay West	**Nushagak**	**727,000**	**4,745,706**	**237,333**	**4,081,215**	**0**	**8,826,921**
	Igushik River			26,796	56,772	0	
	Nushagak River			102,711	2,319,447	0	
	Wood River			107,826	1,704,996	0	
	Togiak	**3,200**	**9,830**	**0**	**0**	**0**	**9,830**
	Togiak River			0	0	0	
Bristol Bay Totals:		**1,482,200**	**10,754,983**	**410,223**	**5,276,499**	**80,000**	**16,111,482**

Sockeye per Drift Delivery for: June 29

	Sockeye per Delivery
Ugashik	2,251
Egegik	959
Naknek-Kvichak	489
Nushagak	582
Togiak	63

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/26/2022	9	534
6/27/2022	10	544
6/28/2022	25	569
6/29/2022	12	581

Registrations as of: June 30 09:00 AM- and - July 02 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	346	373	272	295	74	78
Naknek-Kvichak	271	285	234	245	38	41
Nushagak	914	918	679	682	237	238
Togiak	28	28	28	28		
Ugashik	70	104	54	78	16	26
Grand Total	**1,629**	**1,708**	**1,267**	**1,328**	**365**	**383**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/01/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**234,000**	**974,577**	**14,430**	**21,288**	**40,000**	**1,035,865**
	Ugashik River			14,430	21,288	40,000	
	Egegik	**865,000**	**5,511,250**	**35,376**	**687,138**	**85,000**	**6,283,388**
	Egegik River			35,376	687,138	85,000	
	Naknek-Kvichak	**751,000**	**2,497,172**	**109,098**	**758,568**	**80,000**	**3,335,740**
	Alagnak River			4,536	33,654	0	
	Kvichak River			4,764	278,106	80,000	
	Naknek River			99,798	446,808	0	
Bristol Bay West	**Nushagak**	**1,810,000**	**9,017,078**	**266,999**	**4,471,174**	**0**	**13,488,252**
	Igushik River			19,776	91,530	0	
	Nushagak River			82,871	2,433,754	0	
	Wood River			164,352	1,945,890	0	
	Togiak	**3,700**	**15,577**	**0**	**0**	**0**	**15,577**
	Togiak River			0	0	0	
Bristol Bay Totals:		**3,663,700**	**18,015,654**	**425,903**	**5,938,168**	**205,000**	**24,158,822**

Sockeye per Drift Delivery for: July 1

	Sockeye per Delivery
Ugashik	2,730
Egegik	1,752
Naknek-Kvichak	1,451
Nushagak	2,056
Togiak	235

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/28/2022	25	569
6/29/2022	12	581
6/30/2022	47	628
7/1/2022	43	672

Registrations as of: July 02 09:00 AM- and - July 04 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	362	359	285	282	77	77
Naknek-Kvichak	293	295	253	255	42	42
Nushagak	921	920	683	683	240	239
Togiak	30	30	30	30		
Ugashik	106	119	78	88	28	31
Grand Total	**1,712**	**1,723**	**1,329**	**1,338**	**387**	**389**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/02/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**251,000**	**1,225,400**	**41,616**	**62,904**	**50,000**	**1,338,304**
	Ugashik River			41,616	62,904	50,000	
	Egegik	**498,000**	**6,009,648**	**54,078**	**741,216**	**60,000**	**6,810,864**
	Egegik River			54,078	741,216	60,000	
	Naknek-Kvichak	**395,000**	**2,897,150**	**199,452**	**958,020**	**200,000**	**4,055,170**
	Alagnak River			19,614	53,268	0	
	Kvichak River			15,528	293,634	200,000	
	Naknek River			164,310	611,118	0	
Bristol Bay West	**Nushagak**	**892,000**	**9,908,903**	**330,414**	**4,801,588**	**0**	**14,710,491**
	Igushik River			11,370	102,900	0	
	Nushagak River			134,748	2,568,502	0	
	Wood River			184,296	2,130,186	0	
	Togiak	**4,600**	**20,215**	**0**	**0**	**0**	**20,215**
	Togiak River			0	0	0	
Bristol Bay Totals:		**2,040,600**	**20,061,316**	**625,560**	**6,563,728**	**310,000**	**26,935,044**

Sockeye per Drift Delivery for: July 2

	Sockeye per Delivery
Ugashik	2,593
Egegik	942
Naknek-Kvichak	783
Nushagak	796
Togiak	207

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/29/2022	12	581
6/30/2022	47	628
7/1/2022	43	672
7/2/2022	48	720

Registrations as of: July 03 09:00 AM- and - July 05 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	342	349	266	274	76	75
Naknek-Kvichak	296	316	256	272	42	46
Nushagak	887	888	656	657	233	233
Togiak	30	30	30	30		
Ugashik	115	148	85	112	30	36
Grand Total	**1,670**	**1,731**	**1,293**	**1,345**	**381**	**390**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/03/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**334,000**	**1,559,012**	**31,890**	**94,794**	**40,000**	**1,693,806**
	Ugashik River			31,890	94,794	40,000	
	Egegik	**720,000**	**6,729,833**	**46,284**	**787,500**	**35,000**	**7,552,333**
	Egegik River			46,284	787,500	35,000	
	Naknek-Kvichak	**580,000**	**3,476,294**	**227,304**	**1,185,324**	**100,000**	**4,761,618**
	Alagnak River			51,492	104,760	0	
	Kvichak River			138,504	432,138	100,000	
	Naknek River			37,308	648,426	0	
Bristol Bay West	**Nushagak**	**1,020,000**	**10,953,556**	**180,662**	**4,982,250**	**0**	**15,935,806**
	Igushik River			19,110	122,010	0	
	Nushagak River			68,030	2,636,532	0	
	Wood River			93,522	2,223,708	0	
	Togiak	**0**	**21,025**	**0**	**0**	**0**	**21,025**
	Togiak River			0	0	0	
Bristol Bay Totals:		**2,654,000**	**22,739,720**	**486,140**	**7,049,868**	**175,000**	**29,964,588**

Sockeye per Drift Delivery for: July 3

	Sockeye per Delivery
Ugashik	2,689
Egegik	1,716
Naknek-Kvichak	1,435
Nushagak	1,122
Togiak	

Test Fishery Port Moller

Date	Index Daily	Cumulative
6/30/2022	47	628
7/1/2022	43	672
7/2/2022	48	720
7/3/2022	21	741

Registrations as of: July 04 09:00 AM- and - July 06 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	336	347	261	272	75	75
Naknek-Kvichak	291	315	252	270	41	47
Nushagak	880	880	652	652	230	230
Togiak	31	31	31	31		
Ugashik	120	162	89	123	31	39
Grand Total	**1,658**	**1,735**	**1,285**	**1,348**	**377**	**391**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/04/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**333,000**	**1,891,766**	**23,022**	**117,816**	**50,000**	**2,059,582**
	Ugashik River			23,022	117,816	50,000	
	Egegik	**1,200,000**	**7,920,711**	**44,628**	**832,128**	**60,000**	**8,812,839**
	Egegik River			44,628	832,128	60,000	
	Naknek-Kvichak	**697,000**	**4,175,217**	**281,946**	**1,467,270**	**60,000**	**5,702,487**
	Alagnak River			46,026	150,786	0	
	Kvichak River			159,222	591,360	60,000	
	Naknek River			76,698	725,124	0	
Bristol Bay West	**Nushagak**	**1,780,000**	**12,731,976**	**105,098**	**5,087,348**	**0**	**17,819,324**
	Igushik River			11,970	133,980	0	
	Nushagak River			30,368	2,666,900	0	
	Wood River			62,760	2,286,468	0	
	Togiak	**6,600**	**27,625**	**0**	**0**	**0**	**27,625**
	Togiak River			0	0	0	
Bristol Bay Totals:		**4,016,600**	**26,747,295**	**454,694**	**7,504,562**	**170,000**	**34,421,857**

Sockeye per Drift Delivery for: July 4

	Sockeye per Delivery
Ugashik	2,339
Egegik	1,786
Naknek-Kvichak	1,097
Nushagak	1,268
Togiak	125

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/1/2022	43	672
7/2/2022	48	720
7/3/2022	21	741
7/4/2022	19	760

Registrations as of: July 05 09:00 AM- and - July 07 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	347	348	272	273	75	75
Naknek-Kvichak	308	317	266	273	44	46
Nushagak	874	873	646	645	230	230
Togiak	32	34	32	34		
Ugashik	148	166	112	126	36	40
Grand Total	**1,709**	**1,738**	**1,328**	**1,351**	**385**	**391**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/05/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**247,000**	**2,138,980**	**46,644**	**164,460**	**80,000**	**2,383,440**
	Ugashik River			46,644	164,460	80,000	
	Egegik	**949,000**	**8,894,814**	**92,790**	**924,918**	**80,000**	**9,899,732**
	Egegik River			92,790	924,918	80,000	
	Naknek-Kvichak	**670,000**	**4,846,527**	**277,896**	**1,745,166**	**200,000**	**6,791,693**
	Alagnak River			52,248	203,034	0	
	Kvichak River			80,790	672,150	200,000	
	Naknek River			144,858	869,982	0	
Bristol Bay West	**Nushagak**	**1,366,000**	**14,096,815**	**295,024**	**5,382,372**	**0**	**19,479,187**
	Igushik River			9,636	143,616	0	
	Nushagak River			109,024	2,775,924	0	
	Wood River			176,364	2,462,832	0	
	Togiak	**16,500**	**44,111**	**1,824**	**1,824**	**0**	**45,935**
	Togiak River			1,824	1,824	0	
Bristol Bay Totals:		**3,248,500**	**30,021,247**	**714,178**	**8,218,740**	**360,000**	**38,599,987**

Sockeye per Drift Delivery for: July 5

	Sockeye per Delivery
Ugashik	2,038
Egegik	1,563
Naknek-Kvichak	878
Nushagak	1,081
Togiak	146

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/2/2022	48	720
7/3/2022	21	741
7/4/2022	19	760
7/5/2022	19	779

Registrations as of: July 06 09:00 AM- and - July 08 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	346	348	271	273	75	75
Naknek-Kvichak	315	326	270	279	47	49
Nushagak	866	859	639	632	229	229
Togiak	34	34	34	34		
Ugashik	163	170	123	129	40	41
Grand Total	**1,724**	**1,737**	**1,337**	**1,347**	**391**	**394**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/06/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**304,000**	**2,442,544**	**90,066**	**254,526**	**140,000**	**2,837,070**
	Ugashik River			90,066	254,526	140,000	
	Egegik	**894,000**	**9,789,067**	**107,628**	**1,032,546**	**90,000**	**10,911,613**
	Egegik River			107,628	1,032,546	90,000	
	Naknek-Kvichak	**428,000**	**5,273,873**	**427,758**	**2,172,924**	**400,000**	**7,846,797**
	Alagnak River			137,808	340,842	0	
	Kvichak River			222,462	894,612	400,000	
	Naknek River			67,488	937,470	0	
Bristol Bay West	**Nushagak**	**1,140,000**	**15,238,345**	**276,589**	**5,658,961**	**0**	**20,897,306**
	Igushik River			12,378	155,994	0	
	Nushagak River			99,799	2,875,723	0	
	Wood River			164,412	2,627,244	0	
	Togiak	**15,900**	**59,990**	**2,688**	**4,512**	**0**	**64,502**
	Togiak River			2,688	4,512	0	
Bristol Bay Totals:		**2,781,900**	**32,803,819**	**904,729**	**9,123,469**	**630,000**	**42,557,288**

Sockeye per Drift Delivery for: July 6

	Sockeye per Delivery
Ugashik	2,119
Egegik	1,562
Naknek-Kvichak	868
Nushagak	818
Togiak	172

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/3/2022	21	741
7/4/2022	19	760
7/5/2022	19	779
7/6/2022	25	804

Registrations as of: July 07 09:00 AM- and - July 09 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	339	341	265	266	74	75
Naknek-Kvichak	318	345	273	295	47	52
Nushagak	824	809	607	595	219	216
Togiak	34	34	34	34		
Ugashik	168	195	127	148	41	48
Grand Total	**1,683**	**1,724**	**1,306**	**1,338**	**381**	**391**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/07/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**319,000**	**2,761,215**	**107,514**	**362,040**	**250,000**	**3,373,255**
	Ugashik River			107,514	362,040	250,000	
	Egegik	**768,000**	**10,557,557**	**96,066**	**1,128,612**	**90,000**	**11,776,169**
	Egegik River			96,066	1,128,612	90,000	
	Naknek-Kvichak	**800,000**	**6,079,948**	**455,898**	**2,628,594**	**600,000**	**9,308,542**
	Alagnak River			92,622	433,464	0	
	Kvichak River			303,612	1,198,224	600,000	
	Naknek River			59,664	996,906	0	
Bristol Bay West	**Nushagak**	**950,000**	**16,189,710**	**216,106**	**5,875,067**	**0**	**22,064,777**
	Igushik River			9,330	165,324	0	
	Nushagak River			81,082	2,956,805	0	
	Wood River			125,694	2,752,938	0	
	Togiak	**11,600**	**71,617**	**2,886**	**7,398**	**0**	**79,015**
	Togiak River			2,886	7,398	0	
Bristol Bay Totals:		**2,848,600**	**35,660,047**	**878,470**	**10,001,711**	**940,000**	**46,601,758**

Sockeye per Drift Delivery for: July 7

	Sockeye per Delivery
Ugashik	2,374
Egegik	1,493
Naknek-Kvichak	1,154
Nushagak	915
Togiak	131

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/4/2022	19	760
7/5/2022	19	779
7/6/2022	25	804
7/7/2022	11	815

Registrations as of: July 08 09:00 AM- and - July 10 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	332	328	259	256	73	72
Naknek-Kvichak	320	395	274	331	48	66
Nushagak	775	778	571	573	206	207
Togiak	36	36	36	36		
Ugashik	171	206	130	157	41	50
Grand Total	**1,634**	**1,743**	**1,270**	**1,353**	**368**	**395**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/08/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**190,000**	**2,954,352**	**143,922**	**505,962**	**200,000**	**3,660,314**
	Ugashik River			143,922	505,962	200,000	
	Egegik	**567,000**	**11,124,937**	**118,146**	**1,246,758**	**115,000**	**12,486,695**
	Egegik River			118,146	1,246,758	115,000	
	Naknek-Kvichak	**440,000**	**6,519,212**	**475,014**	**3,103,608**	**500,000**	**10,122,820**
	Alagnak River			66,144	499,608	0	
	Kvichak River			304,038	1,502,262	500,000	
	Naknek River			104,832	1,101,738	0	
Bristol Bay West	**Nushagak**	**1,350,000**	**17,545,017**	**150,883**	**6,025,950**	**0**	**23,570,967**
	Igushik River			8,280	173,604	0	
	Nushagak River			62,503	3,019,308	0	
	Wood River			80,100	2,833,038	0	
	Togiak	**10,000**	**81,655**	**2,712**	**10,110**	**0**	**91,765**
	Togiak River			2,712	10,110	0	
Bristol Bay Totals:		**2,557,000**	**38,225,173**	**890,677**	**10,892,388**	**815,000**	**49,932,561**

Sockeye per Drift Delivery for: July 8

	Sockeye per Delivery
Ugashik	2,468
Egegik	1,218
Naknek-Kvichak	1,002
Nushagak	
Togiak	

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/5/2022	19	779
7/6/2022	25	804
7/7/2022	11	815
7/8/2022	8	823

Registrations as of: July 09 09:00 AM- and - July 11 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	304	280	237	217	67	63
Naknek-Kvichak	345	463	295	377	52	88
Nushagak	732	715	545	529	189	188
Togiak	36	37	36	37		
Ugashik	195	210	148	159	48	52
Grand Total	**1,612**	**1,705**	**1,261**	**1,319**	**356**	**391**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/09/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**526,000**	**3,480,717**	**113,502**	**619,464**	**175,000**	**4,275,181**
	Ugashik River			113,502	619,464	175,000	
	Egegik	**655,000**	**11,780,392**	**99,006**	**1,345,764**	**120,000**	**13,246,156**
	Egegik River			99,006	1,345,764	120,000	
	Naknek-Kvichak	**736,000**	**7,254,460**	**418,896**	**3,522,504**	**600,000**	**11,376,964**
	Alagnak River			87,906	587,514	0	
	Kvichak River			264,348	1,766,610	600,000	
	Naknek River			66,642	1,168,380	0	
Bristol Bay West	**Nushagak**	**1,010,000**	**18,558,511**	**231,744**	**6,257,694**	**0**	**24,816,205**
	Igushik River			8,820	182,424	0	
	Nushagak River			57,084	3,076,392	0	
	Wood River			165,840	2,998,878	0	
	Togiak	**12,000**	**93,731**	**4,620**	**14,730**	**0**	**108,461**
	Togiak River			4,620	14,730	0	
Bristol Bay Totals:		**2,939,000**	**41,167,811**	**867,768**	**11,760,156**	**895,000**	**53,822,967**

Sockeye per Drift Delivery for: July 9

	Sockeye per Delivery
Ugashik	2,512
Egegik	1,421
Naknek-Kvichak	1,383
Nushagak	1,109
Togiak	184

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/6/2022	25	804
7/7/2022	11	815
7/8/2022	8	823
7/9/2022	34	857

Registrations as of: July 10 09:00 AM- and - July 12 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	276	275	214	213	62	62
Naknek-Kvichak	395	511	331	412	66	101
Nushagak	682	662	507	495	177	169
Togiak	37	37	37	37		
Ugashik	206	246	157	190	50	57
Grand Total	**1,596**	**1,731**	**1,246**	**1,347**	**355**	**389**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/10/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**426,000**	**3,906,983**	**186,774**	**806,238**	**200,000**	**4,913,221**
	Ugashik River			186,774	806,238	200,000	
	Egegik	**598,000**	**12,377,939**	**84,036**	**1,429,800**	**75,000**	**13,882,739**
	Egegik River			84,036	1,429,800	75,000	
	Naknek-Kvichak	**904,000**	**8,161,595**	**474,882**	**3,997,386**	**400,000**	**12,558,981**
	Alagnak River			102,804	690,318	0	
	Kvichak River			254,382	2,020,992	400,000	
	Naknek River			117,696	1,286,076	0	
Bristol Bay West	**Nushagak**	**700,000**	**19,260,490**	**249,534**	**6,507,228**	**0**	**25,767,718**
	Igushik River			10,758	193,182	0	
	Nushagak River			73,884	3,150,276	0	
	Wood River			164,892	3,163,770	0	
	Togiak	**9,400**	**103,157**	**4,572**	**19,302**	**0**	**122,459**
	Togiak River			4,572	19,302	0	
Bristol Bay Totals:		**2,637,400**	**43,810,164**	**999,798**	**12,759,954**	**675,000**	**57,245,118**

Sockeye per Drift Delivery for: July 10

	Sockeye per Delivery
Ugashik	2,150
Egegik	1,300
Naknek-Kvichak	1,557
Nushagak	765
Togiak	143

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/7/2022	11	815
7/8/2022	8	823
7/9/2022	34	857
7/10/2022	15	872

Registrations as of: July 11 09:00 AM- and - July 13 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	268	268	207	207	61	61
Naknek-Kvichak	463	584	377	474	88	112
Nushagak	586	582	431	427	157	157
Togiak	37	37	37	37		
Ugashik	211	277	160	211	52	67
Grand Total	**1,565**	**1,748**	**1,212**	**1,356**	**358**	**397**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/11/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**300,000**	**4,206,911**	**115,632**	**921,870**	**175,000**	**5,303,781**
	Ugashik River			115,632	921,870	175,000	
	Egegik	**507,000**	**12,885,030**	**72,048**	**1,501,848**	**0**	**14,386,878**
	Egegik River			72,048	1,501,848	0	
	Naknek-Kvichak	**1,070,000**	**9,232,248**	**630,942**	**4,628,328**	**500,000**	**14,360,576**
	Alagnak River			109,908	800,226	0	
	Kvichak River			316,158	2,337,150	500,000	
	Naknek River			204,876	1,490,952	0	
Bristol Bay West	**Nushagak**	**866,000**	**20,125,480**	**221,925**	**6,729,153**	**0**	**26,854,633**
	Igushik River			9,240	202,422	0	
	Nushagak River			81,639	3,231,915	0	
	Wood River			131,046	3,294,816	0	
	Togiak	**11,500**	**114,641**	**3,354**	**22,656**	**0**	**137,297**
	Togiak River			3,354	22,656	0	
Bristol Bay Totals:		**2,754,500**	**46,564,310**	**1,043,901**	**13,803,855**	**675,000**	**61,043,165**

Sockeye per Drift Delivery for: July 11

	Sockeye per Delivery
Ugashik	2,531
Egegik	1,424
Naknek-Kvichak	1,411
Nushagak	895
Togiak	124

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/8/2022	8	823
7/9/2022	34	857
7/10/2022	15	872
7/11/2022	48	920

Registrations as of: July 12 09:00 AM- and - July 14 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	274	280	211	214	63	66
Naknek-Kvichak	507	633	410	511	100	125
Nushagak	517	513	377	375	141	139
Togiak	37	37	37	37		
Ugashik	245	288	189	221	57	68
Grand Total	**1,580**	**1,751**	**1,224**	**1,358**	**361**	**398**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/12/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**272,000**	**4,477,584**	**64,200**	**986,070**	**175,000**	**5,638,654**
	Ugashik River			64,200	986,070	175,000	
	Egegik	**527,000**	**13,412,504**	**53,574**	**1,555,422**	**0**	**14,967,926**
	Egegik River			53,574	1,555,422	0	
	Naknek-Kvichak	**796,000**	**10,028,709**	**557,298**	**5,185,626**	**500,000**	**15,714,335**
	Alagnak River			155,058	955,284	0	
	Kvichak River			290,622	2,627,772	500,000	
	Naknek River			111,618	1,602,570	0	
Bristol Bay West	**Nushagak**	**711,000**	**20,836,998**	**189,020**	**6,918,173**	**0**	**27,755,171**
	Igushik River			9,246	211,668	0	
	Nushagak River			66,908	3,298,823	0	
	Wood River			112,866	3,407,682	0	
	Togiak	**19,400**	**134,059**	**2,994**	**25,650**	**0**	**159,709**
	Togiak River			2,994	25,650	0	
Bristol Bay Totals:		**2,325,400**	**48,889,854**	**867,086**	**14,670,941**	**675,000**	**64,235,795**

Sockeye per Drift Delivery for: July 12

	Sockeye per Delivery
Ugashik	1,366
Egegik	1,157
Naknek-Kvichak	1,016
Nushagak	753
Togiak	184

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/9/2022	34	857
7/10/2022	15	872
7/11/2022	48	920
7/12/2022	10	930

Registrations as of: July 13 09:00 AM- and - July 15 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	274	277	209	212	65	65
Naknek-Kvichak	576	653	469	524	110	132
Nushagak	489	478	359	352	131	127
Togiak	37	38	37	38		
Ugashik	271	309	206	234	66	76
Grand Total	**1,647**	**1,755**	**1,280**	**1,360**	**372**	**400**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/13/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	337,000	4,814,401	145,602	1,131,672	130,000	6,076,073
	Ugashik River			145,602	1,131,672	130,000	
	Egegik	426,000	13,838,857	56,682	1,612,104	0	15,450,961
	Egegik River			56,682	1,612,104	0	
	Naknek-Kvichak	822,000	10,849,836	639,876	5,825,502	0	16,675,338
	Alagnak River			138,324	1,093,608	0	
	Kvichak River			454,830	3,082,602	0	
	Naknek River			46,722	1,649,292	0	
Bristol Bay West	**Nushagak**	470,000	21,307,209	96,807	7,014,980	0	28,322,189
	Igushik River			10,248	221,916	0	
	Nushagak River			32,835	3,331,658	0	
	Wood River			53,724	3,461,406	0	
	Togiak	20,000	154,735	4,224	29,874	0	184,609
	Togiak River			4,224	29,874	0	
Bristol Bay Totals:		2,075,000	50,965,038	943,191	15,614,132	130,000	66,709,170

Sockeye per Drift Delivery for: July 13

	Sockeye per Delivery
Ugashik	1,308
Egegik	1,009
Naknek-Kvichak	1,249
Nushagak	619
Togiak	181

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/10/2022	15	872
7/11/2022	48	920
7/12/2022	10	930
7/13/2022	14	944

Registrations as of: July 14 09:00 AM- and - July 16 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	280	287	214	220	66	67
Naknek-Kvichak	627	658	506	527	124	134
Nushagak	447	442	330	326	118	117
Togiak	38	38	38	38		
Ugashik	325	326	244	245	82	82
Grand Total	1,717	1,751	1,332	1,356	390	400

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/14/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**380,000**	**5,194,193**	**65,670**	**1,197,342**	**75,000**	**6,466,535**
	Ugashik River			65,670	1,197,342	75,000	
	Egegik	**417,000**	**14,255,651**	**37,092**	**1,649,196**	**0**	**15,904,847**
	Egegik River			37,092	1,649,196	0	
	Naknek-Kvichak	**1,100,000**	**11,949,278**	**570,300**	**6,395,802**	**0**	**18,345,080**
	Alagnak River			104,490	1,198,098	0	
	Kvichak River			383,220	3,465,822	0	
	Naknek River			82,590	1,731,882	0	
Bristol Bay West	**Nushagak**	**450,000**	**21,756,323**	**72,611**	**7,087,591**	**0**	**28,843,914**
	Igushik River			6,192	228,108	0	
	Nushagak River			20,315	3,351,973	0	
	Wood River			46,104	3,507,510	0	
	Togiak	**15,000**	**169,961**	**2,352**	**32,226**	**0**	**202,187**
	Togiak River			2,352	32,226	0	
Bristol Bay Totals:		**2,362,000**	**53,325,406**	**748,025**	**16,362,157**	**75,000**	**69,762,563**

Sockeye per Drift Delivery for: July 14

	Sockeye per Delivery
Ugashik	1,561
Egegik	1,305
Naknek-Kvichak	1,401
Nushagak	893
Togiak	228

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/11/2022	48	920
7/12/2022	10	930
7/13/2022	14	944
7/14/2022	8	952

Registrations as of: July 15 09:00 AM- and - July 17 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	288	288	221	221	67	67
Naknek-Kvichak	644	669	516	538	131	134
Nushagak	434	434	318	318	117	117
Togiak	38	38	38	38		
Ugashik	327	326	245	244	83	83
Grand Total	**1,731**	**1,755**	**1,338**	**1,359**	**398**	**401**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/15/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**213,000**	**5,407,679**	**52,998**	**1,250,340**	**0**	**6,658,019**
	Ugashik River			52,998	1,250,340	0	
	Egegik	**405,000**	**14,667,210**	**21,588**	**1,670,784**	**0**	**16,337,994**
	Egegik River			21,588	1,670,784	0	
	Naknek-Kvichak	**544,000**	**12,469,397**	**220,518**	**6,616,320**	**0**	**19,085,717**
	Alagnak River			42,480	1,240,578	0	
	Kvichak River			127,824	3,593,646	0	
	Naknek River			50,214	1,782,096	0	
Bristol Bay West	**Nushagak**	**330,000**	**22,082,114**	**76,290**	**7,163,881**	**0**	**29,245,995**
	Igushik River			3,558	231,666	0	
	Nushagak River			14,940	3,366,913	0	
	Wood River			57,792	3,565,302	0	
	Togiak	**14,500**	**184,845**	**2,040**	**34,266**	**0**	**219,111**
	Togiak River			2,040	34,266	0	
Bristol Bay Totals:		**1,506,500**	**54,811,245**	**373,434**	**16,735,591**	**0**	**71,546,836**

Sockeye per Drift Delivery for: July 15

	Sockeye per Delivery
Ugashik	836
Egegik	1,023
Naknek-Kvichak	759
Nushagak	645
Togiak	186

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/12/2022	10	930
7/13/2022	14	944
7/14/2022	8	952

Registrations as of: July 16 09:00 AM- and - July 18 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	295	298	224	226	71	72
Naknek-Kvichak	656	691	525	554	134	140
Nushagak	404	400	298	296	107	105
Togiak	38	38	38	38		
Ugashik	324	327	242	244	83	84
Grand Total	**1,717**	**1,754**	**1,327**	**1,358**	**395**	**401**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/16/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**147,000**	**5,554,748**	**36,036**	**1,286,376**	**0**	**6,841,124**
	Ugashik River			36,036	1,286,376	0	
	Egegik	**191,000**	**14,856,985**	**25,398**	**1,696,182**	**0**	**16,553,167**
	Egegik River			25,398	1,696,182	0	
	Naknek-Kvichak	**290,000**	**12,758,368**	**229,404**	**6,845,724**	**0**	**19,604,092**
	Alagnak River			66,762	1,307,340	0	
	Kvichak River			128,040	3,721,686	0	
	Naknek River			34,602	1,816,698	0	
Bristol Bay West	**Nushagak**	**202,000**	**22,286,724**	**42,515**	**7,206,396**	**0**	**29,493,120**
	Igushik River			5,658	237,324	0	
	Nushagak River			8,477	3,375,390	0	
	Wood River			28,380	3,593,682	0	
	Togiak	**21,000**	**205,922**	**840**	**35,106**	**0**	**241,028**
	Togiak River			840	35,106	0	
Bristol Bay Totals:		**851,000**	**55,662,747**	**334,193**	**17,069,784**	**0**	**72,732,531**

Sockeye per Drift Delivery for: July 16

	Sockeye per Delivery
Ugashik	735
Egegik	571
Naknek-Kvichak	448
Nushagak	556
Togiak	276

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/13/2022	14	944
7/14/2022	8	952

Registrations as of: July 17 09:00 AM- and - July 19 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	298	294	222	218	76	76
Naknek-Kvichak	660	740	531	588	132	155
Nushagak	363	377	272	285	92	93
Togiak	38	38	38	38		
Ugashik	303	302	225	224	79	79
Grand Total	**1,662**	**1,751**	**1,288**	**1,353**	**379**	**403**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/17/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**40,000**	**5,595,131**	**14,718**	**1,301,094**	**0**	**6,896,225**
	Ugashik River			14,718	1,301,094	0	
	Egegik	**115,000**	**14,971,909**	**13,998**	**1,710,180**	**0**	**16,682,089**
	Egegik River			13,998	1,710,180	0	
	Naknek-Kvichak	**423,000**	**13,184,008**	**208,170**	**7,053,894**	**0**	**20,237,902**
	Alagnak River			50,340	1,357,680	0	
	Kvichak River			137,418	3,859,104	0	
	Naknek River			20,412	1,837,110	0	
Bristol Bay West	**Nushagak**	**116,000**	**22,402,937**	**37,587**	**7,243,983**	**0**	**29,646,920**
	Igushik River			7,374	244,698	0	
	Nushagak River			7,467	3,382,857	0	
	Wood River			22,746	3,616,428	0	
	Togiak	**0**	**205,589**	**1,866**	**36,972**	**0**	**242,561**
	Togiak River			1,866	36,972	0	
Bristol Bay Totals:		**694,000**	**56,359,574**	**276,339**	**17,346,123**	**0**	**73,705,697**

Sockeye per Drift Delivery for: July 17

	Sockeye per Delivery
Ugashik	689
Egegik	877
Naknek-Kvichak	863
Nushagak	551
Togiak	

Test Fishery Port Moller

Date	Index Daily	Cumulative
7/14/2022	8	952

Registrations as of: July 18 09:00 AM- and - July 20 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	289	289	215	215	74	74
Naknek-Kvichak	689	760	553	604	139	159
Nushagak	359	373	269	282	91	92
Togiak	38	38	38	38		
Ugashik	298	298	221	221	78	78
Grand Total	**1,673**	**1,758**	**1,296**	**1,360**	**382**	**403**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/18/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**43,000**	**5,637,969**	**14,844**	**1,315,938**	**0**	**6,953,907**
	Ugashik River			14,844	1,315,938	0	
	Egegik	**74,000**	**15,048,094**	**17,580**	**1,727,760**	**0**	**16,775,854**
	Egegik River			17,580	1,727,760	0	
	Naknek-Kvichak	**424,000**	**13,607,482**	**106,656**	**7,160,550**	**0**	**20,768,032**
	Alagnak River			28,074	1,385,754	0	
	Kvichak River			48,024	3,907,128	0	
	Naknek River			30,558	1,867,668	0	
Bristol Bay West	**Nushagak**	**110,000**	**22,512,803**	**46,118**	**7,290,101**	**0**	**29,802,904**
	Igushik River			4,134	248,832	0	
	Nushagak River			7,370	3,390,227	0	
	Wood River			34,614	3,651,042	0	
	Togiak	**10,000**	**215,589**	**1,836**	**38,808**	**0**	**254,397**
	Togiak River			1,836	38,808	0	
Bristol Bay Totals:		**661,000**	**57,021,937**	**187,034**	**17,533,157**	**0**	**74,555,094**

Sockeye per Drift Delivery for: July 18

	Sockeye per Delivery
Ugashik	475
Egegik	894
Naknek-Kvichak	1,305
Nushagak	650
Togiak	163

Test Fishery Port Moller
No recent results found. Potentially weathered out.

Registrations as of: July 19 09:00 AM- and - July 21 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	289	289	215	215	74	74
Naknek-Kvichak	740	779	588	616	155	166
Nushagak	367	363	279	277	89	87
Togiak	38	38	38	38		
Ugashik	285	276	212	204	74	73
Grand Total	**1,719**	**1,745**	**1,332**	**1,350**	**392**	**400**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/19/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**70,000**	**5,708,030**	**11,208**	**1,327,146**	**0**	**7,035,176**
	Ugashik River			11,208	1,327,146	0	
	Egegik	**143,000**	**15,190,668**	**22,842**	**1,750,602**	**0**	**16,941,270**
	Egegik River			22,842	1,750,602	0	
	Naknek-Kvichak	**274,000**	**13,881,413**	**131,250**	**7,291,800**	**0**	**21,173,213**
	Alagnak River			47,838	1,433,592	0	
	Kvichak River			58,200	3,965,328	0	
	Naknek River			25,212	1,892,880	0	
Bristol Bay West	**Nushagak**	**110,000**	**22,622,763**	**41,759**	**7,331,860**	**0**	**29,954,623**
	Igushik River			9,264	258,096	0	
	Nushagak River			9,173	3,399,400	0	
	Wood River			23,322	3,674,364	0	
	Togiak	**28,000**	**242,206**	**3,750**	**42,558**	**0**	**284,764**
	Togiak River			3,750	42,558	0	
Bristol Bay Totals:		**625,000**	**57,645,080**	**210,809**	**17,743,966**	**0**	**75,389,046**

Sockeye per Drift Delivery for: July 19

	Sockeye per Delivery
Ugashik	610
Egegik	1,039
Naknek-Kvichak	577
Nushagak	746
Togiak	301

Test Fishery Port Moller
No recent results found. Potentially weathered out.

Registrations as of: July 20 09:00 AM- and - July 22 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	293	293	218	218	75	75
Naknek-Kvichak	760	808	604	637	159	174
Nushagak	362	365	277	279	86	87
Togiak	38	38	38	38		
Ugashik	255	255	189	189	67	67
Grand Total	**1,708**	**1,759**	**1,326**	**1,361**	**387**	**403**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/20/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**61,000**	**5,768,674**	**12,942**	**1,340,088**	**0**	**7,108,762**
	Ugashik River			12,942	1,340,088	0	
	Egegik	**90,000**	**15,280,514**	**13,192**	**1,763,794**	**0**	**17,044,308**
	Egegik River			13,192	1,763,794	0	
	Naknek-Kvichak	**113,000**	**13,994,559**	**207,930**	**7,499,730**	**0**	**21,494,289**
	Alagnak River			78,924	1,512,516	0	
	Kvichak River			113,130	4,078,458	0	
	Naknek River			15,876	1,908,756	0	
Bristol Bay West	**Nushagak**	**67,000**	**22,690,018**	**46,697**	**7,378,557**	**0**	**30,068,575**
	Igushik River			16,878	274,974	0	
	Nushagak River			7,577	3,406,977	0	
	Wood River			22,242	3,696,606	0	
	Togiak	**7,500**	**250,025**	**3,198**	**45,756**	**0**	**295,781**
	Togiak River			3,198	45,756	0	
Bristol Bay Totals:		**338,500**	**57,983,790**	**283,959**	**18,027,925**	**0**	**76,011,715**

Sockeye per Drift Delivery for: July 20

	Sockeye per Delivery
Ugashik	670
Egegik	677
Naknek-Kvichak	356
Nushagak	503
Togiak	392

Test Fishery Port Moller
No recent results found. Potentially weathered out.

Registrations as of: July 21 09:00 AM- and - July 23 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	293	293	218	218	75	75
Naknek-Kvichak	779	809	616	638	166	174
Nushagak	360	363	276	278	85	86
Togiak	38	38	38	38		
Ugashik	254	256	188	189	67	68
Grand Total	**1,724**	**1,759**	**1,336**	**1,361**	**393**	**403**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/21/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	**34,000**	**5,802,644**	**20,466**	**1,360,554**	**0**	**7,163,198**
	Ugashik River			20,466	1,360,554	0	
	Egegik	**96,000**	**15,376,384**	**20,358**	**1,784,152**	**0**	**17,160,536**
	Egegik River			20,358	1,784,152	0	
	Naknek-Kvichak	**118,000**	**14,112,797**	**169,968**	**7,669,698**	**0**	**21,782,495**
	Alagnak River			68,430	1,580,946	0	
	Kvichak River			88,998	4,167,456	0	
	Naknek River			12,540	1,921,296	0	
Bristol Bay West	**Nushagak**	**35,000**	**22,724,947**	**39,516**	**7,418,073**	**0**	**30,143,020**
	Igushik River			17,352	292,326	0	
	Nushagak River			7,338	3,414,315	0	
	Wood River			14,826	3,711,432	0	
	Togiak	**32,000**	**281,999**	**6,852**	**52,608**	**0**	**334,607**
	Togiak River			6,852	52,608	0	
Bristol Bay Totals:		**315,000**	**58,298,771**	**257,160**	**18,285,085**	**0**	**76,583,856**

Sockeye per Drift Delivery for: July 21

	Sockeye per Delivery
Ugashik	659
Egegik	898
Naknek-Kvichak	382
Nushagak	386
Togiak	458

Test Fishery Port Moller
No recent results found. Potentially weathered out.

Registrations as of: July 22 09:00 AM- and - July 24 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	294	294	219	219	75	75
Naknek-Kvichak	805	810	635	638	173	175
Nushagak	361	361	277	277	85	85
Togiak	38	38	38	38		
Ugashik	256	256	189	189	68	68
Grand Total	**1,754**	**1,759**	**1,358**	**1,361**	**401**	**403**

Alaska Dept. of Fish and Game - Division of Commercial Fisheries

- Bristol Bay Daily Run Summary -

through 07/31/2022

		Catch Daily	Cumulative	Escapement Daily	Cumulative	In-River Estimate	Total Run
Bristol Bay East	**Ugashik**	0	6,169,625	0	1,436,784	0	7,606,409
	Ugashik River			0	1,436,784	0	
	Egegik	0	15,866,660	0	1,786,152	0	17,652,812
	Egegik River			0	1,786,152	0	
	Naknek-Kvichak	0	14,271,050	0	7,814,400	0	22,085,450
	Alagnak River			0	1,668,222	0	
	Kvichak River			0	4,224,882	0	
	Naknek River			0	1,921,296	0	
Bristol Bay West	**Nushagak**	0	22,794,801	2,184	7,583,124	0	30,377,925
	Igushik River			2,184	377,760	0	
	Nushagak River			0	3,457,752	0	
	Wood River			0	3,747,612	0	
	Togiak	7,000	447,886	11,922	196,470	0	644,356
	Togiak River			11,922	196,470	0	
Bristol Bay Totals:		7,000	59,550,022	14,106	18,816,930	0	78,366,952

Sockeye per Drift Delivery for: July 31

	Sockeye per Delivery
Ugashik	
Egegik	
Naknek-Kvichak	
Nushagak	
Togiak	225

Test Fishery Port Moller
No recent results found. Potentially weathered out.

Registrations as of: August 01 09:00 AM- and - August 03 09:00 AM

District	Permits	Permits in 48 hrs.	Vessels	Vessels in 48 hrs.	DBoats	DBoats in 48 hrs.
Egegik	299	299	222	222	77	77
Naknek-Kvichak	806	806	636	636	173	173
Nushagak	360	360	276	276	85	85
Togiak	40	40	40	40		
Ugashik	253	253	187	187	67	67
Grand Total	1,758	1,758	1,361	1,361	402	402

Appendix E

ADF&G season summary of the 2022 Bristol Bay salmon season.
Published September 2022

Advisory Announcement

For Immediate Release:
September 23, 2022

Time: 12:00 p.m.

CONTACT:

Tim Sands, Nushagak/Togiak Area Biologist
Travis Elison, Naknek-Kvichak Area Biologist
Aaron Tiernan, Egegik/Ugashik Area Biologist
Phill Stacey, Westside Assistant Area Biologist
(907) 842-5227

2022 BRISTOL BAY SALMON SEASON SUMMARY

The following is an overview of the 2022 Bristol Bay commercial salmon season. All data are preliminary. The 2022 inshore Bristol Bay sockeye salmon run of 79.0 million fish (Table 1) is the largest inshore run on record and was 81% above the 43.6 million average run for the latest 20-year period (2002–2021). Additionally, it was just the fourth time on record that the Bristol Bay inshore sockeye salmon run has exceeded 60.0 million fish.

The 2022 Bristol Bay sockeye salmon run was 8% above the preseason inshore forecast of 73.4 million fish (Table 2). Runs to every district, except Togiak, were larger than the preseason forecast. The commercial harvest of 60.1 million sockeye salmon was essentially the same as the 59.9 million preseason forecast (Table 1). This was the largest harvest on record, surpassing the previous record set in 1995 of 44.3 million sockeye salmon by 36%. All sockeye salmon escapement goals were met or exceeded, with a total bay-wide escapement of 18.9 million fish (Table 3). The preliminary harvest estimates for other species are 8,374 Chinook, 301,816 chum, 9,040 coho, and 95,724 pink salmon (Table 1).

EXVESSEL VALUE

Exvessel value of salmon caught in Bristol Bay in 2022 was estimated using the fish ticket weight, and price paid for each species. The 2022 Bristol Bay preliminary exvessel value of $351.7 million for all salmon species ranks first in the last 20 years and was 110% above the 20-year average of $167.5 million (Table 4). The 60.5 million harvest of all salmon species was the largest harvest on record (Table 1). Prices are based on the major buyers' base price and do not include future price adjustments for icing, bleeding, floating, or production bonuses.

SPECIES PERFORMANCE

Sockeye Salmon

The 2022 harvest of 60.1 million sockeye salmon was 104% higher than the recent 20-year average of 29.4 million for all districts (Table 5). Sockeye salmon escapement goals were exceeded on the Nushagak, Wood, and Ugashik rivers, all other systems were within their respective escapement goal ranges (Table 3). Overall, run timing was one day early, making it the earliest since 2014.

The 2022 Bristol Bay sockeye salmon run was dominated by the 1.2 and 1.3 age classes, or fish with one year of freshwater residence and two or three years of ocean growth. The 1.3 age class was the largest component of the 2022 run at roughly 53% and came in over the preseason forecast of 47%. Age 1.2 fish made up the next largest component of the run at 28% which was below the forecasted 41%. Fish with

two years of freshwater residence (2.2s and 2.3s) made up most of the remaining age classes seen in 2022. The 2.2 return was 15%, almost double the preseason forecast of 8% and the 2.3 age class returned as forecasted at 3% of the total run. Average weight for sockeye salmon in 2022 was 5.1 pounds which is slightly higher relative to recent years due to the high percentage of larger 1.3 age fish, but below the most recent 20-year average of 5.6 pounds (Table 4).

Chinook Salmon

Chinook salmon harvested in Bristol Bay this season were incidentally caught during directed sockeye salmon fishing periods. The Nushagak District, which is the main contributor of Chinook salmon in Bristol Bay, was again actively managed to reduce Chinook salmon harvest in an effort to ensure achievement of the established escapement goal. Overall, the 2022 Chinook salmon harvests were below average in all districts of Bristol Bay (Table 6). A preliminary total of 8,374 Chinook salmon were harvested which is below the most recent 20-year average of 42,658 fish, and the second lowest in the last 20 years (Table 6). The Nushagak District Chinook salmon harvest was 5,325 fish, which is well below the 20-year average harvest of 34,260 fish (Table 6).

The Nushagak River Chinook salmon in-river run estimate at Portage Creek Sonar was 44,434 fish, which is below the escapement goal of 55,000–120,000 and the in-river goal of 95,000.

Chum Salmon

The 2022 preliminary Bristol Bay chum salmon harvest was 301,816 fish (Table 1), was below the recent 20-year average of 1.1 million fish. The Nushagak District, the largest producer of chum salmon, harvest was 172,069 fish (Table 1). The Nushagak River chum salmon escapement of 116,692 fish was below the lower bound sustainable escapement goal of 200,000 fish.

Pink Salmon

Although pink salmon were abundant in Bristol Bay in 2022, there was not a fishery directed at them. The harvest was incidental to the sockeye salmon fishery and totaled 95,724 fish, 19% of the average harvest for last ten even years. Pink salmon escapement was not enumerated anywhere in Bristol Bay in 2022.

Coho Salmon

The preliminary coho salmon harvest in 2022 was 9,040 fish (Table 1), which was below the recent 20-year average of 97,139 fish. The Nushagak District is typically the largest producer of coho salmon, though in 2022 Egegik District produced the bulk of the coho salmon harvest at 5,138 fish. Coho salmon harvest in the Nushagak District was 1,789 fish (Table 1). Harvests of coho salmon can be variable from year to year depending on processor availability, market conditions, and overall fishing effort. In 2022, fishing ended early due in part to weather and processor interest.

ALLOCATION

Bristol Bay fisheries are managed for allocation (secondary to escapement) between drift and set gillnet gear groups in four of five districts. The Togiak District is excluded from the allocation plan. Strategies used to achieve allocation between gear groups included varying the amount of fishing time and providing separate gear group openings. The Ugashik District harvest percentages were relatively close to their established allocation goals, while the Egegik, Nushagak, and Naknek-Kvichak districts had differences from the harvest percentages found in regulation (Table 7). During seasons of large sockeye salmon returns, allocations can be difficult to achieve when the primary objective is managing to meet escapement goals.

Acknowledgements

Table 1.–Preliminary 2022 Bristol Bay salmon harvest and escapement by district and species.

District	Sockeye	Chinook	Chum	Pink	Coho	TOTAL
Naknek-Kvichak catch	14,172,393	1,129	33,962	18,823	1,003	14,227,310
Escapement-Kvichak twr.	4,224,882	ND	ND	ND	ND	4,224,882
Naknek twr.	1,921,296	ND	ND	ND	ND	1,921,296
Alagnak twr.	1,668,222	ND	ND	ND	ND	1,668,222
NK subtotal	21,986,793	1,129	33,962	18,823	1,003	22,041,710
Egegik catch	16,468,800	272	27,141	4,317	5,138	16,505,668
Escapement-Egegik twr.	1,786,152	ND	ND	ND	ND	1,786,152
Egegik subtotal	18,254,952	272	27,141	4,317	5,138	18,291,820
Ugashik catch	6,247,386	277	15,989	362	11	6,264,025
Escapement-Ugashik twr.	1,436,784	ND	ND	ND	ND	1,436,784
Ugashik subtotal	7,684,170	277	15,989	362	11	7,700,809
Nushagak catch	22,619,021	5,325	172,069	12,366	1,789	22,810,570
Escapement- Wood twr.	3,747,612	ND	ND	ND	ND	3,747,612
Igushik twr.	378,768	ND	ND	ND	ND	378,768
Nushagak sonar	3,455,272	44,434	116,692	ND	ND	3,616,308
Nushagak subtotal	30,200,673	49,759	288,761	12,366	1,789	30,553,258
Togiak catch	583,498	1,371	52,655	59,856	1,099	698,479
Escapement - Togiak twr.	242,412	ND	ND	ND	ND	242,412
Togiak subtotal	825,910	1,371	52,655	59,856	1,099	940,891
Bristol Bay catch	60,091,098	8,374	301,816	95,724	9,040	60,506,052
Bristol Bay escapement	18,861,400	44,434	116,692	0	0	19,022,436
Bristol Bay total run	78,952,498	52,808	418,508	95,724	9,040	79,528,488

Note: Nushagak sonar enumerated Chinook, sockeye, and chum salmon in 2022.

Table 2.–Difference between Bristol Bay sockeye salmon actual inshore run and preseason forecast by district, 2022.

District	Inshore forecast	Inshore run	% Above/below forecast
Naknek-Kvichak	20,680,000	21,986,793	6% Above
Egegik	15,990,000	18,254,952	14% Above
Ugashik	6,100,000	7,684,170	26% Above
Nushagak	29,480,000	30,200,673	2% Above
Togiak	1,150,000	825,910	28% Below
Totals	73,400,000	78,858,717	7% Above

Table 3.–Bristol Bay sockeye salmon escapement goals and actual escapements, 2022.

River system	Sustainable escapement goal range	Escapement
Kvichak River	2,000,000–10,000,000	4,224,882
Naknek River	800,000–2,000,000	1,921,296
Alagnak River	320,000 minimum	1,668,222
Egegik River	800,000–2,000,000	1,786,152
Ugashik River	500,000–1,400,000	1,436,784
Nushagak River	370,000–900,000	3,455,272
Wood River	700,000–1,800,000	3,747,612
Igushik River	150,000–400,000	378,768
Togiak River	120,000–270,000	242,412
Total		18,861,400

Table 4.–Average price, weight, harvest, and value of salmon harvest in Bristol Bay, 2022.

Species	Price/lb.	Avg. weight (lb.)	Number of fish	Total weight	Value
Sockeye	$1.15	5.1	60,091,098	305,262,778	$351,052,195
Chinook	$0.74	8.6	8,374	71,933	$53,230
Chum	$0.32	5.5	301,816	1,669,042	$534,094
Pink	$0.14	3.3	95,724	317,804	$44,493
Coho	$0.73	5.8	9,040	51,980	$37,945
Totals			60,506,052	307,373,537	$351,721,956

Table 5.–2022 Preliminary commercial sockeye salmon harvests and 20-year averages by district.

District	2002–2021 Average sockeye harvest	2022 Sockeye salmon harvest
Naknek-Kvichak	9,110,892	14,172,393
Egegik	7,791,737	16,468,800
Ugashik	3,160,967	6,247,386
Nushagak	8,718,014	22,619,021
Togiak	599,210	583,498
Totals	29,380,820	60,091,098

Table 6.–2022 Chinook salmon preliminary harvest data and 20-year averages by district.

District	2002–2021 Average Chinook salmon harvest	2022 Chinook salmon harvest
Naknek-Kvichak	1,714	1,129
Egegik	760	272
Ugashik	968	277
Nushagak	34,260	5,325
Togiak	4,956	1,371
Totals	42,658	8,374

Table 7.–Allocation of Bristol Bay drift and set gillnet harvest, 2022.

District	Drift gillnet percent of harvest allocated /caught	District set gillnet percent of harvest allocated /caught	Section set gillnet percent of harvest allocated /caught
Naknek-Kvichak	84% / 75%	16% / 25%	Naknek: 8% / 14%
			Kvichak: 8% / 11%
Egegik	86% / 79%	14% / 21%	–
Ugashik	90% /89%	10% / 11%	–
Nushagak [a]	74% /82 %	26% / 18%	Nushagak: 20% / 13%
			Igushik: 6% / 2%
			Wood River 3%

[a] Wood River Special Harvest Area harvest was entirely set gillnet and is included in the 20% listed above.

Appendix F

Port Moller Test Fishery At-Sea Genetics Lab Season Summary 2022

Port Moller Test Fishery At-Sea Genetics Lab Season Summary 2022
Prepared by Natura Richardson, August 12, 2022

For the 2022 Port Moller Test Fisher, the BBSRI at-sea genetics lab on the Half Moon Bay (HMB) provided stock composition data for analysis by ADF&G with minimal data loss and in a timely manor. The turn around time and the quality of the results were equal to or better when compared to previous years when samples had to be shipped to and processed in the ANC lab. The success of the 2022 season was a result of having a good working platform, including a fully built-out lab connex, a capable sturdy vessel, high-quality, fresh genetics samples, a strong team of experienced and available genetics lab support, and personal on the HMB.

Generally a full genetics run could be completed in about a day. When a major lab error occurred and a process had to to be repeated, it would take about a day and half. The average time for a genetics run, from the time compiled inventory was emailed to ADFG through the time data was emailed to ADFG for analysis, was 28 hours. The shortest time to complete a genetics run was 18 hours, and the longest time to complete a genetics run was 42 hours. Note the 42-hour genetics run was due to weather and not human errors.

For each genetic run, a Fluidigm 192.24 chip was used, which allows analysis of 190 fish for 24 SNPs (assays). It is not uncommon to lose data; if a single fish or SNP falls below certain criteria, those data will be excluded (i.e. lost). For the 2022 season, a total of 13 chips were run and the average number of fish lost per chip was two. The largest number of fish lost was eight and there were three runs in which no fish were lost. Only during one genetics run was single assay lost.

Genetics Run	Total At-Sea Hours*	# Fish Sampled	# Fish Lost	# Assay Lost	Notes
1	24	190	3	0	
2	22	190	2	0	
3	24	190	8	0	
4	21	190	4	1	Loaded chip twice
5	23	190	5	0	
6	42	190	1	0	Weather delay
7	37	187	1	0	
8	38	190	1	0	Loaded chip twice
9	26	190	0	0	
10	38	190	4	0	Cut and extract twice
11	18	190	0	0	
12	22	190	0	0	
13	25	190	1	0	
Average	28	190	2	0	

* From the time updated inventory was sent to ADFG through the time data was sent to ADFG for analysis

2022 General Workflow
Heather Hoyt did an excellent job in structuring the workflow and smoothing out the process as the season progressed, to balance all the needs of at-sea and in-shore personnel with the project's objectives. (Appendix A and B). To understand the process and communication between the BBSRI and ADFG staff, the following summarizes the general workflow for a single genetics run for 2022. All estimated times are for BBSRI personnel time only assuming no hiccups in communication or process.

<u>Sample selection and cutting</u>
After two days of fishing, vessels meet up and samples from the OC are transferred to the HMB. Genetics personal on the HMB review, label, and organize the Whatman cards and update the excel inventory sheet, which is then emailed to ADFG folks. Tyler uses inventory and BBSRI CPUE data to make sample selection. Genetics lab staff add sample inventory to the ADFG database (Loki) and use Tyler's sample selection to create pdf transparencies to overlay on Whatman cards and the extraction sheet, which include the initial plate maps (which fish are located where on the plate). Genetics personal on the HMB print up extraction sheet and transparencies, and 190 samples (two plates) are cut from the Whatman cards.

This stage is very communication dependent and sometimes took longer due to lags in WiFi, sending/receiving emails, or timing of staff available in ANC. Much of this communication took place typically between 6:00-10:00 pm and sometimes was pushed into the following morning. Estimated time to update inventory, communicate/ exchange data with ADFG personal, and prepare and cut samples is 2.5-3 hours.

DNA extraction
Lysis mixture is added to tissue samples and must digest for a minimum of 3 hours, up to a maximum of 24 hours. After digestion, a series of chemical additions and centrifuge spinnings occur which result in DNA extraction. After DNA is extracted, HMB genetics personal notify ADF&G staff if the plate map is still correct, or communicate any changes needed to update the plate map (if tissues were accidently placed in wrong well, rows were accidentally swapped, plates inverted, etc). ADFG emails the plate map file that will later be used in the Fluidigm genotyping software during chip scoring. Estimated time for digestion (assuming 3 hour digestion), extraction, and communication is 6 hours.

Running a chip
From extracted DNA to scored data, occurs in 4 steps:
1. Prepare to load the chip- Two Fischer plates of samples are prepared by combining a small quantity of extracted DNA with reaction mix. (20-30 min)
2. Hand load the chip- This is one of the most precise steps and requires focus and calm seas. When necessary, personal communicate with the captain to turn the vessel to provide the flattest, smoothest ride possible with the current sea conditions. This should be timed in such a way to have minimal impact on fishing operations (before setting or after hauling gear). After loading the chip, HMB genetics personal notify ADFG staff if anything occurred during the Fischer plate preparation or chip loading that would require updates to the plate map or assay map files. (20-30 min)
3. Run chip through loader, thermocycler, and EP1. Running the EP1 is a very short but sensitive step; if seas are rough, again communication with the captain is required to smoothen out the ride if possible (1.5 hours)
4. Scoring the chip- Data is produced from the EP1 and is processed and scored in the Fluidigm genotyping software. For each chip scoring, the plate map and assay map files are uploaded into the software. Assay maps files are saved on the laptop and should always be the same as they are the same 24 SNPs loaded in the same locations on the chip for each run (unless a mistake was made when loading the assays, which did not occur in 2022). However, the plate map file is unique for each chip and is generated by ADFG personal; as previously described, communication after several steps up to this point is required to ensure the plate map is correct. After the chip is scored in the software, the data is emailed to ADFG lab staff to double score, and double scored data is sent to Tyler for analysis. (30 min)

Estimated total time for running a chip and having data to ANC for analysis is 3+ hours depending on conditions and communication.

The total time for DNA extraction up to sending scored data can vary greatly due to human error in the lab, weather, lags in WiFi, sending/receiving emails, or timing of staff available in ANC to double score.

Chronological Details of 2022 Season
The following chronologically summarizes the 2022 season, highlighting any issues and how they were resolved.

ADF&G Genetics Lab, May 2-13 & June 1-2
Natura Richardson spent 12 days in the ADF&G genetics lab, training under Heather Hoyt and Jodi Estrada. Most concepts and steps for the process were covered during this period however, there was a lot to learn mentally and physically and it was definitely like drinking from a fire hose. At the time of departure, Natura felt prepared but it was a situation where one doesn't know what they don't know. In hindsight, another week or two of training would have allow her to gain more knowledge, experience, and muscle memory before needing to apply it on the vessel.

<u>Dutch Harbor, June 3-8</u>
The at-sea genetics lab could not be set up or tested until the connex was loaded on the vessel and connected to power. Initial days spent in DH were spent coordinating and waiting for this to occur. Once the connex was secured on the vessel, Natura and Jodi set up the lab, unpacked supplies and lab equipment, and secured them in place. While still in port, a validation chip run was performed; a chip was hand loaded (using non-PMTF DNA extracted in the ANC lab during training) and the loader, thermocycler, and EP1 were tested to assure they were all working. Good images and data were achieved from the EP1 giving confidence the equipment survived the transport and handling.

<u>On board Half Moon Bay (HMB), June 8 –July 13</u>

Validation Runs and Additional Training, June 9-12
One of the biggest unknowns for lab in 2022 was if the large centrifuge, used at almost every step of DNA extraction, would work while at sea. In planning for this, non-PMTF samples were cut in the ANC lab, to allow a full DNA extraction and chip run using the centrifuge. A validation run took place while steaming to the PMTF grounds. The centrifuge operated fine while at sea and a complete DNA extraction was completed with no problems. After DNA extraction, a chip was hand loaded,
After the chip was loaded and run through the EP1, we were able to deduce that the equipment was working correctly but there was something wrong with the samples and there was major cross contamination. While loading the chip, Natura was having difficulties due to and insufficient sample mix from the second Fischer plate. Therefore, it was determined Natura accidently put DNA from both extraction plates into one sample mix plate (i.e. Fischer plate) and no DNA in the second Fischer plate.

The following day another chip was loaded to complete the validation process. Natura again made an error in preparing the sample mix, and grabbed a wrong DNA plate to prepare the Fischer plate. There were several plates of DNA used for validation runs, which was still unclear to Natura (a symptom of drinking from the fire hose). This error also wasn't noticed until the chip was loaded, fully run, and results returned. At this point, we again knew the equipment and lab were good; human error was the issue and extra labeling and marking of all the plates (DNA plates and Fisher plates) become part of the process to prevent future plate errors. Additionally, future plates of DNA would be produced by Natura and therefore would be more familiar and easy to keep track of.

Although the centrifuge successfully operated while under sea, on June 12th, Jodi and Natura performed an extraction using the vacuum system, which was used solely during for the 2021 pilot at-sea lab on the OC. This additional at-sea training was to prepare Natura for using the vacuum system extraction method in the event the seas are too rough to use the centrifuge.

Genetics Run 1, June 14-15
Vessels met up in the evening of June 15th, updated inventory was sent by 7:05 pm and transparencies and extraction sheet was received back by 8:00 the following morning. Jodi and Natura each cut a plate of tissues. Natura wanted to ensure she didn't repeat the previous errors in preparing and loading the chip therefore, Jodi extracted DNA and Natura hand loaded and ran the chip. Data files were sent by 7:04 pm and results were published that evening, June 16th. Everything in the lab went smoothly with no major errors. Total at-sea hours were 24, three fish were lost, and no assays were lost.

Genetics Run 2, June 16-17
Vessels met up a little earlier in the day, updated inventory was sent over by 4:58 pm on June 17th and transparencies were sent back within the hour. We didn't want to set a standard for a one-day turnaround for a genetics run, especially since Natura would soon be doing it alone. However, there was an opportunity for Jodi to get off the vessel (the HMB was near Port Moller), therefore both at-sea and in-shore personnel worked quickly to allow Jodi to be present for a second run but also take advantage of the vessel's location and disembarking. Jodi and Natura each cut a plate of tissues and started the digestion that evening. The following morning, Natura performed the DNA extraction and Jodi loaded the chip. During the DNA extraction, the order of two buffer washes (BW and B5) was accidentally switched. Natura immediately recognized the error and after consulting with Jodi and Heather, the extraction process continued with an

extra wash. The extra wash did not have an effect on the results. Data was sent by 2:42 pm and results were published that afternoon on the 18th. Total at-sea hours were 22, two fish were lost, and no assays were lost. The evening June 18th, Jodi disembarked the HMB in Port Moller.

Genetics Run 3, June 18-19
The third genetics run was Natura's first solo run. Initially she tried to maintain the workflow similar to the second run, cutting and digesting tissues in the evenings, and extracting and running the chip the following day, to split the workload over two days. The updated inventory was sent at 8:34 pm and transparencies were sent back by 9:42 pm. When going to cut, Natura noticed the transparencies didn't match with the Whatman cards and was able to track down a data entry error in the inventory file. A corrected inventory file was sent late that evening and the following morning new transparencies were sent. Natura was able to cut (two samples wells were swapped during cutting so the plate map needed modification by ADFG), extract DNA, and run the chip in one day and had the data files sent by 8:41 pm June 20th. Total at-sea hours were 24, no assays were lost, and eight fish were lost. At least six of those fish were likely due air bubbles in the chip samples (Natura remembers pushing the pipetter past the first stop slightly then stopping quickly when she recognized the action).
To avoid future data entry errors, it became protocol to have another BBSRI personnel double check the inventory to the Whatman cards before inventory is emailed. Additionally, there was some concern from ADFG staff that doing the full genetics run, from cutting to data, in one day would be too much. However, in preparation for a full genetics day, Natura did not work on the deck, rested during the digestion, took a break between extraction and chip loading, and felt comfortable to stop at any step if she felt fatigued.

Genetics Run 4, June 20-21
The updated inventory was sent at 6:48 pm June 21. With a quick turnaround time on transparencies, samples were cut in the evening allowing for an overnight digestion. DNA extraction went smoothly early the following morning, but by afternoon the weather came up, making hand loading the chip distracting and difficult. While loading the chip in rough weather, Natura accidently double loaded a row of wells on the chip. This would automatically result in a 12 fish loss, excluding any other losses that might occur. After consulting with Heather and Tyler, it was decided to re-load a new chip. Again due to rough weather, a 6-barel pipette of samples was loaded ahead a row. Thankfully, the next row of samples could swap the place of the previous and the plate map was modified by ADFG to correct the loading error. With the updated plate maps, Natura was able to score and send finished data by 4:05 pm June 22nd and results were published within an hour. Total at-sea hours was 21, one assay and four fish were lost.
After this run, Natura modified her hand loading technique to have a white background underneath the chip, rather than the black background she had been using. This allowed better visibility for determining if samples were loaded in the chip wells.

Genetics Run 5, June 22-23
Vessels met up early evening and updated inventory was sent at 6:19 pm June 23rd. However, there was a discrepancy between the CPUE data and the inventory data so the fish selection and all processes downstream were delayed. Tyler, Scott, and Natura spent additional time tracking down and correcting the error (the haul number was written incorrectly on the scale and Whatman cards). Due to the delay, Natura did not cut that evening but instead woke up super early (~4:00 a.m.) and did the full run in one day. Two sample wells were swapped during cutting so the plate map needed modification by ADFG.
Data files were sent at 5:05 pm and results were published by 6:00 June 24th. Total at-sea hours were 23, no assays were lost, and five fish were lost.

Genetics Run 6, June 24-25
The sixth genetics run was longest run, at 42 hours, due to weather. The inventory was sent at 6:20 pm June 25th, but the weather picked up preventing any lab work to be done for approximately 24 hours. Once the weather layed down, cutting and digesting occurred the evening of the 26th, and DNA extraction and chip run was completed on the morning of the 27th. No assays were lost and one fish was lost.

Genetics Run 7, June 28-29
For the seventh run, the inventory was sent at 7:23 pm June 29th. Natura was sensing push back from ADFG lab staff for a same evening turnaround and transparencies were emailed back the following

morning at 8:30 am. Natura did the full genetics work up that day but knowing there was some reluctance to work evenings from ADFG lab staff, she sent the files the next morning, July 1st at 8:21 am. No assays were lost and one fish was lost. Total at-sea hours were 37; there was no bad weather and no lab errors but it took longer for sending/receiving files and communication back and forth. There seemed to be some general burn out to which Heather tried to resolve through an email sent on June 30th, setting timelines for receiving and sending data (Appendix B).

About this time in the season, schedules and workflow started to be such that the genetics lab work was all occurring in one day rather than cutting and digesting in the evening, then extracting and running chip the following day. There was again some concern that it was too much work in one day but this schedule evolved to be the preference for Natura.

Genetics Run 8, June 30-July1
The inventory was sent at 7:25 pm July 1st and the transparencies were sent back that same evening, although it was planned to cut and do the full genetics run the following day. Upon printing the transparencies in the morning, it was noticed they didn't look right and many fish were missing. Because it was a Saturday morning, Natura waited for decent hour to contact ADFG staff and get corrected transparencies and leading to a later start in cutting and a full run. After running the chip, the EP1 images looks abnormal, like part of the chip was fuzzy, leading to a loss of ~30 fish. After troubleshooting with Heather on the phone for more than hour that evening, it was determined it was a faulty chip (manufacture's issue) and a second chip needed to be run. Early the following morning a new chip was run and data was sent at 9:39 am July 3rd.
Total at-sea hours were 38, no assays were lost and one fish was lost.

Genetics Run 9, July 2-3
The inventory was sent at 7:42 pm July 3rd. All the lab work was completed the following day, with no issues and the data sent at 9:39 pm July 4th. Total at-sea hours were 26, no assays were lost and one fish was lost.

Genetics Run 10, July 4-5
The inventory sent 8:05 pm on July 5th, but there were discrepancies in dates between the CPUE data and the inventory due to fishing overnight (crossing two dates). Once that was resolved, updated inventory was sent at 8:42 pm and a single day of lab work was scheduled for the following morning July 6th. During the DNA extraction, the extraction filter plates were accidentally tossed before the final centrifuge, which extracts DNA into the final plates. It was most likely there was contamination from being in the garbage* therefore the process needed to be completely re-done, starting at cutting. The second cutting and DNA extraction were completed that evening, the chip was run the follow morning, and data was sent at 10:18 am July 7th. Total at-sea hours were 38, No assays were lost and one fish was lost.

*For a post-season experiment, the discarded filter plates were retrieved from garbage, buffer added, and centrifuged into DNA plates. In the ANC genetics lab, the samples were run to see if the DNA was valid, which it was not.

Genetics Run 11, July 6-7
The 11th genetics run was the smoothest run and had the quickest turnaround at 18 hours. The inventory was sent at 8:36 pm July 7th. All the lab work was completed the following day (starting early ~3:30 am) with no issues and data was sent at 3:04 pm on July 8th. No assays were lost and one fish was lost.

Genetics Run 12, July 8-9
The 12th genetics run also went smoothly. The inventory was sent at 8:43 pm July 9th. All the lab work was completed the following day (starting around ~6:00 am) with no issues and data was sent at 6:45 pm July 10th. Total at-sea hours were 22, no fish or assays were lost.

Genetics Run 13, July 10-11
Although the last day of fishing was the 11th, it was unknown if another genetics run would be done for the last samples. After it was decided there would be a run, inventory was updated and sent the following day,

July 12th at 1:25 pm. The lab work was split over two days, while steaming back to Duth Harbor. There with no issues and data was sent 2:14 pm July 13th. Total at-sea hours were 25, no assays were lost and one fish was lost.

Dutch Harbor, July 13-16
All BBSRI staff (Sam, Will, Donovan, and Natura) worked to demobilization the lab. Most lab equipment was removed from the connex and stored at the ADFG Dutch Harbor office, which is inside and heated. Some BBSRI equipment and all borrowed ADFG equipment was shipped back to Anchorage via ACE cargo. Some equipment is extremely heavy (i.e centrifuge) or fragile (i.e. EP1) and required the use of a crane to get it off the vessel. This took a full day on the 14th (the ADFG building was locked by 4:30 pm) and the morning of the 15th.
The three technicians flew out on the 15th, while Natura stayed an additional day to see that the connex and nets remnants were in a secured location and locked.

Random suggestions for future- maybe doesn't belong in this summary but a different running document
There were several human mistakes that occurred in the at-sea genetics lab. When caught, extra steps or assurances were made to try to prohibit duplication of the mistake. However, in general, more experience and familiarity with each step and process would resolve most of the human error. By the end of the season with more experience gained, errors were minimal. In the future, new staff should consider one month lab training, or longer overlap at sea with experienced lab personal.

Potential future workflow to have one day in lab, then one day on deck. This allows rotation and change for the personnel, other crewmembers know and can prepare/plan workload accordingly, allows alternate use of the lab connex for genetics and scales (although it is possible to have both working at once)

Puncher not needed. Preferred to cut by hand even if it takes more time. Seems like more work to get it set up, takes up a lot of room, and negates sharing the air compressor.

Vacuum not needed- centrifuge is a solid workhorse on the HMB.

It should be established if fishing date is the date fishing started or the date fishing ended, in the instance there is more fishing over midnight.

Slightly larger samples needed, particularly from OC- tissue sample size only allowed two cuts per tissue. For one run, tissues had to be re-cut and extracted which either exhausted the tissue or left little for post season analysis.

Appendix A. Email from Heather Hoyt outlining in season workflow

From: Hoyt, Heather A (DFG) <heather.hoyt@alaska.gov>
Sent: Wednesday, June 8, 2022 11:41 AM
To: Dann, Tyler H (DFG) <tyler.dann@alaska.gov>; Barkley, Tela C (DFG) <tela.barkley@alaska.gov>; Estrada, Jodi L (DFG) <jodi.estrada@alaska.gov>
Subject: Outline of Steps for In Season Workflow DRAFT

Hi All,
Tela and I came up with this list of the major steps in the workflow. Will Natura be accessing her email throughout as well? If so, will it be her Gmail account?

What do you think of this outline?

1. Jodi/Natura complete SPMOL22_WGC Inventory Excel file
2. Jodi/Natura email file to Tyler, Tela, and Heather
   a. Tela/Heather build fish and tissues to Loki, add sample date and station to tissue table, and let Tyler know when that's done
   b. Tyler gets CPUE and other important information from Scott/Michael
3. Tyler selects the fish to extract and emails Tela/Heather
4. Tela/Heather setup extractions, prints extractions sheets and transparencies to PDF format, emails them to Jodi/Natura
5. Jodi/Natura extract and then email Tela/Heather information from extractions (date, who cut, who spun, any fish exhausted, any comments, etc.)
6. Tela/Heather build extractions, add to iStrategy, export DNA plate maps, create combined file, and email plate maps and combined file to Jodi/Natura
7. Jodi/Natura genotype, pre-score the chip run, and email Tela/Heather these three files:
   a. ChipRun.bml
   b. ChipRun.Processed.bin
   c. ChipRunLog.txt
8. Tela/Heather rebuilt chip file, double score, import data into Loki, and let Tyler know when done
9. Tyler does analysis

Thanks,
Heather

Appendix B. Email from Heather Hoyt refining in season workflow and outlining timelines

From: Hoyt, Heather A (DFG) <heather.hoyt@alaska.gov>
Sent: Thursday, June 30, 2022 1:46 PM
To: Dann, Tyler H (DFG) <tyler.dann@alaska.gov>; Barkley, Tela C (DFG) <tela.barkley@alaska.gov>; Estrada, Jodi L (DFG) <jodi.estrada@alaska.gov>; BBSRI (Halfmoon Bay) <hmb@bbsri.org>
Subject: Timelines and expectations

Hi All,
This year has really been a work in progress while we figure out how long it takes for things to get done and how fast we need to go to get those things done. In the effort to standardize the timelines and to set more defined expectations, this is what I suggest.

Please feel free to object or suggest other ideas.

- Inventory file
    - If it is to arrive to GCL staff before 5:30pm, one of us will do what we need to do and email back the files to Natura as quickly as possible.
    - If it is to arrive to GCL staff after 5:30pm, then the email with files will be sent between 7 & 7:30am the next morning.
- Extraction list
    - Tyler will complete the extraction list in the evening regardless of what time the files come in, as that is his preference.
- Extractions
    - If Natura receives the files before 6pm, then she is welcome to setup and cut extractions.
    - If Natura receives the files back the next morning, she will start them in the morning.
- Genotyping
    - If extractions are started the night before, it is great if genotyping can be done the same day.
    - If extractions are started in the morning, there is no pressure to extract and genotype the same day. Extracting that day and genotyping the next is totally fine.
        - If the genotyping is done the same day but files are not received by GCL staff prior to 5:30pm, then they won't be finalized until the next morning anyway.

The intention of this email is to create less stress by having set boundaries. Hopefully, that will be the case.

Feedback?

Thanks,
Heather