



Nisga'a Lisims Government

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## **2021 NASS RIVER SALMON STOCK ASSESSMENT UPDATE – FRIDAY, 16 JULY**

The following is the fourth general weekly public update for 2021 of Nass River salmon and summer-run steelhead stock assessments from the Nisga'a Lisims Government Fisheries and Wildlife Department.

**All data presented in this update are preliminary and subject to change with further assessment information that becomes available and should be interpreted cautiously. For in-season assessment purposes only.**

### **NASS RIVER ASSESSMENT OPERATIONS UPDATE**

#### **OPERATIONAL ASSESSMENT INFORMATION FOR 2021**

1. Fishwheel Assessment data: 31 May to 15 July. Data summary below.
2. Meziadin Fishway data: 1 July to 16 July. Counts to date are: 38 Sockeye (vs. 21,200 mean) and 0 Chinook (vs. 22 mean). Similar water temperature (15.0°C vs. 15.4°C) and level (1.30 m vs 1.30 m) to date compared to averages from 1994 to 2020 operations.
3. Kwinageese video-counting weir data: in construction and will start soon.

#### **GITWINKSIHLKW (GW) FISHWHEELS - NASS RIVER TEST FISHERY – STARTED IN 1994 [28th year]:**

The Nass River test fishery fishwheels (FW1 and FW2) began operation on 31 May 2021 for tagging and historical catch index assessments for salmon and summer-run steelhead. All fish caught in the GW fishwheels were released alive after tagging and/or counting.

GW fishwheels are currently operating at ideal water levels and have caught many salmon over the past week. Current water level is just above average water levels (2.6 m vs. 2.7 m) based on 1994–2020 operations. A chart of the water levels at the test fishery follows the text summary that compares current levels to historical levels. Both fishwheels restarted on 4 July after high water shutdown periods (June 2-6 and June 21–July 3) during high flow periods. Fish can slowly pass GW canyon when flow rates are less than 2,900 m<sup>3</sup>/s (<4.9 m); but typical unobstructed passage occurs below 2,000 m<sup>3</sup>/s (<3.4 m) and high capture efficiencies occur at 1,500 m<sup>3</sup>/s (2.5 m).

The water levels in June and July to date rank the second highest (after 2007) experienced since the start of fishwheel operations in 1994 that resulted in too high-water conditions for upstream passage for most of June and early July (Table 1). Current water temperatures at the GW fishwheels are 0.2°C below average (9.7°C vs. 9.9°C) based on 1994–2020 operations.

Table 1. Monthly mean water levels (m) at Gitwinksihlkw fishwheels, 2000-2021.

Month	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Mean (94-20)
June	3.4	3.5	4.0	3.0	3.2	2.9	3.6	4.8	2.8	4.1	2.6	3.5	3.8	3.1	2.6	2.6	2.1	2.9	1.8	2.0	3.1	4.5	3.2
July	3.2	3.0	2.6	2.4	2.3	2.2	2.6	4.0	2.6	2.8	1.8	2.1	3.5	1.7	2.0	1.7	1.6	1.7	1.4	1.5	2.7	3.6	2.5
Aug	2.4	1.9	2.0	1.2	1.7	1.7	1.4	1.8	2.3	1.6	1.4	1.8	1.7	1.2	1.1	1.5	1.1	1.6	1.0	1.8	3.1		1.8
Sep	2.3	1.1	1.7	1.3	0.9	1.3	1.3	1.3	1.0	1.2	0.9	3.9	0.9	0.7	0.7	0.8	1.1	1.1	0.3	1.0	1.4		1.3
Season	2.8	2.5	2.7	2.2	2.2	2.1	2.3	3.1	2.5	2.6	1.7	2.7	2.7	1.9	1.8	1.8	1.6	2.0	1.3	1.7	2.7		2.3
<b>Ranking of HIGHEST water levels over 28 years (1994-2021)</b>																							
June	12	9	4	18	14	19	8	1	21	3	25	10	5	17	24	23	26	20	28	27	15		2

### GREASE HARBOUR (GH) FISHWHEELS:

Three fishwheels are currently operating at Grease Harbour (upstream of Ts'im Anwihlist), located approximately 16 km upstream of GW fishwheels. Start-up dates of the upper fishwheels was on 18 June (FW6), 6 July (FW3), and 7 July (FW5). The GH fishwheels are used for in-season mark-recapture tag recoveries of salmon, abundance estimates passing upstream, additional tagging (adult Chinook and Chum salmon, and Pacific Lamprey), and for selective harvesting when permitted by Nisga'a Lisims Government (not in 2021).

All Sockeye caught at all fishwheels to date have been released (19,095), as have the other salmon, steelhead and other fish caught. The total Nass fishwheel catches this year are above average for Sockeye, Pink, and Pacific Lamprey, and below average for other species. Total fishwheel catches of salmon, steelhead, and Pacific Lamprey to date are shown below including tagging results and jacks caught.

FISHWHEEL CATCH SUMMARIES	SOCK	CHIN	COHO	STEEL	PINK-ODD	CHUM	LAMP
FISHWHEEL TOTAL CATCH OF ADULTS	19,095	2,025	0	1	69	0	335
HISTORICAL AVG CUM CATCH (00-20) TO DATE	15,700	3,500	3	10	40	2	210
HISTORICAL AVG CUM TOTAL CATCH (00-20)	42,000	4,000	13,000	1,000	12,000	130	700
AVERAGE DAILY CATCH (5 D) OF ADULTS - GW	1,021	97	0	0	10	0	1
AVERAGE DAILY CATCH (5 D) OF ADULTS - GH	2,349	279	0	0	4	0	20
FISHWHEEL TOTAL TAGGED (OR ADIPOSE FIN MARKED)	3,025	1,197	0	0	0	0	85
FISHWHEEL TOTAL JACKS	1,202	867	0	NA	NA	NA	NA
HISTORICAL MEAN JACKS (00-20) TO DATE	810	495	1	NA	NA	NA	NA

Other adult species and juvenile salmon catches at the fishwheels to date include: 11 Rainbow Trout, 6 Cutthroat Trout, 5 Dolly Varden (1 tagged), 2 Peamouth Chub, 2 Pikeminnow, 1 Mountain Whitefish, 0 Sculpin, 0 Redside Shiners, 0 River Lamprey, 3 Suckers, and 18 salmon smolts (9 Coho, 8 Chinook, 1 Sockeye).

### RUN SIZE AND ESCAPEMENT ESTIMATES FOR NASS SALMON & SUMMER-RUN STEELHEAD

In-season estimates of run size and projected forecasts to Gitwinksihlkw fishwheels for adult Nass salmon and summer-run steelhead are shown below and are based on in-season mark-recapture (sockeye) and historical catch index (Chinook) methods. Mark-recapture estimates will fluctuate over a 5-d period while mark-rates are obtained at the Grease Harbour fishwheels.

The current run sizes for 2021 have increased with no migration restrictions from flow of the Nass River; but are below average for Nass Sockeye (14,000 less) and Chinook (6,100 less) when compared to means to date from 1994 to 2020. No summer-run steelhead have been captured in July yet to start to generate run estimates. The steelhead run size target is based on a minimum return goal as steelhead will continue to enter the Nass River after the fishwheels shutdown in mid-September.

IN-SEASON RUN SIZE SUMMARIES	SOCK	CHIN	COHO	STEEL	15-Jul-21
IN-SEASON RUN SIZE ESTIMATE TO DATE	106,694	11,058	-	-	
HISTORICAL MEAN RUN SIZE TO GW FOR DATE (94-20)	121,000	17,200	33	80	
RUN SIZE TARGET 2021 (MIN. FOR STEELHEAD)	250,000	15,000	65,000	4,200	

In-season preliminary forecast projections above Gitwinksihlkw are shown below. Estimates to Gitwinksihlkw are based on two methods, mean run timing and linear-regression of the in-season to final estimates to date. The current run size projection estimate for Nass Sockeye is ranging between 170,000 and 358,000 with mean estimate of 264,000 based on the in-season to final regression method and mean-run timing (43%; range: 27–60%) of the run passed Gitwinksihlkw to date. For Upper Nass Chinook, the run size projection is ranging between 11,000 and 14,000 with mean estimate of 12,800 based on the in-season to final regression method and mean-run timing (90%; range: 68–96%) of the run passed Gitwinksihlkw to date. The Sockeye projection is on track to reach the run size target (250,000); but Chinook is still tracking below target (15,000).

IN-SEASON FORECASTS TO GW - METHODS:	SOCK	CHIN	COHO	STEEL		15-Jul-21
1. RUN TIMING METHOD (94-20) - Mean Run timing	249,000	12,000	Too Early	Too Early		
Lower (-2 S.D.)	172,000	11,000	Too Early	Too Early		
Upper (+2 S.D.)	497,000	15,000	Too Early	Too Early		In-season/Final
2. IN-SEASON TO FINAL (regression):	264,000	12,800	Too Early	Too Early		r <sup>2</sup> (CH) = 0.99
95% CI - lower	170,000	11,000	Too Early	Too Early		r <sup>2</sup> (SO) = 0.58
95% CI - upper	358,000	14,000	Too Early	Too Early		r <sup>2</sup> (CO) =
GW RUN SIZE TARGET (DEPENDING ON HARVESTS ABOVE GW)	250,000	15,000	65,000	4,200		r <sup>2</sup> (ST) =
Mean Run Timing % Return Estimate to GW fishwheels (94-20)	43%	90%	0%	0%		
Late run	27%	68%	0%	0%		
Early run	60%	96%	0%	0%		

Net Escapement Estimates for adult Nass salmon to date are shown below and relative to the Upper Nass net aggregate escapement goals. Approximately, 106,000 Sockeye and 9,500 Chinook are estimated to have passed to the Upper Nass River to date and are below average.

IN-SEASON NET ESCAPEMENT ESTIMATES	SOCK	CHIN	COHO	STEEL		15-Jul-21
HARVEST ESTIMATES ABOVE GW TO DATE	1,228	255	-	-		
NET ESCAPEMENT (ABOVE GW):	105,466	10,803	-	-		
NET ESCAPEMENT TARGET (UPPER RIVER ONLY)	200,000	13,000	60,000	4,000		

The NFWD program carefully tracks Nass salmon and steelhead runs each year to ensure adequate numbers reach their spawning grounds (escapement). On 13 July, the Nisga’a Lisims Government publicly announced the closure of the Nisga’a food fishery for Chinook Salmon for the rest of season starting on 15 July with no directed harvests permitted, and a 12-d closure of the Sockeye food fishery from 15 July to 26 July. The closures were in response to very low returns to 12 July and lack of fish passing to the upper river to reaching spawning targets (Tables 1 and 2). As of 15 July, the run sizes passing Gitwinksihlkw and to the Upper Nass for Sockeye and Chinook have improved; but continue to be below average abundance levels (21,000 Sockeye and 6,000 Chinook below average) to week ending 17 July based on returns from 1994 to 2020.

Table 1. Weekly Nass Sockeye Salmon cumulative run size estimates passing Gitwinksihlkw and Grease Harbour in 2021 and compared to historical averages.

Wk	End date	Run passing Gitwinksihlkw			Cum Run passing Grease Harbour (after accounting for escapement and catch below)		
		Cum 2021	Mean Cum (94-20)	Diff.	Cum 2021	Mean Cum (94-20)	Diff.
23	05-Jun	0	400	-400	0	300	-300
24	12-Jun	20	2,000	-2,000	19	1,700	-2,000
25	19-Jun	160	12,000	-12,000	155	11,200	-11,000
26	26-Jun	180	38,000	-38,000	174	36,400	-36,000
27	03-Jul	830	73,000	-72,000	790	70,200	-69,000
28	10-Jul	27,990	103,000	-75,000	25,922	97,600	-72,000
29	17-Jul	106,690	128,000	-21,000	105,462	118,600	-13,000
30	24-Jul		161,000			150,300	

Table 2. Weekly Nass Chinook Salmon cumulative run size estimates passing Gitwinksihlkw and Grease Harbour in 2021 and compared to historical averages.

Wk	End date	Run passing Gitwinksihlkw			Cum Run passing Grease Harbour (after accounting for escapement and catch below)		
		Cum 2021	Mean Cum (94-20)	Diff.	Cum 2021	Mean Cum (94-20)	Diff.
23	05-Jun	0	100	-100	0	20	0
24	12-Jun	80	500	-400	44	300	-300
25	19-Jun	280	2,700	-2,400	190	2,300	-2,100
26	26-Jun	290	7,500	-7,200	177	6,800	-6,600
27	03-Jul	290	12,900	-12,600	168	11,800	-11,600
28	10-Jul	1,130	16,100	-15,000	739	14,500	-13,800
29	17-Jul	11,060	17,400	-6,300	9,478	14,500	-5,000
30	24-Jul		17,900			15,000	

## HARVEST ESTIMATES FOR ADULT NASS SALMON & STEELHEAD

ALASKAN FISHERIES IN SE ALASKA (information courtesy from ADFG's website):

The 2021 Alaskan Southeast fisheries started on 20 June for gillnet fisheries in District 101 (Tree Point) and District 106 (Sumner and Upper Clarence), and seine fisheries in District 102 (Middle Clarence). District 101 (Lower Clarence) and District 104 (Noyes/Dall) seine fisheries opened on 4 July and 11 July, respectively. District 103 (Cordova) seine fishery is scheduled to open on July 18. The table below shows the current estimates of catches of salmon in Alaskan net fisheries in Districts 101–106 (and mean catch comparisons from 2000 to 2020) to **16 July 2021** based on data from ADFG. Current catches are below average for all salmon except Pink Salmon in D102 and D104 seine fisheries. ADFG also reported on 16 July 16 the current Hugh Smith sockeye return “projects a total escapement of 2,850 sockeye salmon, well below the optimal escapement goal range of 8,000–18,000 sockeye salmon” and will continue to monitor and take management actions in District 1 if needed.

IN-SEASON SE ALASKAN CUM. SALMON CATCH ESTIMATES (ADFG WEBSITE) - 2021								WEEK END: 17-Jul-21			
DISTRICTS	AREA	SOCK CATCH	AVG (00-20)	CHIN CATCH	AVG (00-20)	PINK CATCH	AVG ODD (00-19)	CHUM CATCH	AVG (00-20)	COHO CATCH	AVG (00-20)
DIST 101 GN	TREE PT	6,600	38,000	1,600	1,300	15,600	103,600	68,500	117,000	2,500	4,900
DIST 106 GN	UPP. CLAR	4,400	46,000	400	1,200	9,600	99,000	22,500	77,000	2,600	29,000
DIST 101 SN	LOW CLAR	4,300	7,200	0	200	527,000	598,000	27,000	66,000	3,000	4,000
DIST 102 SN	MID CLAR.	3,000	10,000	0	500	177,000	147,800	93,500	246,000	5,600	13,200
DIST 103 SN	CORDOVA	0	0	0	0	0	2,000	0	0	0	0
DIST 104 SN	NOYES/DALL	16,000	27,000	0	500	190,000	191,000	38,000	36,000	12,000	13,000
<b>CUMULATIVE TOTAL</b>		<b>34,000</b>	<b>128,000</b>	<b>2,000</b>	<b>4,000</b>	<b>919,000</b>	<b>1,141,000</b>	<b>250,000</b>	<b>542,000</b>	<b>26,000</b>	<b>64,000</b>

The average harvest of Nass salmon in Alaskan net fisheries from 2000 to 2020 was 108,000 Sockeye (range: 22,000–304,000), 63,000 Pink (range: 4,000–192,000), 143,000 Coho (range: 57,000–491,000), and 6,600 Chum (<500–24,000). Of the total in-season Sockeye catch reported in the SE Alaskan fisheries in 2021 to date 34,000, approximately 26% (9,000) is estimated as Nass origin based on mean stock composition estimates from 1982 to 2020 and is currently below average (39,000) to date.

CANADIAN COMMERCIAL NET & RECREATIONAL FISHERIES IN AREA 3 (information courtesy from DFO Prince Rupert):

On 29 June, DFO announced significant commercial salmon closures throughout BC in 2021 as part of DFO's Pacific Salmon Strategy Initiative (PSSI; <https://www.canada.ca/en/fisheries-oceans/news/2021/06/minister-jordan-announces-long-term-commercial-closures-and-licence-tetirement-program-in-effort-to-save-pacific-salmon.html>). The salmon closures are in response to significant declines in BC salmon stocks due to recent ocean warming and poor survival conditions. As a result of DFO's PSSI announcement, the Area C Gillnet sockeye fishery will not proceed in 2021 and commercial gillnet openings will not occur in Area 3 in 2021 to start to rebuild Nass Area salmon stocks to historical levels.

On 15 July, DFO announced the closure of recreational (sport) fishing for salmon in the Nass River watershed starting 16 July in response to low Chinook and Sockeye returns to the Nass River and Nisga'a Lisims Government's closure of Nisga'a food, social, and ceremonial fisheries from July 15 to July 26.

Although the closures were announced above, DFO opened a seine fishery in outside Area 3 (Areas 3-3 and 3-7) on 12 July to target Pink Salmon with Chum Salmon retention allowed. Total harvests from 17 seine boats were 8,234 Pink and 4,513 Chum with 787 Sockeye, 101 Chinook, and 113 Coho released in the one-day fishery.

GEAR	DATE	Vessel												
		days	SO-harv	SO-Rel	CO-HARV	CO-Rel	PK-HARV	PK-Rel	Chum-harv	Chum-Rel	CH-harv	CH-Rel	STEEL-Rel	
SN	2021-07-12	17	0	787	0	113	8,234	0	4,513	0	0	101	0	
SN Total		17	0	787	0	113	8,234	0	4,513	0	0	101	0	

LABELS: SO=SOCKEYE, PK=PINK, CO=COHO, CH=CHINOOK; HARV=HARVESTED, REL=RELEASED.

On 16 July, DFO announced another seine fishery opening in outside Area 3 (Areas 3-3 and 3-7) for Monday, 19 July to target Pink Salmon with Chum Salmon retention allowed. Concerns continue to be raised by NFWD’s Fisheries and Wildlife Director regarding these Area 3 seine fishery openings due to lack of abundance data for Pink Salmon returning to the Nass Area streams to reach aggregate escapement goal (which has not been met twice since 2011), harvests of Chum Salmon when Nass Area Chum are projected to be below their escapement goal in 2021, and bycatch of Nass Sockeye that are forecasted to be well below average return in 2021. The poor overall return status of Nass Area odd-year Pink Salmon in recent years including 2019 (which did not reach aggregate escapement goal and will be the brood year fished) is concerning (Fig. 1).

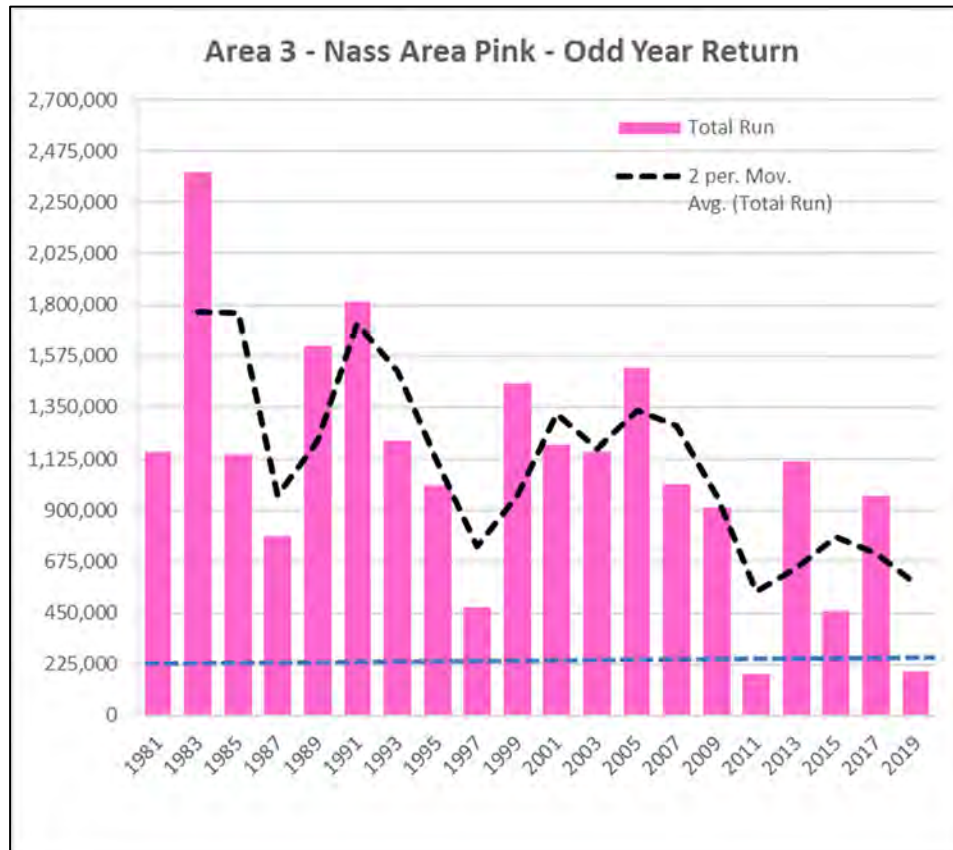


Figure 1. Declining trend of total returns of odd-year Nass Area Pink Salmon in Area 3 from 1981 to 2019 and the aggregate escapement goal (225,000; blue dashed line).

NISGA’A FOOD, SOCIAL, CEREMONIAL (FSC) AND ECONOMIC FISHERIES:

Nisga’a domestic and sale fisheries are monitored by the Nisga’a Fisheries and Wildlife Department and catch monitoring began on 1 May 2021. Due to low Nass salmon returns projected for 2021 and expected food, social and ceremonial catches, no sale fisheries are expected to occur in Nisga’a fisheries.

Cumulative harvests in Nisga’a fisheries to week ending **10 July** are shown in the table below for Food, Social, and Ceremonial (FSC) catches. The current harvests of Nass salmon and steelhead estimated in 2021 for Nisga’a fisheries are well below average (17,500 vs. 20,900 or 58,000 when including past sale fisheries) when compared to harvests from 2000 to 2020. High water during June and July impacted ability to fish in the Nass River.

Reported Week Ending Period		DOMESTIC (FSC) HARVESTS TO WK END - 2021		TOTAL HARVESTS TO DATE INCLUDING ESTIMATED RELEASE MORTALITIES 2021	
NASS SPECIES	Wk end	Harvest	Mean*	Harvest	Mean*
CHINOOK	10-Jul-21	3,936	4,400	3,945	5,000
SOCKEYE	10-Jul-21	13,397	15,200	13,397	49,200
PINK	10-Jul-21	107	1,012	113	3,190
COHO	10-Jul-21	0	50	0	67
CHUM	10-Jul-21	5	189	10	189
STEELHEAD	10-Jul-21	11	73	11	73
<b>TOTAL</b>		<b>17,456</b>	<b>20,900</b>	<b>17,477</b>	<b>58,000</b>

\* Total mean harvests from 2000-2020 for week end periods also include historical sale fisheries. Total harvests include all gear types estimates (net, angling, seine, etc.) and release mortality (60% of releases).

The total harvest summary of Nass salmon and steelhead to date in all Nisga'a fisheries is as follows:

NISGA'A TOTAL HARVEST SUMMARY	SOCK	CHIN	COHO	PINK-ODD	CHUM	STEEL
MARINE SALE FISHERY TOTAL	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
IN-RIVER SALE FISHERY TOTAL	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
<b>INDIVIDUAL SALE (IS) FISHERY TOTAL</b>	<b>CLOSED</b>	<b>CLOSED</b>	<b>CLOSED</b>	<b>CLOSED</b>	<b>CLOSED</b>	<b>CLOSED</b>
NLG COMMUNAL SELECTIVE TREATY FISHERY - GH FISHWHEELS	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
NLG COMMUNAL SELECTIVE TREATY FISHERY - SEINE	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
<b>DOMESTIC (FSC) GILLNET FISHERY - WK END: JULY 10</b>	<b>13,397</b>	<b>3,945</b>	<b>0</b>	<b>113</b>	<b>10</b>	<b>11</b>
<b>SUB TOTAL (NLG TREATY FISHERIES)</b>	<b>13,397</b>	<b>3,945</b>	<b>0</b>	<b>113</b>	<b>10</b>	<b>11</b>
NLG SOCK DEMONSTRATION FISHERY HARVEST - DFO INVENTORY	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
<b>GRAND TOTAL</b>	<b>13,397</b>	<b>3,945</b>	<b>0</b>	<b>113</b>	<b>10</b>	<b>11</b>

## TOTAL RETURN TO CANADA (TRTC) AND NISGA'A ENTITLEMENT ESTIMATES FOR NASS SALMON

Pre-season TRTC and Nisga'a entitlement forecasts:

Based on the preliminary Nass salmon return and age information from 2020, preliminary forecasts for Nass salmon and Nisga'a entitlement allocations for 2021 were calculated using pre-season forecast models. The pre-season forecasts were used for general planning purposes until in-season forecasts were available. Forecast models used were a combination of sibling (Sockeye and Chinook only) and brood year mean returns that project 25%, 50%, and 75% probability point estimates.

Pre-season TRTC forecasts (50% probability estimates) for 2021 predicted well below average return forecasts for Nass Sockeye (318,000 vs. 609,000), Nass Chinook (25,000 vs. 31,000), Nass odd-year Pink (395,000 vs. 551,000); Nass Chum (39,000 vs. 52,000; projected to below the 45,000-escapement goal), and Nass Coho (150,000 vs. 187,000) based on mean TRTC returns from 1994 to 2020.

PRE-SEASON TRTC & ENTITLEMENT FORECASTS	SOCK	CHIN	COHO	PINK-ODD	CHUM
HISTORICAL MEAN TRTC (1994-2020)	609,000	31,000	187,000	551,000	52,000
<b>PRE-SEASON TRTC FORECAST (50% PROBABILITY)</b>	<b>318,000</b>	<b>25,000</b>	<b>150,000</b>	<b>395,000</b>	<b>39,000</b>
75% probability	217,000	19,000	88,000	176,000	25,000
25% probability	469,000	33,000	280,000	888,000	62,000
<b>TOTAL PRE-SEASON NISGA'A CATCH POTENTIAL</b>	<b>44,000</b>	<b>5,300</b>	<b>12,000</b>	<b>28,000</b>	<b>3,100</b>
75% probability	17,000	4,000	7,000	1,000	<500
25% probability	78,000	6,900	19,200	104,000	5,000

When reviewing Nass salmon returns over a 30-year period and forecasted for 2021 (1994-2021), the pre-season forecast projections predict 2021 to be poor (i.e., > 40% less than average returns or below escapement goal) for Sockeye (3<sup>rd</sup> worst), Pink (14<sup>th</sup> worst), and Chum (17<sup>th</sup> worst), and fair for Chinook (11<sup>th</sup> worst) and Coho (15<sup>th</sup> worst). The overall return of Nass salmon in 2021 (927,000 vs. 1,430,000 average) is predicted to be the 8<sup>th</sup> worst return in 30 years.

Total Return to Canada estimates for Nass Salmon							Ranking - Poorest return from 1 to 30					
Year	Sockeye	Pink	Chinook	Coho	Chum	Total	Sockeye	Pink	Chinook	Coho	Chum	Total
1992	1,572,000	328,000	35,000	160,000	54,000	2,149,000	29	11	20	16	20	28
1993	1,586,000	874,000	45,000	62,000	239,000	2,806,000	30	23	28	2	30	30
1994	590,000	184,000	43,000	351,000	105,000	1,273,000	20	6	25	28	28	15
1995	855,000	829,000	22,000	68,000	83,000	1,857,000	26	22	8	3	26	23
1996	694,000	465,000	42,000	126,000	40,000	1,367,000	24	18	24	8	18	16
1997	574,000	416,000	36,000	33,000	31,000	1,090,000	19	16	21	1	14	12
1998	446,000	143,000	46,000	72,000	182,000	889,000	14	3	29	4	29	7
1999	645,000	1,259,000	29,000	107,000	68,000	2,108,000	22	29	15	6	24	26
2000	539,000	292,000	33,000	134,000	26,000	1,024,000	18	10	17	11	13	10
2001	380,000	995,000	48,000	247,000	36,000	1,706,000	9	27	30	23	16	22
2002	1,279,000	365,000	28,000	319,000	18,000	2,009,000	28	13	13	27	7	25
2003	1,024,000	1,019,000	44,000	176,000	76,000	2,339,000	27	28	26	18	25	29
2004	681,000	696,000	33,000	136,000	58,000	1,604,000	23	19	17	12	21	19
2005	522,000	1,348,000	28,000	216,000	33,000	2,147,000	17	30	13	21	15	27
2006	637,000	136,000	44,000	130,000	60,000	1,007,000	21	2	26	10	22	9
2007	351,000	896,000	40,000	179,000	13,000	1,479,000	7	24	23	19	4	18
2008	333,000	51,000	30,000	139,000	3,800	556,800	5	1	16	13	1	1
2009	425,000	810,000	39,000	362,000	22,000	1,658,000	12	21	22	29	8	21
2010	392,000	185,000	27,000	184,000	9,000	797,000	10	7	12	20	3	5
2011	458,000	174,000	18,000	129,000	7,000	786,000	15	4	4	9	2	4
2012	419,000	270,000	16,000	164,000	16,000	885,000	11	9	2	17	6	6
2013	437,000	976,000	16,000	510,000	15,000	1,954,000	13	26	2	30	5	24
2014	487,000	399,000	23,000	267,000	22,000	1,198,000	16	15	10	24	8	13
2015	753,000	422,000	33,000	146,000	60,000	1,414,000	25	17	17	14	22	17
2016	362,000	349,000	18,000	288,000	24,000	1,041,000	8	12	4	25	10	11
2017	341,000	926,000	11,000	302,000	24,000	1,604,000	6	25	1	26	10	19
2018	294,000	256,000	22,000	89,000	50,000	711,000	2	8	8	5	19	2
2019	326,000	175,000	20,000	218,000	25,000	764,000	4	5	6	22	12	3
2020	265,000	744,000	21,000	123,000	104,000	1,257,000	1	20	7	7	27	14
2021	318,000	395,000	25,000	150,000	39,000	927,000	3	14	11	15	17	8
Average:												
92-20	609,000	551,000	31,000	187,000	52,000	1,430,000						
* Color coding from mean averages from 1992-2020: Green - above average; Yellow - below average but higher than 1 SD; and Red - below average and lower than 1 SD.												

In-season Total Return to Canada (TRTC) and Nisga’a entitlement estimates for Nass salmon:

Current in-season TRTC estimates estimated by NFWD are: 1) Nass Sockeye is ranging between 188,000 and 416,000 with a point estimate of 284,000, and 2) Chinook is ranging between 17,000 and 27,000 with a point estimate of 20,000. The TRTC estimates are based on run size projections from in-season to final regression methods and run timing ranges to Area 3 to date for Nass Sockeye (46%; range: 29–62%) and Chinook (87%; range: 62–95%, including lower/coastal stocks based on habitat capacity proportions). Currently, in-season TRTC and Nisga’a entitlement estimates for Nass Sockeye and Chinook are much lower than pre-season forecasts.

Insufficient in-season data are available for the other Nass salmon species so pre-season Nisga’a entitlements are considered as preliminary Nisga’a entitlement estimates.

Nisga'a entitlement ranges for 2021 catch potential to date are based on TRTC estimates and early to late run ranges as follows:

- Nass Sockeye is between 20,000 and 66,000 with point estimate 37,000. Current harvest estimate is 13,397 (with no release mortalities) to 10 July;
- Nass Chinook is between 3,600 and 5,700 with point estimate 4,200. Current harvest is 3,936 (plus 9 release mortalities) to 10 July;
- Nass Coho is between 7,000 and 19,200 with point estimate 12,000 based on pre-season forecast. Current harvest is 0;
- Nass Pink is between 1,000 and 104,000 with point estimate 28,000 based on pre-season forecast. Current harvest is 107 (plus 6 release mortalities) to 10 July;
- Nass Chum is between <500 and 5,000 with point estimate 3,100 based on pre-season forecast. Current harvest is 5 (plus 5 release mortalities) to 10 July; and
- Nass steelhead, upper limit is 1,000 summer-run and no limit set for winter/spring run, with current harvest of 11 (with no release mortalities) to 10 July.

IN-SEASON TRTC & ENTITLEMENT ESTIMATES - PRELIMINARY	SOCK	CHIN	COHO	PINK-ODD	CHUM
PROJECTED TRTC BASED ON INSEASON TO FINAL REGRESSION	<b>284,000</b>	<b>20,000</b>	Pre-season	Pre-season	Pre-season
Lower (95% CI)	188,000	17,000	Pre-season	Pre-season	Pre-season
Upper (95% ci.)	416,000	27,000	Pre-season	Pre-season	Pre-season
ESTIMATED %TRTC TO DATE: MEAN. RUN TIMING (AREA 3D)	46%	87%	0%	0%	1%
Late run	29%	62%	0%	0%	0%
Early run	62%	95%	0%	1%	13%
IN-SEASON NISGA'A ENTITLEMENT TARGET	<b>37,000</b>	<b>4,200</b>	Pre-season	Pre-season	Pre-season
Lower (95% CI)	20,000	3,600	Pre-season	Pre-season	Pre-season
Upper (95% ci.)	66,000	5,700	Pre-season	Pre-season	Pre-season

The next Nass River general stock assessment update from the Nisga'a Fisheries and Wildlife Department is planned for: **Friday, 23 July 2021.**

Nass stock assessment updates are available at the following links (no passwords are required):

Weekly email updates are posted after each update to DFO and NLG's websites:

- DFO: <http://www.pac.dfo-mpo.gc.ca/fm-gp/northcoast-cotenord/nass-eng.html>
- NLG: <http://www.nisgaanation.ca/stock-assessments>

Daily and weekly run size information are also posted on Mondays, Wednesdays, and Fridays to the following site:

- <ftp://ftp.lglsidney.com//Nass Stock Assessment Updates>





Photo 1. Sockeye Salmon caught and spaghetti/PIT tagged at Gitwinksihlkw fishwheels on 15 July 2021.



Photo 2. Chinook Salmon caught, operculum and PIT tagged at Gitwinksihlkw fishwheels on 12 July 2021.



Photo 3. Chinook Salmon caught, operculum and PIT tagged at Gitwinksihlkw fishwheels on 15 July 2021.



Photo 4. Chinook Salmon caught, operculum and PIT tagged at Gitwinksihlkw fishwheels on 15 July 2021.



Photo 5. PIT tagging (top) and operculum tagging (bottom) Chinook Salmon caught at Gitwinksihlkw fishwheels on 16 July 2021.



Photo 6. Pink Salmon caught and adipose-fin clipped at Gitwinksihlkw fishwheels on 12 July (top) and 15 July (bottom).

*Photos courtesy of NFWD's senior crew leader, Ben Guno Jr, and other staff.*



Nisga'a Lisims Government

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 PO Box 228 / 5101 Gitzyon St  
 New Aiyansh BC / Canada V0J 1A0  
 NISGAANATION.CA

**2021 NASS STOCK ASSESSMENT UPDATE**

FISHWHEEL OPERATIONAL DATA TO:	15-Jul-21
WATER LEVEL FOR DATE AT GITWINKSIHLKW (m)	2.6
HISTORICAL LEVEL FOR DATE - MEAN 94-20 (m)	2.5
WATER TEMPERATURE FOR DATE AT GITWINKSIHLKW (m)	9.7
HISTORICAL WATER TEMP FOR DATE - MEAN 94-20 (m)	9.9

FISHWHEEL CATCH SUMMARIES	SOCK	CHIN	COHO	STEEL	PINK-ODD	CHUM	LAMP
FISHWHEEL TOTAL CATCH OF ADULTS	19,095	2,025	0	1	69	0	335
HISTORICAL AVG CUM CATCH (00-20) TO DATE	15,700	3,500	3	10	40	2	210
HISTORICAL AVG CUM TOTAL CATCH (00-20)	42,000	4,000	13,000	1,000	12,000	130	700
AVERAGE DAILY CATCH (5 D) OF ADULTS - GW	1,021	97	0	0	10	0	1
AVERAGE DAILY CATCH (5 D) OF ADULTS - GH	2,349	279	0	0	4	0	20
FISHWHEEL TOTAL TAGGED (OR ADIPOSE FIN MARKED)	3,025	1,197	0	0	0	0	85
FISHWHEEL TOTAL JACKS	1,202	867	0	NA	NA	NA	NA
HISTORICAL MEAN JACKS (00-20) TO DATE	810	495	1	NA	NA	NA	NA

IN-SEASON RUN SIZE SUMMARIES	SOCK	CHIN	COHO	STEEL	15-Jul-21
IN-SEASON RUN SIZE ESTIMATE TO DATE	106,694	11,058	-	-	
HISTORICAL MEAN RUN SIZE TO GW FOR DATE (94-20)	121,000	17,200	33	80	
RUN SIZE TARGET 2021 (MIN. FOR STEELHEAD)	250,000	15,000	65,000	4,200	

IN-SEASON FORECASTS TO GW - METHODS:	SOCK	CHIN	COHO	STEEL	15-Jul-21
1. RUN TIMING METHOD (94-20) - Mean Run timing	249,000	12,000	Too Early	Too Early	
Lower (-2 S.D.)	172,000	11,000	Too Early	Too Early	
Upper (+2 S.D.)	497,000	15,000	Too Early	Too Early	In-season/Final
2. IN-SEASON TO FINAL (regression):	264,000	12,800	Too Early	Too Early	r <sup>2</sup> (CH) = 0.99
95% CI - lower	170,000	11,000	Too Early	Too Early	r <sup>2</sup> (SO) = 0.58
95% CI - upper	358,000	14,000	Too Early	Too Early	r <sup>2</sup> (CO) =
GW RUN SIZE TARGET (DEPENDING ON HARVESTS ABOVE GW)	250,000	15,000	65,000	4,200	r <sup>2</sup> (ST) =
Mean Run Timing % Return Estimate to GW fishwheels (94-20)	43%	90%	0%	0%	
Late run	27%	68%	0%	0%	
Early run	60%	96%	0%	0%	

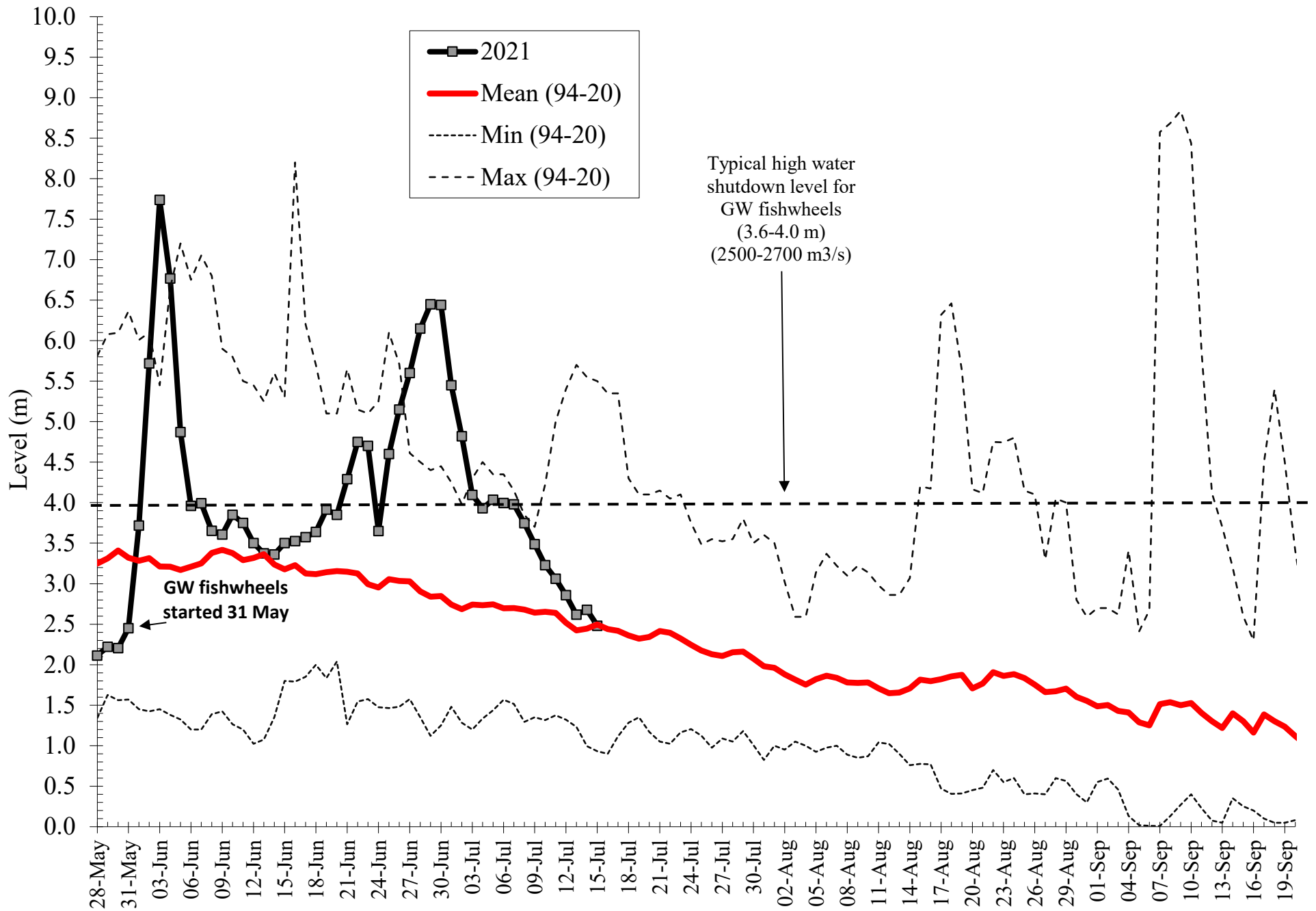
IN-SEASON NET ESCAPEMENT ESTIMATES	SOCK	CHIN	COHO	STEEL	15-Jul-21
HARVEST ESTIMATES ABOVE GW TO DATE	1,228	255	-	-	
NET ESCAPEMENT (ABOVE GW):	105,466	10,803	-	-	
NET ESCAPEMENT TARGET (UPPER RIVER ONLY)	200,000	13,000	60,000	4,000	

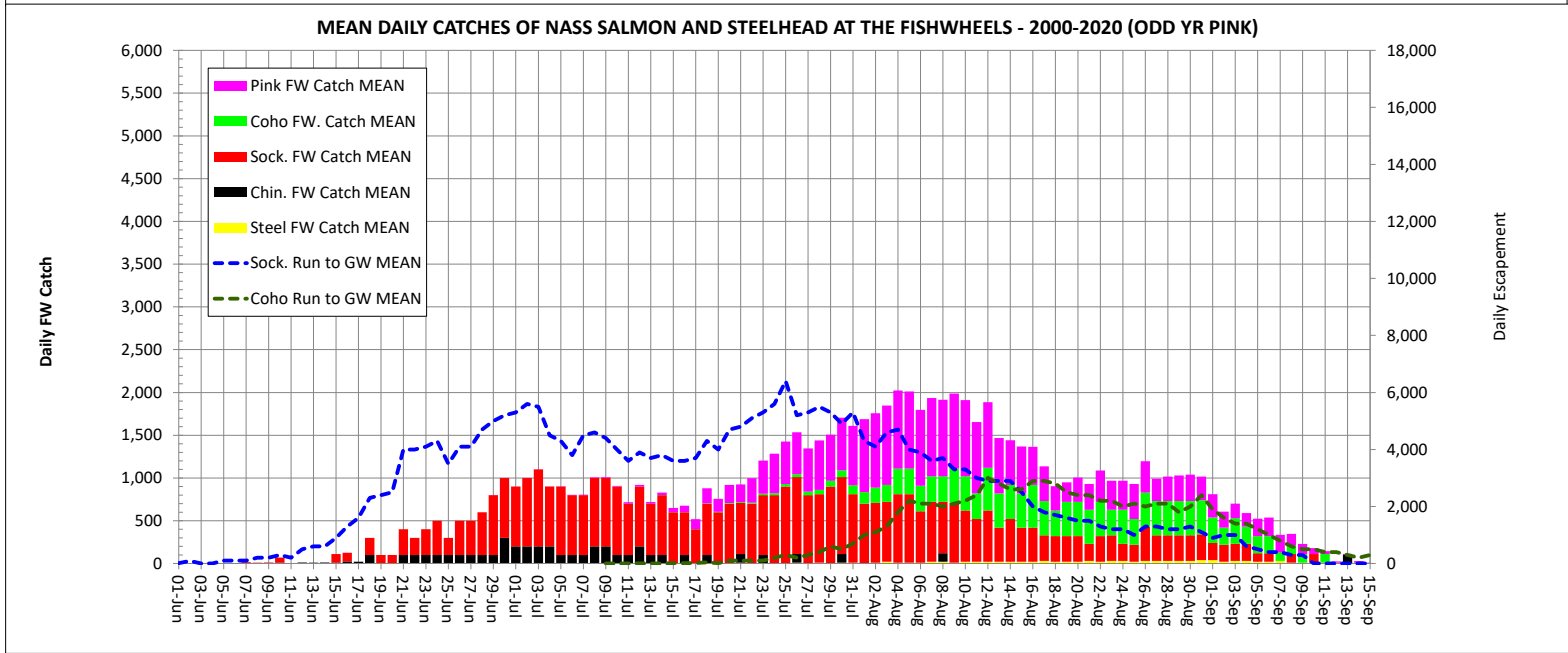
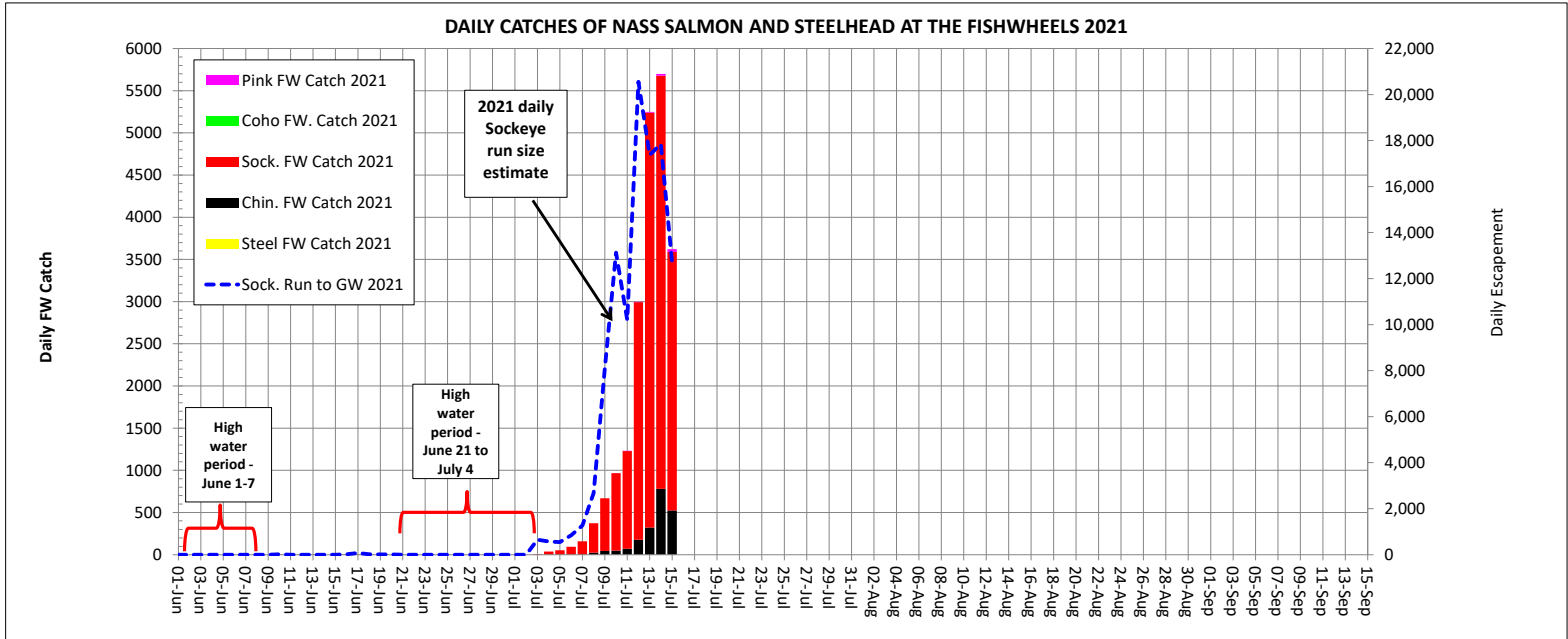
NISGA'A TOTAL HARVEST SUMMARY	SOCK	CHIN	COHO	PINK-ODD	CHUM	STEEL
MARINE SALE FISHERY TOTAL	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
IN-RIVER SALE FISHERY TOTAL	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
INDIVIDUAL SALE (IS) FISHERY TOTAL	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
NLG COMMUNAL SELECTIVE TREATY FISHERY - GH FISHWHEELS	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
NLG COMMUNAL SELECTIVE TREATY FISHERY - SEINE	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
DOMESTIC (FSC) GILLNET FISHERY - WK END: JULY 10	13,397	3,945	0	113	10	11
SUB TOTAL (NLG TREATY FISHERIES)	13,397	3,945	0	113	10	11
NLG SOCK DEMONSTRATION FISHERY HARVEST - DFO INVENTORY	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
GRAND TOTAL	13,397	3,945	0	113	10	11

PRE-SEASON TRTC & ENTITLEMENT FORECASTS	SOCK	CHIN	COHO	PINK-ODD	CHUM
HISTORICAL MEAN TRTC (1994-2020)	609,000	31,000	187,000	551,000	52,000
PRE-SEASON TRTC FORECAST (50% PROBABILITY)	318,000	25,000	150,000	395,000	39,000
75% probability	217,000	19,000	88,000	176,000	25,000
25% probability	469,000	33,000	280,000	888,000	62,000
TOTAL PRE-SEASON NISGA'A CATCH POTENTIAL	44,000	5,300	12,000	28,000	3,100
75% probability	17,000	4,000	7,000	1,000	<500
25% probability	78,000	6,900	19,200	104,000	5,000

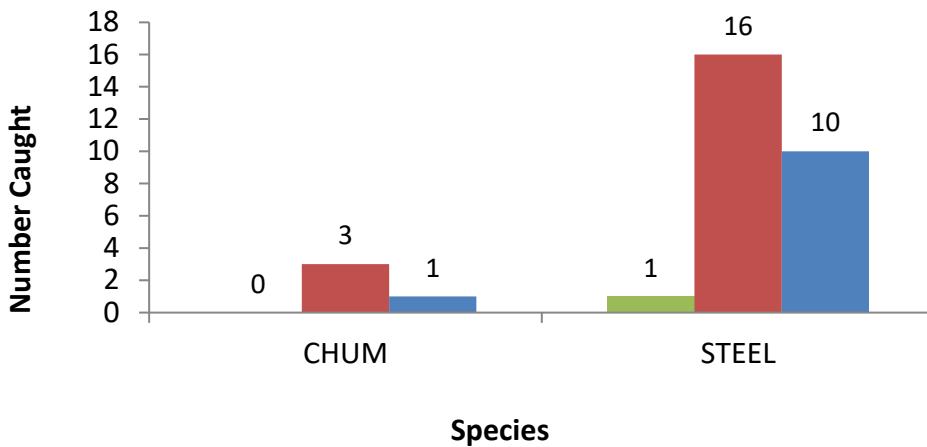
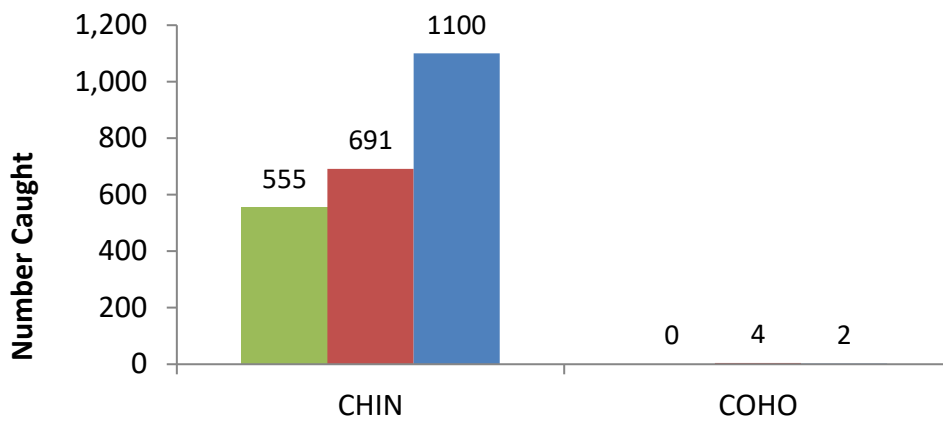
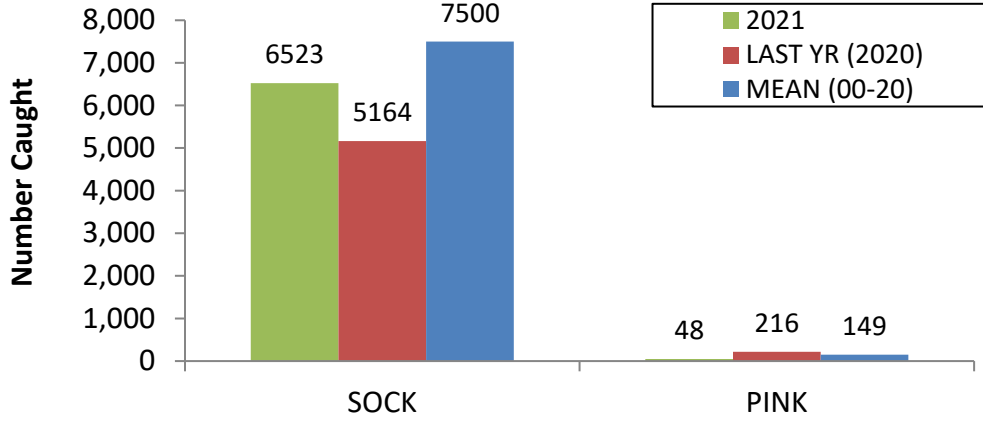
IN-SEASON TRTC & ENTITLEMENT ESTIMATES - PRELIMINARY	SOCK	CHIN	COHO	PINK-ODD	CHUM
PROJECTED TRTC BASED ON INSEASON TO FINAL REGRESSION	284,000	20,000	Pre-season	Pre-season	Pre-season
Lower (95% CI)	188,000	17,000	Pre-season	Pre-season	Pre-season
Upper (95% ci.)	416,000	27,000	Pre-season	Pre-season	Pre-season
ESTIMATED %TRTC TO DATE: MEAN. RUN TIMING (AREA 3D)	46%	87%	0%	0%	1%
Late run	29%	62%	0%	0%	0%
Early run	62%	95%	0%	1%	13%
IN-SEASON NISGA'A ENTITLEMENT TARGET	37,000	4,200	Pre-season	Pre-season	Pre-season
Lower (95% CI)	20,000	3,600	Pre-season	Pre-season	Pre-season
Upper (95% ci.)	66,000	5,700	Pre-season	Pre-season	Pre-season

# Daily Water Level at Gitwinksihlkw Fishwheels 2021





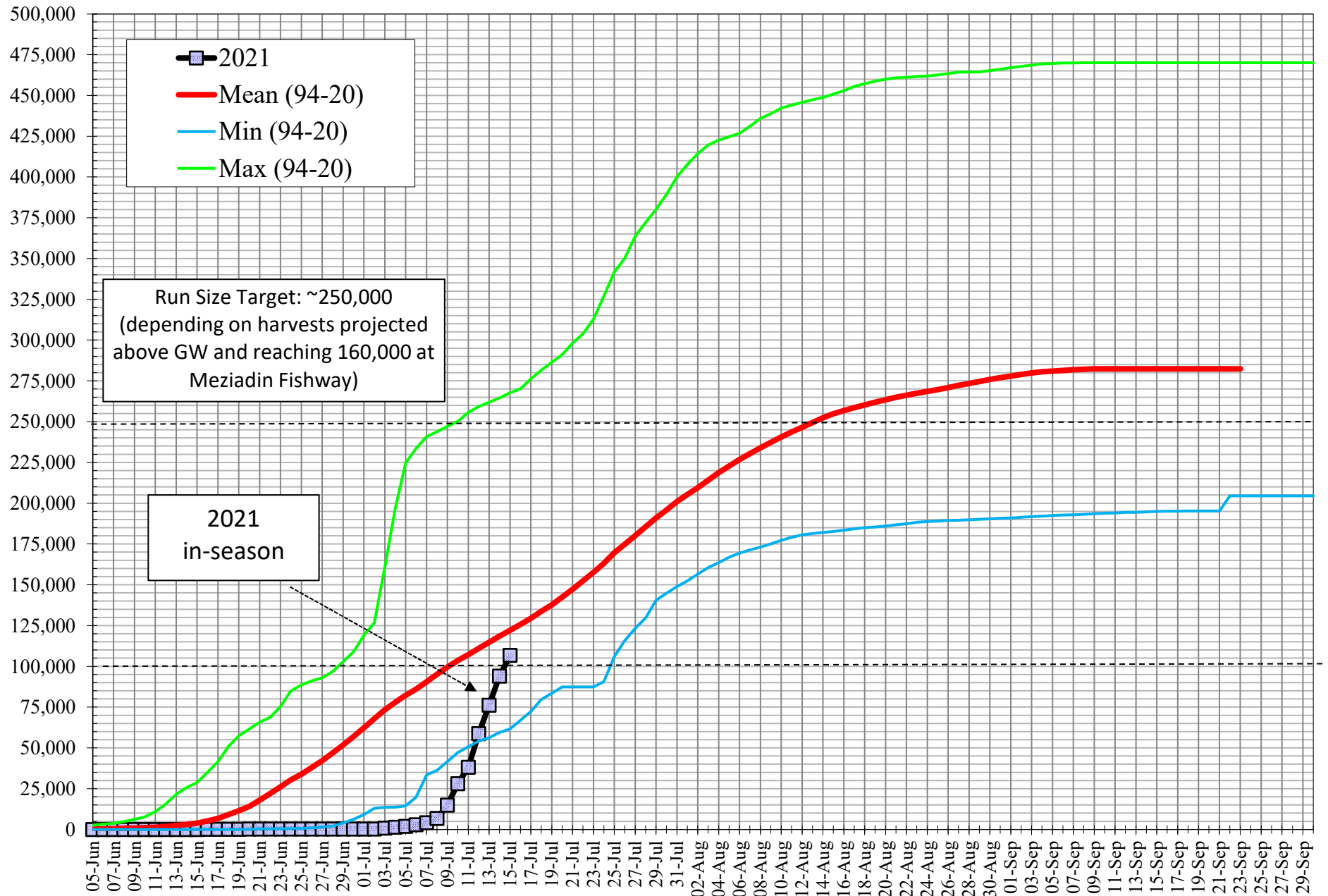
### Nass Fishwheel Catches 2021 - GW only (May 31 - July 15)





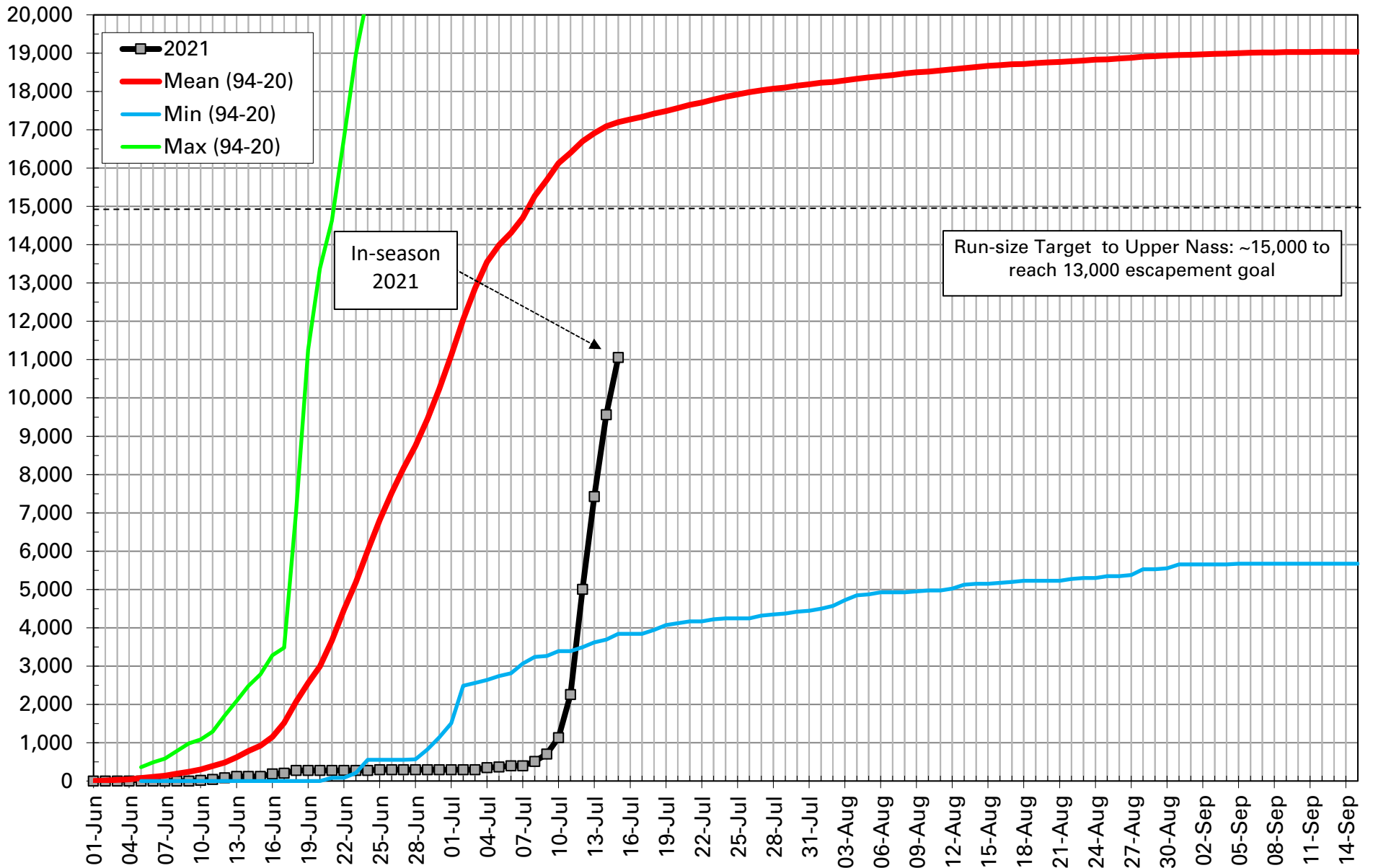


## Nass Sockeye Cum. Run Size to Gitwinksilhkw Fishwheels 2021 versus 94-20 Mean, Min, Max returns (before upriver harvests)

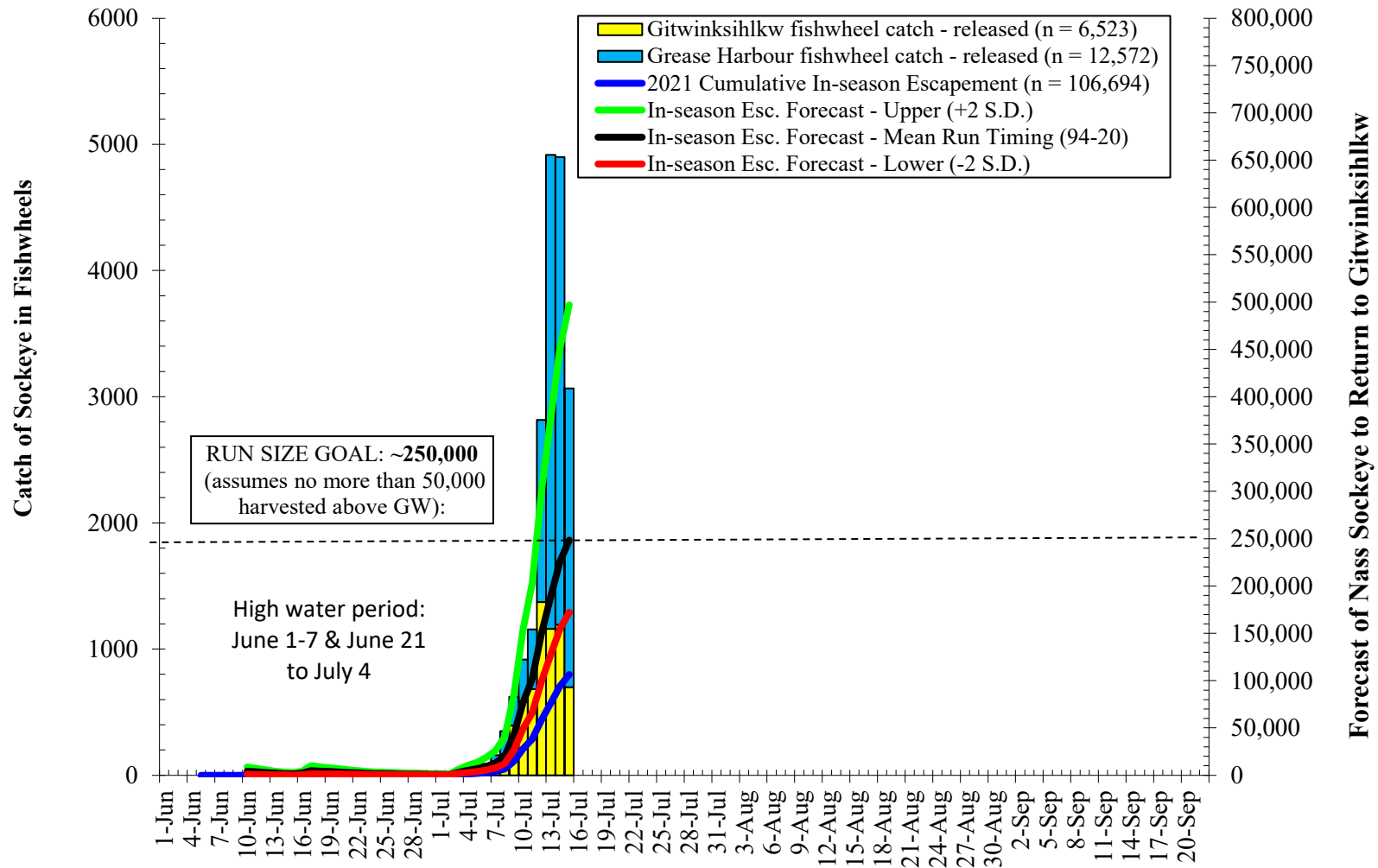




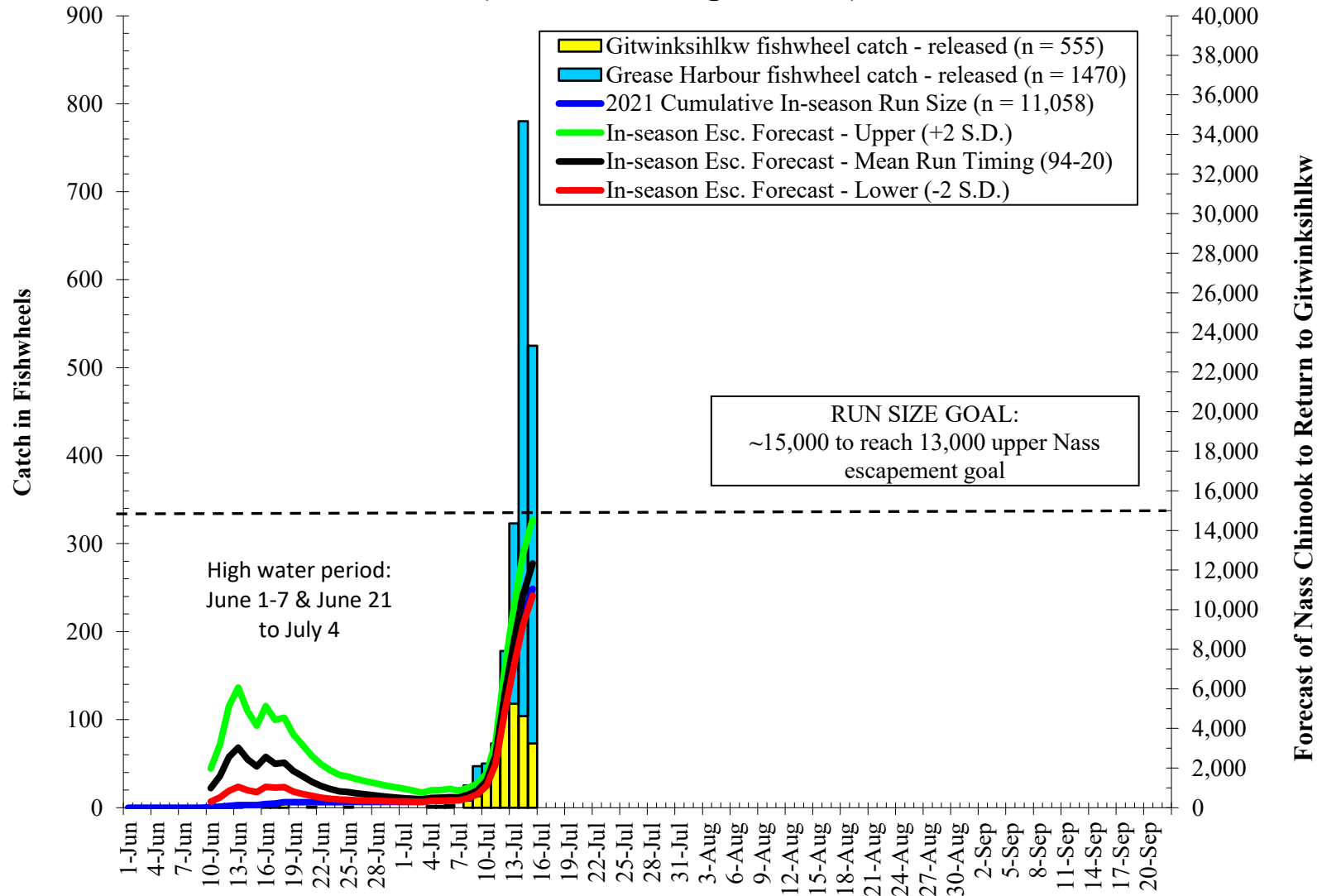
## Cumulative Nass Adult Chinook Run Size to Gitwinksihlkw 2021 vs 94-20 Mean, Minimum and Maximum returns (before up river harvests)



### Nass Sockeye ( $\geq 45$ cm NFL) Run Forecasts to Gitwinksihlkw Fishwheels 2021 (Mean Run timing - 1994-20)



### Nass Chinook ( $\geq 50$ cm NFL) Forecasts to Gitwinksihlkw Fishwheels 2021 (Mean Run timing - 1994-20)



2021 Nass Fishwheel Catches

	GW		GW Total	GH				GH Total	Grand Total
Data	FW1	FW2		FW3	FW4	FW5	FW6		
<b>Chin-adult catch</b>	<b>250</b>	<b>305</b>	<b>555</b>	<b>321</b>	<b>0</b>	<b>836</b>	<b>313</b>	<b>1,470</b>	<b>2,025</b>
Chin-tagged	211	274	485	203	0	377	132	712	1,197
Chin-Pit tags	211	274	485	203	0	376	132	711	1,196
Chin-recaps	10	4	14	15	0	27	9	51	65
Chin-Jacks	93	108	201	115	0	399	152	666	867
Sum of CH Harv	0	0	0	0	0	0	0	0	0
<b>Sockeye-adult catch</b>	<b>2,917</b>	<b>3,606</b>	<b>6,523</b>	<b>2,306</b>	<b>0</b>	<b>7,396</b>	<b>2,870</b>	<b>12,572</b>	<b>19,095</b>
Sockeye-tagged	1,234	1,791	3,025	0	0	0	0	0	3,025
Sockeye-PIT Tags	857	1,251	2,108	0	0	0	0	0	2,108
Sockeye-recaps	86	51	137	35	0	79	43	157	294
Sockeye_jacks	136	184	320	147	0	550	185	882	1202
Sum of sk_harvest_total	0	0	0	0	0	0	0	0	0
<b>Coho-adult catch</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Coho-tagged	0	0	0	0	0	0	0	0	0
Coho-PIT tags	0	0	0	0	0	0	0	0	0
Coho-recaps	0	0	0	0	0	0	0	0	0
Coho-jack	0	0	0	0	0	0	0	0	0
Sum of co_harvest_total	0	0	0	0	0	0	0	0	0
<b>Steel-adult catch</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
Steel-Adipose marked	0	0	0	0	0	0	0	0	0
Steel-unmarked	0	1	1	0	0	0	0	0	1
Steel-recap-total	0	0	0	0	0	0	0	0	0
<b>Pacific Lamprey-catch</b>	<b>4</b>	<b>31</b>	<b>35</b>	<b>30</b>	<b>0</b>	<b>184</b>	<b>86</b>	<b>300</b>	<b>335</b>
Lamprey-tagged	4	25	29	1	0	28	27	56	85
Lamprey-released	0	6	6	29	0	156	59	244	250
Lamprey-recaps	0	0	0	0	0	0	0	0	0
River Lamprey	0	0	0	0	0	0	0	0	0
<b>Pink-adult-catch</b>	<b>22</b>	<b>26</b>	<b>48</b>	<b>9</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>21</b>	<b>69</b>
<b>Chum-adult-catch</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Chum-tagged	0	0	0	0	0	0	0	0	0
Chum-punched	0	0	0	0	0	0	0	0	0
Chum-recaps	0	0	0	0	0	0	0	0	0
<b>Rainbow Trout</b>	<b>7</b>	<b>3</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>11</b>
<b>Cutthroat Trout</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>
<b>Dolly Varden</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>
Dolly-tagged	0	1	1	0	0	0	0	0	1
Peamouth Chub	0	1	1	0	0	0	1	1	2
Pikeminnow	0	0	0	0	0	2	0	2	2
Mountain Whitefish	0	0	0	0	0	1	0	1	1
Sculpin	0	0	0	0	0	0	0	0	0
Redside Shiners	0	0	0	0	0	0	0	0	0



