## PACIFIC SALMON COMMISSION

FRASER RIVER PANEL
Friday September 15, 2023
Distribution

1) Run status of Fraser River sockeye salmon relative to forecasts and adopted run sizes

PSC Staff
2) In-season data flow for updating objectives
a) Test fishing catches and acoustics
b) Mission projected sockeye vs. Qualark sockeye comparison
c) Stock proportions
d) Environmental conditions
e) Observations from the watershed

DFO
3) Assessments

PSC Staff
4) Other Business

Panel
a) Weekly Report
5) Next FRP Meeting, Tuesday September 19, 11:00 a.m. via Zoom Webinar

Panel

2023 Run status of Fraser sockeye and pink salmon
Date: Sep. 15, 2023
The information presented in this distribution has been prepared by PSC Secretariat staff and should be considered preliminary until reviewed by the Fraser River Panel

| Week of: Sep. 10-Sep. 16, 2023 | Sockeye |  |  |  |  | Pink <br> Total <br> Fraser |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Management Group |  |  |  | Total <br> Fraser |  |
|  | E.Stuart | E.Summer | Summer | Late |  |  |
| Mission passage (inclds Pitt, Alouette, Coquitlam) | 40,900 | 322,700 | 905,100 | 309,800 | 1,578,500 | 7,510,800 |
| Catch downstream of Mission | 200 | 3,900 | 10,800 | 4,000 | 18,900 | 846,200 |
| Accounted Run To Date | 41,100 | 326,600 | 915,900 | 313,800 | 1,597,400 | 8,357,000 |
| Run size adopted in-season ${ }^{2}$ | 41,000 | 335,000 | 950,000 | 280,000 | 1,606,000 | 15,000,000 |
| Run size forecasted pre-season | 23,000 | 186,000 | 1,167,000 | 188,000 | 1,564,000 | 6,135,000 |
| Area 20 timing adopted in-season | 2/Jul | 26/Jul | 13/Aug | 17/Aug | 8/Aug | 20/Aug |
| Area 20 timing expected pre-season | 7/Jul | 6/Aug | 17/Aug | 24/Aug | 16/Aug | 25/Aug |
| Johnstone Str. Diversion Rate |  | Annual average to date |  |  | 67\% | 35\% |
|  |  | Preseason forecast of annual rate: |  |  | 67\% | 62\% |

For pink salmon the accounted run-to-date is a reconstruction-based estimate.
${ }^{2}$ Run sizes are usually not adopted until after the peak of the run has passed through marine test fishery areas in Juan de Fuca and Johnstone straits.


* Alaska data are processed post-season and so are unavailable in-season.
** Includes Qualark
*** All catches in marine areas and in the Fraser River downstream of Mission.
**** May include unauthorized directed retention or unauthorized bycatch retention in fisheries directed
at other species


[^0]

## 2023 Fraser Pink Test Fishing \& Escapement Summary

| Area/Gear <br> Location <br> From A20 | Fraser River |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A29-13 GN | A29-16 GN | Whon CPUE |  | Qualark |  | Missio | acoustics | Hell's Gate |
|  | Cottonwood | Whonnock | Estimate | GN Catch | Estimate ${ }^{1}$ | Method ${ }^{2}$ | Estimate ${ }^{3}$ | Method ${ }^{4}$ | Estimates ${ }^{5}$ |
| 24-Aug | 34 | 17 | 1.31 | 2 (3 sets) | 7,571 | RB+LB | 120,190 | A1+S1+M2+A2 | 4,290 |
| 25-Aug | 26 | 23 | 1.81 | 7 | 12,565 | RB+LB | 56,460 | A1+S1+M2+A2 | No Count |
| 26-Aug | 14 | 46 | 3.68 | 41 | 51,300 | RB+LB | 62,410 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | No Count |
| 27-Aug | 50 | 40 | 3.05 | 45 | 71,734 | RB+LB | 70,460 | A1+S1+M2+A2 | 31,780 |
| 28-Aug | 48 | 60 | 4.81 | 27 | 44,094 | RB+LB | 154,870 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | No Count |
| 29-Aug | 145 | 80 | 6.35 | 43 | 41,317 | RB+LB | 239,120 | A1+S1+M2+A2 | 51,240 |
| 30-Aug | 97 | 92 | 7.32 | 66 | 61,206 | RB+LB | 302,670 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | 44,450 |
| 31-Aug | 137 | 34 | 2.58 | 52 | 126,025 | RB+LB | 243,740 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | 35,060 |
| 1-Sep | 130 | 88 | 7.04 | 62 | 263,386 | RB+LB | 218,060 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | No Count |
| 2-Sep | 86 | 226 | 18.08 | 71 | 261,637 | RB+LB | 564,750 | A1+S1+M2+A2 | 307,070 |
| 3-Sep | 14 | 118 | 9.44 | 40 | 174,053 | RB+LB | 751,580 | A1+S1+M2+A2 | 293,070 |
| 4-Sep | 42 | 165 | 13.20 | 54 | 328,619 | RB+LB | 559,760 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | 275,210 |
| 5-Sep | 91 | 73 | 5.84 | 52 | 373,026 | RB+LB | 324,300 | A1+S1+M2+A2 | 250,940 |
| 6-Sep | 78 | 48 | 3.86 | 36 | 354,913 | RB+LB | 216,380 | A1+S1+M2+A2 | 276,850 |
| 7-Sep | 80 | 34 | 2.68 | 38 | 313,590 | RB+LB | 295,310 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | 411,600 |
| 8 -Sep | 73 | 139 | 11.12 | 44 | 181,620 | RB+LB | 275,260 | A1+S1+M2+A2 | No Count |
| 9-Sep | 94 | 222 | 17.76 | 90 | 177,116 | RB+LB | 246,460 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | 345,040 |
| 10-Sep | 140 | 297 | 23.76 | 87 | 175,596 | RB+LB | 340,690 | A1+S1+M2+A2 | 398,960 |
| 11-Sep | 62 | 280 | 22.22 | 36 | 152,836 | RB+LB | 615,700 | A1+S1+M2+A2 | 151,880 |
| 12-Sep | 22 | 246 | 19.70 | 23 | 155,582 | RB+LB | 659,780 | A1+S1+M2+A2 | 152,130 |
| 13-Sep | 54 | 74 | 5.96 | 42 | 180,082 | RB+LB | 529,940 | A1+S1+M2+A2 | 125,770 |
| 14-Sep | 27 | 35 | 2.56 |  |  |  | 254,320 | $\mathrm{A} 1+\mathrm{S} 1+\mathrm{M} 2+\mathrm{A} 2$ | No Count |

[^1]

Date: 15/Sep/23

\begin{tabular}{|crr|}
\hline \& \multicolumn{4}{l|}{ ` } <br>

\hline \& \multicolumn{2}{l|}{| Common |
| :--- |
| Days |} <br>

\hline Mission projection \& $1,192,156$ \& $1,180,027$ <br>
Qualark estimate \& $1,452,662$ \& $1,452,662$ <br>
\hline \& Difference \& $\mathbf{- 2 7 2 , 6 3 5}$ <br>
\& \%Difference \& $(23 \%)$ <br>
\hline
\end{tabular}




2023 Fraser River Sockeye Salmon Stock identification Review
Recent stock composition estimates for sockeye salmon

|  |  |  |  |  |  |  |  |  |  | Fra | r-only S | ock Pr | portions | by Repo | ring Gr | $u^{4}$ (\%) |  |  |  |  | Age (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | Early Stuart |  |  | arly Summ |  |  |  |  | Summe |  |  |  | Lat |  |  | Overall Stocks |
| Area/Gear ${ }^{1}$ | Fishing <br> Sector ${ }^{2}$ | Date | $\text { Type }{ }^{3}$ | Sample <br> Size ( n ) | \%Fraser | Early Stuart | Chilli- <br> wack | Pitt <br> Alouette <br> Coquit- <br> lam | Nadina <br> Bowron <br> Gates <br> Nahat- <br> latch <br> Taseko | Early Thompson | Early Summer subtotal | Harri- <br> son <br> Widg <br> eon | Late <br> Stuart <br> Stellako | Chilko Quesnel | Raft <br> North <br> Thomp- <br> son | Summer subtotal | Birken- <br> head <br> Big <br> Silver |  | Weaver Cultus | Late subtotal | Age-4 ${ }_{2}$ |
| Johnstone S | ait \& Que | n Charlotte | rait |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Juan de Fuca | Strait \& | ashington 8 | ther |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| In-river |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hop-Qua gn | tf | Sep7-10 | DNA | 26 | 100\% | 0\% |  |  |  |  | 0\% |  | 3\% | 71\% | 8\% | 82\% |  | 18\% |  | 18\% | NA |
| $A B \mathrm{gn}$ | tf | Sep7-10 | DNA | 19 | 100\% | 0\% |  |  |  |  | 0\% |  | 3\% | 12\% | 5\% | 20\% | 41\% | 6\% | 32\% | 80\% | 50\% |
| $A B \mathrm{gn}$ | tf | Sep11-13 | DNA | 10 | 100\% | 0\% |  |  |  |  | 0\% |  | 9\% | 42\% | 20\% | 72\% | 18\% |  | 10\% | 28\% | 78\% |
| BB gn Cot | tf | Sep11-13 | DNA | 10 | 100\% | 0\% |  |  |  | 0\% | 0\% | 10\% | 15\% | 35\% |  | 59\% | 11\% | 11\% | 19\% | 40\% | 80\% |

Annual Length of Fraser River Pink Salmon


| Observed Fraser River Temperature at Qualark for 14-Sep | $17.1^{\circ} \mathrm{C}$ |
| :--- | :---: |
| Average (1991-2020) Historical Temperature on this day | $15.5^{\circ} \mathrm{C}$ |
| Deviation from Average | $1.6^{\circ} \mathrm{C}$ |
| Forecast Temperature for $\quad$ 20-Sep-23 | $15.9^{\circ} \mathrm{C}$ |

The forecast in Kamloops and Prince George is for variable air temperature.

| Observed Fraser River Discharge at Hope for 14-Sep | $1291 \mathrm{~m}^{3} \cdot \mathrm{~s}^{-1}$ |
| :--- | :---: |
| Average (1991-2020) Historical Discharge on this day | $2146 \mathrm{~m}^{3} \cdot \mathrm{~s}^{-1}$ |
| \% above or below Historical Discharge | $-40 \%$ |
| Forecast Discharge for $\quad$ 20-Sep-23 | $1196 \mathrm{~m}^{3} \cdot \mathrm{~s}^{-1}$ |
| The forecast in Kamloops is for 7 mm of precipitation. The forecast in Prince George <br> is for 22 mm of precipitation. |  |



## Discharge Legend

- Mean Dis (1991-2020)
--- +/- sd
- Min Dis (1991-2020)
- Max Dis (1991-2020)
- Current Dis
- Forecast Dis
- E.Stuart Threshold $\left(\mathrm{m}^{3} \cdot \mathrm{~s}^{-1}\right)^{1}$
- E.Summer Threshold $\left(\mathrm{m}^{3} \cdot \mathrm{~s}^{-1}\right)^{11}$

[^2]| Upriver of Slide | Map \# | Current Temperatures 13-Sep | Daily Mean | Historic Mean | Deviation from Historical Mean | Historic Year Range |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fraser River Mainstem |  |  |  |  |  |  |
|  | 1 | Fraser River @ Qualark | 17.0 | 15.7 | 1.3 | 1991-2020 |
|  | 2 | Fraser River @ Texas Creek | 15.9 | 15.0 | 0.9 | 2006-2022 |
|  | 3 | Fraser River @ Big Bar Creek | NA | NA | NA | 2019-2022 |
| - | 4 | Fraser River @ Marguerite | 15.9 | 14.5 | 1.4 | 2015-2022 |
| - | 5 | Upper Fraser @ Shelley | 13.5 | 11.6 | 1.9 | 1994-2022 |
| Fraser River Tributaries |  |  |  |  |  |  |
|  | 6 | Thompson R. @ Ashcroft | 18.1 | 17.1 | 1.1 | 1995-2022 |
|  | 7 | South Thompson @ Chase | 18.5 | 17.9 | 0.6 | 1994-2022 |
|  | 8 | North Thompson @ McLure | 15.6 | 13.5 | 2.1 | 2006-2022 |
| - | 9 | Quesnel R. @ Quesnel | 16.3 | 14.9 | 1.4 | 2000-2022 |
| - | 10 | Nechako R. @ Isle Pierre | 15.2 | 15.1 | 0.1 | 2006-2022 |
| - | 11 | Stuart R. @ Ft. St. James | 15.2 | 14.5 | 0.7 | 2000-2022 |



## Pink In-season Update

## September 15, 2023

## Current Trends - Mission Passage

- Current run size estimate based on Mission escapement to date plus seaward catch is now over 10 million ( 10.8 million)
- The historical percent Mission escapement remaining to come after September 14 ranges from 4-39\%.
- Figure courtesy of: FRP Application (shinyapps.io)



## Pink Salmon Run Size Weight of Evidence

| Default Run Size Method: Time Density Model |  |  |  |
| :--- | :--- | :--- | :--- |
| $<10 \mathrm{M}$ |  | 10-20M |  |
|  | $\square \square$ | $\square \square$ |  |
| $\square$ | $\square \square 20 \mathrm{M}$ |  |  |


| $\square$ Default run size estimate = Time Density Model |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\square$ Pre-season alternative run size estimate |  |  |  |  |  |
| $\square \mathrm{In}$-season alternative run size estimate |  |  |  |  |  |
| Models |  | Description |  | Category | In-season model? |
| PreSeason Forecast | $\square$ | Recruits per spawner (mean) |  | < $=10 \mathrm{M}$ | no |
| Time Density Model |  | Bayesian fit to CPUE*EL data | (300 expansion line) | 10-20M | yes |
| SST Regression | $\square$ | June SST at Pine Island vs. run |  | <=10M | no |
| Average CPUE | $\square$ | Short-term average CPUE vs. run | size (Aug 20 Area 20 date) | >20M | yes |
| Cumulative Escapement | $\square$ | Cumulative Mission regressio | date plus catch | 10-20M | yes |
| Power(fry) forecast | $\square$ | Recruits per spawner |  | 10-20M | no |
| Timing-based | $\square$ | Double the CPUE* 150 EL at as | med 50\% date (Aug 20) | >20M | yes |

## 2023 Fraser River run size and timing estimates

The information presented on this page has been prepared by PSC Secretariat Staff. All in-season estimates of run size and timing should be considered draft preliminary estimates unless adopted by the Fraser River Panel.
Preseason forecasts, inseason estimates, and official estimates of run size and associated timing

|  | Run Size |  |  |  |  |  |  | Run size components |  |  |  | Run Timing ${ }^{1}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Inseason |  | Inseason estimate |  | Inseason 80\% $\mathrm{Pls}^{2}$ |  | Method | Catch + Escapement | 6-day Projection ${ }^{3}$ | Seaward Abundance | Migration Delay | Inseason Adopted | Preseason Forecast | Inseason estimate | Inseason 80\% P1s ${ }^{2}$ |  | Method |
|  | Adopted | Forecast |  |  | 10\% PI | $90 \% \mathrm{PI}$ |  |  |  |  |  |  |  |  | 10\% PI | 90\% PI |  |
| Total Fraser sockeye | 1,606,000 | 1,564,000 |  | 1,698,000 |  |  |  | 1,598,000 | 1,000 | 0 | 99,000 | 08-Aug | 16-Aug | 14-Aug |  |  | Recon |
| Early Stuart Run | 41,000 | 23,000 | $\checkmark$ | 41,000 | 41,000 | 41,000 | Recon | 41,000 | 0 | 0 | 0 | 02-Jul | 07-Jul | 02-Jul | 02-Jul | 02-Jul | Recon |
| Early Summer Run | 335,000 | 186,000 | $\checkmark$ | 326,000 | 327,000 | 327,000 | Sum | 327,000 | 0 | 0 | 0 | 26-Jul | 06-Aug | 27-Jul | 27-Jul | 27-Jul | Recon |
| Chilliwack |  | 2,000 | $\checkmark$ | 32,000 | 32,000 | 32,000 | Recon | 32,000 | 0 | 0 | 0 |  | 20-Jul | 05-Jul | 05-Jul | 05 -Jul | Recon |
| Pitt/Nadina Group ${ }^{4}$ |  | 123,000 |  | 247,000 | 247,000 | 247,000 | Recon | 247,000 | 0 | 0 | 0 |  | 05-Aug | 26-Jul | 26-Jul | 26-Jul | Recon |
| Early Thompson ${ }^{5}$ |  | 61,000 |  | 48,000 | 48,000 | 48,000 | Recon | 48,000 | 0 | 0 | 0 |  | 09-Aug | 05-Aug | 05-Aug | 05-Aug | Recon |
| Summer Run | 950,000 | 1,167,000 | $\checkmark$ | 917,000 | 916,000 | 916,000 | Sum | 916,000 | 0 | 0 | 0 | 13-Aug | 17-Aug | 14-Aug | 14-Aug | 14-Aug | Recon |
| Harrison / Widgeon |  | 51,000 | $\checkmark$ | 41,000 | 41,000 | 41,000 | Recon | 41,000 | 0 | 0 | 0 |  | 12-Aug | 02-Aug | 30-Jul | 05-Aug | Model |
| Late Stuart / Stellako |  | 196,000 |  | 152,000 | 152,000 | 152,000 | Recon | 152,000 | 0 | 0 | 0 |  | 13-Aug | 12-Aug | 12-Aug | 12-Aug | Recon |
| Chilko |  | 591,000 |  | 573,000 | 573,000 | 573,000 | Recon | 573,000 | 0 | 0 | 0 |  | 17-Aug | 14-Aug | 14-Aug | 14-Aug | Recon |
| Quesnel |  | 319,000 |  | 122,000 | 122,000 | 122,000 | Recon | 122,000 | 0 | 0 | 0 |  | 19-Aug | 14-Aug | 14-Aug | 14-Aug | Recon |
| Raft / North Thompson |  | 10,000 |  | 28,000 | 28,000 | 28,000 | Recon | 28,000 | 0 | 0 | 0 |  | 23-Aug | 17-Aug | 17-Aug | 17-Aug | Recon |
| Late Run | 280,000 | 188,000 |  | 414,000 | 374,000 | 463,000 | Sum | 314,000 | 1,000 | 0 | 99,000 | 17-Aug | 24-Aug | 18-Aug | 16-Aug | 19-Aug | Weight |
| Birkenhead Group |  | 92,000 | $\checkmark$ | 217,000 | 216,000 | 220,000 | Recon(2) | 216,000 | 1,000 | 0 | 0 |  | 24-Aug | 18-Aug | 18-Aug | 18-Aug | Recon(2) |
| L.Shuswap / Weaver Gr. |  | 96,000 | $\diamond$ | 197,000 | 158,000 | 243,000 | Recon(2) | 98,000 | 0 | 0 | 99,000 |  | 24-Aug | 17-Aug | 13-Aug | 20-Aug | Marine N |
| Fraser Pink salmon | 15,000,000 | 6,135,000 |  | 15,000,000 | 7,875,000 | 23,475,000 | Wt. of Evid. | 8,357,000 |  | 6,643,000 |  | 20-Aug | 25-Aug | 21-Aug | 19-Aug | 23-Aug | Model |

${ }^{1}$ Run timing refers to the date when $50 \%$ of the run migrated past the Area 20 reference point.
$80 \%$ Probability Interval: there exists an $80 \%$ chance that the true abundance lies within this interval
${ }^{3}$ Normally based on test fishery data. Based on Model if Method $=$ Recon(2).
${ }^{4}$ Pitt / Alouette / Coquitlam / Nadina / Bowron / Gates / Nahatlatch / Taseko
${ }^{5}$ Early South Thompson / North Barriere.

## Run Size Uncertainty Legend ${ }^{\dagger}$

$\checkmark \geq 95 \%$ of the run size has been accounted for in catch + escapement. Clear indication of run size; minor run size updates still expected

- $\geq 70 \%$ of the run size has been accounted for in catch + escapement. Good indication of run size; peak fo the run has been observed at Mission, uncertainty relates to seaward abundance
- $\geq 50 \%$ of the run size has been accounted for in catch + escapement. Decent indciation of run size; $\geq 50 \%$ confirmed at Mission
$\diamond<50 \%$ of the run size has been accounted for in catch + escapement. Uncertain or early indciation of run size based on marine data
${ }^{\dagger}$ The Run Size Uncertainty Indicator is a categorical indication of the degree of uncertainty present in the run size estimate. Estimates are categorized quantitatively based on the proportion of the run that has been accounted for with high certainty in catch + escapement


[^0]:    ${ }^{1}$ Qualark escapement estimate - does not include Chilliwack, Pitt, Harrison, Birkenhead, Big Silver, Weaver, and Cultus
    ${ }^{2}$ Qualark source:
    ${ }^{3}$ Mission escapement estimate - does not include Pitt
    ${ }^{4}$ Mission source:
    CPUE-Wh-Avg = 3-day average Whonnock CPUE x Expansion line
    ${ }^{5}$ Daily Hells Gate abundance estimate; actual daily count has been expanded.

[^1]:    ${ }^{1}$ Qualark escapement estimate - does not include Chilliwack, Pitt, Harrison, Birkenhead, Big Silver, Weaver, and Cultus
    ${ }^{2}$ Qualark source:
    ${ }^{3}$ Mission escapement estimate - does not include Pitt
    ${ }^{4}$ Mission source:
    A1 + S1 + M2 + A2 $=$ Left-bank ARIS (A1) + Left bank split-beam (S1) + Mobile ARIS (M2) + Right-bank ARIS (A2)
    ${ }^{5}$ Daily Hells Gate abundance estimate; actual daily count has been expanded.

[^2]:    Run timing bars represent a 31 day spread of the run centered around the Hell's Gate date. Hell's gate timing is 5 days from Mission for Early Stuart and Late run; and 4 days from Mission for Early Summer and Summer run.'pMA is the proportional increase to spawning escapement targets to help ensure targets are achieved."\%DBE is \%difference betweeen estimates of potential spawning escapement and spawning escapement. ${ }^{*}$ This is the optimum temp for aerobic swimming - $\mathrm{T}_{\text {opt }}$ (Eliason et al. (2011). Science 332: 109-112)**This is the upper range of the optimum temp for aerobic swimming - $T_{\text {pejus. ' }}$ 'Discharge threshold of 8000 cms for Early Stuart from Macdonald (2000). Can. Tech. Rep. Fish. Aquat. Sci. 2315: 120p. "Discharge threshold of 6500 cms for Early Summer run from Macdonald et al. (2010). Trans. Am. Fish. Soc. 139: 768-782. 19 days of T \& Q data are required to calculate a pMA - 15 days before the Hell's Gate Date and 3 days after. MA estimates can be calculated 4 days after the Area 20 date.

