

WIN: 18823.00
 Town: Haynesville
 Route No. US2A
 Asset ID: LC-46921
 Lat: 45.81344 Long: -68.01262

Project Name: culvert replacement - MAP/HCD
 Stream Name: trib to Alder Brook, W. Br. Mattawamkeag R.
 Bridge Name: n.a.
 Analysis by: M. Lickus
 Date: 11/9/2022

Peak Flow Calculations by USGS Regression Equations (Lombard/Hodgkins, 2021; Hodgkins, 1999 & Lombard/Hodgkins, 2015)

Enter data in blue cells only!

	km ²	mi ²	ac
A	3.99	1.54	985.6
W	1.58	0.6	389.3
P _c	577394	5072687	
County	Aroostook S		

Enter data in [mi²]

Watershed Area *DRNAREA*
 Wetlands area (by NWI)

watershed centroid (E, N; UTM 19N; meters)
 choose county from drop-down menu

ver. 2022 Oct 20

Worksheet prepared by:

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Watershed Characteristics from StreamStats

STORAGE	42.90	Storage as %
STORNWI	39.50	NWI Wetlands %
SANDGRAV	0.00	sand & gravel aquifer as decimal fraction of watershed A
ELEV	448.8	mean basin elevation (ft)
BSLDEM10M	2.25	mean basin slope (%)
COASTDIST	107.00	distance from the coast (mi)
ELEVMAX	531.2	maximum basin elevation (ft)
LC06WATER	0	percent of drainage basin land cover as open water
PRECIP	41.9	mean annual precipitation
STATSGOA	12	mean basin percentage of hydrological soil group A

References:

Hodgkins, G.A., 1999.
 Estimating the magnitude of peak flows for streams in Maine
 for Selected Recurrence Intervals
WRIR 99-4008, USGS Augusta, ME

Lombard, P.J. & G.A. Hodgkins, 2015.
 Peak flow regression equations for small, ungaged streams:
 in Maine: Comparing Map-Based to Field-Based Variables
SIR 2015-4059, USGS, Augusta, ME

Lombard, P.J. & G.A. Hodgkins, 2020.
 Estimating Flood Magnitude and Frequency on Gaged and
 Ungaged Streams in Maine
SIR 2020-5092, USGS, Augusta, ME.

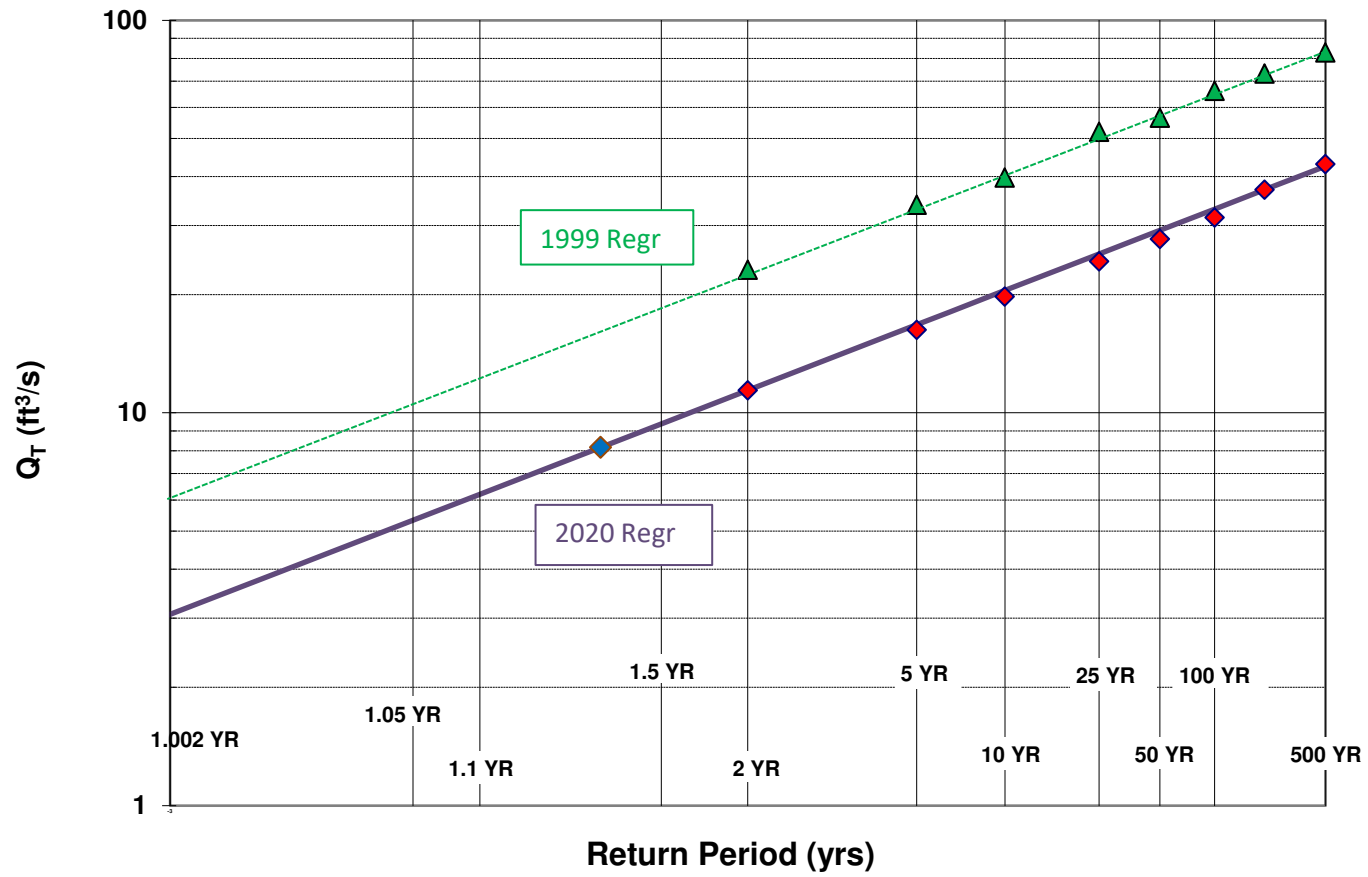
Ret Pd T (yr)	I24	Q _T (ft ³ /s)		Q _T (ft ³ /s) Design
		1999 / 2015	2020	
1.1			6	5
2	2.62	23	11	10
5	3.20	34	16	15
10	3.69	40	20	20
25	4.35	52	24	25
50	4.86	56	28	30
100	5.38	66	31	30
200	5.94	73	37	35
500	6.75	83	43	45

Calculated Bankfull Width: 12.7 ft

Instructions:

Enter values in blue cells only, watershed data from StreamStats
 Copy I24 values from Stream Stats
 Use results under "Design"
 Check against gage data and FEMA studies if available
 Questions? Check with ENV / Hydrology Section

Log-Normal Probability Plot



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DO NOT ENTER ANY DATA ON THIS PAGE; EVERYTHING IS CALCULATED

MAINE MONTHLY MEDIAN FLOWS and HYDRAULIC GEOMETRY BY USGS REGRESSION EQUATIONS (2004, 2013, 2015)

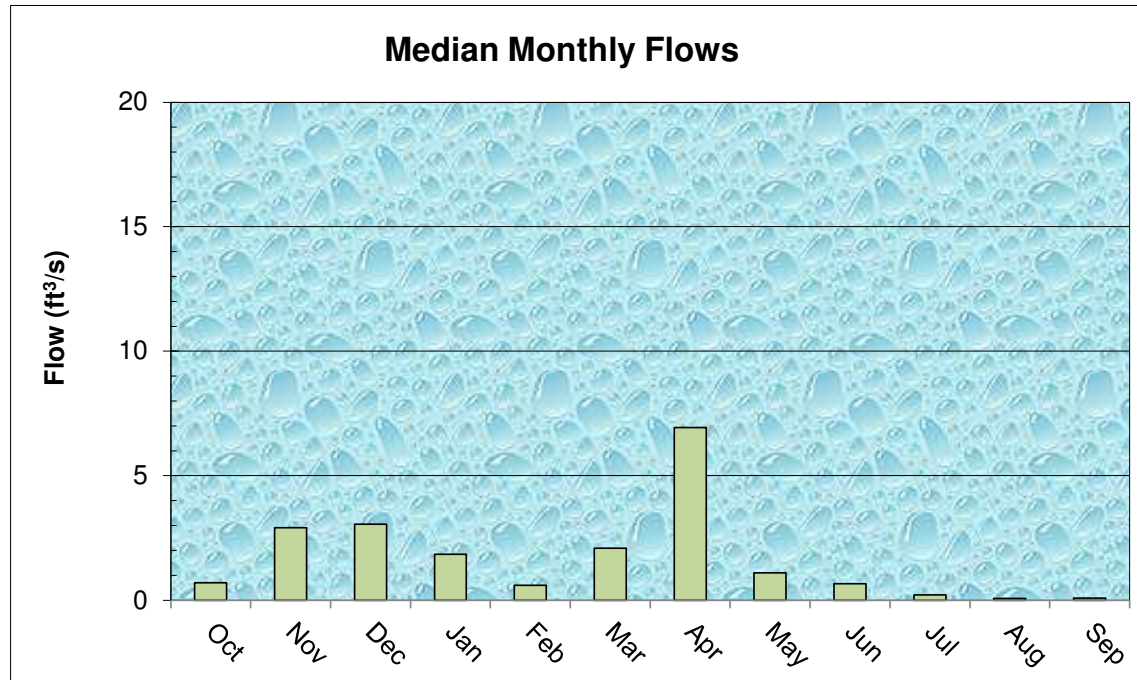
Value	Variable	Explanation
1.54	A	Area (mi ²)
577394.3	P_c	Watershed centroid (E,N; UTM; Zone 19; meters)
106.06	DIST	Distance from Coastal reference line (mi)
41.9	pptA	Mean Annual Precipitation (inches)
0.00	SG	Sand & Gravel Aquifer (decimal fraction of watershed area)

Month	Q_{median} (ft ³ /s)	(m ³ /s)
Jan	1.84	0.0522
Feb	0.60	0.0170
Mar	2.09	0.0593
Apr	6.93	0.1964
May	1.11	0.0313
Jun	0.67	0.0189
Jul	0.21	0.0060
Aug	0.08	0.0022
Sep	0.09	0.0025
Oct	0.70	0.0198
Nov	2.91	0.0825
Dec	3.05	0.0864

Q_{bf}	8.2
ann avg	3.6
ann med	1.4
$Q_{1.002}$	3.1
$Q_{1.01}$	3.9
$Q_{1.05}$	5.3
Q_{bf}	35.1

assume v = 4ft/s

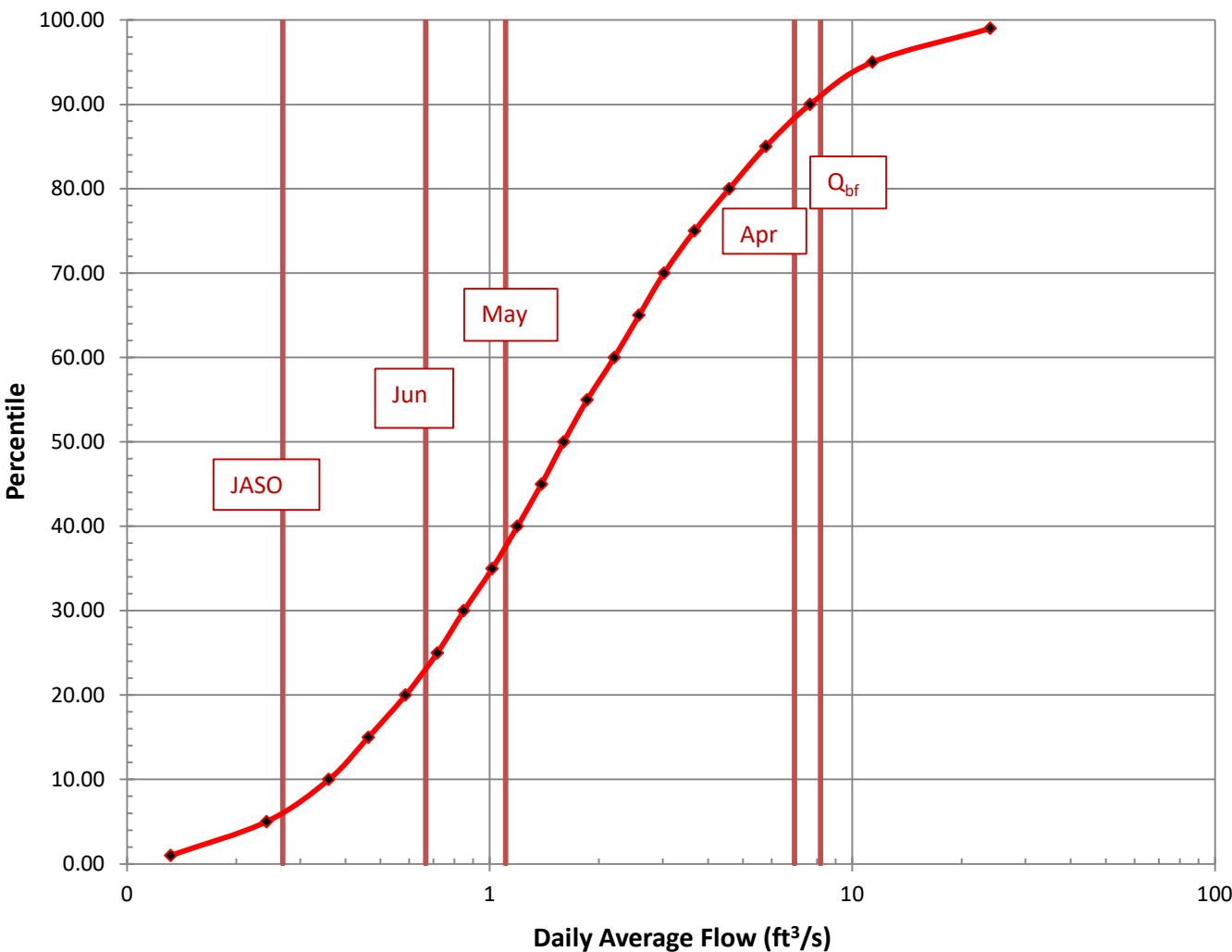
W_{bf}	12.7	estimated bankfull width (ft)
d_{bf}	0.7	estimated bankfull depth (ft)
A_{bf}	6.6	estimated bankfull flow area (ft ²)



References

- Dudley, 2013. FY2013 Progress Report - Phase 1 ..., USFWS QRP Project
- Dudley, 2004. Estimating Monthly Streamflows ... , SIR 2004-5026
- Dudley, 2015. Regression Equations for Monthly & Annual Mean..., USGS SIR 2015-5151

Daily Average Flow Distribution



Daily Avg Flow Dist

$A_{ws} = (mi^2)$ 1.5

$Q (ft^3/s)$

Pctl	Median	84 th pctl
1.00E-06	0.00	0.00
1	0.13	0.23
5	0.24	0.39
10	0.36	0.54
15	0.46	0.68
20	0.59	0.82
25	0.72	0.96
30	0.85	1.09
35	1.02	1.25
40	1.19	1.44
45	1.39	1.63
50	1.60	1.92
55	1.86	2.23
60	2.21	2.62
65	2.58	3.06
70	3.03	3.57
75	3.67	4.29
80	4.58	5.12
85	5.78	6.56
90	7.65	8.81
95	11.35	13.70
99	24.01	31.61

Q_{bf}	8.2
$Q_{1.002}$	3.1
$Q_{1.1}$	6.2
Q_2	11.4

