

DIVISION OF MINING, LAND AND WATER
WATER RESOURCES SECTION
www.dnr.state.ak.us/mlw/water/index.htm



Anchorage Office 550 West 7 th Avenue, Suite 1020 Anchorage, AK 99501-3562 (907) 269-8588 Fax: (907) 269-8947		For ADNR Use Only Date/Time Stamp
For ADNR Use Only LAS #	For ADNR Use Only CID #	For ADNR Use Only Receipt Type WR

APPLICATION FOR RESERVATION OF WATER

INSTRUCTIONS
<ol style="list-style-type: none"> 1. Complete one application per stream segment or water body (incomplete applications will not be accepted). 2. Attach legible map(s) indicating all sections from the beginning to the end of stream segment or for all parts of the lake or water body. 3. Submit non-refundable fee of \$1,500. 4. Attach extra pages for each section, as needed.

APPLICANT INFORMATION			
Organization Name (if applicable) _____		Agent or Consultant Name (if applicable) _____	
Individual Applicant Name (if applicable) _____		Individual Co-applicant Name (if applicable) _____	
Mailing Address _____	City _____	State _____	Zip Code _____
Daytime Phone Number _____		Alternate Phone Number (optional) _____	
Fax Number (optional) _____		E-Mail Address (optional) _____	

LOCATION OF PROPOSED RESERVATION OF WATER					
Geographic Name of Waterbody _____					
Meridian	Township	Range	Section	Quarter Sections	
				1/4	1/4
				1/4	1/4

Describe the location of the point or points defining the boundary of the proposed reservation of water by river mile index, river mile, geographical or cultural landmark, etc., on the stream or water body.

Attach a US Geological Survey map at 1:63,360 scale, or 1:250,000 scale if 1:63,360 scale is unavailable for the area, clearly identifying the following for the proposed reservation of water:

1. Sections, townships, range and meridians
2. The stream or water body in which the reservation of water is proposed
3. Specific point or points defining the boundary of the proposed reservation of water
4. Permanent, temporary or planned locations of water measurement devices (such as gaging stations, weirs, staff gages)
5. Permanent, temporary or planned bench marks

WATER USE

Identify the purpose(s) of the proposed reservation of water by checking the appropriate box(es).

- Protection of fish and wildlife habitat, migration, and propagation
- Recreation and park purposes
- Navigation and transportation purposes
- Sanitary and water quality purposes

Describe in detail the purpose(s) of the proposed reservation, including, when appropriate, species and life stage, type of recreation, vehicle, or water quality parameter, or other relevant information.

Is the water currently being used for the purpose(s) applied for?

Yes

No If no, when will use for this purpose begin? Specify approximate date _____

WATER QUANTITY

Water requested to be reserved – **Check one**

- To maintain a specific instream flow rate, measured in cubic feet per second
- To maintain a specific amount of surface water, measured in cubic feet or acre feet
- To maintain a specific surface water elevation, measured in relation to a permanent benchmark

Quantify the specific amount of water requested to be reserved. Identify and quantify, as appropriate, flow rates, quantities, surface water elevations, depths, etc., as they relate to the requested time periods of the year during which the reservation is proposed. Include any flow release schedules from projects upstream of the proposed reservation that would be necessary.

METHODOLOGY AND MONITORING

Attach and submit with this application documentation or reports showing facts to support the following:

- (a) The need for the proposed reservation of water, including reasons why the reservation is being requested.
- (b) Identify and describe the methodology, data, and data analysis used to substantiate the need for and the quantity of water requested for the proposed reservation of water, including:
 - 1. Name and description of method used
 - 2. Who conducted the study and analysis
 - 3. Schedule of when data collection and analysis occurred
 - 4. Type(s) of instrument(s) used to collect and analyze data
 - 5. Description of data and how the data were collected, including when applicable, (A) selection of stream reach, study site and transect selection, (B) flow, survey, elevation, and depth measurements, (C) pertinent physical, biological, water chemistry and socio-economic data
 - 6. Description of how data were analyzed, and
 - 7. Maps, photos, aerial photos, calculations, and any other documents supporting this application

If there are provisions for monitoring this proposed reservation of water, include the following:

- (a) Description of monitoring equipment (such as gaging stations, staff gages, weirs)
- (b) Location of monitoring equipment
- (c) Provisions for payment for monitoring
- (d) Reporting system

11 AAC 93.142 sets out the required information on the application for a reservation of water. 11 AAC 93.143 authorizes the commissioner to decide what additional information needed to process an application for a reservation of water. This information is made a part of the state public water records and becomes public information under AS 40.25.110 and 40.25.120. Public information is open to inspection by you or any member of the public. A person who is the subject of the information may challenge its accuracy or completeness under AS 44.99.310, by giving a written description of the challenged information, the changes needed to correct it, and a name and address where the person can be reached. False statements made in an application for a benefit are punishable under AS 11.56.210.

SIGNATURE

The information presented in this application is true and correct to the best of my knowledge.

Signature

Date

Name (please print)

Title (if applicable)

Fee required by regulation 11 AAC 05.010(a)(8)

- **\$1,500** for up to 40 hours of staff time

Make checks payable to "Department of Natural Resources."

LOCATION OF PROPOSED RESERVATION OF WATER

Meridian	Township	Range	Sections
Copper River	73S	82E	16

Threemile Creek is a tributary to Klawock Lake near the town of Klawock on Prince of Wales Island in Southeast Alaska (Figure 1). This proposed reservation of water applies to stream flows within an unnamed tributary of Threemile Creek, one of four reaches within the Threemile Creek watershed for which ADF&G has submitted a reservation of water application. This unnamed reach begins at the downstream end of Anadromous Water Catalog (AWC) Stream Number 103-60-10470-2071-3045 and extends upstream to the upper extent of the AWC at river mile 0.50 (Figure 2). Stream reach boundaries were selected to ensure fish were present and to minimize the differences in flows (from accretion or reduction) within the reach. Reach boundaries were based on U.S. Geological Survey (U.S. Geological Survey, 1962) topographic maps.

Threemile Creek flows in a southwesterly direction before entering the northeast side of Klawock Lake (Figure 2). The surface elevation of Klawock Lake is 9.1 m, a total surface area of 11.9 km², a mean depth of 17.7 m, and a maximum depth of 49 m (Conitz 2010). The landscape surrounding Threemile Creek and Klawock Lake is primarily influenced by a maritime climate with an average Jan temp of 39°F and average July temp of 55°F and an average annual precipitation of 88 inches.

WATER USE

The primary purpose of this proposed reservation is to protect fish habitat, migration and propagation within Threemile Creek and its watershed. This reach has been specified as important to anadromous fish (under AS 16.05.871) as Anadromous Water Catalog stream number 103-60-10470-2071-3045 by the Alaska Department of Fish and Game (Johnson and Blanche 2011). Coho salmon (*Oncorhynchus kisutch*), pink salmon (*O. gorbuscha*), sockeye salmon (*O. nerka*), cutthroat trout (*O. clarki*), and Dolly Varden (*Salvelinus malma*) utilize Threemile Creek for a portion of, or all of their spawning, incubation, rearing, and passage life phases (S. McCurdy, Sport Fish Biologist, ADF&G, Craig, 2006, personal communication; Figure 3). These species contribute to sport and commercial (K. Monagle Commercial Fisheries Biologist, ADF&G, Douglas, 2003, personal communication) fisheries in the area and provide recreational opportunities and values as well. Water of sufficient quantity is needed to sustain production of these valuable fisheries.

WATER QUANTITY

Requested instantaneous flows in cubic feet per second (cfs) to be reserved:

Time Period	Requested Reservation Flows (cfs)
January	10
February	5.7

March	5.0
April	7.4
May	13
June	14
July	11
August	9.4
September	17
October	15
November	13
December	11

METHODOLOGY AND MONITORING

Procedures used to prepare this reservation complied with reservation of water application instructions and requirements established by state law (AS 46.15.145) and regulations (11 AAC 93.141-147), and relevant portions of the *"State of Alaska Instream Flow Handbook"* (DNR 1985).

Requested flows were based primarily on flow duration analyses (Annear et al. 2004). Flow requests were developed with seasonal flow variability that mimicked the natural hydrograph. This approach provided a basis to mimic natural seasonal flows to which fish and other aquatic fauna have adapted to and are dependent upon (Hynes 1970; Estes 1984; Estes and Orsborn 1986; Poff et al. 1997; Richter et al. 1997; Stewardson and Gippel 2003; Annear et al. 2004; Lytle and Poff 2004; Arthington et al. 2006).

Hydrologic Analyses:

The United States Geological Survey (USGS) operated stream gage 15081610 within Reach B (latitude 55° 32' 06", longitude 132° 57' 17") from March 1, 1999 to September 30, 2003 (Figure 2). ADF&G operated stream gage 11001 at the same location from October 1, 2005 to October 18, 2006. Instantaneous and mean daily flow data from the Threemile Creek Stream Gage 15081610 were obtained from the USGS National Water Information System website (<http://waterdata.usgs.gov/nwis>).

USGS took 10 measurements of instantaneous discharge near the upstream boundary of the unnamed tributary reach (latitude 55°32'36", longitude 132°57'08") at USGS discharge station 15081607 (Figure 2) between September 07, 2000 and April 01, 2003 (Table 1). Instantaneous flow data from discharge station 15081607 were obtained from the USGS National Water Information System website (<http://waterdata.usgs.gov/nwis>).

The 10 instantaneous discharge measurements taken at USGS discharge station 15081607 were regressed against 10 instantaneous discharge measurements taken at USGS stream gage station 15081610 for the corresponding time period (Table 1, Figure 4). The estimated regression parameter was used to predict mean daily flows within the unnamed tributary reach from March

01, 1999 to September 30, 2003 and October 01, 2005 to October 18, 2006 (mean daily flow period of record from USGS stream gage 15081610 and ADF&G stream gage 11001). SAS-based applications¹ were used to generate mean daily, monthly, and annual flow summaries and flow duration values by specified time period.

Flow Duration Analyses:

Duration estimates represent the expected frequency of occurrence of mean daily flows within the specified time periods. The durations of daily mean flows were calculated as the percentiles of the empirical distribution of observed values within the specified time periods over the period of record (Table 2). This provided an estimate of the percentage of time a given mean daily flow was equaled or exceeded within the distribution of mean daily flows for each time period analyzed.

Mean Flow Statistics:

Mean monthly flows were estimated as the mean of monthly mean daily flows for all complete months over the entire period of record (Figure 6 and Table 3). Mean annual flows were estimated as a mean of the annual mean daily flow values for all complete water years of record (Table 4). Mean daily flows are presented in Figure 5 and Table 5.

Reservation of Water:

Sufficient flows are needed to support riverine habitats used by fish and to provide fluvial processes that maintain these habitats. To maintain seasonal uses of habitats by each life history stage, we recommend maintaining a flow regime that mimics the magnitude and timing of the natural flow regime as discussed above. This approach is necessary to meet the needs of species' life history stages that have coevolved and exhibit biological adaptations to the river's flow regime.

In general, flow requests fell within the 25 to 75% exceedance range for the specified time periods. Flows within the 25 to 75% exceedance range are normal hydrologic conditions and should provide flows and habitat conditions to which fish have adapted. Deviations from these levels subject riverine species to conditions that are increasingly uncommon. Flows outside of this range are defined as dry (75 to 100% exceedance) or wet (0 to 25% exceedance) conditions according to the USGS (2009).

Although important for maintaining fish habitat and overall aquatic and riparian productivity, channel maintenance or other high flows were not specified and requested within this application. Channel maintenance flows are gradually ascending and descending and most effectively meet sediment transport thresholds for the full-range of particle sizes. Evidence suggests that bankfull flow approximates the effective discharge in stable stream channels (Andrews 1980; Leopold 1994; Annear et al. 2004). Other types of periodic high flows are

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recognized for their importance to habitat maintenance and support of other environmental and biological needs, such as fish migration cues. Collectively, these flows provide the function and structure of river ecosystems (Annear et al. 2004; Schmidt and Potyondy 2004).

Currently, there is no monitoring of streamflow in Threemile Creek.

REFERENCES

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Stewardson, M.J. and C.J. Gippel. 2003. Incorporating flow variability into environmental flow regimes using the flow events method. *River Research and Applications* 19:459-472.

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U.S. Geological Survey. 2009. <http://waterwatch.usgs.gov/ptile.html>.

Figure 1. Area map, Threemile Creek near Klawock, Prince of Wales Island, Southeast Alaska.

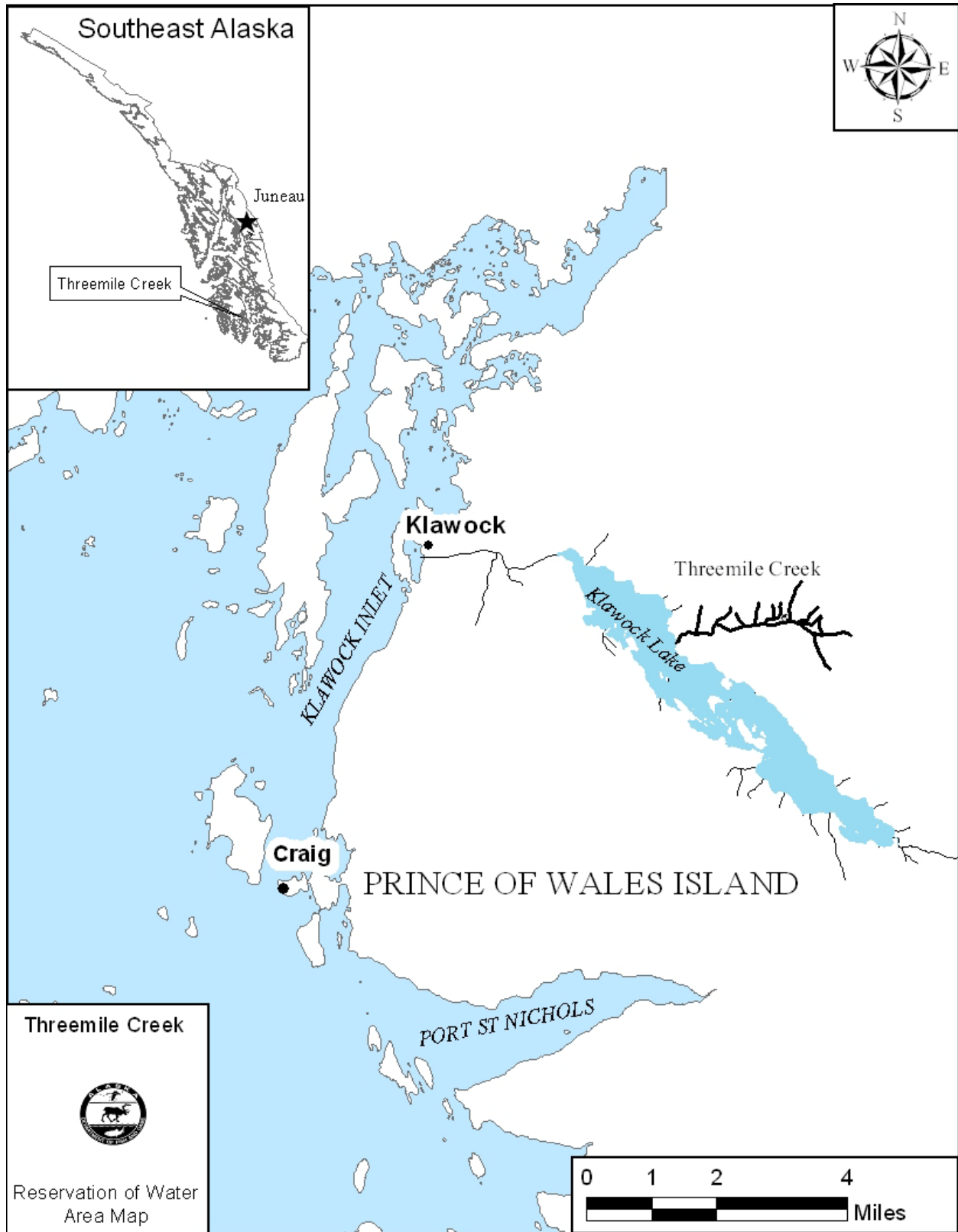


Figure 2. Reservation of Water reach boundaries, Threemile Creek near Klawock, Prince of Wales Island, Southeast Alaska.

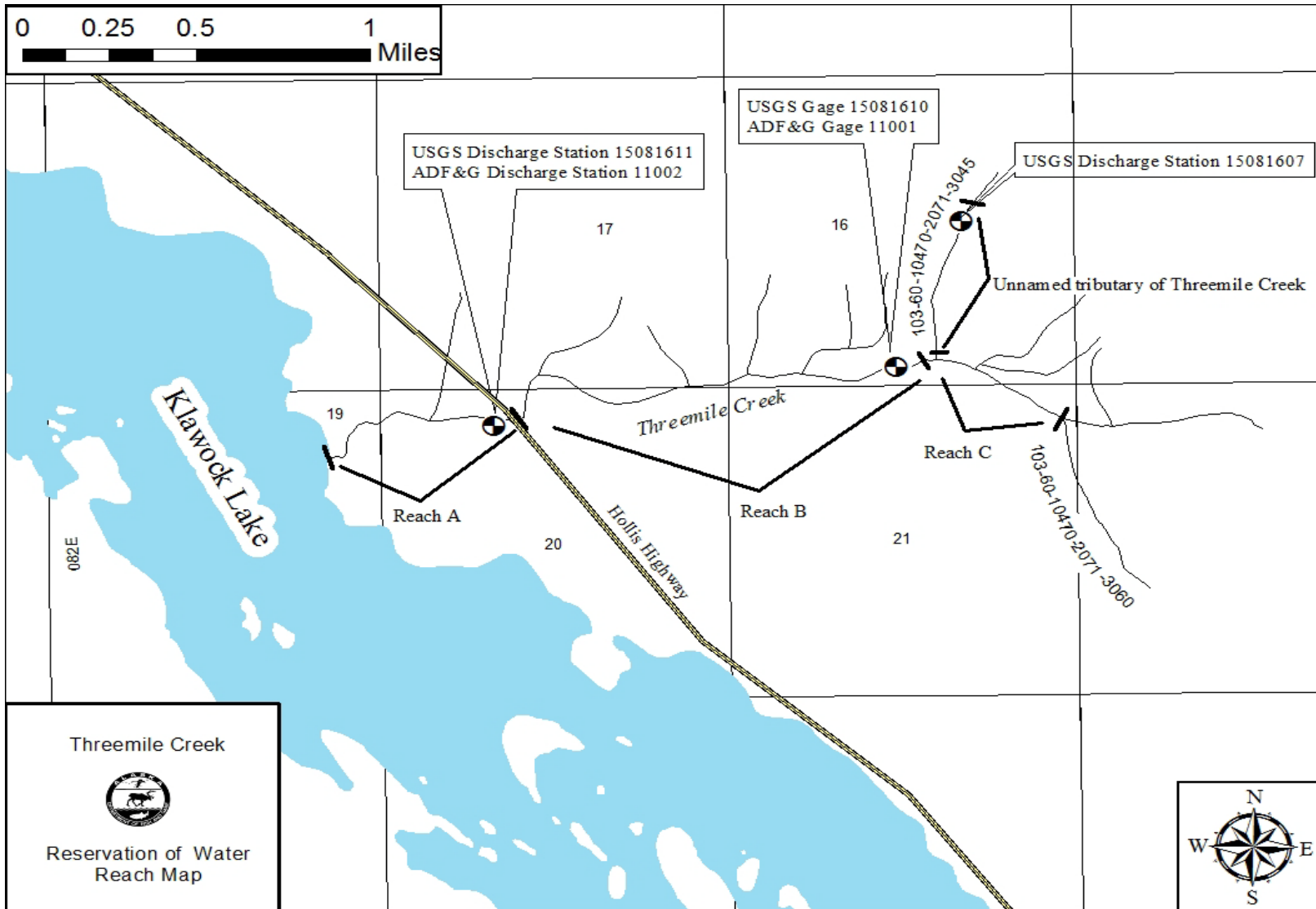


Figure 3. Fish species periodicity chart for Threemile Creek near Klawock, Prince of Wales Island, Southeast Alaska.

Coho Salmon

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Smolt Passage			XX	XXXX	XXXX	XX						
Adult Passage								XXXX	XXXX	XXXX	XX	
Spawning								XX	XXXX	XXXX	XXXX	XX
Incubation	XXXX	XXXX	XXXX	XXXX				XX	XXXX	XXXX	XXXX	XXXX
Rearing	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

Pink Salmon

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fry Passage			XX	XXXX	XXXX	XX						
Adult Passage							XXXX	XXXX	XXXX			
Spawning							XX	XXXX	XXXX	XX		
Incubation	XXXX	XXXX	XXXX	XXXX	XX		XX	XXXX	XXXX	XXXX	XXXX	XXXX
Rearing				XXXX	XX							

Sockeye Salmon

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fry Passage				XXXX	XXXX	XX						
Adult Passage						XX	XXXX	XXXX				
Spawning							XXXX	XXXX	XX			
Incubation	XXXX	XXXX	XXXX	XXXX			XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Rearing	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

Dolly Varden

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Smolt passage *			XXXX	XXXX	XXXX							
Adult passage			XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	
Spawning									XX	XXXX	XX	
Incubation	XXXX	XXXX	XXXX	XXXX	XX				XX	XXXX	XXXX	XXXX
Rearing	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

Cutthroat Trout

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Smolt passage *			XXXX	XXXX	XXXX							
Adult passage			XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	
Spawning				XXX	XXXX	XX						
Incubation				XXX	XXXX	XXXX	XXXX	XX				
Rearing	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

Based upon professional judgment of ADF&G biologists

Smolt passage is for juvenile emigration to estuarine/marine environment

Adult passage: for salmon is immigration: for trout, char, and other species, immigration and emigration.

Incubation life phase includes time of egg deposition to fry emergence

* DV and CT smolt defined as those fish undergoing initial emigration

Figure 4. Simple linear regression relationship between instantaneous discharge (cfs) measured at USGS discharge station 15081607 and instantaneous discharge (cfs) measured at USGS stream gage 15081610 taken over the corresponding time period.

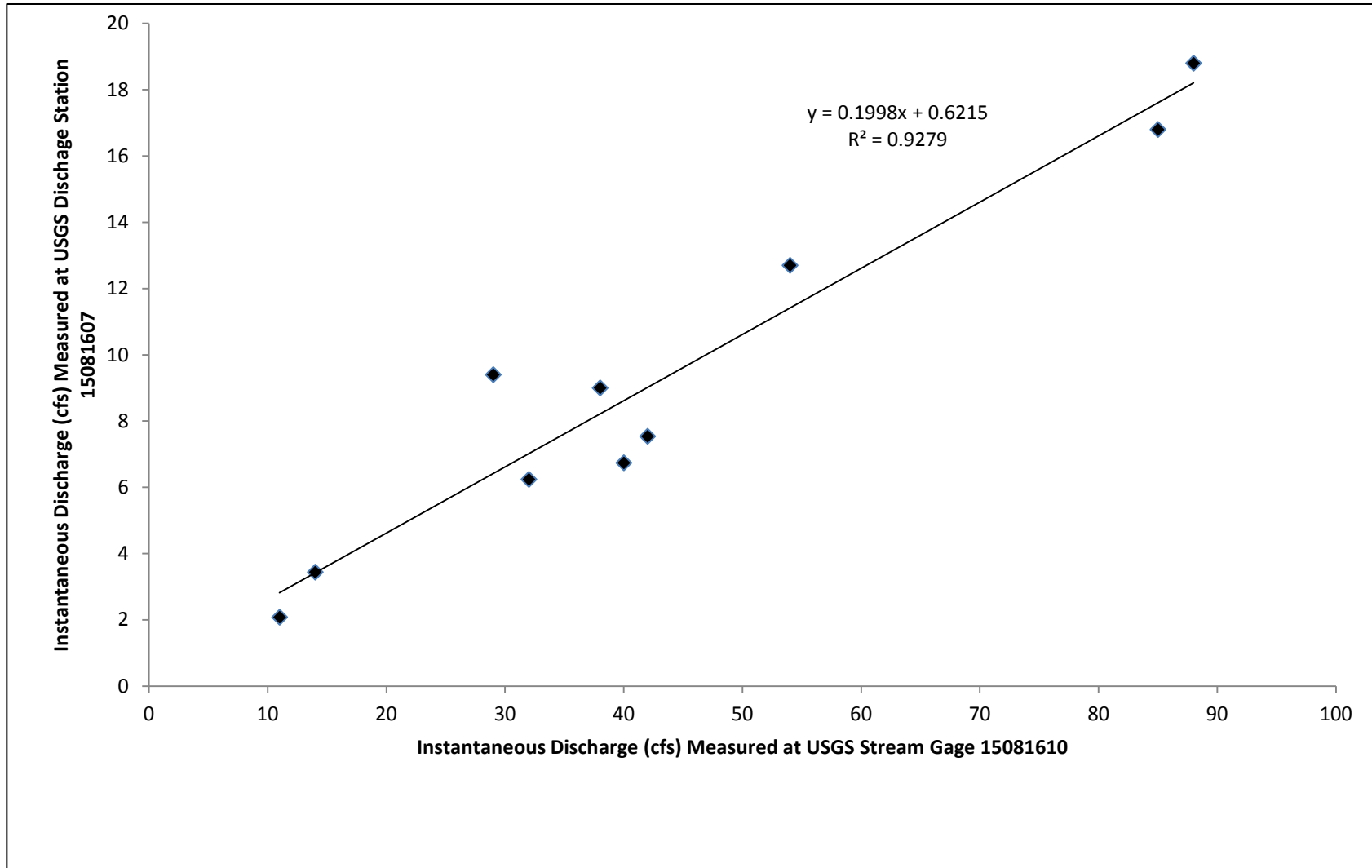


Figure 5. Annual hydrograph of estimated mean daily flows (cfs) for the Threemile Creek unnamed tributary reservation reach. Based on complete water years of record from USGS gage 15081610 (October 1, 1999 to September 30, 2003) and ADFG gage 11001 (October 01, 2005 to September 30, 2006).

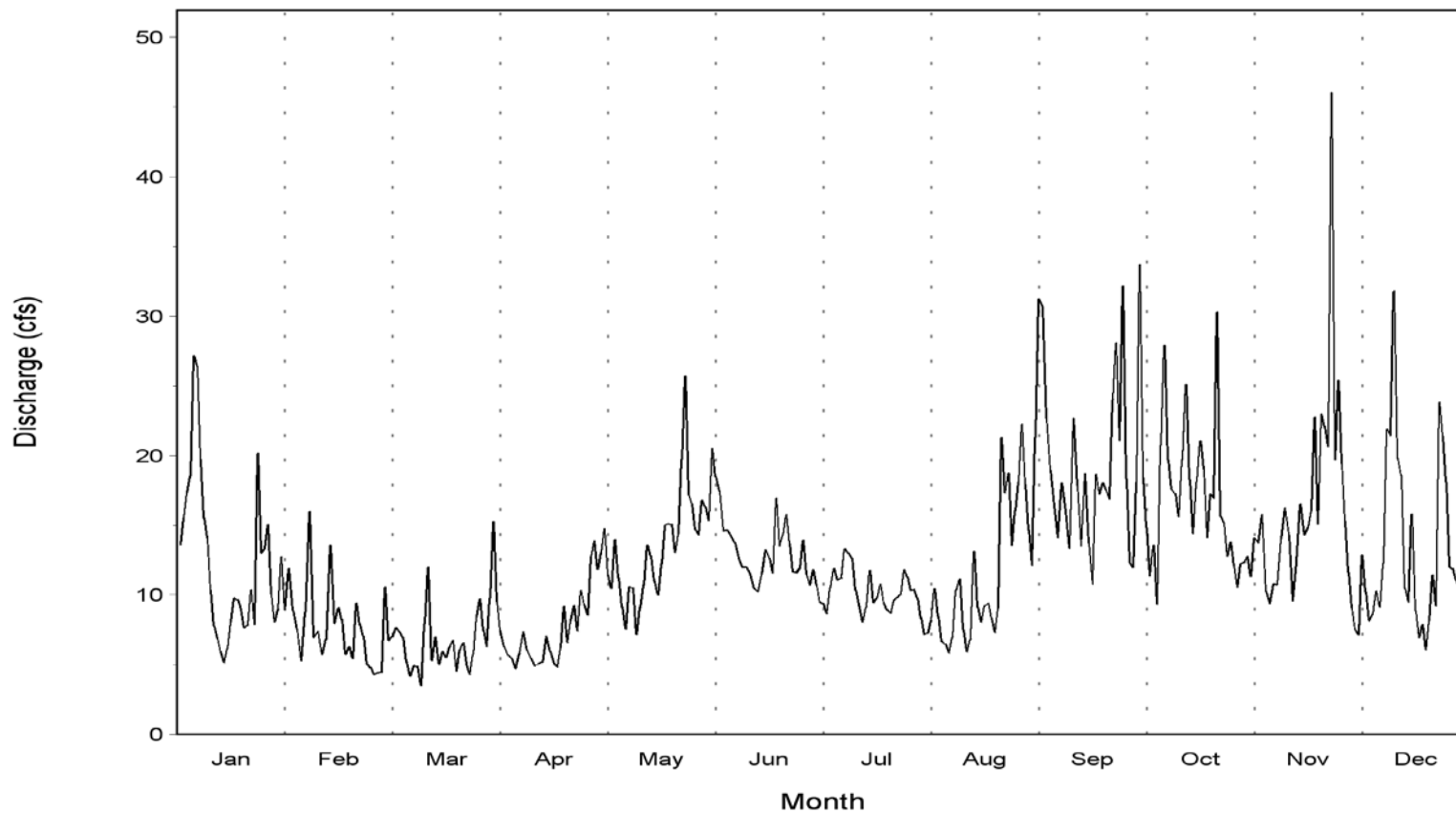


Figure 6. Estimated mean monthly flows and reservation flow requests (cfs) for the Threemile Creek unnamed tributary reservation reach. Based on complete months of record from USGS gage 15081610 (March 01, 1999 to September 30, 2003) and ADFG gage 11001 (October 01, 2005 to September 30, 2006).

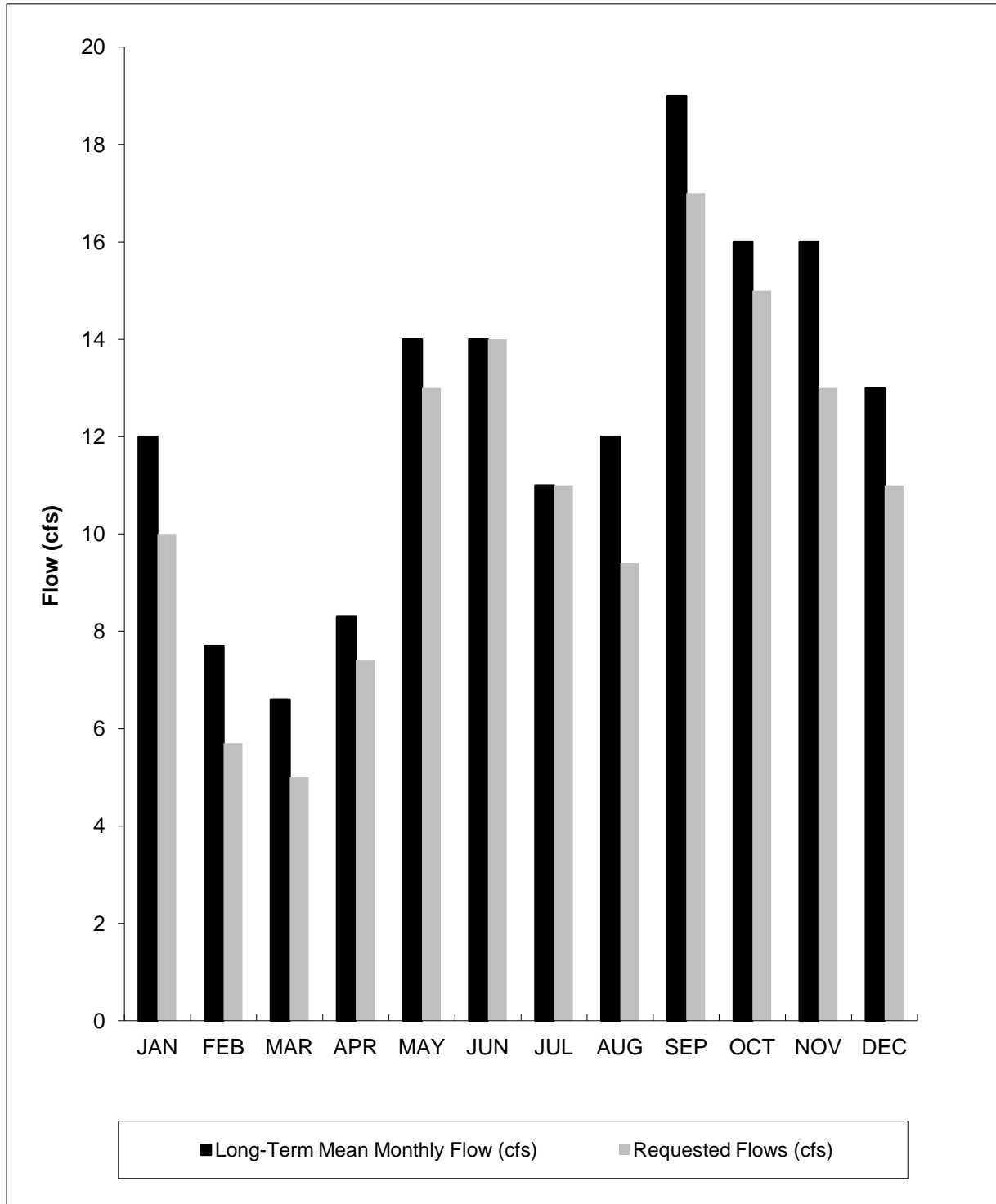


Table 1. USGS discharge station 15081607 instantaneous discharge measurement data and instantaneous discharge measured at USGS stream gage 15081610 for the corresponding time period.

Date	USGS 15081607 Instantaneous Discharge (cfs)	USGS 15081610 Instantaneous Discharge (cfs)
12/07/2000	13	54
02/13/2001	6.2	32
04/22/2001	9.4	29
07/10/2001	17	85
08/30/2001	9.0	38
10/30/2001	19	88
02/07/2002	3.4	14
04/03/2002	2.1	11
06/20/2002	7.5	42
04/01/2003	6.7	40

Table 2. Estimated monthly exceedance flows (cfs) for the Threemile Creek unnamed tributary reservation reach. Based on complete months of record from USGS gage 15081610 (March 01, 1999 to September 30, 2003) and ADFG gage 11001 (October 01, 2005 to September 30, 2006).

% Time exceeded	January	February	March	April	May	June	July	August	September	October	November	December
0	70	56	49	29	90	34	31	55	86	97	155	106
5	32	19	16	18	29	28	20	32	44	31	38	37
10	25	14	12	15	23	21	18	23	37	27	28	26
15	19	12	10	13	21	21	16	18	33	24	23	19
20	16	10	9.0	12	19	19	15	16	30	22	19	17
25	15	9.0	8.0	10	17	18	13	15	26	20	18	15
30	14	7.6	7.0	9.5	16	18	13	13	23	18	16	14
35	13	6.8	6.2	8.7	15	16	12	12	20	16	15	13
40	11	6.1	5.6	7.9	14	15	11	10	18	15	14	12
45	10	5.7	5.0	7.4	13	14	11	9.4	17	15	13	11
50	9.4	5.2	4.7	6.8	13	14	9.8	8.9	15	13	13	10
55	8.4	4.7	4.2	6.2	12	13	9.4	8.0	15	13	12	8.8
60	8.1	4.4	3.8	5.8	11	12	9.0	7.7	13	12	11	7.8
65	7.4	4.2	3.6	5.4	10	11	8.6	6.8	12	11	10	7.2
70	6.3	4.2	3.4	5.0	9.2	11	8.0	6.4	11	10	9.7	6.2
75	5.8	4.0	3.2	4.8	8.4	9.9	7.2	6.0	11	9.8	8.8	5.6
80	5.1	3.8	3.0	4.4	8.0	9.0	6.2	5.4	9.0	9.6	7.8	5.3
85	4.6	3.6	2.8	4.2	7.2	8.3	5.8	4.0	7.8	8.6	6.7	4.8
90	3.8	3.4	2.5	3.8	6.0	7.2	5.1	3.2	6.0	7.2	6.0	4.4
95	3.2	3.2	2.3	2.9	5.6	6.3	4.2	2.6	5.0	5.8	4.4	4.0
100	2.8	2.6	2.1	2.6	4.2	5.4	3.2	2.4	3.4	4.4	4.0	3.6
Mean	12	7.7	6.6	8.3	14	14	11	12	19	16	16	13

Table 3. Estimated mean monthly flow statistics (cfs) for the Threemile Creek unnamed tributary reservation reach. Based on complete months of record from USGS gage 15081610 (March 01, 1999 to September 30, 2003) and ADFG gage 11001 (October 01, 2005 to September 30, 2006).

Month	# of Months	Minimum monthly flow (cfs)	Mean monthly flow (cfs)	Maximum monthly flow (cfs)
January	5	7.8	12	17
February	5	6.0	7.7	10
March	6	3.8	6.6	10
April	6	5.7	8.3	11
May	6	11	14	18
June	6	9.2	14	22
July	6	7.5	11	14
August	6	7.5	12	19
September	6	12	19	24
October	5	13	16	23
November	5	12	16	28
December	5	10	13	17

Table 4. Estimated mean annual flows (cfs) for the Threemile Creek unnamed tributary reservation reach. Based on complete water years of record from USGS gage 15081610 (October 1, 1999 to September 30, 2003) and ADFG gage 11001 (October 01, 2005 to September 30, 2006).

Water year	Number of days of record	QAA (cfs)
2000	366	12
2001	365	12
2002	365	12
2003	365	12
2006	365	13
Mean for period of record	1,826	12

Table 5. Estimated mean daily flow statistics (cfs) for the Threemile Creek unnamed tributary reservation reach. Based on complete water years of record from USGS gage 15081610 (October 1, 1999 to September 30, 2003) and ADFG gage 11001 (October 01, 2005 to September 30, 2006).

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
1	January 1	5	9.2	14	25
2	January 2	5	6.9	16	32
3	January 3	5	6.5	17	32
4	January 4	5	5.7	19	50
5	January 5	5	9.6	27	61
6	January 6	5	16	26	48
7	January 7	5	8.4	20	28
8	January 8	5	14	16	18
9	January 9	5	9.4	14	23
10	January 10	5	7.4	10	17
11	January 11	5	6.3	7.8	13
12	January 12	5	5.2	6.9	12
13	January 13	5	4.6	5.9	9.2
14	January 14	5	3.8	5.2	7.6
15	January 15	5	3.6	6.2	10
16	January 16	5	3.4	8.1	14
17	January 17	5	3.2	9.8	15
18	January 18	5	3.2	9.7	14
19	January 19	5	3.2	9.0	14
20	January 20	5	3.0	7.7	12
21	January 21	5	3.0	7.8	13
22	January 22	5	2.8	10	24
23	January 23	5	2.8	7.9	15
24	January 24	5	2.8	20	70
25	January 25	5	3.0	13	34
26	January 26	5	3.4	13	41
27	January 27	5	3.8	15	25
28	January 28	5	3.6	10	18
29	January 29	5	3.6	8.1	14
30	January 30	5	4.0	8.9	15
31	January 31	5	4.0	13	28

-continued-

ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER APPLICATION. Page 17

Table 5. Page 2 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
32	February 1	5	3.6	8.9	18
33	February 2	5	5.4	12	18
34	February 3	5	4.6	8.9	15
35	February 4	5	4.4	7.5	13
36	February 5	5	4.1	5.3	7.4
37	February 6	5	4.2	8.8	25
38	February 7	5	3.6	16	56
39	February 8	5	3.4	6.9	12
40	February 9	5	4.0	7.4	14
41	February 10	5	3.8	5.7	9.4
42	February 11	5	3.8	6.8	11
43	February 12	5	3.6	14	38
44	February 13	5	3.4	8.0	14
45	February 14	5	3.4	9.1	23
46	February 15	5	3.2	8.2	23
47	February 16	5	3.2	5.7	13
48	February 17	5	3.2	6.3	12
49	February 18	5	3.2	5.5	9.2
50	February 19	5	3.2	9.4	20
51	February 20	5	3.0	7.9	13
52	February 21	5	3.0	7.0	14
53	February 22	5	3.0	5.0	7.2
54	February 23	5	2.8	4.8	8.8
55	February 24	5	2.6	4.3	7.6
56	February 25	5	2.6	4.4	6.4
57	February 26	5	3.6	4.5	6.0
58	February 27	5	3.6	11	33
59	February 28 OR 29	6	3.0	6.7	12

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER APPLICATION. Page 18

Table 5. Page 3 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
60	March 1	5	3.2	7.0	11
61	March 2	5	3.2	7.6	12
62	March 3	5	3.2	7.4	11
63	March 4	5	3.1	6.9	17
64	March 5	5	3.2	5.2	12
65	March 6	5	3.0	4.2	6.2
66	March 7	5	2.5	4.9	10
67	March 8	5	2.2	4.9	10
68	March 9	5	2.1	3.5	4.9
69	March 10	5	2.1	7.9	28
70	March 11	5	2.2	12	49
71	March 12	5	2.6	5.3	15
72	March 13	5	2.6	7.0	17
73	March 14	5	2.6	5.1	7.8
74	March 15	5	2.5	5.9	11
75	March 16	5	2.4	5.5	7.8
76	March 17	5	2.4	6.3	12
77	March 18	5	2.3	6.7	16
78	March 19	5	2.2	4.6	8.2
79	March 20	5	2.2	6.1	12
80	March 21	5	2.2	6.6	12
81	March 22	5	2.2	5.0	9.2
82	March 23	5	2.3	4.3	6.4
83	March 24	5	2.4	5.8	9.0
84	March 25	5	4.6	8.4	16
85	March 26	5	3.9	9.7	21
86	March 27	5	4.2	7.4	14
87	March 28	5	3.8	6.3	10
88	March 29	5	3.6	9.8	26
89	March 30	5	3.4	15	42
90	March 31	5	3.2	9.5	17

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF
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Table 5. Page 4 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
91	April 1	5	2.8	7.4	16
92	April 2	5	2.8	6.3	13
93	April 3	5	2.8	5.7	11
94	April 4	5	2.8	5.5	8.0
95	April 5	5	2.6	4.7	6.8
96	April 6	5	2.8	5.8	9.8
97	April 7	5	2.8	7.3	10
98	April 8	5	2.8	6.0	8.7
99	April 9	5	2.8	5.5	8.9
100	April 10	5	4.2	4.9	6.4
101	April 11	5	3.6	5.1	7.2
102	April 12	5	4.4	5.2	5.8
103	April 13	5	3.8	7.0	11
104	April 14	5	3.8	5.9	8.8
105	April 15	5	3.4	5.1	6.8
106	April 16	5	3.4	4.9	6.8
107	April 17	5	3.0	6.2	10
108	April 18	5	3.4	9.2	17
109	April 19	5	3.8	6.6	8.6
110	April 20	5	6.0	8.2	13
111	April 21	5	5.9	9.2	13
112	April 22	5	5.8	7.4	8.6
113	April 23	5	6.2	10	26
114	April 24	5	4.8	9.3	19
115	April 25	5	4.4	8.6	12
116	April 26	5	4.8	13	29
117	April 27	5	5.4	14	28
118	April 28	5	7.2	12	19
119	April 29	5	9.8	13	18
120	April 30	5	9.4	15	20

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF
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Table 5. Page 5 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
121	May 1	5	8.4	11	15
122	May 2	5	7.2	10	14
123	May 3	5	6.2	14	28
124	May 4	5	5.6	11	17
125	May 5	5	4.8	9.1	16
126	May 6	5	4.6	7.6	13
127	May 7	5	4.2	11	18
128	May 8	5	4.2	11	22
129	May 9	5	4.6	7.2	9.2
130	May 10	5	5.2	9.1	13
131	May 11	5	5.4	11	14
132	May 12	5	8.1	14	23
133	May 13	5	6.5	13	22
134	May 14	5	6.0	11	16
135	May 15	5	6.7	10	13
136	May 16	5	8.4	12	19
137	May 17	5	6.6	15	21
138	May 18	5	6.0	15	21
139	May 19	5	5.6	15	21
140	May 20	5	5.4	13	22
141	May 21	5	8.0	14	22
142	May 22	5	15	20	29
143	May 23	5	15	26	55
144	May 24	5	11	17	25
145	May 25	5	9.6	17	24
146	May 26	5	9.4	15	20
147	May 27	5	9.8	14	19
148	May 28	5	13	17	26
149	May 29	5	13	16	29
150	May 30	5	8.2	15	23
151	May 31	5	11	20	39

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER APPLICATION. Page 21

Table 5. Page 6 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
152	June 1	5	9.8	19	28
153	June 2	5	8.4	17	23
154	June 3	5	7.4	15	18
155	June 4	5	6.8	15	21
156	June 5	5	6.4	14	19
157	June 6	5	6.2	14	20
158	June 7	5	5.8	13	21
159	June 8	5	5.8	12	21
160	June 9	5	5.6	12	21
161	June 10	5	5.6	11	18
162	June 11	5	5.4	10	13
163	June 12	5	5.4	10	13
164	June 13	5	5.4	12	16
165	June 14	5	5.6	13	21
166	June 15	5	7.4	13	20
167	June 16	5	7.4	12	16
168	June 17	5	10	17	34
169	June 18	5	8.6	14	21
170	June 19	5	7.3	14	20
171	June 20	5	6.4	16	27
172	June 21	5	8.6	14	24
173	June 22	5	7.9	12	18
174	June 23	5	7.0	12	17
175	June 24	5	6.6	12	17
176	June 25	5	7.2	14	19
177	June 26	5	8.0	11	13
178	June 27	5	8.0	11	12
179	June 28	5	6.8	12	15
180	June 29	5	7.2	11	12
181	June 30	5	6.8	9.5	12

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER APPLICATION. Page 22

Table 5. Page 7 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
182	July 1	5	6.8	9.4	13
183	July 2	5	6.2	8.7	11
184	July 3	5	5.5	11	18
185	July 4	5	5.0	12	21
186	July 5	5	4.6	11	17
187	July 6	5	4.6	11	21
188	July 7	5	5.5	13	31
189	July 8	5	7.2	13	24
190	July 9	5	6.6	13	23
191	July 10	5	6.2	10	17
192	July 11	5	6.0	9.2	13
193	July 12	5	5.8	8.1	11
194	July 13	5	5.8	9.1	14
195	July 14	5	5.6	12	27
196	July 15	5	5.6	9.5	17
197	July 16	5	5.3	9.8	15
198	July 17	5	4.6	11	16
199	July 18	5	4.1	9.4	12
200	July 19	5	3.8	8.9	17
201	July 20	5	4.0	8.7	16
202	July 21	5	5.1	9.6	13
203	July 22	5	5.2	9.8	13
204	July 23	5	6.0	10	14
205	July 24	5	6.0	12	23
206	July 25	5	4.2	11	18
207	July 26	5	3.8	10	19
208	July 27	5	3.6	10	20
209	July 28	5	4.2	9.8	16
210	July 29	5	3.8	8.4	15
211	July 30	5	3.4	7.2	13
212	July 31	5	3.2	7.3	12

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER APPLICATION. Page 23

Table 5. Page 8 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
213	August 1	5	3.2	8.1	15
214	August 2	5	3.6	10	21
215	August 3	5	4.0	8.5	15
216	August 4	5	3.2	6.7	9.1
217	August 5	5	3.0	6.5	10
218	August 6	5	2.8	5.9	9.7
219	August 7	5	2.6	7.0	15
220	August 8	5	2.6	10	23
221	August 9	5	2.6	11	24
222	August 10	5	2.5	7.5	14
223	August 11	5	2.4	5.9	10
224	August 12	5	2.4	6.8	15
225	August 13	5	2.5	13	40
226	August 14	5	2.8	9.1	16
227	August 15	5	2.8	8.1	12
228	August 16	5	2.6	9.2	18
229	August 17	5	2.6	9.4	16
230	August 18	5	2.6	8.3	13
231	August 19	5	3.0	7.3	12
232	August 20	5	6.0	9.1	15
233	August 21	5	9.2	21	55
234	August 22	5	7.7	17	32
235	August 23	5	6.4	19	44
236	August 24	5	6.0	14	23
237	August 25	5	6.6	16	34
238	August 26	5	6.4	18	37
239	August 27	5	6.0	22	44
240	August 28	5	5.8	18	32
241	August 29	5	6.6	15	23
242	August 30	5	7.8	12	23
243	August 31	5	9.8	21	43

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER APPLICATION. Page 24

Table 5. Page 9 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
244	September 1	5	7.6	31	58
245	September 2	5	6.0	31	58
246	September 3	5	5.0	23	41
247	September 4	5	8.5	19	29
248	September 5	5	6.9	16	28
249	September 6	5	5.9	14	20
250	September 7	5	12	18	27
251	September 8	5	12	16	23
252	September 9	5	8.0	13	22
253	September 10	5	5.8	23	37
254	September 11	5	5.2	18	35
255	September 12	5	5.4	14	20
256	September 13	5	4.6	19	53
257	September 14	5	4.0	14	30
258	September 15	5	3.6	11	18
259	September 16	5	3.4	19	43
260	September 17	5	4.0	17	38
261	September 18	5	6.3	18	34
262	September 19	5	5.2	18	28
263	September 20	5	9.2	17	26
264	September 21	5	7.4	24	48
265	September 22	5	6.2	28	52
266	September 23	5	5.6	21	37
267	September 24	5	5.0	32	77
268	September 25	5	4.6	18	33
269	September 26	5	4.2	12	17
270	September 27	5	4.2	12	24
271	September 28	5	8.2	18	45
272	September 29	5	8.0	34	86
273	September 30	5	7.4	18	41

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER APPLICATION. Page 25

Table 5. Page 10 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
274	October 1	5	10	15	25
275	October 2	5	7.8	11	19
276	October 3	5	9.5	14	23
277	October 4	5	5.8	9.4	13
278	October 5	5	4.4	21	70
279	October 6	5	6.8	28	86
280	October 7	5	9.8	20	30
281	October 8	5	12	18	28
282	October 9	5	11	17	28
283	October 10	5	8.8	16	24
284	October 11	5	9.8	20	31
285	October 12	5	11	25	42
286	October 13	5	10	18	36
287	October 14	5	7.8	14	25
288	October 15	5	9.7	18	27
289	October 16	5	9.6	21	34
290	October 17	5	8.0	19	28
291	October 18	5	6.8	14	26
292	October 19	5	11	17	28
293	October 20	5	9.6	17	28
294	October 21	5	8.2	30	97
295	October 22	5	7.2	16	20
296	October 23	5	6.4	15	27
297	October 24	5	5.8	13	20
298	October 25	5	5.4	14	23
299	October 26	5	5.8	12	17
300	October 27	5	7.2	11	16
301	October 28	5	6.0	12	26
302	October 29	5	5.2	12	20
303	October 30	5	4.8	13	17
304	October 31	5	4.6	11	15

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ATTACHMENT A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER APPLICATION. Page 26

Table 5. Page 11 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
305	November 1	5	4.2	14	19
306	November 2	5	4.2	14	21
307	November 3	5	4.0	16	27
308	November 4	5	4.0	10	14
309	November 5	5	4.4	9.4	12
310	November 6	5	6.2	11	13
311	November 7	5	6.0	11	15
312	November 8	5	5.0	14	24
313	November 9	5	4.4	16	40
314	November 10	5	4.2	14	35
315	November 11	5	4.2	9.6	15
316	November 12	5	7.8	12	18
317	November 13	5	8.2	17	38
318	November 14	5	6.8	14	23
319	November 15	5	6.0	15	22
320	November 16	5	6.6	16	23
321	November 17	5	11	23	53
322	November 18	5	9.2	15	30
323	November 19	5	9.6	23	55
324	November 20	5	12	22	36
325	November 21	5	10	21	38
326	November 22	5	13	46	155
327	November 23	5	8.8	20	42
328	November 24	5	7.0	25	69
329	November 25	5	7.8	19	50
330	November 26	5	6.2	15	29
331	November 27	5	5.4	12	20
332	November 28	5	5.0	9.1	13
333	November 29	5	4.4	7.5	11
334	November 30	5	4.0	7.2	11

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APPENDIX A. UNNAMED TRIBUTARY OF THREEMILE CREEK RESERVATION OF WATER
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Table 5. Page 12 of 12.

Julian Day	Day of Year	# of days of record	Minimum-mean daily flow (cfs)	Mean-mean daily flow (cfs)	Maximum-mean daily flow (cfs)
335	December 1	5	3.6	13	35
336	December 2	5	3.6	10	27
337	December 3	5	3.8	8.2	14
338	December 4	5	4.0	8.6	13
339	December 5	5	4.0	10	25
340	December 6	5	4.4	9.1	20
341	December 7	5	6.4	12	23
342	December 8	5	8.0	22	60
343	December 9	5	7.2	21	48
344	December 10	5	6.2	32	106
345	December 11	5	5.6	20	51
346	December 12	5	5.2	19	39
347	December 13	5	4.6	10	17
348	December 14	5	3.8	9.5	22
349	December 15	5	3.6	16	49
350	December 16	5	3.8	8.8	17
351	December 17	5	4.6	6.9	11
352	December 18	5	4.4	7.9	15
353	December 19	5	4.2	6.1	7.4
354	December 20	5	4.2	8.2	13
355	December 21	5	4.4	11	29
356	December 22	5	4.0	9.2	15
357	December 23	5	4.0	24	53
358	December 24	5	6.0	21	37
359	December 25	5	10	18	26
360	December 26	5	8.0	12	18
361	December 27	5	7.0	12	17
362	December 28	5	6.6	11	17
363	December 29	5	5.6	10	14
364	December 30	5	5.8	11	16
365	December 31	5	7.1	13	25