



## Cemetery Creek Smolt Trap

### Data Summary

#### **What is a smolt?**

A "smolt" is one of the life stages of a juvenile salmon. This life stage occurs when the juvenile salmon begins its migration from freshwater to the estuary and adjusts to living in saltwater. Different Pacific salmon species spend different amounts of time rearing in freshwater. For example, coho salmon spend one to two years rearing in freshwater after they emerge from the gravel as fry. They reach about 2-4 inches (50-100 millimeters) in length before they begin migration to the estuary as a smolt. The timing of this movement correlates with spring freshets (high water flow from snow melt or spring rains).

#### **What is a smolt trap?**

A smolt trap is a standard tool used to quantify how many fish are moving through a water system. The trap is designed to capture juvenile fish during their spring outmigration from freshwater down to the estuary. The trap is a stream-wide V-shaped corral that points downstream. The structure funnels fish into a holding box while allowing stream flow to continue downstream. The holding box is used so fish can be safely held onsite until they are identified, counted, and released. An upstream trap is also installed to allow upstream fish passage. The traps are checked multiple times each day.

#### **Cemetery Creek Smolt Trap Data:**

The City of Bellingham has conducted smolt trapping activities on Cemetery Creek, a tributary to Whatcom Creek, during the annual spring outmigration periods of 2004, 2007, 2009, 2012, 2013 and 2016.

Table 1 shows the total number of fish, by species, caught during each of the years that a smolt trap has been installed on Cemetery Creek. Coho salmon have been the most abundant fish species across all years, with cutthroat trout being the second most abundant.

Figures 1-6 show the number of salmonids (salmon and trout species) identified and counted each day during smolt trapping activities on Cemetery Creek. Stream flow is also represented in these figures. Smolt traps tend to show an increase in fish numbers when rain events cause increased stream flows. This pattern of outmigration can be seen as a bell-shaped curve centering on peak flow events with fish numbers tapering on either side of the curve. This trend arises from the fact that salmonids have adapted to using high flow rain events as an energy-saving mode of downstream transport.

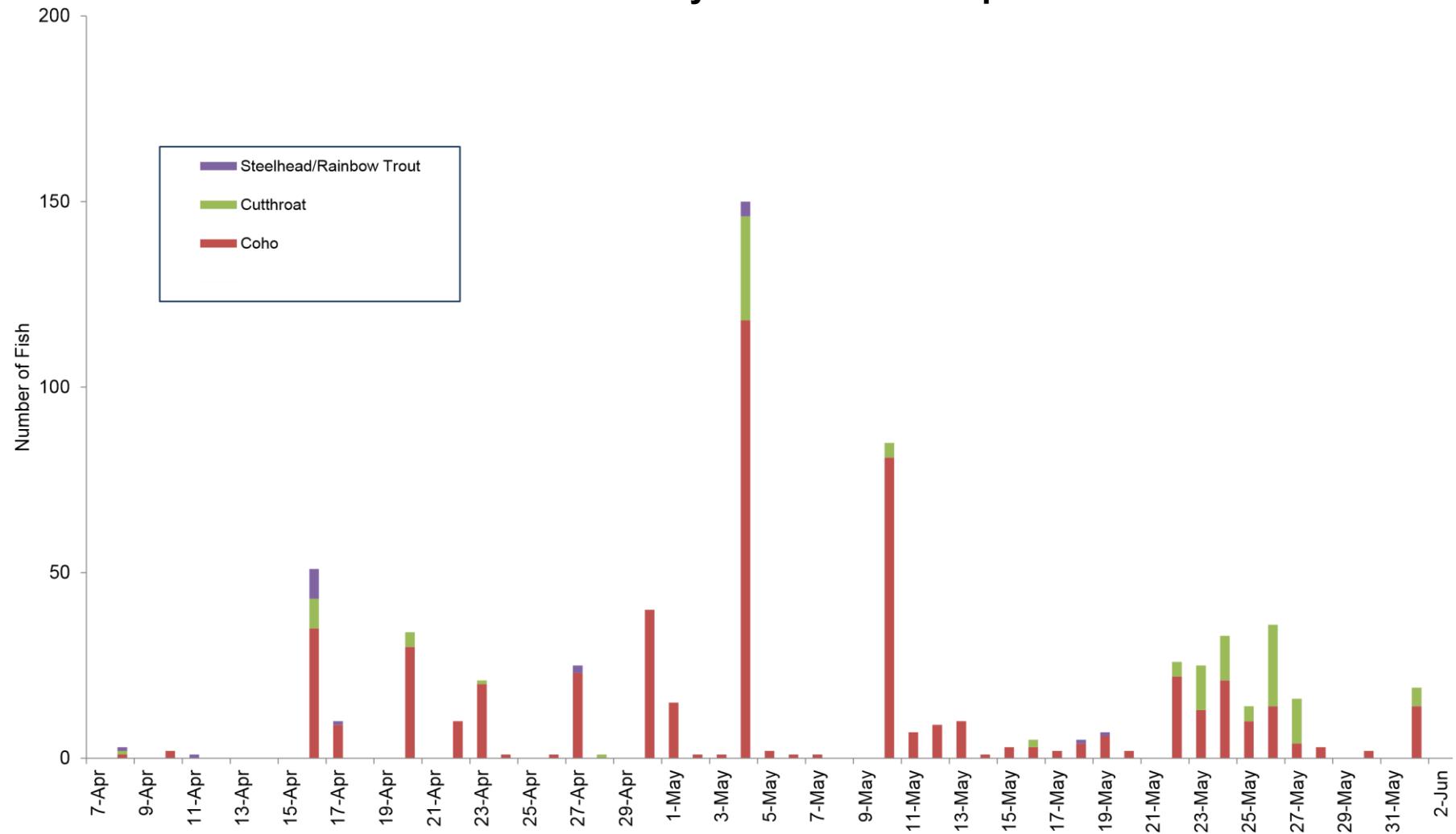
*For more information, please contact:*

*Sara Brooke Benjamin, City of Bellingham Public Works, Natural Resources Division: (360) 778-7969.*

**Table 1. Cemetery Creek Smolt Trap Summary**

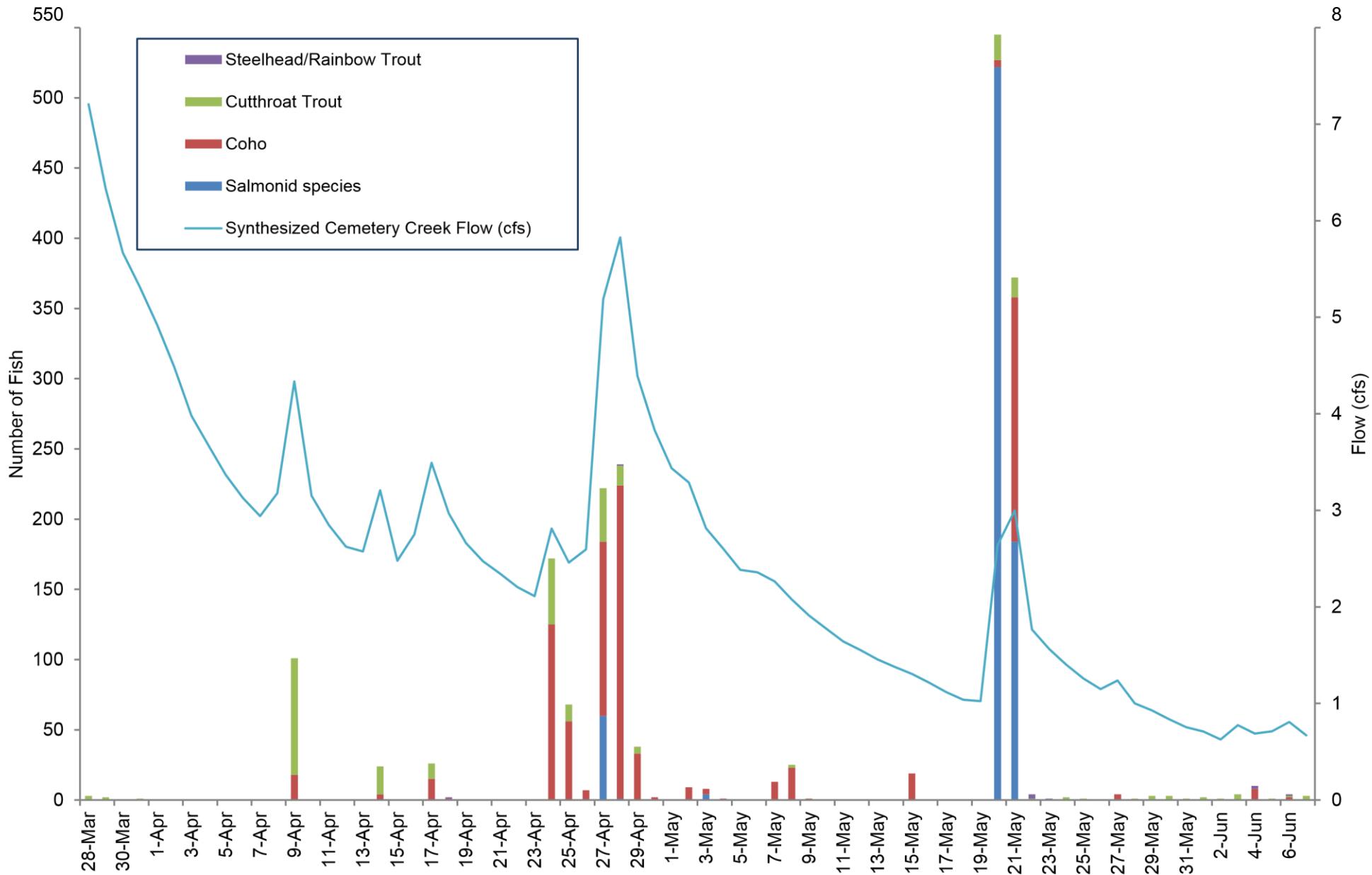
Species	Common Name	2004 (Apr 7-Jun 2)	2007 (Mar 28-Jun 7)	2009 (Mar 18-May 26)	2012 (Mar 13-Jun 11)	2013 (Mar 12-Jun 25)	2016 (Mar 11-Jun 14)
<i>Oncorhynchus kisutch</i>	Coho	542	871	528	769	1614	1257
<i>Oncorhynchus clarki</i>	Cutthroat Trout	120	294	178	32	177	62
<i>Oncorhynchus sp.</i>	Trout species	-	-	87	15	11	35
<i>Oncorhynchus mykiss</i>	Steelhead/Rainbow Trout	19	9	63	58	118	100
<i>Oncorhynchus tshawytscha</i>	Chinook	-	-	-	-	-	1
<i>Oncorhynchus sp.</i>	Salmon species	-	771	27	8	1	3
<i>Oncorhynchus gorbuscha</i>	Pink	-	-	-	1	-	-
<i>Cottus sp.</i>	Sculpin	27	6	22	43	67	12
<i>Lampetra sp.</i>	Lamprey	-	9	12	1	2	273
<i>Gasterosteus aculeatus</i>	Stickleback	4	8	6	8	5	69
<i>Richarsonius balteatus</i>	Red-sided Shiner	-	1	1	-	-	-
<i>Micropterus dolomieu</i>	Smallmouth bass	-	1	-	-	1	-
<i>Lepomis macrochirus</i>	Blue Gill	-	-	-	-	-	1
<i>Lepomis gibbosus</i>	Pumpkinseed	-	-	-	-	1	-
<i>Pimephales promelas</i>	Fat Head Minnow	-	-	-	-	-	1
<i>Perca sp.</i>	Perch	-	-	-	-	1	-
<i>Carassius auratus</i>	Goldfish	-	8	-	-	-	-
<i>Ameiurus natalis</i>	Bullhead	-	-	-	-	-	1
<i>Unknown</i>	Unknown	-	-	8	9	2	-
<b>Total</b>		<b>712</b>	<b>1,978</b>	<b>932</b>	<b>944</b>	<b>2,000</b>	<b>1,815</b>

## 2004 Cemetery Creek Smolt Trap



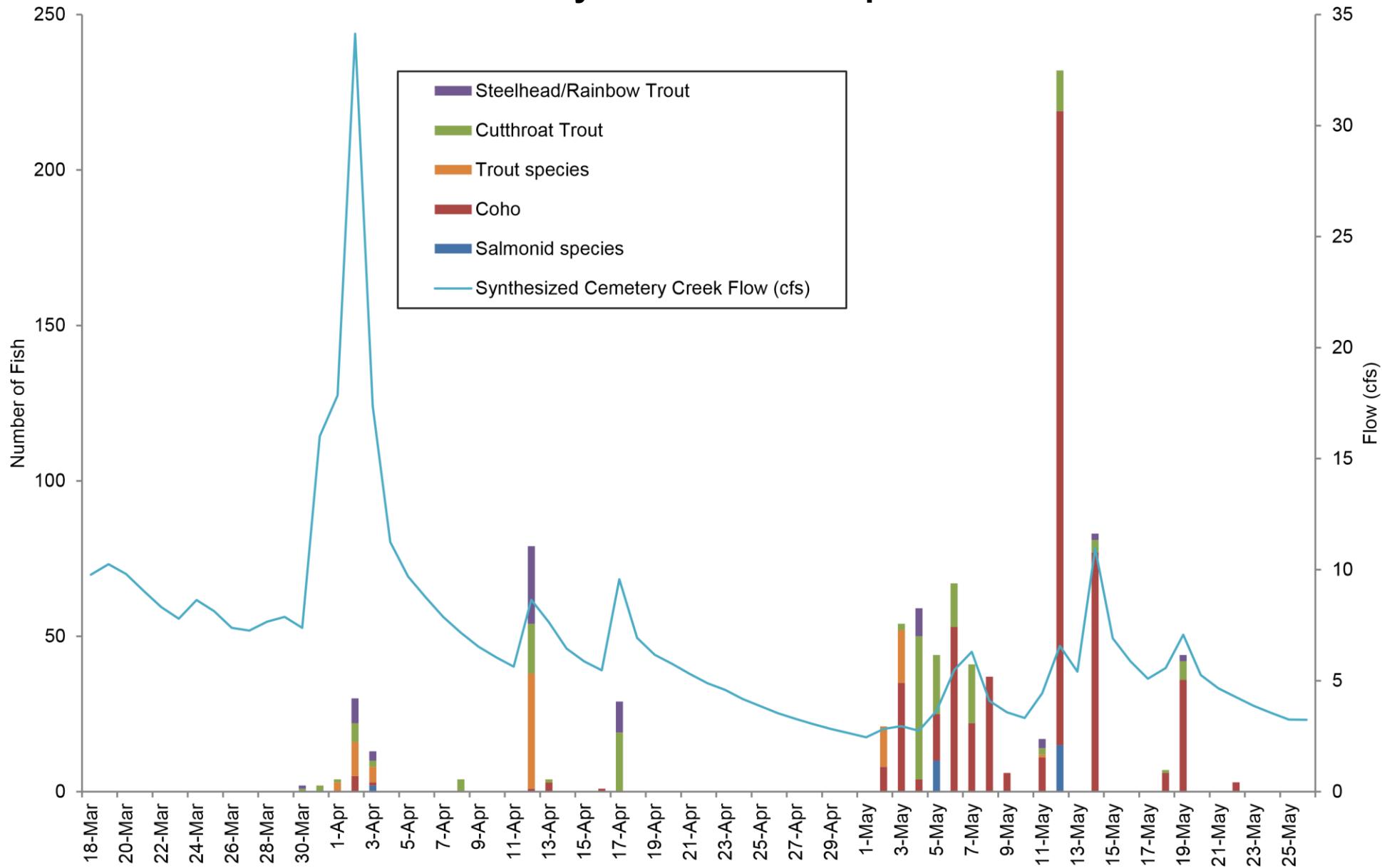
**Figure 1.** Daily salmonid counts during the 2004 outmigration at the smolt trap on Cemetery Creek in Bellingham, WA.

## 2007 Cemetery Creek Smolt Trap



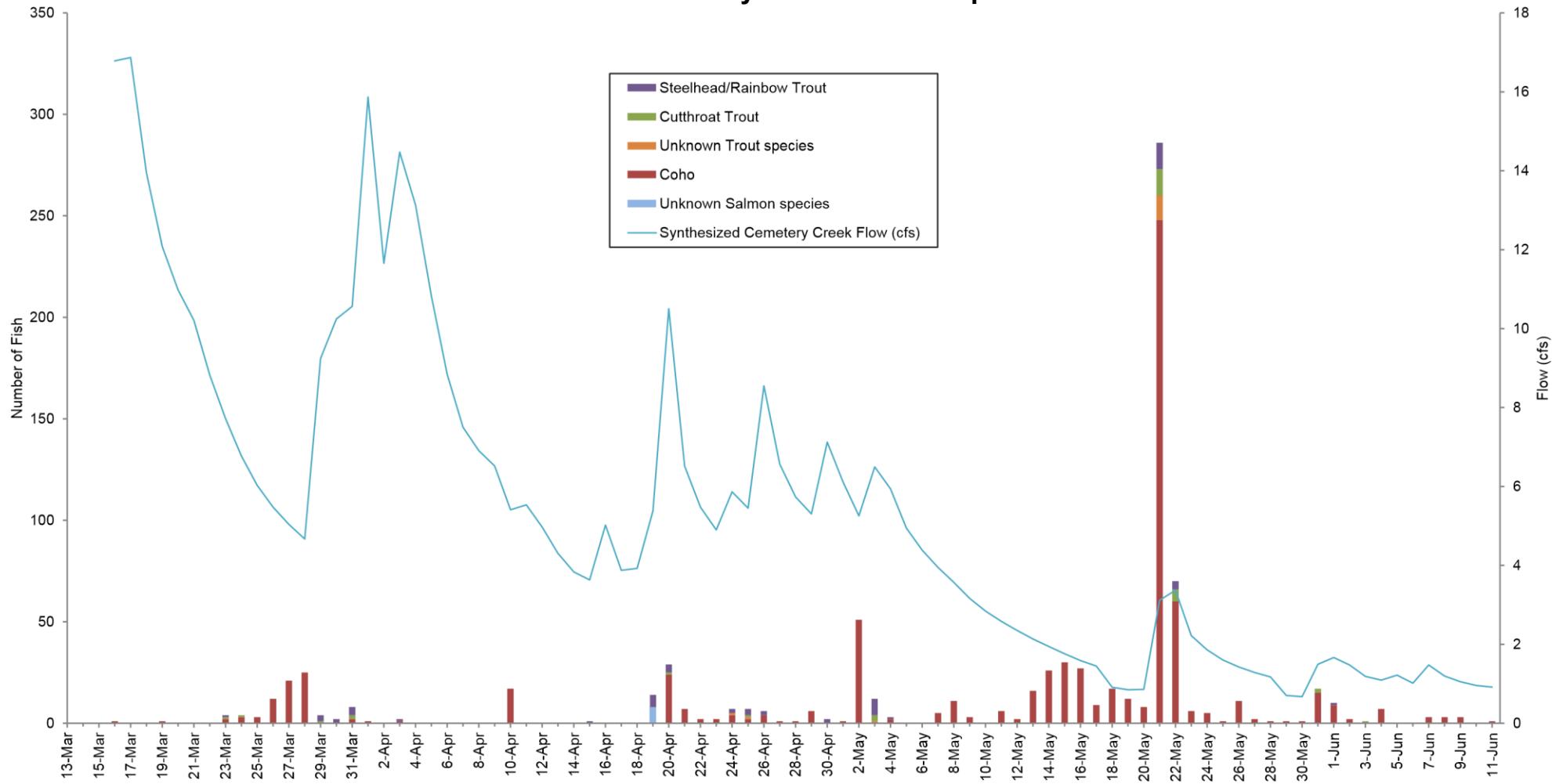
**Figure 2.** Daily salmonid counts during the 2007 outmigration at the smolt trap on Cemetery Creek in Bellingham, WA. "Synthesized Cemetery Creek Flow" is an estimate of discharge in cubic feet per second (cfs) at Cemetery Creek based on an average of daily discharge values measured at nearby Chuckanut and Arroyo Creeks and normalized by respective drainage basin area.

## 2009 Cemetery Creek Smolt Trap



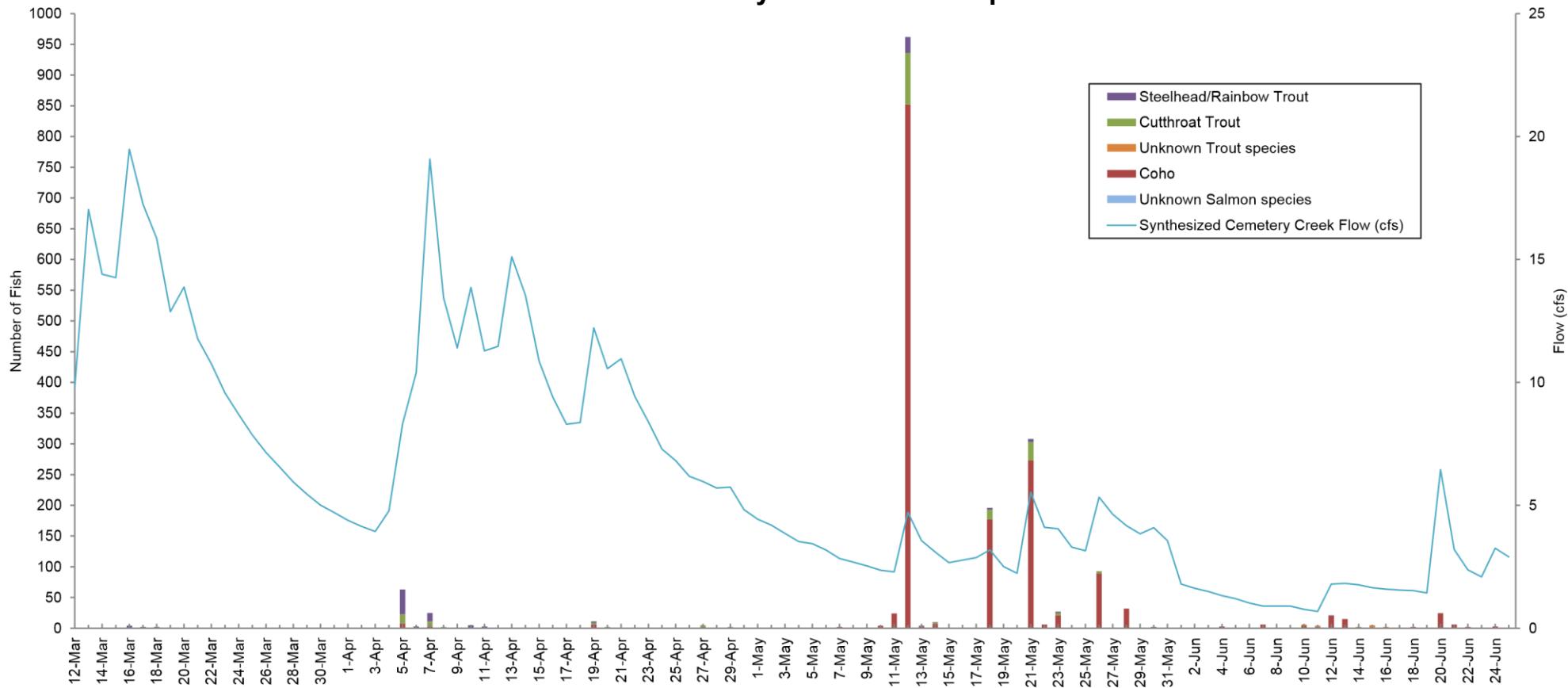
**Figure 3.** Daily salmonid counts during the 2009 outmigration at the smolt trap on Cemetery Creek in Bellingham, WA. "Synthesized Cemetery Creek Flow" is an estimate of discharge in cubic feet per second (cfs) at Cemetery Creek based on an average of daily discharge values measured at nearby Chuckanut and Arroyo Creeks and normalized by respective drainage basin area.

## 2012 Cemetery Creek Smolt Trap



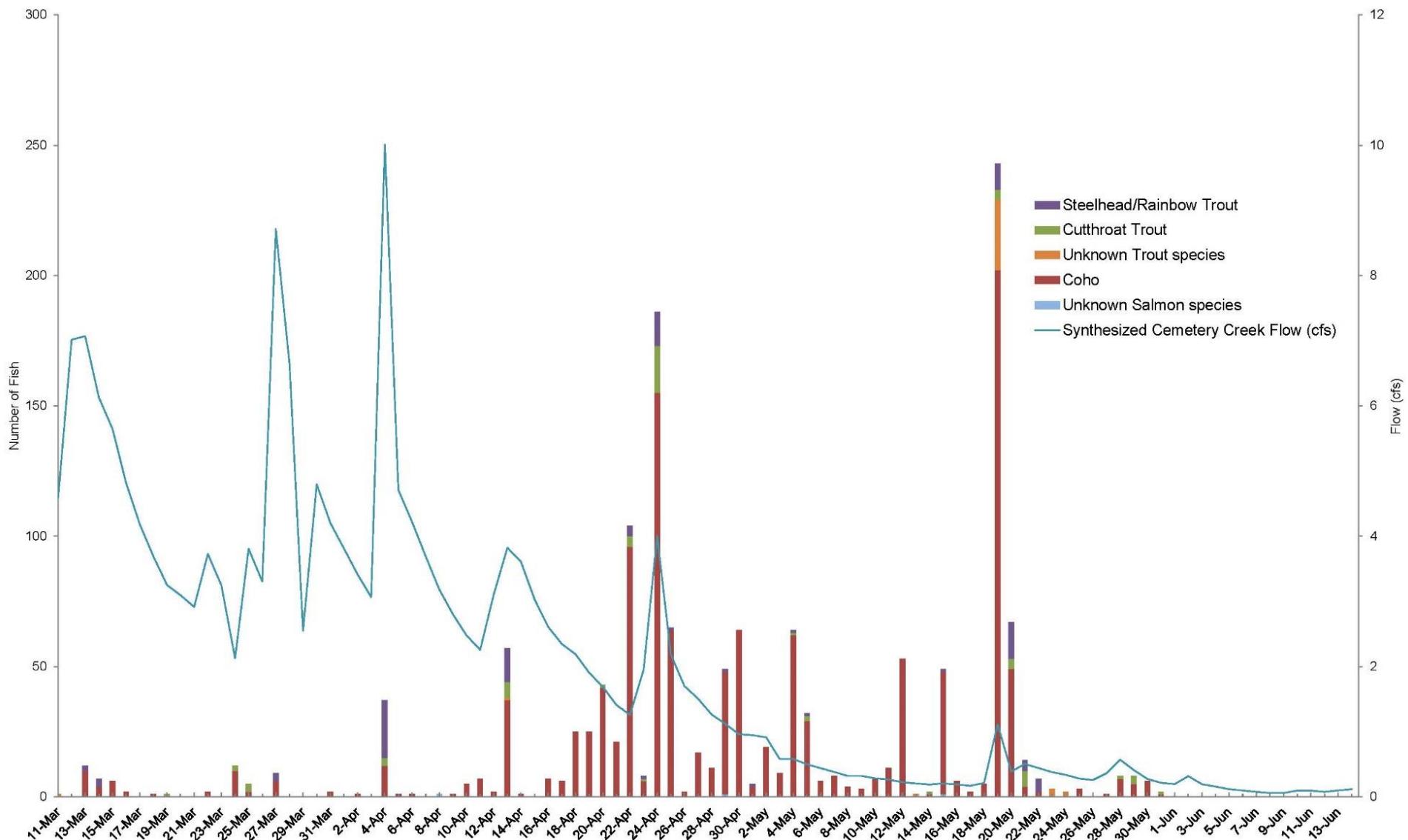
**Figure 4.** Daily salmonid counts during the 2012 outmigration at the smolt trap on Cemetery Creek in Bellingham, WA. "Synthesized Cemetery Creek Flow" is an estimate of discharge in cubic feet per second (cfs) at Cemetery Creek based on an average of daily discharge values measured at nearby Chuckanut and Arroyo Creeks and normalized by respective drainage basin area.

## 2013 Cemetery Creek Smolt Trap



**Figure 5.** Daily salmonid counts during the 2013 outmigration at the smolt trap on Cemetery Creek in Bellingham, WA. "Synthesized Cemetery Creek Flow" is an estimate of discharge in cubic feet per second (cfs) at Cemetery Creek based on an average of daily discharge values measured at nearby Chuckanut and Arroyo Creeks and normalized by respective drainage basin area.

## 2016 Cemetery Creek Smolt Trap



**Figure 6.** Daily salmonid counts during the 2016 outmigration at the smolt trap on Cemetery Creek in Bellingham, WA. "Synthesized Cemetery Creek Flow" is an estimate of discharge in cubic feet per second (cfs) at Cemetery Creek based on an average of daily discharge values measured at nearby Chuckanut and Arroyo Creeks and normalized by respective drainage basin area.