

**Delta Operations for Salmonids and Sturgeon (DOSS) Group**  
**Conference call: 5/22/12 at 9:00 a.m.**

**Objective:** Provide advice to the Water Operations Management Team (WOMT) and National Marine Fisheries Service (NMFS) on measures to reduce adverse effects from Delta operations of the Central Valley Project and the State Water Project on salmonids and green sturgeon. DOSS will coordinate the work of other technical teams. DOSS notes and advice can be found at: <http://www.swr.noaa.gov/ocap/doss.htm>

**DWR:** Mike Ford, Andy Chu, Angela Llaban, James Gleim, Kevin Reece, Edmund Yu, Bryant Giorgi, Tracy Pettit

**FWS:** Craig Anderson, Roger Guinee, Leigh Bartoo, Donald Radcliff

**NMFS:** Barbara Rocco, Barb Byrne, Garwin Yip, Jeff Stuart, Bruce Oppenheim

**Reclamation:** Josh Israel, Thuy Washburn, Tom Morstein-Marx

**DFG:** Julio Adib-Samii, Robert Vincik, Jason Roberts

**EPA:** Erin Foresman, Bruce Herbold

**SWRCB, USGS:** not present

**Agenda**

1. Fish monitoring
2. Current operations
3. Latest tag results for third steelhead release
4. Calendar-based OMR for 2013

**Fish Monitoring:** The following table presents fish monitoring data. Unless otherwise noted, reported sizes are fork length. See:

<http://www.water.ca.gov/swp/operationscontrol/calfed/calfedmonitoring.cfm>.

Location	Chippis Is. Midwater Trawl	Sacramento Trawls	Mossdale Kodiak Trawl	Beach Seines	Knights Landing RST	Tisdale Weir RST
Sample Date	5/14, 5/18	5/15, 5/17	5/14-5/20	5/15-5/17	5/14, 16, 18, 21	5/14, 16, 18, 21
Total Catch	521	83	1,201	365	32	86
FR	332	56	1,193	13	27	74
WR						
SR	50					
LFR						
Ad-Clipped Chinook	124	27		4	5	12
DS	9					
Splittail	2			348		
Longfin	3					
SH (ad-clip)	1		7 (sutures); 1			

			w/antenna			
<b>SH (wild)</b>						
<b>W. Temp. (avg. °F)</b>	65.7	64.8		67.8	69.0	64.0
<b>Flows (avg. cfs)</b>					5,026	6,773
<b>Turbidity (avg. NTU)</b>	43.6	8.9		29.3	13.7	9.3
<b>WR/LFR Avg. CPUE</b>						
<b>FR/SR Avg. CPUE</b>					0.048	0.272

**Key:** FR = Fall run; LFR = Late-fall run; SR = Spring run; WR = Winter run; SH = Steelhead; DS = Delta smelt; LFS = Longfin smelt; CPUE = catch per unit of effort

**Overall Fish Monitoring:** Water temperatures are increasing in the Sacramento River and flows are decreasing. The last of the hatchery fall-run Chinook have been released. No wild steelhead have been seen at Mossdale since early May, but it was noted that juvenile Chinook are still being observed in the Mossdale trawl. Because juvenile steelhead are likely able to handle temperature conditions that juvenile Chinook can tolerate, the absence of steelhead at a monitoring station, coupled with presence of juvenile Chinook, should not be taken to mean that temperatures at that location are too high for steelhead outmigration.

**Fish Salvage Data (5/14–5/20):** Reports are also posted at <ftp://ftp.delta.dfg.ca.gov/salvage>: located the table under folder “DOSS salvage tables” (also try <http://www.dfg.ca.gov/delta/apps/salvage/Default.aspx>) and click on “salvage FTP site.”

Compiled by J. Adib-Samii on May 21, 2012.

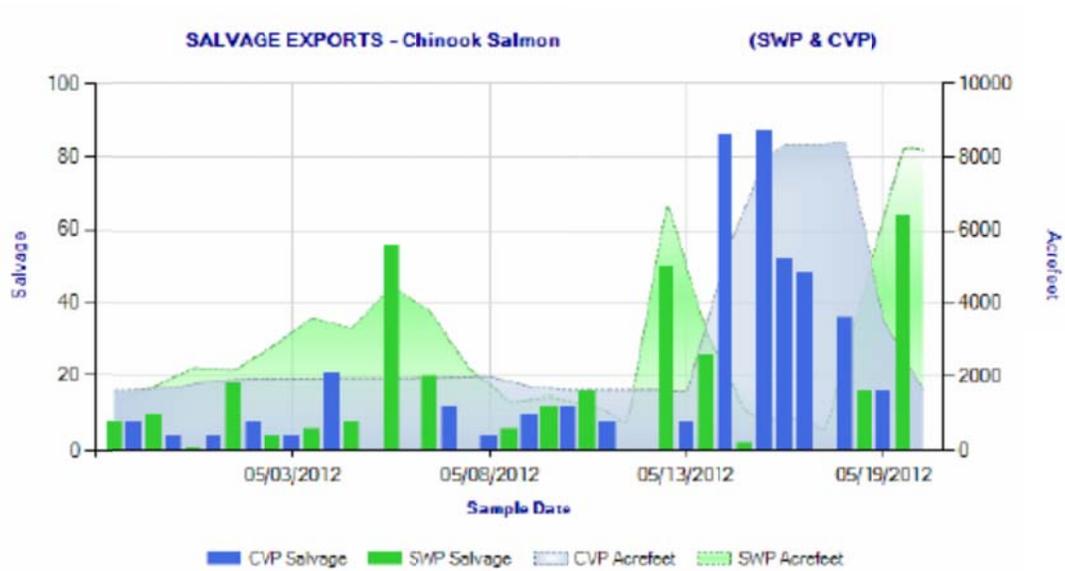


Figure 1. Daily salvage of Chinook salmon (all races) and water exports from the state and federal fish salvage facilities during April 29 through May 20, 2012. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

### Wild Spring Run Sized Chinook Salmon Loss

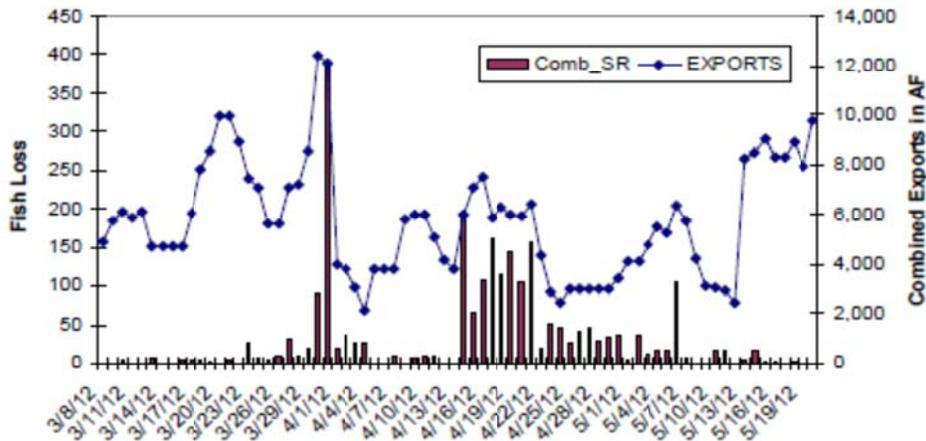


Figure 2. Daily losses of wild spring-run sized Chinook salmon and exports for the combined CVP and SWP facilities from March 8 through May 20, 2012.

Information from DFG daily salmon and smelts summary tables (G. Aasen; 5/21/12). Prepared by J. Adib-Samii on May 21, 2012.

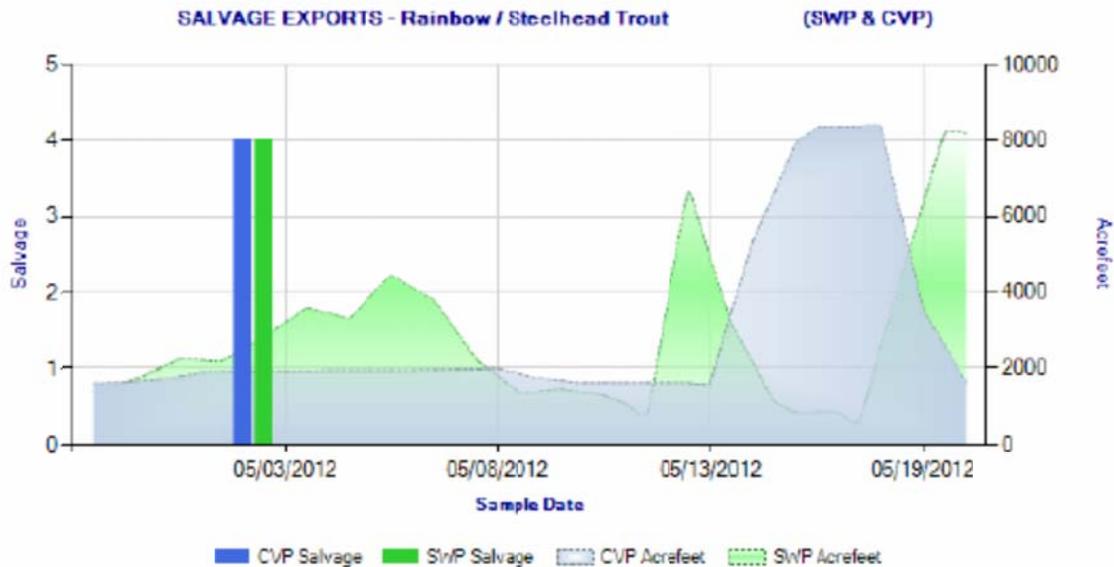


Figure 3. Daily salvage of steelhead and water exports from the state and federal fish salvage facilities during April 29 through May 20, 2012. Graph obtained from the DFG salvage monitoring web-page:

<http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

The following table reported by DFG shows weekly and water-year totals for salvage and loss densities of Chinook salmon and steelhead.

**DOSS Weekly Salvage Update**  
 Reporting Period: May 14 - 20, 2012  
 Prepared by J. Adib-Samii on May 21, 2012  
 Preliminary Results -Subject to Revision

Criteria	14-May	15-May	16-May	17-May	18-May	19-May	20-May	Trend
<b>Loss Densities</b>								
Wild winter-run CS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	→
Wild steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	→
<b>Loss</b>								
Wild spring-run CS	17	2	2	0	2	0	0	↗
SWP daily export	3,171	1,132	0	0	599*	4,424	8,185	↘
CVP daily export	5,354	7,926	8,330	8,332	8,356	3,553	1,618	↗

\* Operations resumed at 2100 hrs

Loss Density = fish lost/TAF; water export = AF; Trend = compared to previous week; wild = adipose fin present

**Chinook Salmon Weekly/Season Salvage and Loss**  
 Combined salvage and loss for both CVP and SWP fish facilities

Category	Weekly Total			Season Total	
	Salvage	Loss	Trend	Salvage	Loss
<b>Wild</b>					
Winter Run	0	0	→	833	2,039 exceeds "warning level"
Spring Run	36	23	↗	1,059	2,392
Late Fall Run	0	0	→	20	14
Fall Run	251	495	↗	510	1,250
Total	287	518		2,422	5,695
<b>Hatchery</b>					
Winter Run	0	0	→	460	1,210
Spring Run	110	153	↗	114	170
Late Fall Run	0	0	→	25	20
Fall Run	36	39	↗	36	39
Total	146	192		635	1,439

Race determined by size at date of capture; hatchery = adipose fin missing;

**Steelhead Weekly/Season Salvage and Loss**  
 Combined salvage and loss for both CVP and SWP fish facilities

Category	Weekly Total			Season Total	
	Salvage	Loss	Trend	Salvage	Loss
Wild	0	0.0	→	320	1,090
Hatchery	0	0.0	→	589	1,101
Total	0	0		909	2,191

Steelhead: The last wild steelhead was salvaged on May 3.

Sturgeon: No green or white sturgeon were salvaged at either facility last week.

**Coded Wire Tagged (CWT) Salvage and Loss as of 5/21/12 (see table below):**

Hatchery Late-Fall Run, Winter-Run, and Spring-Run Chinook Loss at the Delta Fish Facilities, 2011/2012

Release Date	CWT Race	Hatchery	Release Site	Release Type	Confirmed Loss	Number Released	Total Entering Delta	% Loss <sup>1</sup>	First Concern Level	Second Concern Level	Date of First Loss	Date of Last Loss
12/16/11	LF	Coleman NFH	Battle Creek	Production	134.66	394,700	n/a	0.034	n/a	n/a	1/11/12	3/31/12
12/23/11	LF	Coleman NFH	Battle Creek	Spring Surrogate	2.92	62,400	n/a	0.005	0.5%	1.0%	1/18/12	1/31/12
1/3/12	LF	Coleman NFH	Battle Creek	Production	653.06	448,600	n/a	0.146	n/a	n/a	1/19/12	5/7/12
1/13/12	LF	Coleman NFH	Battle Creek	Spring Surrogate	52.17	80,800	n/a	0.065	0.5%	1.0%	1/31/12	2/18/12
1/20/12	LF	Coleman NFH	Battle Creek	Spring Surrogate <sup>2</sup>	101.04	20,000	n/a	0.505	n/a	n/a	1/30/12	3/29/12
2/9/12	W	Livingston Stone NFH	Redding	Production	16.96	185,281	96,525	0.018	0.5%	1.0%	3/31/12	3/31/12
4/3/12-4/25/12	S	Feather River Hatchery	Feather River	Production	0.00	1,110,709	n/a	0.000	n/a	n/a	-	-

For Chinook lost 10/1/2011 through 5/20/2012

SWP coded-wire tags read 10/1/2011 through 5/20/2012

CVP coded-wire tags read 10/1/2011 through 5/20/2012

<sup>1</sup>LF % Loss = (Confirmed Loss/Number Released)\*100; W % Loss = (Confirmed Loss/Total Entering Delta)\*100

<sup>2</sup>Because of the equipment malfunction that stranded a large proportion of the release in the gravel, this 3<sup>rd</sup> surrogate release is tracked for monitoring and information only and not for compliance with Action IV.2.3.

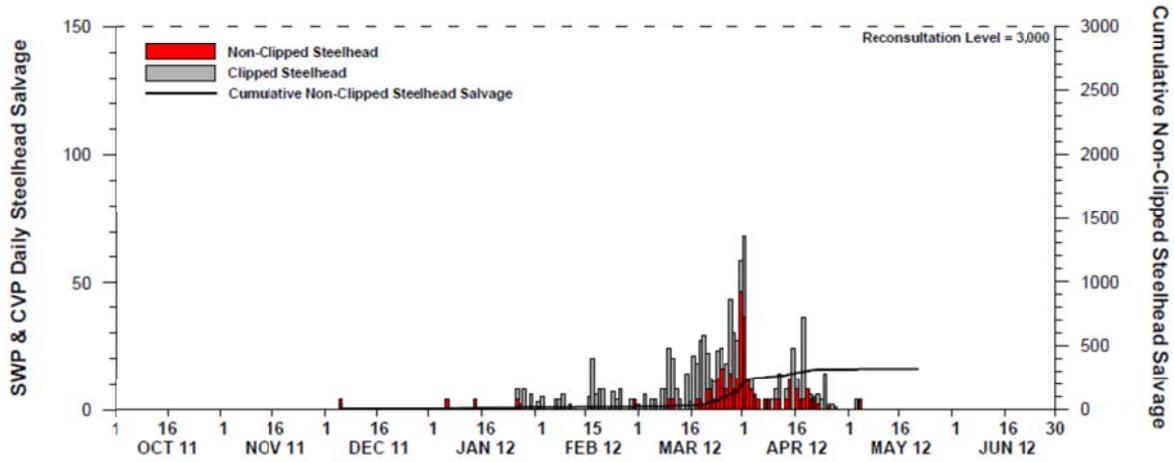
DWR-DES Revised 5/21/2012

Preliminary, subject to revision

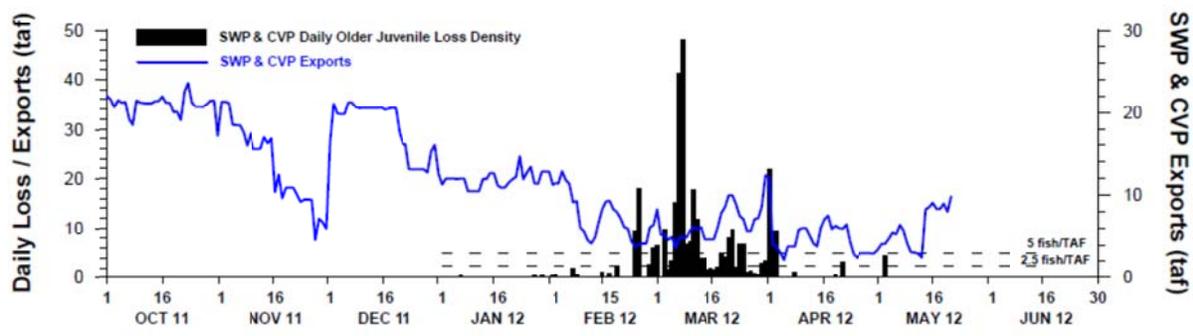
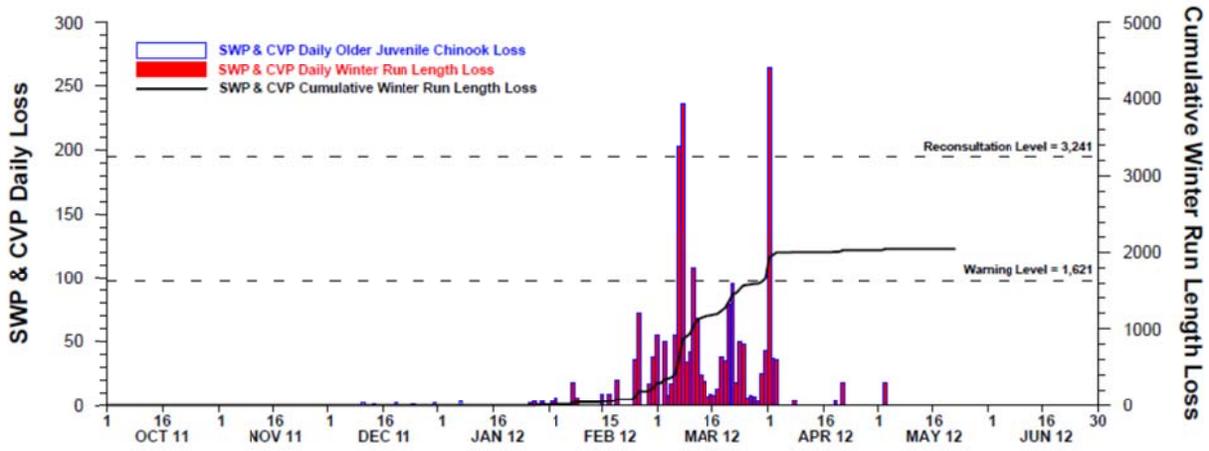
CWT: We have real-time data this year and know in a timely fashion from which hatchery the CWT fish came (see observed Chinook salvage [dot plot] below). Nimbus and Coleman Hatchery fall-run are beginning to show up at the CVP and SWP salvage facilities. No CWT spring-run releases were salvaged this period (last observed on 3/29). A few fall-run Chinook from Nimbus and Coleman were sampled at the fish facilities on 4/15/ and 4/16. There were a number of CWTs collected during the last week, but it has not been determined from which hatcheries they came. Most likely, they are from the Merced Hatchery (San Joaquin River) because the majority of Chinook entering the Delta right now are from the San Joaquin side (see catch data above). DWR has requested the tag codes, but Merced Hatchery has not yet responded.

Below are the salvage and loss graphs for Chinook and steelhead from Llaban (DWR) as of 5/21/12. For additional salvage and loss graphs, please visit the DWR website at: <http://www.water.ca.gov/swp/operationscontrol/calfed/calfedmonitoring.cfm>.

## STEELHEAD SALVAGE AT THE DELTA FISH FACILITIES 01 OCT 2011 THROUGH 20 MAY 2012

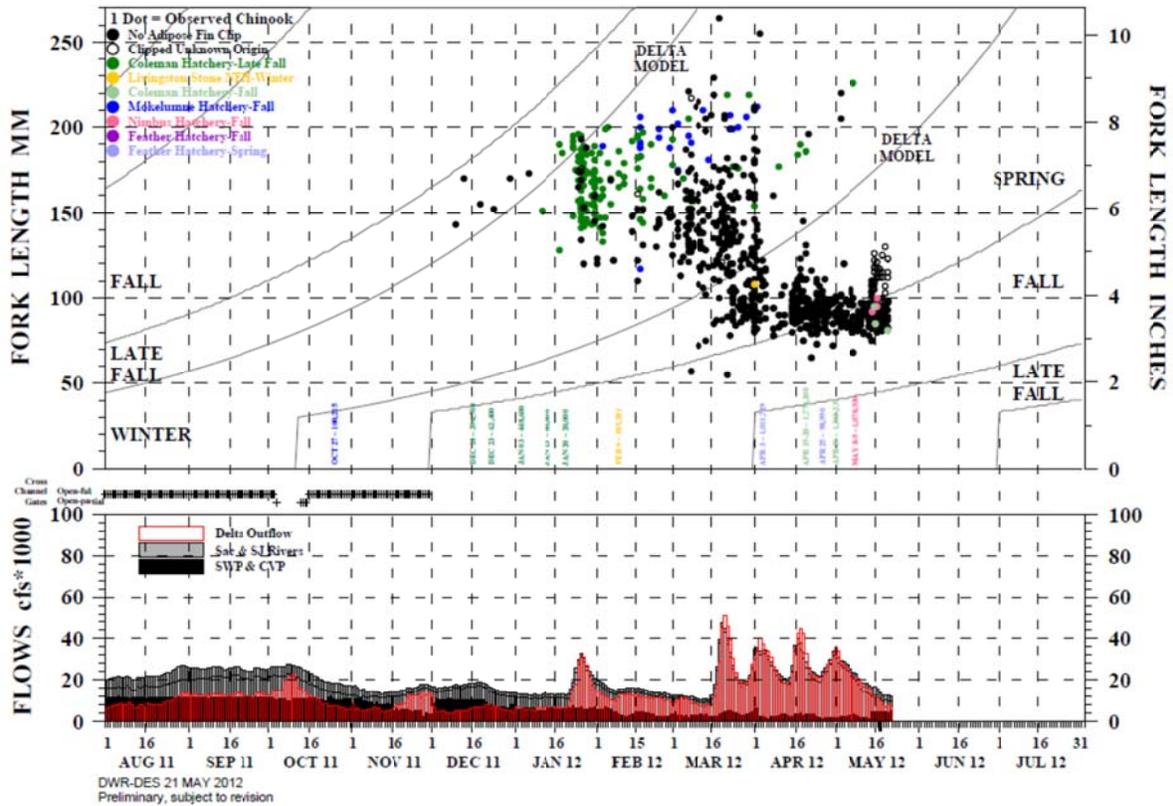


## NON-CLIPPED WINTER RUN & OLDER JUVENILE CHINOOK LOSS AT THE DELTA FISH FACILITIES 01 OCT 2011 THROUGH 20 MAY 2012



DWR-DES 21 MAY 2012  
 Preliminary, subject to revision  
 \* Older juveniles defined as all Chinook above the minimum winter run length line (Delta model)

## OBSERVED CHINOOK SALVAGE AT THE SWP & CVP DELTA FISH FACILITIES 08/01/2011 THROUGH 05/20/2012



### Operations (5/22/12)

SWP		CVP	
<b>Exports (cfs)</b>			
Clifton Court Forebay	3,700	Jones Pumping Plant	800
<b>Reservoir Releases (cfs)</b>			
Feather - Oroville	1,500	Nimbus	2,700 (down to 2,000 cfs on Wednesday)
		Sacramento - Keswick	10,500 (down to 10,000 cfs on Thursday)
		Stanislaus - Goodwin	1,500 (down to 1,000 on Thursday and 900 on Sunday)
<b>Reservoir Storage (in TAF, % of capacity)</b>			
San Luis (SWP)	795	San Luis (CVP)	637
Oroville	3,510	Shasta	4,403
New Melones		Folsom	913
<b>Delta Operations</b>			
DCC	Closed as of 12/1/11 (will open on Memorial Day weekend, closed during the week, and then opened	Sacramento River at Freeport (cfs)	9,991 (dropping)

	on subsequent weekends after that)		
Outflow Index (cfs)	~7,000	San Joaquin River (cfs) at Vernalis	2,460
Total Delta Inflow (cfs)	14,119	OMR (daily) (cfs)	
Water Temperature (°F)	71.6	OMR 5 day (cfs)	-5,183
X2 (km)	74 (near Chipps Island)	OMR 14 day (cfs)	-3,657
E/I (%)	25.7		

**Delta Conditions Team (DCT) Report:** Pettit (DWR) provided a brief report that the discussion at the DCT meeting centered on what to do with exports over the last 3 days in May, with some members supporting relaxing to -5,000 cfs OMR and others supporting extending the action response of minimum combined exports of 1,500 cfs through the end of May. Water temperatures in the Delta and the recent PTM results were also discussed. After the DCT call, information was submitted to DOSS from the Natural Resources Defense Council, with additional responsive comments provided by Cramer Fish Sciences (Attachment 1).

**Sentinel Steelhead Monitoring:** A cumulative total of 34 tags have been observed passing the Railroad (RR) Cut receivers so far in the third sentinel steelhead release period, based on data downloaded yesterday (5/21/12) morning. This exceeded the trigger of 31. NMFS notified WOMT today and operations will be adjusted to a minimum combined export level of 1,500 cfs from 5/24 through at least 5/28, per the 5/11/12 NMFS determination<sup>1</sup>). Based on the timing of tag detections and the resulting action response, the last 3 days in May (5/29–5/31) would be affected if NMFS determined that a change in protocol from the 5/11/12 NMFS determination was warranted because of the change in the San Joaquin Water Index year type.

**PTM Runs:** At last week’s (5/15/12) WOMT meeting, Reclamation requested that PTM runs be conducted to look at conditions under different experimental options. A WOMT subgroup met and developed the PTM run criteria. One set of results dated 5/18/12 (Attachment 2), requested by the WOMT subgroup, and modeling actual expected daily operations, was sent to DOSS yesterday (5/21/12) morning. Another set of PTM results from 5/11/12 (requested by the Smelt Working Group for its 5/14/2012 meeting, and also sent out to DOSS, Attachment 3) modeled conditions under “steady state” operations targeting -5,000 cfs OMR or 1,500 cfs combined exports. These results provide two perspectives on the differences in hydrodynamics and particle movement under different operational scenarios. It was noted that the Vernalis flows assumed for the two sets of modeling results were not quite the same. The 5/11/12 PTM results modeled Vernalis flows expected under a “critical” San Joaquin Water Index year type, while the 5/18/12 PTM results modeled Vernalis flows under a “dry” San Joaquin Water Index year type.

**Run protocols:** For Scenarios A and B in the 5/18/12 runs, the modeling assumed that the rock barrier at the Head of Old River (HORB) was in place, and that the RR Cut trigger would be met so that exports would be reduced to 1,500 cfs combined for 5 days (5/23–5/27). From May 28 through May 31, Scenario A modeled operations targeting -5,000 cfs OMR while Scenario B modeled operations at a minimum combined export level of 1,500 cfs. Before June 1, Scenario C modeled operations targeting an I:E ratio of 2:1 with the HORB out. Beginning June 1, all

<sup>1</sup> <http://www.water.ca.gov/swp/operationscontrol/docs/delta/deltaops.pdf>

scenarios modeled operations targeting -4,000 cfs OMR. In all scenarios, particles were inserted on 5/15 near the confluences of the Mokelumne and Calaveras rivers with the San Joaquin River. The output evaluated included particle flux past Chipps Island, particle flux past RR Cut on Old and Middle rivers, and particle entrainment at the projects. Average OMR under all 3 scenarios, as modeled by the HYDRO module, was also reported out (see the “OMR operations for the last 3 days in May” section below).

If DOSS advises that no change is warranted from the 5/11/12 NMFS determination, that is, stay with the planned operation to -5,000 cfs OMR from May 29-31 the “Daily Modeled OMR” table in the 5/18/12 PTM results suggest that OMR could become nearly 3,000 cfs more negative by the second day of relaxation (i.e., from -1,850 cfs on model-day 5/27 to -4,536 cfs on model-day 5/29).

Some felt that the PTM results were probably more for evaluating protections for smelt than salmon and steelhead because there was still no consensus on whether steelhead are still in the system, and this should be confirmed before DOSS begins to consider and reference PTM runs.

**Consideration of steelhead presence in the Delta in late May and whether a change in the sentinel study operations from 5/29 through 5/31 is warranted:** The OMR adaptive range in the stipulation is intended to provide necessary protections to steelhead entering the Delta from the Mokelumne and Calaveras river basins given that the HORB is in. The hydrodynamic effects of HORB mean that Mokelumne and Calaveras steelhead entering the Delta will experience increased mainstem San Joaquin flows, but more negative OMR flows if they enter interior Delta channels. HORB does not provide route “direction” for steelhead entering the Delta from the Mokelumne and Calaveras rivers as it does for steelhead entering the Delta from upstream of Mossdale, which are directed into the mainstem San Joaquin route; therefore, the focus of the discussion was on steelhead from the Mokelumne and Calaveras rivers.

It was noted that although absolute abundance of steelhead in the Delta might be low in late May, those individuals represent an important component of diversity in outmigration timing and were intended to be protected by the NMFS BiOp. Because steelhead continue to be salvaged in the Delta through June and into July in some years, the fact that the NMFS BiOp actions protecting steelhead through the end of May 31 (Action IV.2.1) and June 15 (Action IV.2.3) means that the NMFS BiOp has already, to some degree, limited protection of the tail end of the outmigrating population. Some folks do not support truncating the period of protection by 3 days as long as there is the potential for steelhead to enter the Delta from the Mokelumne or Calaveras rivers.

There was a peak in wild steelhead outmigrating to the Delta from the San Joaquin River basin around 4/15 based on the Mossdale trawl data. The last steelhead was seen in salvage more than 2 weeks ago (see salvage data above). Looking at other rotary screw trap (RST) data from the Calaveras and Mokelumne rivers, plus an update from FISH BIO (5/22 update), DOSS discussed what that means in terms of OMR flows and what we are trying to manage.

## **OMR Considerations**

Steelhead presence in the Calaveras River: The latest FISHBIO data on 5/22 reported that, from 4/30 to 5/13, 48 *O. mykiss* were caught in the RST at Shelton Road upstream of Bellota weir.

Two of these 48 were staged as 1+ smolts. It was reported that the openings in the many flashboard dams below Bellota in Mormon Slough and the Old Calaveras River were closed on 5/15, and given current flows below Bellota (approximately 35 cfs), successful passage downstream of Bellota would be unlikely. While it was noted that there are still 5 to 7 miles of canal/river channel below the last flashboard/dam and steelhead could still be present there (having moved downstream before 5/15), DOSS generally agreed that any steelhead present below the flashboard dams would most likely move out by the end of May; therefore, it was judged unlikely that juvenile steelhead would be entering the Delta from the Calaveras River from 5/29 through 5/31.

Water temperature influences on fish movement: On 5/20, the water temperature in the Mokelumne River at its confluence to the San Joaquin River reached nearly 70°F (21°C); by 5/21, water temperatures were decreasing and are about 68°F (20°C) now. Water temperatures in the mornings are generally lower. The daily average has not been that high, but water temperatures increase in the afternoon, with about a 4-degree change in water temperature throughout the day. Although DOSS generally agreed that temperatures are higher than optimal for juvenile steelhead, it was noted that most of the temperature gages measure water temperature near the surface (within 1 meter) and steelhead are capable of swimming up and down in the water column to seek cooler water. Beginning next week, we expect air temperatures to be up in the 98 to 100°F (36 to 38°C) range.

There was discussion about the increase in water temperatures and the effect of these temperatures on steelhead and Chinook movement into the Delta, and whether fish exhibit a certain behavior of not just moving with flows but also moving with variations in water temperature. Temperatures are an important cue for steelhead at the smolt stage and not something that has been well evaluated; flows and temperature are most likely both relevant to fish movement.

The RST data indicate that there are still steelhead entering the lower Mokelumne (*i.e.*, below Woodbridge Dam). It was suggested that if those steelhead might turn back upstream (up to Woodbridge Dam) in search of lower temperatures; it is also possible that they would continue downstream migration and enter the Delta. There is currently no optimal habitat for steelhead in the Delta and fish tend to avoid conditions that are suboptimal; however, with the DCC gates opening on Friday, 5/25/12, and through the holiday weekend, some additional flow will be provided to the lower Mokelumne River, which might increase outmigration of steelhead at that point.

OMR operations for last 3 days in May: If we assume that there are steelhead entering the Delta from the Mokelumne River, the question of the level of protection provided by different operations is relevant. The group discussed what sort of hydrodynamic change would be expected over a few days under some of the scenarios being considered. The 5/18/12 modeling results summarized in Attachment 2 show daily modeled OMR flows for each of the three scenarios. Scenario A, in which operations relax to target a -5,000 cfs OMR after a 5-day action response ending on 5/27, shows the following daily OMR trend:

5/27 (1,500 exports): -1,850 cfs  
5/28: -3,553 cfs  
5/29: -4,536 cfs

5/30: -4,478 cfs  
5/31: -4,911 cfs

It was noted that although OMR did get more negative, it did not reach -5,000 cfs until the last of the 4 days of modeled operations. The difference between -4,911 and -5,000 cfs OMR is likely within the noise of the model.

In comparison, Scenario B, in which operations remain at minimum combined exports of 1,500 cfs after the 5-day action response ending on 5/27, shows the following daily OMR trend:

5/27: -1,454 cfs  
5/28: -1,547 cfs  
5/29: -1,639 cfs  
5/30: -1,707 cfs  
5/31: -2,288 cfs

There were some differences of opinion over the potential change in hydrodynamics and the relevance for protection of steelhead. An intermediate OMR level of, for example, -3,500 cfs OMR, might offer intermediate protection to fish if they are still in the system. We could go to -3,500 cfs over the last 3 days or could gradually ramp up combined exports by 1,000 cfs per day, keeping in mind also that OMR is not “steady” throughout the period measured (e.g., 24 hours for a daily OMR). OMR also fluctuates with the tides and it can take 3 to 4 days for OMR to reach some target level after a change in operations. For the last 3 days in May, even if we go back to -5,000 cfs OMR, we will not see OMR at -5,000 cfs for several days, as shown in the modeled results from Scenario A, above. It took nearly 4 days to go from -5,000 to -1,250 cfs OMR.

There was a question about what the gain or loss would be in terms of the experimental study (data value) if OMR remained at -1,250 cfs from 5/29 to 5/31. Whatever the operations from 5/29 through 5/31, the response of the sentinel steelhead to a 5-day action response can be assessed. If operations from 5/29 through 5/31 relax to target an OMR of -5,000 cfs, the sentinel steelhead response to an additional change in the system can be assessed (though not many sentinel steelhead may remain in the Delta and vicinity of the receiver array). From NMFS’ prospective, the baseline comparison of protection is that of RPA Action IV.2.1.

There was concern expressed about continuing to change the stipulation study experimental design to reduce the risks according to individual objectives (i.e., fish protection or water supply). In response, it was noted that the changes made for the second experimental period were in consideration of D-1641 restrictions and the level of protection expected under Action IV.2.1 per the current San Joaquin Dry Water Index year type; it would be consistent to make adjustments for the third experimental period based on the same considerations.

WOMT will most likely consider the water costs in its discussion about operations for the end of May. A comparison to the base case (implementation of RPA Action IV.2.1) shows that higher pumping has occurred under the stipulation; therefore, we have seen some benefit to water supply.

Because DOSS could not reach a consensus on whether wild steelhead from the Mokelumne and the Calaveras rivers would be entering the Delta in late May and need to be protected, DOSS decided to provide WOMT with a status update on its considerations regarding steelhead entry into the Delta in late May and the effects of a possible 3-day operations change on the protection of any such steelhead. There would be no formal advice to NMFS or WOMT; however, DOSS would describe the three options it discussed.

**Calendar-Based OMR for 2013:** Page 8 of the joint stipulation states: "...the parties commit to continuing discussions to develop a monitoring-based trigger, or other real-time operations approach, in 2013 that would modify the current January 1 onset of Action IV.2.3." A DOSS subgroup of biologists and operators will come up with a process and discuss what monitoring triggers or other real-time approach could be used and then provide any recommendation to DOSS. The subgroup would identify other monitoring locations for when winter-run Chinook and steelhead are entering the Delta. The subgroup will meet in person for at least a full day (and possibly 2 days) at the onset.

Each agency to DOSS was asked to think about which representatives to include in the subgroup and also to consider potential monitoring stations. Since the joint stipulation stated that "the parties commit," there was a question about whether a subgroup of DOSS is the appropriate forum for the discussion. Ford (DWR) agreed to contact DCT members to solicit their interest in participating in the effort.

**Smelt Working Group (SWG):** SWG met on Monday, 5/21/12; there were no recommendations for operations.

**DOSS update to WOMT and NMFS:** There was uncertainty on whether any wild steelhead would be exposed to the influence of -5,000 cfs OMR, and differences of opinion concerning the PTM results; therefore, rather than providing advice, DOSS is informing NMFS and WOMT of three potential options for operations during May 29–31, as follows:

- 1) -1,250 cfs OMR (most protective, if Mokelumne River steelhead still outmigrating)
- 2) -5,000 cfs OMR (per 5/11/12 NMFS determination)
- 3) -3,500 cfs OMR or ramp up to -5,000 cfs (compromise option)

RPA Action IV.2.3 continues to be in effect through June 15.

**Next Meeting:** Because of the Memorial Day holiday, there will most likely be a delay in fish monitoring data reporting to DOSS; therefore, DOSS decided not to meet on 5/29/12. The next DOSS conference call will be June 5, 2012, at 9:00 a.m.



Barbara Byrne <barbara.byrne@noaa.gov>

## For DOSS: Information from NRDC

1 message

Barbara Byrne <barbara.byrne@noaa.gov>

Mon, May 21, 2012 at 5:57 PM

To: Garwin.Yip@noaa.gov, Alice Low <ALOW@dfg.ca.gov>, "Anderson, Craig" <Craig\_Anderson@fws.gov>, Andy Chu <andychu@water.ca.gov>, Angela Llaban <allaban@water.ca.gov>, Anne Snider <asnider@waterboards.ca.gov>, Aondrea Bartoo <aondrea\_bartoo@fws.gov>, Barbara Byrne <barbara.byrne@noaa.gov>, Barbara Rocco <barbara.rocco@noaa.gov>, Barbara Rocco <barocco@sbcglobal.net>, Bob Fujimura <bfujimura@dfg.ca.gov>, Bruce Herbold <Herbold.Bruce@epa.gov>, Brycen Swart <brycen.swart@noaa.gov>, Chad Dibble <CDIBBLE@dfg.ca.gov>, Cynthia LeDoux-Bloom <cloux@water.ca.gov>, Dan Yamanaka <dany@water.ca.gov>, Edmund Yu <eyu@water.ca.gov>, Erin Foresman <Foresman.Erin@epamail.epa.gov>, "Ford, Mike" <jmford@water.ca.gov>, Jason Roberts <JDROBERTS@dfg.ca.gov>, Jeff Stuart <j.stuart@noaa.gov>, Jim Gleim <jamesg@water.ca.gov>, Joe Johnson <jrjohnson@dfg.ca.gov>, John Hannon <JHannon@usbr.gov>, Jon R Burau <jrburau@usgs.gov>, Joshua A Israel <JAIsrael@usbr.gov>, Julio Adib-Samii <JADIBSAMII@dfg.ca.gov>, Kevin Reece <creece@water.ca.gov>, "Kiteck, Elizabeth" <EKiteck@usbr.gov>, "Kyler, Kari" <KKyler@waterboards.ca.gov>, "Oppenheim, Bruce" <Bruce.Oppenheim@noaa.gov>, Pat Brandes <Pat\_Brandes@fws.gov>, Paul Fujitani <PFujitani@usbr.gov>, "Pettit, Tracy" <pettit@water.ca.gov>, Rachel Johnson <rbarnettjohnson@usbr.gov>, Robert Vincik <rvincik@dfg.ca.gov>, Roger Guinee <roger\_guinee@fws.gov>, Russell Yaworsky <rpyaworsky@usbr.gov>, Scott Cantrell <SCANTREL@dfg.ca.gov>, Thomas Morstein-Marx <TMorsteinMarx@usbr.gov>, "Washburn, Thuy" <TWashburn@usbr.gov>

FYI.

----- Forwarded message -----

From: **Obegi, Doug** <dobegi@nrdc.org>

Date: Mon, May 21, 2012 at 5:13 PM

Subject: Recommendations to DOSS

To: Barbara Byrne <barbara.byrne@noaa.gov>

Cc: Emily Brown <ebrown@earthjustice.org>, Garwin Yip <garwin.yip@noaa.gov>

Hi Barb,

Sorry I wasn't able to be on the DCT call today, but I did want to submit a few comments for DOSS' consideration.

First, the 5/20 weekly report shows that fewer than half of this third release group has been detected at any receiver (more than half of the fish are not accounted for at all). So while the Railroad Cut trigger has not been hit (based on absolute numbers of fish), a similar or higher percentage of detected fish has already been detected at Railroad Cut:

- The first release group had 151 of 166 tagged steelhead detected by at least one receiver, with 148 of 166 detected at station 9A (just downstream of the release site). 29% (44 fish) were detected at Middle River at Railroad Cut. (5/1 revised weekly report)
- The second release group had 147 of 167 tagged steelhead detected by at least one receiver, with 141 of 167 detected at station 9A. 49 tags were detected at Middle River at Railroad Cut, which equates to 33% of detected fish. (5/13 weekly report, 5/13 daily report)
- The third release group has had only 81 of 167 tagged steelhead detected by at least one receiver, with only 68

of 167 detected at Station 9A. 25 tags (31%) were detected at Middle River at Railroad Cut. The majority of fish have not been detected at all. (5/20 weekly report)

Second, the recent PTM results suggest significantly higher entrainment and lower survival through the Delta under existing conditions than under the RPA. Moreover, the acoustic tagging results show that migrating steelhead were moving through the system over the two week period, much longer than just a few days. The first detection at Railroad Cut was as long as 14 days after release in the first release group, and the second release group had tags at Railroad Cut that were first detected on 5/11 (10 days after release). This suggests that steelhead will be affected by OMR conditions for several weeks, giving more credence to PTM results over a 14 day period.

Third, as has been noted by NMFS, the change in water year type as of May 1 would have resulted in a change in the I:E ratio under the RPA, reducing exports and negative OMRs.

Recommendations:

- 1) In light of the significant number of undetected fish, the PTM results, and this change in water year type, I recommend that OMR should be managed to -1,250 cfs or 1,500 cfs combined exports for the 2-3 days after the end of the 5 day export curtailment, if and when the trigger is hit.
- 2) In addition, NMFS should also consider whether the absolute number of fish at Railroad Cut is still an appropriate trigger in light of the fact that the majority of tags have not been detected at all.

My apologies if I have misstated any of the prior study results; I was trying to synthesize the data quickly. But it does seem like we have a big problem with non-detections in this release group, quite unlike the prior 2 groups.

Thanks,  
Doug

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Doug Obegi  
 Staff Attorney  
 Water Program  
 Natural Resources Defense Council  
 111 Sutter Street, 20th Floor  
 San Francisco, CA 94104  
 415.875.6100 (phone)  
 415.875.6161 (facsimile)

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**Barb Byrne**  
Fish Biologist

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NMFS Central Valley Office | 650 Capitol Mall, Suite 5-100 | Sacramento, CA 95814



Barbara Byrne &lt;barbara.byrne@noaa.gov&gt;

## For DOSS: CFS comments on information from NRDC

1 message

Barbara Byrne &lt;barbara.byrne@noaa.gov&gt;

Mon, May 21, 2012 at 10:08 PM

To: Garwin.Yip@noaa.gov, Alice Low <ALOW@dfg.ca.gov>, "Anderson, Craig" <Craig\_Anderson@fws.gov>, Andy Chu <andychu@water.ca.gov>, Angela Llaban <allaban@water.ca.gov>, Anne Snider <asnider@waterboards.ca.gov>, Aondrea Bartoo <aondrea\_bartoo@fws.gov>, Barbara Byrne <barbara.byrne@noaa.gov>, Barbara Rocco <barbara.rocco@noaa.gov>, Barbara Rocco <barocco@sbcglobal.net>, Bob Fujimura <bfujimura@dfg.ca.gov>, Bruce Herbold <Herbold.Bruce@epa.gov>, Brycen Swart <brycen.swart@noaa.gov>, Chad Dibble <CDIBBLE@dfg.ca.gov>, Cynthia LeDoux-Bloom <clédoux@water.ca.gov>, Dan Yamanaka <dany@water.ca.gov>, Edmund Yu <eyu@water.ca.gov>, Erin Foresman <Foresman.Erin@epamail.epa.gov>, "Ford, Mike" <jmford@water.ca.gov>, Jason Roberts <JDROBERTS@dfg.ca.gov>, Jeff Stuart <j.stuart@noaa.gov>, Jim Gleim <jamesg@water.ca.gov>, Joe Johnson <jrjohnson@dfg.ca.gov>, John Hannon <JHannon@usbr.gov>, Jon R Burau <jrburau@usgs.gov>, Joshua A Israel <JAIsrael@usbr.gov>, Julio Adib-Samii <JADIBSAMII@dfg.ca.gov>, Kevin Reece <creece@water.ca.gov>, "Kiteck, Elizabeth" <EKiteck@usbr.gov>, "Kyler, Kari" <KKyler@waterboards.ca.gov>, "Oppenheim, Bruce" <Bruce.Oppenheim@noaa.gov>, Pat Brandes <Pat\_Brandes@fws.gov>, Paul Fujitani <PFujitani@usbr.gov>, "Pettit, Tracy" <pettit@water.ca.gov>, Rachel Johnson <rbarnettjohnson@usbr.gov>, Robert Vincik <rvincik@dfg.ca.gov>, Roger Guinee <roger\_guinee@fws.gov>, Russell Yaworsky <rpyaworsky@usbr.gov>, Scott Cantrell <SCANTREL@dfg.ca.gov>, Thomas Morstein-Marx <TMorsteinMarx@usbr.gov>, "Washburn, Thuy" <TWashburn@usbr.gov>

Brad Cavallo of Cramer Fish Sciences had comments on the information provided by Doug Obegi, NRDC. See Brad's comments in BOLD (and noted as "BJC") within Doug's e-mail, below.

----- Forwarded message -----

From: **Obegi, Doug** <dobegi@nrdc.org>

Date: Mon, May 21, 2012 at 5:13 PM

Subject: Recommendations to DOSS

To: Barbara Byrne &lt;barbara.byrne@noaa.gov&gt;

Cc: Emily Brown &lt;ebrown@earthjustice.org&gt;, Garwin Yip &lt;garwin.yip@noaa.gov&gt;

Hi Barb,

Sorry I wasn't able to be on the DCT call today, but I did want to submit a few comments for DOSS' consideration.

First, the 5/20 weekly report shows that fewer than half of this third release group has been detected at any receiver (more than half of the fish are not accounted for at all). So while the Railroad Cut trigger has not been hit (based on absolute numbers of fish), a similar or higher percentage of detected fish has already been detected at Railroad Cut:

**BJC: You're assuming the receivers were all downloaded at the same time or that the download history is equivalent to previous weekly reports. This is not the case. Railroad Cut receivers have the most recent download available (5/20), most of the other receivers (e.g. 9A and 9B at Turner Cut where downloaded last at 5/16). Hence the discrepancy observed is due differences in download histories, not to some change in fish behavior or mortality.**

. The first release group had 151 of 166 tagged steelhead detected by at least one receiver, with 148 of 166

detected at station 9A (just downstream of the release site). 29% (44 fish) were detected at Middle River at Railroad Cut. (5/1 revised weekly report)

**BJC: See above explanation.**

The second release group had 147 of 167 tagged steelhead detected by at least one receiver, with 141 of 167 detected at station 9A. 49 tags were detected at Middle River at Railroad Cut, which equates to 33% of detected fish. (5/13 weekly report, 5/13 daily report)

**BJC: See above explanation.**

The third release group has had only 81 of 167 tagged steelhead detected by at least one receiver, with only 68 of 167 detected at Station 9A. 25 tags (31%) were detected at Middle River at Railroad Cut. The majority of fish have not been detected at all. (5/20 weekly report)

**BJC: See above explanation**

Second, the recent PTM results suggest significantly higher entrainment and lower survival through the Delta under existing conditions than under the RPA. Moreover, the acoustic tagging results show that migrating steelhead were moving through the system over the two week period, much longer than just a few days. The first detection at Railroad Cut was as long as 14 days after release in the first release group, and the second release group had tags at Railroad Cut that were first detected on 5/11 (10 days after release). This suggests that steelhead will be affected by OMR conditions for several weeks, giving more credence to PTM results over a 14 day period.

**BJC: By what standard do you have "significantly" been defined? "Significance" is a statistical term referring to results that differ more than would be expected due to random variation, did you perform a test to demonstrate a statistically significant difference? What time period after release of particles is being referred to in drawing this conclusion? No evidence has been provided to suggest that looking at particles more than a day or two after release provides useful information about the fate or behavior of juvenile salmonids. If evidence to the contrary is available, please provide it for discussion (no such information was provided since this stipulation process began with Feb. 7th workshop; though much information supporting the contrary view has been provided). Previous acoustic tagging studies have shown that most fish move through the Delta within 7 days. Though certainly there are many stragglers, 14 days is outside the norm for fish migrating through the Delta from the San Joaquin side (again, using data available to date). It is premature to interpret residence time from 2012 stipulation study data; many of the fish perceived to have a longer residence time may in fact be predators. Also, without a full analysis we can't specify account for the frequency of Delta residence time. However, even if these late detected fish are free swimming, living steelhead smolts, looking at the fate of particles weeks after particle release is NOT equivalent or representative of how these juvenile salmonids will be effected by Delta hydrodynamics. Again, if there is evidence showing long-duration PTM fates are representative for juvenile salmonids, please provide data or scientific literature to support this view; otherwise it is inappropriate to use and drawn conclusion from the PTM data in this way**

Third, as has been noted by NMFS, the change in water year type as of May 1 would have resulted in a change in the I:E ratio under the RPA, reducing exports and negative OMRs.

**BJC: The change in water year type is a classification scheme created for the convenience of managers. The current and near-term future hydrologic conditions experienced by fish in the Delta did not change when the water year type classification changed on May 1st. However, if the I:E ratio is to be used as a standard of comparison of "protectiveness", then the presence of HORB should be credited for improving the "flow ratio" in the San Joaquin River. Without the HORB, flows in the SJR downstream Old River would be 40% less than they are with the barrier.**

Recommendations:

- 1) In light of the significant number of undetected fish, the PTM results, and this change in water year type, I recommend that OMR should be managed to -1,250 cfs or 1,500 cfs combined exports for the 2-3 days after the end of the 5 day export curtailment, if and when the trigger is hit.
- 2) In addition, NMFS should also consider whether the absolute number of fish at Railroad Cut is still an appropriate trigger in light of the fact that the majority of tags have not been detected at all.

My apologies if I have misstated any of the prior study results; I was trying to synthesize the data quickly. But it does seem like we have a big problem with non-detections in this release group, quite unlike the prior 2 groups.

Thanks,

Doug

-----  
Doug Obegi

Staff Attorney

Water Program

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**PRELIMINARY RESULTS, SUBJECT TO REVISIONS**

# **PTM Simulation Results Using DSM2**

Prepared by:  
Delta Compliance & Modeling Section  
Operations Control Office  
Division of Operations & Maintenance

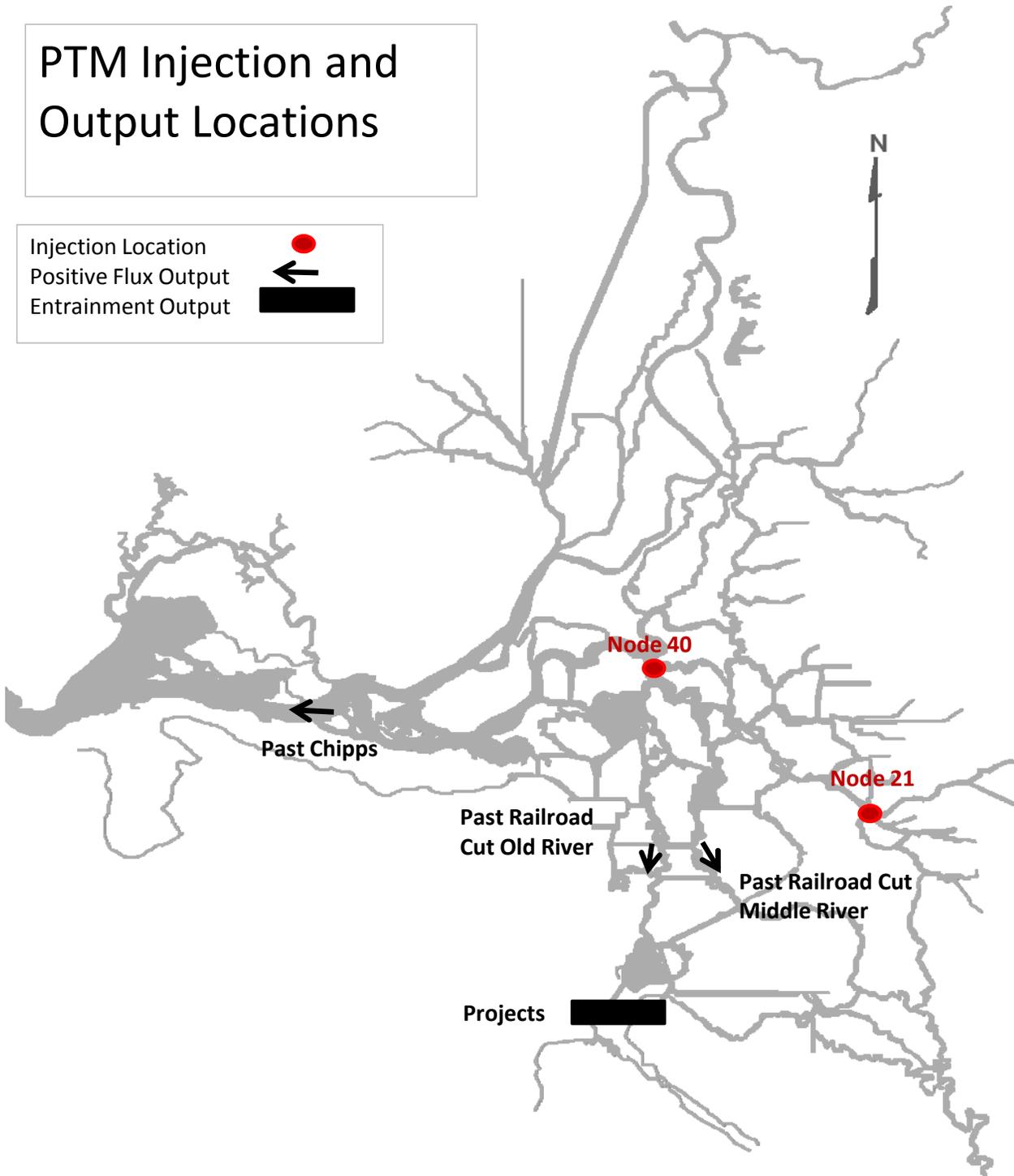
May 18, 2012

## Scenario Simulated

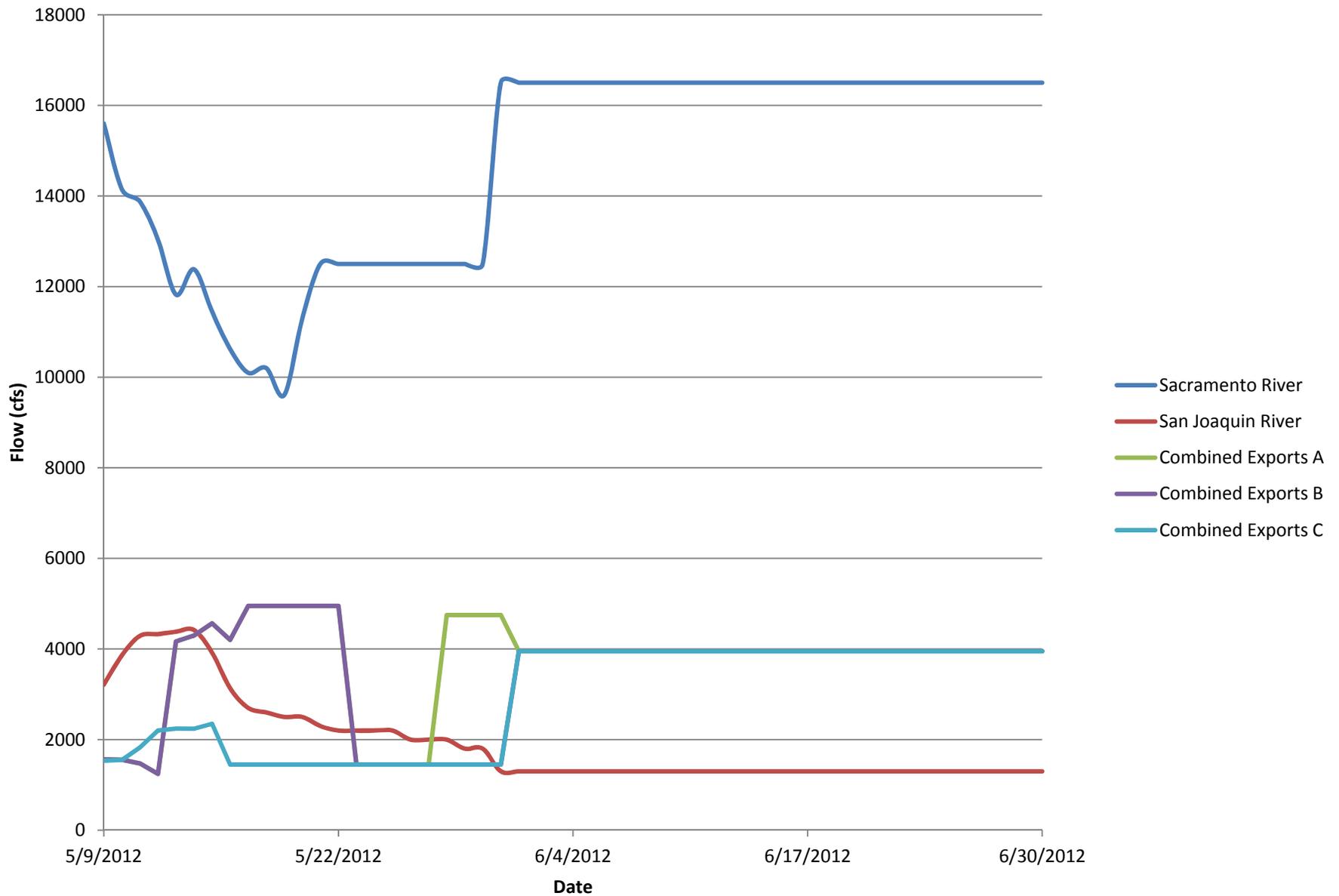
Scenario	HORB condition	Operations May 9-15	Operations May 16-22	Operations May 23-27	Operations May 28-31	Operations June 1-30
A	IN Before June 1 then OUT	Actual operations during 2 <sup>nd</sup> experimental period, intended to set up flow conditions before dropping in particles.	Operations targeting - 5,000 cfs OMR	Minimum combined exports of 1,500 cfs ( <i>assumes the Railroad Cut trigger will be exceeded</i> )	Operations targeting - 5,000 cfs OMR	Projected operations, probably targeting - 4,000 cfs OMR given some expectation of concerns for smelt.
B	IN Before June 1 then OUT				Minimum combined exports of 1,500 cfs	
C	OUT	I:E ratio of 2:1				

# PTM Injection and Output Locations

Injection Location  
Positive Flux Output  
Entrainment Output



# Modeled Daily Flow Assumptions

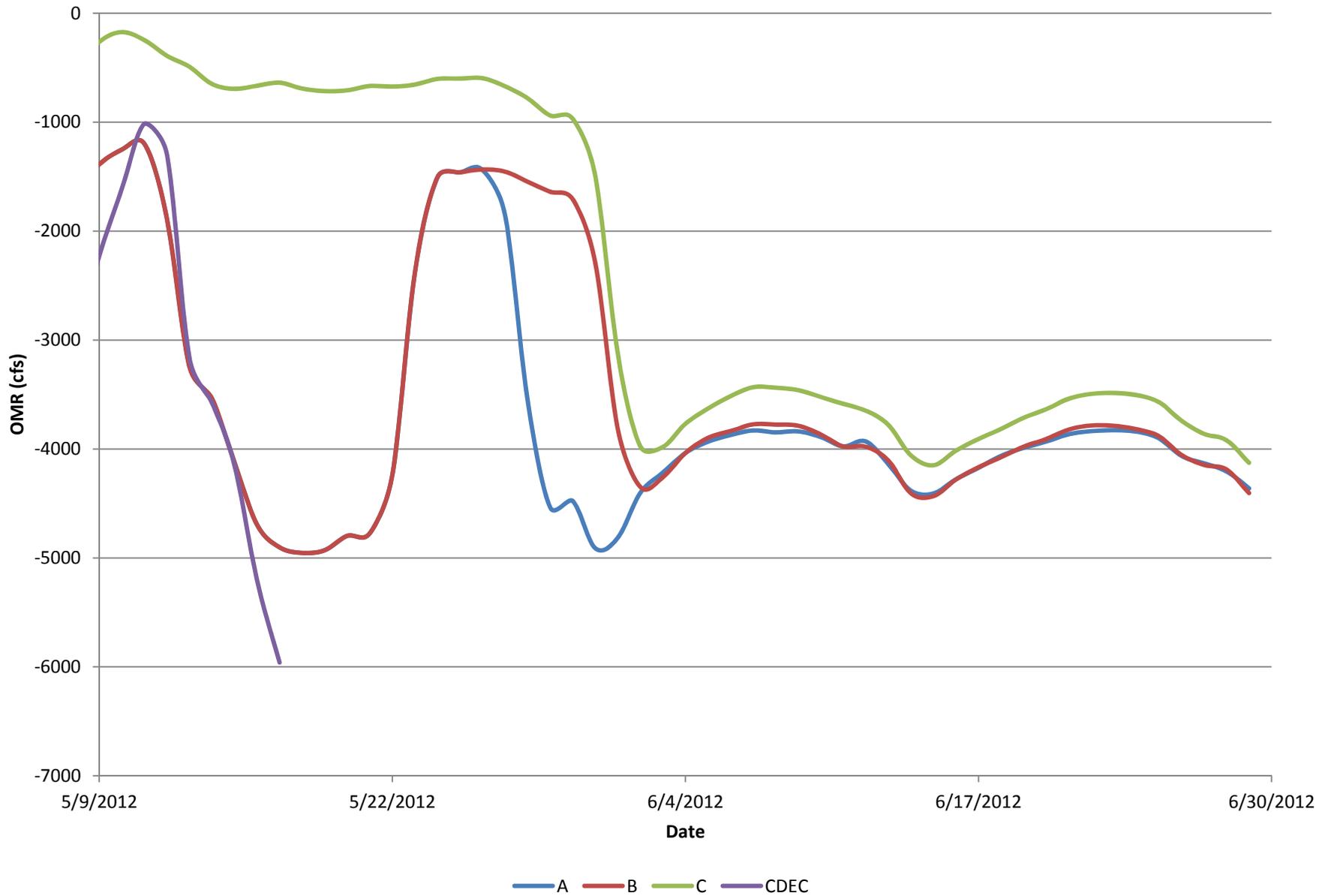


# Daily Modeled OMR

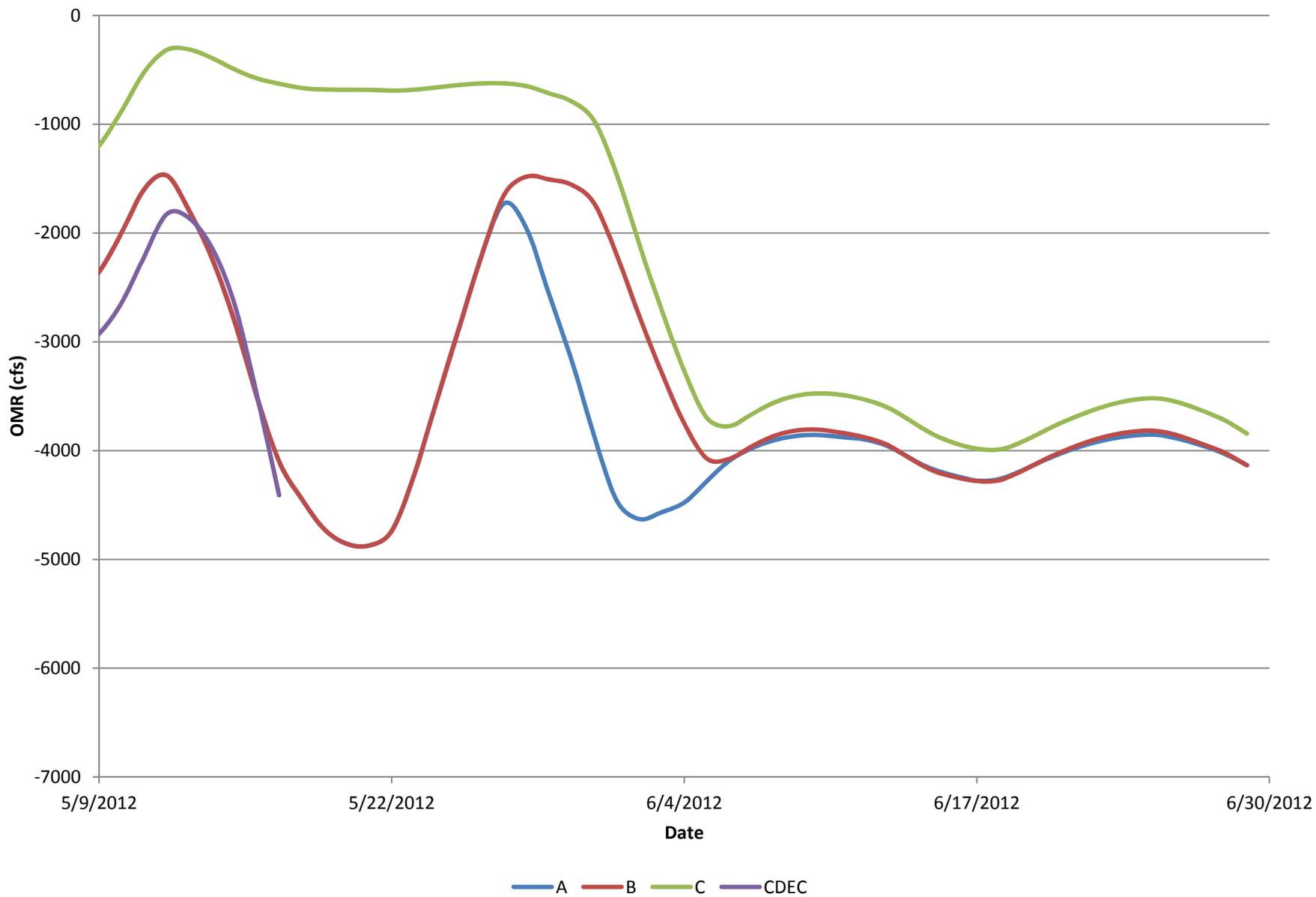
	A	B	C*
5/9/2012	-1388	-1388	-264
5/10/2012	-1253	-1253	-173
5/11/2012	-1198	-1198	-246
5/12/2012	-1884	-1884	-390
5/13/2012	-3244	-3244	-491
5/14/2012	-3536	-3536	-650
5/15/2012	-4124	-4124	-694
5/16/2012	-4695	-4695	-666
5/17/2012	-4903	-4903	-638
5/18/2012	-4954	-4954	-692
5/19/2012	-4930	-4930	-715
5/20/2012	-4798	-4798	-708
5/21/2012	-4775	-4775	-668
5/22/2012	-4241	-4241	-674
5/23/2012	-2380	-2380	-655
5/24/2012	-1506	-1506	-603
5/25/2012	-1461	-1461	-600
5/26/2012	-1438	-1435	-597
5/27/2012	-1850	-1454	-671
5/28/2012	-3553	-1547	-781
5/29/2012	-4536	-1639	-939
5/30/2012	-4478	-1707	-969
5/31/2012	-4911	-2288	-1489
6/1/2012	-4816	-3816	-3126
6/2/2012	-4403	-4348	-3976
6/3/2012	-4219	-4259	-3982
6/4/2012	-4036	-4037	-3769
6/5/2012	-3933	-3898	-3629
6/6/2012	-3873	-3836	-3516
6/7/2012	-3830	-3774	-3433
6/8/2012	-3848	-3776	-3438
6/9/2012	-3838	-3787	-3460
6/10/2012	-3890	-3866	-3522
6/11/2012	-3976	-3977	-3587
6/12/2012	-3931	-3978	-3648
6/13/2012	-4139	-4106	-3778
6/14/2012	-4383	-4406	-4058
6/15/2012	-4409	-4433	-4150
6/16/2012	-4278	-4280	-4015
6/17/2012	-4173	-4168	-3908
6/18/2012	-4064	-4076	-3817
6/19/2012	-3990	-3978	-3714
6/20/2012	-3932	-3909	-3635
6/21/2012	-3865	-3822	-3540
6/22/2012	-3836	-3784	-3494
6/23/2012	-3829	-3787	-3487
6/24/2012	-3841	-3818	-3506
6/25/2012	-3902	-3882	-3569
6/26/2012	-4063	-4054	-3740
6/27/2012	-4132	-4146	-3861
6/28/2012	-4205	-4188	-3920
6/29/2012	-4363	-4405	-4127

\* The Grant Line Canal Barrier is not in place for Scenario C which results in a more positive OMR at the same combined exports

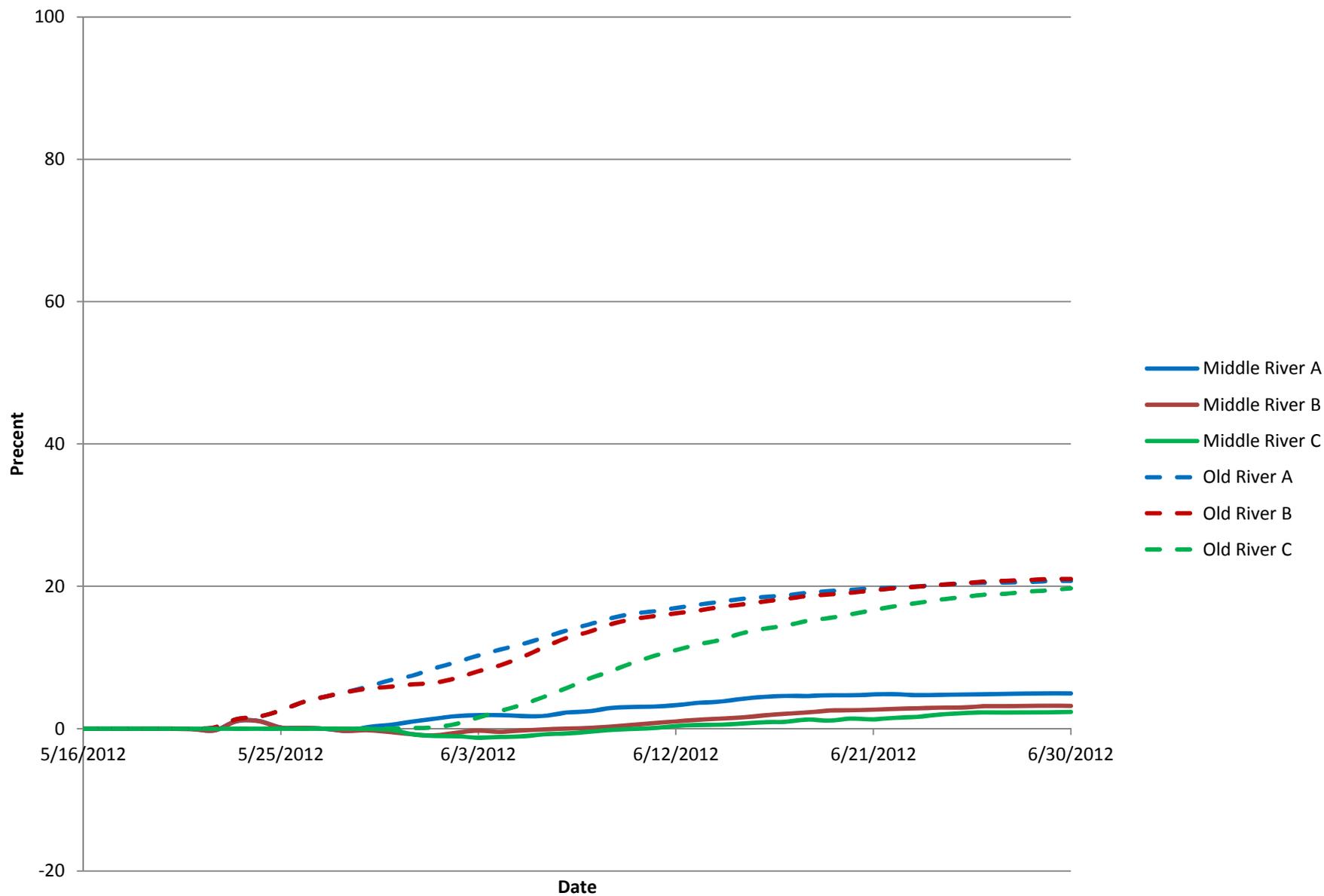
# Daily OMR



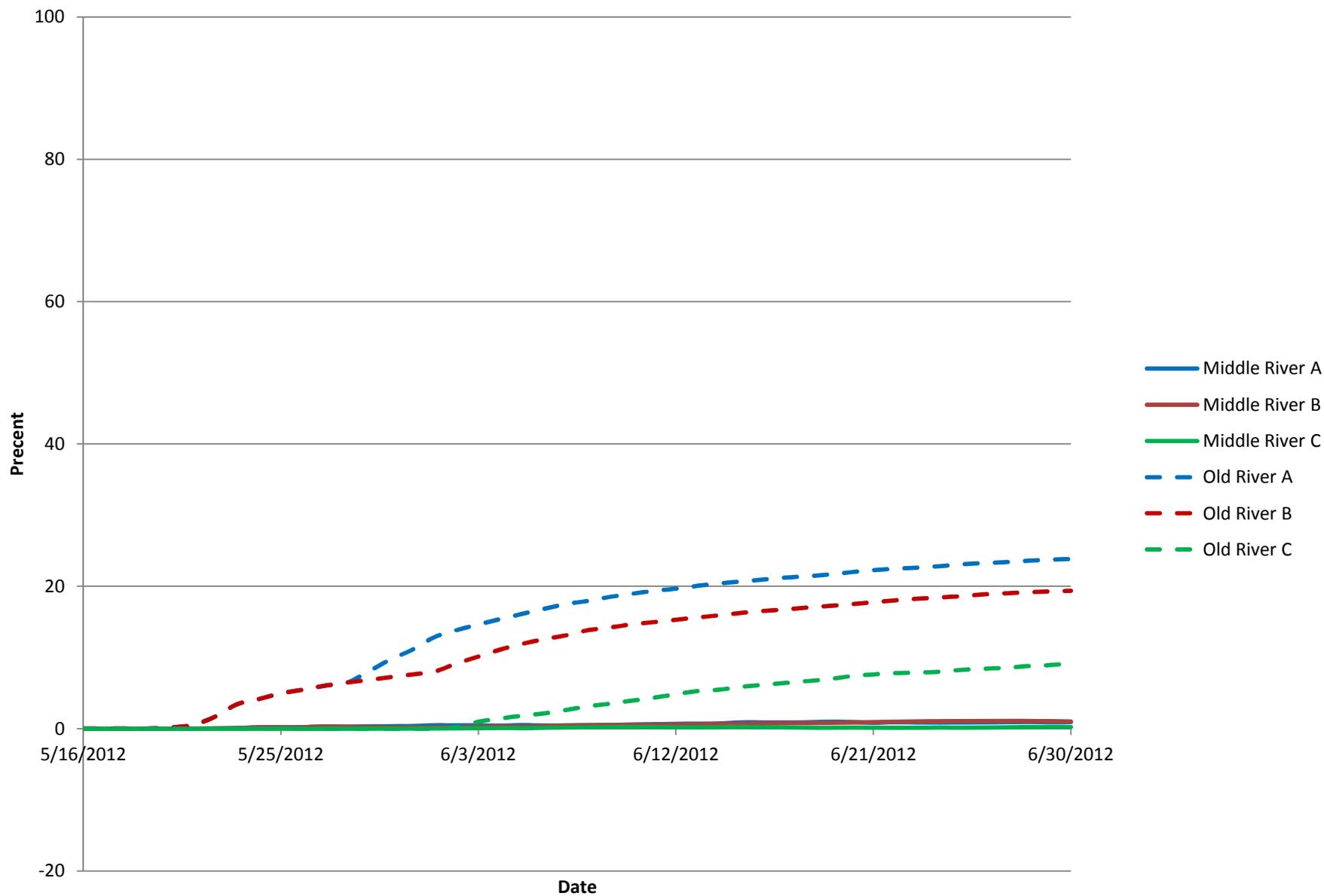
### 5 Day Average OMR



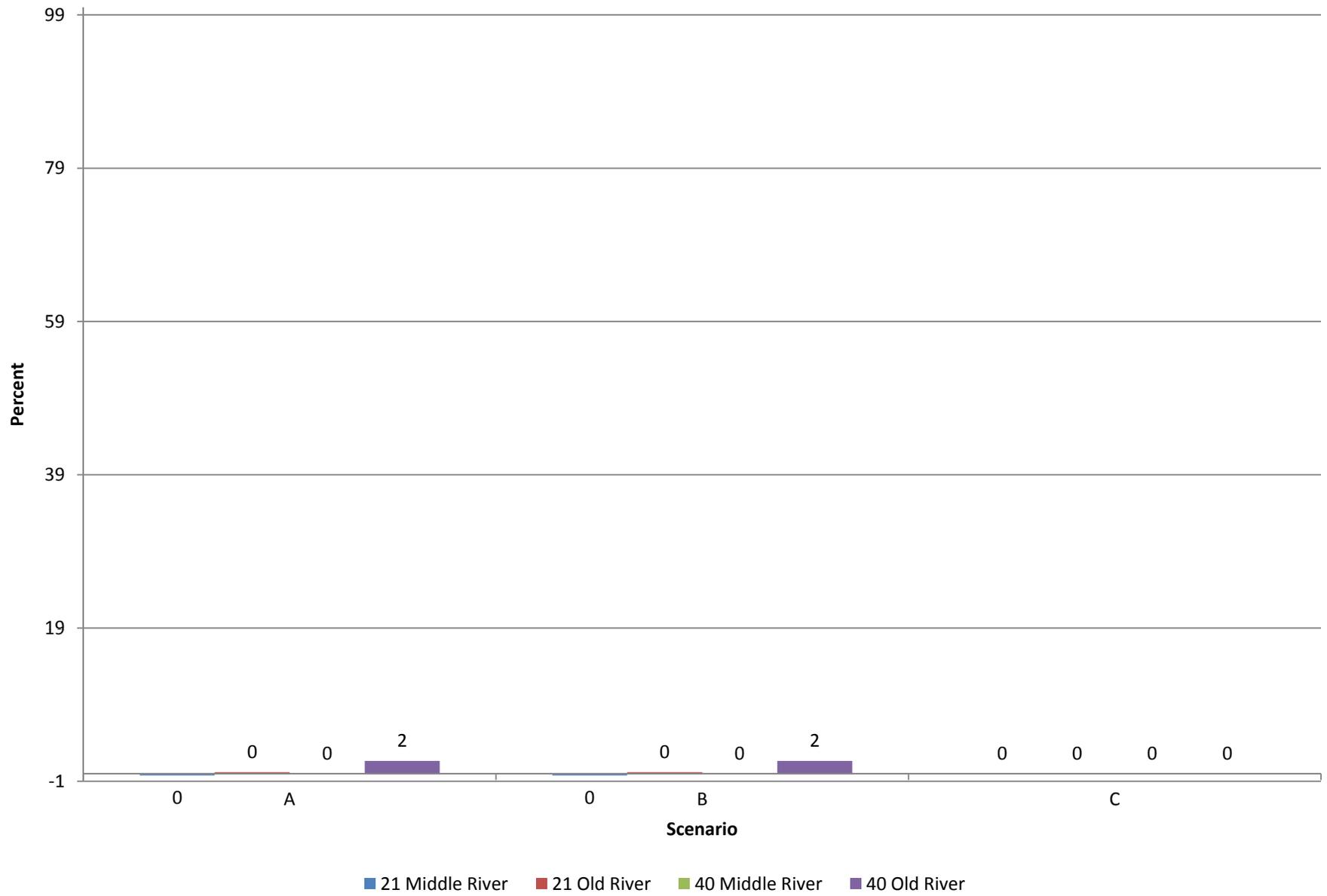
## Flux Past Railroad Cut for Injection at Node 21



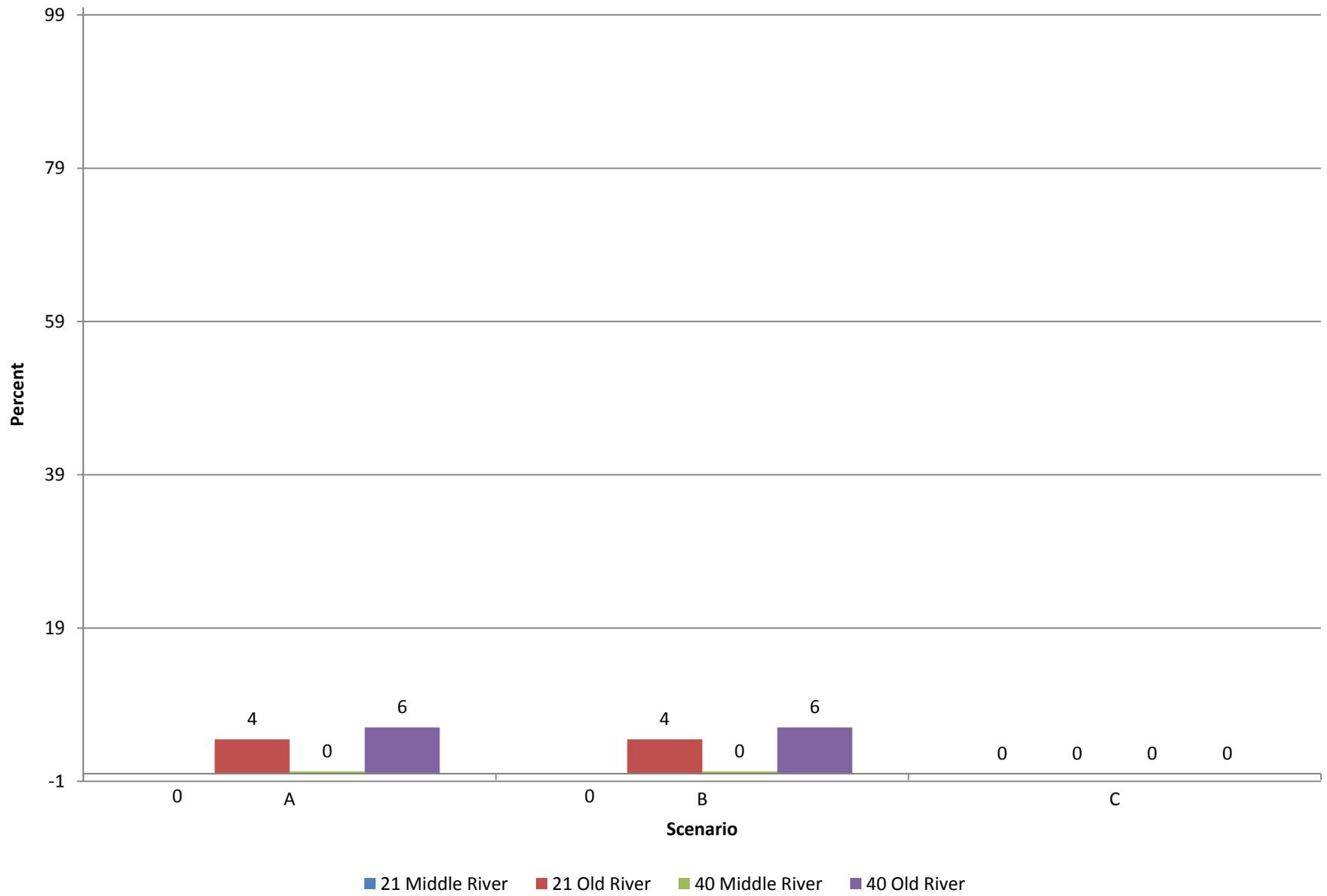
### Flux Past Railroad Cut for Injection at Node 40



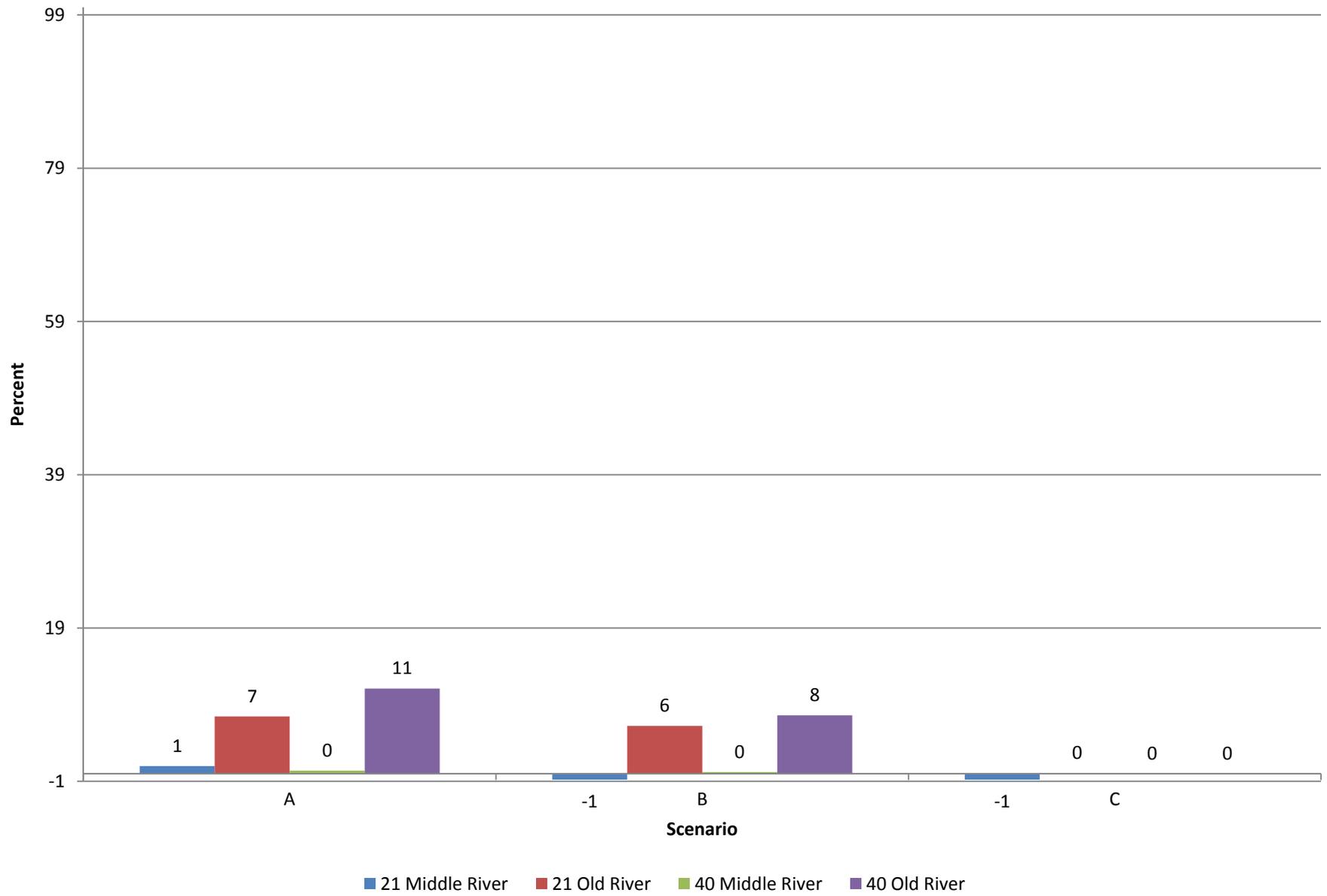
## Flux Past Railroad Cut on 5/22/12



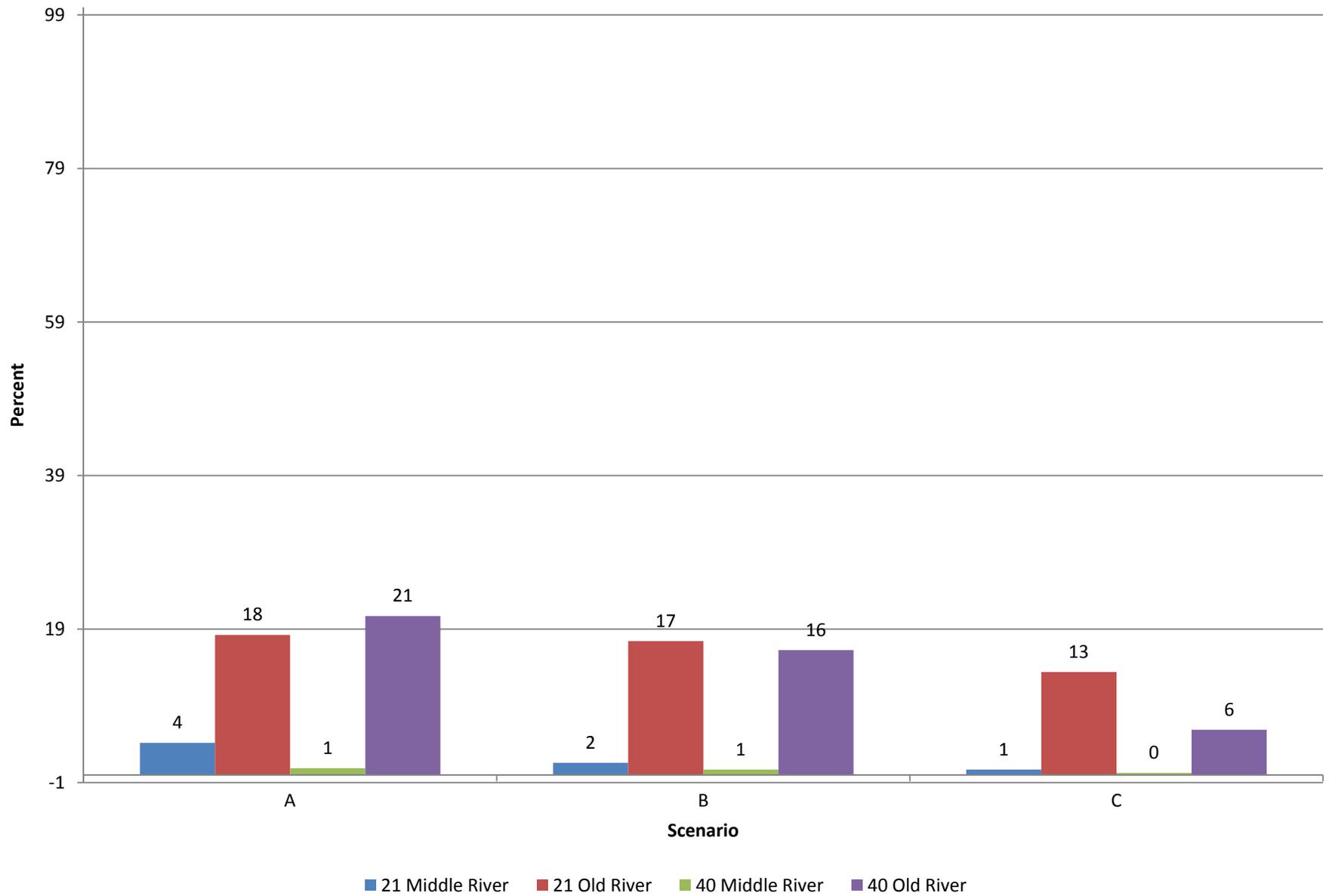
# Flux Past Railroad Cut on 5/27/12



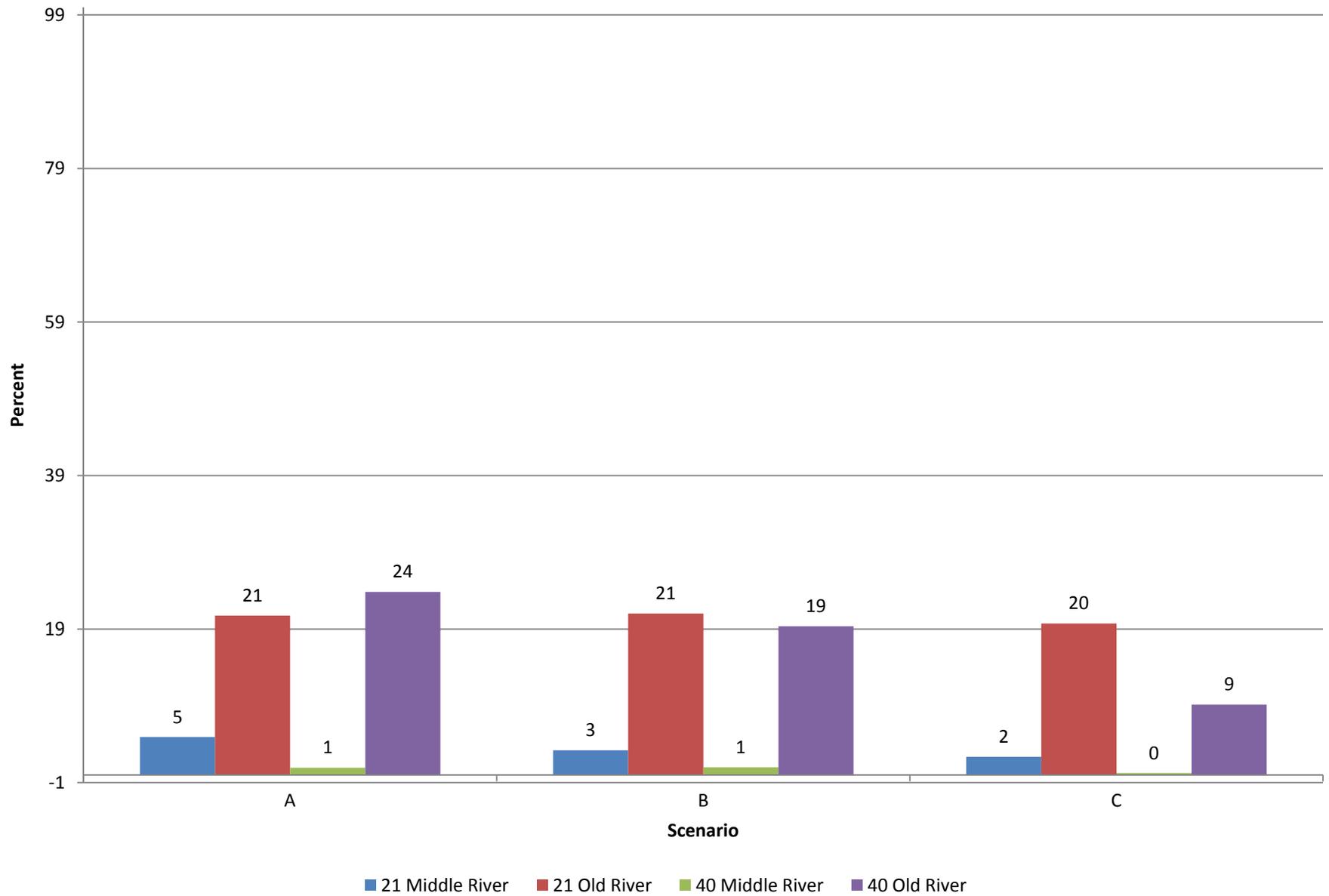
# Flux Past Railroad Cut on 5/31/12



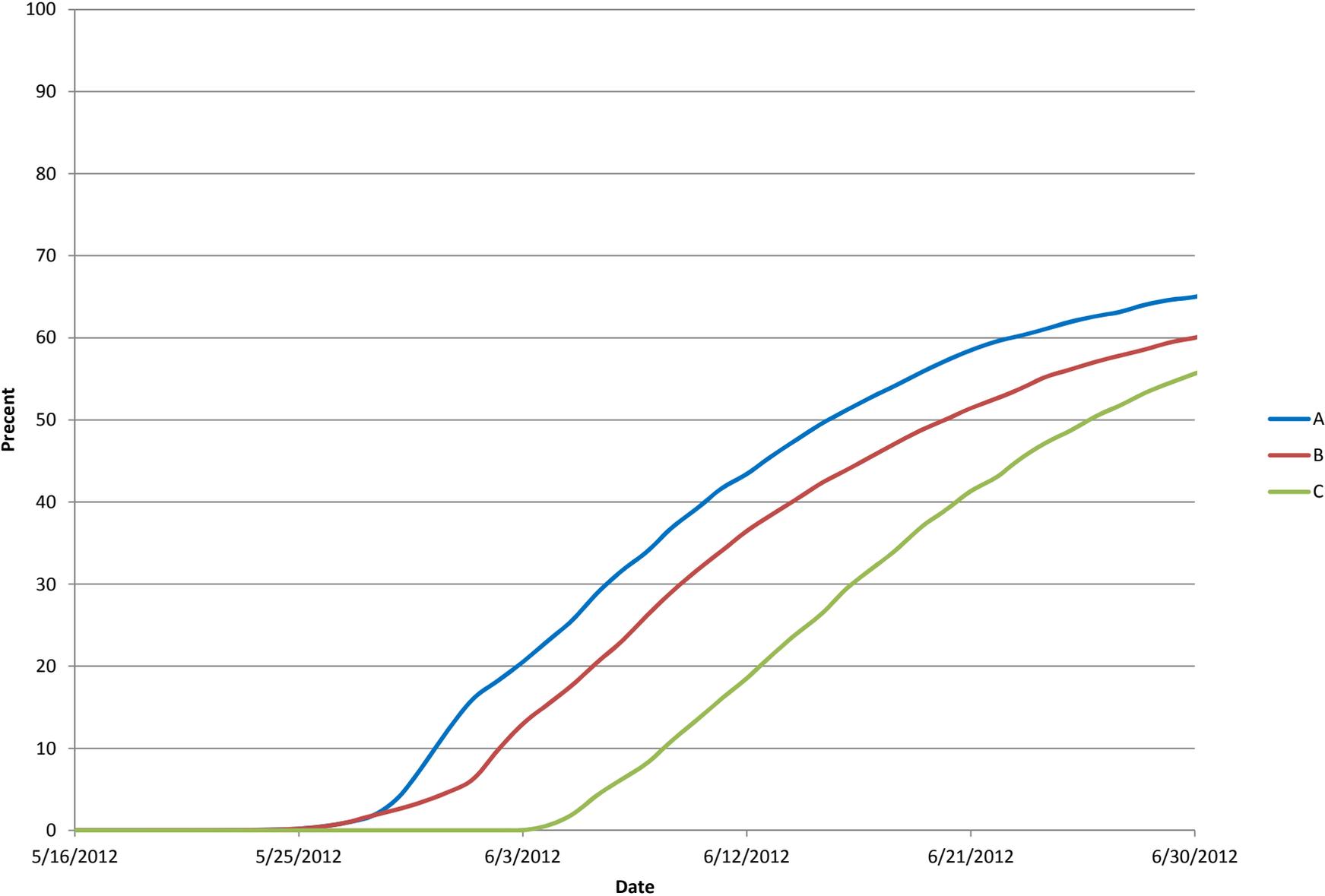
## Flux Past Railroad Cut on 6/15/12



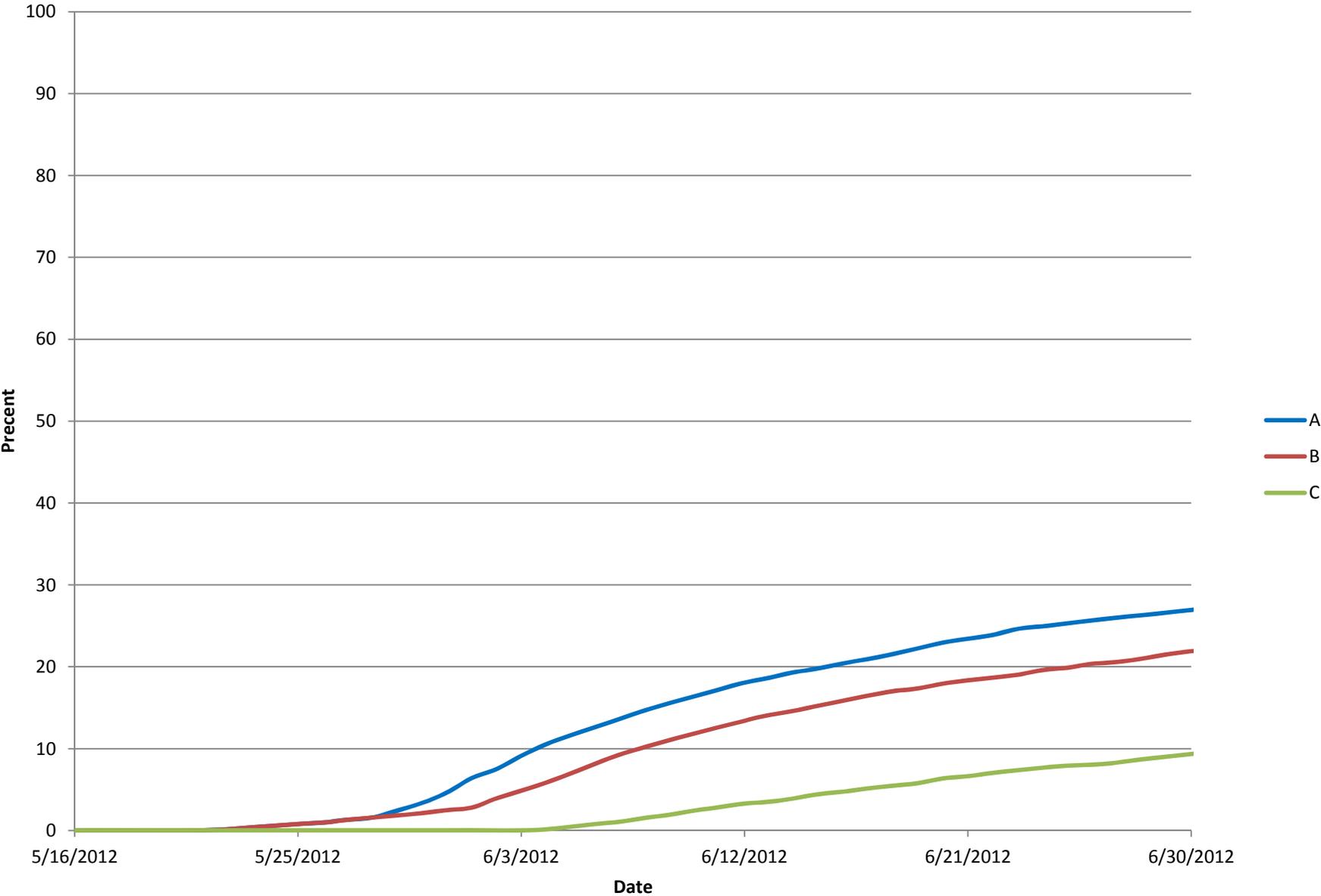
## Flux Past Railroad Cut on 6/30/12



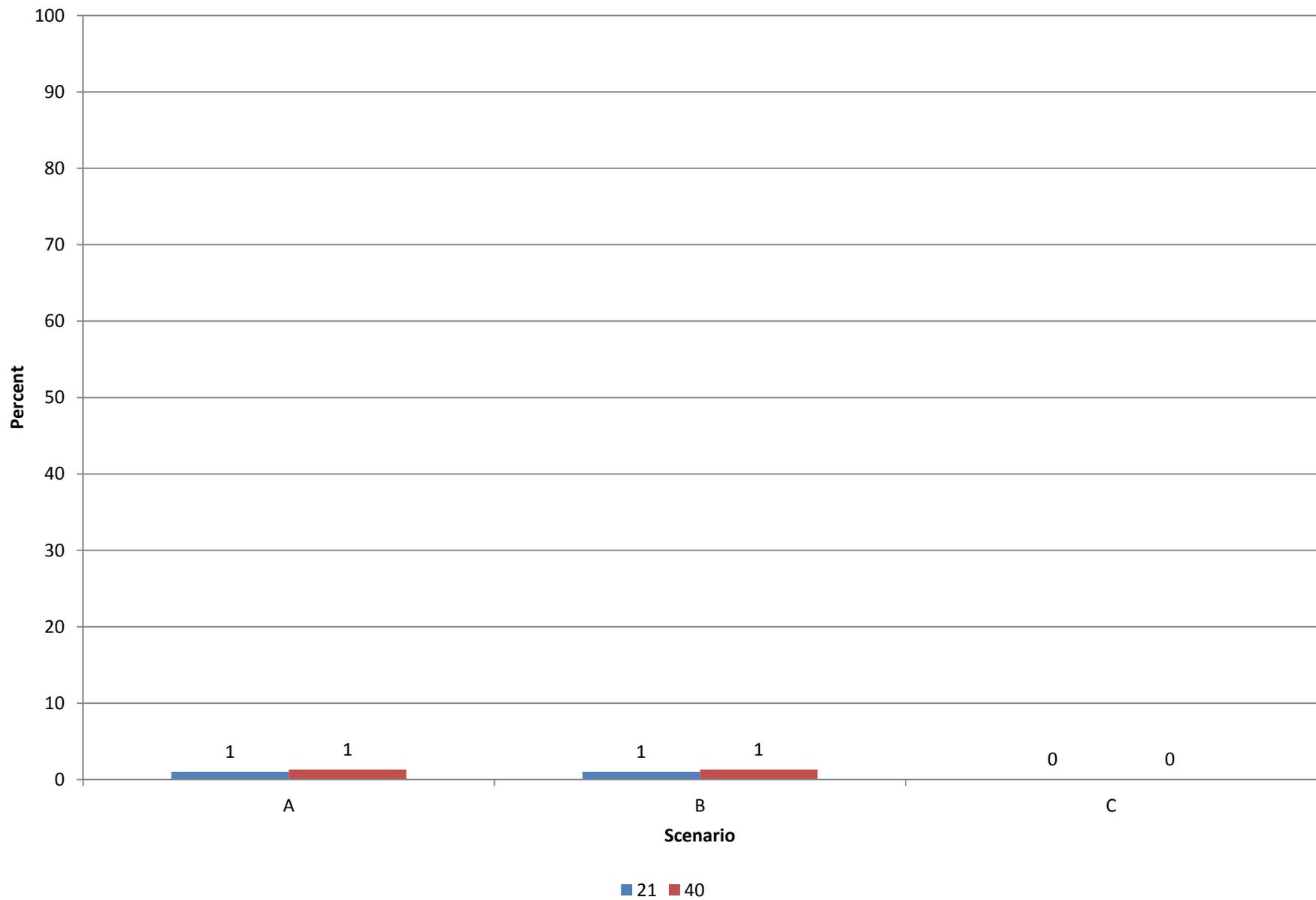
# Entrainment at Projects for Injection at Node 21



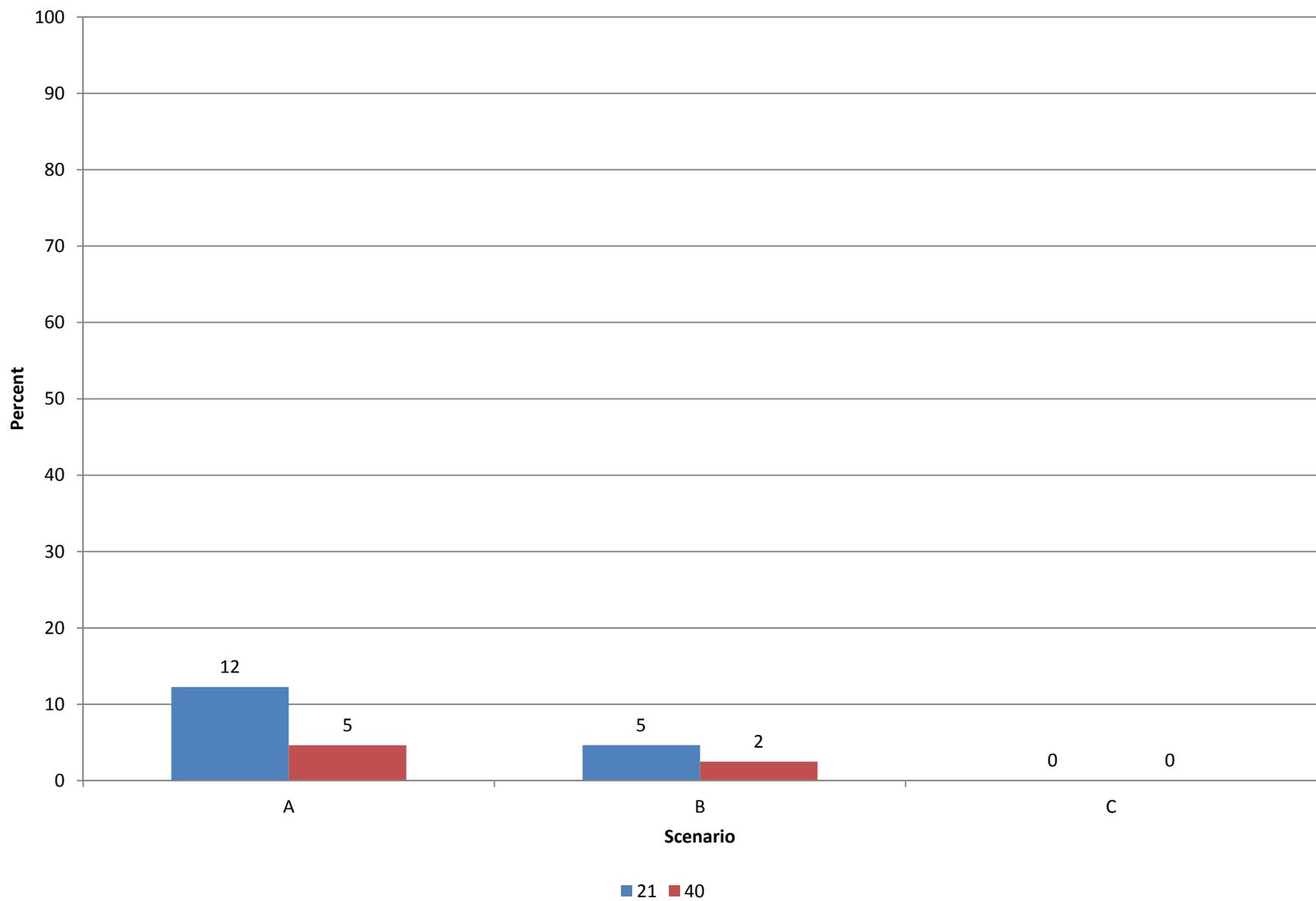
# Entrainment at Projects for Injection at Node 40



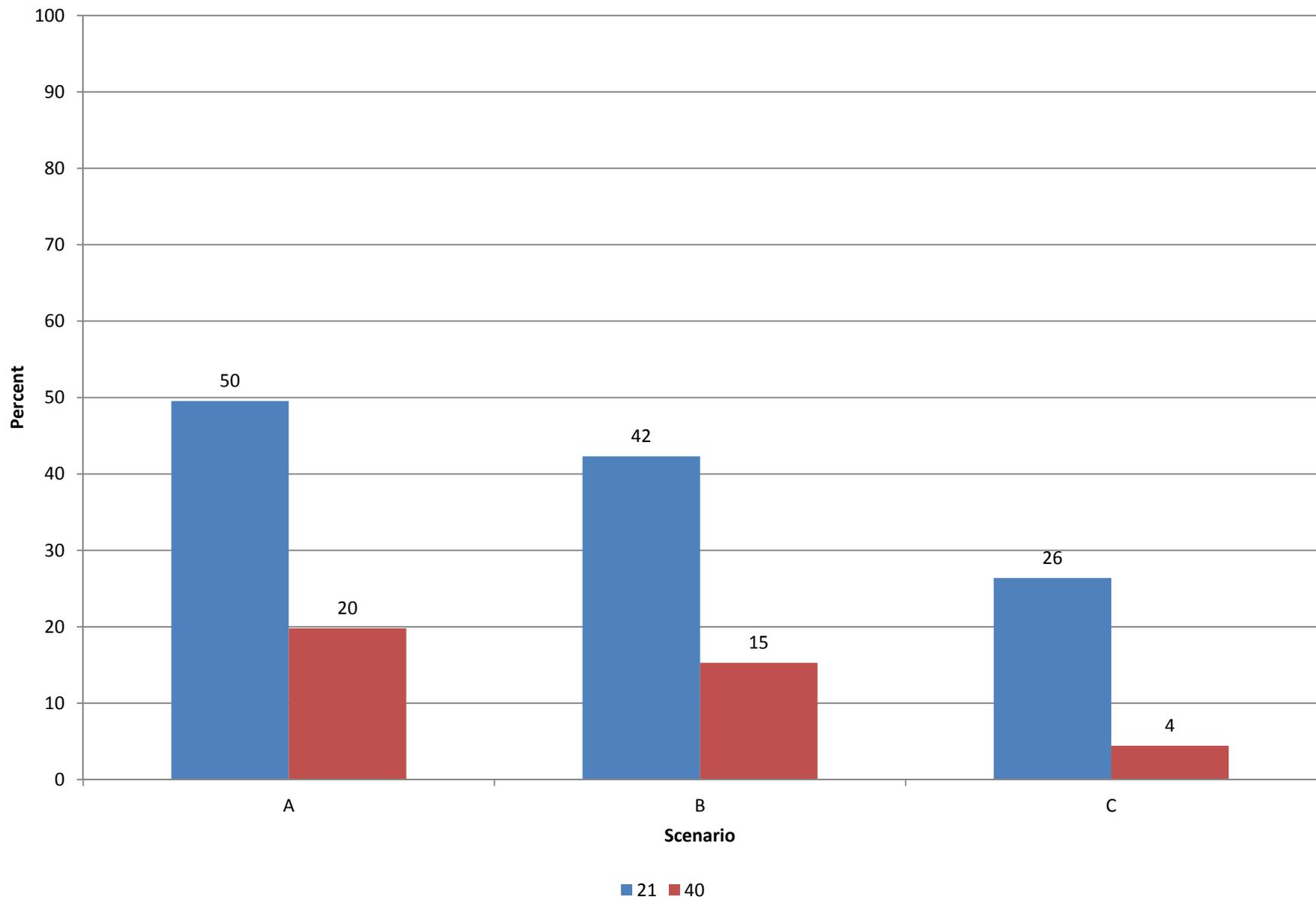
# Entrainment at Projects on 5/27/12



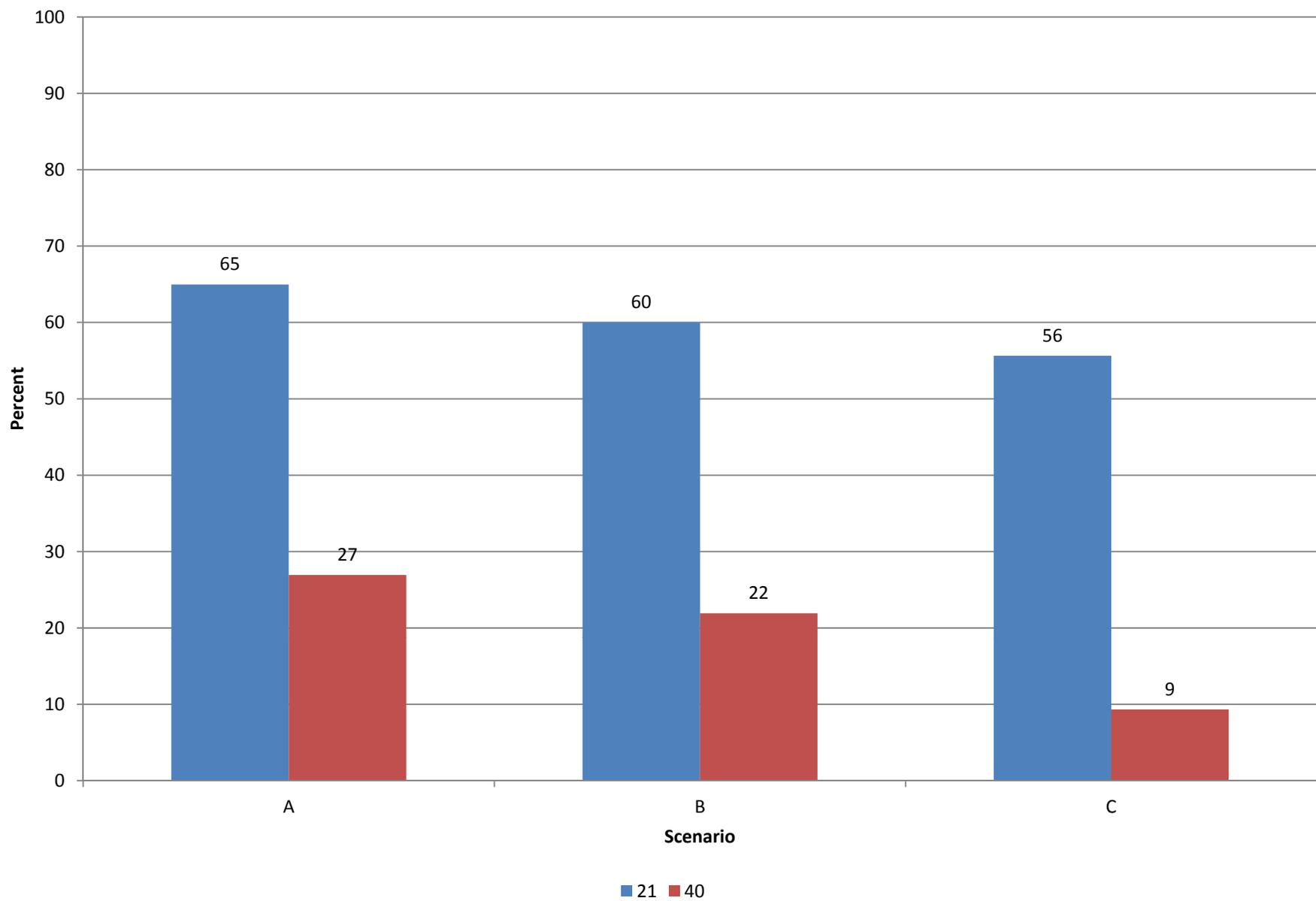
## Entrainment at Projects on 5/31/12



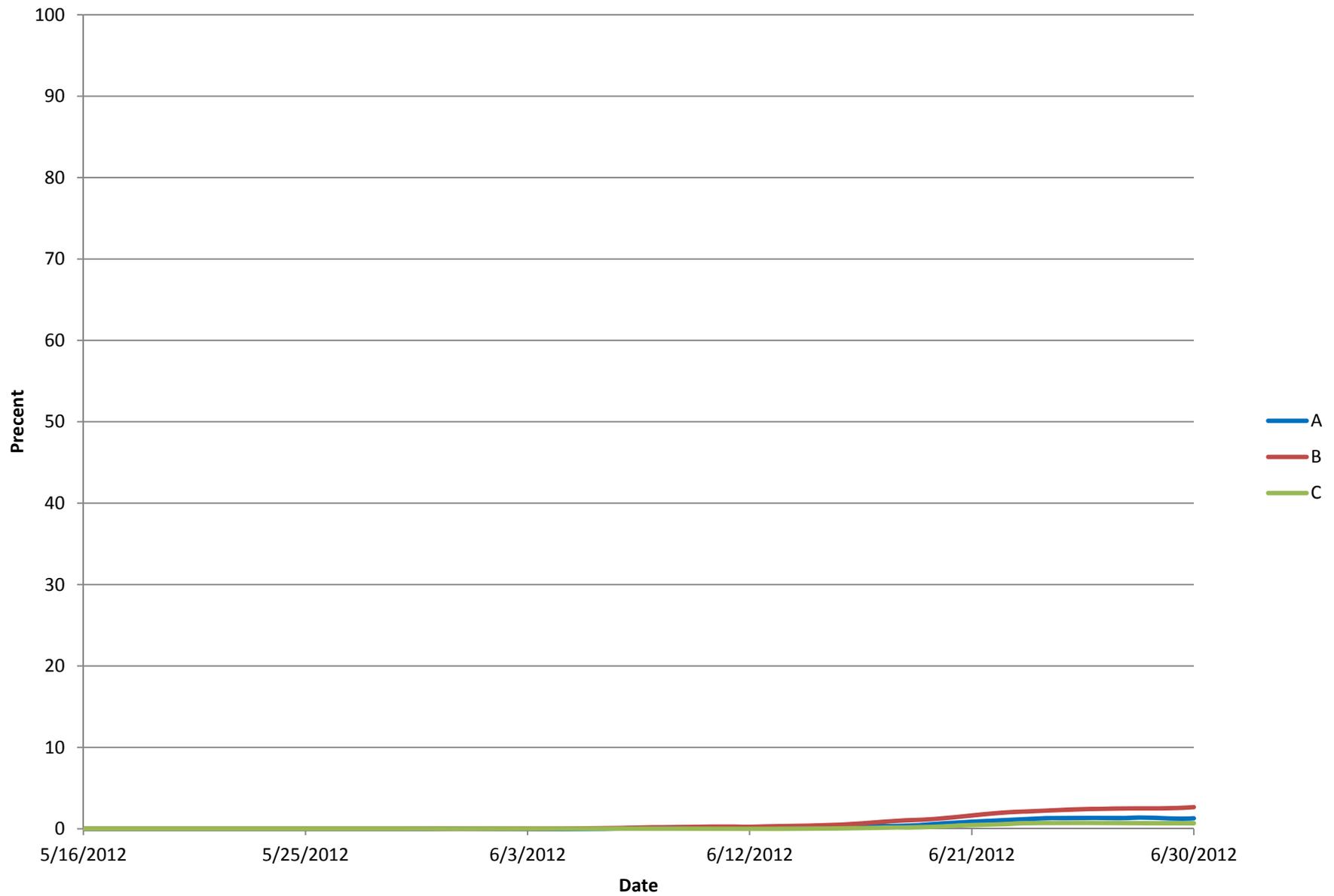
## Entrainment at Projects on 6/15/12



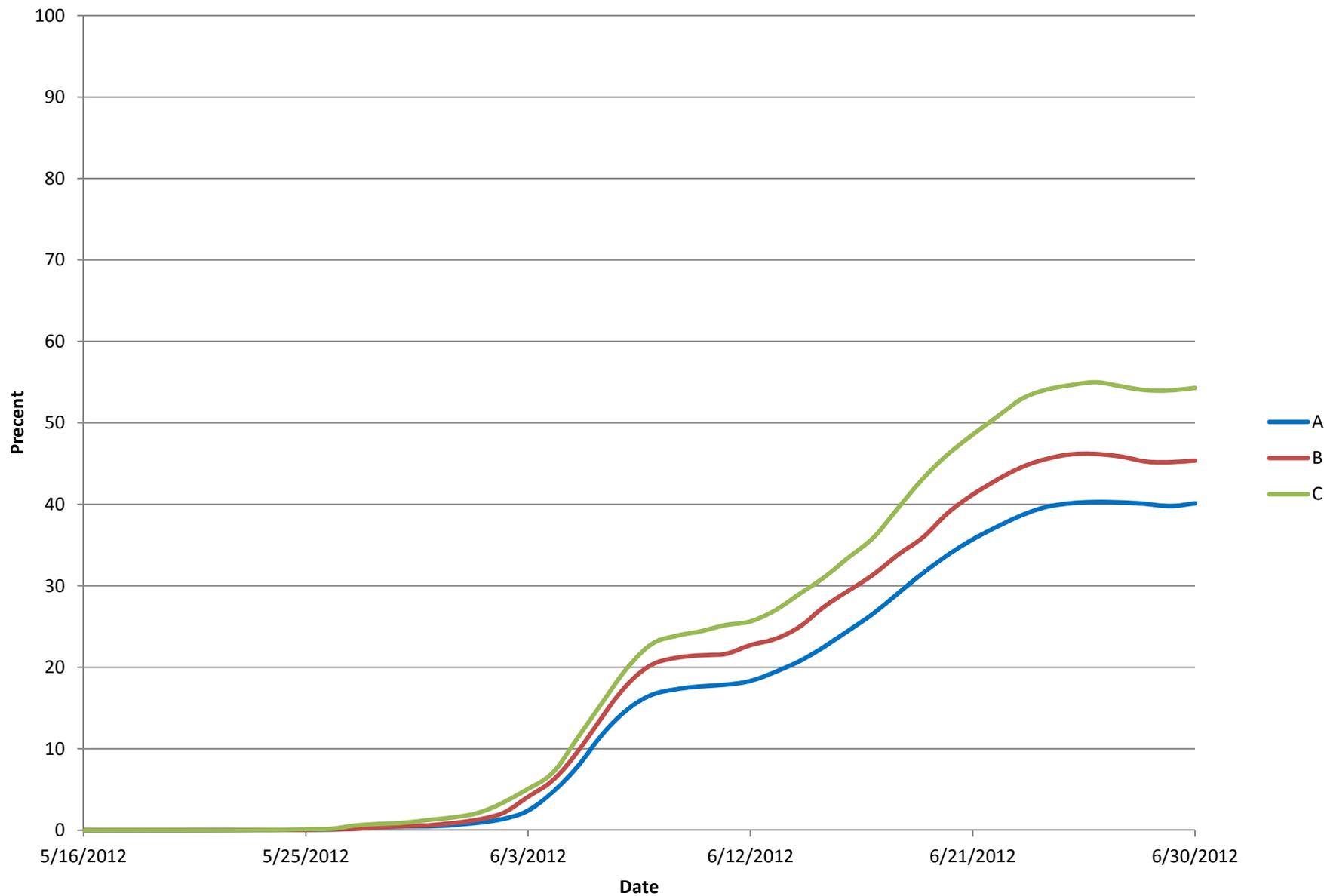
## Entrainment at Projects on 6/30/12



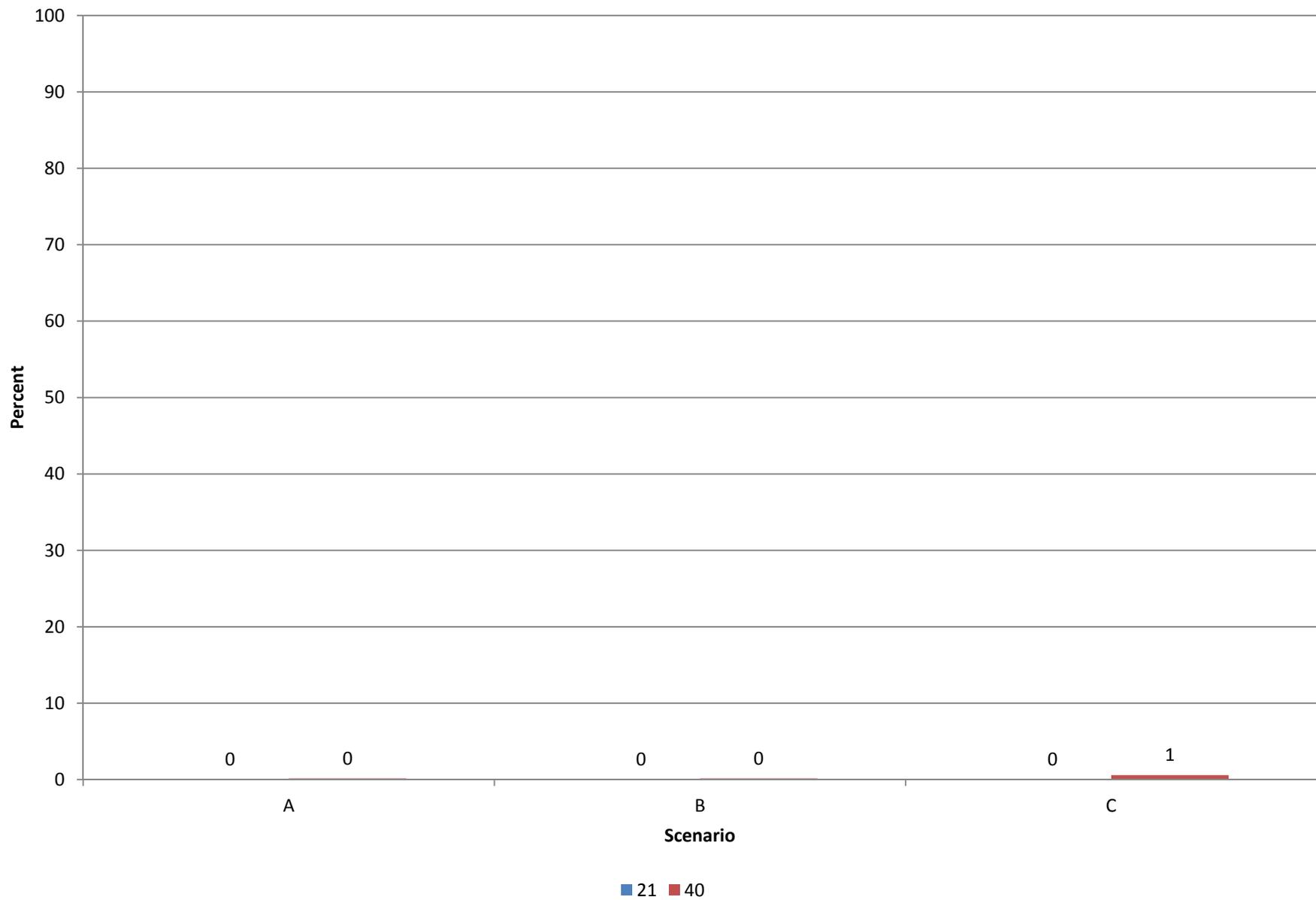
## Flux Past Chipps for Injection at Node 21



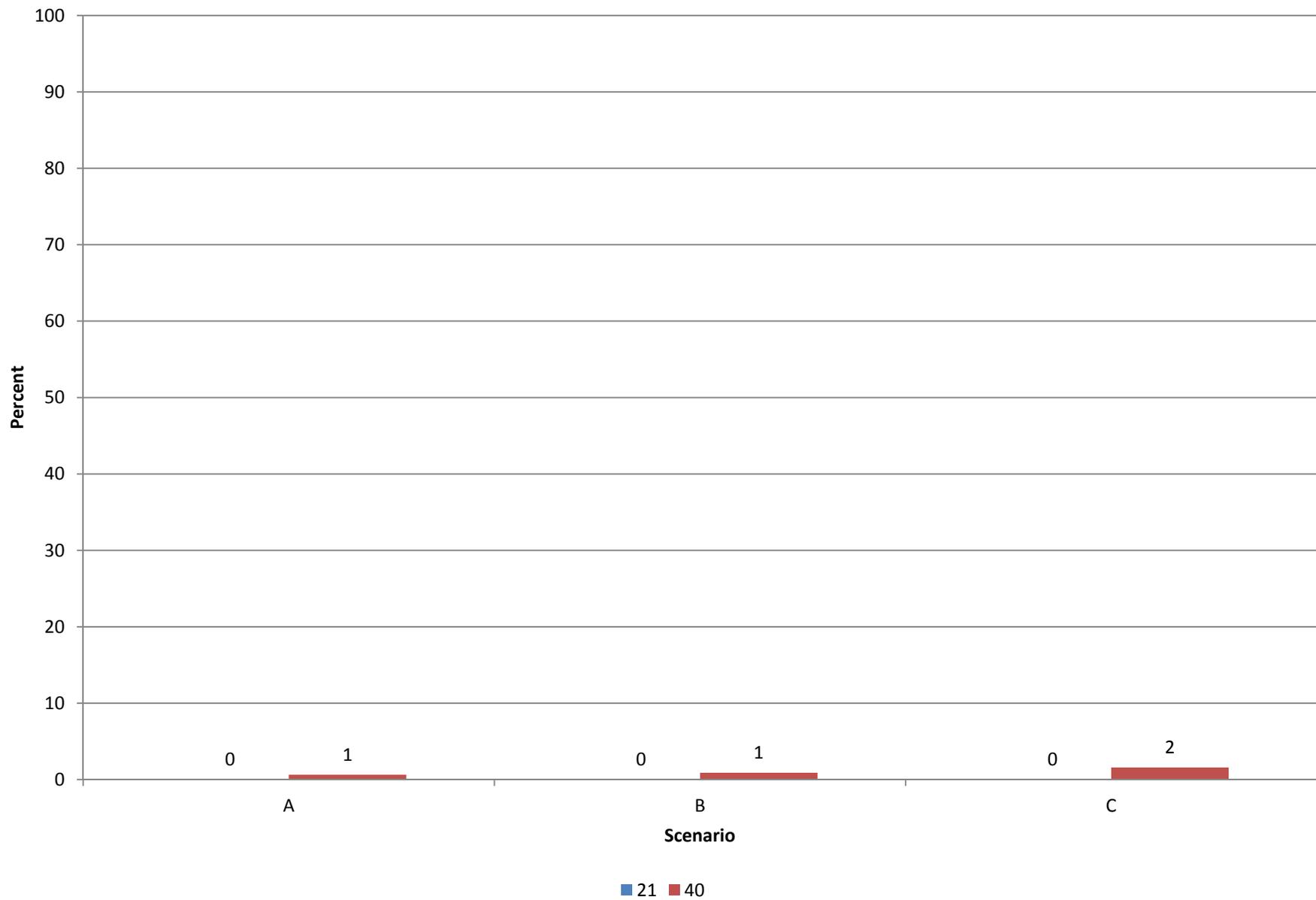
### Flux Past Chipps for Injection at Node 40



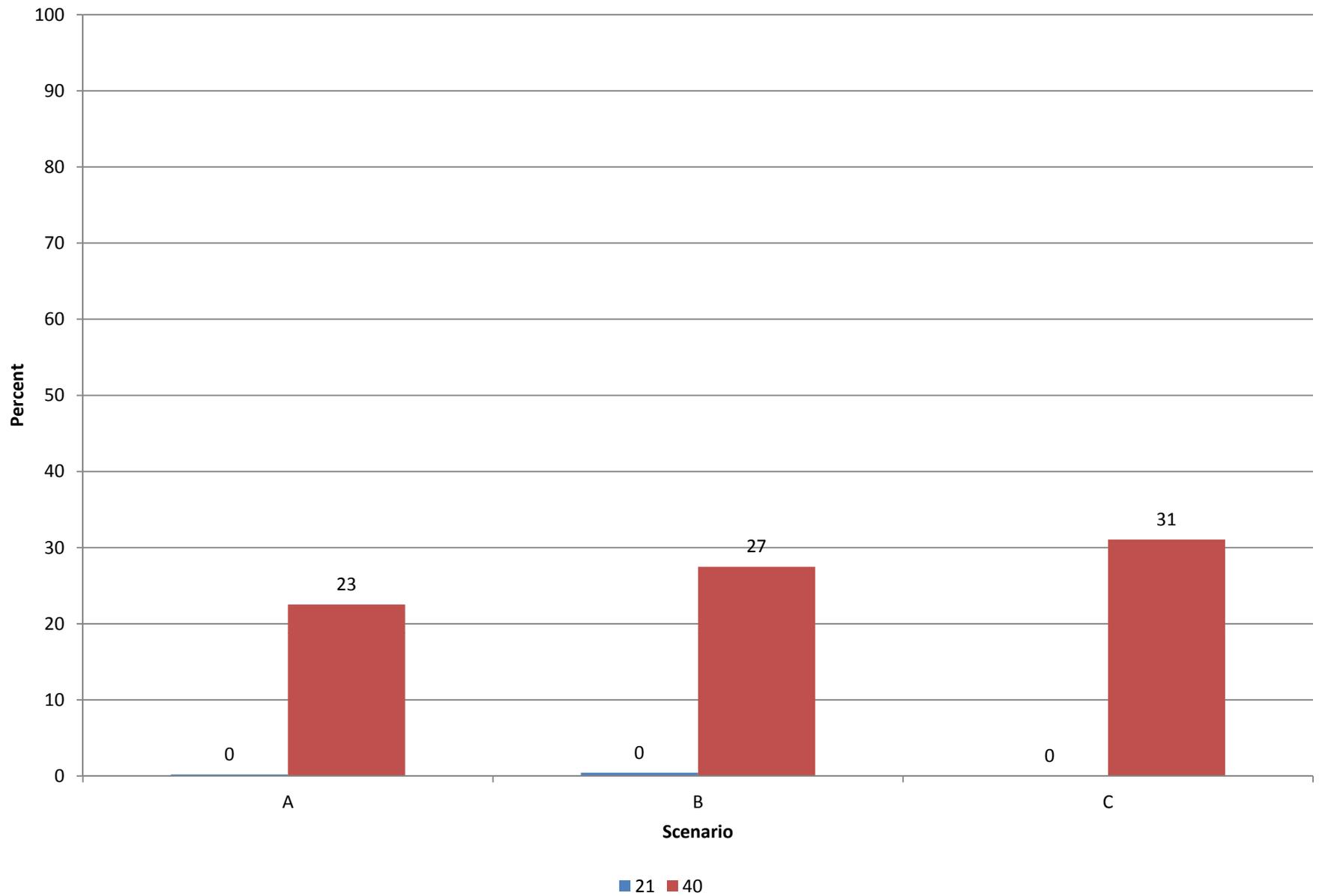
# Flux Past Chipp on 5/27/12



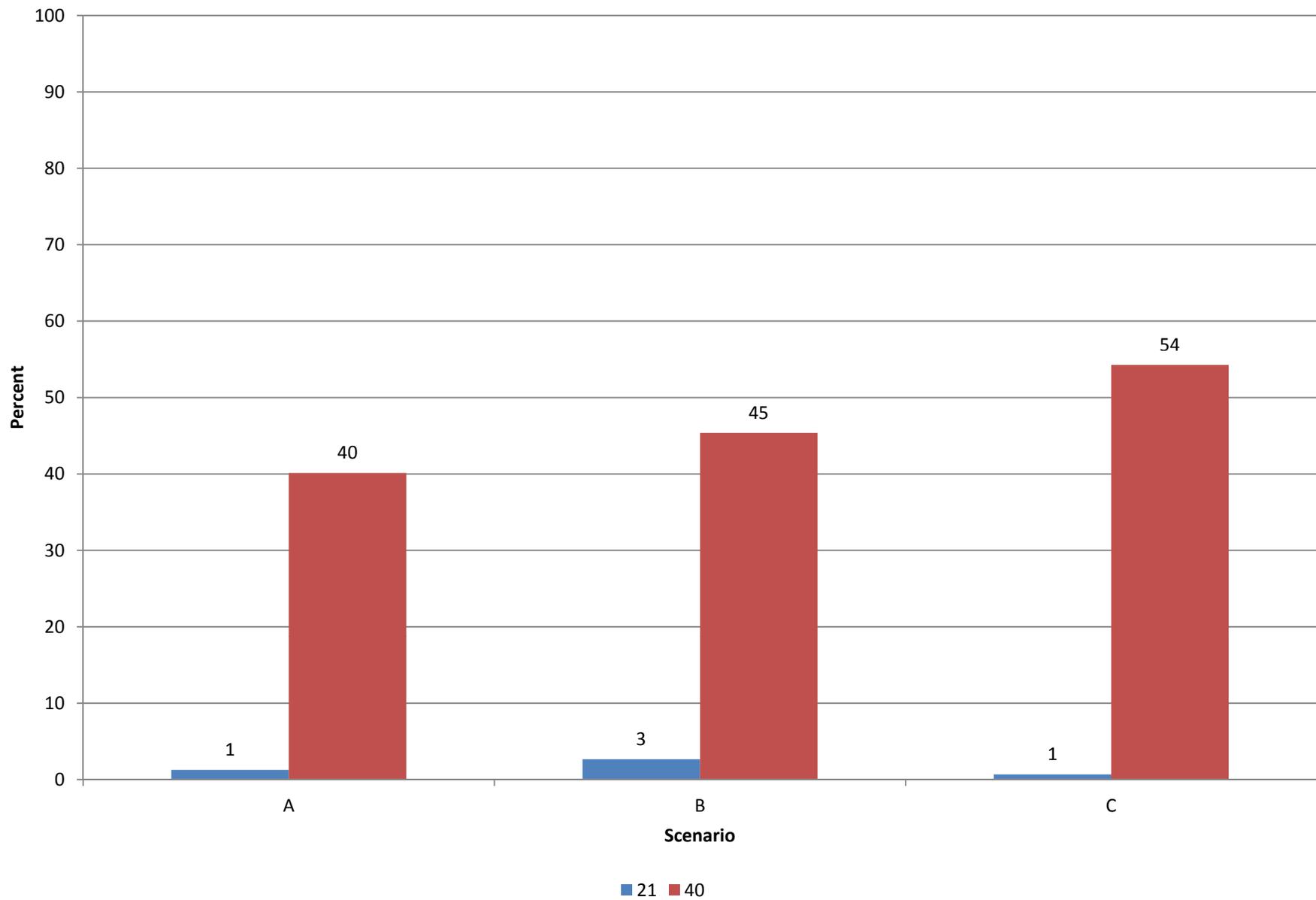
# Flux Past Chipp on 5/31/12



## Flux Past Chipp on 6/15/12



## Flux Past Chipp on 6/30/12



Scenario A

Date		DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BAY	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
16-May-12	N40	0	0	0	0	0	0	0	0	0	0
	N21	0	0	0	0	0	0	0	0	0	0
22-May-12	N40	0	0	0	0	0	0	0	0	0	99
	N21	2	0	0	0	0	0	0	0	0	96
27-May-12	N40	1	0	0	0	0	1	0	0	0	97
	N21	3	0	0	0	0	1	0	0	0	93
31-May-12	N40	2	0	0	0	0	2	3	0	1	93
	N21	4	0	0	0	0	4	9	0	0	80
15-Jun-12	N40	5	1	0	0	0	8	12	8	23	66
	N21	10	0	0	0	0	19	31	0	0	35
30-Jun-12	N40	7	1	0	0	0	11	16	27	40	37
	N21	14	0	0	0	0	24	41	0	1	15

Scenario B

Date	Category	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BAY	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
16-May-12	N40	0	0	0	0	0	0	0	0	0	0
	N21	0	0	0	0	0	0	0	0	0	0
22-May-12	N40	0	0	0	0	0	0	0	0	0	99
	N21	2	0	0	0	0	0	0	0	0	96
27-May-12	N40	1	0	0	0	0	1	0	0	0	97
	N21	3	0	0	0	0	1	0	0	0	93
31-May-12	N40	2	0	0	0	0	2	1	0	1	95
	N21	4	0	0	0	0	4	1	0	0	87
15-Jun-12	N40	5	1	0	0	0	8	7	9	27	68
	N21	10	0	0	1	0	23	19	0	0	42
30-Jun-12	N40	7	1	0	0	0	11	11	32	45	37
	N21	14	0	0	1	0	30	30	1	3	18

Scenario C

Date		DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BAY	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
16-May-12	N40	0	0	0	0	0	0	0	0	0	0
	N21	0	0	0	0	0	0	0	0	0	0
22-May-12	N40	0	0	0	0	0	0	0	0	0	99
	N21	2	0	0	0	0	0	0	0	0	97
27-May-12	N40	1	0	0	0	0	0	0	0	0	99
	N21	3	0	0	0	0	0	0	0	0	95
31-May-12	N40	1	0	0	0	0	0	0	0	0	98
	N21	3	0	0	0	0	0	0	0	0	93
15-Jun-12	N40	4	0	0	0	0	2	2	11	31	79
	N21	11	0	0	0	0	14	12	0	0	57
30-Jun-12	N40	6	0	0	0	0	4	5	37	54	46
	N21	16	0	0	0	0	26	30	0	1	20

**PRELIMINARY RESULTS, SUBJECT TO REVISIONS**

# **PTM Simulation Results Using DSM2**

Prepared by:  
Delta Compliance & Modeling Section  
Operations Control Office  
Division of Operations & Maintenance

Prepared for:  
FWS

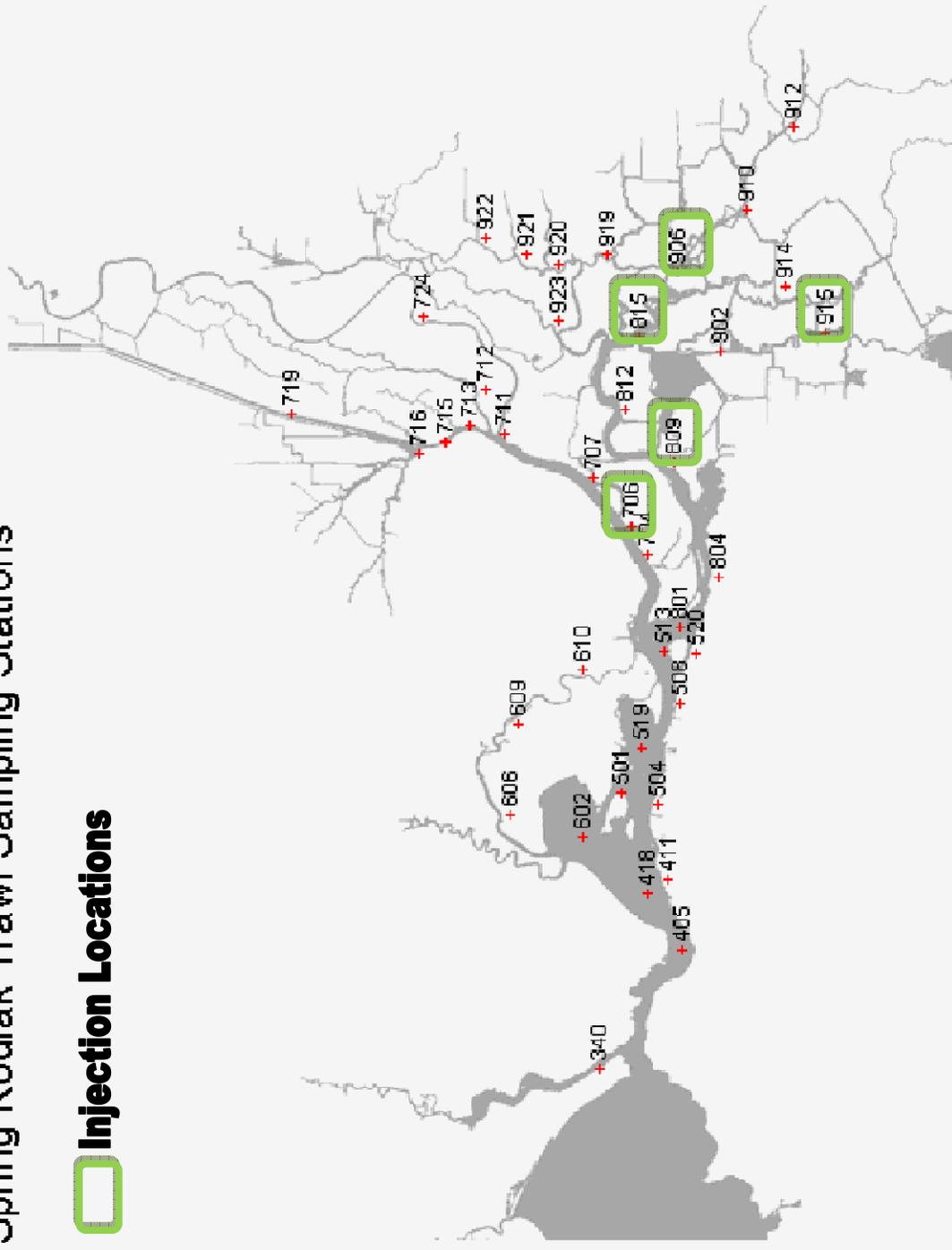
May 11, 2012

## **Scenario Simulated**

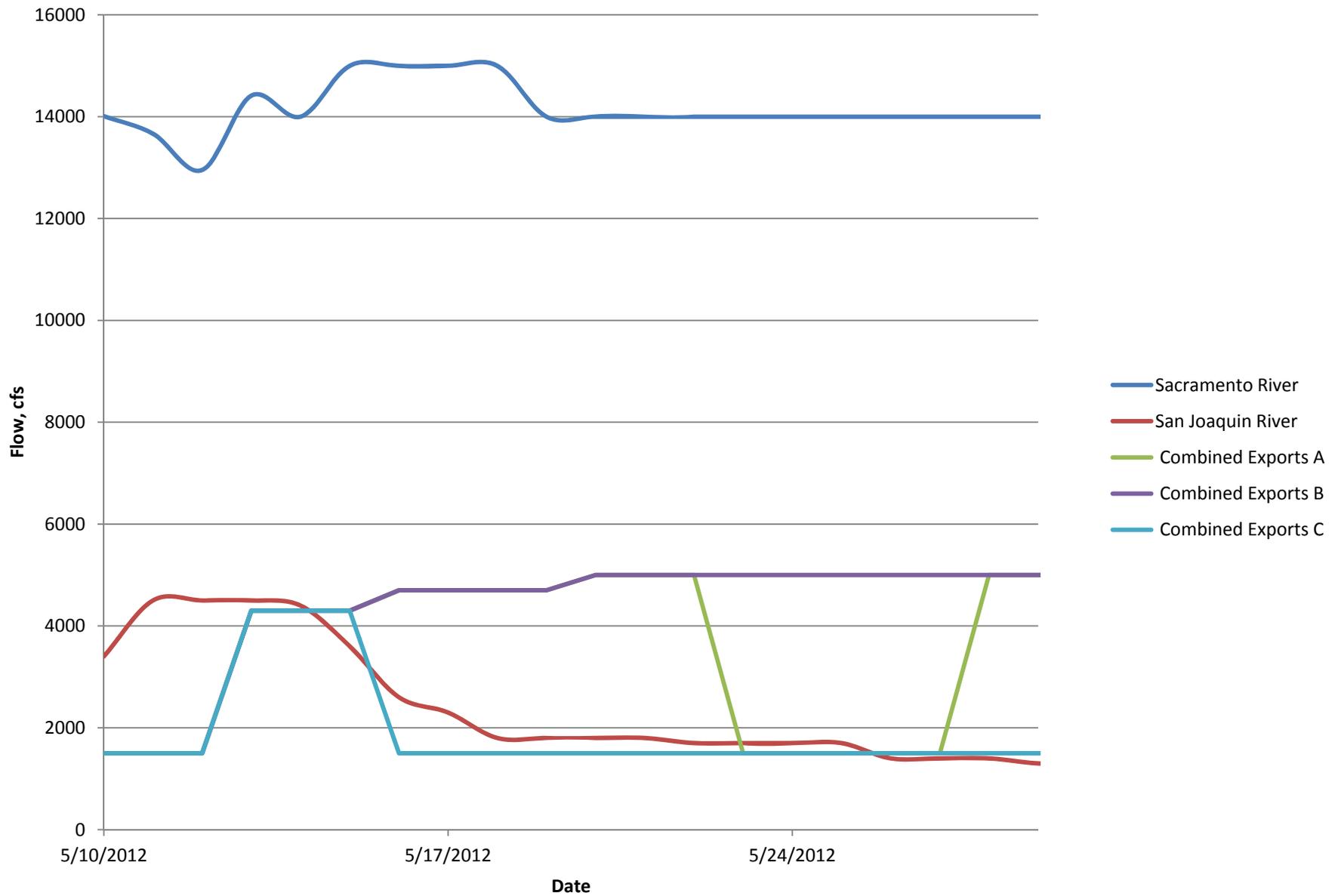
1. Scenario A will assume an OMR of -5,000 cfs for the first seven days, and then, assuming we've hit the salmon trigger on the fifth day, exports will drop to 1500 cfs combined on May 22 through May 26, then increase to OMR=-5,000 cfs for the rest of May.
2. Scenario B will use an OMR of -5,000 cfs through May 31, per the stipulation and assuming we don't hit the salmon trigger.
3. Scenario C will use combined exports of 1500 cfs through May 31.

# Spring Kodiak Trawl Sampling Stations

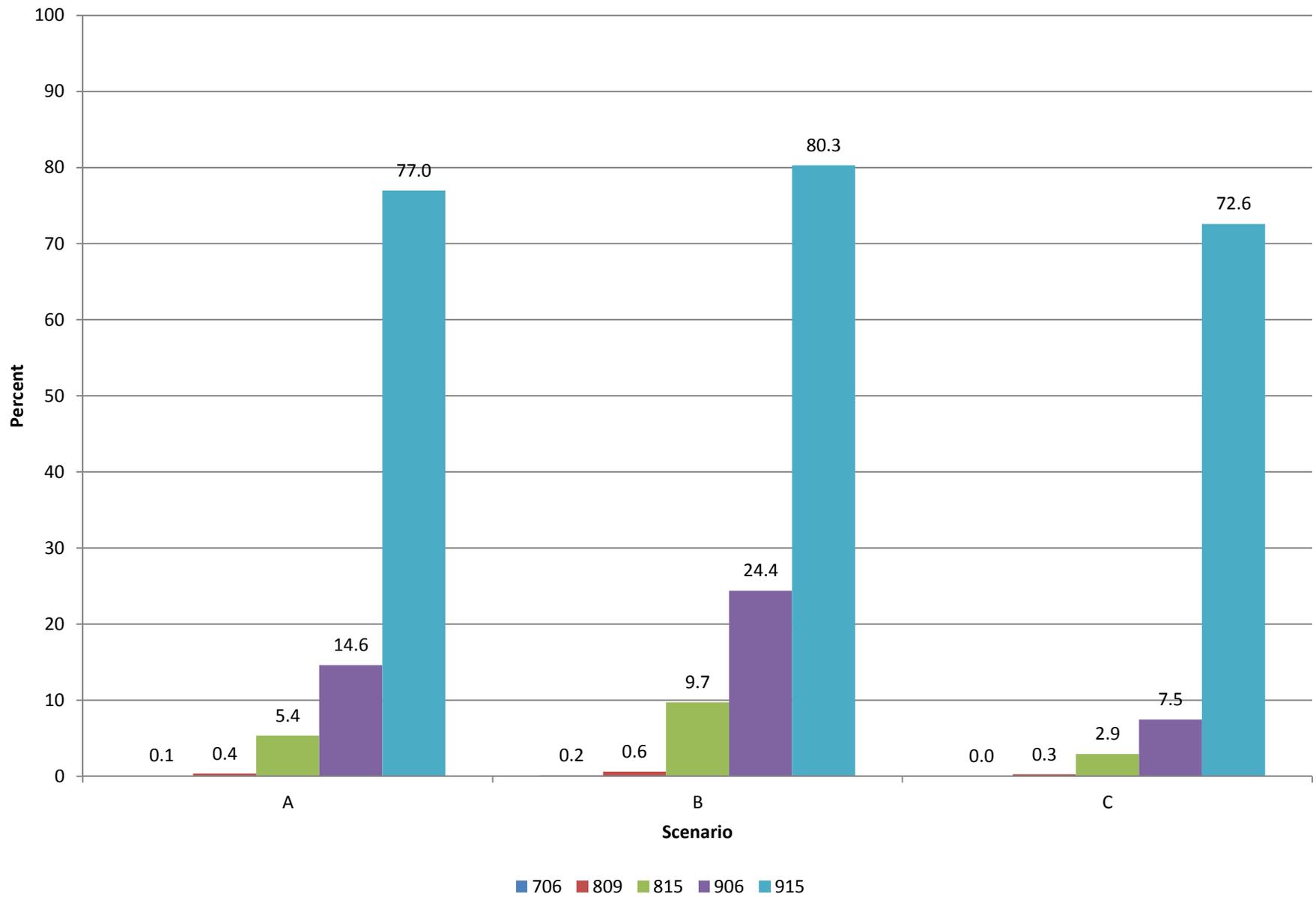
 **Injection Locations**



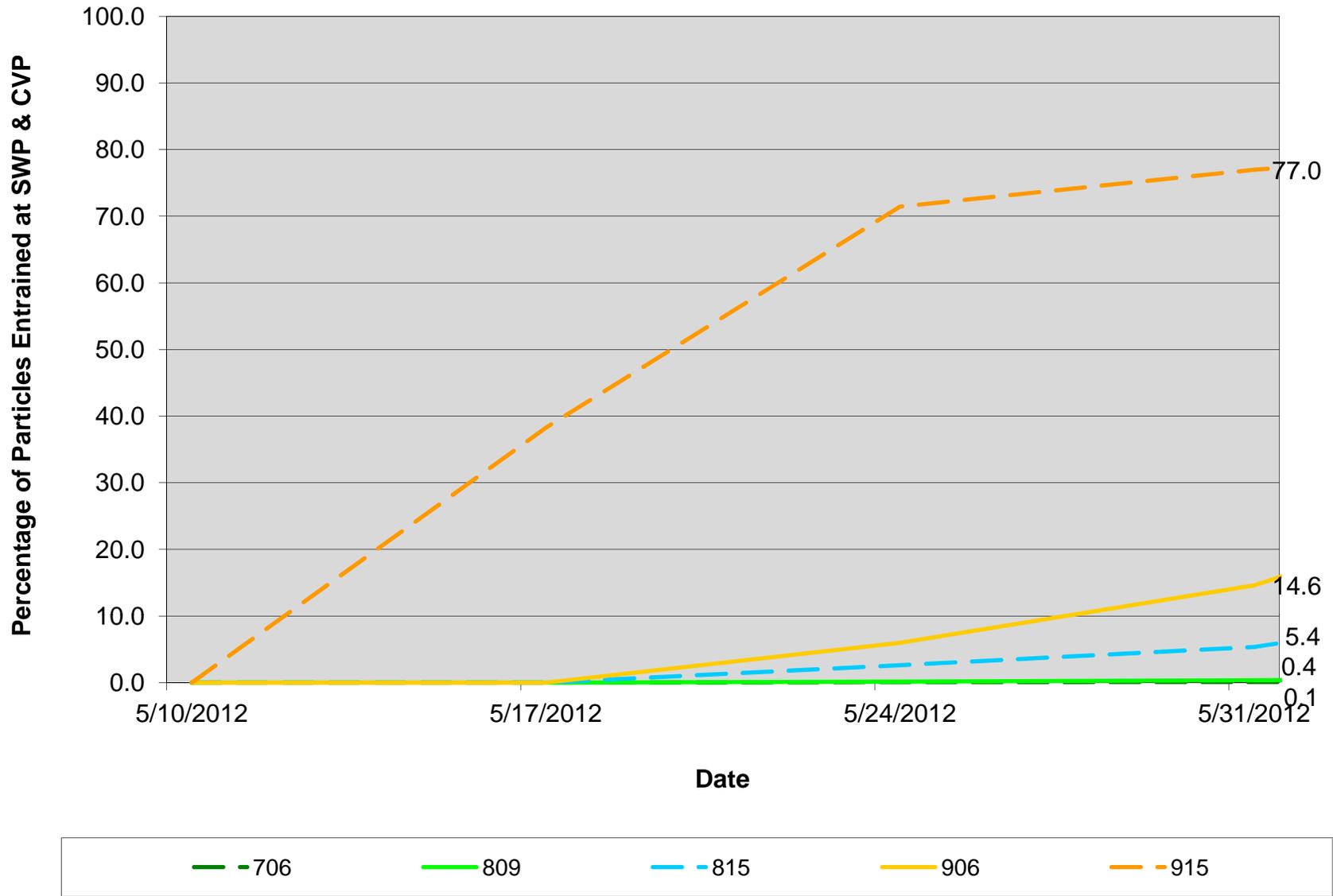
# Modeled Daily Flow Assumptions



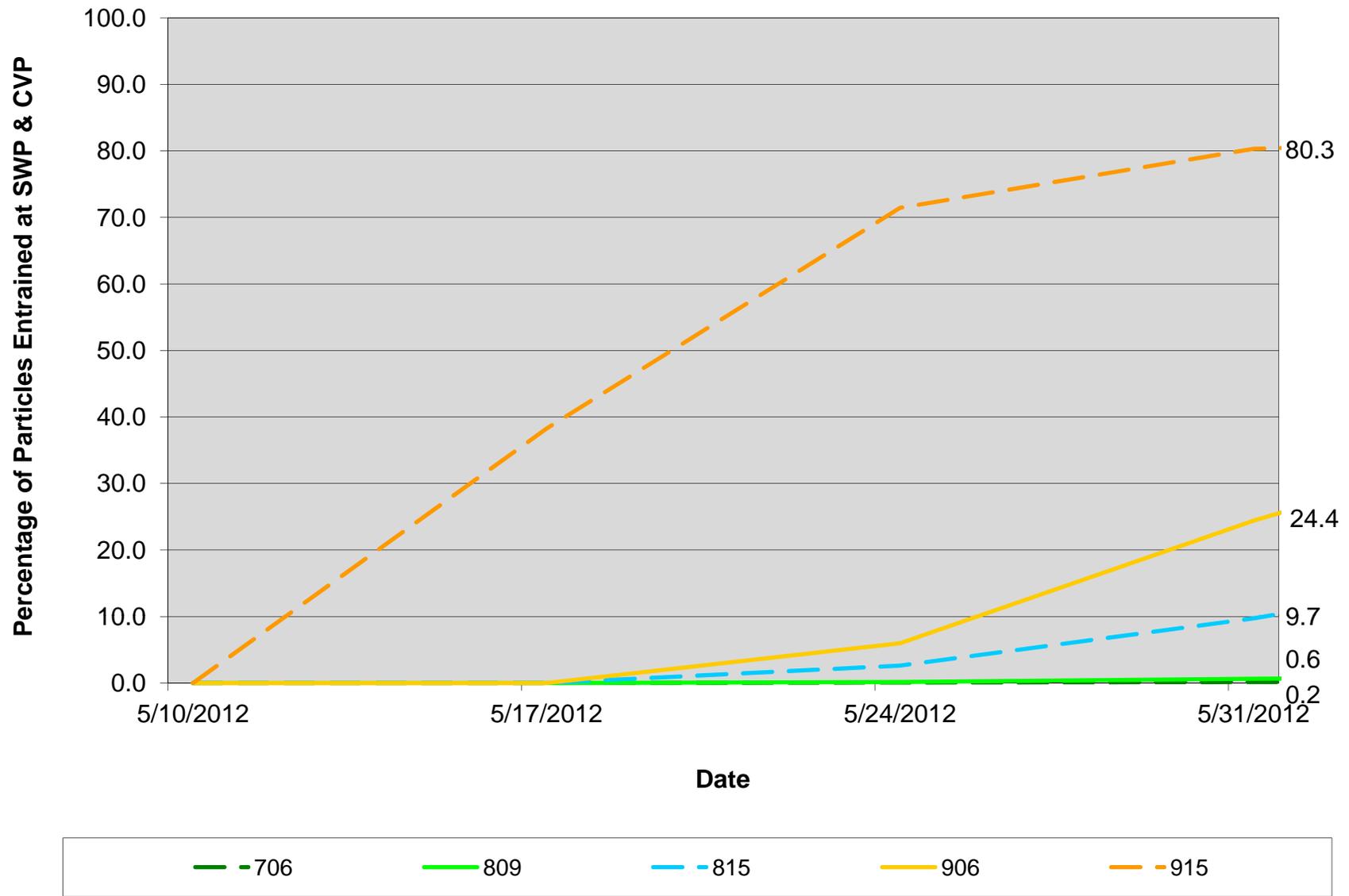
## 21 Days Entrainment @ Projects



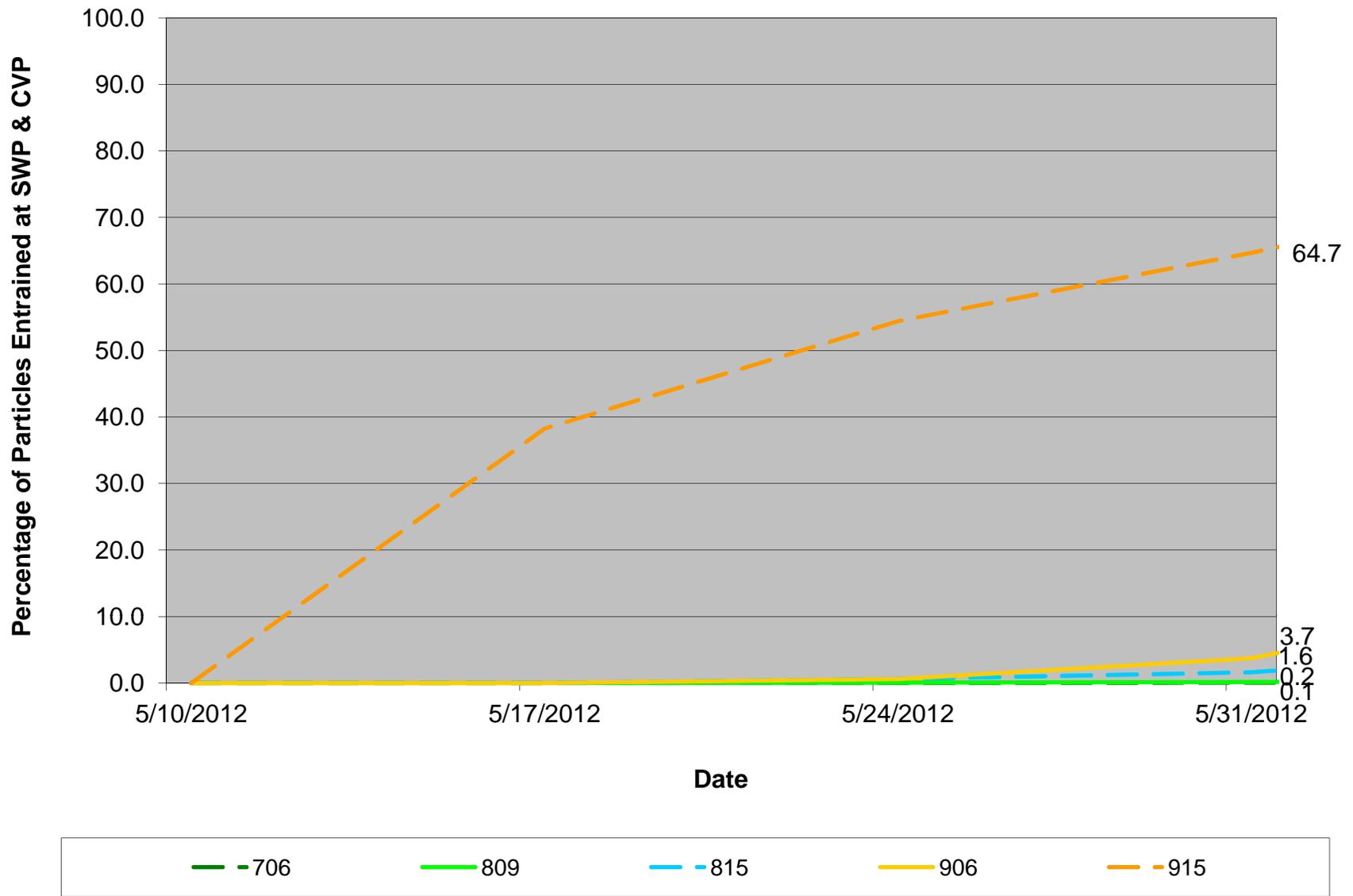
### Scenario A



### Scenario B



### Scenario C



Scenario A

10-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0	0	0	0	0	0	0	0	0	0
809	0	0	0	0	0	0	0	0	0	0
815	0	0	0	0	0	0	0	0	0	0
906	0	0	0	0	0	0	0	0	0	0
915	0	0	0	0	0	0	0	0	0	0
17-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	18.3	99.6
809	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	99.4
815	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.4
906	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.3
915	2.6	1.2	0.0	5.4	0.0	27.0	11.3	0.0	0.0	52.1
24-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.4	0.0	0.0	0.0	0.0	0.0	0.0	18.3	74.9	81.3
809	1.0	0.0	0.0	0.0	0.0	0.1	0.1	4.9	41.9	93.7
815	1.3	0.3	0.0	0.1	0.0	1.3	1.4	0.0	1.6	95.2
906	1.5	0.3	0.0	0.4	0.0	2.2	3.7	0.0	0.4	91.3
915	5.1	1.7	0.0	5.4	0.0	30.6	40.8	0.0	0.0	15.9
31-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.4	0.0	0.0	0.0	0.0	0.1	0.0	46.4	83.3	53.1
809	1.2	0.0	0.0	0.0	0.0	0.1	0.2	23.3	59.0	74.9
815	2.3	0.7	0.0	0.3	0.0	2.8	2.6	0.8	5.3	90.0
906	3.0	0.9	0.0	0.8	0.0	6.6	8.0	0.1	2.3	79.7
915	6.1	1.7	0.0	5.5	0.0	31.7	45.3	0.0	0.0	9.1

Scenario B

10-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0	0	0	0	0	0	0	0	0	0
809	0	0	0	0	0	0	0	0	0	0
815	0	0	0	0	0	0	0	0	0	0
906	0	0	0	0	0	0	0	0	0	0
915	0	0	0	0	0	0	0	0	0	0
17-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	18.3	99.6
809	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	99.4
815	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.4
906	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.3
915	2.6	1.2	0.0	5.4	0.0	27.0	11.3	0.0	0.0	52.1
24-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.4	0.0	0.0	0.0	0.0	0.0	0.0	18.3	74.9	81.3
809	1.0	0.0	0.0	0.0	0.0	0.1	0.1	4.9	41.9	93.7
815	1.3	0.3	0.0	0.1	0.0	1.3	1.4	0.0	1.6	95.2
906	1.5	0.3	0.0	0.4	0.0	2.2	3.7	0.0	0.4	91.3
915	5.1	1.7	0.0	5.4	0.0	30.6	40.8	0.0	0.0	15.9
31-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.5	0.0	0.0	0.0	0.0	0.1	0.1	40.1	79.1	59.3
809	1.2	0.0	0.0	0.0	0.0	0.3	0.4	18.9	53.1	78.9
815	2.4	0.6	0.0	0.5	0.0	4.2	5.6	0.5	3.8	85.7
906	3.1	0.9	0.0	0.8	0.0	9.2	15.2	0.1	1.6	70.0
915	6.0	1.7	0.0	5.5	0.0	31.6	48.7	0.0	0.0	5.9

Scenario C

10-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0	0	0	0	0	0	0	0	0	0
809	0	0	0	0	0	0	0	0	0	0
815	0	0	0	0	0	0	0	0	0	0
906	0	0	0	0	0	0	0	0	0	0
915	0	0	0	0	0	0	0	0	0	0
17-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	18.3	99.6
809	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	99.4
815	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.4
906	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.3
915	2.6	1.2	0.0	5.4	0.0	27.0	11.3	0.0	0.0	52.1
24-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.4	0.0	0.0	0.0	0.0	0.0	0.0	22.8	80.5	76.8
809	0.9	0.0	0.0	0.0	0.0	0.0	0.0	6.5	48.8	92.4
815	1.2	0.2	0.0	0.1	0.0	0.4	0.2	0.1	2.1	97.4
906	1.4	0.3	0.0	0.1	0.0	0.4	0.1	0.0	0.4	97.1
915	5.6	1.7	0.0	5.5	0.0	29.8	24.6	0.0	0.0	32.2
31-May-12	DIVERSION_AG	DIV_CCC	DIV_CCCMIDR	DIV_CCCOLDR	DIV_NORTH_BA	EXPORT_CVP	EXPORT_SWP	PAST_MTZ	PAST_CHIPPS	WHOLE
706	0.5	0.0	0.0	0.0	0.0	0.0	0.0	53.5	88.3	46.0
809	1.0	0.1	0.0	0.0	0.0	0.1	0.0	28.7	68.4	69.8
815	2.1	0.5	0.0	0.2	0.0	1.1	0.6	1.3	6.8	93.7
906	2.5	0.9	0.0	0.6	0.0	2.7	1.0	0.4	3.4	91.1
915	7.2	1.7	0.0	5.7	0.0	30.7	34.0	0.0	0.0	20.1

The RST summary for the week of 5/9/12 through 5/15/12 is a summary for the VINO Farms (upstream - RM 54) GOLF, and BYPASS (downstream – RM 38) traps. The VINO RST began operating on 12/12/11 and the BYPASS trap began operating on 3/20/12. The GOLF RST was operated from 12/27/11 to 3/16/12 and was put back into service on 4/12/12.

**MOKELUMNE RIVER FISHERIES MONITORING PROGRAM OF THE EAST BAY M.U.D.  
 Juvenile Salmonid Migration Monitoring Task Weekly Anadromous Fish Downstream  
 Migrant Passage - Summary Report (Data are preliminary and subject to change).**

Week of: 5/9/12 to 5/15/12

**VINO FARMS - Upstream (RM 54)**

	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Weekly
Date	5/9	5/10	5/11	5/12	5/13	5/14	5/15	Totals
<b>Chinook Salmon</b>								
Trap Captures	11	6	5	--	--	--	8	30
AdClipped	--	--	1	--	--	--	--	1
Fork Lengths (mm) avg:	81	82	83	--	--	--	80	
Fork Lengths (mm) max:	95	91	100	--	--	--	102	
Fork Lengths (mm) min:	74	67	72	--	--	--	49	
CWTed	--	--	--	--	--	--	--	0
Seasonal Cumulative Totals Through Week:								
	Juvenile		AdClipped	CWTed				
Trap Captures:	13896		24	0				
<b>Steelhead</b>								
Trap Captures	2	1	1	--	--	--	--	4
AdClipped	--	--	--	--	--	--	--	0
Fork Lengths (mm) avg:	45	61	49	--	--	--	--	
Fork Lengths (mm) max:	46	61	49	--	--	--	--	
Fork Lengths (mm) min:	45	61	49	--	--	--	--	
Seasonal Cumulative Totals Through Week:								
	Adult		Juvenile	AdClipped				
Trap Captures:	0		44	0				
<b>Lampreys (Lampetra sp.)</b>								
Pacific Lamprey Adult	--	--	--	--	--	--	--	0
Pacific Lamprey Juvenile	33	7	27	--	--	--	21	88
Seasonal Cumulative Totals Through Week:								
	Adult		Juvenile					
Trap Captures:	0		1604					
<b>Physical Environmental Data</b>								
Water Temp. (C)	14.20	13.80	13.40	--	--	13.80	15.30	
Turbidity (ntu)	3.07	2.49	3.79	--	--	2.56	2.87	

## GOLF – Downstream (RM 38)

	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Weekly
Date	5/9	5/10	5/11	5/12	5/13	5/14	5/15	Totals
<b>Chinook Salmon</b>								
Trap Captures	24	20	19	--	--	--	8	71
AdClipped	--	--	--	--	--	--	--	0
Fork Lengths (mm) avg:	86	85	83	--	--	--	91	
Fork Lengths (mm) max:	95	95	97	--	--	--	98	
Fork Lengths (mm) min:	77	73	74	--	--	--	81	
CWTed	--	--	--	--	--	--	--	0
Seasonal Cumulative Totals Through Week:								
	Juvenile	AdClipped	CWTed					
Trap Captures:	862	430	0					
<b>Steelhead</b>								
Trap Captures	--	--	--	--	--	--	--	0
AdClipped	--	--	--	--	--	--	--	0
Fork Lengths (mm) avg:	--	--	--	--	--	--	--	0
Fork Lengths (mm) max:	--	--	--	--	--	--	--	0
Fork Lengths (mm) min:	--	--	--	--	--	--	--	0
Seasonal Cumulative Totals Through Week:								
	Adult	Juvenile	AdClipped					
Trap Captures:	1	26	22					
<b>Lampreys (Lampetra sp.)</b>								
Pacific Lamprey Adult	--	--	--	--	--	--	--	0
Pacific Lamprey Juvenile	2	2	4	--	--	--	3	11
Seasonal Cumulative Totals Through Week:								
	Adult	Juvenile						
Trap Captures:	0	15680						
Physical Environmental Data								
Water Temp. (C)	18.60	19.00	18.90	--	--	18.60	18.50	
Turbidity (ntu)	2.66	2.33	3.95	--	--	3.38	2.92	

## BYPASS - Downstream (RM 38)

	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Weekly
Date	5/9	5/10	5/11	5/12	5/13	5/14	5/15	Totals
<b>Chinook Salmon</b>								
Trap Captures	173	97	161	--	--	--	423	854
AdClipped	1	--	--	--	--	--	5	6
Fork Lengths (mm) avg:	90	91	88	--	--	--	91	
Fork Lengths (mm) max:	106	102	110	--	--	--	107	
Fork Lengths (mm) min:	78	81	72	--	--	--	75	
CWTed	--	--	--	--	--	--	--	0
Seasonal Cumulative Totals Through Week:								
	Juvenile	AdClipped	CWTed					
Trap Captures:	1892	10	0					
<b>Steelhead</b>								
Trap Captures	--	2	5	--	--	--	1	8
AdClipped	--	--	--	--	--	--	--	0
Fork Lengths (mm) avg:	--	64	109	--	--	--	35	
Fork Lengths (mm) max:	--	65	215	--	--	--	35	
Fork Lengths (mm) min:	--	63	33	--	--	--	35	
Seasonal Cumulative Totals Through Week:								
	Adult	Juvenile	AdClipped					
Trap Captures:	0	24	1					
<b>Lampreys (Lampetra sp.)</b>								
Pacific Lamprey Adult	--	--	--	--	--	--	--	0
Pacific Lamprey Juvenile	2	1	--	--	--	--	--	3
Seasonal Cumulative Totals Through Week:								
	Adult	Juvenile						
Trap Captures:	0	15						
<b>Physical Environmental Data</b>								
Water Temp. (C)	19.10	19.20	19.20	--	--	18.80	18.50	
Turbidity (ntu)	2.26	2.22	3.11	--	--	3.63	2.83	