

2012 Hydrograph Development

Status

June 22, 2011

2012 Hydrograph Development

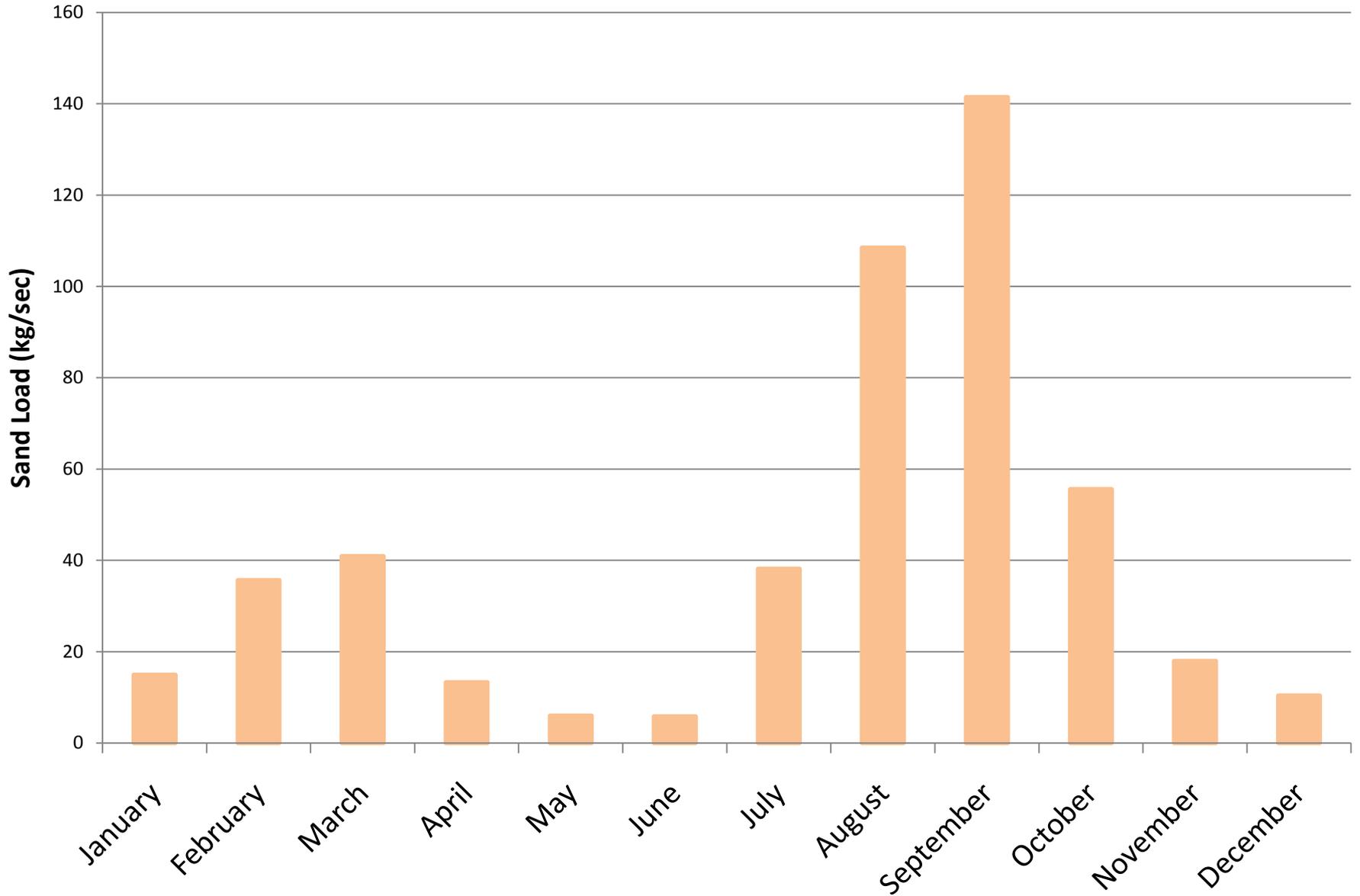
- Start with 2011 Hydrograph
(+/-100 kaf w/16,000 & 22,000 cfs limits)
- Consider operating experiences from 2011
- Look to improve cost/benefit/flexibility
- Within existing environmental compliance



Methods

- USGS Model for sand
- Western's GTMAX hourly model for costs to the Basin Fund
- Compare against original MLFF
- Average sediment inputs
- Objective – Retain sand inputs high in the system in anticipation of a potential HFE

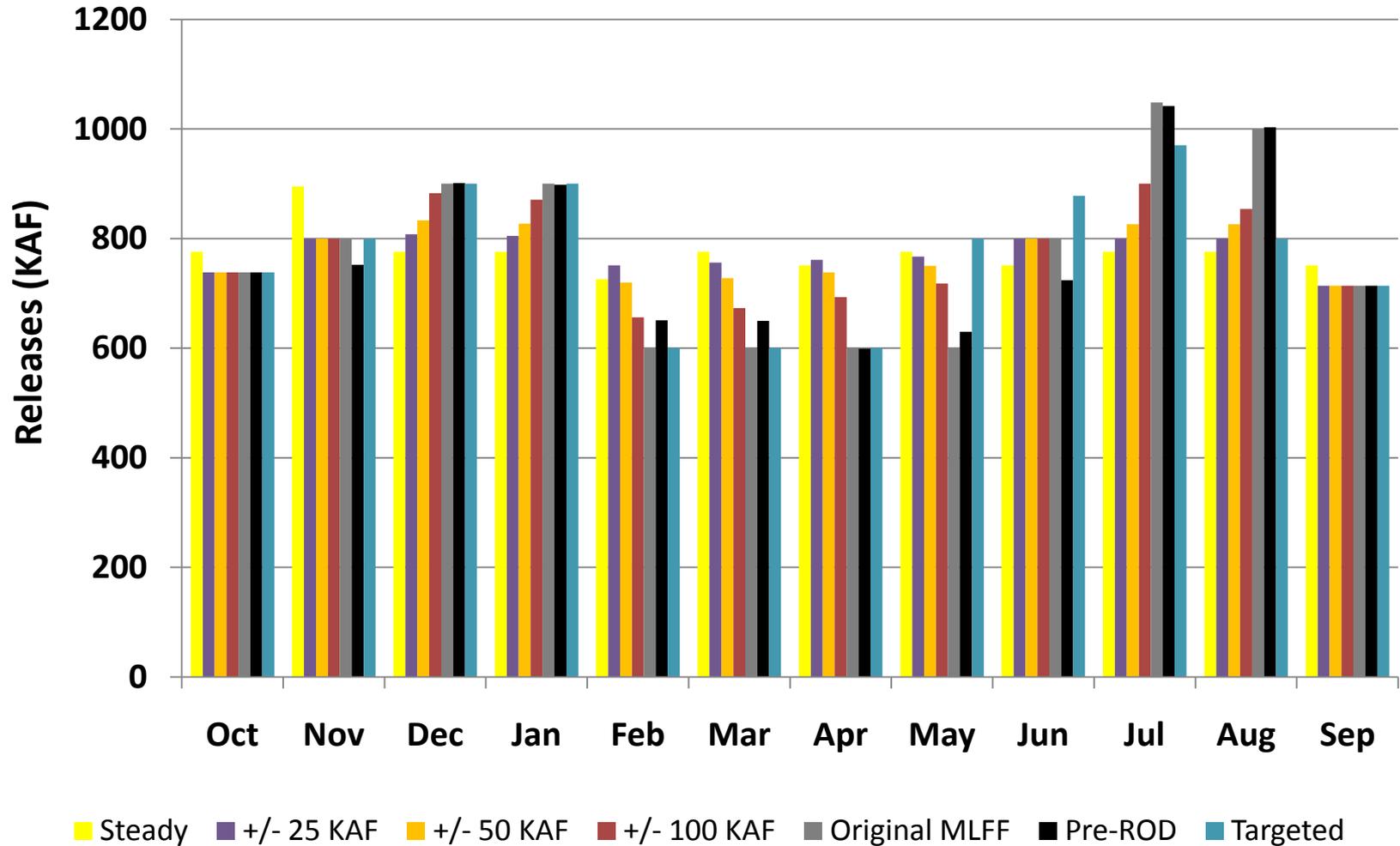
Average Sand Inputs





Bounding the Options

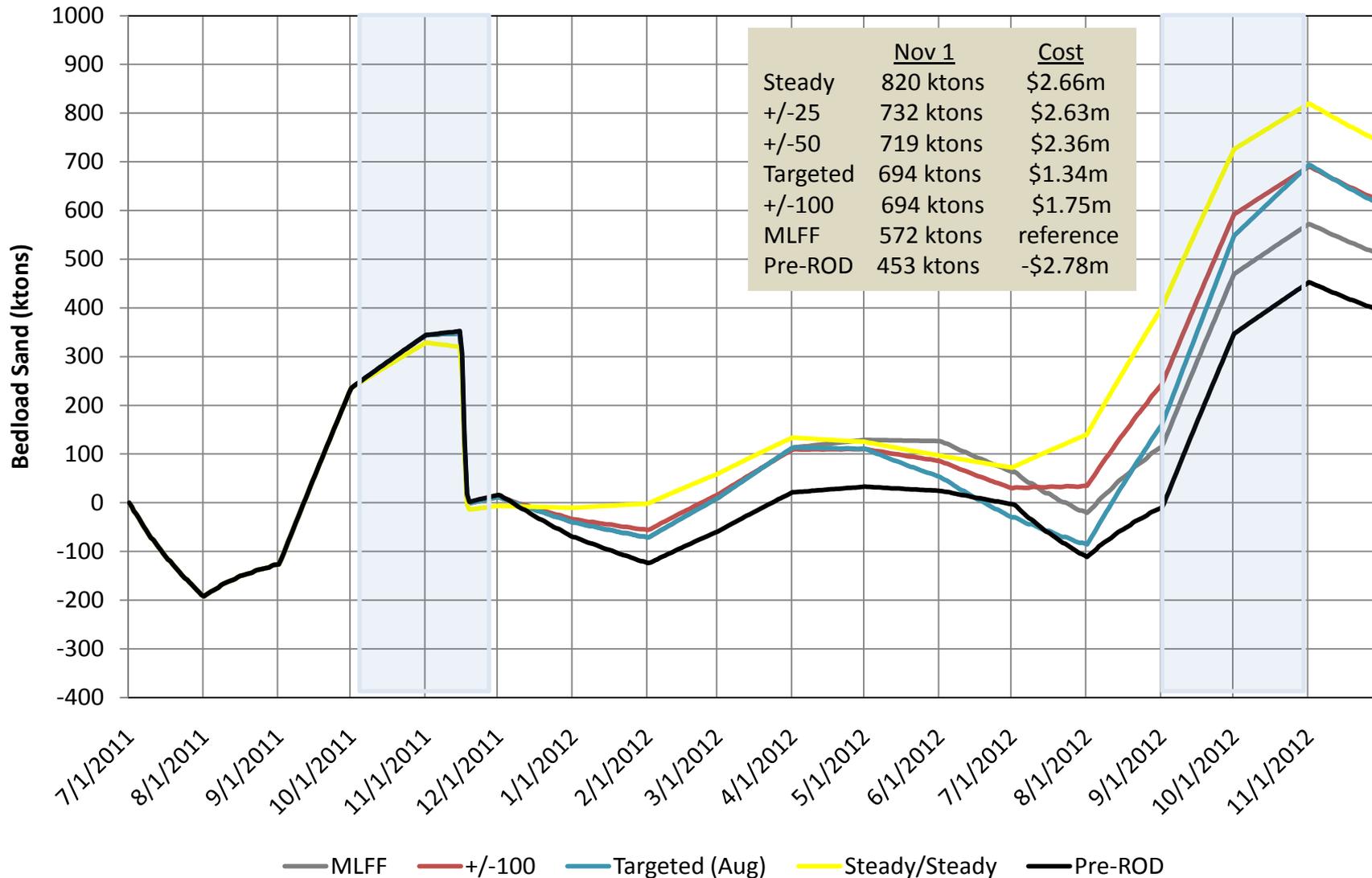
Monthly Release Volumes for 9.3 maf year With November 2011 HFE



Bounding the Options

Upper Marble Canyon (RM30)

9.3 maf Release



Finalists

2011 Hydrograph Method

- Monthly volume may vary +/- 100 kaf from average of remaining balance
- 16,000 cfs limit up to 11.0 maf annual release
- 22,000 cfs limit above 11.0 maf annual release
- No limits if needed for equalization
- ROD limits apply

Targeted Method

- August releases are limited using percentage method to conserve sediment inputs
- Sept/Oct low-steady releases also conserve sediment
- No limits on other months
- No limits if needed for equalization
- ROD limits apply

2012 Finalists

9.3 maf Release Example

+/-100 KAF (SCENARIO 18)

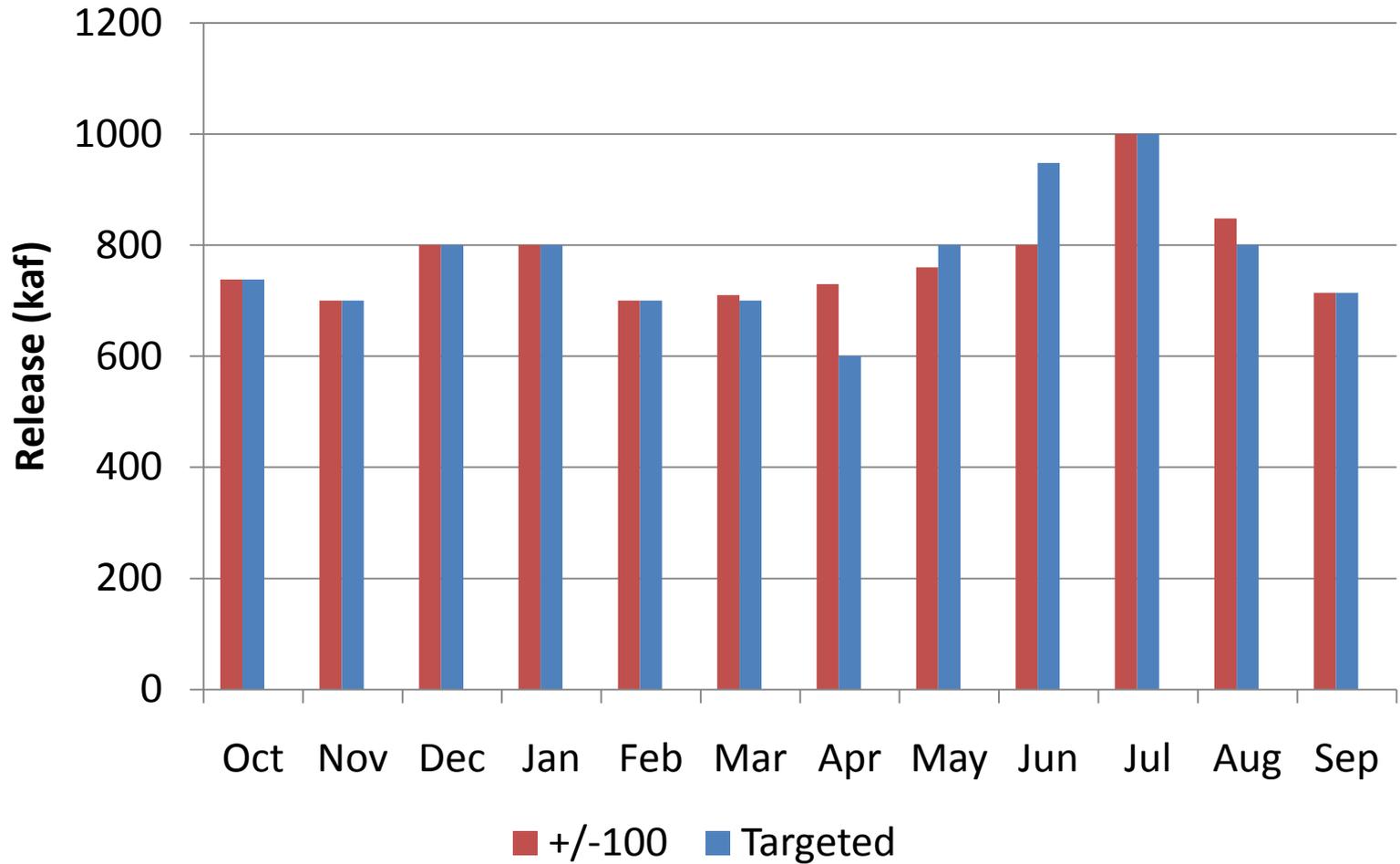
	Release (kaf)	Annual Forecast (maf)	Sept Steady Flow Target (kaf)	Min Monthly Release (Avg - 100 kaf) (kaf)	Max Monthly Release (Avg + 100 kaf) (kaf)
Oct	738	9.30	714	738	738
Nov	700	9.30	714	685	885
Dec	800	9.30	714	694	894
Jan	800	9.30	714	693	893
Feb	700	9.30	714	693	893
Mar	710	9.30	714	708	908
Apr	730	9.30	714	728	928
May	760	9.30	714	752	952
Jun	800	9.30	714	783	983
Jul	1,000	9.30	714	824	1,024
Aug	848	9.30	714	748	948
Sep	714	9.30	714		

Targeted (SCENARIO 19)

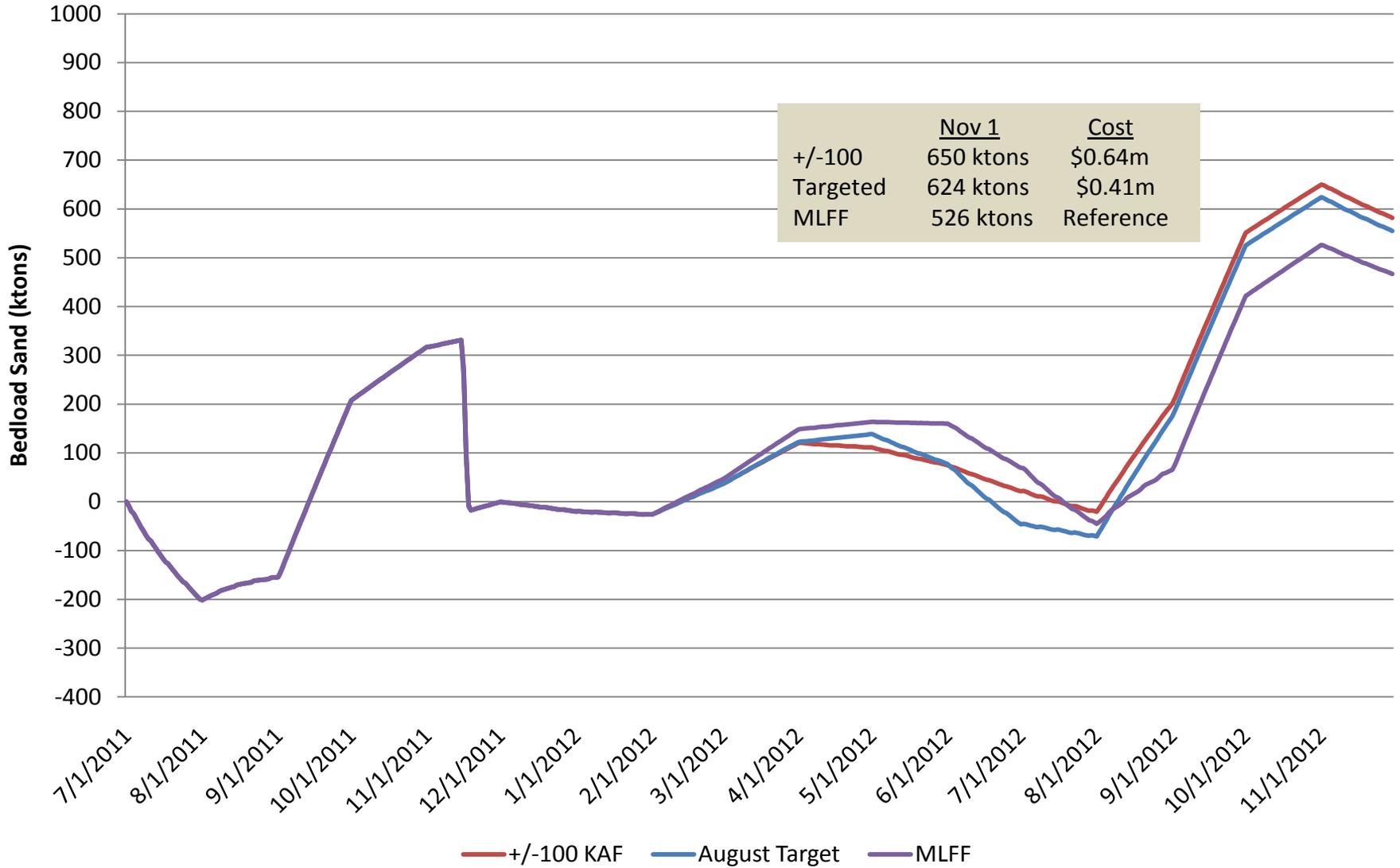
	Release (kaf)	Annual Forecast (maf)	Sept Steady Flow Target (kaf)	August Target Percent	August Target Volume (kaf)
Oct	738	9.30	714		800
Nov	700	9.30	714		800
Dec	800	9.30	714		800
Jan	800	9.30	714	10	800
Feb	700	9.30	714	10	800
Mar	700	9.30	714	12	800
Apr	600	9.30	714	15	800
May	800	9.30	714	20	800
Jun	948	9.30	714	25	800
Jul	1,000	9.30	714	40	800
Aug	800	9.30	714	100	800
Sep	714	9.30	714		



Monthly Release Volumes 9.3 maf Release



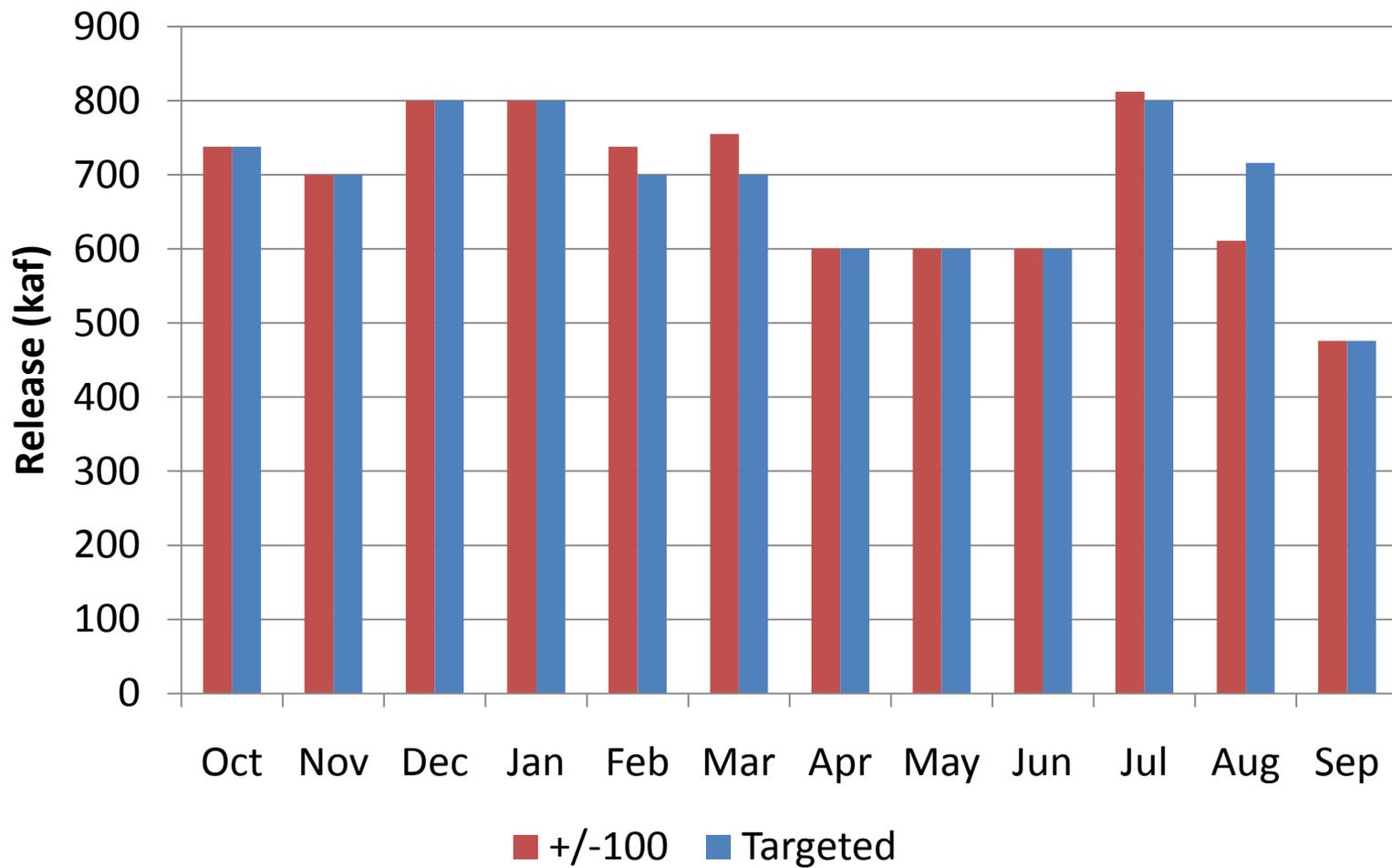
Upper Marble Canyon (RM30) 9.3 maf





Monthly Release Volumes

9.3 maf > 8.23 maf (2004) Pattern

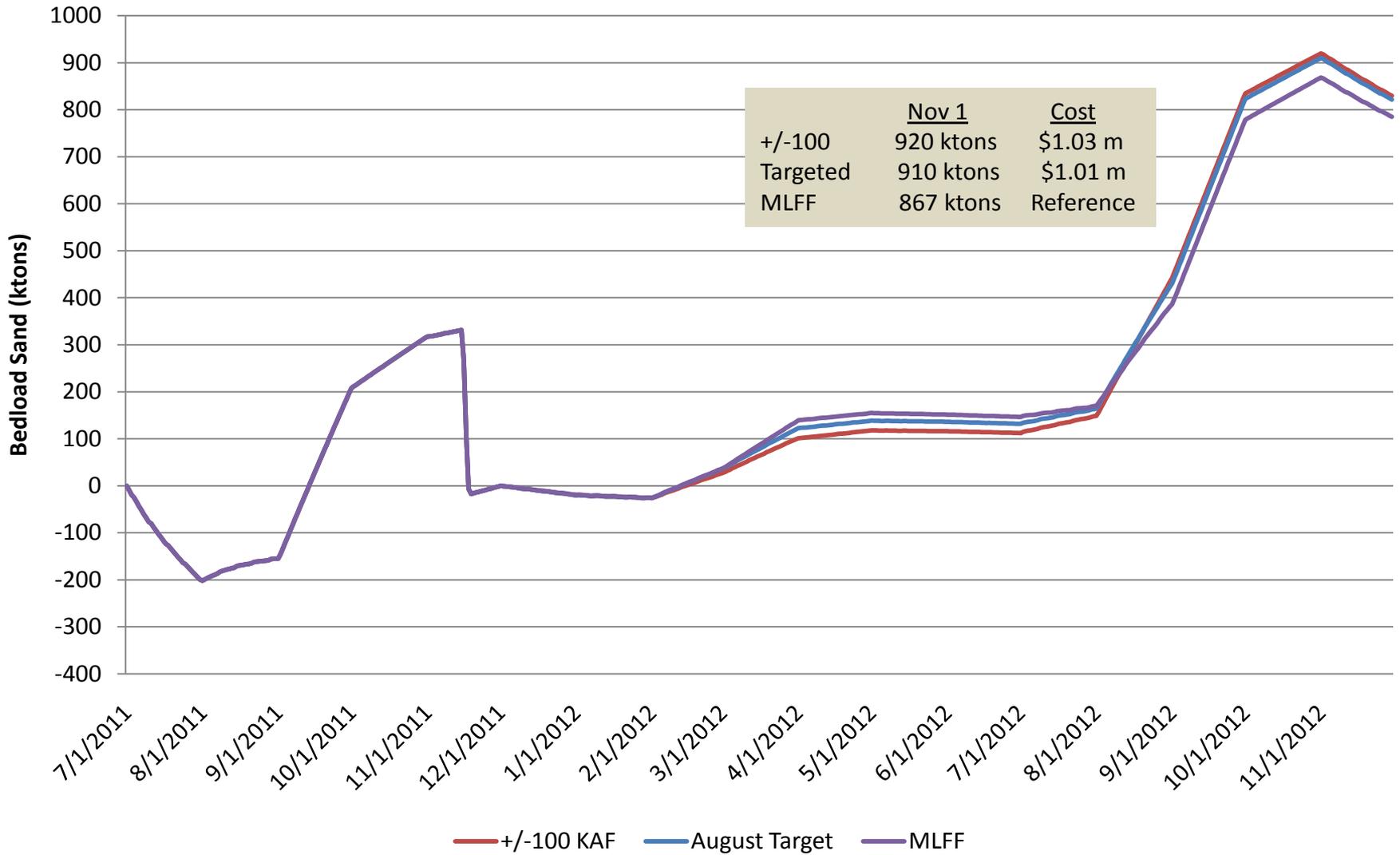




Round 5b

Upper Marble Canyon (RM30)

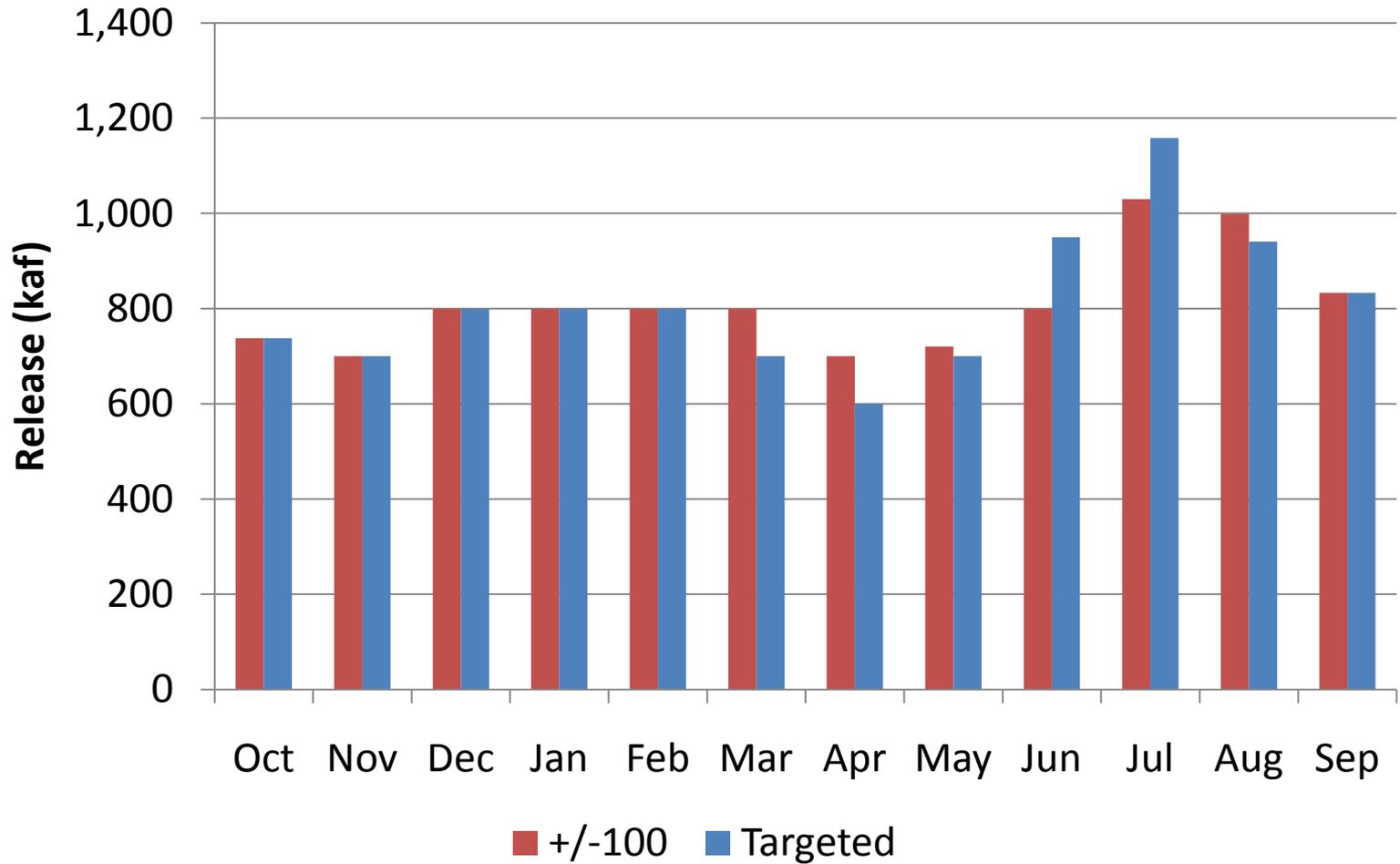
9.3 maf > 8.23 maf





Monthly Release Volumes

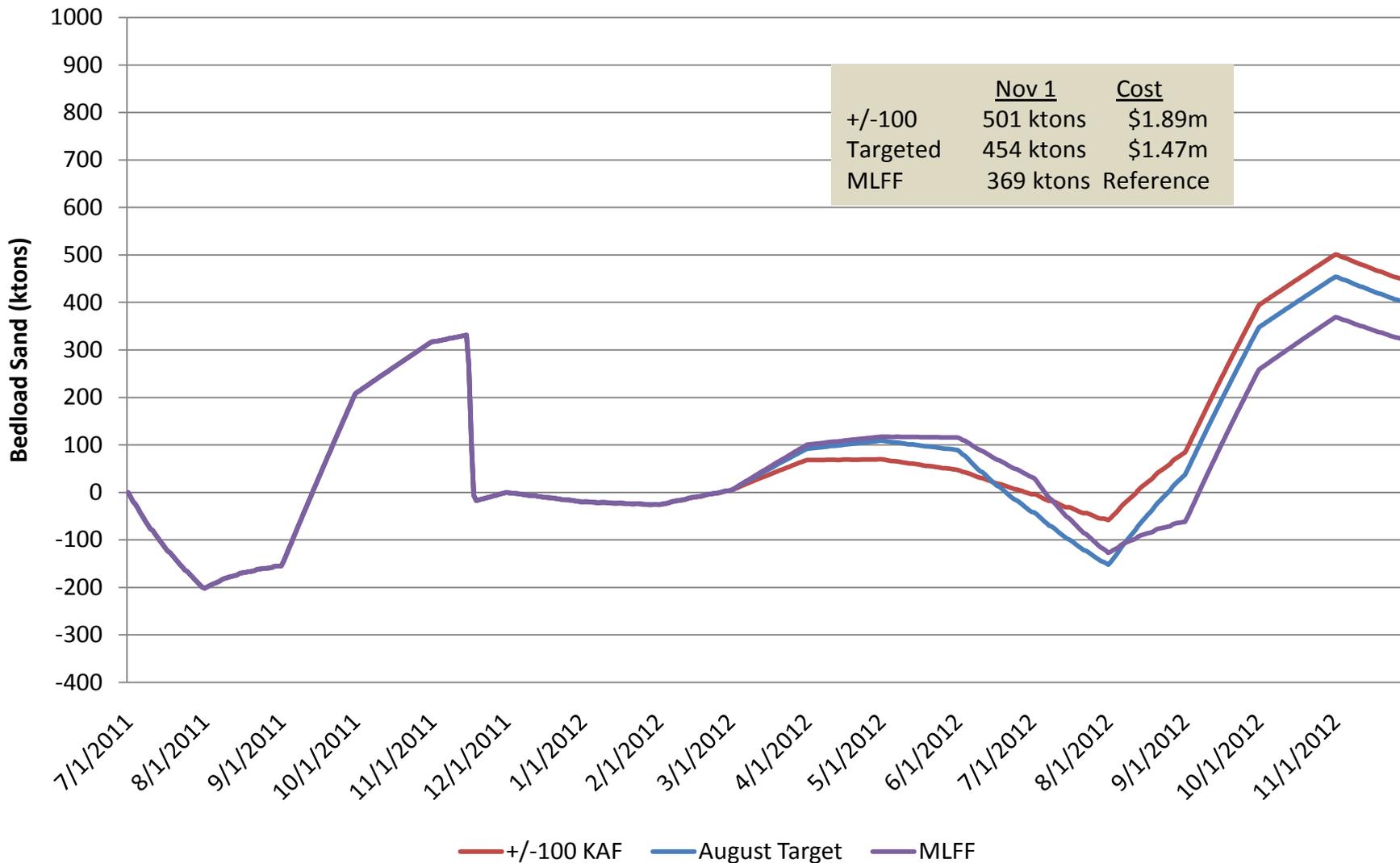
9.3 maf > 9.72 maf Release (July 2009)



Round 5c

Upper Marble Canyon (RM30)

9.3 maf > 9.7 maf



Projected Sand Retained (November)

