

# 2024 Water Supply Review (9/5/24)



**Forecasted Flow Projections  
NRCS - April 2024**

| Table 1: April 2024 NRCS Streamflow Forecast              |  |        |        |        |          |                                     |                 |          |
|---|--|--------|--------|--------|----------|-------------------------------------|-----------------|----------|
| April NRCS Streamflow Forecast, April - July 2024 Volumes |  |        |        |        |          | Site-Specific Water Year Thresholds |                 |          |
| Geographic Area   | Gage Site                                  | 70%    | 50%    | 30%    | % Median | Dry Year                            | Normal Year     | Wet Year |
| Jocko   | South Fork Jocko near Arlee                | 22,000 | 25,000 | 29,000 | 71%      | <24,000                             | 24,000 - 36,000 | >36,000  |
| Mission   | Mission Creek near St. Ignatius            | 23,000 | 25,000 | 27,000 | 96%      | <21,100                             | 21,100 - 29,000 | >29,000  |
|   | South Crow Creek near Ronan                | 8,600  | 9,300  | 10,500 | 91%      | <7,700                              | 7,700 - 11,800  | >11,800  |
|   | Hellroaring Creek                          | 3,200  | 3,500  | 4,000  | 85%      | <3,350                              | 3,350-4,750     | >4,750   |
| Little Bitterroot   | Mill Creek above Bassoo Creek near Niarada | 2,100  | 2,600  | 3,100  | 55%      | <2,200                              | 2,200 - 4,900   | >4,900   |

|        |
|--------|
| Wet    |
| Normal |
| Dry    |

\*all values are in acre feet

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|   | Hellroaring Creek                          | 3,200  | 3,500  | 4,000  | 85%      | <3,350                              | 3,350-4,750     | >4,750   |
| Little Bitterroot   | Mill Creek above Bassoo Creek near Niarada | 2,100  | 2,600  | 3,100  | 55%      | <2,200                              | 2,200 - 4,900   | >4,900   |

|        |
|--------|
| Wet    |
| Normal |
| Dry    |

\*all values are in acre feet

**Observed Flow Values**

| Observed April - July Flows |           |                    |           |                 |           |                  |           |                 |           |
|-----------------------------|-----------|--------------------|-----------|-----------------|-----------|------------------|-----------|-----------------|-----------|
| USGS S. Fork Jocko          |           | USGS Mission Creek |           | 3521 South Crow |           | 0600 Hellroaring |           | 3121 Mill Creek |           |
| Month                       | Acre Feet | Month              | Acre Feet | Month           | Acre Feet | Month            | Acre Feet | Month           | Acre Feet |
| April                       | 4,484     | April              | 2,062     | April           | 983       | April            | 661       | April           | 569       |
| May                         | 10,646    | May                | 5,642     | May             | 2,527     | May              | 1,211     | May             | 862       |
| June                        | 8,484     | June               | 9,525     | June            | 3,367     | June             | 1,045     | June            | 371       |
| July                        | 3,078     | July               | 6,772     | July            | 1,409     | July             | 676       | July            | 190       |
| Total                       | 26,700    | Total              | 24,000    | Total           | 8,300     | Total            | 3,600     | Total           | 2,000     |

Note\*\* The above "Total" Row represents the April-July volumetric totals  
Total Volumes are rounded to 2-3 significant digits to be consistent with input values.

## Forecast Development across the Months – 50% Exceedance Probabilities

| <b>APRIL 1</b> Forecast |  |        |
|-------------------------|--|--------|
| Geographic Area         | Gage Site                                  | 50%    |
| Jocko                   | South Fork Jocko near Arlee                | 25,000 |
| Mission                 | Mission Creek near St. Ignatius            | 25,000 |
|                         | South Crow Creek near Ronan                | 9,300  |
|                         | Hellroaring Creek                          | 3,500  |
| Little Bitterroot       | Mill Creek above Bassoo Creek near Niarada | 2,600  |

**Observed Flow Values**

| Observed April - July Flows |           |                    |           |                 |           |                  |           |                 |           |
|-----------------------------|-----------|--------------------|-----------|-----------------|-----------|------------------|-----------|-----------------|-----------|
| USGS S. Fork Jocko          |           | USGS Mission Creek |           | 3521 South Crow |           | 0600 Hellroaring |           | 3121 Mill Creek |           |
| Month                       | Acre Feet | Month              | Acre Feet | Month           | Acre Feet | Month            | Acre Feet | Month           | Acre Feet |
| April                       | 4,484     | April              | 2,062     | April           | 983       | April            | 661       | April           | 569       |
| May                         | 10,646    | May                | 5,642     | May             | 2,527     | May              | 1,211     | May             | 862       |
| June                        | 8,484     | June               | 9,525     | June            | 3,367     | June             | 1,045     | June            | 371       |
| July                        | 3,078     | July               | 6,772     | July            | 1,409     | July             | 676       | July            | 190       |
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|-------------------------|--|--------|
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| Jocko                   | South Fork Jocko near Arlee                | 25,000 |
| Mission                 | Mission Creek near St. Ignatius            | 25,000 |
|                         | South Crow Creek near Ronan                | 9,300  |
|                         | Hellroaring Creek                          | 3,500  |
| Little Bitterroot       | Mill Creek above Bassoo Creek near Niarada | 2,600  |



| <b>MAY 1</b> Forecast (Observed April Flows + May-July Forecast) |  |        |
|--|--|--------|
| Geographic Area  | Gage Site                                  | 50%    |
| Jocko  | South Fork Jocko near Arlee                | 24,130 |
| Mission  | Mission Creek near St. Ignatius            | 22,030 |
|  | South Crow Creek near Ronan                | 8,580  |
|  | Hellroaring Creek                          | 3,360  |
| Little Bitterroot  | Mill Creek above Bassoo Creek near Niarada | 2,290  |

**Observed Flow Values**

| Observed April - July Flows |           |                    |           |                 |           |                  |           |                 |           |
|-----------------------------|-----------|--------------------|-----------|-----------------|-----------|------------------|-----------|-----------------|-----------|
| USGS S. Fork Jocko          |           | USGS Mission Creek |           | 3521 South Crow |           | 0600 Hellroaring |           | 3121 Mill Creek |           |
| Month                       | Acre Feet | Month              | Acre Feet | Month           | Acre Feet | Month            | Acre Feet | Month           | Acre Feet |
| April                       | 4,484     | April              | 2,062     | April           | 983       | April            | 661       | April           | 569       |
| May                         | 10,646    | May                | 5,642     | May             | 2,527     | May              | 1,211     | May             | 862       |
| June                        | 8,484     | June               | 9,525     | June            | 3,367     | June             | 1,045     | June            | 371       |
| July                        | 3,078     | July               | 6,772     | July            | 1,409     | July             | 676       | July            | 190       |
| Total                       | 26,700    | Total              | 24,000    | Total           | 8,300     | Total            | 3,600     | Total           | 2,000     |

Note\*\* The above "Total" Row represents the April-July volumetric totals  
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| <b>APRIL 1</b> Forecast |  |        |
|-------------------------|--|--------|
| Geographic Area         | Gage Site                                  | 50%    |
| Jocko                   | South Fork Jocko near Arlee                | 25,000 |
| Mission                 | Mission Creek near St. Ignatius            | 25,000 |
|                         | South Crow Creek near Ronan                | 9,300  |
|                         | Hellroaring Creek                          | 3,500  |
| Little Bitterroot       | Mill Creek above Bassoo Creek near Niarada | 2,600  |

| <b>MAY 14</b> Forecast (Observed April Flows + Revised May-July Forecast) |  |        |
|---|--|--------|
| Geographic Area   | Gage Site                                  | 50%    |
| Jocko   | South Fork Jocko near Arlee                | 27,090 |
| Mission   | Mission Creek near St. Ignatius            | 24,360 |
|   | South Crow Creek near Ronan                | 9,080  |
|   | Hellroaring Creek                          | 3,660  |
| Little Bitterroot   | Mill Creek above Bassoo Creek near Niarada | 2,570  |

| <b>MAY 1</b> Forecast (Observed April Flows + May-July Forecast) |  |        |
|--|--|--------|
| Geographic Area  | Gage Site                                  | 50%    |
| Jocko  | South Fork Jocko near Arlee                | 24,130 |
| Mission  | Mission Creek near St. Ignatius            | 22,030 |
|  | South Crow Creek near Ronan                | 8,580  |
|  | Hellroaring Creek                          | 3,360  |
| Little Bitterroot  | Mill Creek above Bassoo Creek near Niarada | 2,290  |

| Observed April - July Flows |           |                    |           |                 |           |                  |           |                 |           |
|-----------------------------|-----------|--------------------|-----------|-----------------|-----------|------------------|-----------|-----------------|-----------|
| USGS S. Fork Jocko          |           | USGS Mission Creek |           | 3521 South Crow |           | 0600 Hellroaring |           | 3121 Mill Creek |           |
| Month                       | Acre Feet | Month              | Acre Feet | Month           | Acre Feet | Month            | Acre Feet | Month           | Acre Feet |
| April                       | 4,484     | April              | 2,062     | April           | 983       | April            | 661       | April           | 569       |
| May                         | 10,646    | May                | 5,642     | May             | 2,527     | May              | 1,211     | May             | 862       |
| June                        | 8,484     | June               | 9,525     | June            | 3,367     | June             | 1,045     | June            | 371       |
| July                        | 3,078     | July               | 6,772     | July            | 1,409     | July             | 676       | July            | 190       |
| Total                       | 26,700    | Total              | 24,000    | Total           | 8,300     | Total            | 3,600     | Total           | 2,000     |

Note\*\* The above "Total" Row represents the April-July volumetric totals  
Total Volumes are rounded to 2-3 significant digits to be consistent with input values.

**Observed Flow Values**

## Forecast Development across the Months – 50% Exceedance Probabilities

| <b>APRIL 1</b> Forecast |  |        |
|-------------------------|--|--------|
| Geographic Area         | Gage Site                                  | 50%    |
| Jocko                   | South Fork Jocko near Arlee                | 25,000 |
| Mission                 | Mission Creek near St. Ignatius            | 25,000 |
|                         | South Crow Creek near Ronan                | 9,300  |
|                         | Hellroaring Creek                          | 3,500  |
| Little Bitterroot       | Mill Creek above Bassoo Creek near Niarada | 2,600  |

| <b>MAY 1</b> Forecast (Observed April Flows + May-July Forecast) |  |        |
|--|--|--------|
| Geographic Area  | Gage Site                                  | 50%    |
| Jocko  | South Fork Jocko near Arlee                | 24,130 |
| Mission  | Mission Creek near St. Ignatius            | 22,030 |
|  | South Crow Creek near Ronan                | 8,580  |
|  | Hellroaring Creek                          | 3,360  |
| Little Bitterroot  | Mill Creek above Bassoo Creek near Niarada | 2,290  |

| <b>MAY 14</b> Forecast (Observed April Flows + Revised May-July Forecast) |  |        |
|---|--|--------|
| Geographic Area   | Gage Site                                  | 50%    |
| Jocko   | South Fork Jocko near Arlee                | 27,090 |
| Mission   | Mission Creek near St. Ignatius            | 24,360 |
|   | South Crow Creek near Ronan                | 9,080  |
|   | Hellroaring Creek                          | 3,660  |
| Little Bitterroot   | Mill Creek above Bassoo Creek near Niarada | 2,570  |

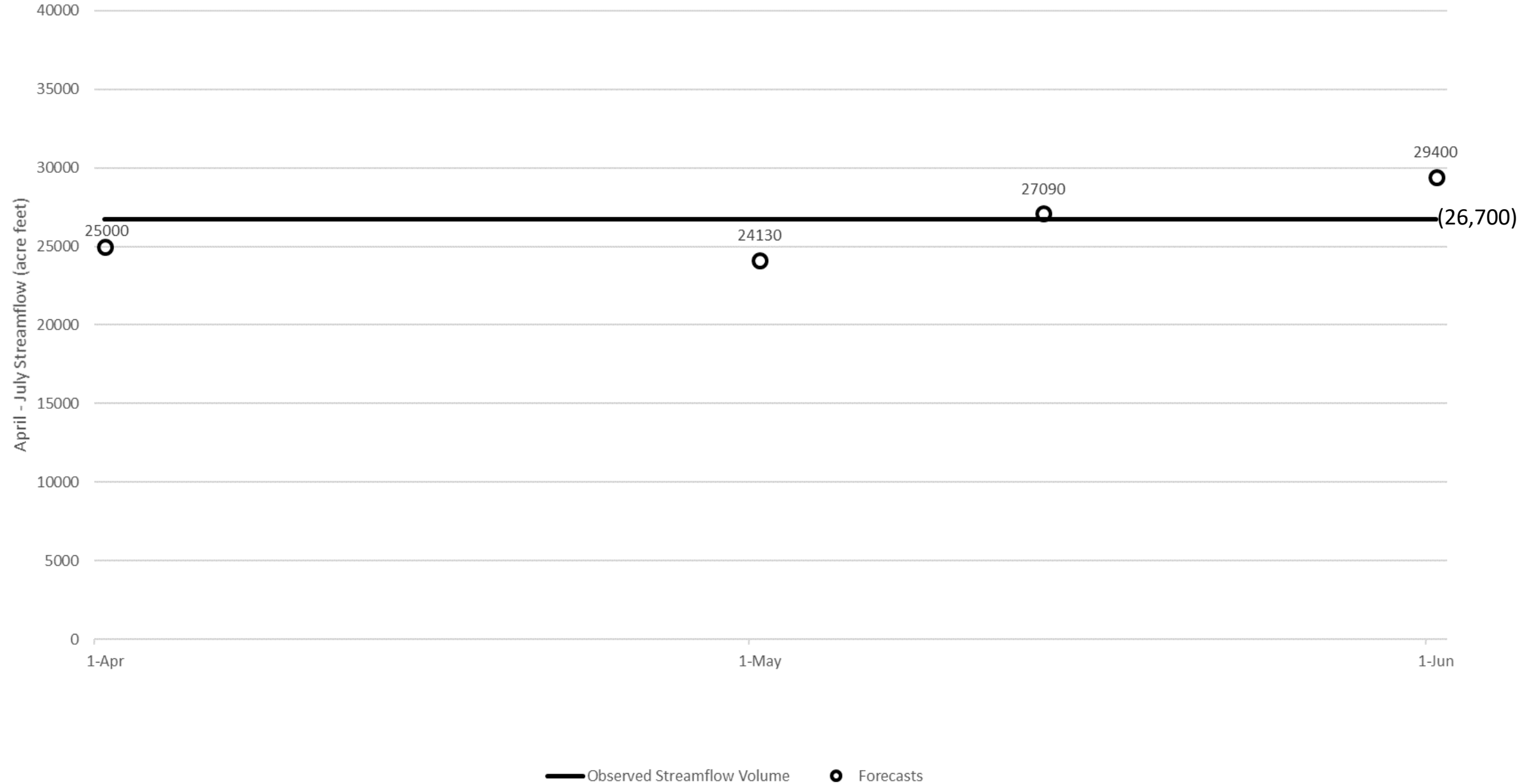
| <b>JUNE 1</b> Forecast (Observed April/May Flows + June thru July Forecast) |  |        |
|---|--|--------|
| Geographic Area   | Gage Site                                  | 50%    |
| Jocko   | South Fork Jocko near Arlee                | 29,400 |
| Mission   | Mission Creek near St. Ignatius            | 23,100 |
|   | South Crow Creek near Ronan                | 9,600  |
|   | Hellroaring Creek                          | 3,830  |
| Little Bitterroot   | Mill Creek above Bassoo Creek near Niarada | 2,380  |

**Observed Flow Values**

| Observed April - July Flows |               |                    |               |                 |              |                  |              |                 |              |
|-----------------------------|---------------|--------------------|---------------|-----------------|--------------|------------------|--------------|-----------------|--------------|
| USGS S. Fork Jocko          |               | USGS Mission Creek |               | 3521 South Crow |              | 0600 Hellroaring |              | 3121 Mill Creek |              |
| Month                       | Acre Feet     | Month              | Acre Feet     | Month           | Acre Feet    | Month            | Acre Feet    | Month           | Acre Feet    |
| April                       | 4,484         | April              | 2,062         | April           | 983          | April            | 661          | April           | 569          |
| May                         | 10,646        | May                | 5,642         | May             | 2,527        | May              | 1,211        | May             | 862          |
| June                        | 8,484         | June               | 9,525         | June            | 3,367        | June             | 1,045        | June            | 371          |
| July                        | 3,078         | July               | 6,772         | July            | 1,409        | July             | 676          | July            | 190          |
| <b>Total</b>                | <b>26,700</b> | <b>Total</b>       | <b>24,000</b> | <b>Total</b>    | <b>8,300</b> | <b>Total</b>     | <b>3,600</b> | <b>Total</b>    | <b>2,000</b> |

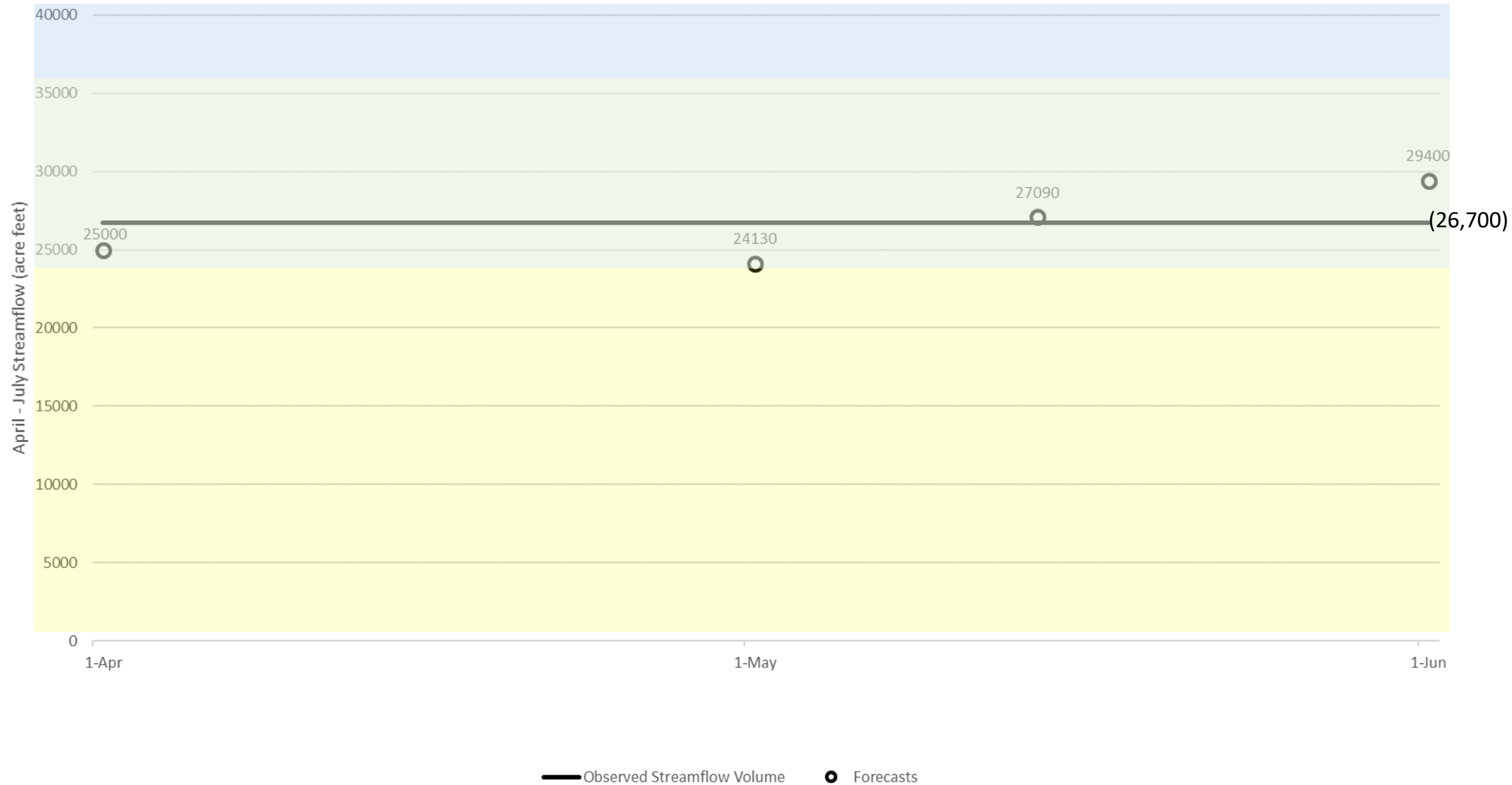
Note\*\* The above "Total" Row represents the April-July volumetric totals  
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# SF Jocko near Arlee - Forecast Values vs. Observed Flows

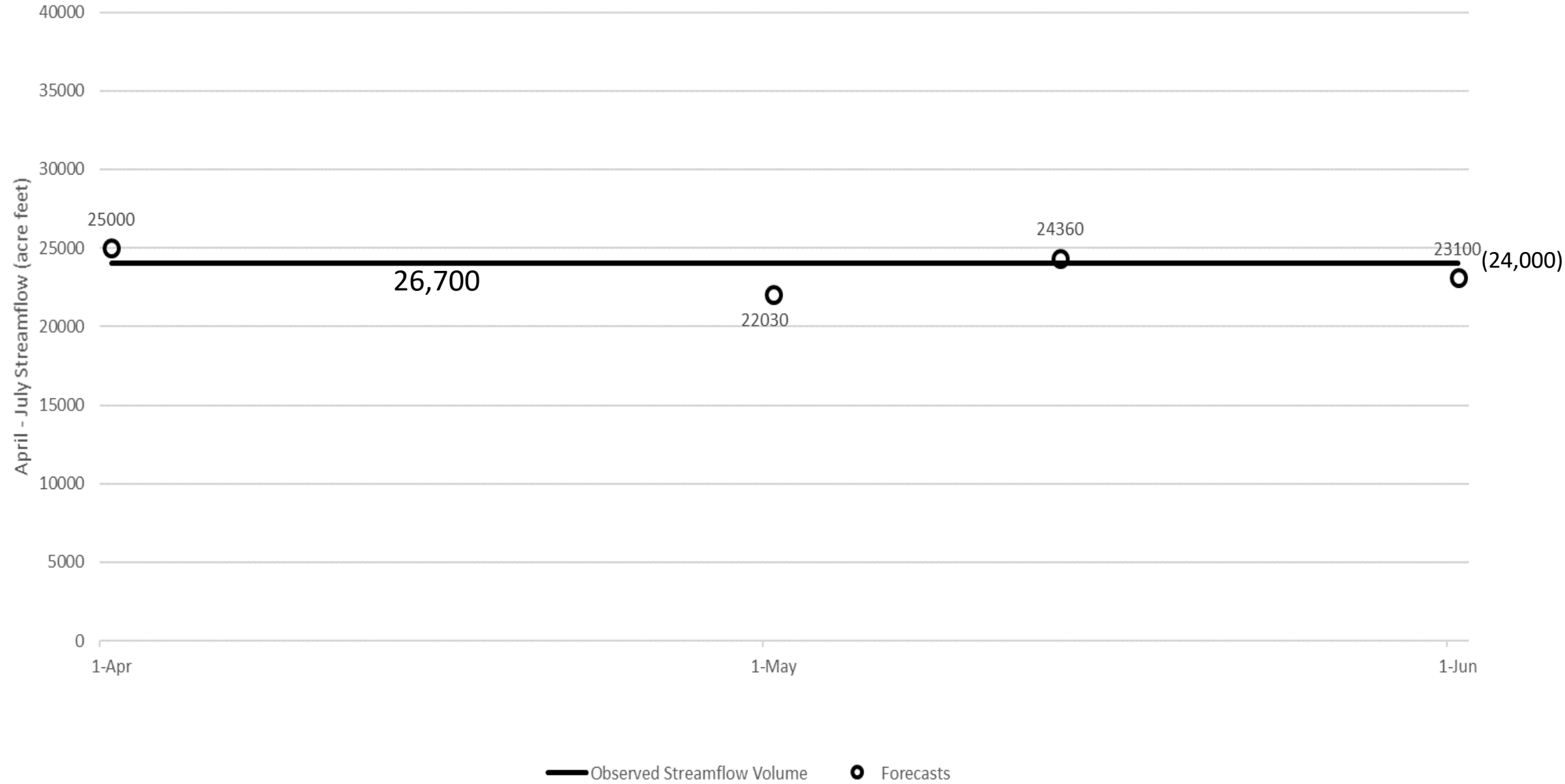




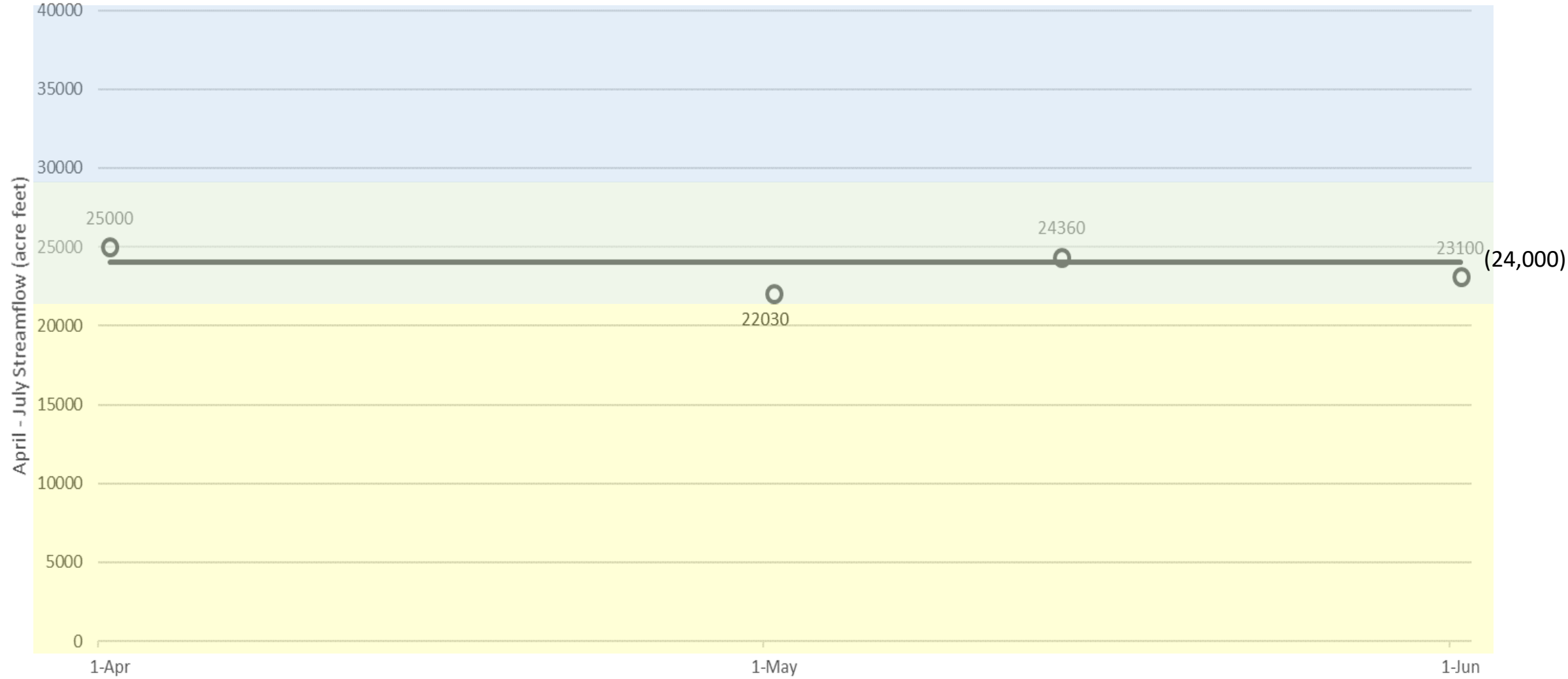
# SF Jocko near Arlee - Forecast Values vs. Observed Flows



# Mission Creek - Forecast Values vs. Observed Flows

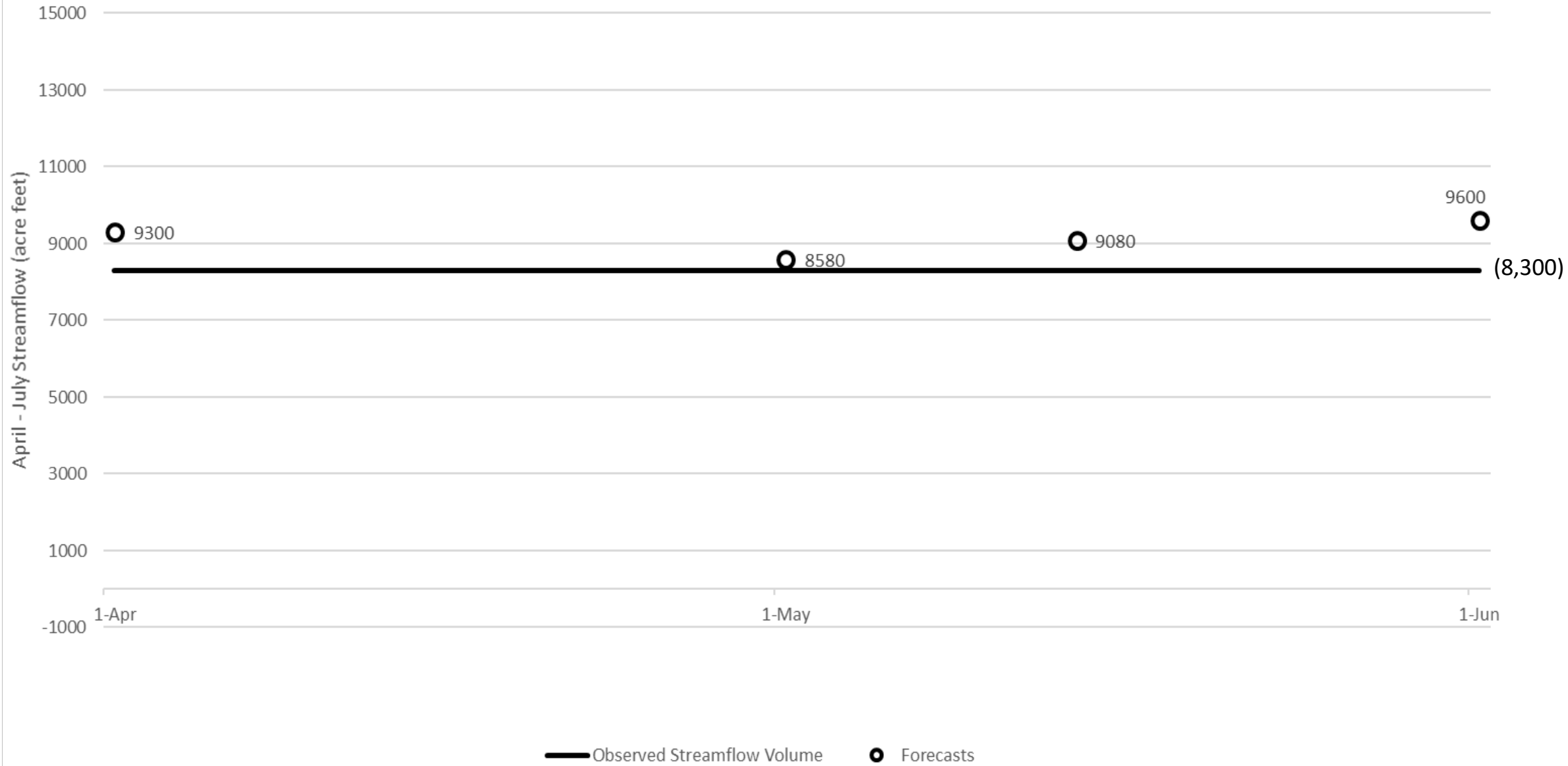


# Mission Creek - Forecast Values vs. Observed Flows

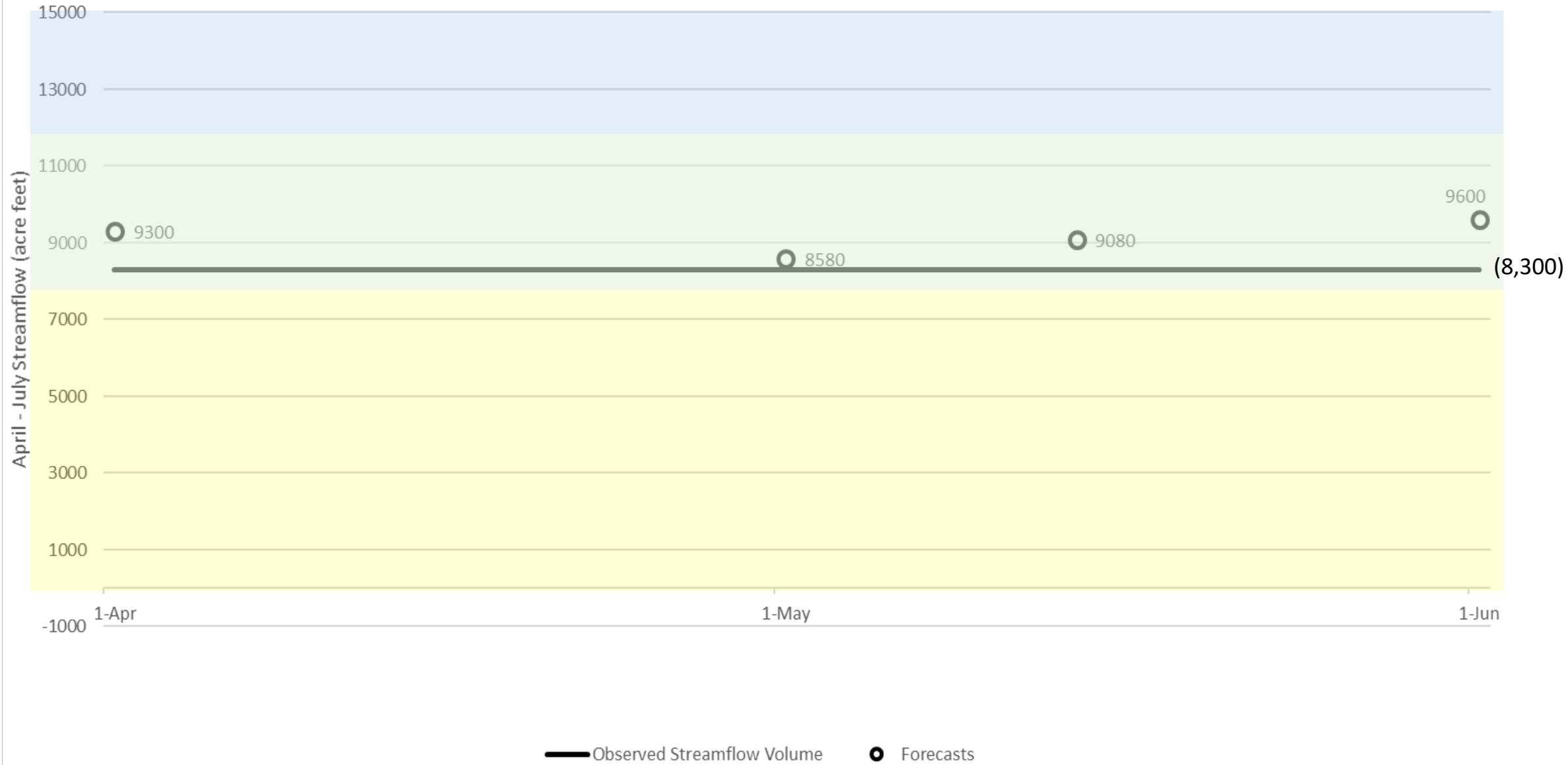


— Observed Streamflow Volume    ○ Forecasts

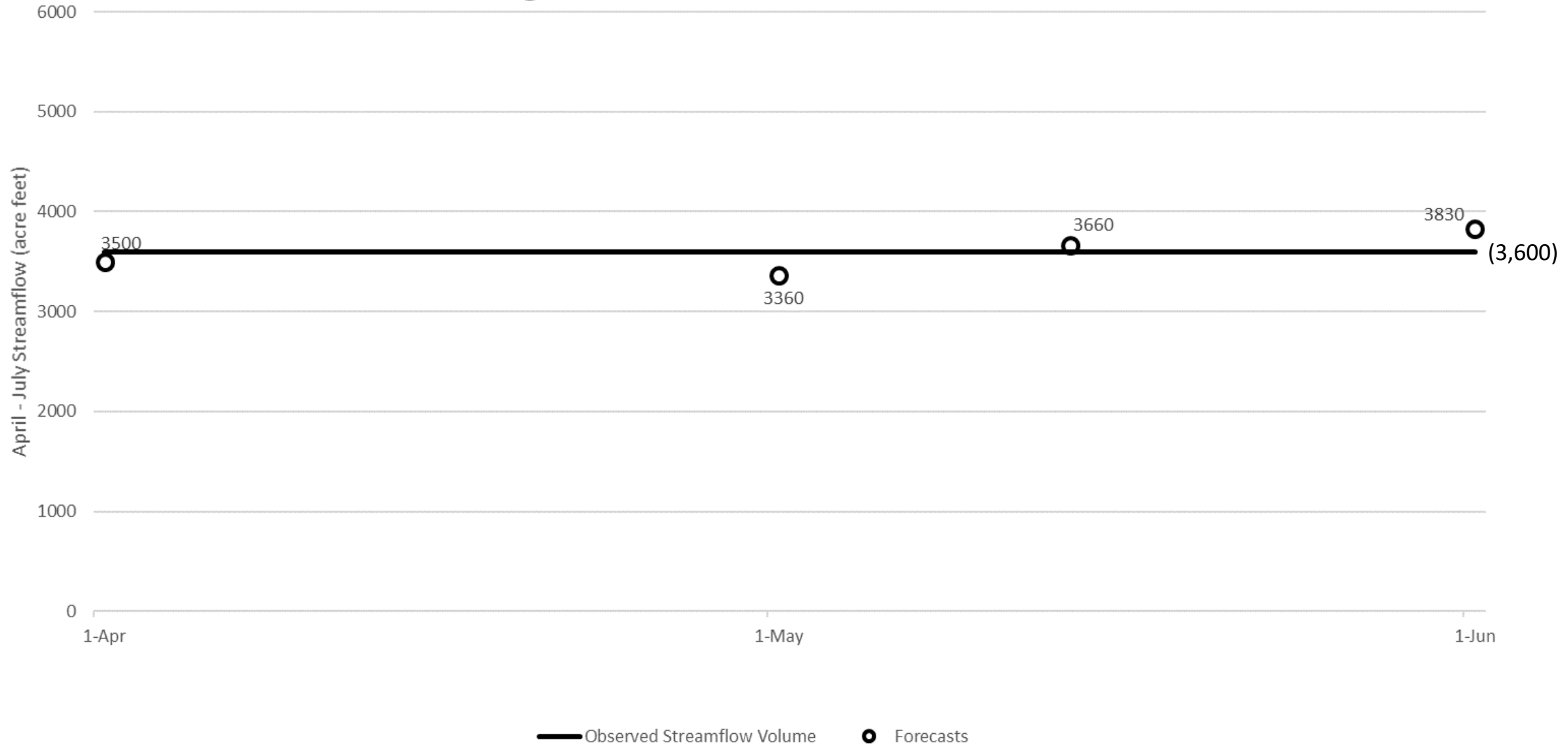
# South Crow Creek - Forecast Values vs. Observed Flows



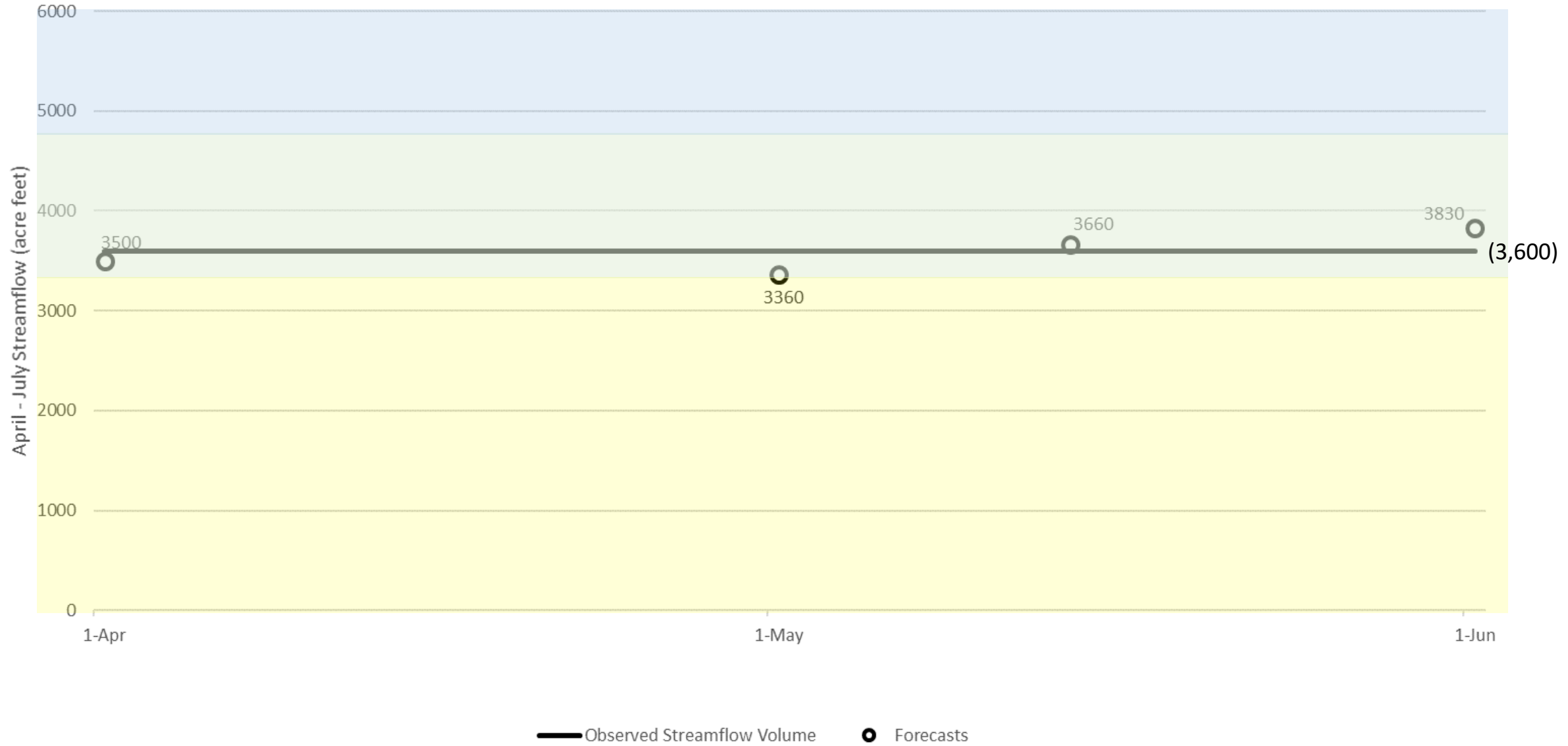
# South Crow Creek - Forecast Values vs. Observed Flows



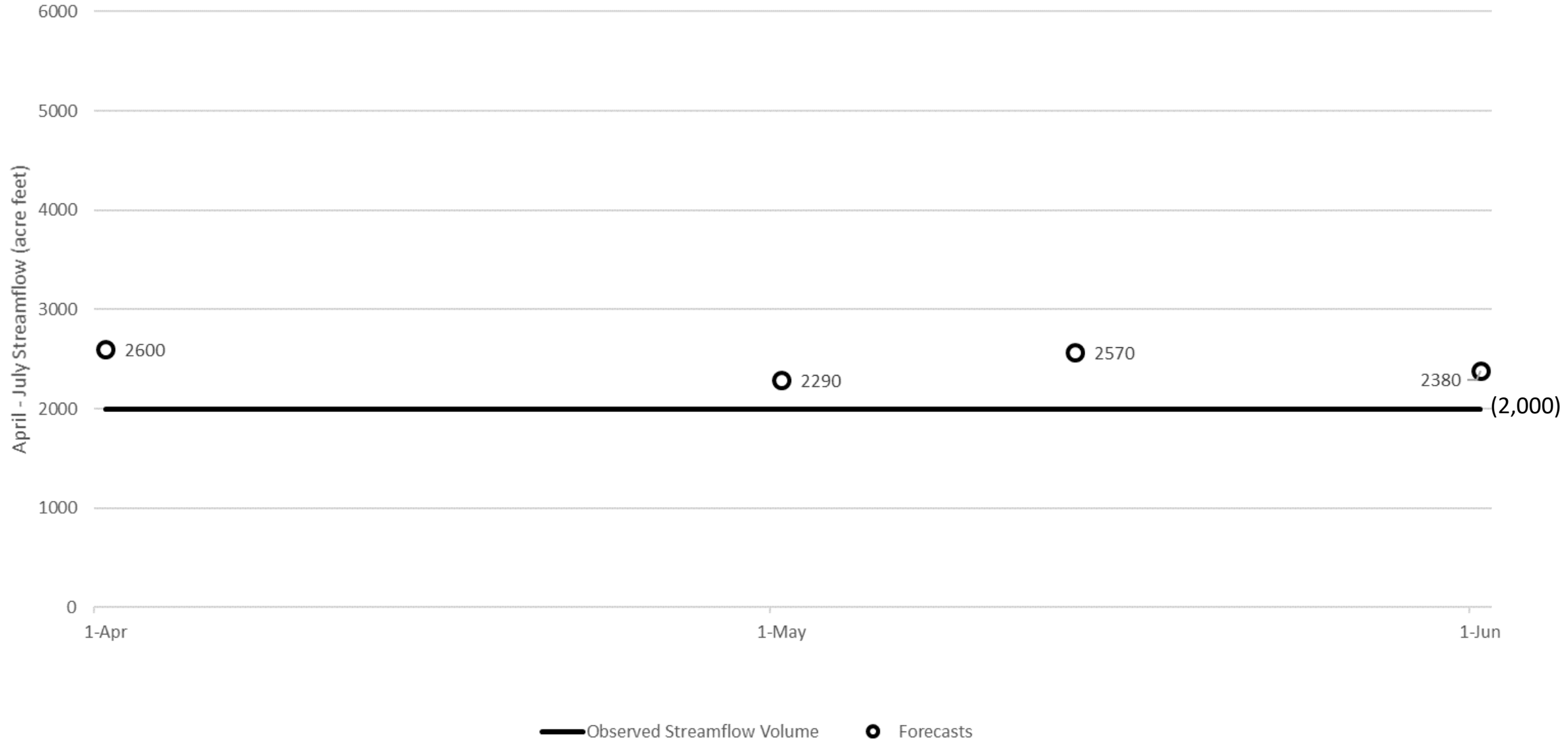
# Hellroaring - Forecast Values vs. Observed Flows



# Hellroaring - Forecast Values vs. Observed Flows

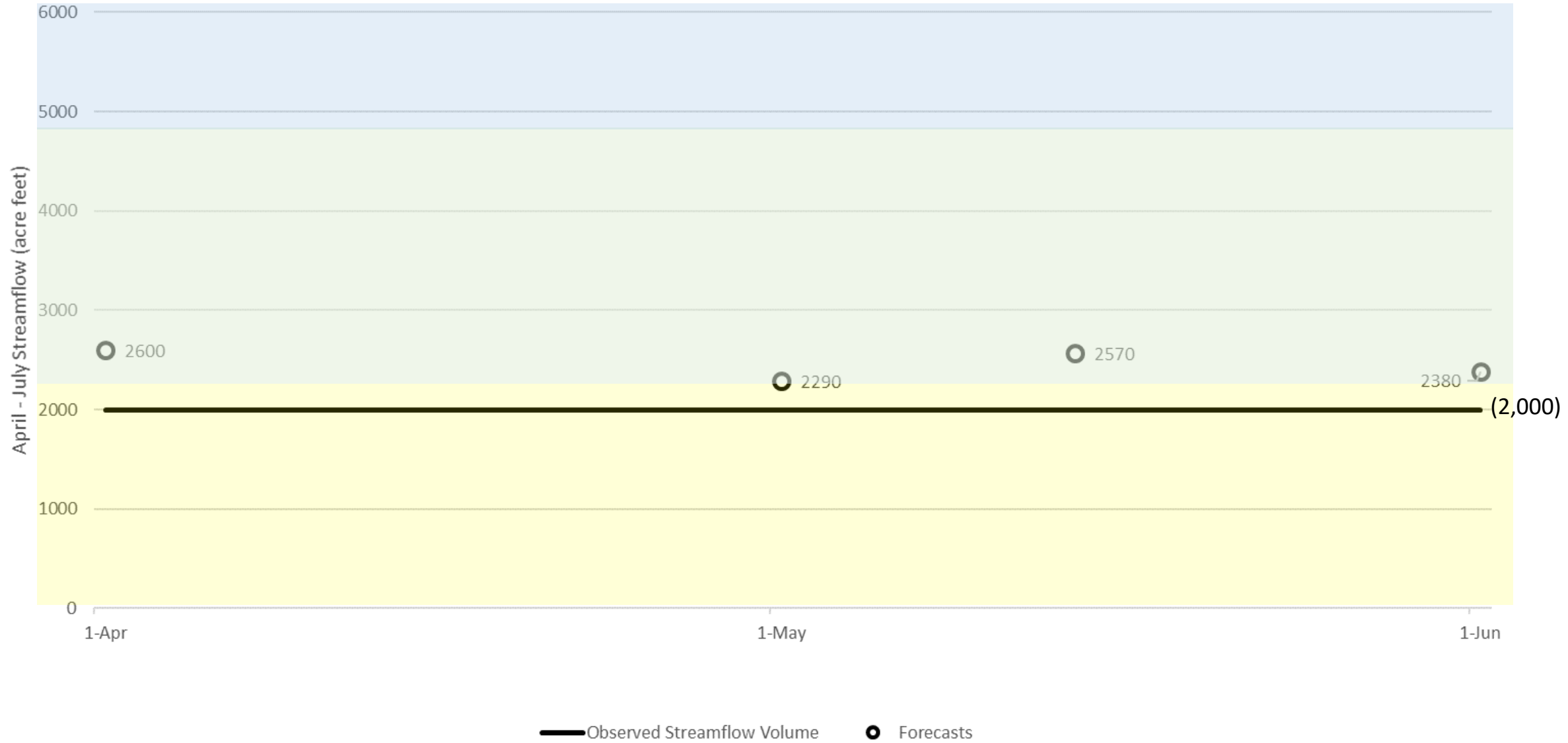


# Mill Creek ab. Bassoo Cr. - Forecast Values vs. Observed Flows

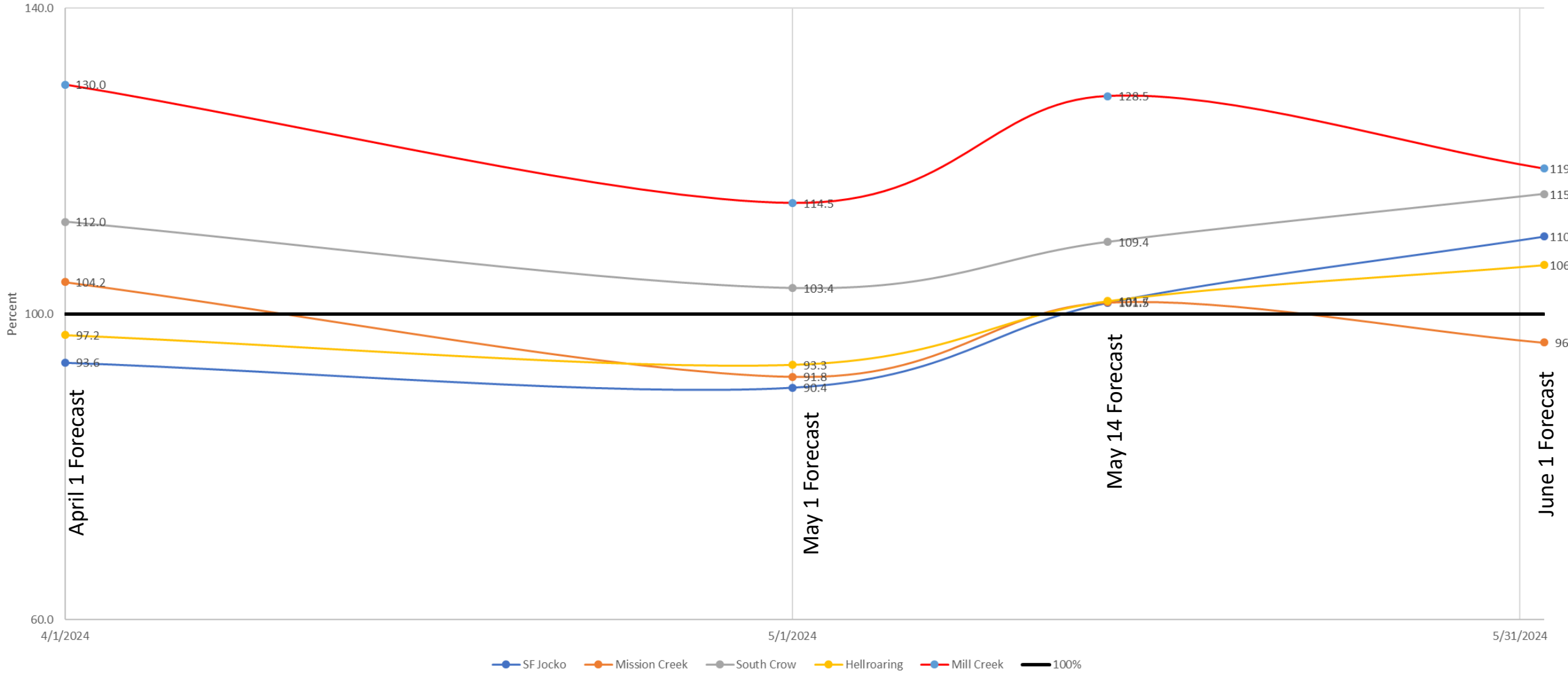




# Mill Creek ab. Bassoo Cr. - Forecast Values vs. Observed Flows



### Percent Forecasted/Observed (50% Exceedance Probability)



# 2024 Water Supply Review Summary (09/05/24)

DRAFT – Not Approved by CITT

- ° Forecasts generally performed well predicting streamflow volumes for Wet/Normal/Dry determinations.
  - ° The exception is Mill Creek which did not produce a “Normal Year” volume; however, CITT discretion established a “Dry Year” determination in that geographical area.
- ° This type of adaptive management approach served the CITT well as the team adjusted to local conditions.
- ° Ongoing Conversations with NRCS will refine and improve future forecasts, including a review of the Mill Creek forecast to determine why it was over-estimated at each step.
- ° The Hellroaring forecast, which was brand new for this year, proved to be very predictive of conditions.
  - ° Additional forecast development is ongoing for North Crow and Agency Creek.