



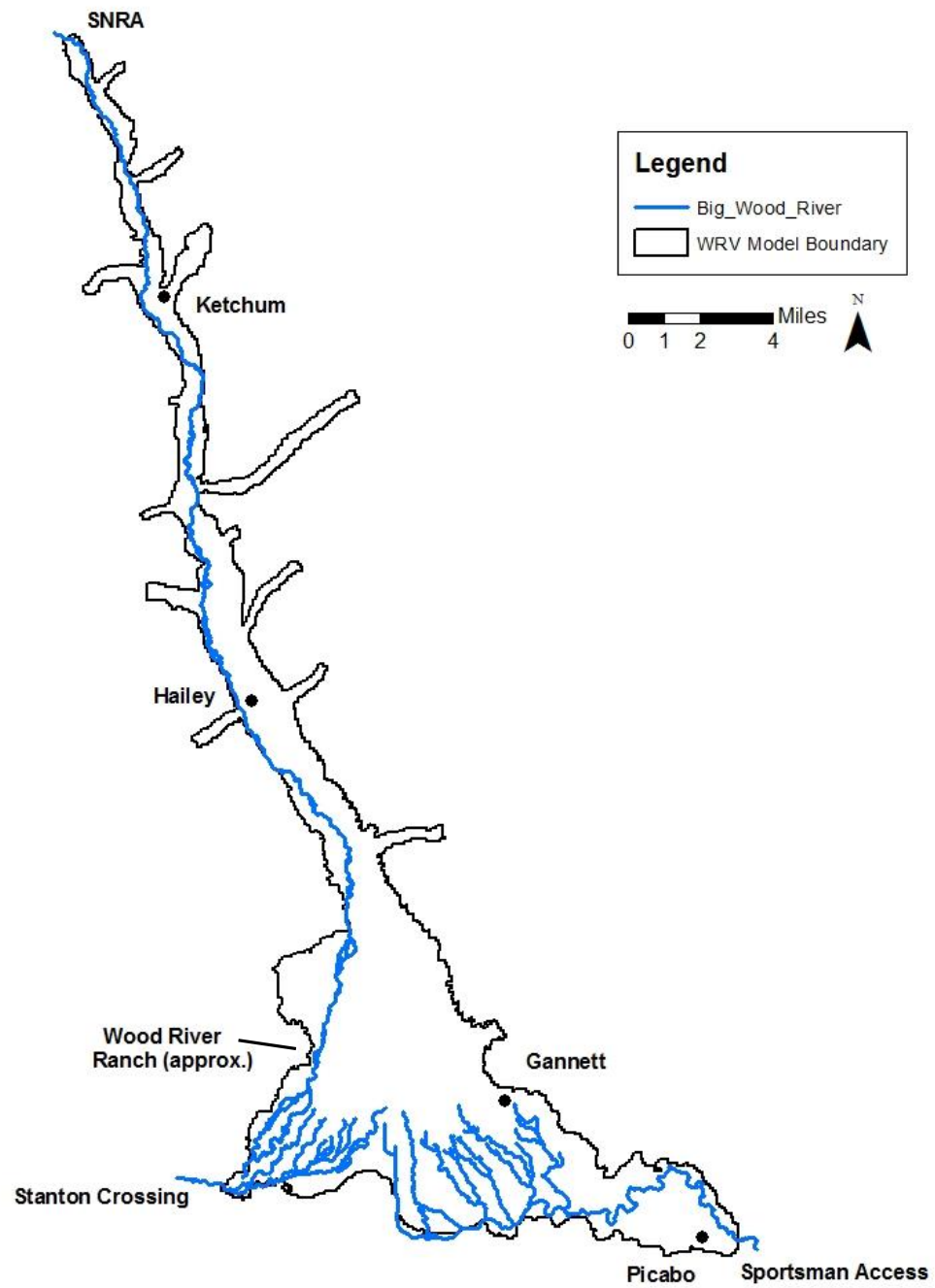
IDAHO
Water Resource Board



Wood River Recharge Potential

Presented by Mike McVay, P.E., P.G.

March 22, 2018



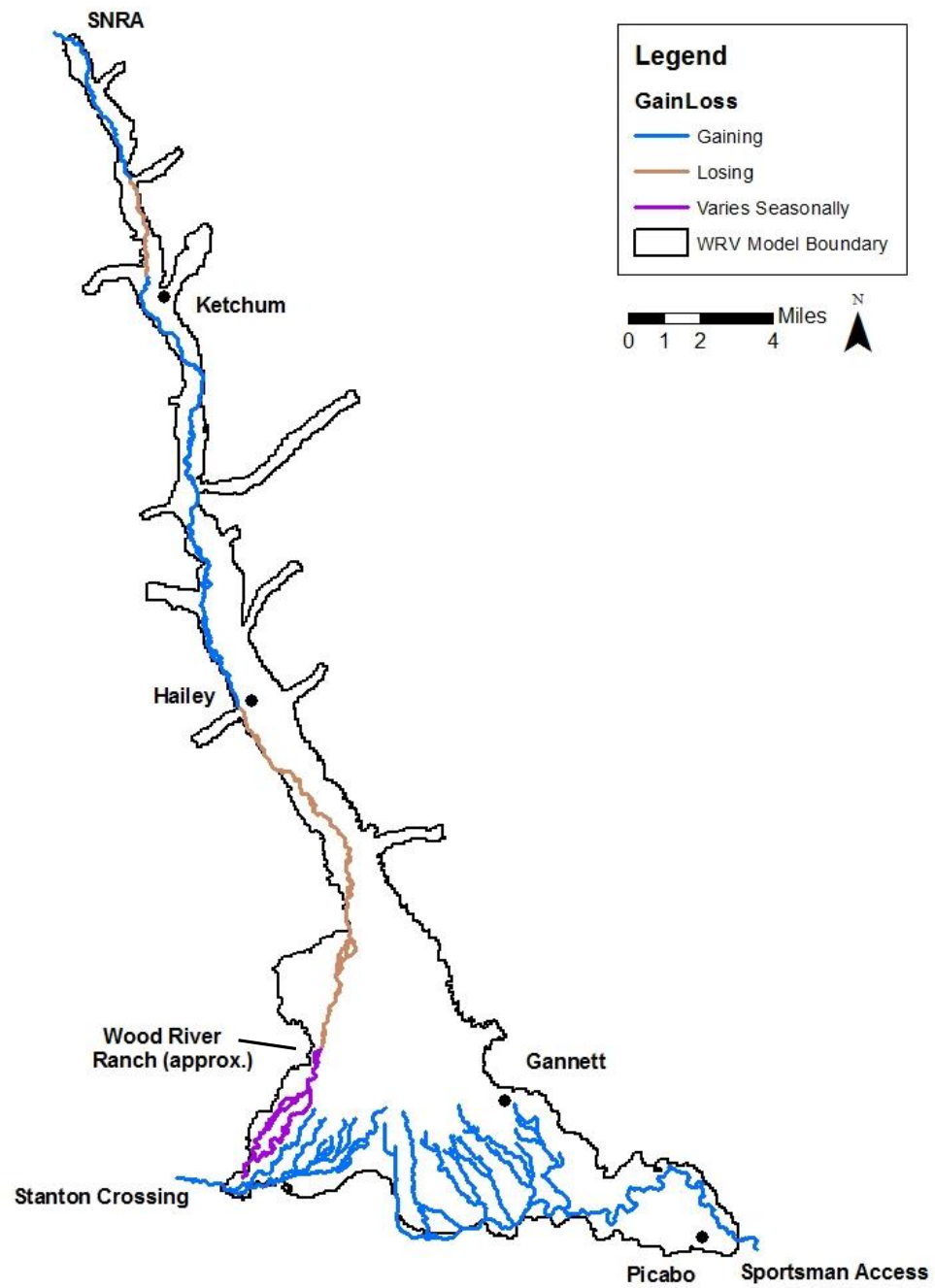
Wood River Valley Hydrogeology Primer

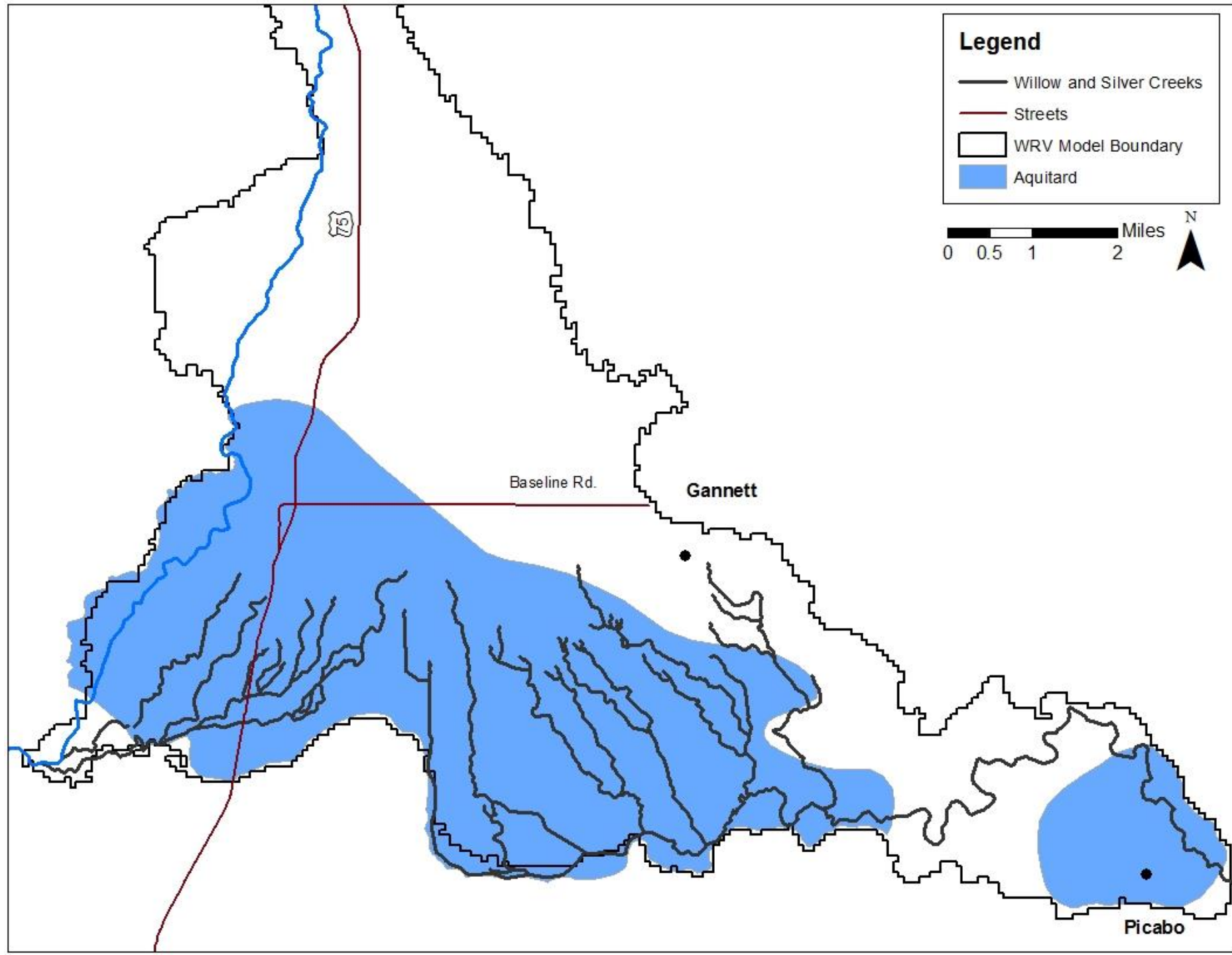
Aquifer

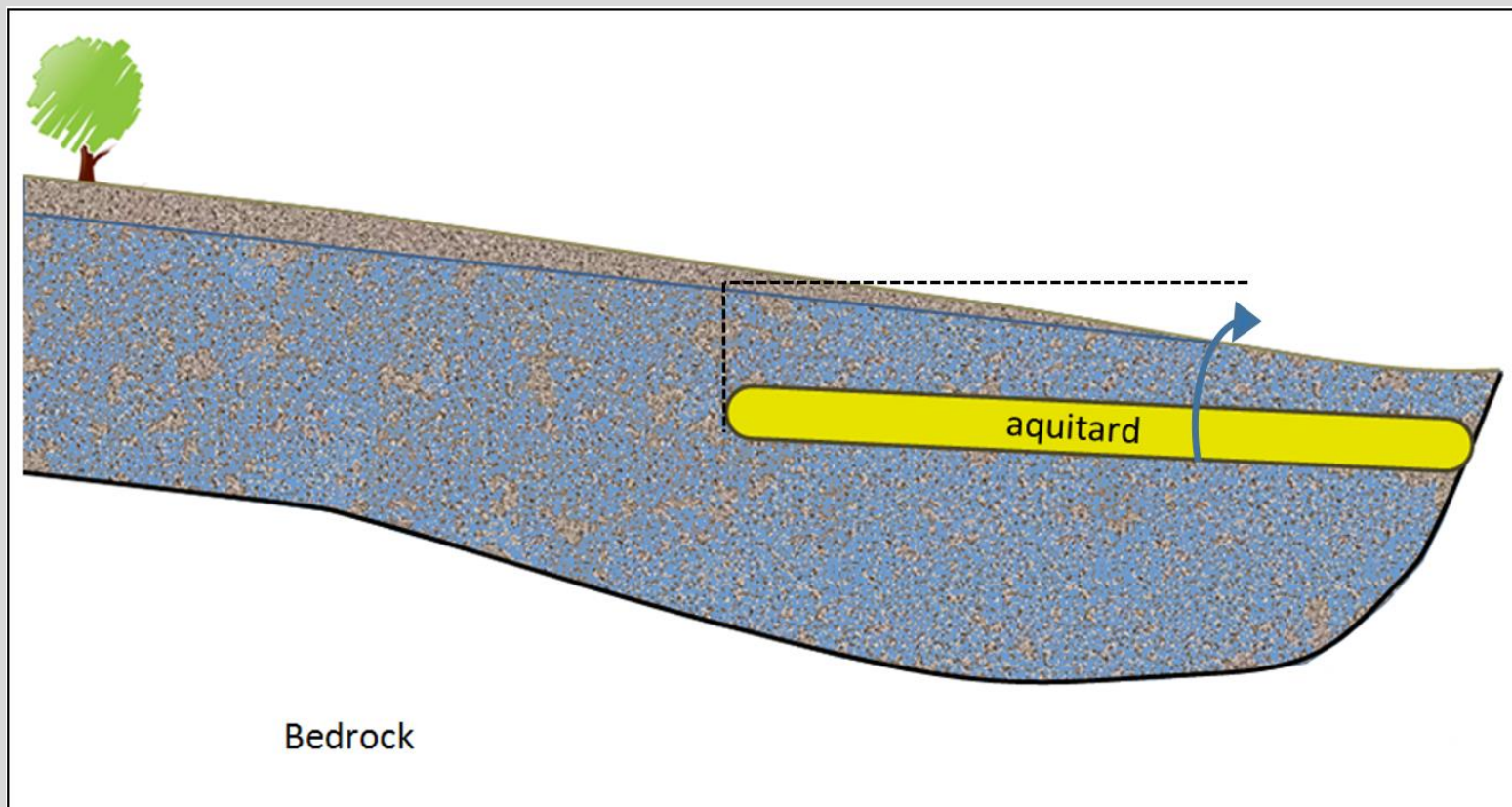
- Generally composed of coarse-grained sediments.
- Aquifer is generally unconfined.
- Confining layer (series of layers) in southern half of Bellevue Triangle composed of fine-grained material.
- Confined aquifer exists in the southern half of the Bellevue Triangle due to confining layer.

Groundwater-Surface Water

- Big Wood River generally gains water from the aquifer north of Hailey.
- Big Wood River loses water to the aquifer from Hailey to approx. Wood River Ranch.
- Groundwater discharges to Big Wood River, Willow Creek, and Silver Creek south of Baseline Road.
- Negligible underflow at Stanton Crossing. Silver Creek underflow \approx 6,000 AF/yr.







ESPA Comparison

- The ESPA is the flagship recharge project for the State.
- Most of our experience, and expectations have come from ESPA recharge efforts.

Legend

- ESPAM Model Area
- Wood River Model Area

Surface Area
59,900 acres

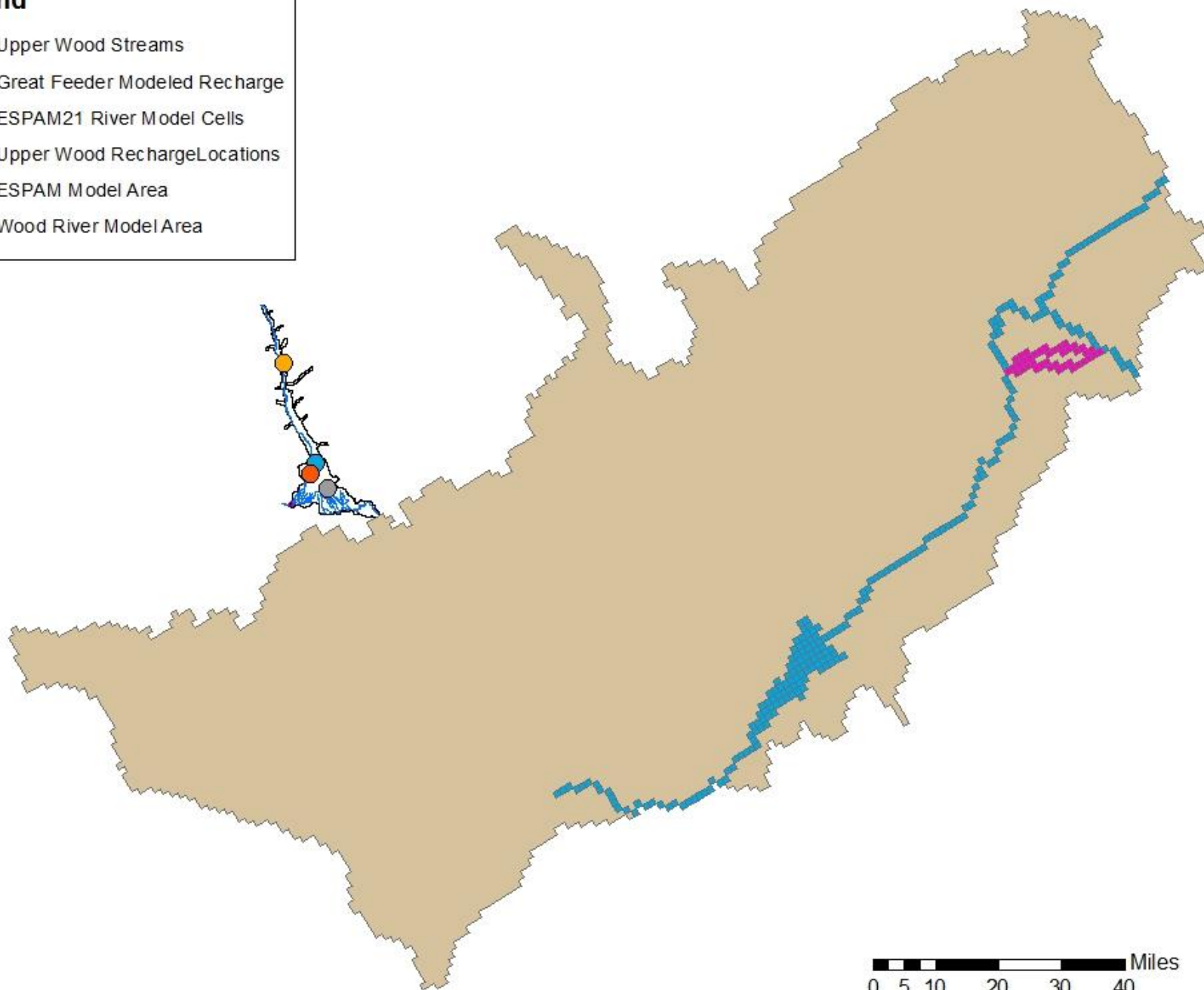
Surface Area
7,191,000 acres

0 5 10 20 30 40 Miles



Legend

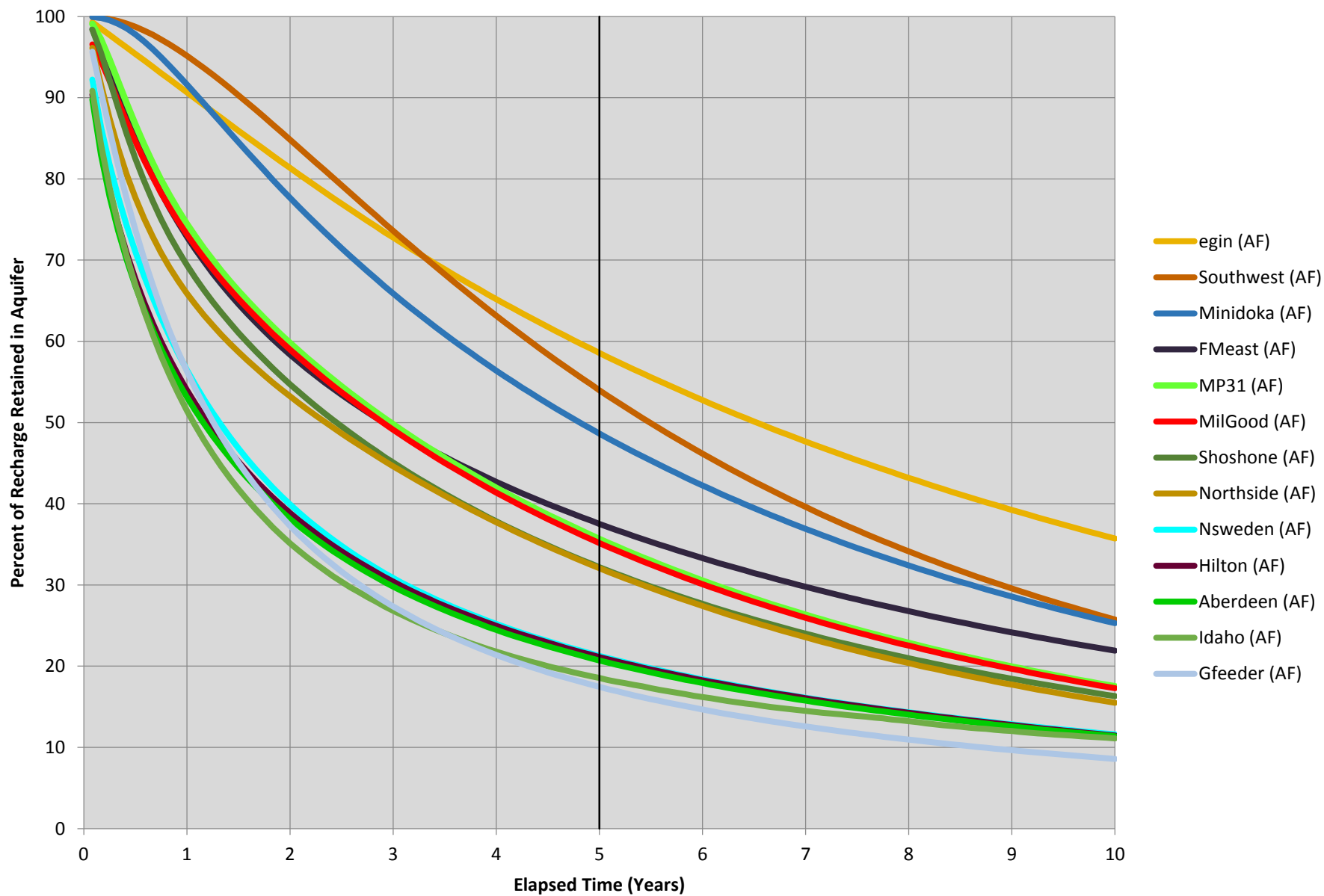
- Upper Wood Streams
- Great Feeder Modeled Recharge
- ESPAM21 River Model Cells
- Upper Wood RechargeLocations
- ESPAM Model Area
- Wood River Model Area



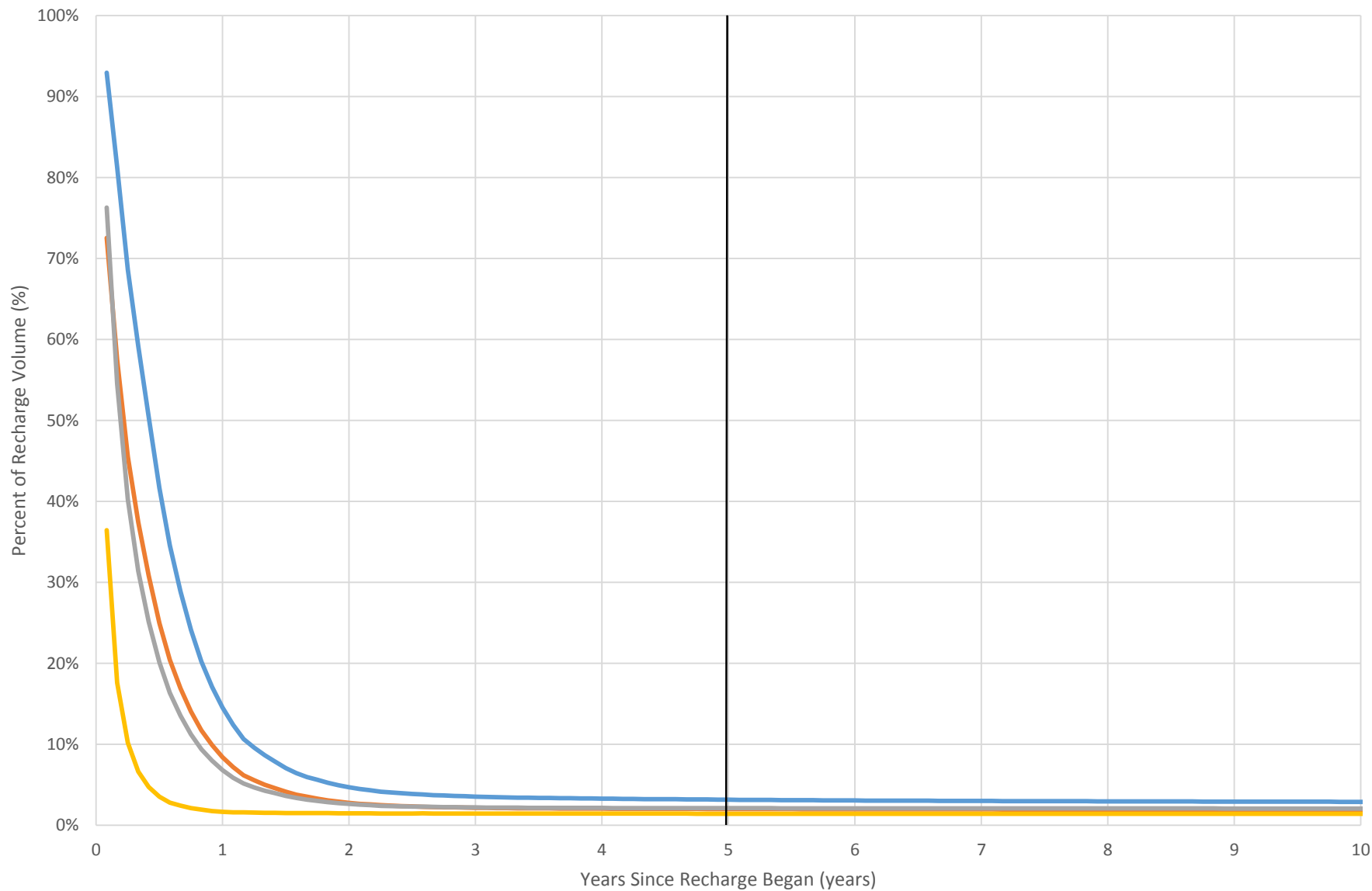
0 5 10 20 30 40 Miles



Retention of Recharged Water within the ESPA



Retention of Recharged Water within Big Wood Aquifer

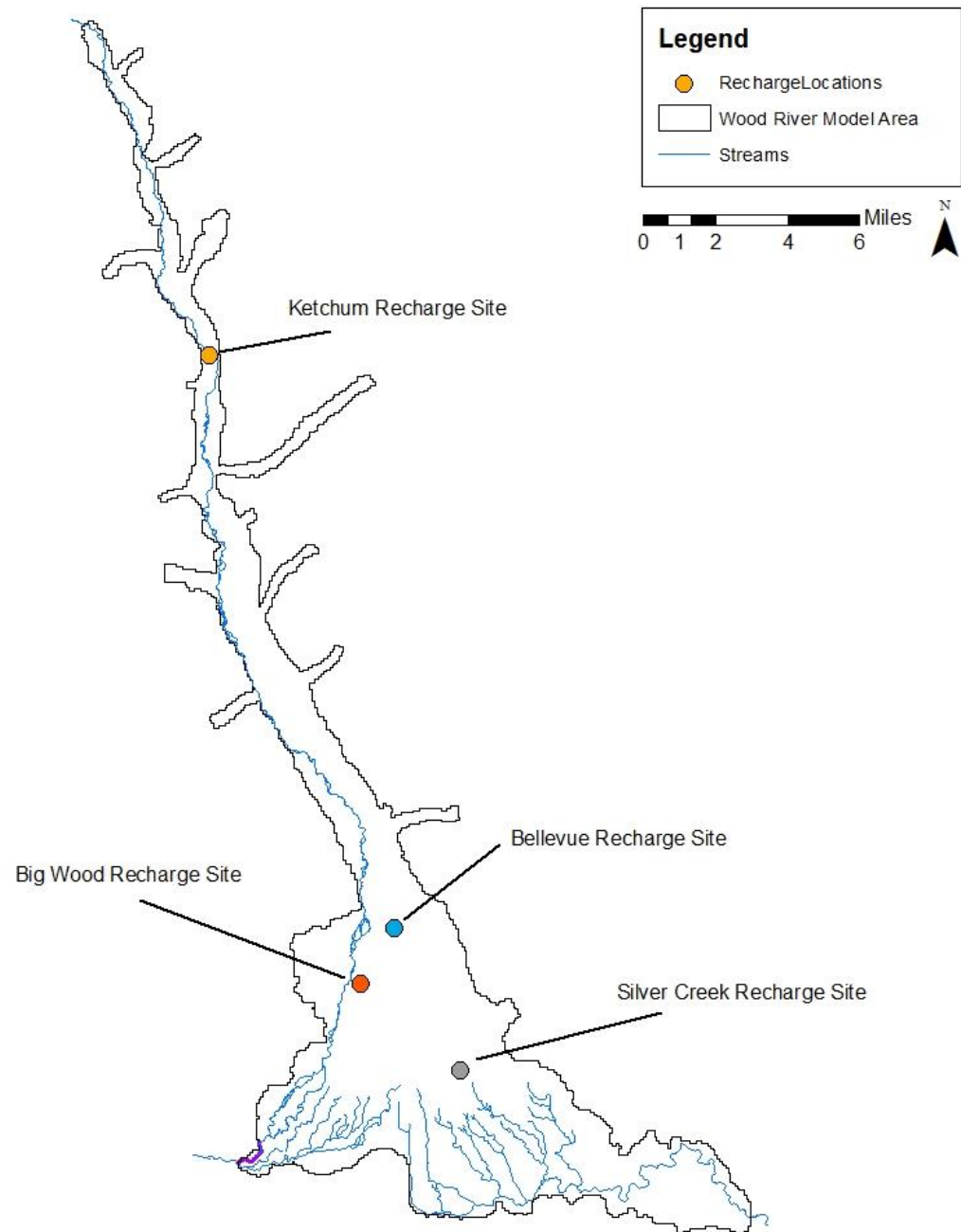


— Bellevue Recharge Site

— Big Wood Recharge Site

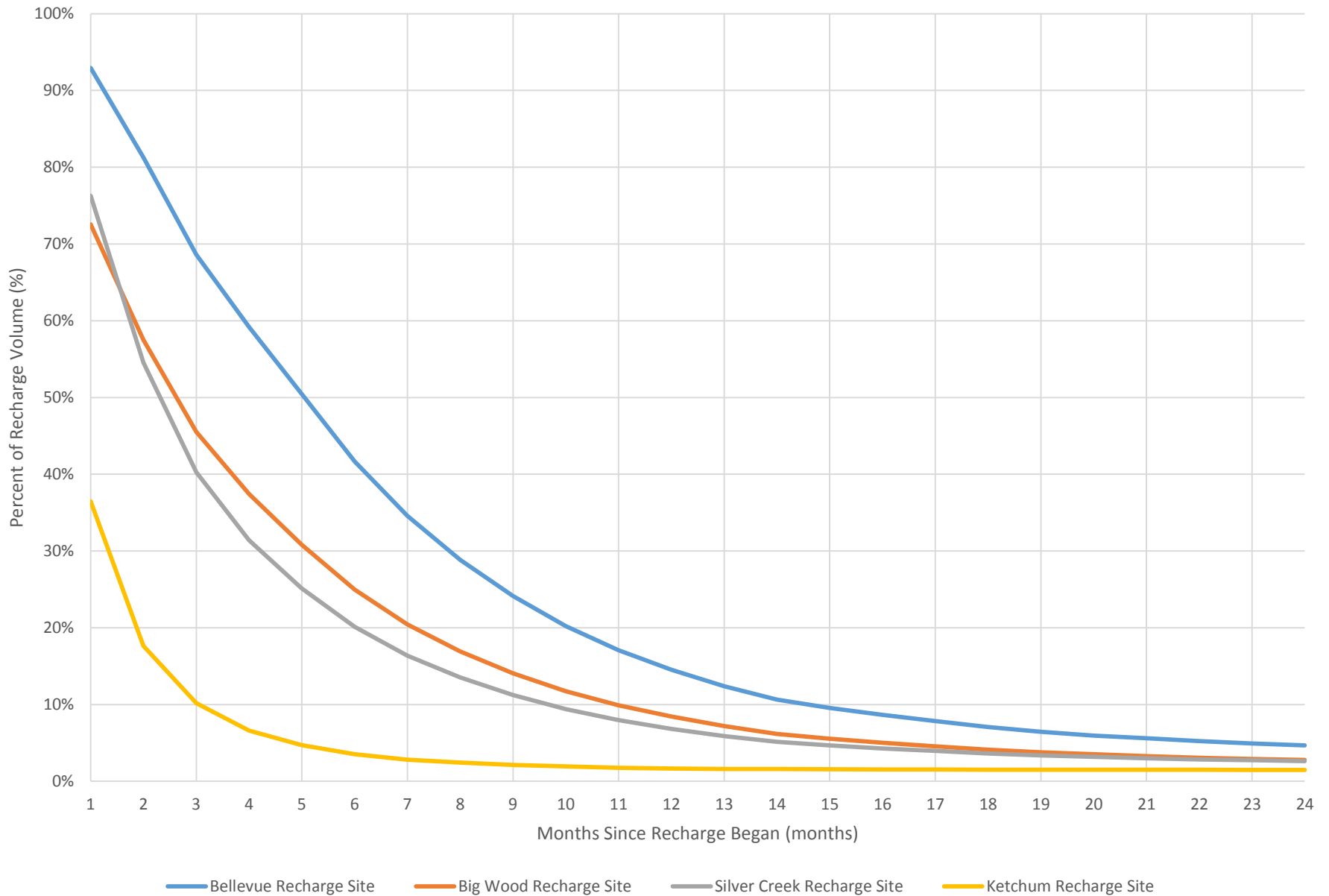
— Silver Creek Recharge Site

— Ketchum Recharge Site

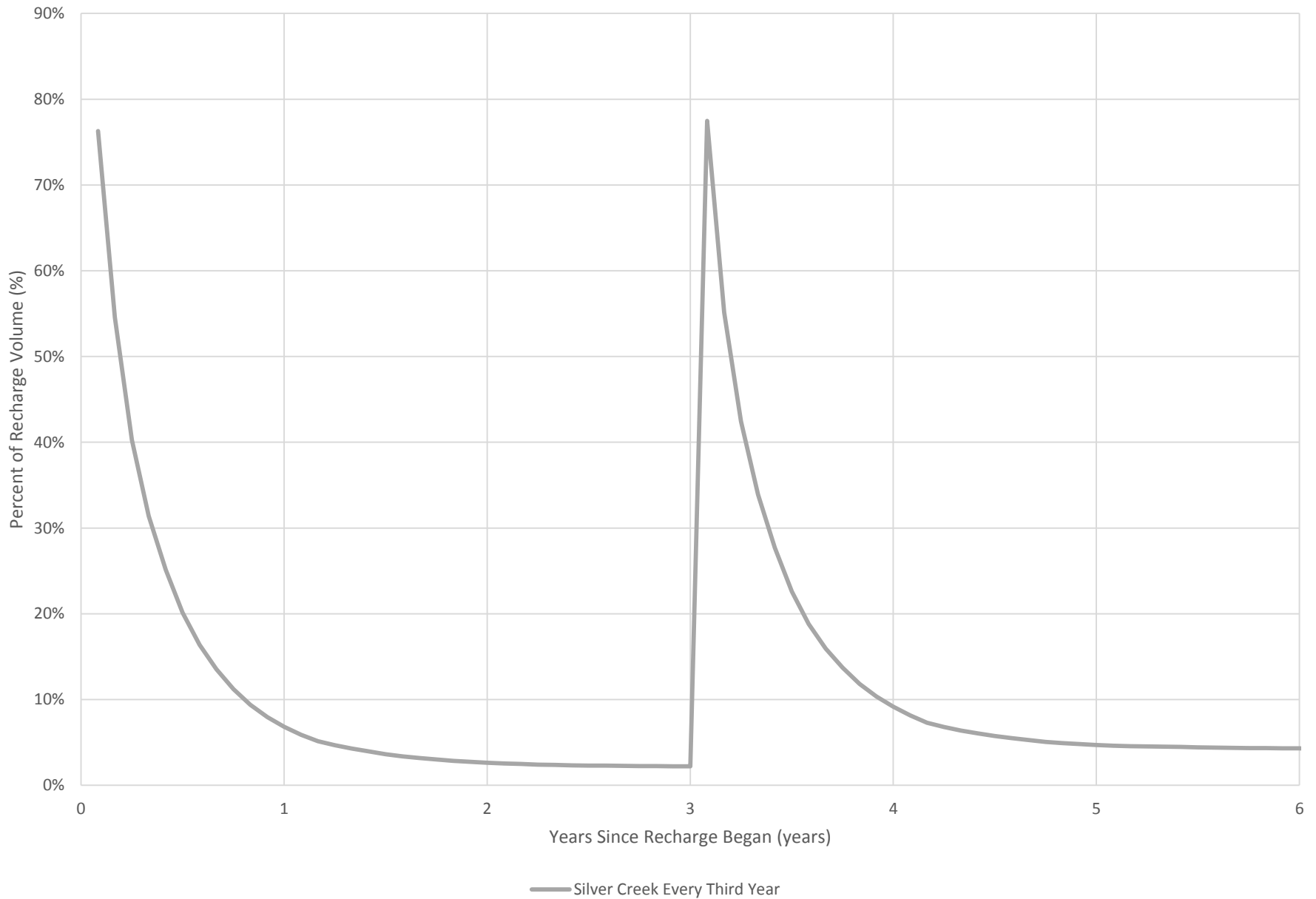


Aquifer Storage Impacts

Retention of Recharged Water within Big Wood Aquifer



Retention of Recharged Water within Big Wood Aquifer (Silver Creek Site)



Aquifer Storage Impacts due to Recharge

Recharge Benefits

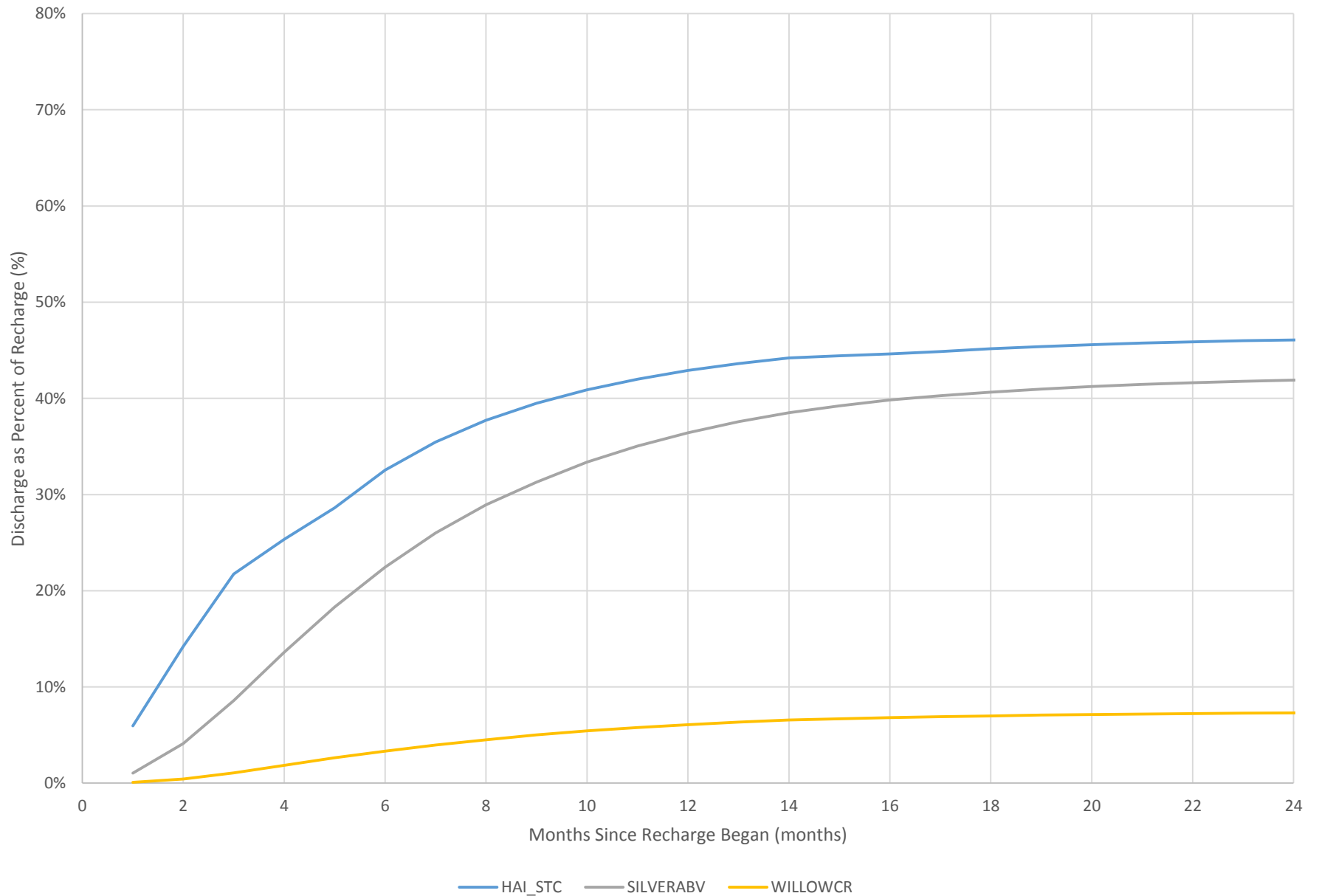
- Moderate percentage of recharge water remains in storage for a few months.
- Residence time may benefit users during the same season as recharge.
- Recharge may improve water quality.

Recharge Limitations

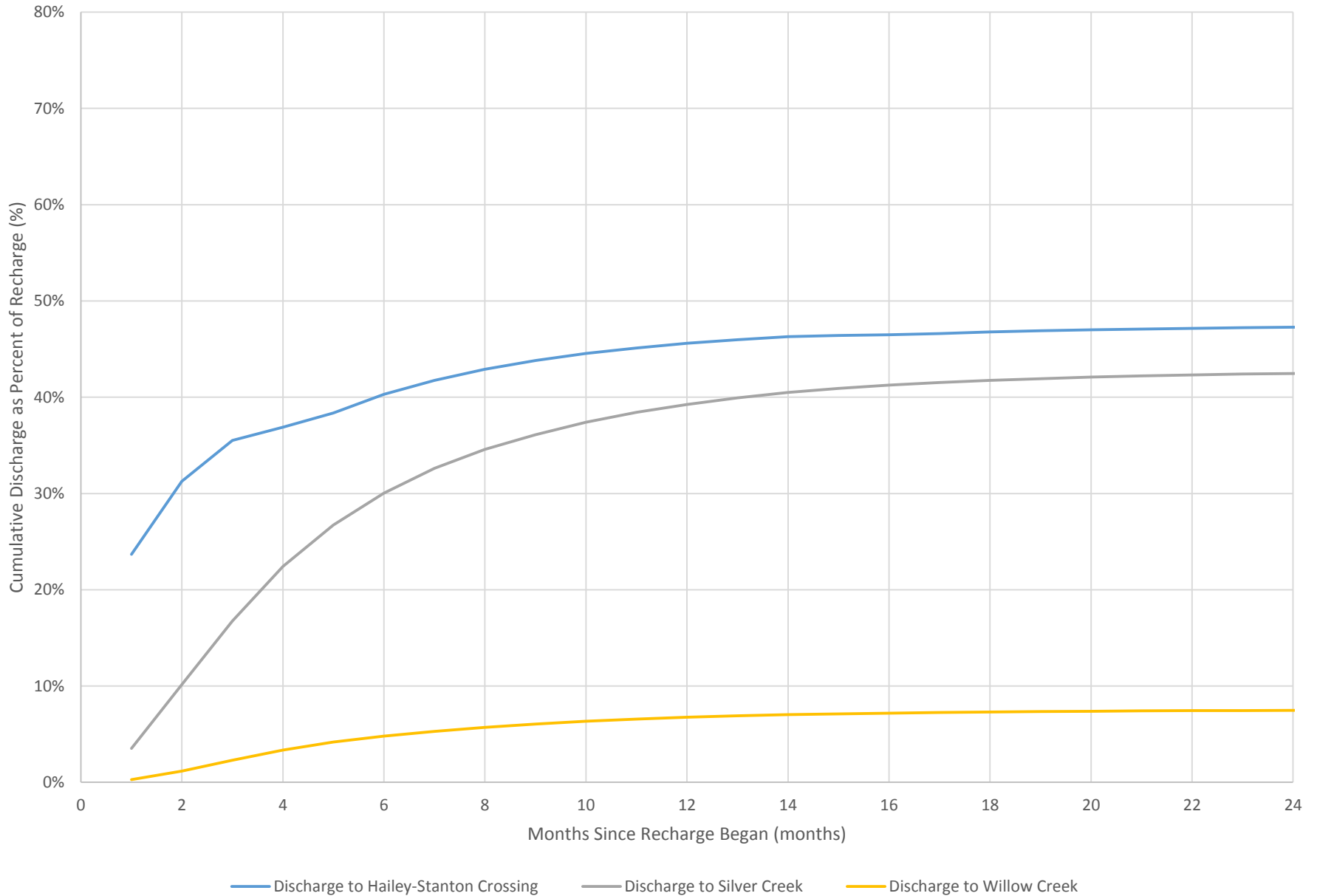
- Aquifer-enhancement benefits are dependent on new water (Magic is full, consumptive-use reduction).
- Recharge during wet years does not provide significant aquifer-enhancement benefits during subsequent dry years.

Surface Water Impacts

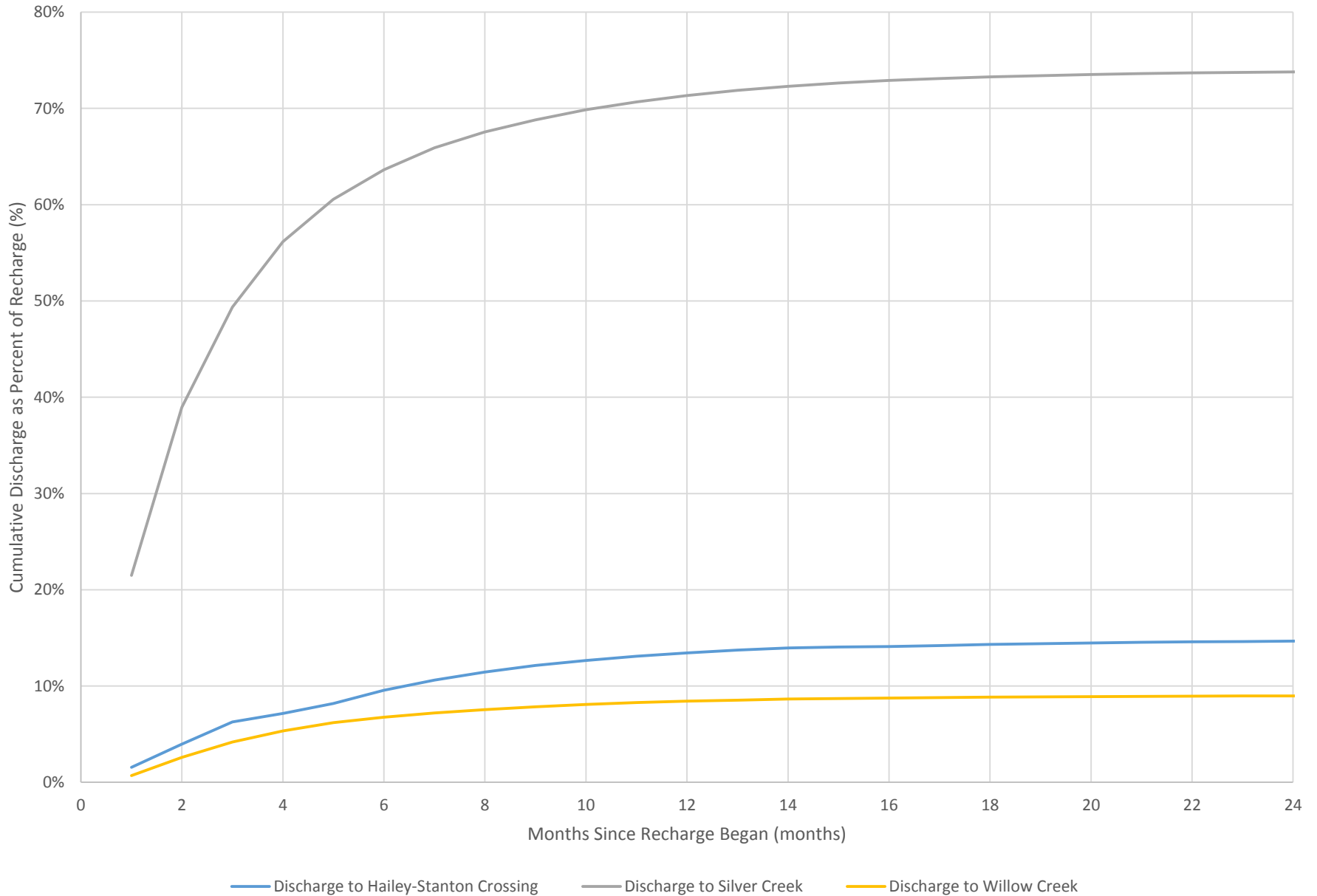
Discharge to Surface Water: Bellevue Recharge Site



Discharge to Surface Water: Big Wood Recharge Site



Discharge to Surface Water: Silver Creek Recharge Site

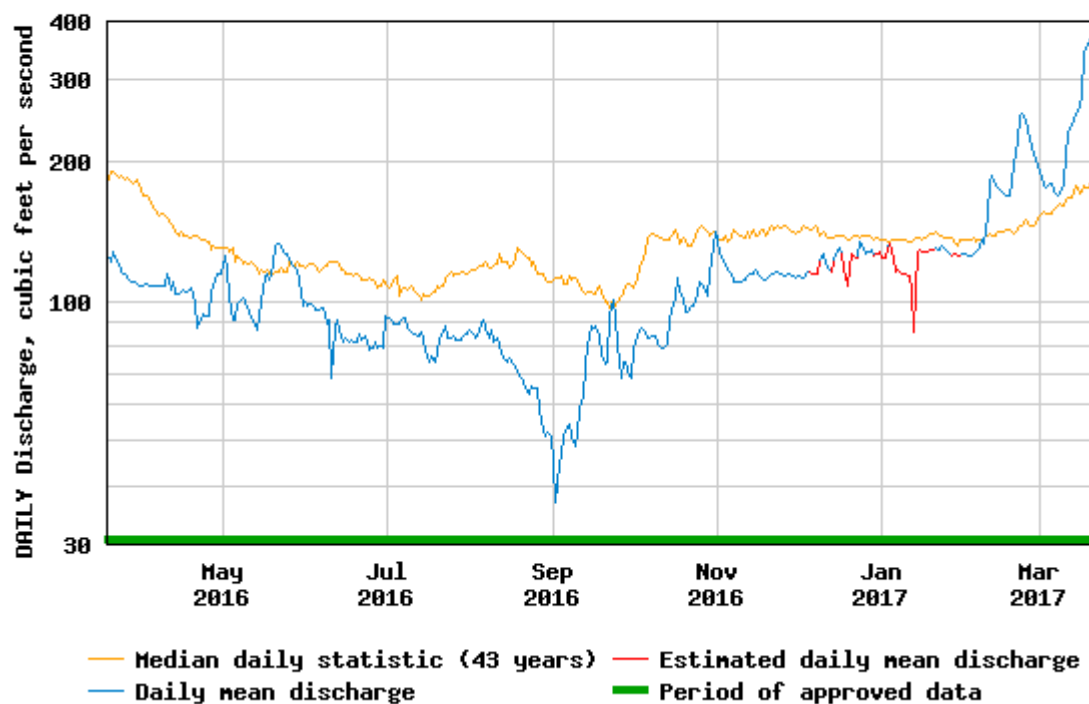


Impacts due to Recharge Location

- Moving recharge from the Big Wood site to the Silver Creek site moves approximately 30% of the recharge volume from Big Wood discharge to Silver Creek discharge.



USGS 13150430 SILVER CREEK AT SPORTSMAN ACCESS NR PICABO ID





USGS 13150430 SILVER CREEK AT SPORTSMAN ACCESS NR PICABO ID



— Median daily statistic (43 years) — Period of approved data
— Daily mean discharge — Period of provisional data

Surface Water Impacts due to Recharge

Recharge Benefits

- Recharge can be used to direct a percentage of the streamflow toward either the Sportsman's Access or Stanton Crossing basin discharge areas.
- Recharge with new water can increase surface water discharge out-of-basin during the same season as recharge.
- Changes in discharge location may benefit downstream users during the same season as recharge.
- Changes in discharge location may benefit upper basin users during the same season as recharge.

Recharge Limitations

- Increased total streamflow benefits are dependent on new water.
- Recharge during wet years does not enhance streamflow in subsequent dry years.
- Changes in discharge location may harm downstream or upper basin users during the same season as recharge.
 - May impact ESPA recharge.
- Increased streamflow to the ESPA may result in more consumptive use.

Summary of Wood River Recharge Potential

- This is a small aquifer.
- Aquifer retention lasts for a few months.
- Benefits occur during the same season as recharge.
- Recharge during wet years does not provide aquifer-enhancement benefits during subsequent dry years.
- Recharge can be used to steer some discharge between Silver Creek and Willow Creek/Big Wood River.
- Aquifer stabilization and benefits to downstream users are dependent on new water.
- Recharge may result in more consumptive use on the ESPA.

Questions?

Average Monthly Silver Creek at Sportsman Access (cfs)

