

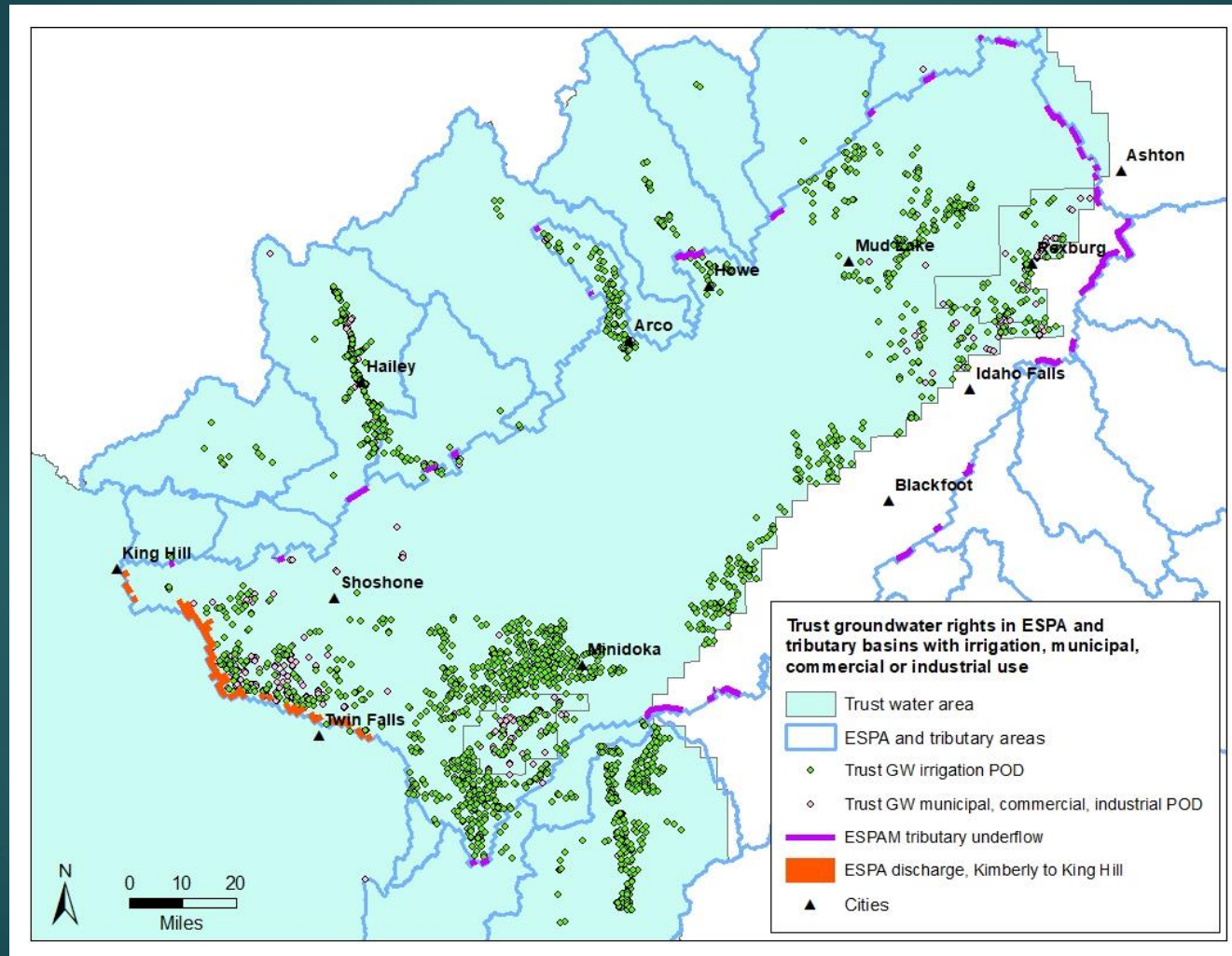


Swan Falls Implementation Group questions 2 through 4

Evaluation of trust water use impact on
Snake River below Milner Dam

Presented to the Swan Falls Implementation Group
November 15, 2022

Q2. Analyze impacts of ESPA groundwater trust water rights to the Snake River below the Milner Dam



Q2. Assumptions

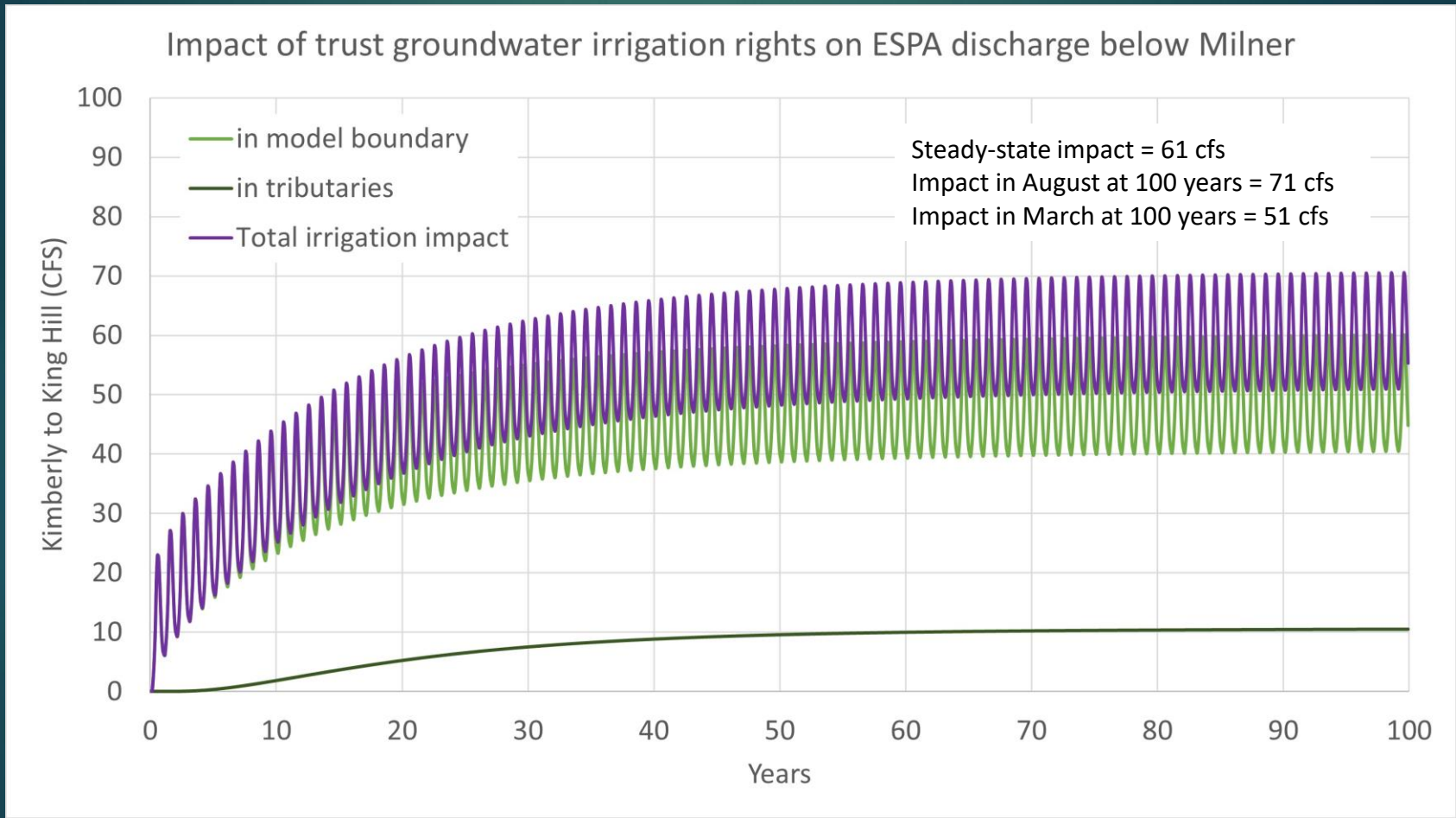
- ▶ Water uses other than irrigation, municipal, commercial and industrial were assumed to have minimal consumptive use and were excluded
- ▶ Water rights flagged as non-consumptive or mitigated were excluded
- ▶ Irrigation water rights were assumed to irrigate one acre per 0.02 cfs and consumptive use was assumed to equal the monthly crop irrigation requirement
 - ▶ in ESPAM boundary – 10-year average monthly CIR from ESPAM2.2 (WY 2009 – WY 2018)
 - ▶ in ESPA tributaries – average monthly precipitation deficit from ET_{Idaho} (usually 30-year average) for peak alfalfa
- ▶ Water right diversion limits were assumed for commercial, municipal, and industrial water rights (maximum authorized diversion rate → likely overestimate of impact)
- ▶ ESPAM2.2 groundwater flow model used to predict volume and timing of impact to Snake River below Milner

Q2. Trust groundwater rights in ESPA and tributaries

Water use	Aggregate diversion rate limit in ESPA	Aggregate diversion rate limit in ESPA tributaries
Irrigation	980 cfs	216 cfs
Commercial	27 cfs	1 cfs
Municipal	58 cfs	19 cfs
Industrial	6 cfs	0 cfs

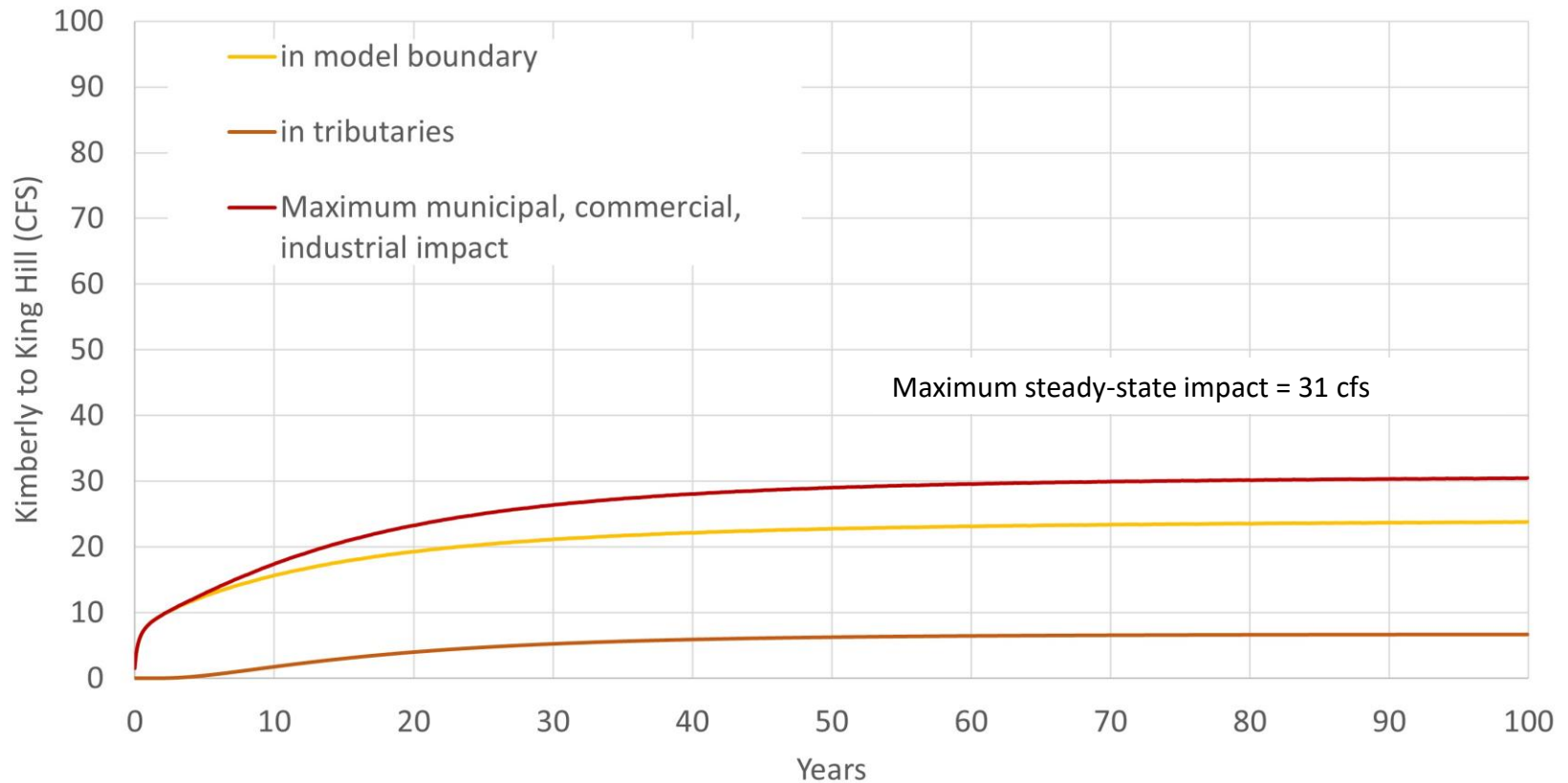
- Modeled irrigation consumptive use in ESPA ~120,000 AF/yr for ~49,000 acres
- Modeled irrigation consumptive use in ESPA tributaries ~34,000 AF/yr for ~11,000 acres
- Modeled CMI consumptive use in ESPA ~46,000 AF/yr
- Modeled CMI consumptive use in ESPA tributaries ~11,000 AF/yr

Q2. ESPAM2.2 modeled impact of irrigation use on Snake River below Milner Dam



Q2. ESPAM2.2 modeled impact of MCI use on Snake River below Milner Dam

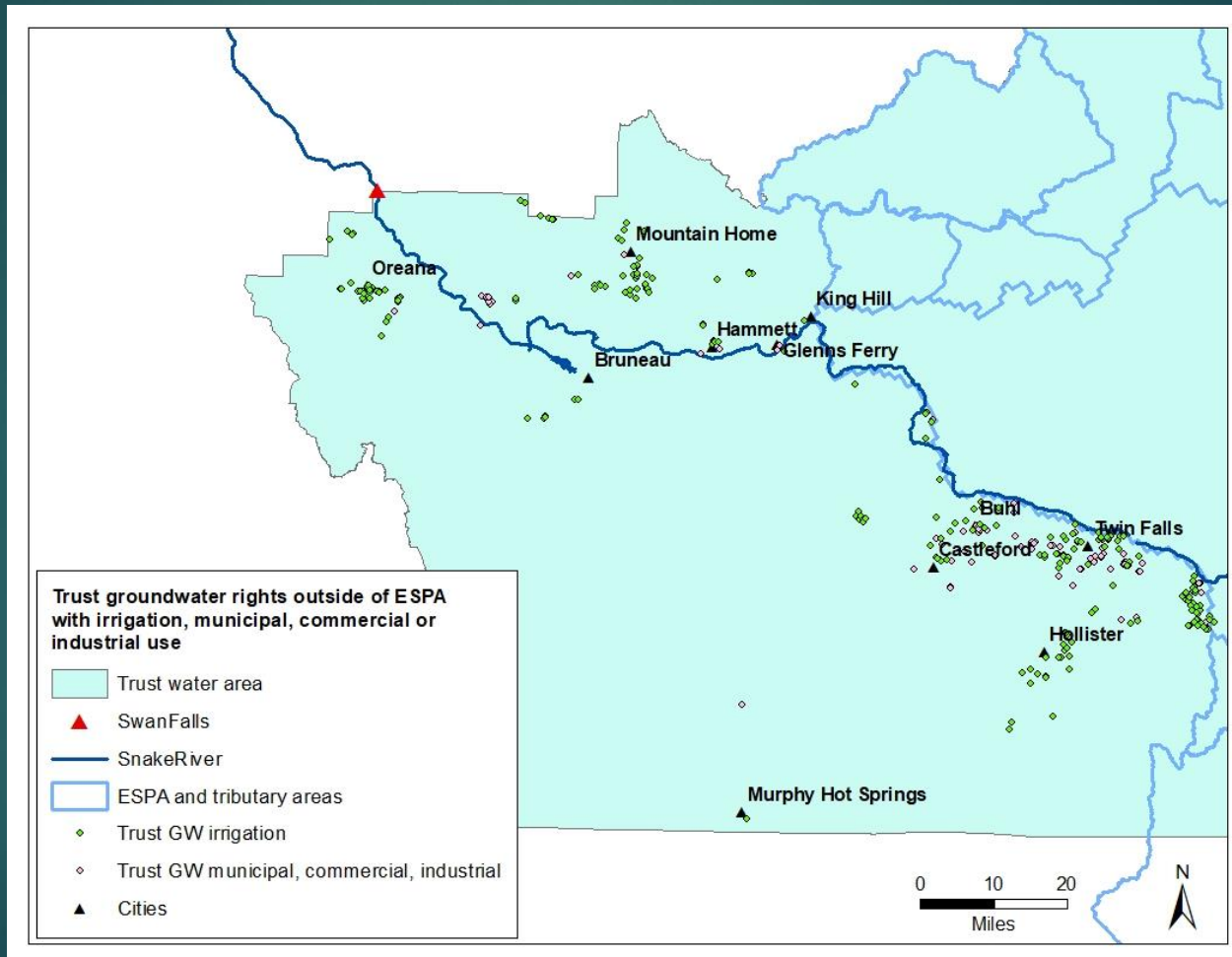
Impact of trust groundwater MCI rights on ESPA discharge below Milner



Q2. Conclusions

- ▶ Estimated long-term impact of trust groundwater rights on ESPA discharge to Snake River below Milner
 - ▶ average annual impact, 61 to 92 cfs
 - ▶ 51 to 82 cfs in March
 - ▶ 71 to 102 cfs in August
 - ▶ Ranges reflect a lack of information on the consumptive use associated with the CMI water rights
 - ▶ ESPAM2.2 model predictive uncertainty is approximately 2-4 cfs for the estimates listed above
- ▶ Approximately 80% of the impacts of trust water use are realized within 25 years and approximately 88% of the impacts are realized within 35 years

Q3. Analyze impacts of groundwater trust water rights not located on the ESPA to the Snake River below the Milner Dam



Q3. Assumptions

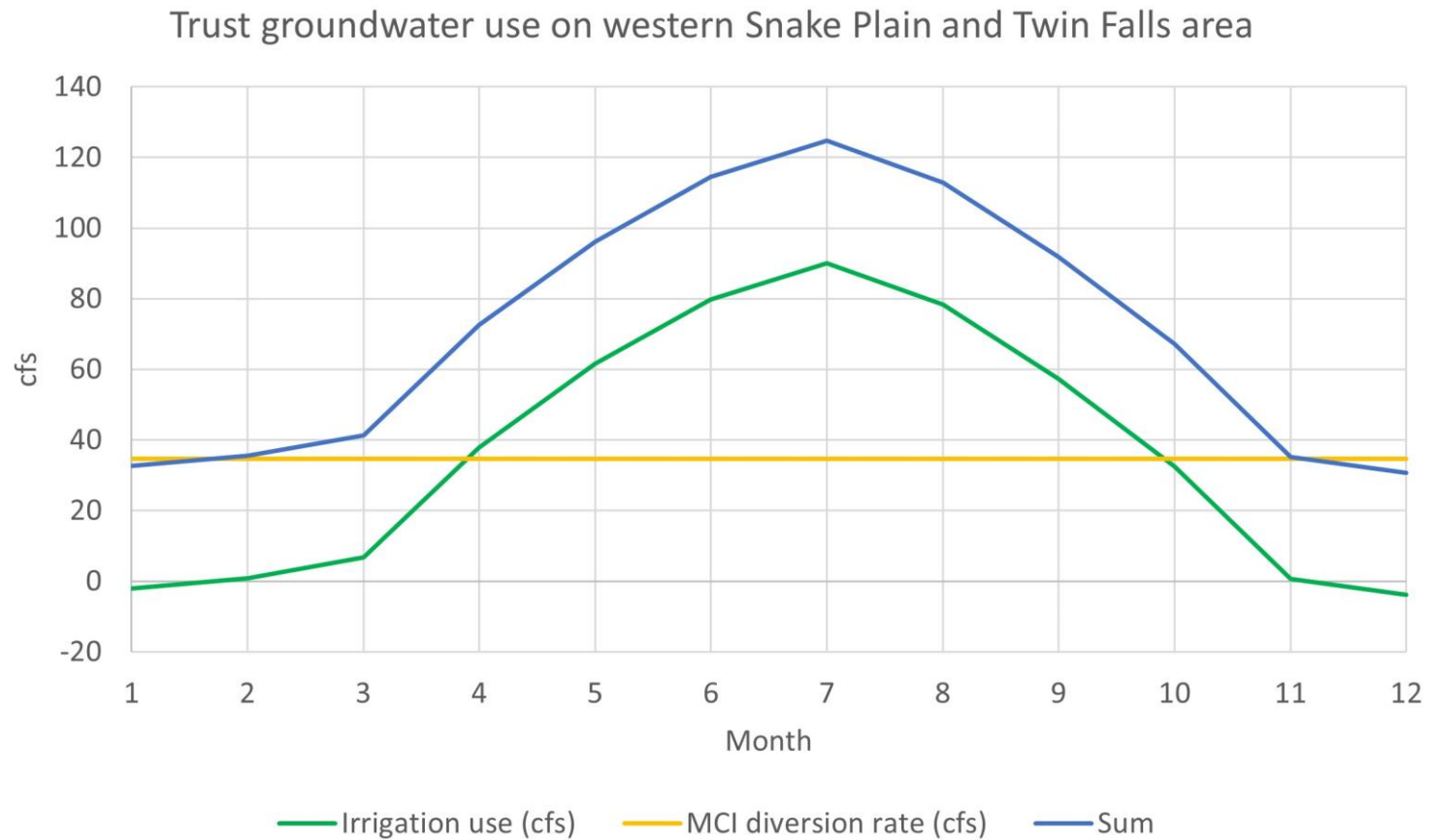
- ▶ Water uses other than irrigation, municipal, commercial and industrial were assumed to have minimal consumptive use and were excluded
- ▶ Water rights flagged as non-consumptive or mitigated were excluded
- ▶ Irrigation water rights were assumed to irrigate one acre per 0.02 cfs and consumptive use was assumed to equal the monthly crop irrigation requirement
 - ▶ average monthly precipitation deficit from ET_{Idaho} (usually 30-year average) for peak alfalfa
- ▶ Paper diversion limits were assumed for municipal, commercial, and industrial water rights (maximum authorized diversion rate → likely overestimate of impact)
- ▶ Long-term volume of impact on Snake River below Milner is assumed to be equal to volume of consumptive use
- ▶ Timing of impact has not been evaluated

Q3. Trust groundwater rights outside of ESPA

Water use	Aggregate diversion rate limit
Irrigation	134 cfs
Commercial	6 cfs
Municipal	33 cfs
Industrial	2 cfs

- Estimated irrigation consumptive use based on peak alfalfa ~27,000 AF/yr for ~7,000 acres
- Maximum CMI consumptive use ~25,000 AF/yr

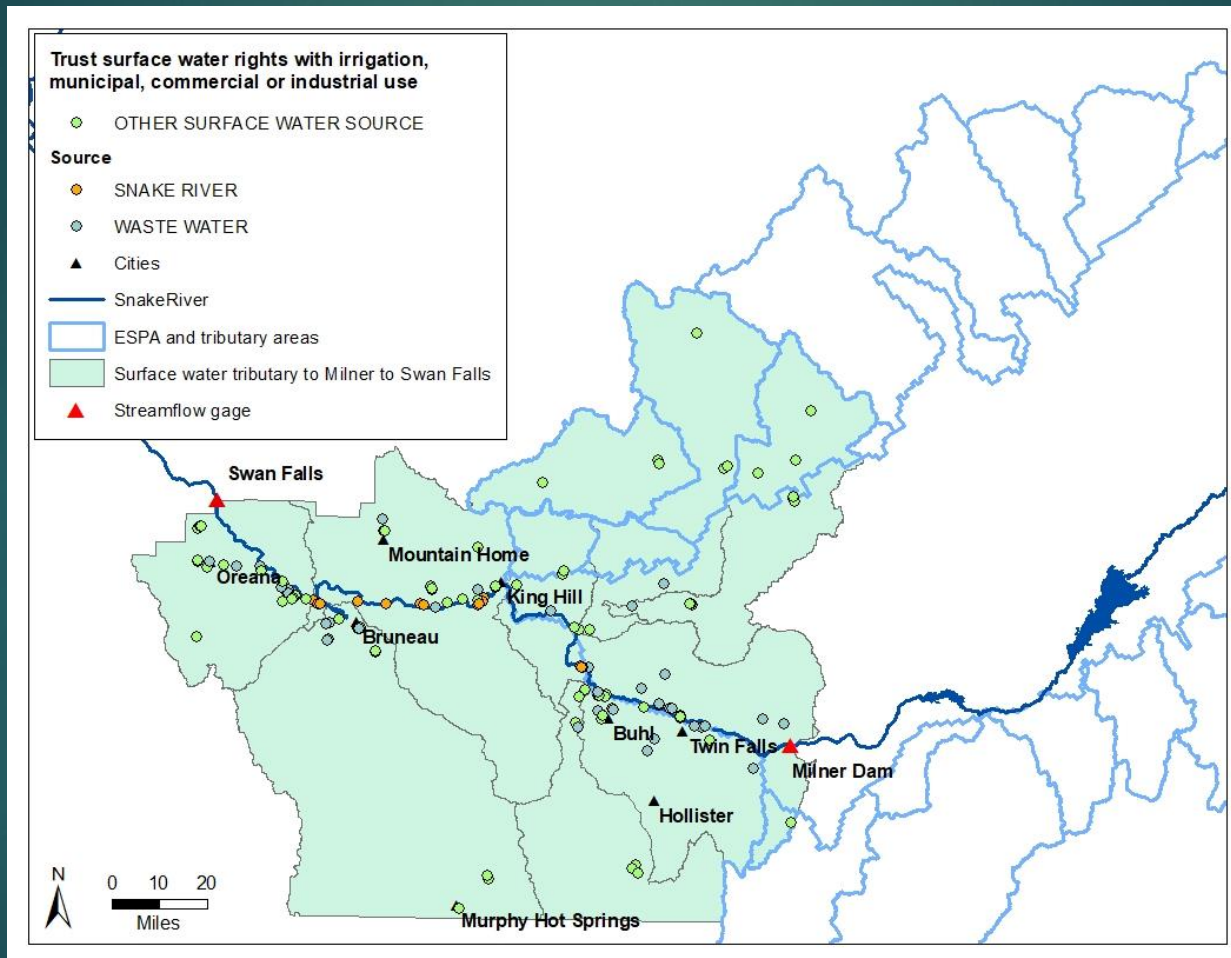
Q3. Trust groundwater use outside of ESPA



Q3. Impact of trust groundwater use outside of ESPA

- ▶ Estimated long-term impact of trust groundwater rights outside of ESPA on discharge to Snake River below Milner
 - ▶ Annual average impact, 37 to 72 cfs
 - ▶ Peak summer impact, 90 to 125 cfs, likely attenuated by response time
 - ▶ Timing of Snake River response to groundwater pumping not evaluated
 - ▶ Ranges reflect a lack of information on consumptive use associated with CMI uses and the timing of impacts from irrigation use

Q4. Analyze impacts of surface water trust water right diversions to the Snake River below the Milner Dam



Q4. Assumptions

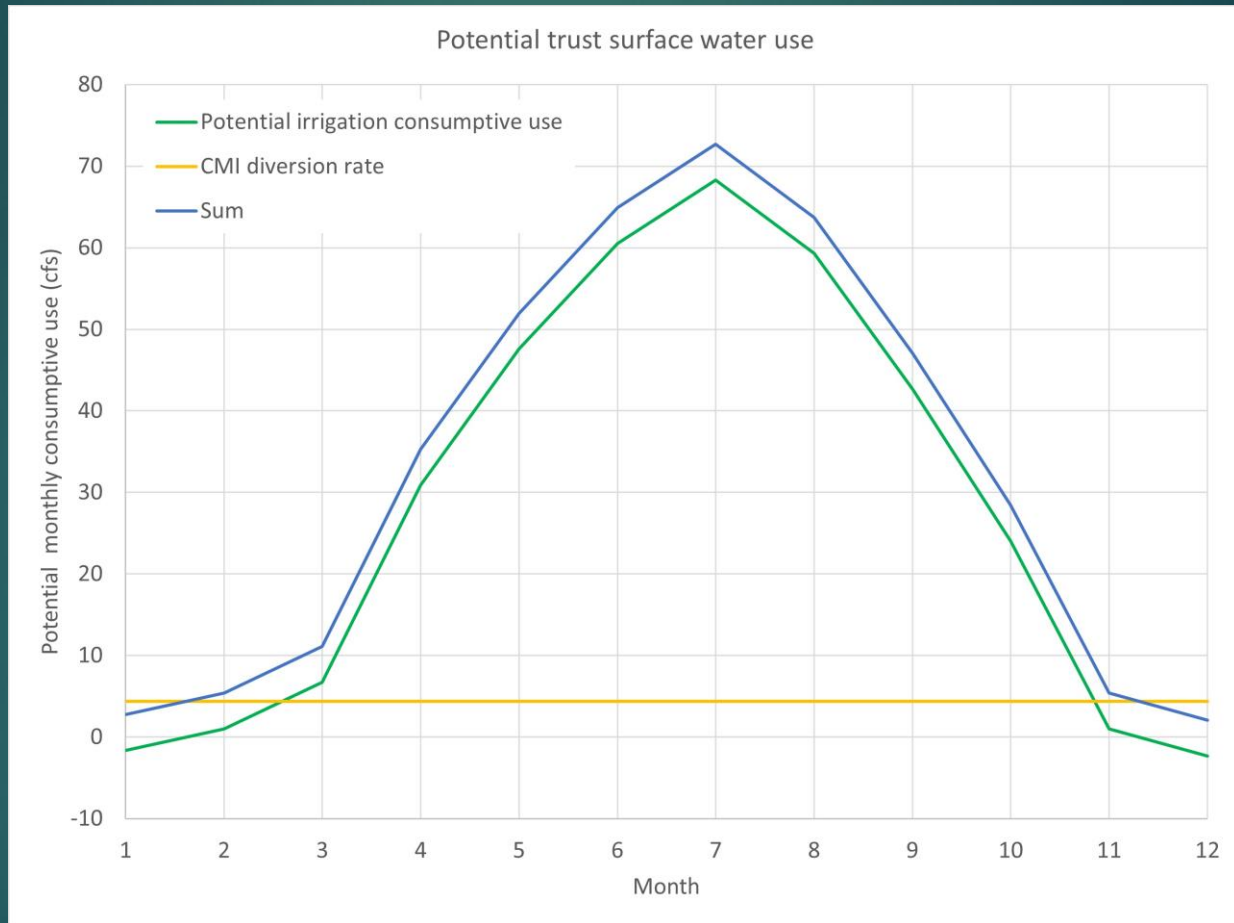
- ▶ Water uses other than irrigation, municipal, commercial and industrial were assumed to have minimal consumptive use and were excluded
- ▶ Water rights flagged as non-consumptive or mitigated were excluded
- ▶ Irrigation water rights were assumed to irrigate one acre per 0.02 cfs and consumptive use was assumed to equal the monthly crop irrigation requirement
 - ▶ average monthly precipitation deficit from ET_{Idaho} (usually 30-year average) for peak alfalfa
- ▶ Paper diversion limits were assumed for municipal, commercial, and industrial water rights (maximum authorized diversion rate → likely overestimate of impact)

Q4. Trust surface water rights

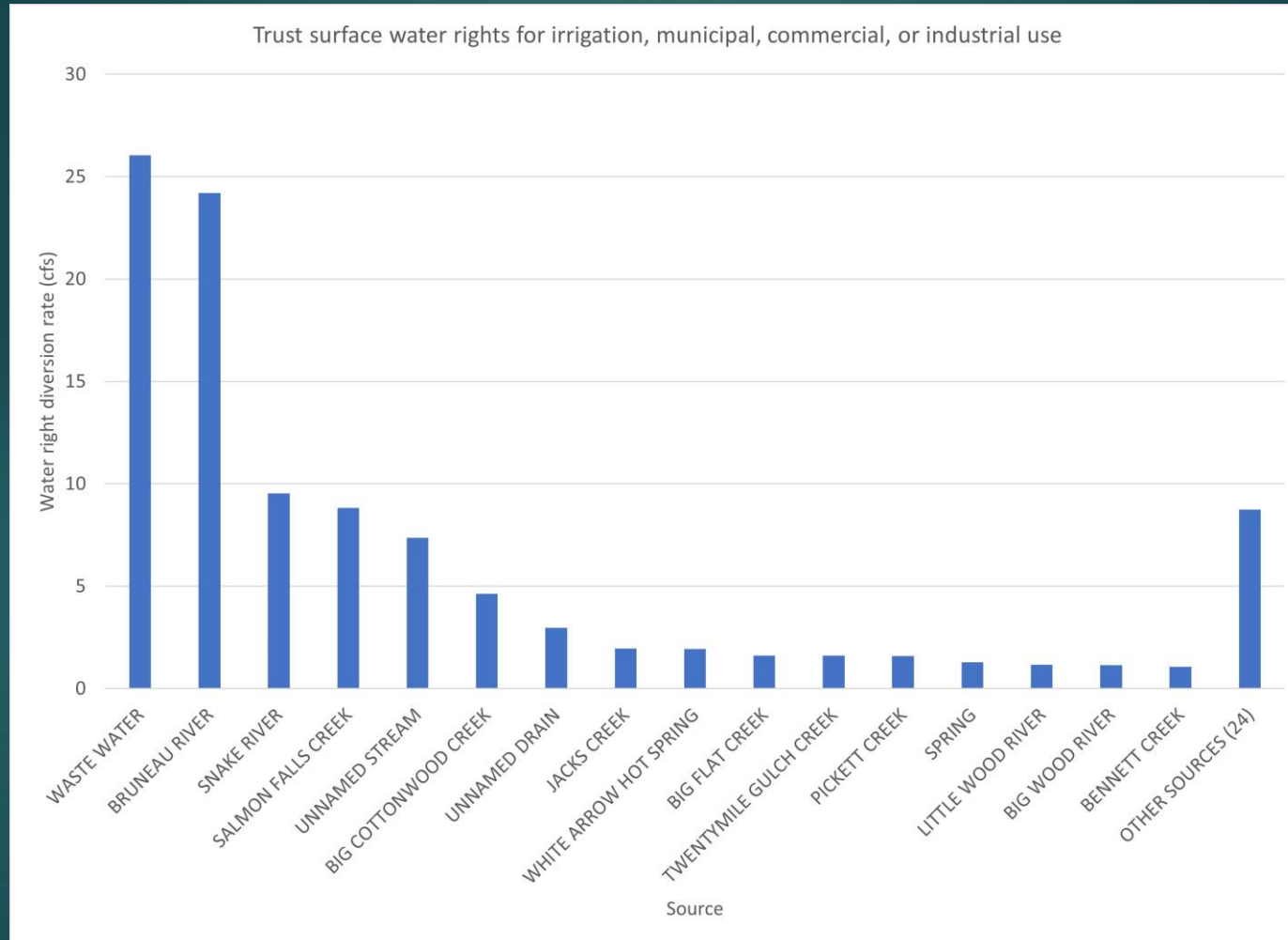
Water use	Aggregate diversion rate limit
Irrigation	101 cfs
Commercial	<1 cfs
Municipal	4 cfs
Industrial	0 cfs

- Potential irrigation consumptive use based on peak alfalfa ~20,000 AF/yr for ~5,000 acres
- Maximum CMI consumptive use ~3,200 AF/yr

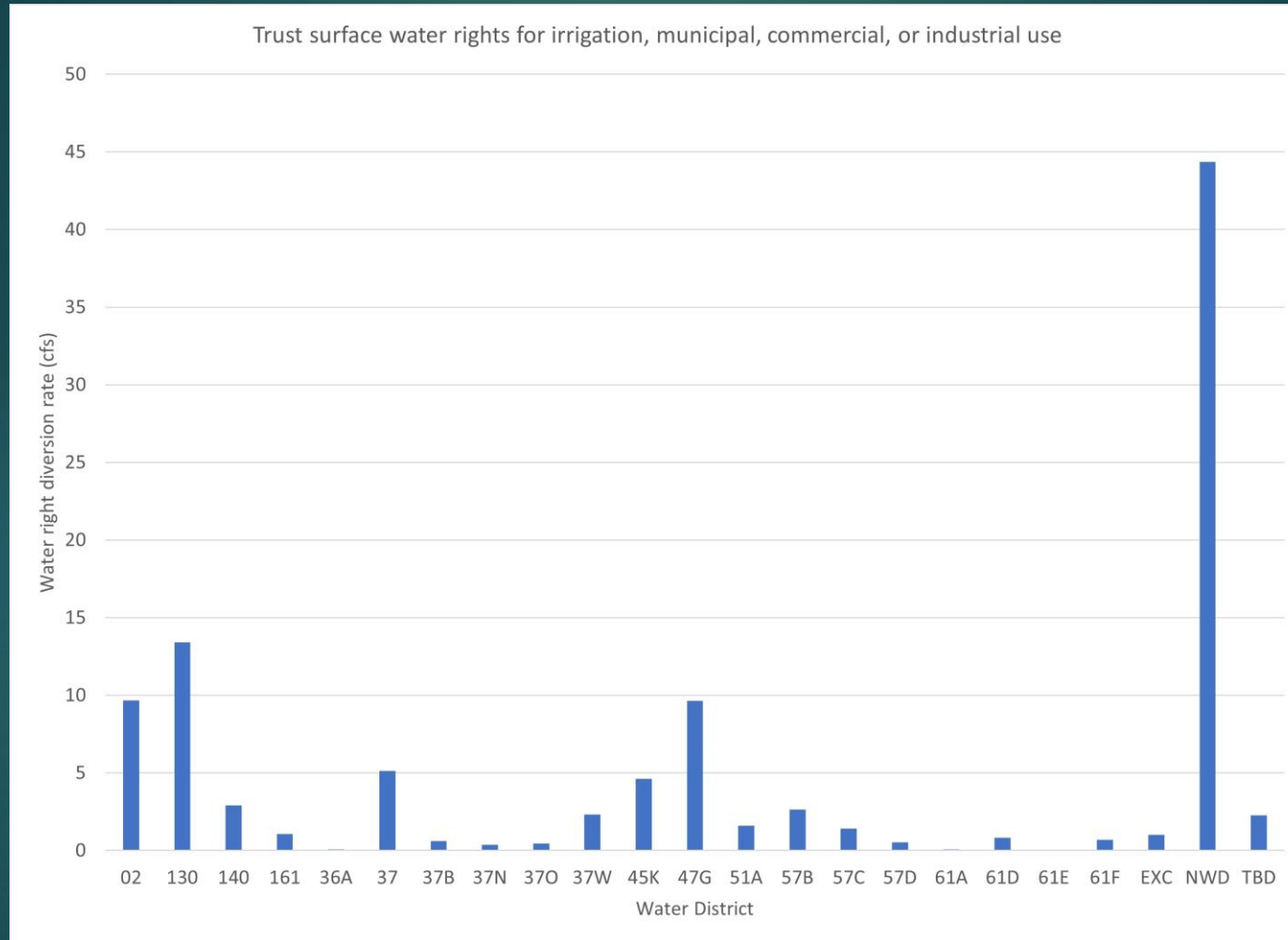
Q4. Potential trust surface water use



Q4. Surface water trust rights by source



Q4. Surface water trust rights by Water District



Q4. Conclusions

- ▶ Estimates of potential impact
 - ▶ CIR for irrigation water rights based on peak alfalfa
 - ▶ 7 cfs in March
 - ▶ 68 cfs in July
 - ▶ 4 cfs municipal
 - ▶ < 1 cfs commercial
- ▶ Impact will depend on how often and what time of year is water available to fill these water rights

Q2 – Q4. Summary of preliminary long-term impact estimates

Time period	ESPA and tributary groundwater trust rights	Twin Falls area and Western Snake Plain groundwater trust rights	Surface water trust rights	Sum
Average annual impact (cfs)	61 - 92	37 - 72	<33	98 - 197
March impact (cfs)	51 - 82	7 - 72	<11	58 - 165
Peak summer impact (cfs)	71 - 102	37 - 125	<73	108 - 300

- Ranges reflect a lack of information on consumptive use associated with CMI uses, the timing of impacts from irrigation use outside of the ESPA, and surface water availability
- Because high end of ranges reflects several conservative assumptions, actual impacts are likely in the lower half of the ranges



Questions?