



MENDOCINO COUNTY INLAND WATER AND POWER COMMISSION

NEXT STEPS - STORAGE

OPTIONS UNDER CONSIDERATION FOR ADDITIONAL STORAGE IN THE RUSSIAN RIVER WATERSHED

- USACE study of Lake Mendocino (with potential pipeline for delivery to Potter Valley) – **being studied**
- Tributary storage – **concept study completed**
- Lower Valley on-stream storage – **concept study completed**
- In-valley pond storage – **concept study completed**
- Conjunctive use – **concept study completed**
- Pump back from Lake Mendocino – **concept study completed**
 - *Note: Costs associated with “concept studies” are typically -50%/+100%*

USACE STORAGE PROJECT PROS AND CONS

- Pros:
 - Federal nexus, if identified, could bring federal funding participation
 - Could be a large project, plenty of storage for users downstream of Lake Mendocino
- Cons:
 - Modest to no local control of timing of study
 - Expensive to study, estimated local share \$4M in 4 years
 - No guarantee of identifying a project
 - Currently on hold due to lack of federal prioritization, restart timing uncertain
- Next Steps & Next Costs
 - Press for federal engagement
 - \$4M over 4-5 years

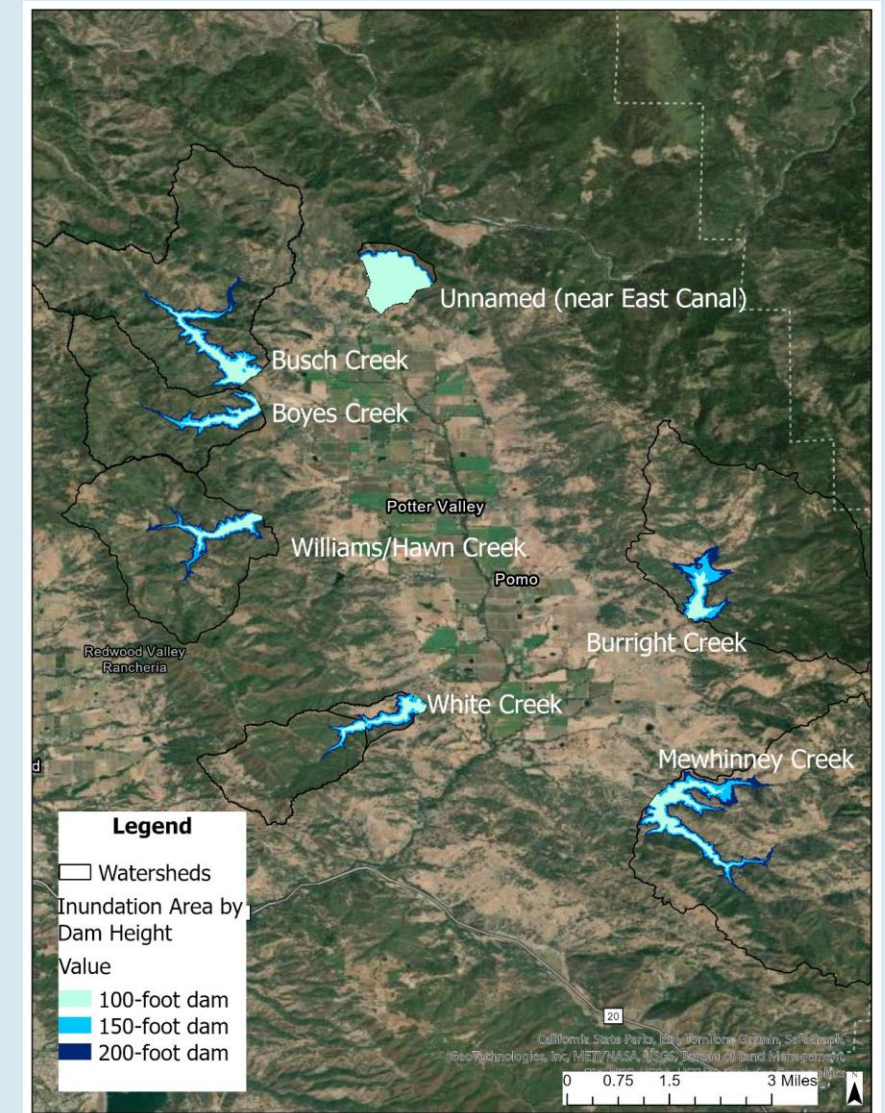
TRIBUTARY STORAGE

- 7 major tributaries evaluated, largest three were selected
- Each simulation utilized historical hydrologic conditions between 1911 and 2022 and annual water supply demands on the order of 6,000 acre-feet in Potter Valley typically occurring between March through October each year.

Name	Dam Height (feet)	Dam Length (feet)	Storage Capacity (AF)	Inundation Area (acres)	Distance to Powerhouse (miles)	Natural Runoff (AFY) [a]
Busch	100 to 200	1,400 to 2,100	4,900 to 25,200	117 to 302	1.6	6,100
Williams/Hawn	100 to 200	850 to 1,500	2,400 to 14,700	62 to 195	1.7	5,400
Mewhinney ^[b]	100 to 200	800 to 2,200	2,700 to 20,200	76 to 304	7.7	10,900

[a] 1910 to 2022 average based on PVIFM model results

[b] Requires a pump-back system and saddle dam



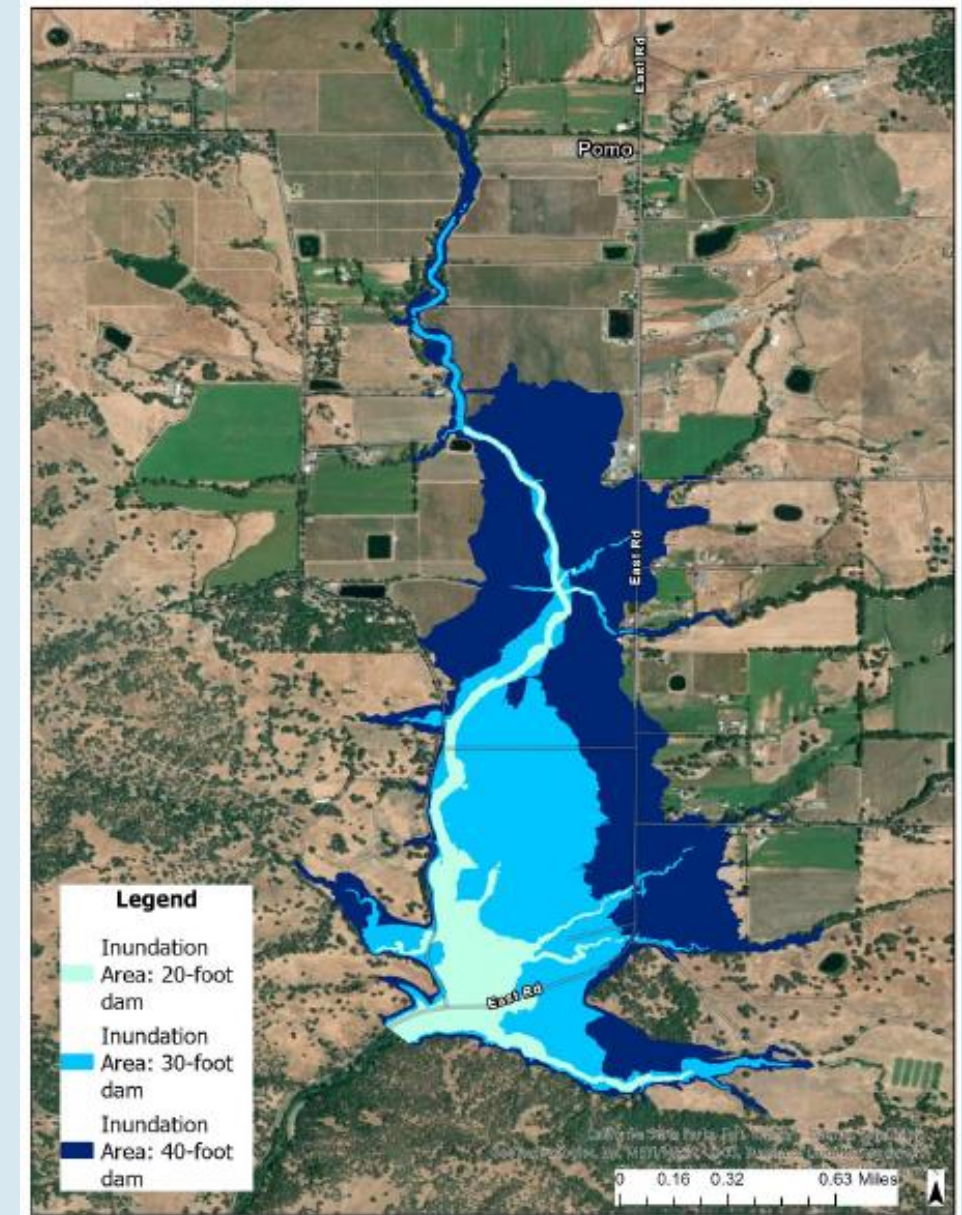
TRIBUTARY STORAGE POTENTIAL COSTS, PROS & CONS

- Costs:
 - Preliminary capital estimate of \$125M to \$250M, plus costs of piping for fill and distribution
- Pros
 - Potential for pressure fill from NERF, then gravity delivery to downstream
 - Could be larger than PVID needs, so this would provide potential regional storage
 - Supplemental to Lake Mendocino study, and on separate timeline than USACE work
- Cons
 - Likely expensive on an acre-foot basis
 - Complex to permit and potential water rights issues
- Next Steps & Next Costs
 - Engage engineering consultant for advanced studies
 - First phase \$500k, next phase \$500k - \$1000k

LOWER VALLEY ON-STREAM STORAGE

- Jacobs evaluated 20, 30, and 40 ft dam heights

Dam Height (feet)	Dam Length (feet)	Storage Capacity (AF)	Inundation Area (acres)	Distance to Powerhouse (miles)
20	360	620	62	6.5
30	420	5,600	280	6.5
40	480	19,300	640	6.5

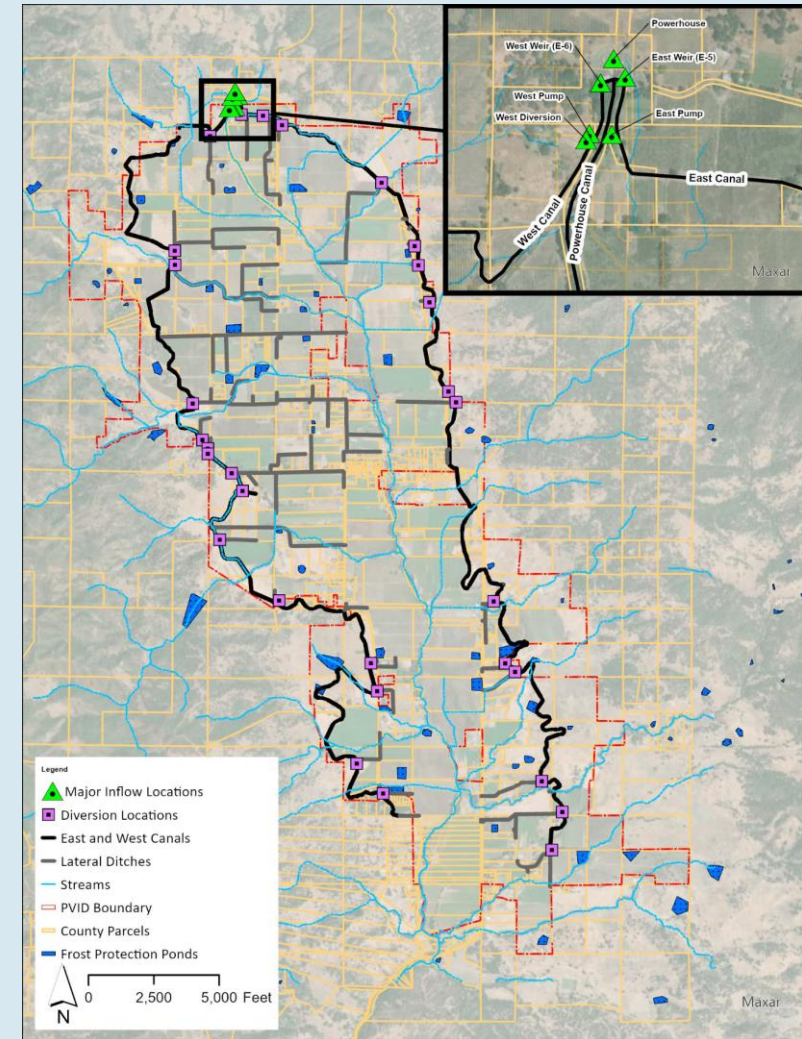


LOWER VALLEY ON-STREAM STORAGE POTENTIAL COSTS, PROS & CONS

- Costs:
 - Preliminary capital estimate of \$115M to \$220M, plus cost of pressure distribution upstream of dam
- Pros
 - Gravity fill, including NERF and in-valley runoff sources
 - Could be larger than PVID needs, so could potentially provide regional storage for other downstream users
 - Supplemental to Lake Mendocino, and on separate timeline than USACE work
- Cons
 - Likely expensive on a per acre-foot basis
 - Complex to permit; land taking; potential water rights issues; potential water quality concerns
- Next Steps & Next Costs
 - Engage engineering consultant for advanced studies
 - First phase \$500k, next phase \$500k - \$1000k

POTTER VALLEY POND STORAGE

- Expand existing surface pond network
- Assumes 5,000 AF of pond storage, 10 ft berm and 8 ft storage
- 625 total acres required; current ponds total 125 acres
- Either smaller disbursed ponds throughout valley, or centralized ponds
- Ponds at head of valley (near NERF outlet works) could provide gravity flow throughout valley

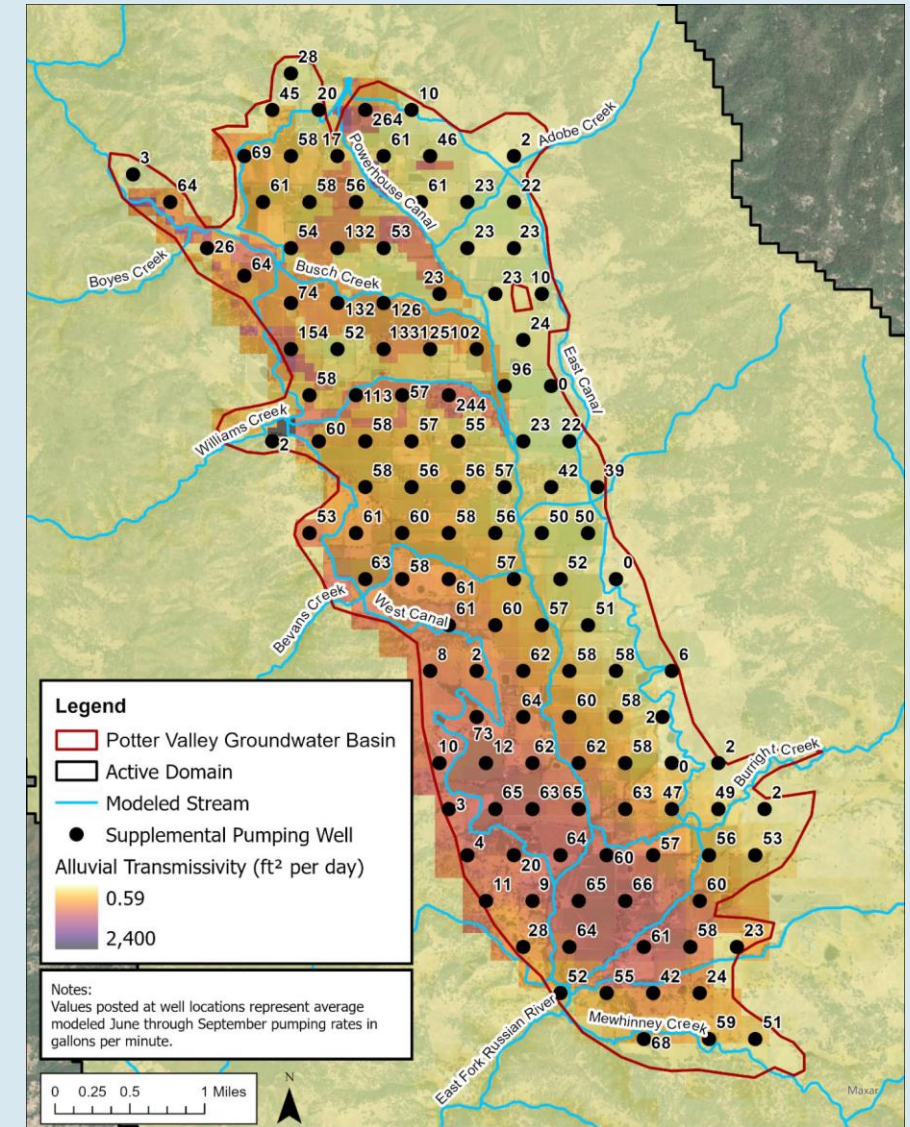


POTTER VALLEY POND STORAGE POTENTIAL COSTS, PROS & CONS

- Costs:
 - Preliminary capital estimate of \$15M to \$28M, plus cost of distribution system(s) for fill and drain
- Pros
 - Scalable and potentially lower cost alternative than others
 - Could be sized for PVID needs only, or PVID plus other downstream needs
 - Supplemental to Lake Mendocino, and on separate timeline than USACE work
 - Could be developed centralized/collective, or disbursed/individual
- Cons
 - Land utilization issues, both footprint and suitability (permeability)
 - How to manage for broad benefit
- Next Steps & Next Costs
 - Engage consultant, identify potential pond locations & system size
 - First phase \$100k, next phase \$200k

POTTER VALLEY CONJUNCTIVE USE ALTERNATIVES

- Supplemental groundwater pumping, potentially supplemented by managed aquifer recharge (MAR) by surface flooding.
- Concept based on 124 wells disbursed throughout the valley; field work required to further refine locations and yields.
- Potential yield of 3,500 acre-feet per year.
- Other conjunctive use projects should be explored in the Ukiah Valley and elsewhere.

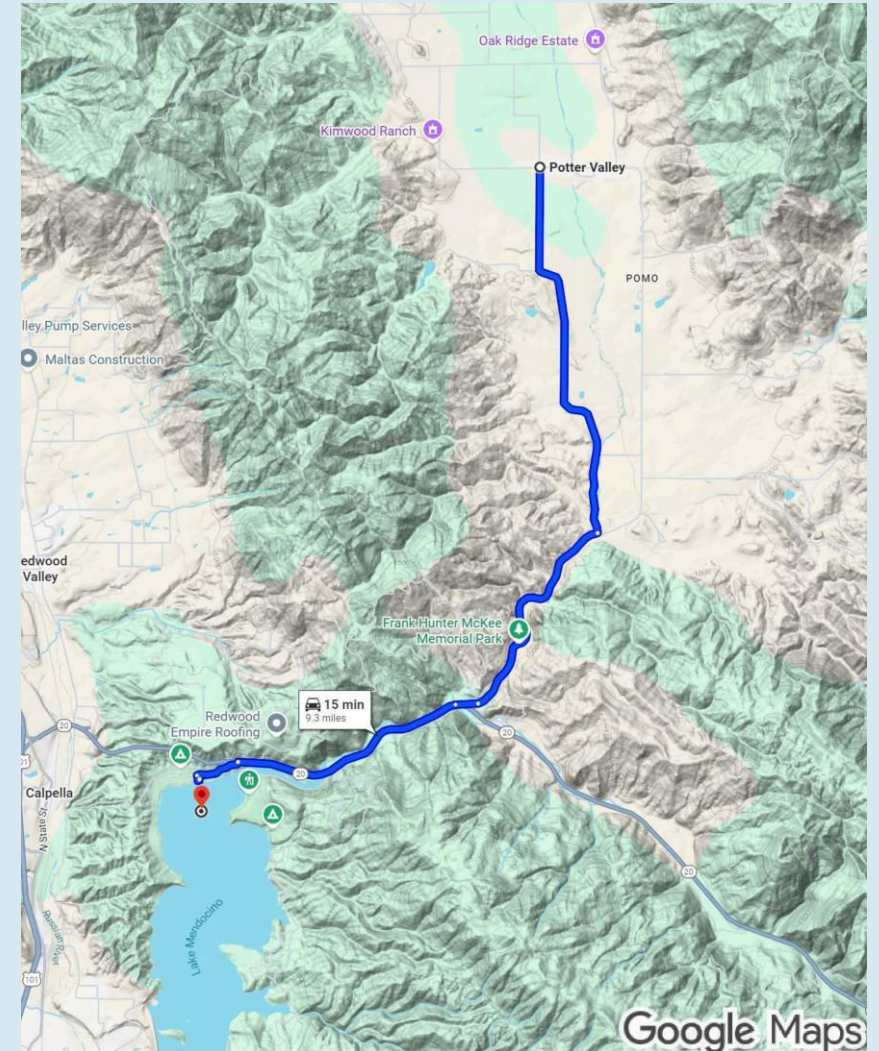


CONJUNCTIVE USE POTENTIAL COSTS, PROS & CONS

- Costs:
 - Preliminary capital estimate of \$19M to \$22M, plus costs of network piping for interconnection
- Pros
 - Scalable, cheaper than some alternatives
 - Supplemental to Lake Mendocino, and on separate timeline than USACE work
- Cons
 - Much additional work to prove out
 - Capacity unknown, but potentially limited to approximately 3,500 acre-feet per year
- Next Steps & Next Costs
 - Engage consultant for additional geotech & test well work
 - First phase \$500k, next phase \$500K - \$1000k

POTTER VALLEY PUMP BACK FROM LAKE MENDOCINO

- 10+ mile pipeline, pump station in Lake Mendocino
- Can be designed for 10,000 AF yr
- Current Lake Mendocino storage is fully subscribed and used, so it will require Lake Mendocino storage expansion or negotiation of existing water rights



PUMP BACK FROM LAKE MENDOCINO POTENTIAL COSTS, PROS & CONS

- Costs:
 - Preliminary capital estimate of \$100M+
- Pros
 - Can meet full demand
- Cons
 - More potential if Lake Mendocino is expanded; far less potential if not
 - Utilizes Lake Mendocino: Water rights issues (Lake Mendocino fully subscribed now)
- Next Steps & Next Costs
 - Engage consultant for next level of design
 - First phase \$600k - \$1000k, next phase \$1000k

NEXT STEPS: STORAGE ALTERNATIVES FORMULATION AND RANKING

- As described, additional investigation is needed for all alternatives
- Time and funding are limited, so ranking and prioritization are needed
- A viable path forward might include tiers:
 1. Best apparent potential (cost/benefit), fund and proceed now with additional investigation
 2. Some potential, fund and proceed when funds are available
 3. Low potential, no further investigation deemed worthy at this time, put on the shelf