

Development of Water Management Actions and Portfolios to Address Central Valley System Risks

Armin Munévar - CH2MHill

RECLAMATION

Objective of Actions and Strategies Development for the Basins Study

- The objective of the Actions and Strategies phase is to identify, describe, and evaluate actions and strategies that can be implemented to improve system performance in the face of climate and socioeconomic uncertainties
- The Study is intended to explore a broad range of adaptation actions and identify promising solutions, but does not result in the selection of a particular proposed action or set of actions

Approach for Developing & Evaluating Actions & Strategies

1

- Solicit and receive input
- Organize and group actions

2

- Develop representative actions
- Evaluate performance of representative actions

3

- Package actions into representative portfolios
- Evaluate performance and robustness of portfolios

4

- Identify key elements of robust portfolios
- Summarize findings and future considerations

Representative Actions Considered

- **Reduce Water Demand**
 - Increase agricultural water efficiency
 - Increase municipal & industrial water use efficiency
- **Increase Water Supply**
 - Increase regional reuse
 - Increase ocean desalination
 - Precipitation enhancement
 - Rainwater harvesting
- **Improve Operational Efficiency**
 - Conjunctive groundwater management
 - Enhance groundwater recharge
 - Improve salinity and nutrient management
 - Improve temperature management
 - Improve SWP/CVP operations
 - Improve tributary and environmental flows
 - Improve system and regional conveyance
 - Increase Sac, SJ, export area, and upper watershed storage
- **Improve Resource Stewardship**
 - Improve forest health
- **Improve Institutional Flexibility**
 - Improve regulatory flexibility and adaptability
- **Improve Data Management**



RECLAMATION

Water Management Action Cost, Quantity, and Timing

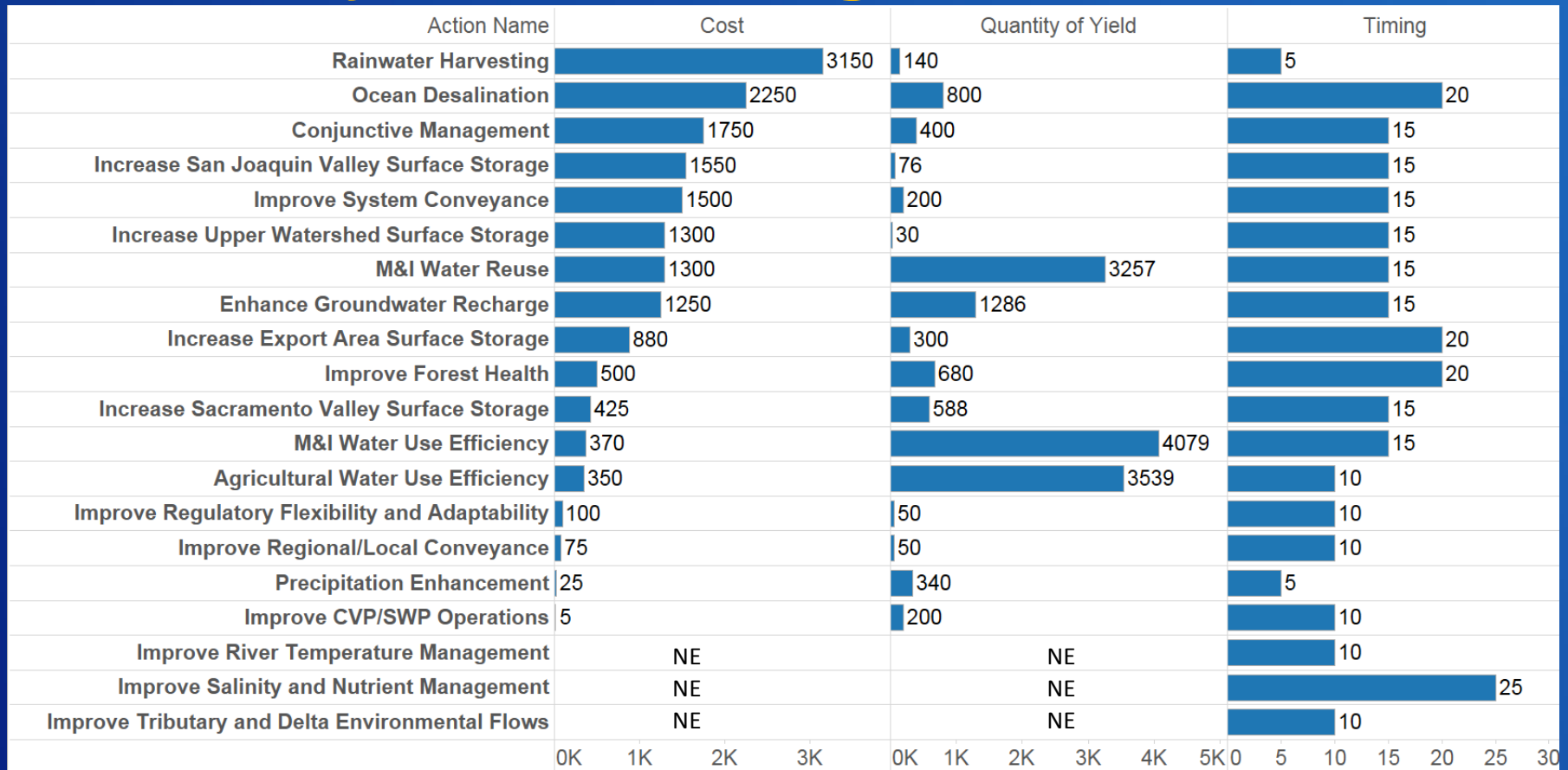


FIGURE 6-2 ESTIMATED MEDIAN COST, QUANTITY, AND TIMING FOR EACH OF THE ACTIONS. COST ARE IN \$/AFY OF SUPPLY IMPROVEMENT OR DEMAND REDUCTION. QUANTIFY OF NEW SUPPLY OR DEMAND REDUCTION IN TAFY. TIMING TO IMPLEMENTATION IN YEARS.

Action Evaluation Criteria

Evaluation Criteria

Action Name	Cost	Quantity of Yield	Timing	Technical Feasibility	Permitting	Legal	Policy	Implementation Risk	Long-term Viability Risk	Operational Flexibility	Energy Needs
Agricultural Water Use Efficiency	A	A	B	B	B	B	A	B	C	E	A
M&I Water Use Efficiency	A	A	C	A	A	A	B	B	B	B	A
M&I Water Reuse	B	A	C	B	C	C	B	B	C	D	D
Ocean Desalination	D	B	C	C	C	C	C	B	C	D	D
Precipitation Enhancement	A	C	A	C	B	C	C	B	D	B	C
Rainwater Harvesting	E	D	A	A	A	A	B	A	B	A	A
Conjunctive Management	C	B	C	B	C	C	A	B	C	D	B
Enhance Groundwater Recharge	C	B	C	B	B	B	A	B	B	E	A
Improve Tributary and Delta Environmental Flows	A	E	B	A	C	B	D	B	B	B	C
Improve System Conveyance	E	C	C	B	D	C	C	C	C	D	D
Improve CVP/SWP Operations	A	D	B	A	D	C	C	B	B	B	C
Improve Regional/Local Conveyance	A	D	B	A	B	B	B	A	B	C	C
Increase Sacramento Valley Surface Storage	A	C	C	B	D	C	B	C	B	D	C
Increase San Joaquin Valley Surface Storage	C	D	C	B	D	C	B	C	B	D	C
Increase Export Area Surface Storage	B	C	C	B	D	C	B	C	B	D	C
Increase Upper Watershed Surface Storage	B	D	C	B	D	C	B	C	B	D	B
Improve Forest Health	A	B	C	D	C	C	E	D	D	E	C
Improve Regulatory Flexibility and Adaptability	A	D	B	A	D	D	B	C	B	A	A
Improve River Temperature Management	E	E	B	A	B	C	B	C	D	C	C
Improve Salinity and Nutrient Management	E	E	D	B	C	D	B	D	C	D	B

Adaptation Portfolios

Portfolios

Water Management Action	Least Cost	Regional Self-Reliance	Healthy Headwaters & Tributaries	Delta Conveyance and Restoration	Expanded Water Storage	Flexible System Operations	Water Action Plan
Increase Agricultural Water Use Efficiency	X	X					X
Increase Urban Water Use Efficiency	X	X					X
Increase Regional Reuse		X					X
Increase Ocean Desalination		X					X
Precipitation Enhancement	X	X					X
Rainwater Harvesting		X					X
Conjunctive Groundwater Management		X			X	X	X
Enhance Groundwater Recharge		X			X	X	X
Improve Tributary Environmental Flows			X				X
Improve System Conveyance	X			X	X		X
Increase Sac Valley Surface Storage	X				X		X
Increase SJ Valley Surface Storage					X		X
Increase Export Area Surface Storage	X				X		X
Increase Upper Watershed Surface Storage					X		X
Improve Forest Health	X		X				X
Improve Regulatory Flexibility/Adaptability	X					X	X

Cost Effectiveness of Portfolios

