

**Evaluation of Portfolio Performance
and
Trade-offs in Management of Future
Central Valley System Risks**

Michael Tansey - Reclamation

RECLAMATION

Basin Study Resource Categories & Selected Performance Metrics

1. Water Delivery

- Total Unmet Demands, End-of September Sacramento Valley Storage, CVP/SWP Delta Exports

2. Water Quality

- Delta salinity, End-of-May Shasta Storage

3. Hydropower

- CVP Net Hydropower Generation

4. Flood Control

- Folsom Reservoir flood control pool

5. Recreation

- Lake Oroville surface area

6. Fish and Wildlife Habitats

- Peleagic Species Delta habitat

7. ESA Species

- Adult salmon migration in Delta

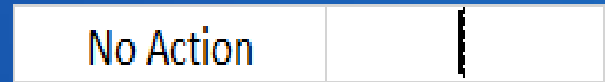
8. Flow dependent eco-resiliency

- Sacramento River floodplain flow processes

Water Delivery – Total Unmet Demands

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Water Delivery	Total Unmet demands	Unmet demands are differences between total water needs and available supply from all sources.	<i>Decreases in the unmet demand indicator imply that water delivery reliability is increasing.</i>

No Action vs RF_CT

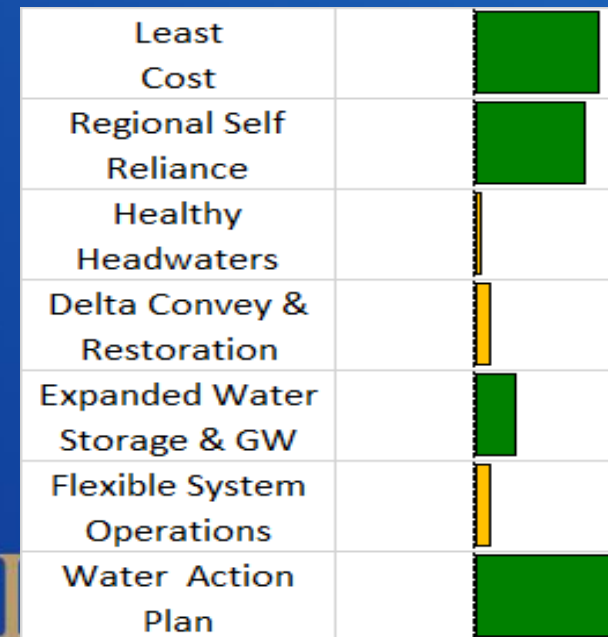


Portfolio Comparisons by Scenario

Water Management Action	Least Cost	Regional Self-Reliance	Healthy Headwaters & Tributaries	Delta Conveyance and Restoration	Expanded Water Storage	Flexible System Operations	Water Action Plan
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Improved performance (green bar)
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 Performance Change < + or – 10%
 Right side (improved) Left side (decreased)

Portfolio vs No Action (Cen_CT)



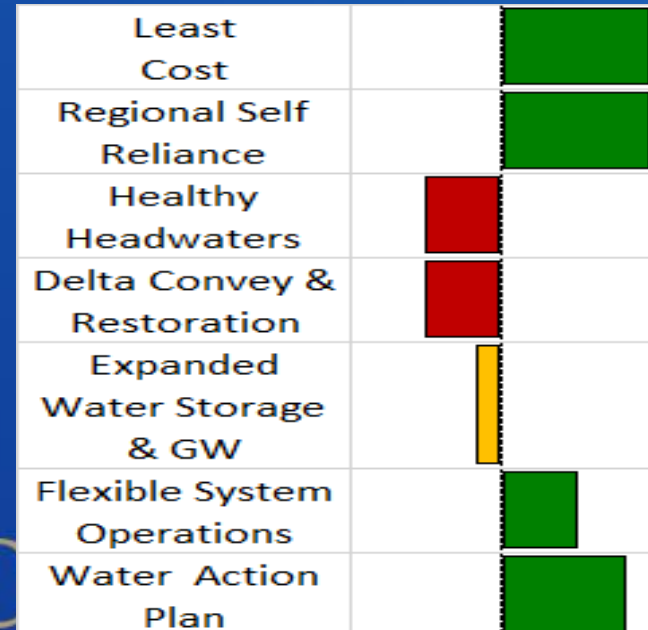
Water Delivery – End-of-Sept Storage

No Action vs RF_CT



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Portfolio vs No Action (Cen_CT)



Portfolio Comparisons by Scenario

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Water Delivery	End-of-September reservoir storage	Sacramento Valley storage is less than 10% of historical end-of-September storage as represented by the Historic Reference scenario	Decreases in this end-of-September storage indicator imply that water delivery reliability is increasing.

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Water Delivery – CVP/SWP Delta Exports

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Water Delivery	CVP/SWP Delta exports	The CVP/SWP exports are curtailed whenever State and Federally mandated Delta water quality and flow standards are exceeded.	<i>Increases in Delta exports imply that water delivery reliability is increasing.</i>

No Action vs RF_CT

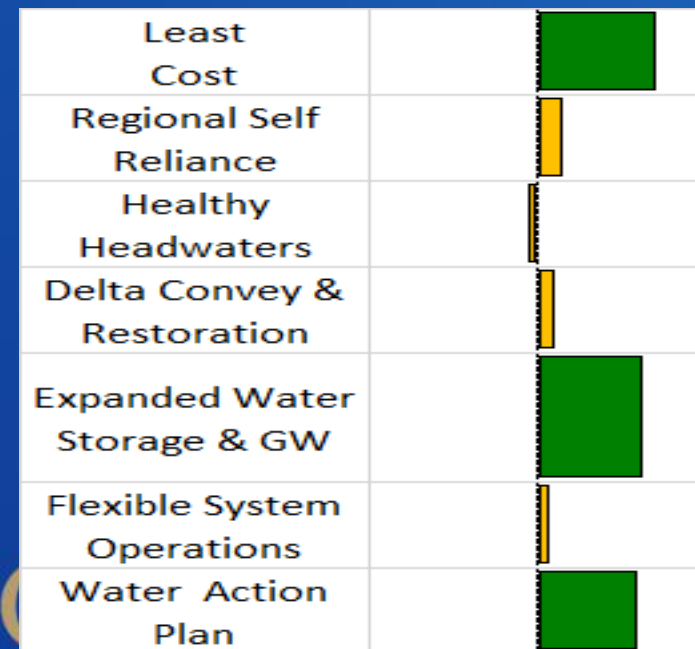


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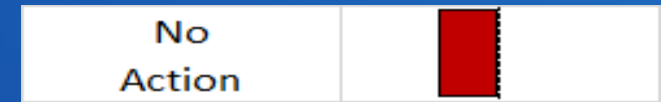
Portfolio vs No Action (Cen_CT)



Water Quality – Delta Salinity

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Water Quality	Delta salinity at Jersey Point	Salinity at Jersey Point in the western Delta expressed as electrical conductivity (EC).	Decreases in Delta salinity imply that water quality is improving.

No Action vs RF_CT



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Portfolio vs No Action (Cen_CT)



Water Quality – End-of-May Storage

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Water Quality	End-of-May storage at Shasta Lake	The end-of-May storage at Shasta Reservoir is less than the 10 th percentile in the Historic Reference scenario.	<i>Decreases in this indicator imply that water quality is improving.</i>

No Action vs RF_CT

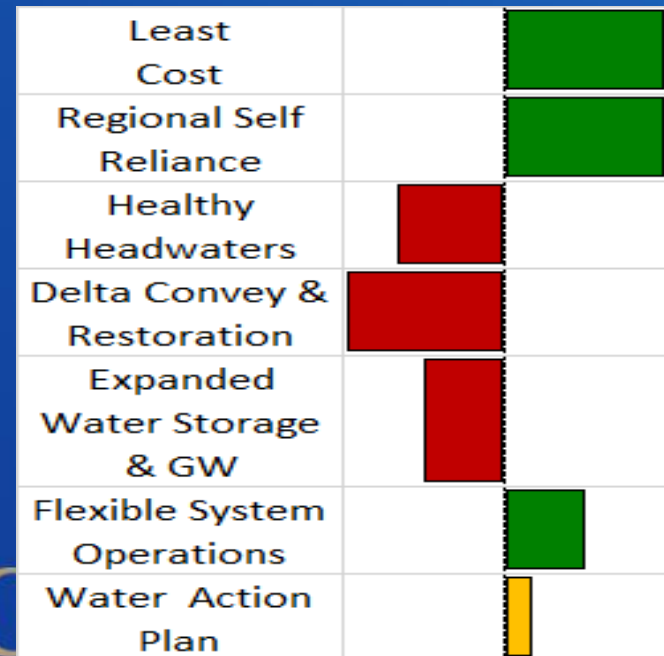


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Hydropower – Net Generation

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Hydropower	CVP Net power generation	CVP Net hydropower generation measured in gigawatt hours per year (GWh/year) is the difference between hydropower production and project use.	<i>Increases in net generation imply that hydropower benefits are increasing.</i>

No Action vs RF_CT

No Action	
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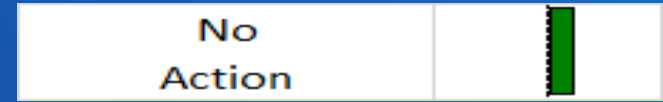
Portfolio vs No Action (Cen_CT)

Least Cost	
Regional Self Reliance	
Healthy Headwaters	
Delta Convey & Restoration	
Expanded Water Storage & GW	
Flexible System Operations	
Water Action Plan	

Flood Control – Flood Pool Storage

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Flood Control	Reservoir storage below flood-control pool	The percent of months from October to June when Folsom reservoir storage is within 10 TAF of the flood conservation pool at Folsom Reservoir.	A decrease in this indicator signifies a reduction in flood risk while an increase means less available flood conservation storage and increased risk.

No Action vs RF_CT

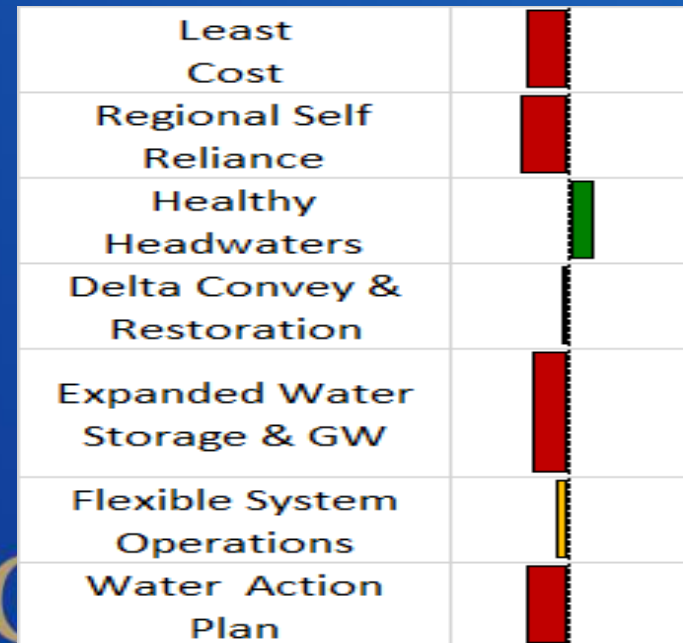


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Recreation – Reservoir Surface Area

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Recreation	Reservoir surface area	The percent of months from May through September that Lake Oroville surface area is less than the historic period median surface area.	<i>Decreases in this indicator imply that recreational opportunities are improved.</i>

No Action vs RF_CT

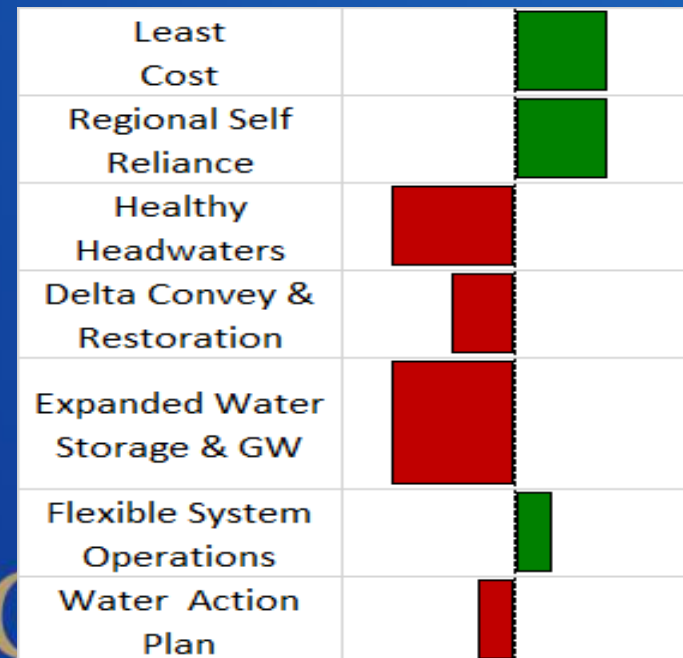


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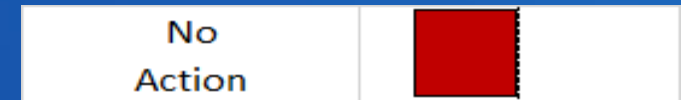
Portfolio vs No Action (Cen_CT)



Fish & Wildlife Habitats – Pelagic Species

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Fish and Wildlife Habitats	Pelagic species' habitats	The percent of months from February to June that 2 ppt salinity (X2) is greater than 74 km east of Golden Gate Bridge.	<i>Decreases in this indicator imply that habitat conditions for Delta smelt are improving.</i>

No Action vs RF_CT

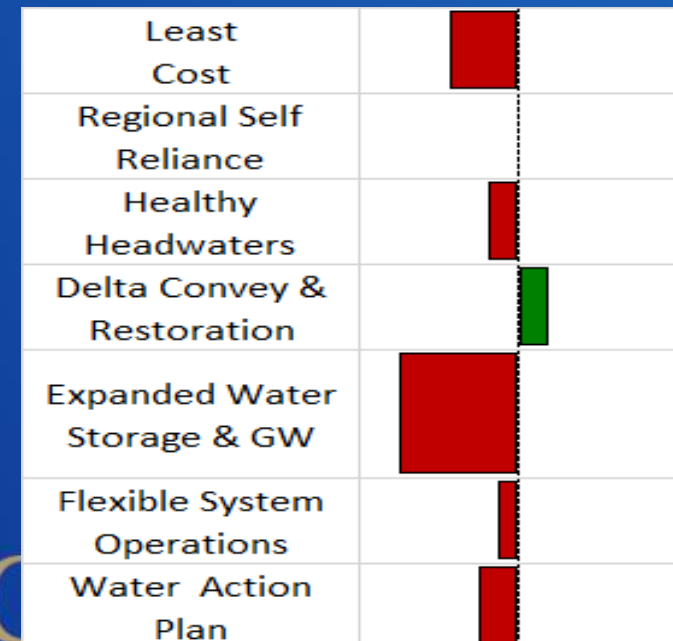


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ESA Species – Adult Salmon

Resource Category	Performance Metric	Performance Indicator	Indicator Change
ESA Species	Adult salmonid migration	The frequency of reverse flows in the OMR channels of the San Joaquin River more negative than -5,000 cfs.	Decreases in the occurrence of reverse OMR flows imply that adult salmon migration conditions are improved.

No Action vs RF_CT

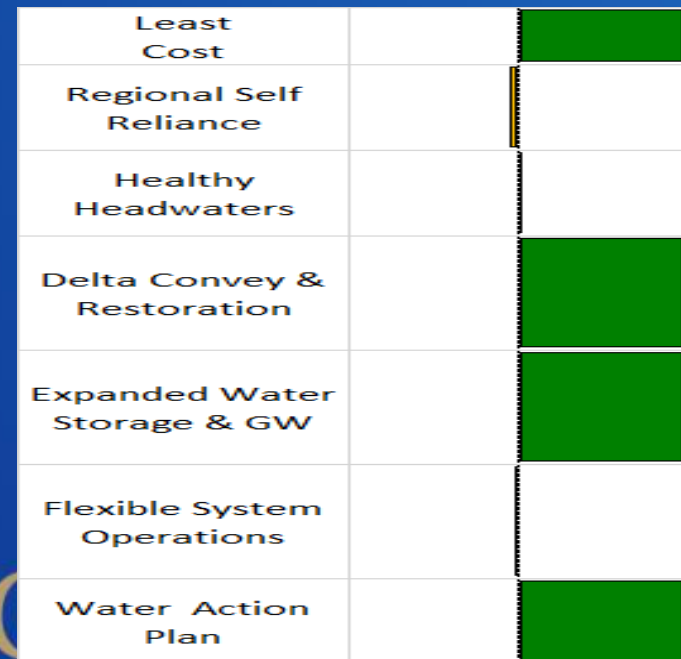


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Eco-Flow Resiliency – Floodplain Processes

Resource Category	Performance Metric	Performance Indicator	Indicator Change
Flow-dependent Ecological Resiliency	Floodplain processes	The percent of months from February through June that flows on the Sacramento River at Keswick are less than the 15,000 cfs	<i>Decreases in this indicator would imply that floodplain processes are improved.</i>

No Action vs RF_CT

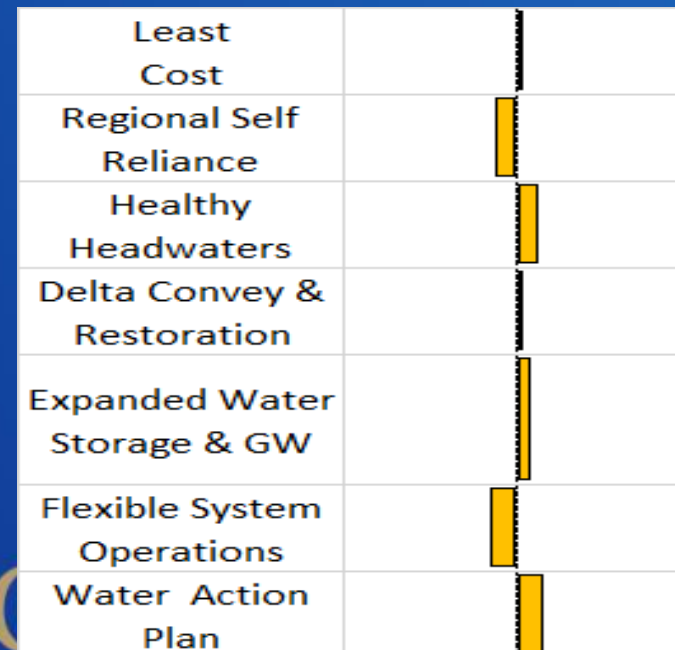


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Decision Support & Tradeoffs



No Action CEN_CT to RF_CT

Portfolio Comparisons to No action CEN_CT only