

WATERSHED BASED CREDIT FACILITY CLEVELAND NATIONAL FOREST SAN JUAN WATERSHED

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BESPOKE
MITIGATION PARTNERS

SWCA[®]



BESPOKE MITIGATION PARTNERS BACKGROUND

- Focus is on mitigation, offsets, trading, full-delivery, and performance-based mechanisms, including water quality enhancement, wetland, stream and species habitat restoration and preservation, water resource protection, stormwater and green infrastructure solutions, flood reduction, and carbon offsets.
- Involved with projects that: reduced of over 250 tons of water quality nutrients, restored and conserved over 294 miles of streams, restored and protected 58,024 acres of wetlands, participated in some 350 mitigation sites, planted over 14,000,000 trees across all operating regions, and enhanced over 10,000 acres of species habitat.

SUITE OF SOLUTIONS



WETLANDS

Restore, enhance, conserve and preserve existing wetlands, and connect to adjacent areas to create more ecologically rich ecosystems



STREAMS

Restore, enhance, and preserve existing stream systems using floodplain and natural channel design, and reconnect associated floodplains



SPECIES

Restore, enhance, and preserve high-quality habitats for endangered terrestrial, avian, freshwater, and marine species



STORMWATER SOLUTIONS

Apply BMPs, water quality trading mechanisms, deliver runoff management solutions, achieve TMDL compliance, and capture and treat impacted waters



BUFFERS

Reestablish riparian buffers along streams to protect against nutrient pollution and land impacts



ECOLOGICAL RESTORATION

Provide comprehensive turnkey solutions through project design, build, monitoring, and ongoing stewardship

VARIED MARKET APPROACHES-REGULATORY

- Localities / Municipalities w/ TMDL-Driven Reduction Obligations (i.e., **Retrofit existing stormwater**)
- O&M included
- One-Off Trades/Turnkey Contracts

Performance-Based Contracts



- Mitigation- wetlands, streams and species
- Construction- Stormwater Permittees (**New Growth**)
- Nutrients
- Banking/Turnkey Contracts

Offsets



- Water Quality Trading
- **New or Expanding Sources** w/ Numeric Discharge Limits
- **Existing Sources**
- Trades/Turnkey Contracts

Trading



PROJECTS IN REGION 5

- Aliso Creek (Orange County) Alternative restoration plan report/optimizing benefits/MCDA
- Rainbow Creek TMDL Compliance-San Diego County-streams (Nitrogen)
- SDSU Regional Stormwater Alternative Compliance Facility-San Diego River Watershed
- Develop Water Quality Trading Program-PCBs and Mercury- San Pablo and County
- City of San Diego Mitigation Offsets for Stormwater Maintenance

REGION 5 PROJECTS – SWCA

San Francisquito Canyon Aquatic Barriers Restoration Program



- SWCA partnership with Resource Institute (RI) in the Angeles National Forest.
- Awarded NFWF grants for river restoration at three sites along San Francisquito Canyon Creek
- Restore aquatic organism passage for CA red-legged frog and unarmored three-spined stickleback
- Barriers due to sedimentation after fire activity and damage at Saint Francis Dam
- Completed natural and cultural resource surveys, permitting, community outreach, and natural channel designs
- Future phases will include construction of the natural channel designs and implementation of riparian restoration

MS4: MUNICIPAL SEPARATE STORM SEWER SYSTEM

- Localities / Municipalities with TMDL-Driven Reduction Obligations
 - Existing stormwater
 - One-Off Trades/Turnkey Contracts

Example: Anne Arundel County

- 188.6 Impervious Acre Credits Produced
- Outfall Stabilization and Stream Restoration Projects
- Turnkey Delivery for Water Quality Improvements
- Cost-effective pollutant (i.e. nitrogen, phosphorus, sediment) reductions and equivalent “impervious acres treated” on private lands throughout the County.
- These projects include stream restoration, outfall stabilization, and wet and dry pond retrofits, and continuous monitoring on four sites.
- Outside of MS4 Footprint

Other Full Delivery Examples:

- Howard County, MD
- Montgomery County, MD-Blended RFP
- SHA, MD- 100,000LF of Stream Restoration RFP
- Fairfax County, VA
- Prince George’s County, MD
- York County, PA



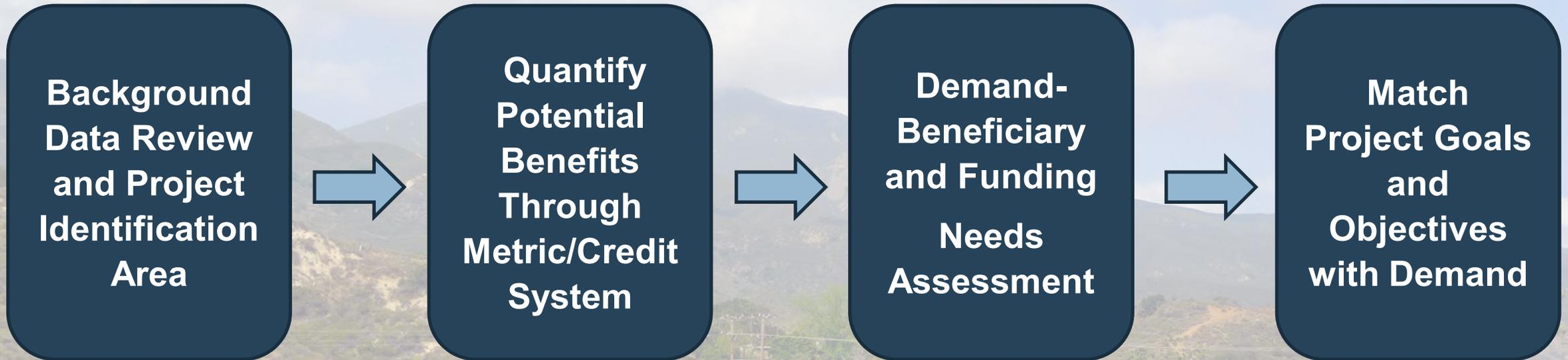
**ANNE ARUNDEL
COUNTY**
MARYLAND



BESPOKE
MITIGATION PARTNERS

SWCA®

WATERSHED BASED CREDIT FACILITY PROCESS



WATER FROM CALIFORNIA NATIONAL FORESTS & ITS BENEFITS



EQUATING TO:
 11+ TRILLION
GALLONS OF WATER

7.5x THE VOLUME OF
SHASTA LAKE

≈17 MILLION OLYMPIC-SIZED
SWIMMING POOLS

ENOUGH
WATER FOR **84+** MILLION HOUSEHOLDS²

952 YEARS' WORTH OF DRINKING WATER FOR THE
ENTIRE POPULATION OF CALIFORNIA

HOW MUCH IS 11 TRILLION GALLONS OF WATER WORTH?

\$3.2 BILLION
ANNUAL VALUE
USING WATER MARKET
WHOLESALE PRICES BY
SECTOR IN CALIFORNIA³

\$367 BILLION
COST OF WATER FOR
LOS ANGELES HOUSEHOLDS
USING 100 GALLONS/DAY
(ON A MONTHLY WATER
BILL OF \$100)⁴

\$583 MILLION
COST OF WATER
TO SAN JOAQUIN
FARMERS AT
\$17/ACRE-FOOT⁵

75%
OF CALIFORNIA'S
PRECIPITATION
(A COMPONENT
OF CALIFORNIA'S
NATIONAL FOREST
WATER SUPPLY) FALLS NORTH
OF SACRAMENTO⁶

75%
OF THE WATER DEMAND OCCURS
SOUTH OF SACRAMENTO. THE
STATE WATER PROJECT (SWP)
AND THE CENTRAL
VALLEY PROJECT
(CVP) HELP MEET
THIS DEMAND

57% OF THE WATER THE LOS ANGELES
DEPARTMENT OF WATER AND
POWER (LADWP) PROVIDES⁷,
COMES FROM THE LASSEN,
PLUMAS, AND INYO NATIONAL
FORESTS VIA THE STATE WATER
PROJECT (SWP) AND THE L.A.
AQUEDUCT. THIS WATER SUPPLIES

4 MILLION
RESIDENTS AND
SUPPORTS MORE THAN
1.8 MILLION
JOBS

WHERE DOES THE WATER FROM CALIFORNIA NATIONAL FORESTS GO AND WHO BENEFITS?

Most CALIFORNIA WATER BEGINS AS
PRECIPITATION OR SNOWPACK IN THE HIGHER
ELEVATIONS AND IS THEN TRANSPORTED BY
RIVERS, RESERVOIRS, AND INFRASTRUCTURE TO
DOWNSTREAM USERS—CITIES, COMMUNITIES,
AGRICULTURAL USERS, AND RECREATIONISTS.

THE CENTRAL VALLEY PROJECT PROVIDES WATER TO
1/3 OF CALIFORNIA'S⁸ **\$47.07** BILLION
AGRICULTURE INDUSTRY

83% OF THE WATER FROM THE PRIMARY
CENTRAL VALLEY PROJECT (CVP)
RESERVOIRS COMES FROM NATIONAL
FORESTS⁹

11.2 MILLION PEOPLE RECREATE
ON LAKE TAHOE, MAMMOTH
LAKES, AND BIG BEAR LAKE—99% OF
WATER FROM EACH LAKE COMES FROM
NATIONAL FOREST LANDS^{10, 11, 12}

RESTORING CALIFORNIA'S NATIONAL FORESTS TO A
HEALTHY AND RESILIENT STATE IS CRITICAL TO PROTECTING
OUR WATERSHEDS FOR FUTURE GENERATIONS

CALIFORNIA
AGRICULTURE
2016 ANNUAL
AVERAGE
EMPLOYMENT
WITH SEASONALS
IS 420,100¹³—
THEREFORE,
OVER 115,000
AGRICULTURE JOBS
ARE SUPPORTED
BY CALIFORNIA'S
NATIONAL
FORESTS.

ADDITIONAL WATER BENEFITS FROM NATIONAL FORESTS

FORESTS PLAY AN IMPORTANT ROLE IN THE WATER CYCLE. AS WATER FLOWS FROM NATIONAL FORESTS TO THE OCEAN, MANY OTHER BENEFITS, IN ADDITION TO URBAN AND AGRICULTURAL USES, ARE PROVIDED ALONG THE WAY (SEE FIGURE TO THE RIGHT).



HABITAT NATIONAL FORESTS IN CALIFORNIA'S STREAMS, RIVERS, AND WETLANDS HOST A MULTITUDE OF KEY WATER-BASED HABITATS FOR ANIMALS:



9,907
MEADOWS &
WETLANDS¹⁴



≈57,000
MILES OF STREAMS



21
WILD AND
SCENIC RIVERS
COVERING OVER
1,213 MILES¹⁷

INSTALLED HYDROPOWER
PLANT CAPACITY ON NATIONAL
FORESTS CAN GENERATE
10,190
MEGAWATTS



PER YEAR FOR
HOMES AND
COMMERCIAL
BUSINESSES
—MORE THAN ENOUGH TO
MEET THE POWER NEEDS
OF 7,642,500 MILLION
HOUSEHOLDS¹⁶



36,500
GALLONS
OF WATER ONE
LARGE TREE
CAN CAPTURE
AND FILTER PER
YEAR.¹⁵



≈400,000
ACRES OF LAKES

WATER QUALITY

NOT ALL WATER FLOWS DIRECTLY TO THE OCEAN, SOME OF IT INFILTRATES THE FOREST FLOOR, BOTH REPLENISHING THE GROUND WATER SUPPLY AND EVENTUALLY REJOINING FLOWS AFTER BEING FILTERED THROUGH SOILS AND ROOTS TO A CLEANER STATE.

FORESTS ALSO REGULATE THE FLOW AND TEMPERATURE OF WATER WITH TREE COVER, MAINTAINING SNOWPACK AND SLOWING THE FLOW OF WATER FOR LATER USE IN THE SUMMER. THIS HYDROLOGIC SYSTEM HELPS MAINTAIN RESERVOIR LEVELS YEAR-ROUND AND LESSENS THE BURDENS ON DOWNSTREAM LEVEES. FORESTED RIPARIAN AREAS ALSO SIGNIFICANTLY DECREASE STREAM TEMPERATURES, REGULATING CRITICAL HABITAT FOR INVERTEBRATES AND FISH SPECIES.





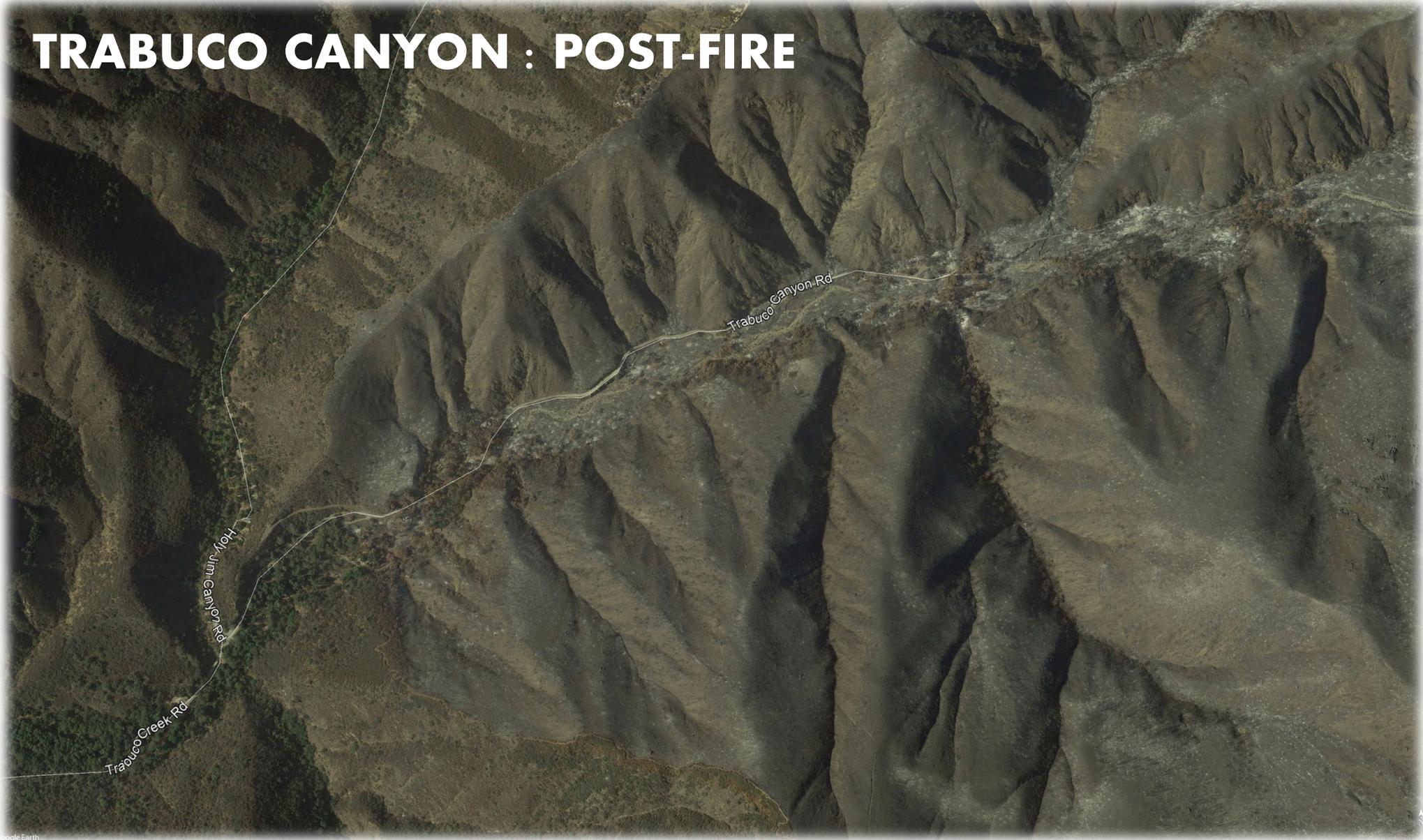


Sources: USGS, Nextzen, OSM Paul Duginski / @latimesgraphics

TRABUCO CANYON : PRE-FIRE



TRABUCO CANYON : POST-FIRE



TRABUCO CANYON : RESTORATION OPPORTUNITIES

**Post-Fire Riparian
Restoration: ~35 acres**

**Sediment
Capture**

**Invasive
Species
Removal**

**Post-Debris Flow Channel
Restoration: ~4,300 linear feet**

Bridge Conveyance

Asset Protection Locations



REGULATORY & NON-REGULATORY DRIVERS



STREAM



WETLAND



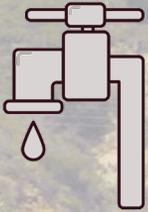
RIPARIAN



FISHERY



GROUNDWATER



**STORMWATER /
MS4's**



FLOODING



**PRE &
POST FIRE**



**NITROGEN,
PHOSPHOROUS &
SEDIMENT**



TEMPERATURE

METRICS

Driver	Metric
Stream	Linear Feet of Stream Uplift
Wetland	Acres of Wetland Uplift
Riparian	Acres of Riparian Habitat
Fisheries	Area of Improved Aquatic Habitat
Groundwater	Acre Feet of Groundwater Storage
TMDL's	Nitrogen, Phosphorus, & Sediment Pounds of Reduction; Trash; Bacteria
Stormwater	Pollution Control & Hydromodification Benefits
Flooding	Acre Feet of Surface Storage
Pre / Post Fire	Area of Fire Buffer or Protection Zone
Temperature	Kilocalories
Asset Protection	Linear Feet of Road Protection



STAKEHOLDER ENGAGEMENT

- Engage Beneficiaries and Funding Options
- Identify Needs and Willingness to Fund
- Assess Scope and Volume
- Pursue project with multiple benefits and potential diverse payment streams
- Obtain Commitment and Position Project to be “Shovel-Ready”





BENEFICIARIES IN THE SAN JUAN WATERSHED



Santa Margarita
Water District



& PRIVATE ENTERPRISES AND DEVELOPERS

Multiple Criteria Decision Analysis (MCDA or Matrix Analysis) of Options/Alternatives

Scoring (How well does alternative meet the criteria)	
5 = Excellent	2 = Below Average
4 = Good	1 = Poor
3 = Satisfactory/Average	

Alternatives	CRITERIA																				Weighted Criteria Score Totals	Ranking
	Implementation Practicability		Relative Cost		Economic Feasibility		Ability to Fund		Net Hydrologic Effects		Sustainability		Impacts to Water Rights and Existing Compacts		Ease of Permitting		Public Acceptability		Synergy			
	WF=15%		WF=13%		WF=15%		WF=2%		WF=13%		WF=5%		WF=8%		WF=0%		WF=18%		WF=11%			
	Score	Score x WF	Score	Score x WF	Score	Score x WF	Score	Score x WF	Score	Score x WF	Score	Score x WF	Score	Score x WF	Score	Score x WF	Score	Score x WF	Score	Score x WF		
Water Management Opportunities																						
Storage and Flood Control																						
"Small" Reservoir "A" - Irrigation & Recreation	2	0.30	1	0.13	2	0.30	3	0.06	5	0.65	2	0.09	1	0.08	1	0.00	2	0.36	3	0.34	6.76	8
"Small" Reservoir "B" - Flood Control & Irrigation	3	0.45	1	0.13	1	0.15	4	0.07	4	0.52	2	0.09	2	0.17	2	0.00	3	0.53	5	0.56	8.94	7
Other Water Management Opportunities																						
Upland Well "A" with AST	3	0.45	3	0.39	3	0.45	2	0.04	4	0.52	3	0.14	3	0.25	3	0.00	4	0.71	3	0.34	11.07	5
Upland Well "B" with Stock Tank	4	0.60	2	0.26	3	0.45	2	0.04	3	0.39	2	0.09	3	0.25	4	0.00	5	0.89	3	0.34	11.91	3
Irrigation Rehabilitation Opportunities																						
Farm "A" - Replace Diversion Structure	5	0.75	5	0.65	5	0.75	5	0.09	3	0.39	2	0.09	3	0.25	4	0.00	5	0.89	1	0.11	17.89	1
Farm "B" - Line Conveyance Channels	4	0.60	3	0.39	4	0.60	5	0.09	2	0.26	1	0.05	2	0.17	4	0.00	4	0.71	2	0.22	10.63	6
Best Management Practices																						
Site "A" - Wetland Restoration	2	0.30	2	0.26	3	0.45	4	0.07	2	0.26	5	0.23	5	0.42	3	0.00	5	0.89	4	0.45	12.79	2
Site "B" Stream Restoration/Stabilization	1	0.15	2	0.26	3	0.45	4	0.07	4	0.52	4	0.19	5	0.42	4	0.00	4	0.71	4	0.45	11.90	4

DEVELOP PROTOCOLS AND TEMPLATES WITH USFS

- Assess applicable Land Management Plans
- Identify land tenure requirements
- Determine NEPA requirements
- Create templates for future use



CONCLUSIONS

- Define project parameters and benefits
- Concept Plan Development
- Metric development of targeted restoration
- Stakeholder support and funding
- Creating a protocols and template for restoring Forest Service lands
- Position projects to be shovel-ready with funding commitments



CONTACT INFORMATION

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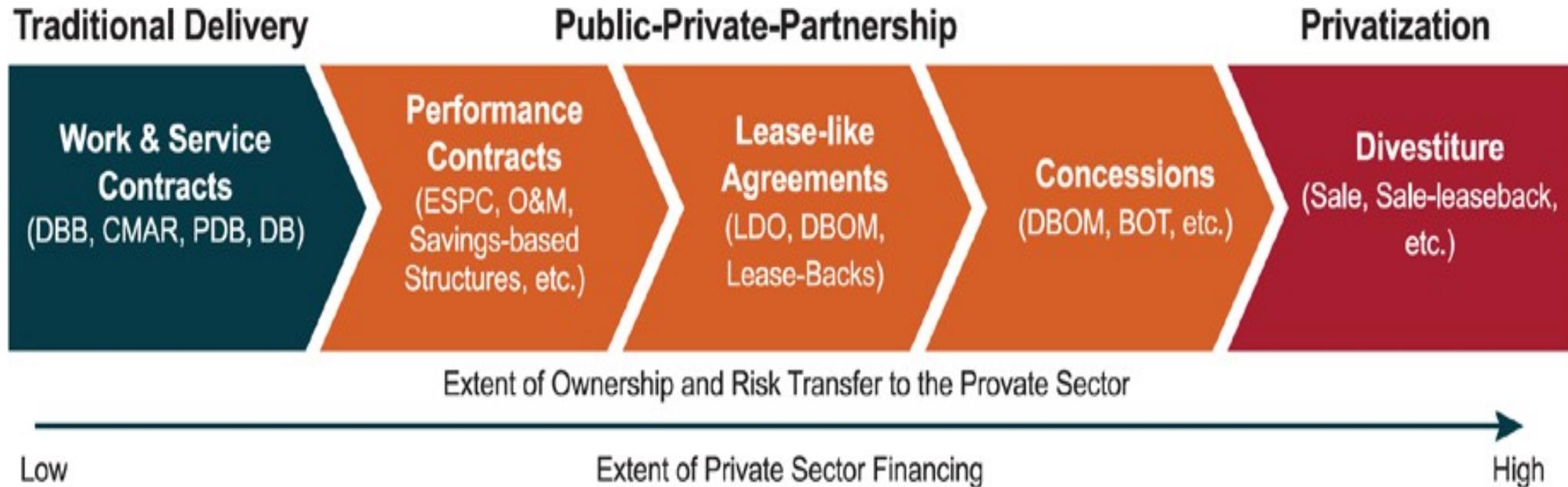
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SPECTRUM OF DELIVERY MECHANISMS



Alternatives Analysis Process

