



# ATTACHMENT 6

MONITORING, ASSESSMENT, AND  
PERFORMANCE MEASURES



COSUMNES, AMERICAN, BEAR & YUBA RIVER  
INTEGRATED REGIONAL WATER MANAGEMENT



**CABY Integrated Regional Water Management Plan  
Proposition 84, Round 2 Implementation Grant**

**Attachment 6. Monitoring, Assessment, and Performance Measures**

The State of California has consistently required project sponsors to develop performance measures to assist both the State and the sponsor in tracking (or measuring) the achievement of desired outcomes. The goals of this project performance monitoring and assessment are to provide a framework for assessment and evaluation of project performance, to identify measures that can be used to monitor progress toward achieving project goals, to provide a tool for grant recipients and managers to monitor and measure project progress, and to guide final project performance reporting to fulfill grant agreement requirement.

This attachment presents anticipated monitoring, assessment, and performance measures for each of the projects included within this proposal. The implementation projects included in this proposal are:

1. Camptonville Water System Improvement Project
2. City of Placerville Waterline Replacement
3. El Dorado County Small Hydroelectric Development Program
4. Water Efficiency, Water Quality and Supply Reliability in the CABY Region
5. Wolf Creek Watershed: Restoration, Stormwater Source Control and Flood Management
6. CABY Mercury and Sediment Abatement Initiative
7. Meadow Restoration, Assessment and Prioritization in the American, Bear and Yuba Watersheds

Additionally, monitoring, assessment, and performance measures are included for Project A:

- A. Project Administration

In accordance with the PSP, this attachment includes the following information:

- The metrics used to evaluate project performance
- The monitoring systems in place to verify project performance
- A description of the data collection process and how the data will be evaluated to ensure the goals and objectives of the IRWM Plan are being met

This attachment also contains project performance measures tables including:

- **Goals:** Statements of desired conditions. Goals articulate the ultimate intention of the project.
- **Desired Outcomes:** Outcomes are the results, impacts, or consequences of project activities. The desired outcomes are the activities or effects that will, in the aggregate, meet the project goals.
- **Output Indicators:** Output indicators track project deliverables and/or intermediate project milestones. Output indicators are quantifiable, can be counted or demonstrate effort, but do not of themselves indicate improvement between pre- and post-project conditions. These may include number of workshop attendees, number of leaks identified, etc.
- **Outcome Indicators:** Outcome indicators are measures to evaluate changes that are a direct result of the project. These may include tons of sediment reduced, percentage of people with increased knowledge, etc.
- **Measurement Tools and Methods:** Measurement tools and methods are specific tools, approaches, or methods that will serve to quantify and/or qualify project outcomes.
- **Targets:** Targets are specific numbers or quantities that the project will meet. Some examples of targets may be 30 gallons saved, five workshops held, etc.

A performance measure and monitoring table for Grant Administration is also included in this Attachment to describe measures that will be implemented by the lead applicant, The Sierra Fund (TSF) to ensure timely reporting, contracting and invoicing.

## **MEETING THE OVERALL GOALS OF THE CABY IRWM PLAN**

All projects' Performance Measures were designed to conform exactly to the goals, primary issues and objectives of the updated CABY IRWM plan. This was done intentionally for all projects, so that progress toward meeting CABY goals and value gained for the State of California could be easily monitored, measured and reported. The CABY IRWM Plan contains a section on protocols for State Database Reporting to ensure that CABY Goals are tracked and adequately reported to all relevant agencies and databases.

## 1. CAMPTONVILLE WATER SYSTEM IMPROVEMENT PROJECT

Project Goal	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
<b>Goal 1:</b>  <b>Ensure adequate and reliable supply that can be adapted to climate change and can meet the needs of the region.</b>	<i>Implement water conservation programs</i>	A: Maximum annual diversion not to exceed 10,000,000 gallons/year	<p>Acre feet per Annum of water supply conserved or enhanced;</p> <p>Acre feet per annum of stream-flow improved</p>	Filter cell and plant effluent flow meters and chart recorders, tank level indicator and chart recorder, daily confirmation of plant production based on actual usage (as indicated by tank level), and totalization of annual plant production
	<i>Implement leak detection and control programs</i>	B: Unaccounted-for water less than 10% of total water produced	<p>Acre feet per Annum of water supply conserved or enhanced;</p> <p>Number of communities implementing new leak detection plans</p>	Treatment plant effluent meter and chart recorder, distribution system meter reading logs, compare amount of water produced to water used, follow-up with leak detection program and/or meter calibrations or replacements
	<i>Upgrade Aging Infrastructure</i>	C: Treatment capacity of 100,000 gallons per day with a filter flow rate of 0.065 gpm/sq.ft.	<p>Complete storage tank recovery during max day conditions</p> <p>Number of projects implemented to upgrade or improve aging infrastructure</p>	Filter cell and plant effluent flow meters, distribution flow meters, tank level indicator and chart recorder, and daily confirmation of filter flow rates and tank levels
		D: 10% reduction in annual man-hours	Number of annual man-hours compared to previous years	Time cards, determine average daily, weekly, monthly, and annual man-hours and compare post-project to pre-project

	<i>Implement a new storage facility with multiple benefits</i>	E: Zero purchase of outside water supplies	Acre feet per Annum of purchased water supply;  Number of projects implemented to upgrade or improve aging infrastructure	Annual cost of water purchases
		F: Consistent compliance with chlorine contact requirements	Measureable improvement in water quality;  Availability of Max Daily Demand;  Availability of 120,000 excess fire reserve;  Number of collaboratively developed plans and assessments	Residual chlorine analyzer and chart recorder, tank level indicator and chart recorder, daily temperature and treated water pH measurements, and daily chlorine contact calculations
	<i>Where possible, outreach and education will be integrated into all CABY projects and programs; this will include both school education and public and community outreach</i>	G: Reduce average daily demand over time	Average Daily Demand (ADD)  Measurable changes in knowledge of behavior  Number and diversity of people reached	Establish and maintain distribution meter reading logs  Consumer surveys

<b>Goal 2:</b>  <b>Ensure sufficient water quality to support healthy ecosystems and dependent organisms</b>	<i>Increase the number of water bodies that can achieve water quality objectives by working with affected parties to restore a natural balance to river systems via the implementation of at least 5 projects by 2020.</i>	A: Zero discharge of chlorinated water	Mass of pollutant reduced per year	Plant effluent flow meters and chart recorders, tank level indicator and chart recorder, chlorine residual analyzer and chart recorder, daily confirmation of plant production based on actual usage (as indicated by tank level), daily confirmation of residual chlorine concentration, and totalization of annual plant production
		B: Elimination of excess water treated and discharged to waste	Dollars per annum saved in treatment costs	Compare previous years' cost of chemicals, replacement filter media, etc. to post project costs
<b>Goal 3:</b>  <b>Preserve and restore watershed health.</b>	<i>Reduce risk of environmental and property damage by working with regional agencies to conduct fuels management on at least 10,000 acres to address loss from catastrophic fire by 2017.</i>	A: Treat two acres	Acres of land improved or restored  Number and diversity of people reached	Treated acres with PRC 4291 compliance
<b>Goal 4:</b>  <b>Maintain and enhance functioning landscapes that provide sustainable services for humans</b>	<i>Work with DACs to develop high scoring projects</i>	Highest score in the CABY IRWMP	DWR Application Score  Number of DAC projects and percent of total infrastructure funding requests	DWR application assessment documentation

## **CAMPTONVILLE WATER SYSTEM IMPROVEMENT PROJECT - PERFORMANCE MEASURES NARRATIVE**

As shown above, this project's Performance Measures were designed to conform exactly to the goals, primary issues and objectives of the updated CABY IRWM plan. All data will be collected as part of the project's internal reporting and as a component of the required grant reporting. All performance measures will be evaluated in the final report required for the grant contract.

### **Goal 1 – Target A: Increase Flows in Campbell Gulch**

Currently, water is diverted from Campbell Gulch and treated based on the operator's forecast of near-term future customer demand. In order not to run short, the operator tends to forecast on the high side. This operational scenario results in periods when demand is less than forecasted and excess water is treated, spilled out of the tank, and discharged to waste. The discharged to waste water does eventually re-enter Campbell Gulch, however a portion is lost to evaporation and seepage. This results in unnecessarily reduced flows in a portion of Campbell Gulch and permanent loss of flows to the creek system. This has also resulted in CCSD diverting more than their DWR allotment of 10,000,000 gallons per year. As a result of the modifications to plant controls proposed in this project, plant production will be based on the actual customer demand as reflected by the tank level. No water in excess of that consumed by CCSD customers will be diverted or lost from Campbell Gulch. Plant records show the amount of water diverted and treated through the plant. Customer water meter records show the amount of water consumed. By comparing plant production records and customer consumption records, the amount of excess water discharged to waste can be quantified on a gallons/year basis. Future plant production records will verify that excess water will no longer be diverted and/or discharged to waste. The amount of water no longer being discharged to waste, quantified in gallons/year, is considered a direct ongoing benefit to Campbell Gulch and the downstream watershed as well as a direct financial benefit to CCSD quantified in \$/year. In addition, annual plant production records will be used to verify whether CCSD stays within their DWR allotment.

### **Goal 1 – Target B: Minimize Unaccounted-For Water**

Unaccounted-for water, also referred to as non-revenue water, is water that has been diverted, treated, and put into the distribution system but is lost before it reaches the customer. These can be direct losses through leakage, theft, or un-metered extractions at fire hydrants, or they can be due to metering inaccuracies. Unaccounted-for water is quantified as the difference between the total water leaving the treatment plant and the total of all customer meter readings over the same period of time, usually expressed in gallons/day. As has been previously discussed, the CCSD plant experiences water losses by treating excess water and discharging to waste from the storage tank. This practice will be eliminated as a result of the proposed project. As a result, any difference between plant effluent and customer meter readings will be considered unaccounted-for water. Once the scope of the unaccounted-for water has been quantified, CCSD can develop a management program which may include a leak

detection program and a meter calibration/replacement program. The goal of the unaccounted-for water management program should be to maintain unaccounted-for water at 10% or less of the total water produced. Reducing water loss through implementation of an unaccounted-for water management plan is a direct benefit which can be quantified as gallons/year and as \$/year.

**Goal 1 – Target C: Meet Maximum Day Demands**

Under the current configuration, the treatment plant is not able to meet the maximum day demand, estimated at 100,000 gallons per day, at the plant’s filter flow rate of 0.065 gpm/sq.ft. This puts the plant out of compliance with the State Waterworks Standards (Title 22, CCR). Plant records for tank level show days when the tank did not fully recover meaning the plant did not produce enough water to meet the daily demand. From these records, the history of non-compliance can be quantified. Following the construction of additional slow sand filter area, installation of additional plant effluent meters, and installation of the tank level indicator and chart recorder, the plant will be able meet maximum day demand requirements and the operator will be able to verify and log compliance. Compliance with maximum day demand requirements is considered a direct health and safety benefit to the CCSD customers. By comparing future water production records with historic records, CCSD will be able to quantify the benefit of being in compliance on a days/year basis.

**Goal 1 – Target D: Reduced Operator Cost**

Treatment plant improvements included in the proposed project will result in automation of plant functions which will in turn result in a reduction of man hours needed to operate the plant. Examples include automatic pacing of filter production based on system demand as measured by tank level such that the operator does not have to forecast future demand and make manual daily adjustments to filter flow rates, and continuous residual chlorine analysis and chart recording which will eliminate the need for the operator to conduct daily grab samples and bench tests. Elimination of treatment of excess water discharged to waste will reduce the frequency of filter maintenance operations, and the addition of filter cell flush valves will allow more efficient raking of the *Schmutzdecke*. Operator time cards will be used to quantify labor savings in \$/year by comparing future and past labor costs on an annual basis, with a goal of reducing labor costs by 10%. Reduction of labor cost is a direct financial benefit to CCSD customers.

**Goal 1 – Target E: Avoid Future Water Purchases**

In the past, CCSD has had to purchase treated water and have it transported to Camptonville by tanker truck to meet short term needs when the treatment plant could not supply sufficient water. CCSD has records of these costs. Following completion of the project improvements, CCSD will compare the cost of future water purchases (which will hopefully be eliminated completely by the

project) to past water purchases on an annual basis. Any reduction in water purchase costs will be quantified in \$/year and considered as a direct financial benefit resulting from the project.

**Goal 1 – Target F: Meet Chlorine Contact Requirements**

Because of the lack of a proper contact tank, the plant is not able to provide adequate contact time during periods when the existing storage tank is drawn down. This puts the plant out of compliance with Surface Water Treatment Rules and the State Waterworks Standards as defined in Title 22 of the California Code of Regulations. Plant records show incidences of tank drawdown events which result in non-compliance such that the history of non-compliance can be quantified. Following the construction of the new water storage tank and installation of the chlorine residual analyzer and chart recorder and tank level indicator and chart recorder, the plant will be able meet contact time requirements and the operator will be able to verify compliance by making and logging daily chlorine contact calculations. Compliance with chlorine contact requirements is considered a direct health and safety benefit to the CCSD customers. By comparing future chlorine contact records with historic records, CCSD will be able to quantify the benefit of being in compliance on a days/year basis.

**Goal 1 – Target G: Reduce Water Demand at the Consumer Level**

A “water efficiency education” program conducted under this project will educate Camptonville Water System customers on one, the fragility of our water supply under normal weather patterns, and the risks associated with climate change effects, on two, the need to conserve water, and on three, the ways that users can conserve and reduce water consumption on an everyday basis, and during water emergencies. Education materials can be developed in the community, using resources developed outside the community for large populations, but customized for the unique rural population in this very small community. The amount of water consumed on a monthly basis can be recorded, and a quantity known as the “Average Daily Demand” computed for the entire system. This parameter can be trended over time and the impacts of education can be verified.

**Goal 2 – Target A: Headwaters Protection, Eliminate Discharge of Chlorinated Water**

Currently, because of limitations in plant process controls, the plant periodically treats excess water which is discharged to waste from the water storage tank. Chlorine concentration in the discharged water typically ranges from 0.3 mg/l to 1.0 mg/l. Water leaves the tank through a pipeline which discharges to a rock dissipater, then is conveyed through an open drainage channel, and is eventually discharged to Campbell Gulch. Chlorine concentrations at the point of discharge are reduced through dissipation along the open channel, however it is likely that some level of chlorinated water is being periodically discharged to Campbell Gulch. As described in Goal 4 above, the amount of water discharged to waste can be quantified on a gallons/year basis and future plant production records will verify that excess water will no longer be discharged to waste. The amount of chlorinated water no longer

being discharged to waste, quantified in gallons/year, is considered a direct ongoing benefit to Campbell Gulch and the downstream watershed.

**Goal 2 – Target B: Reduce Treatment Cost**

Implementation of the proposed project will eliminate the treatment of excess water discharged to waste. This will reduce the total amount of water treated per year which will in turn reduce the total cost of treatment per year. These reductions will be seen as lower chemical costs and lower filter media replacement costs which can be quantified in \$/year. Treatment cost savings is a direct financial benefit to CCSD customers.

**Goal 3 – Target A: Reduce Hazardous Fuels Surrounding Treatment Plant**

The water treatment plant sits on 3.9 acres of timbered land, and is surrounded by the wild land, and is zoned “Very High Fire Hazard Severity” by Calfire. The plant is at risk of damage and loss due to wild fire, and currently hazardous fuels lie within 25 feet of the slow-sand filter structure. The proposed fuels treatment is removal of ladder fuels, increased spacing of trees and brush, and compliance with PRC 4291. The target of 2 acres will provide fuels treatment within 200 feet of the plant and tank structures.

All data will be collected as part of the project’s internal reporting and as a component of the required grant reporting. All performance measures will be evaluated in the final report required for the grant contract.

## 2. CITY OF PLACERVILLE WATERLINE REPLACEMENT

Project Goal	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
<b>Goal 1:</b> <b>Ensure adequate and reliable supply that can be adapted to climate change and can meet the needs of the region: Conservation</b>	Reduce City's total demand for raw water necessary to meet City customer demands, due to increased conservation	A reduction of 70 acre-feet annually	Acre feet per annum of water supply conserved	Evaluate City water supply and demand data
<b>Goal 1:</b> <b>Ensure adequate and reliable supply that can be adapted to climate change and can meet the needs of the region: Aging Infrastructure</b>	Reduce long term water losses	Replace 3,700 feet of pipeline	Number of feet of water line that is replaced to upgrade or improve aging infrastructure	Final Report
<b>Goal 4:</b> <b>Anticipate climate change needs and be prepared to respond adaptively to human and ecosystem needs</b>	Lower air quality impacts and greenhouse gas emissions associated with the energy used for treatment and conveyance.	34 tons GHG reductions (includes CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O)	Tons of emissions avoided	Document electricity consumption for treatment and delivery of water and convert to tons GHG using the CARB, EPA, or other conversion calculation
	Lower air quality impacts and reduce natural gas consumption.	600 MCF natural gas savings	Thousand Cubic Feet of natural gas savings	Document Project specific electricity generation through EID project reports and PG&E reporting requirements. Conversion using the EPA AP 42 Compilation of Air Pollution Emission Factors

	Lower air quality impacts and reduce pollutants.	61 lbs/yr of pollutants (CO, PM, VOC and TOC)	Pounds per year of pollutants avoided	Document Project specific electricity generation through EID project reports and PG&E reporting requirements. Conversion using the EPA AP 42 Compilation of Air Pollution Emission Factors
	Implementation of 1 project which includes climate change adaptive strategies	1 project implemented	Number of adaptive strategies implemented in the CABY Region	Final Report
<b>Goal 2: Ensure sufficient water quality to support healthy ecosystems and dependent organisms: Sedimentation</b>	Protect water quality by reducing the risk of pipeline failure with associated soil erosion and potential sedimentation of nearby streams.	Replace failing infrastructure	Reduced number of pipeline failures resulting in sediment transport to streams	Document response to infrastructure failures

**CITY OF PLACERVILLE WATERLINE REPLACEMENT – PERFORMANCE MEASURES NARRATIVE**

The monitoring system used to verify the identified performance measures will be developed using the monitoring activities specified by CABY in the updated IRWMP. Appropriate performance measures were identified for this particular project. In this way the project will implement the Plan directly by answering specifically to the performance measures addressing the specific objectives identified as relevant to this individual project. The CABY specific objectives identified for this project are:

- 1) Ensure adequate and reliable supply that can be adapted to climate change and can meet the needs of the region.
- 2) Anticipate climate change needs and be prepared to respond adaptively to human and ecosystem needs.

The CABY specific performance measures include the following project-level monitoring activities as identified in the IRWMP:

- Acre feet per annum of water supply conserved
- Number of feet of water line that is replaced to upgrade or improve aging infrastructure
- Tons of emissions avoided

- Thousand Cubic Feet of natural gas savings
- Pounds per year of pollutants avoided
- Number of adaptive strategies implemented in the CABY Region
- Reduced number of pipeline failures resulting in sediment transport to streams

These monitoring activities were tailored to specifically assess the CABY goals and objectives identified for this project. This data will be collected on a quarterly basis as part of the City of Placerville’s internal reporting and as a component of the required quarterly grant reporting. The data will be compiled into the CABY Data Management System, which allows project sponsors to report on performance measures by uploading to the CABY website. The results of this reporting will be a two-to-three-page publication that describes the findings and policy implications. All performance measures will be evaluated in the final report required for the grant contract.

In order to interpret these performance measures the data will be analyzed using the following methods as appropriate for each individual monitoring activity. To confirm the amount of water conserved through project implementation the City will evaluate water supply and demand data before and after project construction. Construction reporting will document and confirm the deteriorated state of the existing infrastructure and the amount of water line replaced. Electricity consumption for treatment and delivery of water will be documented and converted to tons GHG using the CARB, EPA, or other conversion calculation. Project specific electricity generation will be documented through EID project reports and PG&E reporting requirements. This data will then be converted to amount of natural gas savings and pollutants avoided using the EPA AP 42 Compilation of Air Pollution Emission Factors. To document the overall success of the project, the City will document and review responses and frequency of future infrastructure failures.

A monitoring plan will be developed in coordination with CABY and DWR immediately following execution of contract. A typical monitoring plan for projects in the CABY IRWMP would include a brief description of the project and GPS-based location, a description of the monitoring that will be done for the project and the specific, GPS-based location of that monitoring, the protocols and frequency of the monitoring done, the individual and/or entity responsible for monitoring is identified and a contingency plan described in the case that the individual or entity is unable to complete the responsibility, a plan for tracking the data and how it will be used; also, how the data will be made public and how the public will benefit from the information made available and whether any interpretation will be necessary and done in order to convey particular messages to the public, and a description of the funding and/or volunteer coordination efforts needed to complete the monitoring task and how, if applicable, the work will be funded if scheduled to be complete after grant funds expire or are used in full on project implementation.

### 3. EL DORADO COUNTY SMALL HYDROELECTRIC DEVELOPMENT PROGRAM

Project Goal	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
<b>Goal 4:</b> <b>Anticipate climate change needs and be prepared to respond adaptively to human and ecosystem needs</b>	New source of non-carbon, renewable energy with existing water rights and infrastructure	Decrease dependency on the electric grid	Kilowatts of renewable energy production capacity created	Document Project specific electricity generation through EID project reports and PG&E reporting requirements
<b>Goal 5:</b> <b>Maintain and enhance functioning landscapes that provide sustainable services for humans: Hydropower</b>	Governors Clean Energy Jobs Plan – Contribute to the goal of building 12,000 MW of localized electricity generation by 2020 clean energy jobs plan by featuring (emphasizing) the renewable energy potential in the CABY region;	590 Kilowatts of annual localized electricity generation	Kilowatts of renewable energy production capacity created	Document Project specific electricity generation through EID project reports and PG&E reporting requirements
	Hydroelectric development resulting in a reduction in greenhouse gas emissions.	716 MTCO <sub>2</sub> e GHG reductions	Tons of emissions avoided	Document Project specific electricity generation through EID project reports and PG&E reporting requirements. Convert to tons GHG using the EPA Greenhouse Gas calculator

	Hydroelectric development resulting in natural gas savings.	12,600 MCF natural gas savings	Thousand Cubic Feet of natural gas savings	Document Project specific electricity generation through EID project reports and PG&E reporting requirements. Conversion using the EPA AP 42 Compilation of Air Pollution Emission Factors
	Hydroelectric development resulting in a reduction of pollutants.	1,300 lbs/yr of pollutants (CO, PM, VOC and TOC)	Pounds per year of pollutants avoided	Document Project specific electricity generation through EID project reports and PG&E reporting requirements. Conversion using the EPA AP 42 Compilation of Air Pollution Emission Factors
	Implementation of 1 project which includes climate change adaptive strategies	1 project implemented	Number of adaptive strategies implemented in the CABY Region	Final Report

**EL DORADO COUNTY SMALL HYDROELECTRIC DEVELOPMENT PROGRAM – PERFORMANCE MEASURES NARRATIVE**

The monitoring system used to verify the identified performance measures will be developed using the monitoring activities specified by CABY in the updated IRWMP. Appropriate performance measures were identified for this particular project. In this way the project will implement the Plan directly by answering specifically to the performance measures addressing the specific objectives identified as relevant to this individual project. The CABY specific objective identified for this project is to:

- 3) Anticipate climate change need and be prepared to respond adaptively to human and ecosystem needs; Maintain and enhance functioning landscapes that provide sustainable services for humans.

The CABY specific performance measures include the following project-level monitoring activities as identified in the IRWMP:

- Kilowatts of renewable energy production capacity created
- Tons of emissions avoided
- Thousand Cubic Feet of natural gas savings

- Pounds per year of pollutants avoided
- Number of adaptive strategies implemented in the CABY Region

These monitoring activities were tailored to specifically assess the CABY goals and objectives identified for this project. This data will be collected on a quarterly basis as part of the EID's internal reporting and as a component of the required quarterly grant reporting. The data will be compiled into the CABY Data Management System, which allows project sponsors to report on performance measures by uploading to the CABY website. The results of this reporting will be a two-to-three-page publication that describes the findings and policy implications. All performance measures will be evaluated in the final report required for the grant contract.

In order to interpret these performance measures the data will be analyzed using the following methods as appropriate for each individual monitoring activity. Project specific electricity generation will be documented using EID project reports and PG&E reporting requirements. Electricity consumption will be converted to tons GHG using the EPA Greenhouse Gas Calculator. This data will then be converted to amount of natural gas savings and pollutants avoided using the EPA AP 42 Compilation of Air Pollution Emission Factors. To document the overall success of the project, EID will document and review Project implementation activities for completion and improved operations.

A monitoring plan will be developed in coordination with CABY and DWR immediately following execution of contract. A typical monitoring plan for projects in the CABY IRWMP would include a brief description of the project and GPS-based location, a description of the monitoring that will be done for the project and the specific, GPS-based location of that monitoring, the protocols and frequency of the monitoring done, the individual and/or entity responsible for monitoring is identified and a contingency plan described in the case that the individual or entity is unable to complete the responsibility, a plan for tracking the data and how it will be used; also, how the data will be made public and how the public will benefit from the information made available and whether any interpretation will be necessary and done in order to convey particular messages to the public, and a description of the funding and/or volunteer coordination efforts needed to complete the monitoring task and how, if applicable, the work will be funded if scheduled to be complete after grant funds expire or are used in full on project implementation.

#### 4. WATER EFFICIENCY, WATER QUALITY AND SUPPLY RELIABILITY IN THE CABY REGION

Project Goal	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
<b>Goal 1:</b> <b>Ensure adequate and reliable water supply that can be adapted to climate change and can meet the needs of the Region: Conservation, Aging Infrastructure</b>	Connectivity between delivery systems in the case of a catastrophic infrastructure failure	2 interties built	Interties successfully installed and working	Bidirectional flow tests.
	Improve canals to reduce leakage	1.4miles of canal lining and reduce water losses by at least 200 acre feet per year	Lining installed and flowing water without leakage	Decreased water losses by comparing measurement data before and after installation
	Measure water losses in earthen canals	Installation of 6 Gaging Stations, and installation of 100 staff gauges	Gaging Stations installed, calibrated and operational	Visual and/or electronic measurement of water flow at the heads and ends of canals
<b>Overarching Objective:</b> <b>Integrate water efficiency education and outreach programs into CABY projects</b>	Real water savings by the region's water users (irrigation and treated water)	a) Common (unified) message to customers in Placer and Nevada Counties regarding water conservation.  b) Increase the number of NID treated water customers receiving educational materials to be 50% of same for PCWA.	Similar, or identical water education programs between PCWA and NID	a) Outreach data indicating number of customers informed with common PCWA/NID resources b) Survey of treated water customers indicating their awareness of available resources for both agencies. c) Comparison of outreach and survey information between agencies.

## **WATER EFFICIENCY, WATER QUALITY AND SUPPLY RELIABILITY IN THE CABY REGION – PERFORMANCE MEASURES NARRATIVE**

As shown above, this project’s Performance Measures were designed to conform exactly to the goals, primary issues and objectives of the updated CABY IRWM plan. All data will be collected as part of the project’s internal reporting and as a component of the required grant reporting. All performance measures will be evaluated in the final report required for the grant contract.

### **Canal Lining**

Prior to construction, inflow/outflow measurements will be taken to estimate pre-project water losses. Upon completion of construction, inflow/outflow measurements will be taken and compared to pre-project inflow/outflow measurements of the project canal to estimate actual reductions of water loss. Additionally, total post project monthly and annual flows at the Gold Run Pipe Metering Station will be compared to prior months and years to further quantify reductions in water losses. (Gold Run Pipe Metering Station is located upstream of the project canal and records water flows into the project canal on to the PCWA SCADA computer)

After each section of canal is lined with gunite, the soil that was disturbed constructing the access route(s) will be tilled and rice straw waddles will be placed to further reduce the potential for erosion to occur. The disturbed areas may be reseeded with native grasses if recommended by the PCWA Environmental Specialist. All construction activities will follow and adhere to the PCWA Natural Resources Management Plan for Operations and Maintenance Activities (April 2009).

### **Gaging Stations**

Upon completion and calibration, water flow measurements taken from the head gauges and end gauges will be used to measure in-flow and out-flow water along canal segments. This information can then be compared to the quantity of water purchased by customers, enabling the District to refine its operations to reduce operational losses and seepage losses in each canal segment.

### **Education**

During implementation, both agencies will meet and confer on the measurement data on a semi-annual basis, to evaluate the effectiveness of the program and make changes, as necessary, to meet the objectives; in addition, the measurement data will be compared to pre-implementation data.

## 5. WOLF CREEK WATERSHED: RESTORATION, STORMWATER SOURCE CONTROL AND FLOOD MANAGEMENT

Goal	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
<b>Goal 2:</b> <b>Ensure sufficient water quality to support healthy ecosystems and dependent organisms:</b> <b>Contamination, Wastewater Management: Headwaters Protection</b>	Reduce volume and pollutant load of stormwater runoff	10 acre feet per year	Acre feet per annum of runoff that is slowed down and cleaned through green infrastructure stormwater treatment controls	The runoff volume calculated from impervious surface area that is managed by source control (pervious pavement, on-site retention)
	Reduce pollutant loads in a waterbody that is 303d listed	10 acre feet per year	Acre feet per annum of runoff that is slowed down and cleaned through green infrastructure stormwater treatment controls	The runoff volume calculated from impervious surface area that is managed by source control (pervious pavement, on-site retention)
	Increased resilience in project area achieved through stabilizing eroding stream banks and enhancing riparian habitat	325 linear feet	Linear feet of stream bank revegetated and/or restored	GIS delineation
<b>Goal 3:</b> <b>Preserve and restore watershed health: Terrestrial Invasive Species</b>	Conduct non-native invasive plant prevention and control actions	Invasive plants removed from .5 acres	Acres of land enhanced	Plant survey

Goal	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
	Conduct non-native invasive plant education	10 interns trained	# of interns participating in training	Sign-in sheet for training session
<b>Goal 5: Maintain and enhance functioning landscapes that provide sustainable services for humans: Flooding: Disadvantaged Communities</b>	Restored floodplain to reduce flood risk in surrounding developed area	.5 acres of floodplain restored	Acres of floodplain restored	GIS-based floodplain delineation
	Increase infiltration of stormwater to reduce flooding	8 acre feet per annum of increased stormwater infiltration	Acre feet per annum of increased stormwater infiltration	The runoff volume calculated from impervious surface area that is managed by source control (pervious pavement, on-site retention)
	Reduce FEMA-designated floodplain area in a disadvantaged community	6 acres	Decrease in the number of acres covered by the FEMA inundation zone	Comparing the redrawn FEMA flood map to the pre-project map.
	Implement high-priority project in a disadvantaged community	1 project	Completion of project	Final report submitted to DWR
<b>Overarching Objective: Education/Outreach</b>	Educate and empower residents of Grass Valley to preserve and enhance watershed health	200 community members receive information about how to control runoff at their homes	Number of outreach materials distributed	Track outreach material distribution
	Engage DAC residents in watershed stewardship and protection	20 residents control runoff at its source	Measurable changes in knowledge or behavior	Survey residents to track the number of sites that disconnect their downspouts from the stormwater system.

	Educate contractors in region in green infrastructure stormwater management techniques	3 trainings to contractors about pervious concrete	Number of trainings conducted	Record of trainings
<b>Overarching Objective: Regional Planning and Land Use</b>	Local community educated regarding storm water run-off and the positive effects of low-impact design	2 interpretive signs	Number of signs developed and installed	Signs installed
		Project-specific webpage	Webpage live and available to the general public	Counts of web page views tracked using web analytics
	Increase coordinated planning in the region	1 collaborative watershed assessment	Number of collaborative watershed assessments completed	Completed assessment document

## **WOLF CREEK WATERSHED: RESTORATION, STORMWATER SOURCE CONTROL AND FLOOD MANAGEMENT – PERFORMANCE MEASURES NARRATIVE**

As shown above, this project's Performance Measures were designed to conform exactly to the goals, primary issues and objectives of the updated CABY IRWM plan. All data will be collected as part of the project's internal reporting and as a component of the required grant reporting. All performance measures will be evaluated in the final report required for the grant contract.

As shown in the table above, the project team has identified specific targets and indicators to measure our progress toward desired goals and outcomes. We have identified specific measurement tools and methods for each target and indicator. Below, we provide additional detail on the systems we will use to verify project performance.

- To measure reduction in the volume and pollutant load of stormwater runoff, we will calculate the volume of stormwater treated. This will be calculated by measuring the area of impervious surface treated by source control measures (including pervious concrete, downspout disconnection, and rain barrels), the annual rainfall, and the capture efficiency of the control measure. The standard equation is catchment area (ft<sup>2</sup>) x rainfall (ft) x 7.48 gal/ft x runoff coefficient = net runoff (gal) (Lancaster 2006). Once Task 6 (Stormwater Source Control Program) is complete, we will measure the area of pervious pavement that was installed. Additionally, we will conduct surveys to determine how many residents disconnected their downspouts and installed rain barrels. We will use this information to determine the total area of impervious surface treated by source control measures.
- We will use GIS delineation to measure the length of eroding stream banks and riparian habitat that is restored, as well as the area of floodplain that is restored. A half-acre of land will be restored to its natural state as a floodplain. This will improve the land's ability to control flooding in the area. Additionally, the current stream bank is primarily unvegetated and unarmored, which has led to an eroding the channel that cannot reach its main floodplain. The project will create a series of grade control structures in the channel of the Upper Floodplain that will reduce channel scour and reengage the floodplain. Plantings along the banks and in the floodplain will reduce erosion and further stabilize the bank. The length of bank improved will be measured by GIS delineation of aerial photos and will be tracked as a performance measure. The floodplain restoration will be measured by a GIS delineation of aerial photography and tracked as the floodplain is reengaged.
- To measure the decrease in the number of acres covered by the FEMA inundation zone we will compare the Flood Inundation Rate Maps (FIRMs) before and after Task 5 (Update Flood Insurance Rate Map (FIRM) for Peabody Creek Watershed) is implemented. This will allow us to quantify the decrease in acreage within the 100-year floodplain.

- We will conduct a plant survey to determine the progress toward our target of removing invasive plants and establishing native vegetation on .5 acres of land. This will involve measuring the change in ground cover, the diversity of herbaceous species, and ecological condition.
- We will use before and after surveys to track changes in knowledge and behavior (for invasive species removal and control and stormwater source control). Additionally, the project seeks to have at least 20 people manage their roof runoff at the source through downspout disconnection and rain barrels. The number of properties that physically disconnect their roofs from the stormwater system will be counted and recorded.
- We will track progress toward our objective of implementing a high-priority project in a disadvantaged community by completion of project tasks, which will be recorded through reports sent to DWR throughout the project period. We will consider this objective to have been achieved when we submit the final report for the project, which will describe our activities and outcomes.
- To track progress toward our objective of educating and empowering residents of Grass Valley to preserve and enhance watershed health, we will count and record the number of outreach documents that are developed and distributed. Our intent is to reach 200 community members who will receive information about how to control runoff at their homes through downspout disconnection, rain barrels, and rain gardens.
- In order to track progress toward our objective of educating contractors in the region in green infrastructure stormwater management techniques we will require that participants sign in via sign-in sheets so that we can record who attended the trainings that are held.
- In order to track progress toward our objective of educating the local community regarding storm water run-off and the positive effects of low-impact design we will install an interpretive sign at the floodplain restoration site, which is a high-traffic site, as well as count the number of hits on the project-specific webpage. The webpage hits will be counted using website analytics that are built into the page design.
- We will use the watershed assessment document to track progress toward our objective of increasing coordinated planning in the region. The document will describe the partners and stakeholders involved in the assessment, as well as their respective roles. This will allow us to determine the level of coordination involved.

## 6. CABY MERCURY AND SEDIMENT ABATEMENT INITIATIVE

CABY/Project Goals and Primary Issues	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
<b>Goal 2:</b>  <b>Ensure sufficient water quality to support healthy ecosystems, and dependent organisms (both human health and wildlife):</b> <b>Contamination, Legacy Mining Toxins, Abandoned Mine Run Off</b>	Abandoned mine sites selected for remediation (planning, design, and/or implementation) as part of a collaborative process involving land owners and other stakeholders	3 abandoned mine sites	<ul style="list-style-type: none"> <li>▪ Number of abandoned mine lands sites improved or restored</li> <li>▪ Number of collaboratively developed plans or assessments</li> </ul>	Count plans and mine sites by looking at individual project deliverables
	Remove mercury, a legacy mining contaminant, from water system	1,003 pounds	Pounds of mercury reduced per year	<ul style="list-style-type: none"> <li>▪ Weigh elemental mercury removed from sediment at Combie Reservoir</li> <li>▪ Water quality and sediment monitoring at Malakoff Diggins</li> <li>▪ Water quality and sediment monitoring at Relief Hill Diggins</li> </ul>
	Reduce sediment discharge, a legacy mining water quality contaminant, from the water system	20,003,000 pounds	Pounds of sediment discharge reduced (total)	<ul style="list-style-type: none"> <li>▪ Water quality and sediment monitoring at Malakoff Diggins</li> <li>▪ Water quality and sediment monitoring at Relief Hill Diggins</li> </ul>
	Increase the number of water bodies that can achieve water quality objectives for suspended sediment and mercury in discharge	<ul style="list-style-type: none"> <li>▪ 3 water bodies</li> <li>▪ 14,400 linear feet of stream bank protected</li> <li>▪ 26 acres of riparian habitat protected</li> </ul>	<ul style="list-style-type: none"> <li>▪ Linear feet of stream bank protected or restored</li> <li>▪ Acres of riparian habitat and/or floodplain protected or restored</li> <li>▪ Measurable improvement in water quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Quantify linear feet and acres protected or restored through GIS delineation.</li> <li>▪ Measure water quality including mercury and turbidity through continuous monitoring station and grab samples.</li> </ul>

	Identify the major threats to watersheds that are critical for surface drinking water by working with stakeholders	<ul style="list-style-type: none"> <li>▪ Major threats from abandoned mines described in 4 reports</li> <li>▪ 3 continuous water quality monitoring gage stations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of collaboratively developed plans or assessments</li> <li>▪ Number of critical surface drinking water watersheds identified and major threats described</li> </ul>	Final project deliverables including assessments, feasibility studies, and construction “after-action” reports
	Develop projects that make the forests in these watersheds more resilient to the identified threats, working with stakeholders	<ul style="list-style-type: none"> <li>▪ 3 projects addressing major threats from abandoned mines</li> <li>▪ 88 acres of land restored</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of projects addressing threats to source water areas and increased resiliency of those watersheds</li> <li>▪ Acres of land improved or restored</li> </ul>	<ul style="list-style-type: none"> <li>▪ Count projects by looking at individual project deliverables</li> <li>▪ Acres of land will be quantified through GIS delineation and included in above mentioned deliverable reports</li> </ul>
<b>Goal 1: Ensure adequate and reliable water supply that can be adapted to climate change and can meet the needs of the region: Water Storage</b>	Demonstrate reservoir maintenance activities that restore water storage capacity and that are effective at treating mercury-contaminated sediment	Funding secured for full project implementation at Combie Reservoir	<ul style="list-style-type: none"> <li>▪ Number of project funding opportunities applied for</li> <li>▪ Number of individuals participating in public demonstrations</li> </ul>	Count grant application opportunities
<b>Goal 4: Anticipate climate change needs and be prepared to respond adaptively to human and ecosystem needs</b>	Demonstrate adaptive strategies to reservoir maintenance and abandoned mine lands restoration that will make the CABY region more resilient	2 adaptive strategies demonstrated	<ul style="list-style-type: none"> <li>▪ Number of collaboratively developed plans or assessments</li> </ul>	Regional Mercury Strategy document (project deliverable) and other final project deliverables

<b>Goal 5: Maintain and enhance functioning landscapes that provide sustainable services for humans</b>	Involve substantial Native American contribution in project development and implementation	<ul style="list-style-type: none"> <li>▪ 2 projects with Native American leadership</li> <li>▪ 200 individuals reached</li> <li>▪ 38 jobs created for Native Americans</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of collaboratively developed plans or assessments</li> <li>▪ Number and diversity of people reached</li> <li>▪ Number and types of jobs created for Native Americans</li> </ul>	<ul style="list-style-type: none"> <li>▪ Roster of participants in CABY Mercury Forum (a project deliverable)</li> <li>▪ Count number of Native interns implementing Angler Survey</li> <li>▪ Count number of surveyed anglers that choose to report Native American ethnicity</li> </ul>
	Ensure sustainable employment in the CABY region, including disadvantaged communities	66 contractor jobs or new jobs created (various FTE%)  23 professional staff jobs sustained (various FTE%)	<ul style="list-style-type: none"> <li>▪ Number and types of jobs created</li> </ul>	Personnel timesheets and contract invoices (project deliverables)
<b>Overarching Objective: Education and Outreach</b>	Complete data set for fish tissue data at priority water bodies in CABY region	<ul style="list-style-type: none"> <li>▪ 8 water bodies</li> <li>▪ 500 fish tissue samples</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of water bodies with adequate fish tissue data collected to release fish consumption guidelines for all species of concern</li> <li>▪ Number of fish tissue samples collected</li> </ul>	Data submitted to qualified state database and include data in final Angler Survey report (project deliverable)
	Post signage about existing fish consumption guidelines at 303(d) listed water bodies in the CABY region	12 water bodies	<ul style="list-style-type: none"> <li>▪ Number of 303(d) listed water bodies posted with consumption guidelines</li> </ul>	Count water bodies posted and include information in final Angler Survey report (project deliverable)

	Quantify number and type of people consuming fish from CABY water bodies contaminated with mercury (303 (d) listed) by conducting surveys of individuals fishing at each location	150 surveys completed	<ul style="list-style-type: none"> <li>▪ Number and diversity of people reached</li> </ul>	Count completed surveys and analyze in final Angler Survey report (project deliverable)
	Educate individuals fishing at CABY water bodies about the presence and dangers of eating mercury-contaminated fish	200 individuals	<ul style="list-style-type: none"> <li>▪ Number and diversity of people reached</li> </ul>	Count encounters and analyze in final Angler Survey report (project deliverable)
<b>Overarching Objective: Stimulate region-wide coordination and planning</b>	Encourage that all planning in the region be completed in a coordinated fashion that ensures communication and shared solutions	1 CABY region mercury strategy	<ul style="list-style-type: none"> <li>▪ Number of collaboratively developed plans or assessments</li> </ul>	Final CABY Mercury Strategy (project deliverable)

## **CABY MERCURY AND SEDIMENT ABATEMENT INITIATIVE – PERFORMANCE MEASURES NARRATIVE**

As shown above, this project’s Performance Measures were designed to conform exactly to the goals, primary issues and objectives of the updated CABY IRWM plan. All data will be collected as part of the project’s internal reporting and as a component of the required grant reporting. All performance measures will be evaluated in the final report required for the grant contract. Below is a narrative description of the performance measures associated with each of the Initiative’s seven projects:

### Relief Hill Hydraulic Mine Remediation Project

This construction project will implement Best Management Practices for reducing erosion of mercury-contaminated sediment from the historic hydraulic mining pit into onsite water ways and riparian areas. BMPs will include engineering controls to reduce erosion and retain mobilized sediment on site, and land use controls to reduce erosion caused by certain site uses (including off-highway vehicle traffic), encourage the growth of soil-stabilizing vegetation, and reduce direct human contact with contaminants. Pre- and post- project monitoring by technical staff at the Forest Service will include mining impacts, water quality, terrestrial invasive species, floodplain/riparian habitat, and overall site improvement. The acreage and linear feet of stream that will benefit from implementation of BMPs will be mapped by GIS, and improvement will be recorded by pre- and post-project photos and periodic monitoring. Re-vegetation will be monitored by Forest Service botanists, and on-scene coordinator. Success of these methods will be detailed in the Forest Service “after-action report” and by Forest Service scientists. Jobs created will be documented by contracts and Forest Service personnel time tracking.

### Malakoff Diggins Hydraulic Mine Feasibility Study

The main project deliverable, a feasibility study to evaluate and select the most effective actions to improve water quality in Humbug Creek, congruent with the natural habitat and resource management objectives and obligations of State Parks, will detail the majority of performance measures and methods of tracking them. GIS, GPS and LiDAR mapping techniques; seismic surveys; and water quality sampling (methods described in detail in Attachment 4, Workplan, Tasks 2.3-2.7) will be used to quantify erosion quantity, rate and transport processes within the pit, and will provide key data upon which to evaluate the success of the treatment prototypes and erosion control plots that will be constructed. Monitoring of prototype effectiveness will include monitoring suspended sediment and mercury loads before and after treatment at discharge locations near the treatment option and at the outlet of the Pit. Jobs created as part of this project will be documented by contracts and The Sierra Fund time tracking.

### Omega Diggins Hydraulic Mine and Scotchman Creek Assessment

The results of this assessment will be documented in the main project deliverable, a collaboratively developed watershed assessment. The final assessment document will detail importance of the Scotchman Creek watershed as a source water area,

monitoring methods used, threats to the resiliency of the watershed including mining issues impacting water quality and habitat, extent of mining impacts including acreage and downstream water reaches, and number and diversity of stakeholders involved in the collaborative process. Monitoring activities will be guided by a Monitoring Plan and Site Inspection Plan (two other project deliverables). Volunteer monitoring to be conducted as part of the assessment process is guided by a Quality Assurance Project Plan approved by the State Water Resources Control Board. Jobs created will be documented by SYRCL staff timecards.

#### Spring Creek and Shady Creek Mining Impacts Assessment

The results of this project will be documented the main project deliverable, a Water Quality Assessment for Spring and Shady Creeks. This document will include details on installation of the two gage stations, and water quality data collected. Documentation of jobs created will include contracts and Yuba Watershed Institute staff timecards.

#### Combie Reservoir Mercury Treatment Facility

The result of purchasing the mercury treatment facility and demonstrating its effectiveness on site is twofold; first, it allows the project concept to be demonstrated to state legislators and others to help secure project funding for full project implementation and second, it allows for final project design of the water treatment component of sediment treatment to be tried and tested prior to full project implementation. Over three years, the demonstration trials will remove at least 36mg of mercury from 9,000lbs of sediment, but full project implementation will remove at least 440lbs of mercury and treat 200,000 tons of sediment and restore 125 acre feet of water storage space. Demonstration trails will have quantified performance measures in that each trial will have a known amount of sediment processed, estimated by bucket load of sediment loaded into the facility, and a recorded amount of mercury removed, measured by weighing the liquid elemental mercury removed from the treated sediment on a scale in the mobile lab. Scientific studies to measure full project implementation benefits with pre and post project monitoring of water, sediment and biota, will be conducted by USGS scientist when the full project is funded, these studies are described briefly in the Physical Benefits narrative.

#### Mercury Contaminated Fish: Data Collection and Public Education

The results of these two studies will be documented in the main project deliverables, a report on Angler Survey data collected and analyzed, and a compilation of data on mercury levels in fish tissue that will be submitted to the appropriate state database including OEHHA and SWAMP. The Angler questionnaire that will be used was based on one developed by the California Department of Public Health for a survey of anglers in the San Francisco Bay/Delta, in order to facilitate regional comparison of fish consumption. Survey report will summarize the survey methods used, number of questionnaires completed by water body, locations questionnaires were completed, demographics and ethnicity of survey respondents, fish species anglers reported eating,

known fish tissue concentrations of mercury, and the calculated exposure of survey participants based on their answers. In addition to completing questionnaires, survey administrators will conduct education and outreach about mercury in fish at each water body and post signs with state-issued fish consumption guidelines. The survey administrators will track the number of individuals that were provided educational materials, and the number of signs posted.

The main project deliverable for the fish tissue task will be fish tissue data that will be used by state agencies (OEHHA) to complete fish consumption guidelines for mercury impaired water bodies in the CABY region. In order to meet state data standards, rigorous protocols will be followed in fish collection and processing. Upon collection, fish samples will be field frozen with water surrounded by dry ice, using a low-stress protocol developed by USGS research team members in conjunction with UC Davis School of Veterinary Medicine (Protocol #13464). Fish will be thawed, weighed, and measured. Individuals within the human health relevant size ranges ( $\geq$  approx. 150 mm for trout and  $\geq$  305 mm for bass) will be analyzed for fresh weight muscle mercury and smaller fish will be analyzed by whole-body methods using standard cold vapor atomic absorption (CVAA) spectrophotometry at an accredited trace metals lab. Nine to 15 edible-/legal-sized fish of each species will be collected from each targeted location, in order to satisfy the fish advisory requirements. Fish species include: bluegill, sunfish, crappies, brown trout, rainbow trout, catfish, smallmouth bass, largemouth bass, spotted bass, striped bass and carp.

#### CABY Mercury Forum

Development of the two main project deliverables, a CABY regional mercury strategy and profiles of projects completed under the CABY Mercury Initiative, will constitute documentation of the performance measures for this task. Additionally, meeting notes (another project deliverable) will be kept to track number and diversity of individuals participating in the forum, and number and frequency of updates the Forum members receive about other related statewide efforts.

## 7. MEADOW RESTORATION, ASSESSMENT AND PRIORITIZATION IN THE AMERICAN, BEAR AND YUBA WATERSHEDS

Project Goal	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
<b>Goal 1: Preserve and restore watershed health.</b>	Develop headwater protection projects	Six projects	Number of meadow restoration or enhancement projects developed, funded, and/or implemented	Number of projects
<b>Goal 2: Preserve and restore watershed health.</b>	Acres of wetlands/meadows improved	12 acres	Acres of land improved or restored reaching prescription.	Number of acres treated
<b>Goal 3: Terrestrial invasive species</b>	Train staff, volunteers and contractors about weeds	Four trainings	Number of trainings conducted per year	Number of trainings
	Survey lands for invasive species	20 acres	Number of acres surveyed for terrestrial invasive species	Number of acres surveyed
	Remove invasive species	Four acres: 60% reduction in invasive species.	Number of acres treated for terrestrial invasive species with a 60% reduction	Number of acres treated
<b>Goal 4: Maintain and enhance functioning landscapes that provide sustainable services for humans.</b>	Include the Sierra Native Alliance into work program	12 members	Number and diversity of people reached (SNC-PM)	Number of people

## **MEADOW RESTORATION, ASSESSMENT AND PRIORITIZATION IN THE AMERICAN, BEAR AND YUBA WATERSHEDS – PERFORMANCE MEASURES NARRATIVE**

As shown above, this project’s Performance Measures were designed to conform exactly to the goals, primary issues and objectives of the updated CABY IRWM plan. All data will be collected as part of the project’s internal reporting and as a component of the required grant reporting. All performance measures will be evaluated in the final report required for the grant contract.

Of the six desired outcomes, four are directly counted and do not require a survey methodology. As an example for the first goal, the target is six projects developed. The number of projects will simply be counted. There is also a target for hosting four trainings. The measurement for this target is a simple count of the number of trainings. However, two outcomes require a measurement protocol to assure that the outcomes have been achieved. These are the aspen stand improvement target and the weed removal target.

To assess if twelve acres of meadow/aspen stands have been improved the following protocol will be employed:

A qualified biologist will work with USFS staff to use the USFS “Aspen Location and Condition” protocol (USFS 2000), which includes:

- 1) Delineation of the actual area treated for encroachment.
- 2) A count of the number of conifers or average density of conifers within the stand.
- 3) A count of young aspen or average density within the stand prior to treatment
- 4) Four or more photo points within the aspen stand prior to the work.
- 5) Sub-sample 2% of the aspens for browse activity.
- 6) Using a spherical densitometer, measure the amount of canopy closure
- 7) Using a tensiometer, take about 20 readings throughout the stand.
- 8) Conduct two bird counts in the morning within the stand.
- 9) The summer following treatment, repeat steps 2 through 8.
- 10) Report data.

The criteria for success are:

Canopy cover decreases by 55%

Soil moisture increases by 28%

There are three new species of birds are found in the stand.

To assess if four acres of meadow have reduced amount of invasive species, the following protocol will be employed: A qualified biologist will work with USFS staff to use the “Guidelines for Monitoring Weed Control” (Auld 2009) protocol, which includes:

- 1) Delineation of the area of infestation.
- 2) Four or more photo points within area following the USFS photo point methods (USFS, 2002)
- 3) Select three 100 meter areas within the meadow.
- 4) Randomly place three 1-meter quadrants within the selected area.
- 5) Record the total extent of the cover of the weeds of concern.
- 6) The summer following treatment, repeat steps 2 through 6.
- 7) Report data.

The criteria for success is:

Decrease in total cover of target species by 60%

## A. PROJECT ADMINISTRATION

Project Goal	Desired Outcome	Target	Performance Indicators	Measurement Tools and Methods
<p><b>CABY Overarching Objective: Stimulate region-wide coordination and planning</b></p> <p>Encourage that all planning in the region be completed in a coordinated fashion that ensures communication and shared solutions</p>	Legal arrangements for grant funding between TSF and participating organizations to cover all of the conditions required by the DWR Grant Agreement.	Execution of all agreements within 5 months (150 days) of grant award	<ul style="list-style-type: none"> <li>Coordinating Committee, TSF and DWR approval of agreements by all participating organizations.</li> </ul>	<ul style="list-style-type: none"> <li>Executed agreements with local project sponsors.</li> <li>DWR execution of grant Agreement.</li> </ul>
	An oversight and management Committee with one representative per grant funded agency to manage grant admin and coordinate with all CABY Project Sponsors (PS)	<ul style="list-style-type: none"> <li>Timely submission of quarterly reports</li> <li>Clear and adequately documented invoices</li> <li>Timely payments to PS</li> </ul>	<ul style="list-style-type: none"> <li>Effective management as demonstrated by development of detailed work plans, schedules, budgets</li> <li>Well documented invoices</li> <li>Timely resolution of any outstanding issues</li> <li>Active participation in calls/meeting and speed of response to requests for information.</li> </ul>	<ul style="list-style-type: none"> <li>Meeting summaries</li> <li>Progress reports</li> <li>Invoices to DWR</li> <li>Payments from DWR</li> <li>Payments to projects sponsors</li> </ul>
	Well organized grant records, confirmation of progress, and proper accounting protocols in place and clear understanding by PS of their financial obligations under the grant.	<ul style="list-style-type: none"> <li>Full payout of all grant funds due</li> <li>No exceptions on financial reports</li> <li>Easy availability of reporting information</li> </ul>	<ul style="list-style-type: none"> <li>Clear and timely financial statements and problem free financial transactions that inform and are approved by all PS</li> <li>Records covering reporting, invoicing and related information accessible to all participants</li> <li>Acceptance by DWR of the required Labor Compliance Program documentation</li> </ul>	<ul style="list-style-type: none"> <li>Monthly financial records</li> <li>Field reports and photos</li> <li>Invoice records</li> <li>Correspondence</li> </ul>

## **PROJECT ADMINISTRATION – PERFORMANCE MEASURES NARRATIVE**

The Sierra Fund will execute agreements with each project sponsor (PS) to define scope of work and payment schedule. Detailed legal agreements will spell out how all conditions and contingencies will be addressed so there is an agreed upon framework to proceed with the grant. Detailed agreement terms and exhibits will articulate the agreed upon basis for grant work. Each PS will have a unique agreement that will be used to determine responsibilities as part of grant implementation.

The Sierra Fund will establish an oversight and management Committee with one representative per grant funded agency to manage grant admin and coordinate with all CABY partners. The committee will help assure that reporting, grant reimbursement, and outstanding issues are handled in a mutually agreeable manner. Meetings may be in person or on the phone. Meeting notes will indicate participation and e-mail correspondence will indicate responsiveness to requests for information. These documents and timely resolution of outstanding issues will provide a firm and verifiable basis to implement the grant. Summaries of all meetings will be distributed in draft and final form. Progress reports will be prepared in draft and final form to meet deadlines per Grant Agreement.

Invoices will be prepared as soon as the corresponding progress report has been accepted by DWR. Payments to PS are to be promptly disbursed after DWR payment is received. The deadlines for reports will be determined by the reporting cycle and required contents will be specified in the DWR Grant Agreement.

The Sierra Fund will effectively manage and maintain grant records. Records covering reporting, invoicing and related information will be accessible to all project sponsors. A regular information flow will provide DWR and participants with latest info on grant. Satisfactory financial records and transactions will help all parties to know that they are receiving the benefits intended by the Grant. Clear financial records and transactions will inform and be approved by all PS.