

Appendix I: Chapter 12 - A through L Review Factors

I.1 Tier 1 Project Descriptions and Review Factors

The following appendix includes project descriptions and a discussion of the factors that informed CABY's project review process for tier 1 projects only. The following project descriptions are organized by programmatic area and are consistent with the numbering system utilized in Chapter 12 tables 12.2 through 12.4. For a complete project list comprising tiers 1-3, see table 12.2 through 12.4 in Chapter 12.

I.1.2 Programmatic Area 1: Water Supply

This section describes four, tier 1 projects in the programmatic area of Water Supply that are implementation ready. They include:

1. City of Placerville Sewer and Water Line Replacement Program: Pardi/Big Cut/Sacramento Street Waterline Replacements
2. Water Supply Reliability for DACs: Locksley and Mt. Vernon Interties
3. Water Efficiency and Water Quality: Canal Lining, Gauging Stations and Water Efficiency Education
4. Yuba River Regional Water System Infrastructure Improvement Project

Project Number: 1

Project Title: City of Placerville Sewer and Water Line Replacement Program: Pardi/Big Cut/Sacramento Street Waterline Replacements

Primary Applicant: City of Placerville

Key Partners: El Dorado County Water Agency

Project Location: American Watershed

PROJECT SUMMARY

El Dorado County Water Agency (EDCWA) actively supports county water purveyor programs that increase the reliability, decrease the demand, and minimize the cost of customer water service. Supply reliability is critical for the economy and public health and safety, including fire suppression. Reducing demand through water conservation, infrastructure/technology improvement, and public education is also a primary countywide objective as it helps to minimize demands and therefore costs of raw water treatment, conveyance, and wastewater treatment. EDCWA is assisting the City of Placerville with two major projects comprising this proposal that contribute measurably to CABY's regional goals for conservation and instream beneficial uses.

- 1) **Hangtown Creek Sewer Line Replacement** is part of the comprehensive watershed improvements identified in the Draft Hangtown Creek Master Plan and will accomplish the second phase of the trunk sewer line relocation out of Hangtown Creek through the City of Placerville. The relocation of the sewer line will preserve water quality and protect wildlife

habitat by reducing the likelihood of accidental discharge to the creek resulting from blockages or pipeline failures.

The first phase (Bedford to Clay Street segment) was recently completed through the City/Caltrans Highway 50 Operational Improvements Project. This second phase (Clay Street to Locust Street) will:

- Protect Hangtown Creek, a tributary to the South Fork of the American River, instream beneficial uses from sewage contamination, including consumptive uses diverted from Folsom Reservoir.
- Restore natural stream hydraulics without the interference of the sewer pipeline and manhole structures which reduce stream flow conveyance area, thereby substantially reducing flood risk to the City of Placerville downtown area. FEMA has identified this section of Hangtown Creek to be at risk for flooding in a 100 year event.
- Improve the structural and operational reliability of the sewer line.
- Improve maintenance access to the sewer line.
- Improve the aesthetics and natural habitat conditions of the creek along this popular section of a multi-use trail.

2) Pardi/Big Cut/Sacramento Street Waterline replacement represents one of the City of Placerville's highest priority improvements. These segments contribute significantly to the 20% unaccounted for water within the City's distribution system. The project will reinforce and bring up to code the City's potable water system in three areas of the City that have leaking pipelines, and do not meet current fire flow standards. This project will:

- Reduce the City's total long term demand for raw water necessary to meet City customer demand, thereby increasing the amounts available for instream and downstream uses.
- Reduce outages and discharges from failing pipelines.
- Improve City inspection and maintenance capability to waterlines by installing access points.
- Protect ground stability, road integrity, and property by removing risk of subsurface pipe failure.
- Ensure sufficient capacity through increased pipeline sizing and looped flow to provide for fire suppression to protect public health and safety.

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

The City of Placerville with technical assistance from El Dorado County Water Agency has the expertise necessary to implement this project. The Hangtown Creek sewer line replacement

constitutes the second phase of the project and, therefore, the system is well known to the project sponsors. The waterline replacements have been identified as the highest priority projects within the City of Placerville. The necessary planning, assessment and design are complete for all project elements. Both the City of Placerville and El Dorado County Water Agency have extensive experience designing, managing and implementing sewer line and water line replacement projects.

D. Specific Benefits to critical DAC water issues

Based on 2010 census data, Placerville no longer qualifies as a disadvantaged community. However, this project provides critical water benefits to lower income areas within the city.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

As previously stated this project provides critical water benefits to lower income areas within the city limits.

G. Project Costs and Financing

Total project budget: \$3,545,000. Budget Request: \$2,670,000

Project sponsors are providing match through rate payer income. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

A full benefit-cost analysis was conducted for water line replacement components of this project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org website. Regarding the other elements of the project, CABY consulted with an economist to develop a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

The most significant monetized and non-monetized benefits associated with this project include:

- Reduce the City's total long term demand for raw water
- Increase water available for instream and downstream beneficial uses
- Decrease the total energy used to treat City water supplies
- Decrease air quality impacts and greenhouse gas emissions associated with the energy used for treatment and conveyance
- Reduce the City's need for future infrastructure capacity to meet customer demands
- Reduce City's operating costs and costs to customers for water deliveries

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

As described the *12.5 Project Integration*, CABY’s project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. The City of Placerville and El Dorado County Water Agency have created a strategic partnership to implement this project that integrates two previously separate projects. By merging these projects, the project sponsors are able to achieve a much more comprehensive set of outcomes, providing water supply, water quality as well as ecological benefits. The integration process also assisted these two stakeholders in identifying the highest priority projects to the City of Placerville.

K. Contribution of the project in adapting to the effects of climate change

Aforementioned, this project’s measurable outcomes will contribute to the region’s ability to adapt to the effects of climate change by:

- Reducing total long term demand for raw water
- Decreasing the total energy used to treat water supplies
- Decreasing air quality impacts and greenhouse gas emissions associated with the energy used for treatment and conveyance

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 2

Project Title: Water Supply Reliability for DACs: Locksley and Mt. Vernon Interties

Primary Applicant: Placer County Water Agency (PCWA)

Key Partners: Nevada Irrigation District (NID)

Project Location: American, Bear, Yuba Watersheds

PROJECT SUMMARY

Nevada Irrigation District (NID) and Placer County Water Agency (PCWA) serve raw and treated water to adjacent service areas to north Auburn in Placer County. Recent emergency incidents, namely the 49 fire of 2010 and the Pacific Gas and Electric Bear River Canal failure of 2011 have demonstrated the lack of back-up water supply options to many area homes, businesses and municipal treatment plants. NID and PCWA serve adjacent customers from two different, geographically isolated systems. The ability to move

water from one system to the other would significantly address shortages experienced during emergency situations.

This project implements water system interties at Locksley Lane and Mt. Vernon between NID and PCWA's raw and treated water systems. Potential infrastructure connection points could include conduits, valves, canals, penstocks, pumps or tanks. Several interties at critical infrastructure points are currently being assessed by PCWA and NID staff for feasibility of construction.

These emergency interties would increase water supply reliability and provide emergency fire flows for the North Auburn community. In an emergency situation, water would become available for treatment plants to provide drinking water and water for household uses, water to hospitals, commercial businesses and fire flows for fire suppression to protect people, wildlife and structures.

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

Nevada Irrigation District and Placer County Water Agency are in the midst of conducting a broad assessment of intertie opportunities between their respective systems aimed towards systematically improving water supply reliability throughout the region. These two interties have been prioritized for immediate implementation. NID and PCWA are large water purveyors within the region with extensive experience in implementing similar projects.

D. Specific Benefits to critical DAC water issues

This project provides critical water benefits and fire protection to North Auburn, a disadvantaged community.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to Native American tribal communities.

F. Environmental Justice Considerations

This project is consistent with CABY's DAC/EJ project development and outreach strategy where CABY prioritizes communities that are often underserved and/or disproportionately affected or impacted by land and water development projects.

G. Project Costs and Financing

Total Budget: \$862,000; Budget Request: \$437,000

Project sponsors have provided approximately 50% match through rate payer income. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process.

Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

A full benefit-cost analysis has been completed for this project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org website.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

As described in *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. Another key element of CABY's integration approach is to encourage stakeholders to form strategic partnerships. In this project, NID and PCWA formed such a partnership to enhance water supply reliability and fire protection to benefit a disadvantaged community while meeting multiple objectives for the region. The project meets all of CABY's stated Measures of Integration as highlighted in 12.5.2. In particular, these two interties have allowed for greater geographic integration between these two large water districts' water conveyance systems.

K. Contribution of the project in adapting to the effects of climate change

The CABY region has prioritized investing in projects that prepare the region for a future uncertainty around climate change impacts. This project specifically adapts to the effects of climate change and prepares for that uncertainty by enhancing water supply reliability in the region and preparing for catastrophic events, such as wildfires in this critical fire hazard region. By installing back-up water supplies and increasing fire flows, this project not only protects a disadvantaged community but preserves the quality of the water supply from the potential, documented impacts of catastrophic fire, namely by preventing sediment loading as a threat to water quality and water storage.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 3

Project Title: Improving Water Efficiency and Water Quality: Canal Lining, Gauging Station Installation and Regional Water-use Efficiency Education

Primary Applicant: Nevada Irrigation District (NID)

Key Partners: Placer County Water Agency (PCWA)

Project Location: American, Bear, Yuba Watersheds

PROJECT SUMMARY

NID and PCWA operate and maintain over 600 miles of mostly open, earthen canals which have an estimated loss of efficiency between 10-20% due to evaporation, seepage and other factors. In 2010, the State of California mandated a 20% reduction in water use and related operational losses. In this project, NID and PCWA propose to line approximately two miles (10,560 lf) of strategic portions of earthen canals used for raw water conveyance. The project would reduce losses from seepage and failing canal banks to improve water quality, water efficiency and to increase water supply availability.

NID's raw water distribution system would be significantly enhanced through the installation of gaging stations that would calculate hydrologic data and more effectively measure water use. Without these data it is difficult to implement effective water conservation programs. Additionally, measurements from these stations are critical for water management, flood protection, recreation and in-stream flows. This project proposes six gaging stations on raw water canals that would improve water efficiency through accurate measurement of water, leak detection and reduction of spills.

Additionally, the project would include an educational component aimed at achieving the 20% reduction in water use by 2020. The education program would target residential, institutional and agricultural water users. Specifically, the project would develop regional outreach materials consisting of brochures, DVDs and outreach events such as seminars, fairs and individual site visits. The materials would provide accessible information and resources to assist landowners in implementing Best Management Practices, such as checking meters for leaks, tips in agricultural irrigation management, SMART controller technology information, and others. The project would also include the purchase of equipment for demonstrations such as soil probes, Lawn Irrigation Self-Audit (LISA) and water-wise kits.

This project will reduce sediment transfer in canals and increase water quality, water efficiency and supply through water conservation measures through canal lining and installation of gaging stations. Additionally, the project will assist the water agencies in reaching their state mandated water conservation goals through the development of a comprehensive water conservation outreach and education program.

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

As stated in the project description, NID and PCWA manage over 600 miles of earthen canals as an integral feature of their raw water conveyance system. This project would line a very small portion of its canal systems, targeting those areas that experience the greatest loss of water. The water purveyors have extensive experience in implementing like projects and in the use of similar equipment and have conducted the necessary assessments, analyses and design to ensure the project's feasibility as required for CABY Tier 1 project status.

D. Specific Benefits to critical DAC water issues

The multiple benefits associated with this project will be accrued system wide and therefore do not specifically and singularly provide benefits to critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

The CABY membership acknowledges that the long-term effectiveness of the CABY IRWMP is dependent upon broad, stakeholder participation throughout the region. Therefore, CABY has established education and outreach as an overarching objective in project development. This project includes a robust education and outreach component that will target residential, commercial and agricultural water users in a diversity of settings to ensure that every demographic group is reached. Additionally, where appropriate, English-Spanish bilingual materials will be developed as an element of the education effort.

G. Project Costs and Financing

Total Project Budget: \$1,145,000; Budget Request: \$593,750

Project sponsors have provided approximately 50% match through rate payer income. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

A full benefit-cost analysis was completed for this project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org website.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

As described in *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. Another key element of CABY's integration approach is to encourage stakeholders to form strategic partnerships. In this project, NID and PCWA formed such a partnership to enhance water efficiency and data collection while meeting multiple objectives for the region. The project meets all of CABY's stated Measures of Integration as highlighted in 12.5.2. Particularly, this partnership represents a highly efficient project whereby NID and PCWA are able to jointly assess their 600 miles of canals to determine priority areas for lining. Additionally, by installing gaging stations, the water agencies are able to collect crucial data to inform their water conservation efforts, prepare for flooding and to

adapt to climate change. Finally, this integrated project allows PCWA and NID to implement a water conservation education program with a regional reach.

K. Contribution of the project in adapting to the effects of climate change

This project makes a significant contribution to the region in adapting to the effects of climate change by increasing water-use efficiency in two major water conveyance systems in the CABY region within the American, Bear and Yuba watersheds. An investment in canal lining as well as a robust, regional water conservation education program would assist NID and PCWA in reaching the state-mandated 20% reduction in water-use by 2020 as recommended by the California Climate Change Scoping Plan. Additionally, the installation of gaging stations has also been recommended by the California Climate Change Scoping Plan as an important tool in determining flood risk as well as in collecting accurate data to monitor water conservation outcomes.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives.

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 4

Project Title: North Yuba River Regional Water System Infrastructure Improvement Project

Primary Applicant: Camptonville Community Service District (CCSD)

Key Partners: Alleghany County Water District (ACWD), Downieville Public Utilities District (DPUD), Sierra City Fire District (SCFD)

Project Location: Yuba Watershed

PROJECT SUMMARY

Within the North and Middle Yuba River Watersheds, three rural DACs and one other small rural community have critical water supply needs. Antiquated and inadequate water supply systems need enhanced reliability. Current conditions at these facilities limit the water quality, quantity, delivery reliability and adequate fire protection flows for all of their users. At any point in time one or more of these water systems could fail which would result in the loss of each community's main, and in some cases only, source of water. The timing and extent of a potential failure in each system could also have dire impacts on these communities, all of which are located in high fire hazard areas.

The proposed project includes an assessment of the existing water systems, the cost to design, engineer, procure and install the recommended water supply infrastructure enhancements. These communities will benefit not only from increased, reliable water supply and water quality but also from decreased reliance on imported water, reduced groundwater overdraft, decreased operating expense and increased protection from fire.

The proposed project will be conducted within the town of Alleghany, a DAC, where the Alleghany Community Water District serves 58 connections and 18 fire hydrants; the town of Camptonville, a DAC, where the Camptonville Community service District serves 70 connections and 12 fire hydrants; the town of Downieville, a DAC, where the Downieville Public Utilities District serves 227 connections and 17 fire hydrants; and, the town of Sierra City where multiple water agencies cumulatively serve 148 connections and 16 fire hydrants.

Numerous critical infrastructure enhancements are needed to provide adequate, reliable, safe water supplies plus provide the required reserve water supply for emergency fire use in these communities. Known necessary improvements include:

- Addition of a 150,000 gallon water tank in one system and a 250,000 gallon tank in another system
- Replacement of antiquated/failing electrical monitoring/reporting equipment in three systems
- Replacement of antiquated/failing transmission pipes and valves in three systems
- Addition of water sources/wells in two systems
- Addition of a slow sand and green sand filter system
- Rehabilitation of a diversion dam
- Replacement of a surface water diversion pump and two sump pumps
- Replacement of failed water meters in two systems
- Installation pressure regulator
- Replacement of failed emergency backup generators in two systems
- Installation of water treatment plant metering equipment

Measureable Outcomes:

Alleghany Community Water District

- 1) Increased water supply reliability
- 2) Increased water infrastructure efficiency
- 3) Increased water quality, quantity and safety
- 4) Decreased state monitoring requirements

Camptonville Community Service District

- 1) Increased water quality to meet state water quality standards
- 2) Increased quantity, storage and safety
- 3) Increased water reliability
- 4) Improved accuracy of water metering system that will increase income and decreased operating expense

Downieville Public Utilities District

- 1) Increase water quality, water storage, safety and distribution reliability
- 2) Increased cost effectiveness

Sierra City Fire District

1) Increased fire flows to the primary water source of fire protection for Sierra City (CalFire designated high fire threat area)

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

Since three of the four communities in this integrated proposal are either disadvantaged or severely disadvantaged, parts of the engineering and design are included in the scope of the project. However, the lead agency, Camptonville Community Service District has received technical assistance from Yuba County Water Agency for at least 30% of the engineering and design.

D. Specific Benefits to critical DAC water issues

Alleghany, Camptonville and Downieville are all disadvantaged communities with antiquated and inadequate water systems. This project would substantially improve water supply reliability, water quantity, water quality and fire protection in this critical fire hazard area.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

This project is consistent with CABY's DAC/EJ project development and outreach strategy where CABY prioritizes communities who are often underserved and/or disproportionately affected or impacted by land and water development projects.

G. Project Costs and Financing

Total Project Budget: \$2,402,544; Budget Request: \$2,286,525

The overall match for this project is approximately 4%. Three of the four project sponsors represent disadvantaged communities and, therefore, do not require match to be considered implementation ready. The fourth project sponsor, Sierra City Fire District does not represent a disadvantaged community. Hence, the fire district has provided the minimum match requirement of 25% for their project component. Further, the lead project sponsor, Camptonville Community Service District, has procured a match from Yuba County Water Agency for technical assistance, namely engineering and design for their project elements. Project proponents are actively pursuing funding through that California Department of Public Health geared exclusively towards water quality in rural, disadvantaged communities. Additionally, CABY members have initiated a work group comprised of small and large water purveyors in the region aimed at providing technical assistance to small, rural water districts.

Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

A full benefit-cost analysis was conducted for the Camptonville Community Service District's component of this integrated project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org website. Regarding the other elements of the project, CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

Since this project provides specific benefits to DAC critical water issues, it has met all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

As described in *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. Another key element of CABY's integration approach is to encourage stakeholders to form strategic partnerships. In this project, three water districts from rural, disadvantaged communities as well as one fire district were able to join forces to leverage their limited resources in the development of a highly integrated project that in aggregate makes significant water infrastructural and water quality improvements in the Yuba Watershed. Their partnership has also facilitated a broader discussion in the CABY IRWM about ways that small, rural water districts could partner with larger water districts for advisory assistance around technical and funding challenges. The latter represents a key component of CABY's integration strategy: the building of relationships between and among stakeholder entities with varying degrees of organizational capacity.

K. Contribution of the project in adapting to the effects of climate change

The CABY region has prioritized investing in projects that prepare the region for a future uncertainty around climate change impacts. This project specifically adapts to the effects of climate change and prepares for that uncertainty by enhancing water supply reliability in disadvantaged communities and preparing for catastrophic events, such as wildfires in this critical fire hazard region. By installing, upgrading, replacing and enhancing inadequate infrastructure, this project protects and enhances the quantity and quality of the water supply. Additionally, it increases fire protection and preserves the quality of the water supply from the potential, documented impacts of catastrophic fire.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

I.1.3 Programmatic Area 2: Water Quality

This section describes five, Tier 1 projects in the programmatic area of Water Quality that are implementation ready. They include:

1. Providing Recreational Access while Protecting Water Quality: restoration of degraded Barrett Lake Trail impacting the Jones Fork of Silver Fork, tributary to the South Fork of the American River
2. WAG-Bag Campaign within the Caples Creek Recommended Wilderness on the Eldorado National Forest
3. Camp Sacramento Erosion Control and Habitat Improvement Project
4. Combie Reservoir Sediment and Mercury Removal Project
5. CABY Mercury and Sediment Abatement Initiative

Project Number: 5

Project Title: Providing Recreational Access while Protecting Water Quality: restoration of degraded Barrett Lake Trail impacting the Jones Fork of Silver Fork, tributary to the South Fork of the American River

Primary Applicant: Eldorado National Forest

Key Partners: Hilanders Jeep Club, State Division of Off Highway Vehicles

Project Location: American Watershed

PROJECT SUMMARY

The Forest Service proposes to reroute the Barrett Lake 4WD Trail (Forest Trail 16E21) and restore the existing route that crosses the Jones Fork of Silver Creek in the American Watershed. Currently, vehicles drive through the water crossing, which is causing sedimentation to the creek and down-cutting of the primary stream channel. Sediment is entering the channel from both sides of the creek. The project involves .41 miles of new trail construction outside the riparian conservation area, where an approximately 46 foot long wood and steel construction bridge would be constructed, and .44 miles of existing trail would be restored to native vegetation and natural contours of the area. The Jones Fork is habitat to mountain yellow-legged frogs, a Forest Service Sensitive Species.

Primary project objectives include: implementation of measures to reduce erosion and sediment loading to the creek system; management of recreation to minimize impact to watershed resources; protection and restoration of riparian habitat and sensitive species.

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

The Eldorado National Forest has conducted all necessary assessments and planning associated with this project making it ready for implementation. The Forest Service has extensive experience in implementing like projects.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

The Eldorado National Forest aims to provide equal recreational access and information to all forest users. The Forest additionally provides discounted and free recreational passes to certain groups through its Interagency Pass Program.

G. Project Costs and Financing

Total Project Budget: \$200,000; Budget Request: \$40,000

The Eldorado National Forest has provided 80% match from federal funds for project implementation. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project illustrates an integrated, strategic partnership between and among state and federal agencies and a stakeholder group of recreationists who have come together to improve the water quality of an important tributary to the South Fork American River. As described in *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. This project is in alignment with CABY's integration strategy.

K. Contribution of the project in adapting to the effects of climate change

This project's central objective is to reduce sedimentation in Silver Creek, a tributary to the

American River. Sediment loading is a water quality pollutant that can also diminish water storage capacity in reservoirs and cause other operational difficulties for water treatment facilities, making it a water quality and water supply vulnerability. Reducing sedimentation in streams and rivers contributes significantly in adapting to the effects of climate change.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 6

Project Title: WAG-Bag Campaign within the Caples Creek Recommended Wilderness on the Eldorado National Forest

Primary Applicant: Eldorado National Forest

Key Partners: South Fork American River Watershed Group; El Dorado County & Georgetown Divide Resource Conservation Districts

Project Location: American Watershed

PROJECT SUMMARY

Caples Creek is eligible for Wild and Scenic River status and is a Class I productive stream with brown trout and rainbow trout. Caples Creek Recommended Wilderness is detached from any existing wilderness and has high scenic values, with an exceptionally high proportion of the landscape classified as distinctive. Due to these remarkable characteristics, an abundance of recreational uses occur along Caples Creek and within the Caples Creek Recommended Wilderness. As a result, a need exists to address associated dispersed camping and sanitation issues. Human waste is often not disposed of properly and hikers frequently camp too close to aquatic features. This results in risks to both water quality and human health; and may reduce the quality of the aesthetic experience along Caples Creek and within the Caples Creek Recommended Wilderness.

The project aims to reduce potential impacts to water quality and human health by implementing a WAG-bag (waste alleviation and gelling bag) campaign to encourage wilderness users to pack out human waste. In addition, the project provides education to encourage environmentally friendly camping practices. This project was identified as a need in the Watershed Restoration Action Plan (WRAP) for the Caples Creek Watershed. The WRAP was developed as part of the Forest Service's Watershed Condition Framework (WCF).

WAG-bags provide a sanitary way to dispose of human waste, weigh almost nothing, and can be easily transported in camping gear. Airtight construction allows for their safe disposal in any trash container and the bags completely biodegrade in about eight months leaving behind no chemical residue. Distribution of WAG-bags would be combined with user education. During periods of high recreational use, such as holiday periods (approximately ten days per year), WAG-bag distribution sites would be

staffed by personnel capable of providing instruction on WAG-bag use and environmentally friendly camping practices.

Campaign sites are expected to be located at the Lake Margaret and Fitz Ranch Bridge trailheads and would be targeted at reducing human waste and lowering recreational impacts along Caples Creek and within the Caples Creek Recommended Wilderness. It is expected that this project would distribute approximately 2,000 bags a year at the Fitz Ranch Bridge trailhead and approximately 1,000 bags a year at the Lake Margaret trailhead.

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

Not applicable since this project is not technical in nature. Forest service personnel have the necessary knowledge of the area in order to implement this public awareness and Wag-Bag distribution campaign.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

The Eldorado National Forest aims to provide equal recreational access and information to all forest users. The Forest additionally provides discounted and free recreational passes to certain groups through its Interagency Pass Program.

G. Project Costs and Financing

Total Project Budget: \$84,000; Budget Request: \$63,000

The Eldorado National Forest has provided 25% match from federal funds for project implementation. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project illustrates an integrated, strategic partnership between and among state and federal agencies and a local non-governmental organization who have come together to improve the water quality and recreational and scenic attributes of an important tributary to the South Fork American River. Additionally, this project was identified as a need in a multi-stakeholder planning effort, the Watershed Restoration Action Plan (WRAP) for the Caples Creek Watershed. The WRAP was developed as part of the Forest Service's Watershed Condition Framework (WCF). As described in *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. This project is in alignment with CABY's integration strategy.

K. Contribution of the project in adapting to the effects of climate change

This project directly addresses water quality contamination to the American River watershed, thereby protecting the water supply from contamination. As indicated in the CABY climate change adaptation strategies (See 4.2), CABY has signified the importance of identifying places where the dilution of contaminant capacity of streams and rivers may be at risk. The Eldorado National Forest identified Caples Creek as one such area in their Watershed Restoration Action Plan (WRAP). This project strives to eliminate a known source of contamination to a key tributary to the American River.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 7

Project Title: Camp Sacramento Erosion Control and Habitat Improvement Project

Primary Applicant: El Dorado County Resource Conservation Districts

Key Partners: City of Sacramento, Eldorado National Forest, California Department of Conservation, Friends of Camp Sacramento, Boy Scouts of America

Project Location: American Watershed

PROJECT SUMMARY

Erosion from Camp Sacramento during rainfall events and snowmelt is a contributor of suspended sediment to the South Fork American River. The erosion comes from unpaved and compacted roads, denuded slopes, and disturbed areas in camp. Over the years, campers have formed trails and driving areas have expanded leaving some areas bare of low growing shrubs that help break-up rainfall impacts

and reduce erosion. This has led to significant erosion that carries sediment to the river resulting in a negative water quality impact to the American River.

The project would address the erosion problems through several approaches. First, the entry road, Camp Hill Road, and a portion of the Water Tower Road will be paved and fitted with sediment traps to collect sediment and road abrasives. The runoff from these roads will be appropriately discharged to eliminate some of the sediment. Within camp, the over-wide roads and excessive trails will be eliminated and the area re-vegetated. Parking spaces will be created to prevent the haphazard parking that currently occurs.

Runoff in camp will be separated between the forest runoff that enters camp and contributes to the erosive flows in camp, and the runoff generated from rainfall in camp. The forest runoff will be directed around camp and released to the forest to the east and the west of camp. Within camp, the volume of runoff will be reduced through drip line trenches around each cabin and small detention basins. These basins will control and reduce the runoff, and will capture any sediment. Temporary basins have been installed in recent years and have proven successful in capturing sediment.

Areas in camp that show signs of erosion such as gullies or exposed roots will be stabilized and re-vegetated. Stabilization includes the use of natural materials such as logs to block the gully that would then be filled and re-vegetated. Controlling the runoff in camp will eliminate the uncontrolled flow that tends to concentrate and erode the soil.

Measurable Outcomes:

- Complete forest stand improvements and vegetation management on 19 acres.
- Repair of approximately 1000 feet of trail by eliminating unnecessary paths and delineating the trail using natural barriers. Approximately 450 feet of trail will be designed to meet ADA compliance. Construct an additional 400 feet of trail to the Lovers Leap Trail and camp cabins.
- Improve and define 70 existing parking spaces.
- Re-vegetate approximately 20,000 feet of denuded and disturbed areas within camp.
- Install the following erosion control measures throughout camp: 1) rock-lined channel on Horseshoe Pit Hill; 2) drip line trenches around all camp buildings and cabins; 3) detention basins, 1 rock dissipater, and 125 feet of vegetated swale.
- Stabilize 73,000 square feet of camp roads and parking areas.

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

The El Dorado County Resource Conservation Districts, along with the Eldorado National Forest, and

the City of Sacramento, have extensive experience in implementing like projects and in the use of similar equipment and have conducted the necessary assessments, analysis and design to ensure the project's feasibility as required for CABY Tier 1 project status.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

Camp Sacramento is owned by the U.S. Forest Service and leased by the City of Sacramento to provide urban residents of Sacramento and others with access to outdoor recreational opportunities. Eldorado National Forest aims to provide equal recreational access and information to all forest users and prohibits discrimination based on race, color, national origin, sex, age, or disability. Additionally, Camp Sacramento includes facilities that are wheelchair accessible. The project will also rehabilitate a trail, making it ADA compliant.

G. Project Costs and Financing

Total Budget: \$601,800; Budget Request: \$225,000

The project sponsor has provided over 60% non-state match.

Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project illustrates an integrated, strategic partnership between and among state and federal agencies, a municipal government and non-governmental community organizations who have come together to improve the water quality, scenic values and recreational facilities of this camp located in the American River Watershed. As described in *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. This project is in alignment with CABY's integration strategy.

K. Contribution of the project in adapting to the effects of climate change

This project's central objective is to reduce sediment loading to the American River. Sediment loading is a water quality pollutant that can also diminish water storage capacity in reservoirs and cause other operational difficulties for water treatment facilities, making it a water quality and water supply vulnerability. Reducing sedimentation in streams and rivers contributes significantly in adapting to the effects of climate change.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 8

Project Title: Combie Reservoir Sediment and Mercury Removal Project

Primary Applicant: Nevada Irrigation District

Key Partners: The Sierra Fund, and USGS

Project Location: Bear Watershed

Project Summary:

If mercury-contaminated sediment continues to accumulate in Combie Reservoir, methylmercury production will likely increase, future water storage capacity, water quality, and recreation opportunities in Combie Reservoir will be threatened, and downstream reaches of the Bear River, Feather River, Sacramento River, and Bay-Delta, including several water bodies that have been identified by the CVRWQCB as mercury impaired (CVRWQCB 2007) will continue to receive water with elevated methylmercury, a neurotoxin that biomagnifies up the food chain.

Located on the Bear River in the Sierra Nevada foothills approximately 50 miles northeast of Sacramento, Combie Reservoir is listed as an impaired water body because of mercury contamination (CVRWQCB 2007). The water quality of Combie Reservoir has been severely compromised by mercury residing in sediments that have been deposited in the upper reaches of the reservoir. The mercury contamination is manifested in elevated fish tissue concentrations documented by the USGS (May et al. 2000), which are the basis of a fish consumption advisory issued by the California Office of Environmental Health Hazard Assessment (Klasing and Brodberg 2003).

Over the past 20 to 30 years, riverbed excavation or dredging has occurred at Combie Reservoir to maintain water storage capacity on an as-needed basis. The California Regional Water Quality Control Board – Central Valley Region (RWQCB-CVR) halted these operations in 2002 because of elevated mercury levels in the dredge pond.

Since 2002, each storm event has filled Combie Reservoir with additional transported sediment, which is contaminated with mercury left behind from historical hydraulic mining in upstream areas. This project combines innovative mercury removal equipment (remediation technology) with reservoir-maintenance

dredging to remove mercury from dredged sediments. The result will be a reduction of an extremely hazardous water quality and aquatic ecosystem pollutant, an increase in water storage capacity and reduced mercury-methylation potential in the reservoir.

Mercury is a water quality constituent of national concern. Consumption of mercury-laden fish leads to developmental delays in fetuses, infants and children and can lead to neurological symptoms and other health problems in adult humans as well as ecological problems in wildlife. As such, removing mercury from the watershed will have the benefit of removing a serious, public health and environmental hazard. Fish tested in Combie Reservoir (largemouth bass and Sacramento sucker) were among the highest in mercury in a statewide survey recently completed by the State Water Resources Control Board's Surface Water Ambient Monitoring Program. Reduced mercury contamination in Combie Reservoir sediments would likely lead to reduced loads of total mercury and methylmercury into the lower Bear River and the Bay Delta.

The hypotheses that are being tested are: (a) Removing elemental mercury from dredged sediments in Combie Reservoir will result in a less contaminated aquatic food chain; specifically, zooplankton and small fish are expected to have lower methylmercury levels after study completion; (b) Removing elemental mercury from Combie Reservoir will reduce the loads of mercury and methylmercury in the lower Bear River, a tributary to the Bay-Delta; and (c) Removing elemental mercury from dredged sediment as a Best Management Practice during reservoir maintenance dredging activities in mercury-laden reservoirs across the Sierra Nevada would significantly reduce methylmercury exposure to wildlife and loading of mercury and methylmercury in this and other tributaries to the Bay-Delta.

Measurable Objectives:

- to remove 50 to 150 pounds of mercury and 60,000 to 120,000 cubic yards of sediment;
- to reduce the conditions that contribute to mercury methylation by removing elemental mercury from shallow, relatively warm waters, and returning the reservoir back to its baseline contour;
- to determine the net environmental benefit to the Bear River watershed and the Bay-Delta of removing elemental mercury from Combie Reservoir;
- to construct dredging and mercury extraction facilities; and
- to monitor, refine, and document the dredging and mercury extraction process to develop a Best Management Practice for mercury remediation in reservoirs affected by historical gold mining.

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

Nevada Irrigation District (NID) has retained the necessary permits and completed the assessment, design, and planning related to project implementation. Additionally, NID has tested the use of the

mercury extraction equipment to ensure project feasibility and to assure accuracy in determining project outcomes.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

This project aims to reduce mercury contamination from the water supply and decrease methylation of mercury. This would diminish the bioaccumulation of mercury in the food supply thereby reducing the public health risks associated with methylmercury consumption, particularly for those groups who consume fish from regional rivers and streams.

G. Project Costs and Financing

Total Project Budget: \$6,881,080; Budget Request: \$4,800,000

NID has provided 30% match from rate payer income. NID is actively pursuing funding for this project (and component parts of the project) from a range of potential funders. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

The Combie Mercury and Sediment Removal project has reflected a CABY priority since the development of the first IRWM Plan in 2007. However, the size of the project budget has prevented it from moving forward for funding. Therefore, Nevada Irrigation District has pursued funding for component parts of the project thereby building project match while moving the project forward towards implementation. Therefore, an important strategic modification to this project is represented in the following project (#9 *The CABY Mercury and Sediment Abatement Initiative*). A key component from this project which entails procuring mercury extraction equipment for Combie has been included in the Abatement Initiative. If the latter project should be funded, it would allow Nevada Irrigation District to pilot their elemental mercury extraction effort and provide a model for other reservoirs throughout the region.

K. Contribution of the project in adapting to the effects of climate change

This project makes a significant contribution in adapting to the effects of climate change by increasing water storage capacity through dredging mercury-contaminated sediments from Combie Reservoir. Additionally, it reduces the impact of existing stressors to the watershed and improves the quality of the water supply.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 9

Project Title: CABY Mercury and Sediment Abatement Initiative

Primary Applicant: The Sierra Fund

Key Partners: Tahoe National Forest, South Yuba River Citizens League, Yuba Watershed Institute, Bureau of Land Management, Nevada Irrigation District, Sierra Native Alliance

Project Location: Regionwide/ Yuba Watershed focus for remediation activities

PROJECT SUMMARY

The CABY region encompasses the watersheds that were most impacted by the California Gold Rush and as a result has unique and varied landscape features that must be included in the remediation of these impacts. Runoff from abandoned mine sites is the number one contributor of mercury contaminated sediment to reservoirs in the Gold Country. Mercury is a powerful neurotoxin, especially harmful to the brain development of young children and fetuses. The presence of methylmercury is of particular concern because in this organic form mercury becomes part of the food chain. Mercury contaminated sediments that collect in reservoirs is prone to methylation because of the anoxic conditions often present in still water. Mercury contaminated fish are a real and on-going public health threat in many of the CABY waterways.

Efforts to abate mercury contamination are complicated by the widespread nature of the contamination and multiple forms of mercury. Efforts to remediate contamination have begun at individual and isolated site-specific projects throughout the region but they lack prioritization and coordination with watershed-wide planning. Cleaning up contaminated sediment at source areas (specific mine sites) in coordination with cleaning up sediments that have accumulated in reservoirs (sinks), which has the added benefit of restoring/maintaining water storage space, will be most effective when prioritized and coordinated on a watershed scale. This type of watershed scale remediation effort, from source to sink, requires integrated planning and coordinated data collection to measure performance and inform the development of best management practices.

The forum for comprehensive integrated planning and remediation of mercury contaminated sediment is currently lacking and is complicated by a patchwork of ownership (state, federal and private) of discharging mines and water supply facilities.

The CABY Mercury Initiative is an integrated proposal to acquire the necessary information through targeted regional planning coordination, assessment and remediation in order to be responsive to pressing regulatory processes, specifically the Statewide TMDL effort. The Initiative will be coordinated through a forum for regional planning, the CABY Mercury Forum. The Forum will prioritize abandoned mine site information in existing databases, identify sites for remediation throughout the CABY Region and provide technical advice to on-the-ground pilot projects. The progress and results of the pilot projects will be presented to the Mercury Forum. The Forum will be engaged in the statewide planning process for a Mercury TMDL.

Specific pilot projects that relate to each aspect of the program (assessment and remediation) will be implemented as on-the-ground efforts that will inform mercury and sediment abatement planning and prioritization. The pilot projects include:

- Assessment of Omega Diggins and Scotchman Creek (Alpha Diggins);
- Feasibility Study for remediation of Humbug Creek (Malakoff Diggins);
- Relief Hill Mine Remediation; and,
- Phoenix Lake Mine Remediation.

Omega, Alpha and Malakoff Diggins are three hydraulic mine sites in the South Yuba River watershed. Mercury contaminated sediments originate from these mines sites and travel down the South Yuba River to Englebright Reservoir. Removal Actions of mercury contaminated sediment will be conducted at Relief Hill Mine and Phoenix Lake Mine, both in the Yuba River Watershed.

In addition, equipment that is specially designed to remove mercury from fine sediments that accumulate in reservoirs will be purchased as part of this initiative. The equipment will be used in the Bear River watershed as part of the Combie Reservoir Sediment and Mercury Removal project, but the results of this remediation technique will be applicable to reservoirs throughout the CABY region and will be fully integrated in the CABY Mercury and Sediment Abatement Initiative through the Forum.

Additional aspects of the CABY Mercury and Sediment Abatement Initiative include fish consumption education, posting of fish advisories, abandoned mine land (AML) awareness, and community outreach plans, a standardized protocol for AML assessment and prioritization and an incentives program to promote AML remediation using Green Solutions to Abandoned Mines.

Measurable Outcomes:

- >200,000 tons contaminated sediment removed from water source areas
- >50 acres cleaned up
- >12 airshafts and tunnels of physical hazards addressed

- >12 fish advisories posted on 303(d) mercury impaired waterways
- Summary of Green Solutions to Abandoned Mines

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

The Sierra Fund and its partners are currently implementing projects that complement or are similar to the project elements proposed in this project. Each project component has met all of the pre-project planning requirements to achieve CABY Tier 1 status.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

This project aims to reduce mercury contamination from the water supply and decrease methylation of mercury. This would diminish the bioaccumulation of mercury in the food supply thereby reducing the public health risks associated with methylmercury consumption, particularly for those groups who consume fish from regional rivers and streams. Additionally, this project contains a robust education and outreach element that is aligned with CABY's Environmental Justice, DAC and Native American outreach strategy. It also includes universal fish advisory signage, taking into consideration the needs of non-English speakers.

G. Project Costs and Financing

Budget: Total: \$3,202,750; Request: \$1,753,750

The lead entity and its key partners have provided approximately 45% non-state match from various funding sources. Additionally, the project has been awarded state funding from the Sierra Nevada Conservancy for complementary. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

A full benefit-cost analysis was conducted for this project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org website.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

In this project, two federal agencies, the Forest Service and the Bureau of Land Management, are in partnership with a large regional water district (Nevada Irrigation District) and four NGOs whose scopes range from the sub-watershed scale (Yuba Watershed Institute) to a watershed scale (South Yuba River Citizens) and to a broader, regional scale (The Sierra Fund and the Sierra Native Alliance). This diverse and strategic partnership has formed to effectively implement a region-wide mercury and sediment abatement project that addresses high priority issues in the region that are also of statewide importance. The project is in close alignment with CABY's project integration strategy which prioritizes projects representing multi-benefit, multi-stakeholder projects that address multiple objectives. The project also fulfills all of CABY's Measures of Integration as articulated in 12.5.2 where the project meets multiple CABY priorities; integrates within and across like projects employing key resource management strategies; represents geographic and partnership integration; and it effectively combines and integrates outcomes and performance measures.

K. Contribution of the project in adapting to the effects of climate change

This project makes a significant contribution in adapting to the effects of climate change by establishing a highly integrated project with a diverse partnership of local and regional NGOs and state and federal government agencies that recognizes the essential importance of establishing a coordinated effort to address complex, regional issues of statewide importance such as mercury contamination. The project provides a model for IRWM implementation by ensuring a comprehensive and coordinated effort that establishes a framework for assessment, prioritization, planning and remediation of mercury across the region. The on-the-ground remediation efforts will reduce the impacts of existing stressors to the region's watersheds, increase water storage capacity, improve water quality, and monitor and quantify the rate of mercury methylation throughout the region.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

1.1.3 Programmatic Area: Environment and Habitat

An important note pertaining to *Strategic Considerations for IRWM Plan Implementation* (Review Factor J): More than half of the 28 Tier 1 projects described in the Plan fall under the programmatic area of Environment and Habitat. With apparent exceptions (i.e., #14 *Meadow Enhancement and Restoration in the Yuba, Bear and American River Watersheds*) many of these projects have rather small budgets and purposefully have not been integrated with other like projects to accomplish CABY's Five Measures of

Integration. Why did CABY make this strategic decision for these projects when its overall strategy prioritized project integration? During project recruitment, CABY found that fire and fuels management projects represented the greatest number of Step 1 applications. The sheer volume of projects in this programmatic area initially overwhelmed our capacity to facilitate integration opportunities. But, as the planning process ensued, CABY determined through climate change adaptation strategy discussions as well as in the Issues, Objectives and Conflicts framework that fire and fuels had become a clear priority issue. Therefore, when making decisions about project selection, the Planning Committee decided that the threat posed by catastrophic fire to water resources in the region was so significant that fire and fuels management projects should be included, whenever possible, in CABY funding applications. Hence, CABY determined that purposefully leaving these projects as they are allows for more flexibility to be responsive to the preferences of specific funding programs as they emerge. Several projects herein could be configured and reconfigured as integrated projects depending on a particular funding opportunity. Many of the project sponsors have confirmed their interest and willingness to form strategic partnerships if and when such opportunities arise.

Project Number: 10

Project Title: The Intersection of Traditional Ecological Practices and Habitat Restoration at Ladies Valley- North Fork Cosumnes River (Phase 1—Monitoring, Assessment and Outreach)

Primary Applicant: American River Conservancy

Key Partners: Cosumnes Cultural Waterways

Project Location: Cosumnes Watershed

PROJECT SUMMARY:

This project addresses non-native invasive species and native biological diversity in the Cosumnes River watershed. It also involves disadvantaged communities and Indigenous people from the local community in monitoring and restoration activities, educating the public about the importance of resource conservation and utilizing traditional methods of ecological restoration.

Phase One of this project will focus on Monitoring, Assessment and Outreach leading up to Phase Two – Implementation. The monitoring and assessment portion of the project will occur on the subject property (375 acres), located along the North Fork Cosumnes River. The habitat is mostly riparian, oak woodland and montane hardwoods habitat types. Monitoring and assessment activities will identify priority habitat restoration and enhancement areas, sensitive cultural and environmental areas as well as aid in the creation of a restoration and management plan. In addition to monitoring and assessment activities, this phase of the project will also involve a considerable amount of outreach to local and regional native California Indian groups, youth groups and others, with a focus on youth and young adults. The outcome of outreach activities will be to involve these young people in project planning from the outset, fostering a sense of ownership and investment in project activities into the future. Involving youth from the native community in project activities will also foster leadership and career building skills. Eventually, this project will improve water quality in the North Fork Cosumnes River and enhance the hydrological function and biodiversity of the watershed.

Measurable Outcomes:

- Increase in wildlife and plant species diversity and abundance
- Increase in involvement in watershed and cultural issues
- Enhanced educational opportunities
- Increase in # of people involved in volunteer activities

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

The named project represents a pre-implementation phase that entails monitoring, assessment and outreach that are not technical activities by nature. The project lead entity holds title to the property and has established relationships with tribal community leaders, ensuring an effective outreach strategy.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

This project is aligned with CABY's Environmental Justice, DAC, and Tribal outreach strategy and cultivates tribal engagement in watershed restoration in the North Fork Cosumnes Watershed.

G. Project Costs and Financing

Total Project Budget: \$50,000; Budget Request: \$25,000

Project sponsors have provided 50% match from non-state funding sources. The American River Conservancy is actively seeking the remaining necessary funds for project implementation from a variety of funders.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

The second, implementation phase of this project can be found under Tier 2 on the Project Matrix. Initially, the first and second phases of this project were combined in one project application. CABY made the strategic decision to separate the two phases of the project to ensure that at least one aspect of this project could be included in the Tier 1 project list-- the rationale being that this project represents a priority restoration and tribal effort in the Cosumnes Watershed that has excellent integration potential with other related projects in the Habitat and Environment Programmatic Area if an appropriate funding source should become available. By describing this project in the Plan, it poises the initial phase of this project for implementation. See I.1.3 above for further detail on strategic integration opportunities related to this project.

K. Contribution of the project in adapting to the effects of climate change

This project addresses ecosystem and habitat vulnerability in the region and aims to reduce existing stressors on the watershed.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 11

Project Title: Raintree Forest Health Project

Primary Applicant: El Dorado County Resource Conservation Districts

Key Partners: Eldorado National Forest, Georgetown Divide Resource Conservation District

Project Location: Cosumnes Watershed

PROJECT SUMMARY

The project proposes restorative and preventative treatments and management actions in order to improve forest health and re-establish a sustainable landscape condition on public lands within the Raintree project area. Project activities include: reduction of fuel loading to reduce the threat of wildfire by conducting commercial and pre-commercial understory thinning of mixed conifer stands and plantations; maintenance and enhancement of existing old growth conifers, aspen and oak components; removal of hazard trees adjacent to system roads and dispersed camping areas; enhancement and maintenance of Strategically Placed Area fuels Treatments (SPLATs); enhancement of soil productivity

within plantations by increasing soil cover; and prescribed burning on 9,144 acres. Additionally there is a need to improve watershed conditions and related ecosystem services by improving the conditions of several streams and riparian zones in the project area. Improvements include: maintaining and restoring the geomorphological and biological characteristics of special aquatic features within the riparian zones, streams, including in-stream flows and hydrological connectivity within and between watersheds to provide for the habitat needs of aquatic species.

Measurable Outcomes:

- Conduct commercial thinning of conifers (10-29.9 inches dbh) on approximately 3,406 acres in natural stands and selected conifer plantations.
- Conduct reforestation activities on approximately 60 acres in newly created gaps by planting white pine blister rust resistant sugar pine and Jeffrey pine.
- Perform machine piling (grapple or dozer), and cutting small trees and brush (1-3.9 inches dbh) with follow-up burning on approximately 1,687 acres to reduce ground fuels and ladder fuels.
- Conduct prescribed understory burning on approximately 9,144 acres.
- Enhance, maintain and expand existing quaking aspen aggregations totaling approximately 20 acres.
- Reconstruct approximately 57 miles of road systems.
- Maintain approximately 12 miles of paved road systems.
- Enhance and restore watershed conditions by physically closing approximately 47 miles of road system.
- Enhance and restore watershed conditions by decommissioning approximately 1.3 miles of road systems.
- Rehabilitate and restore dispersed recreational areas impacted by motor vehicle use by installing 565 barrier rocks to limit access.
- Install three additional parking areas to increase public access and camping opportunities.
- Reduce tree density
- Sustain old forest conditions
- Enhance wildlife habitats
- Reduce wildfire risk
- Improve long-term scenic sustainability
- Increase recreational opportunities
- Enhance riparian conservation areas
- Maximize revenue derived from commercial products to perform essential and costly biomass removal and surface fuel treatments

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

The El Dorado County Resource Conservation Districts, along with the Eldorado National Forest, and its other partners, have extensive experience in implementing like projects and in the use of similar equipment and have conducted the necessary assessments, analysis and design to ensure the project's feasibility as required for CABY Tier 1 project status

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

The Eldorado National Forest aims to provide equal recreational access and information to all forest users.

G. Project Costs and Financing

Total Project Budget: \$830,000; Budget Request: \$415,000

Project sponsors have provided 50% match from the USDA Forest Service.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project illustrates an integrated, strategic partnership between state and federal agencies who have come together to implement an innovative, high impact, comprehensive forest health initiative that provides a model that could be applied throughout the CABY region and beyond. As described in *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. This project is in close alignment with CABY's aforementioned integration strategy.

K. Contribution of the project in adapting to the effects of climate change

This project contributes significantly in adapting to the effects of climate change by reducing

wildfire risk, actively coordinating between management agencies to effectively implement management goals, implementing fuels management in watersheds where a high vulnerability exists to water resources, improving resiliency of the forest, and sustaining and promoting fundamental ecological functions and services.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 12

Project Title: Renewable Energy and Forest Fuels: Organizational Support for the Biomass Working Group

Primary Applicant: Sierra Forest Legacy

Key Partners: Sierra Nevada Conservancy; National Forest Foundation, Watershed Center, USDA Forest Service, California Forestry Association, California Energy Commission, The Nature Conservancy.

Project Location: Regionwide

PROJECT SUMMARY

The Biomass Working Group was formed in 2010 to focus on the problem of creating the infrastructure needed to process forest biomass closer to rural communities in the Sierra Nevada and using methods and in locations that are profitable. Specifically, the group is focused on creating strategies to address: 1) pricing biomass as a public good; 2) defining sustainability in relationship to biomass use, including defining metrics to assess sustainability; and 3) developing infrastructure to utilize biomass within a forest community at the right scale. Presently, forest biomass generated from fuels reduction and restoration treatments is often piled and burned. This multi-stakeholder group is focused on providing ecologically sustainable options for the use of such residues. Participants include NGOs, federal/state/local agencies, and private interests.

This request is to fund the facilitation and organizational support for this working group. The group meets monthly and has organized itself into four subgroups which meet at various frequencies. Organizational support that is needed includes facilitation of monthly meetings, agenda and meeting organization, website development and maintenance, and support of general communications among participants.

Measurable Outcomes:

- 1) Reduction in forest residue piles that require burning on vegetation management projects in the Tahoe and Eldorado national forests; 2) Establishment of pricing for biomass that reflects the public good achieved; 3) Criteria and metrics to evaluate the ecological sustainability of biomass

operations; 4) Creation of publicly accessible website to support the group's work; 5) Improved communication and efficiency in completion of work.

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

This project is not technical in nature. It is a planning effort.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

The Biomass Working Group's principles and goals are aligned with CABY's Environmental Justice, DAC and tribal strategy, namely in the working group's analysis of the potential for biomass energy in creating robust rural economies and in promoting local equity and ownership models in a region that has been disproportionately affected by resource extraction.

G. Project Costs and Financing

Total Project Budget: \$60,000; Budget Request: \$30,000

Project sponsors have provided 50% non-state funding match.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project represents an important multi-stakeholder, regional effort that informs CABY's climate change adaptation strategies while working to develop an industry that would build more resilient local economies throughout the Sierra. Other strategic considerations for this project are articulated in the introduction of I.1.3 above.

K. Contribution of the project in adapting to the effects of climate change

This project continues to explore environmentally-acceptable and economically-feasible ways of producing and utilizing power from biomass that would contribute towards the reduction of existing environmental stressors in the region. Additionally, it would contribute towards sustaining and promoting fundamental ecological forest functions and services.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

GHG Quantification is not relevant to this project since this project does not include construction activities.

Project Number: 13

Project Title: Evaluating the Response of California Spotted Owl to Habitat Modification from Fuel Treatments and other Stand Altering Practices

Primary Applicant: Sierra Forest Legacy

Key Partners: University of Minnesota; University of California, Berkeley; USDA Forest Service

Project Location: American Watershed

PROJECT SUMMARY

The California spotted owl is listed as a sensitive species by the Forest Service. Demographic studies underway on the Eldorado and Tahoe National Forests since 1993 indicate that this population is in decline. The causes of decline are not known at this time, although habitat modification on public and private lands has been ongoing in the study area for decades. Practices on public lands include uneven-aged management for fuel modification and forest health. Practices on private lands are dominated by even-aged management with the objective of timber production.

This project would assess the changes in habitat condition resulting from vegetation management on public and private lands in the Eldorado Study area. Vegetation and habitat assessment would be conducted using standardized protocols and in coordination with the Forest Service. Inferences about the quality of habitat critical to the support of productive nest sites would be made using the historic and current data from the ongoing demographic study.

Measurable Outcomes:

- Evaluate the relationship between habitat alteration and population health for California spotted owl (CSO);
- Make recommendations on habitat characteristics or configuration of habitat that best support CSO;
- Perform detailed examination of habitat alteration resulting from various types of vegetation management; and,
- Publish and distribute results that would contribute to assessments underway on three other demographic studies in other parts of the Sierra Nevada and that would contribute to a meta-analysis being completed for CSO.

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

The project sponsor and its key partners have the scientific expertise and knowledge of the proposed study area to effectively and feasibly implement this project. The project is a study that could be integrated into other CABY Tier 1 fire and fuel management projects or as a companion to other such projects outside of the CABY IRWMP.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to native American tribal communities.

F. Environmental Justice Considerations

Not applicable.

G. Project Costs and Financing

Budget: Total: \$200,000; Requested: \$75,000

Project sponsors have provided 62% non-state funding match.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

See I.1.3 above for strategic considerations relevant to this project.

K. Contribution of the project in adapting to the effects of climate change

This project addresses ecosystem and habitat vulnerability in the region and aims to reduce existing stressors on the watershed.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 14

Project Title: Meadow Restoration, Assessment and Prioritization in the American, Bear and Yuba Watersheds

Primary Applicant: South Yuba River Citizens League

Key Partners: Tahoe National Forest (Yuba and American River Ranger Districts); American Rivers, American River Conservancy

Project Location(s): American, Bear, Yuba

PROJECT SUMMARY

Mountain meadows are important natural sources of water storage, water purification and habitat for a variety of rare or special status species in the CABY region. However, historic actions have left some meadows in a degraded condition. For example, some have lowered water tables, woody plant encroachment, stream channel incision, areas of erosion, and non-native invasive plant infestation. All of these conditions can render meadows ecologically dysfunctional.

This project proposes restoration actions on several meadows in the CABY region. The project also establishes a foundation for future restoration activities through a watershed-scale assessment and prioritization effort in the American Watershed. Thus, this project represents a coordinated program to maintain and improve meadows across the CABY region.

AMERICAN WATERSHED

Elliot Meadow: For nearly a decade, the momentum around meadow restoration has been building—some critical projects have been implemented and many others have been identified. CABY’s meadow objective has catalyzed interest from other funders, and currently, there is substantial funding from state and federal agencies for “shovel-ready,” on-the-ground implementation projects. A major barrier to initiating new projects is the lack of funding available for design and permitting. This situation has created a bottleneck that many organizations and agencies are unable to overcome, slowing the

meadow restoration effort as a whole, and limiting progress to a few watersheds where design and permitting expertise exists.

This project is designed to address this significant barrier to restoration. American Rivers will work closely with our partners to develop a program focused on design and permitting for projects already identified as high priority throughout the Sierra Nevada, as well as providing training in meadow restoration design and permitting for practitioners throughout the Sierra. The first step in implementing this project is completion of a hydrologic assessment and development of a restoration plan for Elliot Meadow located in the Shirttail Creek watershed, a tributary to the North Fork American in the Tahoe National Forest (TNF). A man-made ditch (up to six feet deep in places) and developing headcuts in Shirttail Creek have lowered the water table in the meadow. In addition, conifers and nonnative invasive plants have become established in the meadow and are expanding into other parts of the meadow. The project requires funding for a hydrologic assessment, development of a restoration plan, and funding to implement restoration of the meadow. A hydrologic assessment will determine current water table elevations, provide a baseline for a given water year, provide information regarding potential increases in water table elevations, estimate vegetative responses to higher water tables, assist in determining the best course of action in addressing 1960 Volcano Fire-based meadow perimeter ditches and roads and modifications at two springs, and inform the design of filling and stabilizing the straight-line ditch that runs through and drains the meadow.

American River Watershed Assessment and Prioritization for Meadow Restoration: Currently very little comparative data have been collected that can be used to evaluate, compare, and prioritize meadow restoration sites. Each meadow is different and has different restoration needs. However, an evaluation of basic components of each meadow provides information that can be compared and used to prioritize restoration efforts. Arguably, it is most important to restore the top candidates at the beginning of an initiative, both to realize maximum gains, and to drive future investment with the strongest possible examples. In addition, American Rivers has found that it takes a strong partnership of organizations all pulling in the same direction to overcome the inevitable obstacles that arise in large restoration projects (e.g., access, competing interests, technical and contracting issues, funding, permitting delays, etc.). A transparent, science-based, and participatory process of assessment and prioritization of meadows in a watershed is a critical step to identifying and forging these important relationships and identifying shared meadow restoration goals.

American Rivers and the Forest Service have been successful initiating this effort in the Yuba and Mokelumne Watersheds, where they developed and tested a method to assess meadows in the Sierra. This “Meadow Scorecard” has been applied successfully and resulted in the prioritization of several meadows for restoration in the Yuba and Mokelumne Watersheds. One of them, Indian Valley Meadow, has already moved to the implementation phase in a short time and restoration was recently completed with funding from several different sources. Without the assessment and prioritization process, stakeholders in that watershed would not have identified this meadow as important, developed the partnerships to move it forward, solved problems, and attracted a range of funding sources.

This previous success in prioritizing meadows for restoration in the Yuba and Mokelumne forms a foundation to expand the effort to the southern extent of the CABY region. Data, however, is the key missing piece. A concerted assessment and prioritization effort in the American River Watershed would fill the geographical gap between the Yuba and Mokelumne Watersheds. This project will use the assessment and prioritization method that was previously developed and will involve assessment and prioritization of meadows for restoration in the American River watershed. Part of this project will involve developing strong partnerships with shared meadow restoration goals.

The American River Watershed originates at the crest of the Sierra Nevada, just west of Lake Tahoe. The watershed encompasses nearly 2,000 square miles. Within that area, the three forks of the American River (north, middle, and south) flow out of the Sierra and into the Central Valley where they converge with the Sacramento River. The watershed is within both the Tahoe and El Dorado National Forest boundaries. The North Fork American has received National Wild and Scenic status which has also been proposed for reaches on the Middle Fork American. Additionally, the watershed contains critical headwaters and significant natural resources, and approximately 50 meadows that will be assessed and prioritized.

Gold Hill Ranch: Gold Hill Ranch is a 272-acre property that contains a small lake, six undeveloped springs and unique low elevation wetland complexes that feed two major tributary streams to the South Fork American River (Granite Creek and Shingle Creek). This enhancement and restoration project will improve water quality in the streams and enhance the hydrological function and biodiversity of the wetland habitats. The project also seeks to provide access and interpretive enhancements to a site of statewide and national historical significance. The Gold Hill Ranch is the site of the first Japanese settlement in North America, the Wakamatsu Tea and Silk Farm Colony (1869) and the gravesite of Okei Ito, the first Japanese woman to be buried in North America. The property also contains soils of unique and statewide importance. This project will encourage the development of a range of educational and recreational activities, adding to the region's tourism economy.

BEAR WATERSHED

Upper Bear Valley/Discovery Trail: Bear Valley has a long history of use, including the seasonal grazing by domestic livestock. Current uses such as recreation in and around the Sierra Discovery Trail at the upper extent of the meadow add to the cumulative impacts to this meadow. The South Yuba River Citizens League (SYRCL) will work with the Tahoe National Forest (TNF) to survey and report populations of CA Dept. of Food and Agriculture (CDFA) - A and B Rated non-native invasive plants on TNF and PG&E properties in and around the Sierra Discovery Trail, upper Bear Valley and along Bowman Road, in order to reduce the risk of spread to meadow and riparian areas in the Yuba and upper Bear River watersheds. Priority species include Scotch thistle and spotted knapweed, which are present in the area, and other species with potential to invade. Trained volunteers, led by SYRCL staff, will survey, document and report location and population information of priority species found to the County Agricultural Commission, TNF, and PG&E. This information will also be entered into CalWeedMapper, a state-wide database for nonnative invasive plants. Other CDFA - C Rated species posing threats to meadows and

riparian areas, such as bull thistle, woolly mullein, and Klamath weed, will be documented and reported based on recommendations by the County Agricultural Commission and TNF. Hand pulling will occur as CEQA-exempt or permitted under existing management plans. This project will build upon past restoration work led by SYRCL in meadows and riparian areas by teaching volunteers to identify non-native invasive plants, to understand the threats they pose to watershed health, and what to do when nonnative invasive plants are found. This project provides an opportunity for SYRCL to develop a “Weed Warrior” program for the Yuba watershed. SYRCL will work with other successful regional watershed organizations to build and implement this program.

YUBA WATERSHED

Deer Meadow Hydrologic Assessment: Located in the headwaters of Texas Creek on the TNF in the Yuba watershed, Deer Meadow is hydrologically connected to Loney Meadow, one of the largest wetland complexes in the South Yuba River watershed. Portions of the meadow were historically hydrologically altered and are in poor condition. A hydrologic assessment of the meadow is necessary to determine: sources of water within the meadow; condition of the meadow streams; and, why some parts of the large meadow complex are dry while other areas are wet. The assessment will guide the development of future enhancement and restoration projects to improve meadow functions.

Butcher Ranch and Rucker Meadows: Conifer encroachment into aspen stands in the Sierra Nevada is identified as a primary cause in the 95 percent reduction of this critical habitat. Encroaching conifers into meadow vegetation can reduce the area of functional meadow vegetation, both through exclusion and competition for shallow water. In some areas, conifer encroachment can have a significant effect on soil moisture, groundwater recharge and stream flow. The purpose of projects located in Butcher Ranch and Rucker Meadows is to remove conifers from aspen stands.

The aspen portions of these wet meadow complexes located in two different headwater areas in the Yuba watershed (Tahoe National Forest) have been identified as plant communities at risk of being lost due to conifer encroachment. Over-story shading and competition from conifers is the overriding causative factor for the decline of aspen stands. The project would enhance aspen stands on 23 acres of aspen/meadow fringe habitat.

Bear Meadow: Bear Meadow is located in the Yuba Watershed near Bullards Bar Reservoir. It is a five-acre meadow that is infested with nonnative invasive plants, including yellow star thistle and Scotch broom. The project would reduce the amount of yellow star thistle and Scotch broom seed produced in the meadow by at least 50 percent within three years and more in successive years. The project proposes to treat the yellow star thistle with sheep/goats/weed whipping twice per year. The proposed action is one step in implementing an integrated nonnative invasive plant management plan for the Pendola area. After the yellow star thistle is controlled (or eradicated) the dry meadow area would be planted with native grass seed. The Scotch broom would be removed by hand.

Black Jack Ravine Fen/Peatland: Globally 50 to 70 percent of all wetlands are peatlands, and these lands are estimated to contain one-third of the world’s soil carbon. This makes peatlands critical for

regulating atmospheric carbon dioxide and other gasses on a global scale (International peat Society 2002 – IN: Fens of the Sierra Nevada, California – Cooper et al, 2006). In the Sierra Nevada, peatlands function to store water and influence local communities by controlling freshwater quality and quantity (Cooper et al 2006). In addition, many of the plant and animal species that occur in forests are dependent on wetlands for at least some part of their life cycle. The wet meadow complexes/peatlands in Black Jack Ravine have experienced disturbance, primarily from cattle, which has reduced the health of their plant communities. This project would improve fen/peatland/wet meadow function and water retention by excluding disturbance and promoting native vegetation. The project would construct electric fences around Black Jack Ravine fen/peatland. Additionally, a closed road (#93-3) that is interrupting the hydrology of the Black Jack wet meadow/fen/peatland complex would be decommissioned. Road decommissioning entails tilling the road bed, removing the culvert, contouring the area to re-establish natural drainage, and planting the tilled area with native grasses. Excluding the cattle would: increase the soil and peat cover by native plants, improve the hydrology (because new cattle trails would not be formed and existing trails would be allowed to heal), and improve amphibian and macro-invertebrate conditions (through vegetative growth at these perennially wet sites). The peatlands are considered watchlist plant communities on the TNF—unique plant communities that contribute to the biodiversity in their areas.

Measurable Outcomes:

- Increased water storage and flood attenuation capacity in meadows
- Acres of meadow habitat restored or improved
- Acres of aspen stands promoted or enhanced
- Volume of water conserved through reduction of evapotranspiration
- Expected increase in minimal stream flow
- Improved aquatic and terrestrial habitat in meadow
- Reduced summer water temperatures in downstream areas
- Reduced erosion and improved water quality in watersheds
- Linear feet of stream bank stabilized
- Increase in native species diversity
- Standardized pre-project monitoring data collected
- Increased ability to leverage funds to implement on-the-ground activities
- All meadows larger than 15 acres in the American and Yuba River Watersheds assessed in the field and prioritized for restoration
- Number of people educated about meadows and the important role they play in source water areas
- Number of volunteers engaged in the project

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**

C. Technical Feasibility of the Project

The project sponsors represent a strategic partnership comprised of NGOs and public land managers who have extensive experience in all aspects of meadow enhancement and restoration represented in this highly integrated meadows project. The partnership also provides for a coordinated effort ensuring overall knowledge of all implementation sites, authority to conduct projects on named sites, and completion of all pre-implementation actions, including, but not limited to, permitting, assessment, planning and design readiness.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities. However, meadows hold historical and pre-historic importance to American tribal communities for summer food forage, medicinal and ceremonial plant collection and traditional cultural sites. Project partners are coordinating activities with the Sierra Native Alliance and a network of tribal groups in the region to ensure their participation and engagement in meadow restoration activities throughout the CABY region.

F. Environmental Justice Considerations

This project represents an alignment with the CABY EJ, DAC and tribal engagement and outreach strategy.

G. Project Costs and Financing

Total Project Budget: \$596,500; Budget Request: \$242,000

Project sponsors have provided 59% non-state match from a range of funding sources.

Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

A full benefit-cost analysis was completed for this project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org website.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This regional meadows project is illustrative of all aspects of CABY's integration strategy and epitomizes CABY's Five Measures of Integration (see 12.5.2). Specifically, the project meets multiple CABY priorities (goals, issues, objectives) and provides multiple benefits. Additionally, the project represents several components that were initially submitted under separate step 1 applications that were similar in nature and employed the same and inter-related resource management strategies. Some of the projects are geographically contiguous and together all project components allow for watershed-scale integration as well as regional integration in the American, Bear and Yuba Watersheds. The diverse, integrated partnership comprised of government and NGO entities collaboratively designed all aspects of the project and integrated objectives, outcomes and their corresponding performance measures.

K. Contribution of the project in adapting to the effects of climate change

This coordinated, regional meadows project contributes significantly in adapting to the effects of climate change by increasing the capacity of the landscape to retain water; increasing the capacity of the landscape to absorb and filter water; preserving and/or restoring riparian vegetation in order to control water temperature for aquatic biota; reducing the impact of existing stressors on regional watersheds; maintaining/improving resiliency of the forest; maintaining/enhancing species and structural diversity and the redundancy of ecosystem types across a landscape; and, maintaining/creating refugia for at-risk populations or unique sites.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 15

Project Title: Aquatic Invasive Species Prevention and Water Quality Monitoring in the North Yuba River Watershed

Primary Applicant: Sierra County Land Trust

Key Partners: Tahoe National Forest, Sierra Streams Institute, Sierra County

Project Location: Yuba Watershed

PROJECT SUMMARY

The proposed project consists of monitoring for Aquatic Invasive Species (AIS) and other water quality constituents, AIS education, and a pilot AIS removal project in the North and Middle Fork of the Yuba River focusing on the Lakes Basin.

Monitoring will primarily address the lack of monitoring for Aquatic Invasive Species (AIS), namely quagga and zebra mussels, and basic water quality constituents in lakes utilized by boaters in the Lakes Basin region of the North Yuba River watershed, the North Fork of the Yuba River, Salmon Creek, Jackson Meadows Reservoir and Milton Reservoir within the upper Middle Yuba River watershed, and in the Middle Fork of the Yuba River. The proposed project will further focus on enhancing the current lack of public awareness concerning quagga and zebra mussels in the region, and will bring together stakeholders to develop collaborative Management Recommendations that detail how to best prevent the introduction and spread of quagga and zebra mussels given that no such regional recommendations currently exist. Finally, a pilot program for invasive species removal of species of concern identified during the monitoring will begin in Year 2.

Monitoring will be conducted from May through September for three years, with varying frequency depending on the component, in Gold Lake, Salmon Lake, Lower Sardine Lake, Upper Sardine Lake, Salmon Creek, the North Fork of the Yuba River, Jackson Meadows Reservoir, Milton Reservoir, and the Middle Fork of the Yuba River. Monitoring for mussels will include suspended artificial substrates, veliger surveys and surface surveys. Individuals will be trained by the California Department of Fish and Game's AIS Regional Coordinator and Sierra Streams Institute (SSI) on sampling methods. Water quality monitoring will be conducted to establish baseline conditions for biological, physical and chemical constituents. The SSI will process and analyze the samples.

Based on the results of the first year of monitoring, the program will design and implement a pilot AIS removal project for up to 3 species of most concern. It is expected that this will be a removal project for bullfrogs and aquatic species such as pondweed, water hyacinth, etc. Focus will be in the Lakes Basin.

Stakeholders will collaborate and draft Management Recommendations for preventing the introduction and spread of quagga and zebra mussels in the specified waterways. Input will be solicited from local, state, and federal resource agencies, local government, community leaders, the general public, and staff of other AIS programs. The final Management Recommendations will be submitted to DWR, CABY IRWM, and all stakeholders involved, and made available electronically at key websites.

Measurable Outcomes:

- Percentage of the above specified lakes/waterways monitored for AIS and water quality
- Percentage of western Sierra County residents provided with AIS educational materials
- Number of outreach meetings
- Number of boater contacts
- Number of permanent signs posted
- Development and submittal of Management Recommendations

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

The project lead and key partners have initiated an AIS program in the North Yuba through federal RAC funding and Sierra County efforts. Therefore, the project sponsors have begun to implement complementary efforts to this project. Additionally, project sponsors have the technical expertise necessary to conduct AIS monitoring that would provide the data necessary to inform the phased pilot project implementation as defined by the project.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

This project's education and outreach program is designed in alignment with CABY's DAC, EJ and Tribal outreach strategy to ensure that all demographic groups operating boats in the pilot, voluntary boat inspection areas will be reached in equal proportion.

G. Project Costs and Financing

Total Project Budget: \$245,520; Budget Request: \$198,000

The Sierra County RAC has funded the beginning of both an educational and outreach program (Sierra County Firesafe and Watershed Council) and a voluntary boat inspection (Sierra County) for quagga and zebra mussels.

Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project reflects an integrated partnership which provides a concentrated effort in the

North Yuba River Watershed, considered an area of high risk for the proliferation of aquatic invasive species (AIS). The project has assembled key partners representing federal and county governments as well as local and regional NGOs reflecting an effective integration of partners who have the authority, political influence and expertise to implement this project. Project sponsors purposefully chose not to integrate this project with the regional AIS effort as a strategic consideration based on political, jurisdictional concerns. However, the partners of both AIS projects have agreed to coordinate through standardized monitoring protocols and information sharing.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by reducing the impact of existing stressors on the region's watershed.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 16

Project Title: Deer Creek Salmon and Steelhead Habitat Restoration Project

Primary Applicant: Sierra Streams Institute

Key Partners: CSU Sacramento, Lake Wildwood Association, Nevada County Sanitation District #1, Central Valley Regional Water Quality Control Board, Gold Country Flyfishers, National Marine Fisheries Service, US Fish and Wildlife Anadromous Fish Restoration Program, California Department of Fish and Game

Project Location: Yuba Watershed

PROJECT SUMMARY

The mouth of Deer Creek was once an exceptionally rich salmon and steelhead spawning habitat for the Yuba River. Salmon and steelhead were present on Deer Creek in large numbers in the early part of the 20th century. Lake Wildwood reservoir dam on Deer Creek, constructed in 1970, 4.25 miles upstream of the confluence with the Yuba River, has had a serious impact on the viability of Deer Creek's spawning habitat, resulting in a lack of suitable spawning gravels, disruptions to the natural flow regime, elevated water temperatures, excessive nutrient loads, and lack of native shade trees.

The project is an effort to restore critical habitat for three ESA-listed species of California Central Valley Chinook salmon and steelhead by employing a combination of gravel augmentation, spawning bed enhancement, and modifications to the management of the watershed. The project builds on prior efforts conducted in Deer Creek since 2010, including a successful gravel injection and spawning bed

enhancement effort, re-vegetation in selected upstream locations; and the development and implementation of a reservoir release plan in 2011 that was designed to replicate the natural hydrology of a winter storm.

This proposal is an effort to: 1) Provide gravels of suitable size for spawning anadromous fish on an annual basis for the project term; 2) Conduct comprehensive physical, biological, chemical and geomorphological monitoring throughout the life of the project; 3) Restore native riparian vegetation within and upstream of the salmon spawning reach; and 4) Collaborate with the management of Lake Wildwood to minimize impacts to the downstream spawning habitat reach, including ensuring that year round flows are in compliance with state regulations and that periodic drawdowns are managed with regard for the needs of the downstream environment.

Measurable Outcomes/Objectives:

- Inject 1500 cubic yards of suitable gravels over three years for spawning in lower Deer Creek
- Create 30 spawning beds in the confluence reach
- Replant 400 native trees and plants
- Collaboratively implement modifications to the Lake Wildwood’s management of reservoir flows
- Complete pre, during and post project monitoring

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

The project builds on prior efforts conducted in Deer Creek since 2010, including a successful gravel injection and spawning bed enhancement effort, re-vegetation in selected upstream locations; and the development and implementation of a reservoir release plan in 2011 that was designed to replicate the natural hydrology of a winter storm. The project sponsors, therefore, have the experience and expertise necessary to implement the next phase of project implementation proposed herein. The requisite pre-implementation actions have been fulfilled to be considered a Tier 1 project.

- D. Specific Benefits to critical DAC water issues**
This project does not address critical DAC water issues.
- E. Specific benefits to critical water issues for native American tribal communities**
This project does not have specific and direct benefits to critical water issues to native

American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$357,525.00; Budget Request: \$192,435.00

This project provides a non-state match of approximately 46% from federal and private foundation funders. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at

www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project constitutes diverse, strategic partner integration of federal, state, and county agencies as well as NGO and private entities which have the authority, expertise and capacity to implement this project. The project is representative of CABY's integration strategy which prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. The project also addresses a priority regional and inter-regional issue of statewide concern.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by preserving and restoring riparian vegetation in order to control water temperature for aquatic biota; reducing the impact of existing stressors on the region's watersheds; maintaining and enhancing species and structural diversity of ecosystem types across a landscape; Maintaining and creating refugia for at-risk populations and unique sites.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 17

Project Title: Woodpecker Preserve Forest and Watershed Erosion Control, Fire Fuels Management and Forest Restoration

Primary Applicant: Bear Yuba Land Trust

Key Partners: Sierra Streams Institute

Project Location: Yuba Watershed

PROJECT SUMMARY

Six years ago, vandalism created a blowout from the NID overflow on the Cascade Canal, causing a landslide and major erosion. The slopes need to be re-vegetated to prevent erosion into nearby canals and waterways, including Little Deer Creek which runs through the property, the singular water resource for the Nevada City Municipal Water Department. In addition, the forest was logged 12 years ago and has become overgrown with brush and small trees in the understory. The forest composition has also been compromised by invasive non-native plants, especially Himalayan blackberry. This effort would benefit forest health and increase protection of a community that is acutely vulnerable to catastrophic wildfire. Fire suppression practices inadvertently created a greater fire danger by leading to flourishing invasive weeds. Such invasives contribute to and are the result of altered fire regimes – replacing native plants that are adapted to the natural fire regime.

This proposal is to implement effective forest watershed management techniques on a property owned by the Bear Yuba Land Trust. Woodpecker Preserve is a heavily forested 28 acre parcel of land which acts as a buffer to a densely populated residential neighborhood on Banner Mountain in Nevada City. The Preserve is adjacent to a privately owned, well-managed 80-acre forest containing a conservation easement, and a nearby 120-acre parcel managed by the Bureau of Land Management (BLM), allowing for a large tract of land to be preserved and managed as a fire buffer. Little Deer Creek which runs through all of these properties provides the water resource for the Nevada City Municipal Water Department.

The implementation of this project would be of great benefit to the area's forest health, would protect water quality and would increase protection of a community that is acutely vulnerable to catastrophic wildfire. The restoration would employ thinning strategies that have emerged as a new standard for fire prevention and control in forest ecosystems, involving the removal or modification of surface fuels, the felling of excess snags, prescriptive fires, and mechanical thinning to decrease overall stand density.

The property is also in need of re-vegetation along the berms of 1,200 feet of the Nevada Irrigation District (NID) DS and Cascade Canals on the property. The erosion-prone slopes need to be revegetated with plants to prevent erosion into nearby canals and waterways such as Little Deer Creek in a manner that protects native plant ecology.

Project activities will be guided by the Woodpecker Ravine Management Plan, developed in 2004 by the Bear Yuba Land Trust (previously Nevada County Land Trust). This work builds upon work already begun with a trails construction project that was completed in 2010 with restoration efforts along the trail

route. At that time, there was no CEQA required because all work was performed with private donations on land owned by the Land Trust. County permitting for the project is complete and funding has been secured through the Sierra Nevada Conservancy (\$76,315) which focuses on the southern and western portions of the property. This project would focus on the eastern and northern portions of the property.

Measurable Outcomes:

- Improve overall forest ecosystem health and habitat structure on eastern and northern portions of property;
- Control spread and invasion of non-native species on eastern side of NID Ravine;
- Reduce competitive pressures on native flora;
- Improve ecosystem structure and function;
- Preserve and encourage native biodiversity and rare/endangered species;
- Improve Water Quality of Little Deer Creek

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

As indicated in the project description, the proposed project activities are guided by the Woodpecker Ravine Management Plan which was developed in 2004 representing the priority implementation actions for this property owned by the Bear Yuba Land Trust. Additionally, this project complements and builds upon work already begun with a trails construction project that was completed in 2010. Further, County permitting for the project is complete and complementary funding has been secured through the Sierra Nevada Conservancy to conduct similar implementation actions focused on the southern and western portions of the property. This project would focus on the eastern and northern portions of the property.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$82,000; Budget Request: \$65,000

This project provides a non-state match of approximately 25% from federal and private foundation funders. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

See I.1.3 above for strategic considerations relevant to this project.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by strategically reducing wildfire risk ; coordinate between management agencies and levels to better address clear management goals; reducing the impact of existing stressors on the region's watersheds; maintaining and improving resiliency of the forest; sustaining and promoting fundamental ecological functions/services; maintaining and enhancing species and structural diversity of ecosystem types across a landscape.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 18

Project Title: Sugarloaf Mountain Fuels Reduction Project

Primary Applicant: Sierra Streams Institute

Key Partners: City of Nevada City, Friends of Sugar Loaf, Fire Safe Council of Nevada County

Project Location: Yuba Watershed

PROJECT SUMMARY

Sugarloaf Mountain is a high priority for fuels reduction work because of its location. Within one mile of the site are the historic buildings of Nevada City whose entire downtown is listed on the National Register of Historic Places, and the location of the headquarters of Tahoe National Forest, and the Nevada County Government Center with its County Administration Center, County Jail, Main Library, Mental Health Facility, Facilities maintenance center, county sheriff and emergency operations center. Because Sugar Loaf towers over these facilities, an uncontrolled wildfire would rain fire brands on these buildings, with a high potential for ignition and part or total loss of County infrastructure and of irreplaceable historic buildings. At the same time, the Sugarloaf Mountain is an open space jewel, just steps from an urban center. The site is characterized by dense manzanita, oak and pine forest. Invasive Scotch broom has taken hold of the summit area, and Himalayan blackberry is becoming established throughout the property. There is considerable ladder fuels density in the form of dead limbs and brush.

This proposal is an effort to complete a brush and ladder-fuels reduction project on 31 acres at Sugar Loaf Mountain adjacent to downtown Nevada City.

The City of Nevada City purchased the iconic Sugar Loaf Mountain in a much-celebrated and long sought deal in January 2011, using Proposition 40 funding. The mountain was purchased to preserve as open space for local residents, and the city intends to improve the existing trail, do fire clearing work, and review other recreational opportunities. Fuels reduction work on Sugar Loaf was added to the Nevada County Multi-Hazard Mitigation Plan in 2011.

The intent is to create defensible space through a fuels reduction and non-native invasives removal program in a manner that protects native plant ecology. The program will employ selective thinning strategies that have emerged as a new standard for fire prevention and control in forest ecosystems, involving the removal or modification of surface fuels, the felling of excess snags, and mechanical thinning to decrease overall stand density. Selective reduction in tree density through careful thinning improves tree growth and vigor, increases live crown ratios, reduces insect and disease mortality, and promotes understory shrub development. Modest re-vegetation work is expected to be needed but not in vast areas because native plants and trees are well represented on the site and will repopulate over time.

Additionally, maintaining a fire safe forest on Sugarloaf will prevent potential water quality impacts to nearby Deer Creek by ensuring that post fire erosion and resulting sedimentation and nutrient additions to Deer Creek are avoided. The slopes of Sugarloaf drain into two intermittent streams which flow into Deer Creek.

Measurable Outcomes:

- Invasive Species Removal: Reduction of competitive pressures on native flora; Reduction in amount of non-native species
- Fire Safety: Reduction of fuel load accumulation

- Stream Protection: Fire safe forest avoiding post fire erosion, sedimentation, and nutrient additions to Deer Creek.

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

Sierra Streams Institute in partnership with the City of Nevada City, the Fire Safe Council of Nevada County and Friends of Sugarloaf have the experience and expertise to conduct the technical aspects for project implementation as well as in completing the pre-implementation project planning tasks. Some fuel reduction on Sugarloaf has already been conducted by Friends of Sugarloaf. The first two work days have been conducted – one full day of machine mastication, and a volunteer day with use of weed wrenches. In early 2012, Sierra Club volunteers also conducted a Scotch broom pull work day.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$119,000; Budget Request: \$89,250

This project provides a non-state match of 25%. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

See I.1.3 above for strategic considerations relevant to this project.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by strategically reducing wildfire risk; coordinating between management agencies and levels to better address clear management goals; reducing the impact of existing stressors on the region's watersheds; maintaining and improving resiliency of the forest.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 19

Project Title: Deer Creek and Tribute Trail Forest Health Initiative

Primary Applicant: Sierra Streams Institute

Key Partners: City of Nevada City, Bureau of Land Management, California Native Plants Society- Redbud Chapter, California Conservation Corps, Fire Safe Council of Nevada County, Natural Resources Conservation Service

Project Location: Yuba Watershed

PROJECT SUMMARY

The Deer Creek watershed below Nevada City is a hotspot of both biodiversity and activity. It has also been recognized as the #1 fire hazard in Nevada County as specified in the Community Wildlife Protection Plan developed by the Fire Safe Council, Nevada County Fire Chiefs Council, and the County Board of Supervisors. This forest land just west of Nevada City is sparsely populated and contains high fuel loads due to a century and a half of fire suppression efforts. The forest composition in this canyon has been compromised by invasive non-native plants, especially English ivy, Scotch broom, Vinca, Himalayan blackberry and tree of heaven. Invasive plants both contribute to and are the result of altered fire regimes; the problem is compounded by the loss of native plants that are adapted to the natural fire regime. During the summer and fall months, prevailing winds flow easterly up this relatively steep canyon to historic downtown Nevada City.

The proposed project has three main objectives: 1) to restore forest health on approximately 75 acres of mixed conifer forest on private lands in Deer Creek canyon; 2) reduce the risk to historic Nevada City from large, damaging fires started in this canyon; and 3) to create an incentive and model for private landowners to increase the health of their forests lands.

The project partners have signed several Memoranda of Understanding that outline a shared commitment to create defensible space in the Nevada City Environs and on BLM land through a fuels reduction and non-native invasive removal program using methods that protect native plant ecology

and habitat. The project would focus these methods on private lands in the Deer Creek/Tribute Trail region and employ selective thinning strategies that have emerged as a new standard for fire prevention and control in forest ecosystems. These methods involve the removal or modification of surface fuels, the felling of excess snags, and mechanical thinning to decrease overall stand density. Selective reduction in tree density through careful thinning has proven to: improve tree growth and vigor, increase live crown ratios, reduce insect and disease mortality, and promote understory shrub development.

Proposed project activities are as follows:

1. Building off of the *Deer Creek Tribute Trail and Restoration Project Vegetation Management Plan*, developed in 2009 by American Rivers and Sierra Streams Institute, removal of invasive non-native vegetation and thinning on 75 acres of private property in coordination with the landowners.
2. Pre-, mid- and post-project monitoring including vegetation surveys and monthly water quality monitoring within, upstream and downstream of the project parcel to determine effectiveness of treatments and habitat benefits.
3. Collaborative planning with project partners to draft and implement a re-vegetation effort that maximizes forest health, re-establishes native plants, and reduces wildfire risk.
4. Coordinate with local schools, trail planners, and woodworkers to use the wood produced from thinning to create shade structures, benches, and small bridges.

Measurable Outcomes:

- Improved forest health
- Increased habitat
- Increase in native plants
- Reduced risk of wildlife
- Increased understanding of methods and practices to promote long-term forest health on both private and public lands in Nevada County.

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

As indicated in the project description, this project originates from the *Deer Creek Tribute Trail and Restoration Project Vegetation Management Plan*, and, therefore, is guided by the priority implementation actions and processes established through that Planning effort. Additionally, the project sponsors have the necessary authorizations to conduct the project on the proposed sites as well as the expertise and experience to for pre-project planning as

well as implementation.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$150,000; Budget Request: \$112,500

This project provides a non-state match of 25% from federal and private foundation funders. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

See I.1.3 above for strategic considerations relevant to this project.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by strategically reducing wildfire risk; coordinating between management agencies and levels to better address clear management goals; reducing the impact of existing stressors on the region's watersheds; maintaining and improving resiliency of the forest; sustaining and promoting fundamental ecological functions/services; maintaining and enhancing species and structural diversity of ecosystem types across a landscape.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 20

Project Title: Monitoring and Public Demonstration Centered on Invasive Species Removal and Fuels Reduction in the Grizzly Creek, Spring Creek, and Shady Creek Watersheds in the 'Inimim Forest

Primary Applicant: Yuba Watershed Institute

Key Partners: Bureau of Land Management (BLM), Tahoe National Forest (TNF)

Location: Yuba Watershed

PROJECT SUMMARY

As part of the community-management of the 'Inimim Forest on BLM land in the Yuba Watershed, the YWI has been implementing long term fuel-load management, Scotch broom mapping and removal, meadow restoration, wildlife monitoring, and community outreach events. Current fuel-load management efforts, which include pile and burn on several acres in the Shields Camp parcel in the Spring Creek drainage, strategic fuel breaks, and ladder fuel reduction surrounding large diameter trees, are funded through RAC, USDA-FS, BLM, and other sources. There is a need to monitor the effects of current and future fuel-load management techniques on forest vegetation, particularly related to the introduction and spread of invasive plants in the watershed.

YWI would monitor vegetation response to ongoing fuel-load reduction methods in the 'Inimim Forest using the following methods:

- Establish baseline data by documenting pre-treatment vegetation parameters, including fuel-load characteristics and locations of invasive plant populations, in sample locations where fuel-load treatments are planned.
- Sample sites would be visited annually for up to three years to monitor vegetation response to treatments, fuel-load re-growth, and potential encroachment of invasive plants in treated areas.
- Incorporate pre- and post-treatment data into an existing GIS database for the 'Inimim Forest. This vegetation data would inform the future development of an updated management plan for the 'Inimim Forest.

The effects of fuel-load treatments on vegetation in the 'Inimim Forest, including the introduction and spread of invasive plants, would be summarized in a brief report following the third year of monitoring. Additionally, the YWI would coordinate a community outreach event with local landowners, Tahoe National Forest, BLM, and others focused on invasive plant management, fuel-load reduction, wildlife habitat, and overall forest health on the San Juan Ridge.

Measurable Outcomes:

- Establish 5-10 new long-term vegetation monitoring plots in the 'Inimim Forest
- Develop a report summarizing effects of fuels treatments on vegetation and invasive plants in the 'Inimim Forest

- Coordinate forest health public outreach event for the San Juan Ridge

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

The Yuba Watershed Institute has been managing the 'Inimim Forest in partnership with the BLM through a community-based forest management plan for over 20 years. The organization has the authority to implement the project on the named public lands as well as the experience and expertise to effectively and collaboratively implement this project in cooperation with the BLM and the Tahoe National Forest.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$24,000; Budget Request: \$18,000

This project provides a non-state match of 25% through RAC funding administered through the Forest Service and in-kind contributions from BLM staff and YWI volunteers. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

See I.1.3 above for strategic considerations relevant to this project.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by strategically reducing wildfire risk; coordinate between management agencies and levels to better address clear management goals; reducing the impact of existing stressors on the region's watersheds; maintaining and improving resiliency of the forest; maintaining and enhancing species and structural diversity of ecosystem types across a landscape.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 21

Project Title: South Yuba Forest Stewardship

Primary Applicant: South Yuba River Citizens League

Key Partners: California State Parks, Malakoff Diggins Park Association, Bureau of Land Management (BLM), Tahoe National Forest (TNF), Sierra College, California Conservation Corps (CCC)

Project Location: Yuba Watershed

PROJECT SUMMARY

Malakoff Diggins State Historic Park is much loved and well-used by visitors interested in California's Gold Rush history but it has been under threat of closure in recent years. Invasive species removal projects have taken place over the years at the Park, but a larger effort is required for substantial lasting gains to forest health. The Malakoff Forest Health Project will give CA Dept. of Parks additional assistance in treating 20-30 acres of priority areas where invasive species are threatening forest health by degrading habitat, creating fire risk and fuel ladders.

SYRCL currently partners with the CA Dept. of Parks, the BLM and Tahoe National Forest in planning and implementing invasive species removal projects in the South Yuba corridor. This work has the potential to greatly benefit forest ecosystems by expanding in scope and coordinated prioritization. Such a program has been called for since the development of the South Yuba Comprehensive Management Plan by these and other partner organizations. With a focus on the Malakoff forest, and a broader scope of the South Yuba canyon, this overall project will harness substantial existing resources, including community volunteers, to accomplish a model forest restoration program: invasive species removal for fire risk reduction and ecological benefit in the South Yuba River watershed.

SYRCL will recruit and train crews of approximately 10 volunteers working 9 work days per year for three years to remove invasive species from the Park and other prioritized sites within the South Yuba River corridor. Additionally, Sierra College will provide an intern to help with mapping and surveying, and the California Conservation Corps (CCC) will work for 12 days total.

Invasive Himalayan and cut-leaf blackberry have displaced native vegetation, especially within drainages adjacent to creeks and ponds, and have created dense fuel ladders into the forest canopy creating hazardous fire conditions. Scotch broom is present throughout the park and creates an understory of flammable fuel. Several species of invasive grassland weeds such as Medusahead grass, barb goatgrass, yellow star-thistle, and others recently invaded grassland areas, out-competing native bunchgrasses and creating fuel-buildup.

This project will achieve 50% control of blackberry with near eradication of Scotch broom and all grassland weeds within the park. This will alleviate the risk of catastrophic fire within the South Yuba canyon, a heavily recreated area which supports an important part of the local economy and is a vital foothill ecosystem of the Sierra Nevada. All volunteers and CCC crew will receive on-site training and an evening presentation about the Park resources and invasive species within the Park.

In years 2 to 3, SYRCL will use lessons learned to write and design an online “How-To” manual for volunteer groups throughout the CABY region. This fills an important gap, because, to our knowledge there is no publication that adequately combines information about Sierra invasive plant removal with a thorough knowledge of what it takes to recruit, train and run volunteer groups undertaking large scale, long-term restoration. This manual will fill that gap and also highlight the need for invasive plant removal to maintain healthy forests, drawing a clear nexus between forest health and watershed impacts. We will promote and monitor its use in the CABY region during the third year of this project.

Measurable Outcomes:

- Acres of Land Improved or Restored measured in invasive species controlled
- Percent change in invasive species cover for units of ownership (e.g. park area)
- Number of people reached and educated on invasive species and fire risk including trainings and groups using How-To manual
- Hours of job *training in natural resource management provided*
- Dollar value of resources leveraged for the Sierra Nevada including volunteer contributions, SYRCL in-kind match, partner agency contributions, and Sierra College

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

SYRCL has a 30-year history of successful volunteer-based watershed activities, 600 active volunteers and is widely known for its expertise in recruiting and training volunteers. SYRCL’s volunteer restoration activities include regular invasive species removal days in the Yuba watershed, riparian restoration in the Lower Yuba and meadow restoration in the upper watershed. SYRCL has led an extensive volunteer water quality monitoring program and has completed ten years of concentrated monitoring at Humbug Creek, the main tributary from the Park to the South Yuba River. SYRCL has produced a number of

How-To manuals including *Sharing Stewardship: A guide to involving volunteers in assessment, monitoring and restoration of meadows in the Sierra Nevada and the "Volunteer Guide to River Monitoring."*

In addition to the primary applicant's stated expertise, project implementation will follow recommendations from CA. Dept. of Food and Agriculture's Noxious and Invasive Weed Action Plan, as well as other invasive plant authorities.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$160,000; Budget Request: \$120,000

This project provides a non-state match of 25%. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

See I.1.3 above for strategic considerations relevant to this project.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by strategically reducing wildfire risk; coordinating between management agencies and levels to better address clear management goals; reducing the impact of existing stressors on the region's

watershed; maintaining and improving resiliency of the forest; maintaining and enhancing species and structural diversity of ecosystem types across a landscape.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 22

Project Title: Removal of Scotch broom in Nevada and Placer Counties by community group sponsors to reduce wildfire hazard and invasive weed spread in the CABY region

Primary Applicant: Fire Safe Council of Nevada County

Key Partners: Alta Sierra Property Owners' Association, Banner Mountain Homeowners' Association, Bear Yuba Land Trust, Bureau of Land Management, Cal Trans, California State Parks, Champion Mine Road Association, City of Nevada City, Greater Cement Hill Neighborhood Association, Lake Wildwood Firewise Committee, Lake of the Pines Firewise Committee, Mountain Lakes Estates Homeowners' Association, Nevada County Agricultural Commissioner, Nevada Irrigation District, Placer County Agricultural Commissioner, Placer Land Trust, Placer-Sierra Fire Safe Council, California Native Plants Society Redbud Chapter, South Yuba River Citizens League, Tahoe National Forest, Rattlesnake Ridge Homeowners Association, UC Master Gardeners, Wolf Creek Community Alliance, Yuba Watershed Institute

Project Location: Regionwide

PROJECT SUMMARY

Highly invasive Scotch, French and Spanish broom is spreading along roadways into new areas throughout Nevada and Placer Counties. Many newcomers to the foothills who have used the plant as ornamental landscaping in prior home locations plant it exacerbating the problem. Broom varieties are highly flammable and create a "ladder fuel" effect that enables a ground fire to step up vegetation into the forest tree canopy and create catastrophic wildfire conditions. Many public lands are highly infested with broom and have little resources to remove and control the rate of spread which displaces native plant species and wildfire forage. This project represents a regional program to systematically control broom in the CABY region.

Project elements include:

- 1) A public education campaign through radio, newspaper, website, social networking tools, and community newsletters on the hazards and ecological impacts associated with broom. Education includes broom identification, control methods (and weed wrench loan program assistance), re-vegetation recommendations and solicitation for volunteers at community project sites in Nevada and Placer Counties. The project and education campaign is governed by

a core team of volunteers including representatives from Nevada/Placer County Ag Commission, Forest Service, UC Master Gardeners, Native Plant Society and community groups. Due to the active Scotch broom removal program in Nevada County, the Nevada County Agricultural Commissioner banned the sale of Scotch broom as ornamental landscaping in 2007. We aspire to have Placer County follow suit to ban its sale.

- 2) Ongoing landowner weed wrench loan program for: individual property owners on private lands; and, community groups working on public lands (19 sites in Nevada/Placer Counties in 2010 with over 300 volunteers).
- 3) Site identification and project coordination. Project sites are identified by core team members, the public, and agencies in need of assistance. Project site sponsors are asked for a five year commitment to pull, monitor and re-vegetate the area. Spring pulls are intended to enable crews to pull the weeds while the soil is soft from rains and before seed disbursement occurs using hand tools and weed wrenches specially designed to uproot the plants to avoid re-sprouting.

Project site hosts coordinate with landowners for access, restroom facilities, parking and refreshments. Tools, safety equipment, volunteer medical insurance, landowner liability insurance, volunteer coordination (recruitment, coordination, communication, etc.), and signage are provided by the Fire Safe Council.

- 4) Before and after photo documentation. Community site photographs are taken by site coordinators. A photo contest is held for those working on their own property pulling broom to encourage them to take photographs of their efforts for evidence of treatment.
- 5) Maintenance. Participating sites make a commitment to continue eradication and ongoing maintenance for 5 years.

Measurable Outcomes:

- Public Education: 50,000 people reached in two counties in the CABY Region
- Weed Wrench Loans: 3,500 weed wrenches loaned each year for three years
- Acres Treated: 100 acres treated each year for three years
- Cubic Yards of broom removed: 250 cubic yards of broom removed over three years
- Project Sites: 20 community pull sites each year for three years
- Number of Volunteers: 350 volunteers a year for three years
- Photo Monitoring (Before & After Photos): Before and After photos taken at each project site each year for three years

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.
- B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

The Fire Safe Council of Nevada County has been implementing this high impact, low cost program for several years and has established an extensive network of partners as well as the requisite policies, procedures and protocols to ensure the programs continuing success. This project proposes to expand the effort throughout the CABY region to increase the regional impact towards reducing the risk of catastrophic fire and its known impacts on watershed health and water quality.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$50,000; Budget Request: \$25,000

This project provides a non-state match of 50% through partner groups and in-kind volunteer work hours. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

See I.1.3 above for strategic considerations relevant to this project.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by strategically reducing wildfire risk; reducing the impact of existing stressors on the region's watersheds; maintaining/improving resiliency of the forest; maintaining/enhancing

species and structural diversity of ecosystem types across a landscape.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 23

Project Title: Native Conservation Corps: Job training, environmental education and watershed restoration workforce development in the CABY Region

Primary Applicant: Sierra Native Alliance (SNA)

Key Partners: Tsi-Akim Maidu Tribe, Colfax-Todd's Valley Consolidated Tribe, Shingle Springs Rancheria, United Auburn Indian Community, El Dorado Indian Council, Maidu Museum, California Indian Basketweaver's Association, Maidu Family Story, Shingle Springs Tribal TANF, Placer Indian Education, UC Davis Cooperative Extension, American Rivers, American River Conservancy, The Sierra Fund, South Yuba River Citizens League, Tahoe National Forest

Project Location: Regionwide

Project Summary

This three year project integrates workforce development, job training with environmental education and leadership skills to create pathways for Native American youth and adults to enter careers that are relevant to the cultural and environmental goals of their communities while providing a labor force for watershed restoration activities in the CABY Region.

The project primarily serves Native youth in the CABY Region, who are over-represented in child welfare, juvenile justice, and mental health systems. In Placer County alone, Native youth make up 28% of cases in the child welfare system, with many residing in foster care, group homes and juvenile detention facilities. Native youth also experience the highest school-failure rates. Sixty-eight percent of Native students in the region qualify for free school lunch programs, and many receive social assistance and special education services through Title XII Indian Education programs. In a recent needs assessment, the Native community expressed concern about the loss of healthy lifestyles as a direct result of the loss of traditional connections to the environment. "The health of our community is strongly rooted to the preservation of our language, culture and the lands our ancestors lived upon... and is dependent upon the preservation of the plants and animals around us" (CRA 2008).

This project will support 3 youth team leaders and recruit and train twelve interns from Placer, El Dorado and Nevada Counties in environmental education, restoration, advocacy, and media skills. Additionally, the project will form a leadership group to produce peer-education materials, and facilitate

outdoor education experiences for an additional 150 underserved youth each year. This project will expand the conservation internship model that the Sierra Native Alliance (SNA) has developed over the last three years. Through this project, SNA is developing a best practice prevention/health promotion model for high-risk Native youth. The Sierra Native Alliance has a proven track record of success in addressing the social, cultural, health and economic needs of Native youth by facilitating access to culturally relevant environmental experiences and career pathways.

SNA was originally formed as a grassroots network of Native youth, elders, cultural leaders, educators, and social service providers. SNA is governed by an all-Native board that includes youth, elders and members of Native communities in Placer, El Dorado, and Nevada Counties. SNA currently employs five full-time Native staff members, who are supported by a rich resource pool of cultural consultants and volunteers to implement ongoing youth leadership, mentoring, advocacy, and education programs. SNA's afterschool education programs include cultural arts, language, and outdoor education on the Alta Vista Nature Trail, which was restored by past interns as a resource for the SNA Cultural Education Center in Auburn.

Measurable Outcomes:

- Workforce development for the implementation of on-the ground restoration projects including meadow restoration, fire fuel reduction, invasive plant removal, native plant re-vegetation, erosion control and other restoration activities at various sites in the CABY region
- Labor cost savings for implementation of natural resources projects
- Education and training for tribal youth and adults including:
 - acquiring tribal language skills associated with native plants, birds, and fish
 - learning native restoration techniques
 - developing skills in media and outreach around conservation issues
 - researching traditional use of resources and ceremonial significance of sites
 - understanding the range of professional opportunities in the conservation field from administrative to scientific

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

The Sierra Native Alliance has been administering similar programs for several years and in recent years has partnered with other CABY project sponsors, such as American Rivers, to conduct meadow restoration and other on-the-ground restoration activities with National Fish and Wildlife Foundation funding.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

While this project does not directly benefit critical water issues for Native American tribal communities, the project benefits tribal communities by investing in the education and training of youth and adult tribal members to assist them in following viable career paths that will economically and culturally benefit tribal communities.

F. Environmental Justice Considerations

This project is consistent with CABY's DAC/EJ project development and outreach strategy where CABY prioritizes communities who are often underserved and/or disproportionately affected or impacted by land and water development projects. This project engages Native American tribal communities in watershed restoration activities.

G. Project Costs and Financing

Total Project Budget: \$187,500; Budget Request: \$150,000

This project provides a non-state match of 25% through funding from the National Fish and Wildlife Foundation. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

A full benefit-cost analysis was completed for this project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org website.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project is entirely integrative in nature and stands out as an illustrative example of CABY's commitment to building strategic partnerships that leverage resources of stakeholder groups with varying degrees of capacity while more efficiently implementing the IRWM Plan regionwide. Several CABY Tier 1 on-the-ground implementation projects have committed to partnering with the Sierra Native Alliance for projects in the programmatic areas of Water Quality, Habitat and Environment and Human-Landscape Interaction. In addition to working with the Native Conservation Corps to build a regional labor force for restoration projects and provide critical job training for disadvantaged

communities, CABY is able to facilitate relationships between and among regional tribal communities and other CABY stakeholder groups.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by promoting the adaptation strategies previously identified in project numbers 9, 14, 19, and 26.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

GHG quantifications are not relevant to the education and training components of this project. For GHG quantifications relating to on-the-ground restoration projects, refer to the Tier 1 projects of SNA partner entities for projects 9, 14, 19 and 26.

Project Number: 24

Project Title: Aquatic Invasive Species Prevention in the CABY Region

Primary Applicant: South Yuba River Citizens League

Key Partners: Tahoe National Forest, California Department of Fish and Game, California Invasive Species Council

Project Location: Regionwide

PROJECT SUMMARY

Much of the ongoing spread of aquatic invasive species (AIS) to inland waters throughout North America can be attributed to the overland movement of small-craft boats. Additionally, spread of AIS can occur by footwear and leggings. Many recreationists in the CABY region are unaware of proper decontamination techniques. Every time a boat or wading gear is transported overland after use in an invaded waterway there is the possibility that AIS will be introduced to new areas. Many small-craft boat owners are not aware that they could be transporting AIS from one area to another and only about 1/3 of boat users are known to clean their boats before moving them between waterways. AIS have extensive negative effects on the ecosystems they invade including degradation of water quality. Baseline inventories of the types of AIS that occur in the CABY region do not exist. Best management practices for prevention of AIS have not been developed, but many educational materials and prevention program techniques from other areas could be adopted for the CABY region.

The project includes multiple components designed to prevent the spread of AIS. SYRCL would partner with the Forest Service (FS) to conduct AIS prevention involving SYRCL's extensive volunteer and community network, and including the River Monitoring Program. SYRCL, the Forest Service and others would partner to develop and provide training in AIS identification to citizen monitoring groups and other interested parties throughout the CABY region. Training would include methods for documenting areas surveyed and the AIS found so that the information could be put into approved databases. The FS

would also partner with the California Department of Fish and Wildlife, SYRCL, the California Invasive Species Council (Cal ISC) to develop a packet of prevention outreach materials to be given to boaters, stores that sell aquarium supplies, and others. SYRCL volunteers and FS personnel would distribute these materials to pet stores, at boat shows, at county fairs and other events. SYRCL volunteers, FS personnel and other volunteers would also distribute these materials at popular boat launching sites within the CABY Region. In addition, the FS with the help of cooperators would develop draft BMPs to be used to prevent the spread of AIS.

Measurable Outcomes:

- Number of preventative packets delivered
- Number of miles of waterway surveyed
- Number of preventative opportunities provided at local waterways
- Number and type of AIS infestations discovered
- Number of people trained in AIS identification
- Development of draft preventative BMPs for AIS

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

SYRCL has a 30-year history of successful volunteer-based watershed activities, 600 active volunteers and is widely known for its expertise in recruiting and training volunteers. SYRCL has led an extensive volunteer water quality monitoring program for more than a decade and has produced a number of How-To manuals including *Sharing Stewardship: A guide to involving volunteers in assessment, monitoring and restoration of meadows in the Sierra Nevada* and the *Volunteer Guide to River Monitoring*. Therefore, SYRCL has the expertise and capacity to incorporate AIS into its existing volunteer monitoring program and with assistance from project partners to provide the necessary volunteer training to successfully implement all technical aspects of this project.

D. Specific Benefits to critical DAC water issues

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

SYRCL and its partners will distribute education and outreach materials at a range of

venues to ensure equal access to these critical and informative educational materials.

G. Project Costs and Financing

Total Project Budget: \$120,000; Budget Request: \$90,000

This project provides a non-state match of 25% through in-kind contributions from federal agency partners and volunteer monitors' work hours. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

This project reflects a coordinated effort that assembles an integrated partnership between and among federal and state agencies as well as NGOs to implement an aquatic invasive species program across the region. It also intends to coordinate efforts with the North Yuba AIS effort through information sharing and standardized monitoring protocols (See project #15 above). As described in *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. This project is in alignment with CABY's aforementioned integration strategy.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by reducing the impact of existing stressors on the region's watersheds.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

1.1.4 Programmatic Area 4: Climate Change

This section describes 1, tier 1 project in the programmatic area of Climate Change that is implementation ready. It includes:

1. CABY Regional Renewable Energy with Micro and Small Hydro

Project Number: 25

Project Title: CABY Regional Renewable Energy with Micro and Small Hydro Project

Primary Applicant: Placer County Water Agency

Key Partners: Nevada Irrigation District, El Dorado Irrigation District, El Dorado County Water Agency

Project Location: Regionwide

PROJECT SUMMARY

Several hundred miles of treated and raw water delivery infrastructure covering 5,000 or more feet of head is present in the CABY region. There is significant energy generation potential associated with delivering and treating this water, at minimal environmental costs. These projects would develop renewable energy projects in the form of in-conduit hydro-electric facilities, as defined under state law.

California and National energy policies and regulations have changed significantly over the past several years and will continue to do so. The change stems from growing concern over global climate change, public health concerns related to the continued use of fossil fuels, ongoing petroleum shortages, rising fossil fuel prices and geopolitical and national security issues related to foreign energy dependence. Several key pieces of legislation are driving California's response to these concerns. The California Renewables Portfolio Standard Program requires retail sellers of electricity to purchase at least 33% of electricity generated from eligible renewable energy resources by 2020.

These projects assess, prioritize, design, and fund construction of small, in-conduit hydro-electric generation equipment at various water system facilities. Many water purveyors in the region have significant, intrinsic small hydro-electric development potential in their water systems, but lack access to capital funding to develop the facilities. This project would provide the financial assistance necessary to install generation facilities.

Placer County Water Agency Projects

During 2009, PCWA completed an Energy and Greenhouse Gas Benchmark Study. This study considered potential opportunities for PCWA to develop renewable energy such as small in-conduit hydro-electric. PCWA has identified three locations for initial implementation. Two potential sites are located on piped sections of PCWA's canal system. A third potential site is located at an existing facility within PCWA's treated water system. PCWA has started implementation of hydro-electric generation at the third site, the Lincoln Metering Station, by beginning design.

Lincoln Metering and Hydroelectric Generation Station: PCWA provides wholesale treated water deliveries to the City of Lincoln at the Lincoln Metering Station. The Lincoln Metering Station was constructed approximately ten years ago and is located on a 0.58 acre parcel owned by PCWA located north of PCWA's Sunset Water Treatment Plant. The facility includes piping, flow and pressure control

valves, and flow meters housed within a building that is approximately 35-feet by 45-feet in size. The perimeter of the site is fenced. Water enters the metering station at high pressure and flows through pressure reducing and flow control valves before being delivered to the City of Lincoln's 5.0 million gallon water storage tank that is located directly north and adjacent to the facility.

It is proposed to incorporate hydroelectric generation equipment into the Lincoln Metering Station. The new hydroelectric equipment will be housed within a new structure to be constructed as an expansion of the existing building. Power from the new equipment is proposed to be sold to PG&E under the provisions of a Power Purchase Agreement. There is an existing 21 KV PG&E powerline adjacent to the site that has sufficient capacity to receive power from the new generation facilities.

The other two potential PCWA hydro-electric generation sites planned for future development are the Gold Run Pipeline Hydroelectric Station and the Secret Town Pipeline Hydroelectric Station. The Gold Run Pipeline site is in design phase and the Secret Town Pipeline site is in planning phase.

Robie Point Loop Replacement: Though there is treated water service to the Robie Point area of the PCWA treated water distribution system, it is comprised of many different undersized pipes and pipe materials. Development of this area occurred primarily between 1937 and 1941 by simply extending the existing 4" and sometimes 6" lines out to serve additional homes, without concern for fire flows to the homes which are located on the edge of the American River Canyon. These steel, cast iron, AC, and welded steel pipes are now 70 years old and are in some cases badly corroded and the area has a history of water loss due to main line leaks. The small pipe size coupled with pipe corrosion restricts the carrying capacity of the pipes further and varying pipe sizes and materials, inherently causes challenges to provide sufficient water service as well as fire flow to this PCWA service area.

This project would replace: 350 feet of 4" steel with 8 inch Ductile Iron (DI) piping in Broadview between Robie Point and Placerado; 400 feet of 4" pipe with 8" DI at the end of Virginia Street; 450 feet of 4" pipe with 8" DI in Belmont, 1320 feet of 4' with 8" DI on Robie Point and 420 feet of 4" with 8" DI at the end of Placerado. Area fire hydrants will be upgraded or installed in locations along the new pipe alignment as requested by Auburn City Fire Department. In total 2,940 feet of 4" pipe will be replaced with 8" DI.

The PCWA service area is comprised of over 170 miles of treated water pipelines and funding only allows for a small portion of the water mains to be replaced or upgraded each year. Without additional funding, the proposed area for pipeline replacement will be deferred for several more years or longer, giving way to pipelines that can be replaced at lower cost.

Robie Point Access Road: This project would install approximately 1165 feet of 8 inch Ductile Iron pipe beginning mid-block on Virginia Street, follow what appears to be a fire access road, and connect to the water main on Traverse Street. Fire hydrants will be installed along the planed pipe alignment if requested by Auburn City Fire Department. The addition of this pipeline will increase the reliability of the water system and allow for fewer potential interruptions of water service for routine maintenance and repairs.

Nevada Irrigation District's La Barr Meadows Hydroelectric Project

Many water purveyors in the region have significant, intrinsic micro and small hydro-electric development potential in their water systems, but lack the capital funding to develop the facilities. This project would provide the financial assistance necessary to develop the hydroelectric generation facility. This project is to assess and design micro, in-conduit hydro-electric generation equipment at the NID La Barr Meadows pressure reducing valve (PRV) station. Preliminary findings demonstrate the hydroelectric power would generate approximately 5-20 kw.

El Dorado County Small Hydroelectric Development Program Tank 7 In-Conduit Hydroelectric Project

In 2007, the El Dorado County Water Agency (EDCWA), in partnership with the El Dorado Irrigation District (EID) embarked on the preparation of a study to identify hydroelectric opportunities in El Dorado County including to develop renewable energy resources that are both non-carbon and dependable for meeting peak demands. The report identified several in-conduit/canal projects as feasible and recommended further development of these projects. EID's Tank 7 In-conduit Hydroelectric Project is one of the most promising projects. As a result, EID has completed preliminary engineering and 10% design, CEQA, and has received a Federal Energy Regulatory Commission In-conduit Exemption. This project falls under the El Dorado County Small Hydroelectric Development Program that is included in the CABY IRWMP.

The challenge facing many of these projects is a payback period that extends beyond that which water agency boards are willing to undertake in these challenging economic times. In this case, grant funding is critical to developing a financial profile the EID Board of Directors can support and fund. EDCWA believes this project will be an important catalyst and model for other water purveyors in the CABY region to undertake in-conduit hydroelectric projects.

Measurable Outcomes:

- Increase the amount of energy produced and made available to the power grid under a power purchase agreement
- Contribute to the state of California reaching a 33% renewable energy portfolio
- Provide consistent and reliable water flows and pressures during all high demand events, including, but not limited to:
 - High usage due to daily demands
 - High usage from fire suppression efforts
 - High usage from fire hydrant maintenance and testing
 - Reduction in the number of customers affected by maintenance activities
 - Reduction in unavoidable water loss (water losses that cannot be detected from conventional leak detection methods due to lack of sound or presence of water surfacing on to roadway)
 - Infrastructure reliability

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**
 These four water agencies have developed a strategic partnership to implement a micro and hydro program regionwide. Each water agency has the expertise and system knowledge to implement these projects and has conducted the necessary studies to determine feasibility and to accurately characterize project outcomes.
- D. Specific Benefits to critical DAC water issues**
 This project does not address critical DAC water issues.
- E. Specific benefits to critical water issues for native American tribal communities**
 This project does not have specific and direct benefits to critical water issues to native American tribal communities.
- F. Environmental Justice Considerations**
 Not applicable
- G. Project Costs and Financing**
 Total Project Budget: \$3,931,000; Budget Request: \$2,600, 510
 This project provides a non-state match of 34% through ratepayer income. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.
- H. Economic Feasibility**
 A full benefit-cost analysis was completed for the *El Dorado County Small Hydroelectric Development Program Tank 7 In-Conduit* project component of this integrated project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org. Regarding the other project components, CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.
- I. Project Status**
 This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.
- J. Strategic Considerations for IRWM Plan Implementation**
 This regional project strategically implements CABY's Five Measures of Integration (12.5.2) to address issues of regional importance and statewide concern. The project effectively

meets multiple CABY priorities (goals, issues, objectives) and provides multiple benefits. It integrates within and across like projects employing key resource management strategies. It reflects geographic integration across watersheds and integrates multiple partners. The region's four large water agencies have formed this strategic partnership and collaboratively designed this project as well as integrated their outcomes and performance measures for effective and strategic IRWM Plan implementation.

K. Contribution of the project in adapting to the effects of climate change

Low impact, in-conduit hydro has greater potential to reduce overall GHG emissions than other forms of renewable energy because: 1) it is a dependable source of renewable energy compared to intermittent solar and wind renewable energy sources; 2) its energy generation pattern is closely related to water flow patterns, which correlate with seasonal energy demands (higher summer water flows when energy demands are highest); 3) it is less energy intensive to manufacture, install, and maintain; and, 4) it has a proven economic life generally ranging from 30 to 40 or more years, compared to other forms of renewable energy that generally have a 15 to 20 year economic life. In addition, it does not have any carbon emissions that are associated with biomass renewable energy.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

1.1.5 Programmatic Area 5: Human-Landscape Interaction

This section describes three, tier 1 projects in the programmatic area of Human-Landscape Interaction that are implementation ready. They include:

1. Peabody Creek: Flood Management, Creek Restoration and Green Infrastructure in a Disadvantaged Community
2. Livestock and Lands Program
3. Fish Friendly Farming Program

Project Number: 26

Project Title: Peabody Creek: Flood Management, Creek Restoration and Green Infrastructure in a Disadvantaged Community

Primary Applicant: American Rivers

Key Partners: City of Grass Valley, Wolf Creek Community Alliance

Project Location: Bear Watershed

PROJECT SUMMARY

The Peabody Creek Restoration Project is a comprehensive effort that includes three components: creek restoration, flood management, and green infrastructure stormwater management in a disadvantaged community.

Peabody Creek flows from the hills outside of downtown Grass Valley through relatively dense residential neighborhoods and along the bottom of 80-acre Condon Park before joining Wolf Creek, a major tributary to the Bear River. Peabody represents a unique opportunity for restoration and stewardship in an area where most creeks have been almost entirely lost due to encroachment and development or buried in an underground network of culverts.

Although Peabody Creek could be a vibrant, healthy part of the watershed, providing important habitat and educational opportunities, it carries the water quality footprint and constrained ecosystem of an urbanizing area that is struggling to integrate growth with ecological and social values. The open space surrounding Peabody Creek could provide habitat for native plants and wildlife, however it is currently choked with invasive species. Additionally, 23 miles of Wolf Creek and its associated tributaries (including Peabody) are listed as impaired under Section 303(d)(1) of the Clean Water Act and have an applicable TMDL schedule for fecal coliform. Also, extensive impervious pavement and other factors result in periodic flooding of the neighborhood surrounding the project site. Currently, all of the storm drains in the surrounding neighborhood are linked directly to the creek, further exacerbating flooding and water quality issues.

The overall goal of this project is to improve the hydrologic and ecological function of Peabody Creek, while addressing local flooding issues, incorporating green infrastructure stormwater management elements, and actively engaging local community members in stewardship of the creek.

The proposed project is part of a multi-phase effort. Phase 1 is complete and included restoration of a half-acre site along Peabody Creek. Phase 1 restored and enhanced a wetland and riparian habitat along the creek before it flows into Condon Park. Phase 2 focuses on retrofits of the Phase 1 site to improve wetland function. Phase 3 includes assessment and restoration of the creek and riparian zone downstream of the Phase 1 site, source control, and outreach and engagement in the local community. Phases 2 and 3 are the focus of this proposal.

Measurable Outcomes:

- Improved water quality
- Reduced flooding in project area
- Reduction of invasive species
- Increased native vegetation and habitat
- Improved wetland function
- Decrease in stormwater flowing directly into creek
- Increased awareness of creek

Review Factors

A. How the project contributes to the IRWM Plan objectives. See Table 12-3.

B. How the project is related to resource management strategies. See Table 12-4.

C. Technical Feasibility of the Project

This project represents the continuation of a project whose first phase has been completed. Therefore, the City of Grass Valley has significant knowledge of the project area, owns the land of the proposed project site and has the engineering and land use planning staff capacity to coordinate all aspects of the project from planning to design to implementation. American Rivers has substantial experience implementing like projects that in some instances have been funded by the California Department of Water Resources and the State Water Resources Control Board. These similar projects have included low impact development green infrastructure installations such as pervious concrete, rain gardens, bioswales, to name of few examples of the technologies they have employed. American Rivers, additionally, has been the lead agency in the planning, design and implementation of floodplain restoration projects of a similar and larger scale.

D. Specific Benefits to critical DAC water issues

This project provides water quality and direct flood mitigation benefits to Grass Valley, a disadvantaged community.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

This project is consistent with CABY's DAC/EJ project development and outreach strategy where CABY prioritizes communities who are often underserved and/or disproportionately affected or impacted by land and water development projects.

G. Project Costs and Financing

Total Project Budget: \$900,000; Budget Request: \$500,000

This project provides a non-state match of 45%. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

A full benefit-cost analysis was completed for some components of this project as a part of the Proposition 84 Implementation Round 2 Grant Program application and is available through the www.cabyregion.org. Regarding the other project components, CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1,

ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

The proposed project is an illustrative example of CABY's commitment to building strategic partnerships that leverage resources of stakeholder groups with varying degrees of capacity while more efficiently implementing the IRWM Plan regionwide. American Rivers, a national NGO with California regional offices in Nevada City, Berkeley and Palo Alto emerged as the project lead in order to assist the City of Grass Valley, a disadvantaged community (DAC) in the implementation of this priority project. This approach to strategic partnerships removes some of the barriers to project implementation facing DACs. Additionally, the project is in close alignment with CABY's Integration Strategy which prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. Particularly noteworthy, the project meets a significant number of CABY's IRWMP objectives and establishes a model for the integration of water management and land use decision making, an area of regional and statewide concern.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by increasing the capacity of the landscape to absorb and filter water; identifying 303(d)-listed waters that may become more challenging to manage under future climate scenarios and work with affected agencies and the Water Board to develop management strategies and identify improvement projects/actions that address near-term and future impacts; identifying places where the assimilative (dilution of contaminants) capacity of streams and rivers may be at risk and monitor those areas; working within the CABY region membership (water and land use agencies) as well as with relevant state agencies to identify better flood management practices, including data tracking and communication and updated land use policies; continuing to update flood maps for communities in the region as additional management strategies are implemented and more updated information becomes available; increasing infiltration rates in urban areas to combat localized flooding (implement low impact design principles); reducing the impact of existing stressors on the region's watersheds; sustaining and promoting fundamental ecological functions/services.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 27

Project Title: Livestock and Land Program Implementation Project

Primary Applicant: El Dorado County Resource Conservation Districts

Key Partners: Ecology Action, Horse Owner Associations, NRCS, El Dorado County, Backcountry Packers, homeowners' associations, Southern County Large Animal Rescue, animal control, Equestrian Trails Foundation

Project Location: American and Cosumnes Watersheds

PROJECT SUMMARY

The purpose of the Livestock and Land Program is to achieve immediate and lasting reductions in nutrient, sediment and pathogen pollution to surface and ground waters through the implementation of Best Management Practices (BMPs) on livestock facilities. The program will achieve this overarching goal by constructing demonstration sites readily available to the public to highlight proposed BMPs and for use at future workshops. These community demonstration sites will be a one of a kind asset that will serve as physical successes within the community for landowners, as well as county administrators, to learn and experience firsthand the results of responsible land care for livestock and equine properties. The Livestock and Land Program utilizes an incentives-based approach to achieve the cultural change needed for livestock facilities to voluntarily adopt management measures that improve the healthy functioning of watersheds.

Objectives:

Construction of Demonstration Site –Specific BMPs include: use of vegetative swales and buffer strips, manure bunkers and other containment practices, installation of gutters, road and trail improvements, reestablishment of vegetation, and taking high use areas off-line in winter. These may include practice changes or infrastructure improvements. BMPs will be designed to meet NRCS service life standards. Sites will achieve water quality protection and serve as classrooms, training opportunities and a permanent local resource for the community.

Designing Projects that Perform - Equestrian community will work with a local Technical Advisory Committee (TAC) to develop the scope for implementation of water quality BMPs. Through site visits landowners will have one-on-one interaction with local water quality experts, including NRCS who can provide site assessment, detailed recommendations and design assistance.

Water Quality Site Planning - Participants will receive training on how to identify water quality challenges on their sites and the assistance needed to complete a written site plan.

Recruitment & Technical Assistance Programs - Provide technical training series on BMP implementation that also provides an opportunity to recruit livestock owners to participate in implementation site projects. Peer Leaders will also be recruited to lead and foster a peer-to-peer network of information transfer. An estimated 100 livestock owners will receive an average of 12 hours each of technical training on water quality protective BMPs in this project.

Monitoring and Modeling – Site specific load reduction modeling will be completed for demonstration sites, as well as collecting other measures to address project efficacy.

Measurable Outcomes:

- **Acres of land improved:** Construction of demonstration facilities demonstrating soil and water Best Management Practices to serve as examples for private landowners and public land managers.
- **Acre-feet of stream flow improved:** Quantitative results will be calculated with Load Reduction Modeling Tools computing annual loads of nutrients, pathogens, and sediments.
- **Number of people reached:** Hands-on technical training at livestock operation project sites reviewing BMP construction addressing reductions in sediment, nutrient, pathogen pollution and soil and water quality improvements; Two three-day technical workshop training series and site tours will be held with a projected 100 livestock facility owners will receive 12 hours (3 hours per workshop) of technical training specifically on livestock facility management for water quality protection.
- **Enhanced renewable energy production capacity:** Energy audits will be performed describing current energy use based on an inventory of existing energy-consuming processes and equipment and resulting in a report of possibly changes or measures that could reduce energy consumption. Implementation of management practices to address water conservation, manure and facility management, noxious and invasive weeds, fire fuels management, and habitat improvements. Comprehensive Site-Specific Conservation Plans provided to all interested parties with livestock operations on their land. All participants will develop a site-specific Conservation Plan for their livestock operation utilizing the adopted BMP planning framework. Development of a “Horseowner’s Guide to El Dorado County” highlighting BMPs specific to resource issues of the region. Resources will be made available and promoted to the local County agency responsible for regulating impacts from equestrian facilities.
- **Cultural impacts:** Surveys will be completed to account for measurable cultural changes knowledge or behavior to improve appreciation for and stewardship of natural resources.

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

This program is being conducted statewide as a partnership with RCDs, NRCS offices and local partners. Therefore, the technical feasibility and outcomes are well known and understood. Additionally, the El Dorado County RCDs have been implementing this program and have the experience, network and expertise to expand the effort throughout the American and Cosumnes (and possibly throughout the CABY region).

- D. Specific Benefits to critical DAC water issues**

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$500,000; Budget Request: \$275,000.00

This project provides a non-state, federal match of 45%. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

The project establishes a partnership between state and federal agencies and agriculturalists to sustainably achieve CABY's integration strategy which prioritizes projects such as this which represent multi-benefit, multi-stakeholder integrated projects that address multiple objectives. While immediate project implementation is proposed in the American and Cosumnes Watersheds, where larger scale livestock and agricultural facilities exist, the project also has the potential for regional application in the future.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by increasing the capacity of the landscape to absorb and filter water; preserving and/or restoring, where appropriate, riparian vegetation in order to control water temperature for aquatic biota; identifying places where the assimilative (dilution of contaminants) capacity of streams and rivers may be at risk and monitor in those areas; reducing the impact of existing stressors on the region's watersheds; sustaining and promoting fundamental ecological functions/services; recognizing that water management is only part of a comprehensive approach to climate change and implementing Integrated Resource Management by communicating regularly with land us, transportation, human health, education,

environmental, and economic-focused agencies.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.

Project Number: 28

Project Title: Fish Friendly Farming Regional Program

Primary Applicant: El Dorado County Resource Conservation Districts

Project Partners: California Land Stewardship Institute, Placer County Resource Conservation District, Amador County Resource Conservation District, USDA- Natural Resources Conservation Service, El Dorado County Agricultural Commissioner, Placer County Agricultural Commissioner, University of California Cooperative Extension

Project Location: Regionwide

PROJECT SUMMARY

Discharges from agricultural lands include irrigation return flow, flows from tile drains' and storm water runoff from fields, managed wetlands, nurseries, and water districts that accept agricultural discharges. These discharges can affect water quality by transporting constituents of concern including pesticides, sediment, nutrients, salts (including selenium and boron), pathogens, and heavy metals from cultivated fields into surface waters. Many surface water bodies are impaired because of pollutants from agricultural sources. Groundwater bodies also have suffered pesticide, nitrate, and salt contamination. Statewide, approximately 9,493 miles of rivers/streams and some 513,130 acres of lakes/reservoirs are listed on Section 303(d) list as being impaired by irrigated agriculture. Of these, approximately 2,800 miles, or approximately 28%, have been identified as impaired by pesticides. The Fish Friendly Farming (FFF) Program is a voluntary, incentive-based comprehensive program for farmers to inventory and assess their properties and apply Beneficial Management Practices to reduce erosion, conserve water, increase native habitats, and enhance aquatic habitats. Landowners enroll their property in the FFF Program and work with California Land Stewardship Institute (CLSI) and Resource Conservation District (RCD) technical staff to complete a Farm conservation Plan. The Plan inventories and documents all existing and potential sediment sources, including natural features, all concentrated flow sources, current chemical use, irrigation practices, detailed road assessments, inventory and assessment of all creeks and waterways with native plant re-vegetation and restoration plans. The plans contain a list of required implementation actions and a timeline for their completion. The landowner/manager implements the improvements listed in the farm plan. The landowner/manager completes these tasks on their property and photo monitors the results as part of a certification process. Certification is a third party process. Re-certification is completed every five years and serves as a status update on progress in implementing and maintaining the Plan.

The overall goals are to: 1) restore and/or maintain the highest reasonable quality of state waters considering all the demands being placed on the water; 2) minimize waste discharge from irrigated agricultural lands that could degrade the quality of state waters; 3) maintain the economic viability of agriculture; and 4) ensure that irrigated agricultural discharges do not impair safe and reliable drinking water.

Measurable Outcomes:

- 100 growers enrolled/certified in the program
- 10,000 new acres under conservation within the program
- Land use: El Dorado County has adopted provisions in its General Plan 2004, Agriculture and Forestry Element, for the preservation of agricultural lands, recognizing the economic, environmental, and social benefits of agriculture. In assisting agricultural operations in meeting regulatory requirements and preserving the agricultural heritage, the FFF program supports the county General Plan provision.
- Preservation of working landscapes: for many landowners, the regulatory system is frustrating and expensive. Such requirements translate to an increasing financial obligation on already overburdened farmers. If regulation becomes too severe and costly, agricultural uses may give way to the pressures of urban development. Due to the extent of impervious surfaces and their effects on hydrology and habitat, urban areas are far less likely to produce either clean water or sustainable habitats so retaining agriculture is important to sustaining these resources.
- Protect and improve water and air quality: A key element towards accomplishing this task is to reduce sediment loads generated from agricultural lands and to sustain these improvements by integrating BMPs into agricultural operations. This is achieved through enrollment in FFF, educational workshops, development of Farm Plans with BMP prescriptions, and implementation and certification of Farm Plans.

Review Factors

- A. How the project contributes to the IRWM Plan objectives. See Table 12-3.**
- B. How the project is related to resource management strategies. See Table 12-4.**
- C. Technical Feasibility of the Project**

This program is being conducted in Napa, Sonoma, Mendocino, Solano and El Dorado Counties in partnership with RCDs and local agricultural partners. Therefore, the technical feasibility and outcomes are well known and understood. Additionally, the El Dorado County RCDs have been implementing this program in El Dorado County and have the experience, network and expertise to expand the effort throughout the CABY Region.

- D. Specific Benefits to critical DAC water issues**

This project does not address critical DAC water issues.

E. Specific benefits to critical water issues for Native American tribal communities

This project does not have specific and direct benefits to critical water issues to native American tribal communities.

F. Environmental Justice Considerations

Not applicable

G. Project Costs and Financing

Total Project Budget: \$325,000; Budget Request: \$243,000

This project provides a non-state match of 25%. Project sponsors developed preliminary budgets as a requirement of CABY's tiering application process. Those preliminary budgets are available at www.cabyregion.org.

H. Economic Feasibility

CABY developed a benefit-cost framework whose completion will be required to achieve Tier 1, ready to proceed status in the future. See Appendix J for benefit-cost framework.

I. Project Status

This project has fulfilled all CABY Tier 1 requirements (see 12.4.2) and therefore is ready to proceed.

J. Strategic Considerations for IRWM Plan Implementation

As described the *12.5 Project Integration*, CABY's project review process prioritizes projects representing multi-benefit, multi-stakeholder integrated projects that address multiple objectives. El Dorado County Resource Conservation Districts have assembled a strategic partnership that unites RCDs in the region with other state and federal agencies to implement this project. The project also partners with the California Land Stewardship Institute, who is successfully implementing this program in several other counties throughout northern California. This incentive-based program partners with agriculturalists to provide them with training and planning resources to effectively implement many of CABY's water quality objectives. Additionally, it establishes a model that integrates water management with land use planning, a key area of concern and importance to the region and state.

K. Contribution of the project in adapting to the effects of climate change

This project contributes in adapting to the effects of climate change by increasing the capacity of the landscape to absorb and filter water; preserving and/or restoring, where appropriate, riparian vegetation in order to control water temperature for aquatic biota; identifying places where the assimilative (dilution of contaminants) capacity of streams and rivers may be at risk and monitor in those areas; reducing the impact of existing

stressors on the region's watersheds; sustaining and promoting fundamental ecological functions/services; recognizing that water management is only part of a comprehensive approach to climate change and implement Integrated Resource Management by communicating regularly with land use, transportation, human health, education, environmental, and economic-focused agencies.

L. Contribution of the project in reducing GHG emissions as compared to project alternatives

See Appendix K for all Tier 1 project GHG quantifications.