NORTH COAST RESOURCE PARTNERSHIP
2018/19 IRWM Project Application Instructions

Important note: Potential project proposal applicants should read through this entire document before beginning to develop a project application.

The North Coast Resource Partnership (NCRP) 2018/19 Project Application and additional information can be found at the NCRP 2018/19 Project Solicitation webpage (https://northcoastresourcepartnership.org/proposition-1-irwm-round-1-implementation-funding-solicitation/). Please fill out grey text boxes provided on the application and select all the check boxes that apply to the project. Application responses should be clear, brief and succinct. Character limits are provided and include spaces. It is important to save the application file with a distinct file name that references the project name. When the application is complete, please email to kgledhill@westcoastwatershed.com

Project Applications will be accepted until 5:00 pm, March 8, 2019. The project solicitation will be closed after this date/time and edits to project applications and new applications will no longer be accepted.

If you have questions, need additional information or proposal development assistance please contact:

- Katherine Gledhill at kgledhill@westcoastwatershed.com or 707.795.1235
- Tribal Projects: Sherri Norris, NCRP Tribal Coordinator at sherri@cieaweb.org or 510.848.2043

BACKGROUND

The Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1), approved by California voters on Nov. 4, 2014, authorizes $7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection. Proposition 1 authorized the appropriation of $510 million in Integrated Regional Water Management (IRWM) funding for Implementation and Planning efforts throughout the state. The North Coast funding area allocation is $26.5 M ($24.6 M after DWR's administrative cut) and has approximately $22 M available for implementation projects over the course of two rounds of funding.

The Proposition 1 IRWM Grant Program provides funding for projects that help meet the long-term water needs of the state, including:

- Assisting water infrastructure systems adapt to climate change;
- Providing incentives throughout each watershed to collaborate in managing the region's water resources and setting regional priorities for water infrastructure; and
- Improving regional water self-reliance.

On October 5, 2018 the California Department of Water Resources (DWR) released the Draft 2018 Integrated Regional Water Management (IRWM) Program Guidelines and Draft 2018 Draft Proposition 1 IRWM Round 1 Implementation Proposal Solicitation Package (PSP). The final DWR 2018 IRWM Guidelines and 2018 PSP are expected to be released in early 2019. Release of the final guidelines and PSPs may result in changes to the North Coast Resource Partnership (NCRP) Project Review and Selection Process Guidelines and application materials. Information about IRWM program, guidelines and PSPs can be found at https://www.water.ca.gov/Work-With-Us/Grants-And-Loans/IRWM-Grant-Programs/Proposition-1.

The NCRP 2018/19 Project Review and Selection Process Guidelines (Guidelines) and application materials were developed by the NCRP Proposition 1 Implementation Funding Solicitation Ad Hoc Committee per the direction of the NRCP Policy Review Panel (PRP) during the October 19, 2018 NCRP meeting. During that meeting the PRP also directed that up to 60% or $12.7 million of the implementation funding could be allocated during the first round of funding, pending approval of DWR. Familiarity with the NCRP Guidelines is essential to developing a competitive project proposal. Other important sources of information include the NCRP website, North Coast IRWM Plan (NCIRWM Plan) and the NCRP 2018/19 Project Solicitation webpage that includes an informative list of Frequently Asked Questions and answers: https://northcoastresourcepartnership.org/proposition-1-irwm-round-1-implementation-funding-solicitation/.

Projects are required to be included in the NCIRWM Plan to be eligible for Proposition 1 IRWM Implementation Grant programs. One regional application consisting of a suite of Priority Projects will be submitted on behalf of the North Coast Region for the 2018/19 NCRP Project Grant, as per the final IRWM guidelines and PSP expected to be released in early 2019.

ELIGIBLE PROJECTS

Eligible projects must yield multiple benefits and include one or more of the following elements.

- Water reuse and recycling for non-potable reuse and direct and indirect potable reuse
- Water-use efficiency and water conservation
- Local and regional surface and underground water storage, including groundwater aquifer cleanup or recharge projects
- Regional water conveyance facilities that improve integration of separate water systems
- Watershed protection, restoration, and management projects, including projects that reduce the risk of wildfire or improve water supply reliability

- Stormwater resource management projects to reduce, manage, treat, or capture rainwater or stormwater
- Stormwater resource management projects that provide multiple benefits such as water quality, water supply, flood control, or open space
- Decision support tools that evaluate the benefits and costs of multi-benefit stormwater projects
- Stormwater resource management projects to implement a stormwater resource plan
- Conjunctive use of surface and groundwater storage facilities
- Decision support tools to model regional water management strategies to account for climate change and other changes in regional demand and supply projections
- Improvement of water quality, including drinking water treatment and distribution, groundwater and aquifer remediation, matching water quality to water use, wastewater treatment, water pollution prevention, and management of urban and agricultural runoff
- Regional projects or programs as defined by the IRWM Planning Act (Water Code §10537)

PROJECT REVIEW AND SELECTION PROCESS

All projects submitted to the NCRP will be subject to review by the NCRP TPRC and PRP. As approved by the PRP, the NCRP Project Review and Selection Process Guidelines define the process for project compilation, review, ranking and selection. The NCRP Guidelines include procedures for public input during the project review process, conflict of interest guidelines and project review scoring criteria. With the assistance of the TPRC's technical project review, the PRP will approve a suite of NCRP Priority Projects for inclusion in the $12.7 million North Coast 2018/19 Project Grant application due to DWR in the spring 2019. The project selection will be based on a number of factors including: technical project scores; project scalability and potential funding allowance; the overall balance of projects based on the PRP's defined guidelines for project selection; and the collective ability of the projects to meet NCRP goals and be competitive for the funding opportunity.

Given the limited funding available in this round, project proponents are encouraged to determine the highest priority projects for their organization, agency or Tribe; and to consider the scalability of the projects. Any project that is selected as a Priority Project for inclusion in the regional NCRP 2018/9 IRWM Project proposal may be subject to budget revisions to accommodate funding limitations.

SCHEDULE

- October: DWR release Draft IRWM Guidelines and 2018 Proposal Solicitation Package (PSP)
- November 29 – March 8: NCRP 2018/19 Project Proposal Solicitation
- December: DWR release Final IRWM Guidelines and 2018 Project Solicitation Package
- Early January: Informational & Assistance Workshops held throughout the North Coast Region
- March 8, 2019: NCRP 2018/19 Project Proposals due
- March 12 – April 8: TPRC Project Implementation Proposal review
- April 10 & 11 (tentative): TPRC Project Review meeting

- April 19 (or April 26): NCRP PRP & TPRC meeting
- May 6 – 17 (tentative, exact date to be determined by DWR): Funding Area Pre-Application Workshop
- July 2019 (tentative): NCRP Regional Project Application due to DWR

NORTH COAST RESOURCE PARTNERSHIP PROJECT APPLICATION

The Microsoft Word and Excel documents that make up the NCRP 2018/19 Project Application are available for reference and for application development. If you would like to request a copy please contact Katherine Gledhill at kgledhill@westcoastwatershed.com or 707-795-1235. The documents can also be downloaded from the NCRP website at: https://northcoastresourcepartnership.org/proposition-1-irwm-round-1-implementation-funding-solicitation/.

NCIRWM Plan projects already submitted for IRWM Funding will not be automatically reviewed and ranked for 2019 IRWM project funding, though these projects will remain part of the NCIRWM Plan. All relevant projects to be considered for the NCRP 2018/19 IRWM Project grant funding must be resubmitted.

Project Applications will be accepted until 5:00 pm, March 8, 2019. The project application will be closed after this date/time and edits to project applications and new project applications will no longer be accepted. Please provide the application files with distinct file names that reference the organization and project name. When the application is complete, please send to kgledhill@westcoastwatershed.com

A COMPLETE APPLICATION

A Complete Application includes the following files. *All files should be provided with a distinct file name that references the organization and project name.*

☐ NCRP 2018/19 Project Application Word file

☐ NCRP 2018/19 Project Application Excel File: Major Tasks, Task Descriptions, Schedule and Budget

☐ Supporting documents: copies of the studies, plans and designs completed for the project

ADDITIONAL REQUIREMENTS OF PRIORITY PROJECT APPLICANTS

The NCRP Priority Project sponsors selected by the PRP in April 2019, to be included in the NCRP regional proposal will be required to attend the Funding Area Pre-Application Workshop sometime mid-May (exact date to be determined) to present information about their project and answer questions posed by DWR representatives. In addition, the NCRP Priority Project sponsors will need provide additional project and applicant eligibility information to allow NCRP staff to develop a complete regional application.

- Attendance at a Funding Area Pre-Application Workshop
- A detailed Work Plan and Budget
- A description of how the project schedule is realistic, reasonable, and accomplishable, if requested
- Additional information and documentation to support the Project Justification claims, if requested

- Project location and service area boundary GIS shapefiles or detailed map that shows the project's geographical location and the surrounding work boundaries, service area boundaries, facilities of the project, the water resources (groundwater or surface water) that will be affected, DACs within the project service area, and proposed monitoring locations.
- Letters of demonstrating support for the project by affected disadvantaged communities or economically distressed areas for project sponsors requesting a cost share waiver.
- And other items deemed necessary by NCRP staff

NCRP PRIORITY PROJECT ELIGIBILITY DOCUMENTATION REQUIREMENTS

(some requirements are waived; see instructions Section B)

- For those projects that directly impact groundwater, the project sponsor will be required to submit a self-certification document regarding Groundwater Management Plans and documentation that the project has support from the Groundwater Sustainability Agency (GSA) of the impacted groundwater basin(s).
- Urban water suppliers will be required to submit DWR verification and self-certification documents regarding Urban Water Management compliance and Water Metering compliance.
- Surface Water Diverters will be required to submit SWRCB verification documentation.
- Documentation of notification or land owner access from the appropriate jurisdiction.
- For stormwater and/or dry weather runoff capture projects the project sponsor will be required to submit documentation that the project is included in a Stormwater Resource Plan that has been incorporated into the North Coast IRWM Plan.
- Signed North Coast Memorandum of Mutual Understandings (MoMU)

ADDITIONAL REQUIREMENTS OF PROJECT SPONSORS PRIOR TO CONTRACT AGREEMENT AWARDS

If the North Coast 2018/19 Project Grant application is selected for funding, DWR will award a contract agreement to the County of Humboldt, the NCRP contract administrator. NCRP Priority Project proponents will need to provide the following prior to entering into a sub-agreement with the County of Humboldt.

- Audited Financial Statements for project sponsors
- CEQA completion documentation (this requirement is waived for projects that wholly benefit disadvantaged communities or Tribes).
- Resolution documenting formal adoption of the North Coast Resource Partnership Plan (expected to be finalized in the spring 2019). A sample resolution is provided as Attachment A of this document.
- A Monitoring Plan consistent with DWR requirements and the *NCRP Project Performance and Monitoring Plan Guidelines*
- Other materials that DWR deems necessary, which will be detailed in the award notification letter.

Project sponsors may wish to review the NCRP Frequently Asked Questions available online: https://northcoastresourcepartnership.org/proposition-1-irwm-round-1-implementation-funding-solicitation/.

NORTH COAST RESOURCE PARTNERSHIP PROJECT APPLICATION INSTRUCTIONS

Please note that at the bottom of each section there is an Additional Information text box that allows the project sponsor to add critical information about a project that is not addressed in one of the questions already asked.

Project Name: Provide the Project Name

A. ORGANIZATION INFORMATION

1. Please provide the name of the organization.
2. Provide information about the Project Contact person along with contact information.
3. Please provide other information about the organization that will be implementing and managing the project including the address of the Organization
4. Select the type of Organization. Please note, the 2018 Guidelines specify that Public Utilities and Mutual Water Companies must be a public utility that is regulated by the Public Utilities Commission or a mutual water company that has a clear and definite public purpose and shall benefit the customers of the water system and not the investors.
5. Indicated whether the organization has implemented similar projects.
6. Provide information about the Authorized Representative along with contact information.
7. List all projects the organization is submitting to the North Coast Resource Partnership for the 2018/19 Project Solicitation in order of priority.
8. Include other important information about the project sponsor in the Organization Information Notes (only succinct information please)

B. ELIGIBILITY

The following section defines the project eligibility requirements specific to this funding opportunity.

1. Addressing NCRP Objectives is a critical eligibility and project review criterion. Select all the Objectives that apply to the project. More information about the NCIRWM Plan and objectives can be found throughout the NCRP website (https://www.northcoastresourcepartnership.org/) and the NCIRWM Plan (https://northcoastresourcepartnership.org/planning/).
2. Each project must demonstrate that the project has a useful life of at least 15 years as required by Government Code 16727, as applicable. Please indicate whether the project has a useful life of at least 15 years. If no, explain how it is consistent with Government Code 16727. [500 characters max.]
3. Indicate whether the organization is compliant with the following legislative requirements, as per the IRWM 2018 Guidelines Section II.B. & PSP Section V.B.3. Priority projects selected for funding during the April 2019 NCRP meeting, will need to provide compliance documentation for the regional application per the following directions. In the project application, please indicate whether the organization will be able to provide these documents to include in the NCRP Regional Project Application due to DWR in summer of 2019, should it be selected as a Priority Project.

CALIFORNIA GROUNDWATER MANAGEMENT SUSTAINABILITY COMPLIANCE

a) Indicate whether the proposed project directly affects groundwater levels or quality.

b) If Yes, indicate whether the organization will be able to provide compliance documentation prior to the submittal of the regional proposal in the spring of 2019, should the project be selected as a Priority Project including:

- Groundwater Management Plan Self-Certification Form to show compliance with CWC §10753 regarding Groundwater Management Plans (GWMPs).
- Please note that projects located in a CASGEM High or Medium priority groundwater basin, that affect groundwater levels or quality, without an adopted GWMP in compliance of CWC §10753 before January 1, 2015 will not be eligible (CWC §10750.1(a)).
- Documentation that the project has support from the Groundwater Sustainability Agency (GSA) of the impacted groundwater basin(s). The format for the documentation to be determined by the project sponsor and GSA, and can include but is not limited to, a letter of support or resolution.

CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING (CASGEM) COMPLIANCE

a) Indicate whether the project overlies a medium or high groundwater basin as prioritized by DWR? The CASGEM Program description, along with the basin prioritization information, can be found at: https://water.ca.gov/Programs/Groundwater-Management/Groundwater-Elevation-Monitoring--CASGEM

b) If Yes, list the groundwater basin (including basin or sub-basin number) and CASGEM priority.

c) If Yes, please specify the name of the organization that is the designated monitoring entity.

d) If there is no monitoring entity, indicate whether project is wholly located in an economically disadvantaged community. Please note that if the entire service area of the Project sponsor's service area is demonstrated to be a DAC, the project will be considered eligible for grant funding notwithstanding CASGEM compliance.

URBAN WATER MANAGEMENT PLAN

a) Indicate whether the organization is required to file an Urban Water Management Plan (UWMP)?

b) [*Definition of entity that is required to file an UWMP with DWR: water supplier of more than 3,000 customers or supplying more than 3000 acre-feet annually*].

c) If Yes, list the date the UWMP was approved by DWR.

d) Indicate whether the UWMP in compliance with AB 1420 requirements?

e) Indicate whether the urban water supplier meets the water meter requirements of CWC 525?

f) If Yes, indicate whether the organization will be able to provide Certification of Compliance with Water Metering Requirements prior to the submittal of the regional proposal in the spring of 2019 should the project be selected as a Priority Project.

AGRICULTURAL WATER MANAGEMENT PLAN

a) Indicate whether the organization – or any organization that will receive funding from the project – required to file an Agricultural Water Management Plan (AWMP)?

b) [*Definition of an agricultural water supplier: a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding the acreage that receives recycled water. This includes a supplier or contractor for water regardless of the basis of right that distributes or sells water for ultimate resale to customers*.]

c) If Yes, list date the AWMP was approved by DWR.

d) Indicate whether the agricultural water supplier(s) meet the requirements in CWC Part 2.55 Division 6?

SURFACE WATER DIVERSION REPORTS

a) Indicate whether the organization is required to file surface water diversion reports per the requirements in CWC Part 5.1 Division 2?

b) If Yes, indicate whether the organization will be able to provide SWRCB verification documentation prior to the submittal of the regional proposal in the spring of 2019 should the project be selected as a Priority Project.

STORM WATER MANAGEMENT PLAN

a) Indicate whether the project a stormwater and/or dry weather runoff capture project?

b) If yes, indicate whether does the project benefits a Disadvantaged Community with a population of 20,000 or less? If yes, the requirement is waived.

c) If no, please provide documentation that the project is included in a Stormwater Resource Plan that has been incorporated into the North Coast IRWM Plan.

d) If No, indicate whether the organization will be able to provide documentation that the project is included in a Stormwater Resource Plan that has been incorporated into the North Coast IRWM Plan, should the project be selected as a Priority Project, in the spring of 2019.

C. GENERAL PROJECT INFORMATION

1. Provide the Project Name
2. Select all the eligible project types as listed in DWR's 2018 IRWM Project PSP. Projects must address critical water supply or water quality needs of the region.
3. The project abstract should briefly provide an overview of the project including summarizing major components, objectives, goals, and intended outcomes/benefits. [500 characters max.]
4. The project description should build on the project abstract and include a problem statement, how the project addresses the problem and critical water needs of the region, the major components of the project and the intended purpose of the project. [2000 characters max.] The Project Description should include:
    - the intended purpose of the project

- a problem statement: why the project is needed
- project setting and background
- the major components of the project
- a description of how the project will be implemented
- and the expected benefits (i.e. a summary of information from the Project Benefits Table, Section F)

5. List the specific project goals and objectives for each goal. Add goals and objectives as needed. Goals [100 characters max.] and objectives [200 characters max.]
6. Describe how the project addresses the NCRP/ North Coast IRWM Goals and Objectives listed. [1000 characters max.]
7. Describe the need for the project, including recent and historical conditions that provide background for benefits to be claimed; for example, recent water shortages, loss of habitat or ecosystem function, and water quality problems. [1000 characters max.]
8. List the impaired water bodies that the project benefits. [500 characters max.] For more information about impaired waterbodies, see the NCRP Interactive Map, Clean Water Act Section 303(d) List, and Total Maximum Daily Load (TMDL) program:
   - State Water Resource Control Board (http://www.swrcb.ca.gov/water_issues/programs/tmdl/303d_lists.shtml);
   - US Environmental Protection Agency (https://www.epa.gov/tmdl/impaired-waters-and-tmdls-pacific-southwest-region-9)
9. Please indicate and describe whether the project will mitigate an existing or potential Cease and Desist Order or other regulatory compliance enforcement action. If Yes, please describe [500 characters max.]
10. Provide a brief description about the population served by the project and indicate whether the project provides direct water-related benefits to a Tribe, an economically disadvantaged community (DAC) or severely disadvantaged community. [500 characters max.] A DAC is defined by DWR as a community with an annual median household income that is less that 80% of the Statewide annual median household income. Severely Economically Disadvantaged Community (SDAC): A community with an annual household income that is less than 60% of the statewide MHI. An EDA is an area with a state median household income between 80% and 85% of the statewide annual MHI. While the EDA definition is similar to the DAC definition in utilizing state MHI as a determining factor, it also includes other factors such as financial hardship, unemployment and population density. To find out if your community is a DAC, SDAC, or EDA, use the NCRP's mapping data tool (https://northcoastresourcepartnership.org/data/). You may also find DWR's DAC Mapping Tool useful (https://gis.water.ca.gov/app/dacs/).
11. Indicate whether the project provides direct water-related benefits to a project area comprised of Disadvantaged Communities or Economically Distressed Communities and list these communities. [NCRP Interactive Map]
12. Indicate whether the project provides direct water-related benefits to a project area comprised of Severely Disadvantaged Communities and list these communities. [NCRP Interactive Map]
13. Indicate whether the project provides direct water-related benefits to a Tribe or Tribes and list these communities. If the project provides direct water-related benefits to a Tribe or Tribes, please send a

letter of support or other evidence of support from each Tribe listed as receiving these benefits with the application package.

14. If the project directly benefits Tribal communities or economically disadvantaged communities, please describe how the project addresses the water-related need of the community. [1000 characters max.]
15. Indicate whether the project addresses and/or adapts to the effects of climate change and the climate change vulnerabilities in the North Coast region. If yes, please explain. [500 characters max.] See NCRP integrated strategy documents at http://northcoastresourcepartnership.org/north-coast-integrated-regional-planning/
16. Describe how the project contributes to regional water self-reliance. [1000 characters max.]
17. Briefly describe how the project benefits salmonids and other endangered/threatened species. [500 characters max.] Following are related resources:
    - Critical Coastal Areas (CCA) http://www.coastal.ca.gov/nps/cca-nps.html
    - Marine Protected Areas (MPA) http://oceanservice.noaa.gov/ecosystems/mpa/
    - Areas of Special Biological Significance (ASBS) http://www.swrcb.ca.gov/water_issues/programs/ocean/asbs.shtml
    - To view the locations of sensitive habitats (CCA, MPA, ASBS, Wilderness Lands and Endangered Species Act Critical Habitat Areas); and impaired waterbodies (303d Listed) in the North Coast region, go to https://northcoastresourcepartnership.org/data/
18. Briefly describe the local and political support for the project. [500 characters max.]
19. List and briefly describe the collaborative partnerships involved in and the support for this project. [750 characters max.]
20. Indicate whether the project is part or a phase of a larger project. Explain whether other groups are conducting similar projects in the area that collectively represent a larger project or effort in the area. Discuss ways that the other projects support the proposed project or help to leverage resources. [500 characters max.]
21. Describe the kind of notification, outreach and collaboration that has been done with the County(ies) and/or Tribes within the proposed project impact area, including the source and receiving watersheds, if applicable. [500 characters max.] *Note that selected projects may be requested to submit documentation of notification or land owner access for the appropriate jurisdiction of the proposed project impact area.*
22. Describe how the project provides a benefit that meets at least one of the Statewide Priorities listed below as defined in the 2018 IRWM Grant Program Guidelines (see page 3) and Tribal priorities as defined by the NCRP. [1000 characters max.] For more information about Statewide Priorities, see the IRWM Program Guidelines (https://water.ca.gov/Work-With-Us/Grants-And-Loans/IRWM-Grant-Programs/Proposition-1/Implementation-Grants)
    - Make Conservation a California Way of Life
    - Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
    - Protect and Restore Important Ecosystems
    - Manage and Prepare for Dry Periods
    - Expand Water Storage Capacity and Improve Groundwater Management

- Provide Safe Water for All Communities
- Increase Flood Protection
- Increase Operational and Regulatory Efficiency
- Identify Sustainable and Integrated Financing Opportunities
- To support Tribal self-determination and cultural resources
- Utilize Traditional Ecological Knowledge in coordination with Tribe(s)
- Ensure that there is a sustainability aspect to the project

23. Include other important information about the project (only succinct information please)

D. PROJECT LOCATION

1. In the Location Description text box, provide information about the project location, with enough detail to allow NCRP staff to generally map the project location. Please provide latitude and longitude in degrees, minutes and seconds (and in NAD84 UTM) if available. [500 characters max.]
2. Provide the project site address, if available.
3. Indicate whether the applicant has legal access rights, easements, or other access capabilities to the property to implement the project and describe the arrangement. [500 characters max.]
4. Include other important information about the project location (only succinct information please)

E. PROJECT TASKS, BUDGET AND SCHEDULE

1. Provide anticipated project start and completion dates. [Date format: M/d/yy]
2. Indicate whether CEQA will be completed within 6 months of Final Award and if already completed the State Clearinghouse number. Each project proponent, including Tribes, is responsible for complying with CEQA requirements and must submit documentation to DWR for review prior to beginning construction. Please note that CEQA and all permits are required to be complete and submitted to DWR within 6 months of funding award and prior to executing the grant agreement. *This requirement is waived for projects that entirely benefit DACs, EDAs and/or Tribes or if a Tribe is the local sponsor*. Environmental planning and permitting costs for projects are not an eligible cost for grant reimbursement, *unless a project is providing a water-related benefit entirely to DACs, EDAs, or Tribes, or projects implemented by Tribes.*
3. Complete the CEQA Information Table that describes the estimated dates for completion of CEQA tasks. [Date format: M/d/yy] Proposition 1 IRWM funding requires CEQA compliance to be completed to enter into a contract for this funding. If a project wholly benefits a DAC, EDA or Tribe, or is a Tribal local sponsor this requirement is waived. Provide additional explanation or justification of the timeline if needed or describe why the project does not require CEQA. [500 characters max.]
4. Indicate whether all permits necessary to begin construction will be acquired within 6 months of Final Award. Provide a complete listing of the permits required for the project. Please note that permits are required to be complete and submitted to DWR within 6 months of funding award and prior to

executing the grant agreement. *This requirement is waived if a project wholly benefits a DAC, EDA and/or Tribe, or if a Tribe is the local sponsor.*

5. Complete the Permit Acquisition Plan table that describes the estimated dates for completion of permitting tasks. [Date format: M/d/yy] Proposition 1 IRWM funding requires that all permits have been acquired to enter into a contract for this funding. If a project wholly benefits a DAC or Tribe, or is a Tribe local sponsor this requirement is waived. For permits not acquired, describe the actions taken to date and describe any issues that may delay acquisition of any permits. [500 characters max.]
6. Describe the financial need for the project and why the project cannot be completed with the existing financial resources of the project proponent, landowner and/or beneficiary. [500 characters max.]
7. Indicate whether the project is scalable. Briefly describe how a scaled budget would impact the overall project. [500 characters max.] Given the limited amount of overall funding available for the NCRP 2018/19 Project solicitation, budget and scalability are important project selection factors (see the NCRP Guidelines). *Please note that if a project proponent states that their project is not scalable and the TPRC determines that the proposed budget amount is greater than the available funding resources, a highly ranked project may not be recommended for funding.*
8. Describe the basis for the costs in enough detail to allow the technical reviewers understand how the costs were derived for the project budget. Include the source of the unit cost estimates used. Also, explain any costs that are higher than the average market value. If labor costs are higher than those required by prevailing wage, explain why and what those labor costs are based on. [500 characters max.]
9. Provide a narrative on cost considerations including alternative project costs. For example, were other alternatives evaluated to achieve the same types and amounts of physical benefits as the proposed project? If the proposed project is not the lowest cost alternative, why is it the preferred alternative? What are other advantages that the proposed project provides from a cost perspective? [500 characters max.]
10. Provide a detailed list of non-state matching funds including the funding amounts and status (i.e. not applied for, pending, and received). *Proposition 1 requires a minimum cost share of 50% of the total project cost. Applicants must demonstrate that a minimum of 50% of the total proposal costs will be paid for with non-State funds. Costs incurred after January 1, 2015 can be used as local cost share; in-kind services may also be used for local cost share. An applicant may request the local cost share requirement be waived or reduced for projects that directly benefit DACs and/or EDAs (see question 12).*
11. Provide a detailed list of state matching funds including the funding amounts and status (i.e. not applied for, pending, and received). Note, state funds are not eligible for matching funds but are recorded here to describe the full funding picture.
12. Please indicate whether a Cost Share Waiver is requested for the matching funds listed above. If a waiver or cost share reduction is requested please provide a justification narrative. [1000 characters max.] Note that for the 2018 IRWM Project grant there is a minimum funding match of 50% required for the regional grant proposal. The 50% funding match may be fully or partially waived for projects that address a water supply or water quality need of a DAC or EDA. Please see the NCRP Interactive Map to determine whether your project is eligible for the cost share waiver. Should the project sponsor self-identify as a DAC or EDA and this tool does not reflect that, please contact Katherine Gledhill at 707-795-1235 to discuss options. Additional information may be required, should the project be selected as a Priority Project to be submitted as part of the regional application including spatial data of the impact area and letters of support. If documentation submitted is reasonable, cost share waivers will be determined as follows:

- 76% - 100% DAC/EDA Benefit: 100 percent cost share waiver
- 51% - 75% DAC/EDA Benefit: 75 percent cost share reduction waiver
- 25% - 50% DAC/EDA Benefit: 50 percent cost share reduction waiver
- Less than 25% DAC/EDA Benefit: No cost share reduction waiver

13. NCRP 2018/19 Project Application Excel File: Major Tasks, Task Descriptions, Schedule and Budget

A completed Major Tasks, Task Description, Schedule and Budget Excel table is a requirement of the project application. The 2018/19 Project Application Microsoft Excel file can be downloaded at https://northcoastresourcepartnership.org/proposition-1-irwm-round-1-implementation-funding-solicitation/. Fill out the highlighted sections of the table and add additional rows as needed. Please send a copy of the Excel document with the final application to kgledhill@westcoastwatershed.com. Please provide the Excel document with a distinct file name that references the organization and project name.

- In the Major Tasks, Task Description, Schedule and Budget table list the title for the Major Tasks, a brief Task Description, and a short phrase for Major Deliverables the project proponent will be submitting for 2018/19 Project funding. While being succinct, please provide enough detail to allow the review committee to understand how the project will be implemented.
- Provide an estimated start date and completion date. Please note that the assumed start date for project funding is March 1, 2020 and an assumed end date is no later than December 31, 2025 (these dates are subject to change based on information from DWR).
- Indicate the current stage of completion as a percentage.
- For each major task, include a budget total for labor and materials including the non-state funding match and the IRWM budget request amount for IRWM 2018/19 Project funding. Eligible costs incurred after the final award date will be eligible for reimbursement, including the reasonable costs of engineering, design, land and easement, legal fees, preparation of environmental documentation, environmental mitigation, and project implementation including directly related administrative costs.
- Costs that are not reimbursable with grant funding include, but are not limited to:
  - Costs for preparing and filing a grant application
  - CEQA environmental planning and permitting costs are not an eligible cost for grant reimbursement, unless a project is providing a water-related benefit entirely to DACs, EDAs, or Tribes, or the project is implemented by a Tribe.
  - Operation and maintenance costs, including post construction project performance and monitoring costs
  - Purchase of equipment not an integral part of the project
  - Establishing a reserve fund
  - Purchase of water supplies with the exception of Water Code §79709 (c)
  - Replacement of existing funding sources for ongoing programs
  - Support of existing punitive regulatory agency requirements and/or mandates in response to negligent behavior
  - Purchase of land in excess of the minimum required acreage necessary to operate as an integral part of the project, as set forth and detailed by engineering and feasibility studies or acquisition of land by eminent domain
  - Overhead not directly related to project costs

- Indirect Costs which includes those costs that are incurred for a common or joint purpose benefiting more than one cost objective and are not readily assignable to the funded project (i.e., costs that are not directly related to the funded project).
- Mitigation for environmental impacts not resulting from implementation of the project funded by this program

- At the bottom of the table, indicate whether the budget request amount for the NCRP IRWM 2018/19 Project funding, project budget total and funding match is scalable by 25% and by 50% and include the scaled totals. Given the limited amount of overall funding available for the 2018/19 Project solicitation, budget and scalability are important project selection factors. *Please note that if a project proponent states that their project is not scalable and the TPRC determines that the budget amount is greater than the available funding resources, a highly ranked project may not be selected for funding.*

F. PROJECT BENEFITS & JUSTIFICATION

A critical technical review measure is the project justification for claimed benefits and the magnitude of those benefits to the communities that the project serves and the region.

1. Indicate whether the project provides physical benefits to multiple IRWM regions or funding area(s). If it does, please describe. [500 characters max.]
2. Provide a narrative for the technical basis for the project, including how the project can achieve the claimed level of benefits listed in the table below. List studies, engineering reports, plans and designs completed for the project. [3000 characters max.] Please send copies of these supporting documents with the final application to kgledhill@westcoastwatershed.com. Provide the supporting documentation file(s) with a distinct file name that references the project and organization name. if the documentation file size is too large to email, please contact Katherine at the email above (or at 707-795-1235) to discuss other options for submitting these documents.
3. Indicate whether the project addresses a contaminant listed in AB 1249 (nitrate, arsenic, perchlorate, or hexavalent chromium) and if yes, provide a description of how the project helps address the contamination. [500 characters max.]
4. Indicate whether the project provides safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes consistent with AB 685 and if yes, please describe. [500 characters max.]
5. Indicate whether the project employs new or innovative technologies or practices, including decision support tools that support the integration of multiple jurisdictions, inducing, but not limited to, water supply, flood control, land use, and sanitation and if yes, please describe. [500 characters max.]
6. **Project Benefits Table.** Complete the Project Benefits Table with information for each of the Potential Benefits that the project claims. [200 characters max.] Below is the Potential Project Benefits Worksheet that will help to complete the table in the application materials. Following are instructions and background information to help complete the worksheet; once the worksheet is filled in, transpose the information into the Project Application Project Benefits Table. Additional information is provided in Attachment B with guidance, source materials and examples from North Coast projects.
7. Provide any additional information Project Justification & Technical Basis Notes.

The benefits listed in the Potential Project Benefits Worksheet consist of benefits that projects commonly produce and are sorted into general categories:

- Water Supply Benefits
- Water Quality Benefits
- Other Ecosystem Service Benefits
- Community and Social Benefits
- Climate Change Mitigation Benefits
- Beneficial Uses for All Benefit Types

The work tables below outline these benefits. The first column identifies the benefit. The second and third columns provide guidance on how to quantify the benefit in biophysical units. The last two columns provide guidance on how to translate the biophysical effect into an economic value. Please Attachment B for more information examples drawn from past projects on the North Coast.

For some benefits, the economic value can be quantified in monetary terms. Where feasible, suggested dollar values are provided to use in the calculation. These dollar values are drawn from economic studies of projects in California can are generally applicable to projects in Northern California. It is always preferable to use local, site-specific data over these more general values, so if you have better information from the project area itself, please provide it. If not, it is permissible to use the unit value provided. In many cases, only site-specific information can be used to quantify the economic benefit and no general unit value is given. The table provides suggestions for the types of local data that are useful to describe the benefit in monetary terms. Please be sure to specify the unit to which the monetary benefit applies.

For other benefits, the economic value may not be quantifiable in monetary terms, but can be described qualitatively. It is important to provide as much detail as you can to describe and justify the benefit when it cannot be quantified monetarily. The table provides suggestions about the types of information that would be most helpful in this description.

POTENTIAL PROJECT BENEFITS TABLE WORKSHEET

Potential Benefits	Physical Amt of Benefit	Suggested Physical Units	Economic Value (estimate)	**Suggested Economic Units** If project-specific units are used, provide source or other documentation of value at the end of each subsection.
WATER SUPPLY BENEFITS				
Increased Instream Flow for Environmental Purposes		Acre-feet per year		$80-120 per acre-feet per year, depending on scarcity and availability of substitutes. A higher value may be appropriate if water is being made available for San Francisco Bay area ($160-$250) or Central Valley ($80-$280) users.
Increased Instream Flow for Agricultural Purposes		Acre-feet per year		$80-120 per acre-feet per year, depending on scarcity and availability of substitutes. A higher value may be appropriate if water is being made available for San Francisco Bay area ($160-$250) or Central Valley ($80-$280) users.
Increased Instream Flow for Municipal Purposes		Acre-feet per year		$80-120 per acre-feet per year, depending on scarcity and availability of substitutes. A higher value may be appropriate if water is being made available for San Francisco Bay area ($160-$250) or Central Valley ($80-$280) users.
Change in Timing and Volume of Instream Flow		Cubic feet per second (cfs) over a particular period (document evidence of scarcity during this period)		Project specific / Not monetized
Increased Water Supply Reliability		Number of household customers; Reduction in frequency of water shortages (e.g., once in five years, once in ten years); Reduction in magnitude of shortage (e.g., 10% reduction, 20% reduction)		$19–$27 per household per month Lower value is appropriate for improvements in reliability in situations where shortage is likely to occur infrequently and/or for short periods of time. Higher value is appropriate for improvements in reliability in situations where shortage occurs frequently and/or for longer periods of time.
Increased Groundwater Recharge		Percent increase; Gallons per year; Acre-feet per year		Project Specific/Not monetized
Avoided Water Supply Purchases		Volume of water purchased per year (or at the frequency purchases would be avoided)		Project specific: $ per unit of raw water purchased per year
Avoided Water Supply Projects		Description of the avoided project, including physical benefits, and timing of actions		Project specific: Cost of avoided project(s), including capital, replacement, and operations & maintenance costs, as applicable.
Avoided Water Shortage Costs		Gallons per year; Acre-feet per year;		Project specific: Avoided costs associated with water shortages

Potential Benefits	Physical Amt of Benefit	Suggested Physical Units	Economic Value (estimate)	Suggested Economic Units If project-specific units are used, provide source or other documentation of value at the end of each subsection.
		Percent change in frequency /severity of water shortages		
Avoided Electric Costs		Energy units (kWh) per year; Acre-feet of water pumped per year		Project specific: $ per kWh per year (PG&E current rates for different customers can be found at: http://www.pge.com/nots/rates/tariffs/rateinfo.shtml)
Avoided Costs Associated with Emergency Repairs		Project Specific		Project specific: Avoided costs associated with labor and capital to make the emergency repair.
Revenue from Water Sales to New Customers		Gallons per year; Acre-feet per year		Project specific: $ amount of net increase in revenue
Project specific units and source of value (Water Supply):				
WATER QUALITY				
Sediment Reduction		Tons per year		Project specific/ Up to $11 per ton of sediment per year
Decreased Water Temperature		Avoided project; Change in maximum daily temperature, by day		Project specific/Not monetized
Increased Dissolved Oxygen (DO)		Avoided project; Change in DO concentration		Project specific/Not monetized
Bacteria/ Contaminant Reduction		Avoided project; Change in bacteria/ contaminant concentration		Project specific/Not monetized
Additional Water Quality Projects Avoided		Avoided projects		Project specific/Not monetized
Avoided Water Treatment Costs		Gallons per year; Acre-feet per year		Project specific: Reduction in water treatment costs per unit of water per year
Avoided Culvert Failures		Number of culvert failures avoided		Project specific: Cost of culvert failure Either estimate costs if specific culvert failed or use an average appropriate for type of culvert and downstream/surrounding conditions.
Flood Damage Reduction		Project specific.		Project specific. May include avoided costs of damage to structures and infrastructure, avoided cost of loss or disruption of critical services, avoided cost of loss of life.

Potential Benefits	Physical Amt of Benefit	Suggested Physical Units	Economic Value (estimate)	**Suggested Economic Units** If project-specific units are used, provide source or other documentation of value at the end of each subsection.
Project specific units and source of value (Water Quality):				
OTHER BENEFITS				
Fishery Improvement		Number of fish per year; Percent population increase; Density (fish/m^2); Amount (e.g., miles) of new spawning habitat available. Other description of expected effects on fish populations, if none of the above are available.		Project and species-specific values; Potential overlap with other benefits, such as water quality improvements and recreation benefits.
Increased Quantity or Quality of Recreation or Public Access		Number of recreation days, by type of activity		$128 per camping day, $54 per fishing day, $28 per hiking day, $33 per motorboating day, $61 per mountain biking day, $79 per picnicking day, $25 per sightseeing day, $33 per swimming day, $89 per wildlife viewing day.
Improved Fish Passage		Number of fish per year; Percent population increase; Density (fish/m^2) Amount (e.g., miles) of new spawning habitat available; Other description of expected effects on fish populations, if none of the above are available.		Project and species-specific values; Potential overlap with other benefits, such as water quality improvements and recreation benefits.
Habitat Restoration		Acres of habitat, by type		$120 per acre per year (riparian habitat) $2,000–$4,000 per acre per year (wetland habitat); Project-specific values may also be appropriate.
Invasive Plant Removal		Acres of habitat improved		$120 per acre per year (riparian habitat) $2,000–$4,000 per acre per year (wetland habitat); Project-specific values may also be appropriate.
Flood Control		Area and type of land protected; Change in flood probabilities		Project specific. See also Flood Damage Reduction, above.
Reduction in Shellfish Closures		Number of days per year of reduced closures. Change in quantity of commercial shellfish production. Change in shellfish-related recreation days.		Project specific
Decreased Operation and Maintenance Costs		Project specific		Project specific: Avoided costs associated with labor and capital for operations and maintenance.
Avoided Costs of Road Maintenance		Miles of road		Project specific: Average road maintenance costs per mile including labor and capital.

Potential Benefits	Physical Amt of Benefit	Suggested Physical Units	Economic Value (estimate)	Suggested Economic Units If project-specific units are used, provide source or other documentation of value at the end of each subsection.
Enhanced Fire-Fighting Capabilities		Area protected per year; Avoided costs associated with other sources of water; Avoided costs of delays associated with responding to fires		Project specific
Reduced Risk of Wildfire		Amount of fuel load reduced; predicted reduction in annual fire risk		Project specific; Non Monetized
Project specific units and source of value (Other Benefits):				
COMMUNITY AND SOCIAL BENEFITS				
Enhancement of Beneficial Uses: Tribal Subsistence Fishing		Number of fish per year; Percent population increase; Density (fish/m^2); an increase of the frequency or duration of fish runs per year. Other description of expected effects on fish populations, if none of the above are available.		Project and species-specific values; Potential overlap with other benefits, such as water quality enhancement, fishery improvement and recreation benefits.
Enhancement of Beneficial Uses: Tribal Cultural Uses		Increased ability for Tribes to utilize waters and adjacent resources for cultural uses		Project specific; Not monetized
Jobs created and/or maintained		Number of full/part time positions		Project specific
Education or Technology Benefits		Number of people reached; Description of effects of technology (e.g., saved labor, better accuracy, etc.)		Project specific; Not monetized
Avoided Public Water Resources Conflicts		Describe and quantify the conflicts		Project specific; Not monetized
Social Health and Safety		Describe the effects in the project benefit notes		Project specific; Not monetized
Project specific units and source of value (Community & Social Benefits):				
CLIMATE CHANGE AMELIORATION				
Carbon Emissions Reductions from Reduced Electricity Use		Reduction in emissions of CO_2 equivalent (CO2E) per year, in tons. Reduced electricity use per year in kWh. To calculate emissions for the project area, go to		**$15 per ton of carbon dioxide equivalent** (increases at a real rate of 2.5% per year)

Potential Benefits	Physical Amt of Benefit	Suggested Physical Units	Economic Value (estimate)	Suggested Economic Units If project-specific units are used, provide source or other documentation of value at the end of each subsection.
		http://oaspub.epa.gov/powpro/ept_pack.charts		
Carbon Emissions Reductions from Other Reduced Energy Use		Reduction in emissions of CO_2 equivalent (CO2E) per year, in tons. Reduced energy use per year (e.g., gallons of diesel fuel). To calculate emissions reductions from different energy sources, go to http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results		**$15 per ton of carbon dioxide equivalent** (increases at a real rate of 2.5% per year)
Carbon Sequestration		Number of trees planted, by type; Volume of CO_2 sequestered per year (in tons); May use the Tree Carbon Calculator to estimate carbon dioxide sequestration from tree planting projects: https://www.fs.usda.gov/ccrc/tools/tree-carbon-calculator-ctcc		**$15 per ton of carbon dioxide sequestered** (increases at a real rate of 2.5% per year); If estimates are not available but an estimate of number of trees planted is available, use the following value estimates: $0.64 for per hardwood planted per year; $0.49 per conifer planted per year; (average annual value of carbon sequestered by a tree with a moderate growth rate over 50 years, discounted at a rate of 3%);
Project specific units and source of value (Climate Change): _____				

Attachment A

Resolution No. _____

Date: _____

RESOLUTION OF _____

ADOPTING THE NORTH COAST INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, in the past 15 years, the California electorate approved three general obligation bonds including Propositions 50, 84, 1E and 1 that have provided more than $12 billion for water-related projects in California for projects that are included in Integrated Regional Water Management (IRWM) Plans; and

WHEREAS, the development of a regional coalition to organize and promote local and regional projects for funding has proven to be effective in obtaining funding from these bond measures directing more than $65 million to water related projects located in the North Coast Region over the past 10 years; and

WHEREAS, a concerted effort by North Coast Resource Partnership IRWM Plan participants and interested stakeholders has resulted in the completion of Phase I, II & III of the North Coast IRWM Plan that have been adopted by seven partner counties in 2005, 2007 and 2014; and

WHEREAS, the North Coast Resource Partnership IRWM Plan has identified $435 million funding in needs for capital projects that will improve water supply reliability, protect and improve water quality, increase water use efficiency and reuse, and protect and restore threatened and endangered aquatic species; and

WHEREAS, local and regional water suppliers across California face significant financial challenges due to effort to replace aging water infrastructure, meet increasingly difficult regulatory compliance standards, adapt to climate change, and increase water reuse and improve groundwater management; and

WHEREAS, projects to implement water-related efforts throughout the North Coast Region are eligible for grant funding from the Proposition 1 IRWM Program; and

WHEREAS, projects that complement the North Coast IRWM Plan have been reviewed and ranked by the North Coast Technical Peer Review Committee and approved by the North Coast Policy Review Panel; and

WHEREAS, all persons desiring to be heard and provide comment at the North Coast Policy Review Panel meetings and via the North Coast Resource Partnership website were given the opportunity to present their views and all written communications regarding the plan were publically presented.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors/Tribal Council of the _____ hereby find, determine and declare as follows:

1. All of the above recitals are true and correct.

2. Phase IV of the North Coast Resource Partnership IRWM Plan, _[date]____ is adopted.

APPROVED AND ADOPTED by the Board of Supervisors/Tribal Council of the _____, at a regular meeting of said Board/Council, held on the _[date]_____ by the following vote.

Attachment B

The work tables below outline potential benefits of project implementation in the North Coast region. The first column identifies the benefit. The second and third columns provide guidance on how to quantify the benefit in biophysical units. The last three columns provide guidance on how to translate the biophysical effect into an economic value. The last column provides examples drawn from projects on the North Coast. For some benefits, the economic value can be quantified in monetary terms. Where feasible, suggested dollar values are provided to use in the calculation. These dollar values are drawn from economic studies of projects in California can are generally applicable to projects in Northern California. In many cases, only site-specific information can be used to quantify the economic benefit and no general unit value is given. The table provides suggestions for the types of local data that are useful to describe the benefit in monetary terms. For other benefits, the economic value may not be quantifiable in monetary terms, but can be described qualitatively. Please be sure to specify the unit to which the monetary benefit applies.

WATER SUPPLY BENEFITS					
Potential Benefit	Physical Amt of Benefit	Suggested Physical Units	Estimated Economic Value	Suggested Economic Units	Example of Applying Economic Units
Increased Instream Flow for Environmental Purposes		Gallons per year; Gallons per minute; Acre-feet per year		**$80–$120 per acre-foot per year**[1] This value represents the market prices paid in California water markets for water in 2013. This value should be applied to the increase in the volume of water that is left instream to support ecological functions. The value of this benefit accumulates over time. A higher value may be appropriate if water is being made available for San Francisco Bay area ($160-$250) or Central Valley ($80-$280) users.	A project helps a farmer install drip irrigation equipment. The farmer is then able to reduce withdrawals from the river by one acre-foot per year, which leaves more water instream to protect habitat for salmon and other species. The value of the benefit is $80 per year, for as many years as the water is guaranteed to remain as instream flow.
Increased Instream Flow for Agricultural Purposes		Gallons per year; Gallons per minute; Acre-feet per year		**$80–$120 per acre-foot per year**[1] This value represents the market prices paid in California water markets for water in 2013. This value should be applied to the increase in the volume of water available to agricultural users. The value of this benefit accumulates over time. A higher value may be appropriate if water is being made available for San Francisco Bay area ($160-$250) or Central Valley ($80-$280) users.	A project covers irrigation ditches, which reduces evaporation by one acre-foot per year. This water is available to irrigate more acreage than before. The value of this benefit is $57 per year, for as many years as the water is available to meet agricultural demands.
Increased Instream Flow for Municipal Purposes		Gallons per year; Gallons per minute; Acre-feet per year		**$80–$120 per acre-foot per year** This value represents the market prices paid in California water markets for water in 2013. This value should be applied to the increase in the volume of water available to municipal users. The value of this benefit accumulates over time. A higher value may be appropriate if water is being made available for San Francisco Bay area ($160-$250) or Central Valley ($80-$280) users.	A project provides rebates for water-efficient toilets, which reduces per-capita water use and overall water use by one acre-foot per year. This water is available to meet municipal demands from population growth than before. The value of this benefit is $121 per year, for as many years as the water is available to meet municipal demands.

[1] West Water Research. 2013. *2013 California Spot Market Price Forecast.*

WATER SUPPLY BENEFITS					
Potential Benefit	Physical Amt of Benefit	Suggested Physical Units	Estimated Economic Value	Suggested Economic Units	Example of Applying Economic Units
Change in Timing and Volume of Instream Flow		Cubic feet per second (cfs) over a particular period (document evidence of scarcity during this period)		**Project specific / Not monetized** Water that provides an increased instream flow during periods of scarcity is particularly valuable. Other benefit categories (e.g., increased instream flow for environmental purposes) already capture some of the benefit associated with increased instream flows. To the extent that increased instream flows occur during periods of scarcity, those values may underestimate the true value of this flow.	A project provides rain tanks that allow a farmer to collect water during the wet season and replace irrigation withdrawals during summer months. This would increase the river's flow during typically drier periods, when water is more scarce and additional flows are more critical for maintaining fish habitat. The exact value of this additional flow, above the average value provided for instream flow for environmental purposes, may not be known, but its importance should be described.
Increased Water Supply Reliability		Number of household customers; Reduction in frequency of water shortages (e.g., once in five years, once in ten years); Reduction in magnitude of shortage (e.g., 10% reduction, 20% reduction)		**$19–$27 per household per month**[2] These values represent how much households are willing to pay to avoid specific types of water shortages. At the low end, respondents said they were willing to pay about $19 per month to avoid a 10% shortage that occurs once every 10 years. At the high end, they were willing to pay about $27 per month to avoid a 50% shortage that occurs once every 20 years. The lower value is appropriate for improvements in reliability in situations where shortage is likely to occur infrequently and/or for short periods of time. The higher value is appropriate for improvements in reliability in situations where shortage occurs frequently and/or for longer periods of time.	A project that installs low-flow appliances results in a decrease in per-capita water demand. This reduces the likelihood the water utility must enforce water rationing, mandating a 10 percent reduction in water consumption when droughts occur, which is about once every 10 years in the watershed this utility depends on. This utility serves 500 customers, so the value of this benefit is about $9,500 per month or $114,000 per year. This is a tricky benefit to quantify. Project-specific conditions should be taken into account and may affect values considerably.

[2] Barakat & Chamberlin, Inc. 1994. The Value of Water Supply Reliability: Results of a Contingent Valuation Survey of Residential Customers. August.

WATER SUPPLY BENEFITS					
Potential Benefit	Physical Amt of Benefit	Suggested Physical Units	Estimated Economic Value	Suggested Economic Units	Example of Applying Economic Units
Increased Groundwater Recharge		Percent increase; Gallons per year; Acre-feet per year		**Project Specific/Not monetized** The benefits that arise from groundwater recharge may be addressed by other benefit categories (e.g., increased instream flow for multiple purposes, improved habitat, avoided costs, etc.) If other categories don't cover the benefit, describe specifics here.	A project diverts stormwater to constructed wetlands, increasing recharge to the aquifer. This may produce a wide range of benefits, including increased instream flows, avoided pumping costs, avoided costs of adapting to subsidence, etc. Where possible, address this effect in these other, direct, benefit categories.
Avoided Water Supply Purchases		Volume of water purchased per year (or at the frequency purchases would be avoided);		**Project specific: $ per unit of raw water purchased per year** This value depends on the types and costs of avoided water purchases. It's best to rely on information from the project area. If water would have been purchased yearly, the benefit accrues annually. If it's every 5 or 10 years, value accrues periodically over time.	A project decreases water demand by installing low-flow appliances. This decrease in water demand means that the community no longer has to purchase $100,000 worth of water from a neighboring water district each year. The value of this benefit is $100,000 per year. It could potentially increase over time if water supply purchases would have increased.
Avoided Water Supply Projects		Description of the avoided project, including physical benefits, and timing of actions		**Project specific: Cost of avoided project(s), including capital, replacement, and operations & maintenance costs, as applicable.** This benefit is equal to the costs of other potential future projects aimed at increasing/improving water supplies that are avoided as a result of the project.	A project covers a reservoir, decreasing evaporation. Since more water is available from the reservoir, a planned expansion that would have cost $500,000 no longer has to take place. The value of this benefit would a one-time avoided cost of $500,000. If the reservoir expansion would have cost $500 per year more to maintain, the annual avoided cost would be $500 dollars, and is additional to the one-time capital cost.

WATER SUPPLY BENEFITS					
Potential Benefit	Physical Amt of Benefit	Suggested Physical Units	Estimated Economic Value	Suggested Economic Units	Example of Applying Economic Units
Avoided Water Shortage Costs *See also* Avoided Water Supply Purchases, Increased Water Supply Reliability		Gallons per year; Acre-feet per year; Percent change in frequency /severity of water shortages		**Project specific: Avoided costs associated with water shortages** The value of this benefit may already be included elsewhere (e.g., avoided water supply purchases, increased water supply reliability). To the extent that the project's capacity to reduce costs attributable to water shortages has not already been captured, it could be included here.	A community increases the efficiency of municipal water use resulting in a decrease in water demand. This decrease in water demand results in an avoided water shortage each summer. Historically, the community had incurred costs of $100,000 during its annual water shortage, from lost business opportunities. This project would have an annual benefit of $100,000.
Avoided Electric Costs		Energy units (kWh) per year; Acre-feet of water pumped per year		**Project specific: $ per kWh per year** If a project specific change in electricity use is available, it can be multiplied by local electricity prices to estimate the value of the benefit. (PG&E current rates for different customers can be found at: http://www.pge.com/nots/rates/tariffs/rateinfo.shtml)	A project decreases leakage from irrigation piping resulting in a decrease in energy used to pump water for irrigation. The value of the benefit would be equal to the avoided electricity costs.
Avoided Costs Associated with Emergency Repairs		Project Specific		**Project specific: Avoided costs associated with labor and capital to make the emergency repair.** Insofar as the avoided costs have not been included elsewhere, they can be included here. To the extent that the project avoids costs associated with emergency repairs, the value of those costs may be included as a benefit.	For the past 10 years, emergency crews have been called on to repair an old water pipe, on average, every two years. A project that replaces that pipe would provide a benefit equal to the average annual costs of those avoided repairs.
Revenue from Water Sales to New Customers		Gallons per year; Acre-feet per year		**Project specific: $ amount of net increase in revenue**	A utility fixes leaky distribution pipes, which allows it to sell more water to meet demands it currently cannot meet without developing new supplies. The benefit is equal to revenue earned from the additional water sales.

WATER QUALITY BENEFITS					
Potential Benefit	**Physical Amt of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Applying Economic Units**
Sediment Reduction		Tons per year		**Project specific/Up to $11 per ton of sediment**[3] This value represents the sum of several avoided costs associated with reducing sedimentation (e.g., avoided reservoir dredging, avoided flood damage, avoided sediment filtration costs). The actual value likely is less than $11 per ton, and depends on the types of downstream users likely to benefit.	A project involves planting 100 trees in a previously barren riparian area resulting in reduced sediment from erosion. The project reduces sedimentation to the stream by one ton per year. The annual value of the benefit is $11 per year. *Alternately, the water treatment plant downstream can document that it will spend $1,000 less per year on treatment supplies to remove the sediment. The benefit in that case will be $1,000 per year. This is a hypothetical, project-specific benefit.*
Decreased Water Temperature		Avoided project; Change in maximum daily temperature, by day		**Project specific** To avoid double counting of habitat benefits, the value of this benefit is equal to the costs of other potential future projects aimed at reducing water temperature that are avoided due to this project's impact. If there are not potential avoided future projects, this benefit may still have biophysical value, but does not necessarily provide an economic benefit.	A project involves planting 100 trees along a stream These trees shade the stream and decrease the water temperature. Due to lower water temperatures from this project, another future project costing $100,000 is no longer necessary. This benefit has a one-time value of $100,000.
Increased Dissolved Oxygen (DO)		Avoided project; Change in DO concentration		**Project specific** To avoid double counting, the value of this benefit is equal to the costs of other potential future projects aimed at increasing DO concentrations that are avoided due to this project's impact. If there are not potential avoided future projects, this benefit may still have biophysical value, but does not necessarily provide an economic benefit.	A project involves planting 100 trees between a farm and a stream. The decrease in nutrient runoff from the farm improves dissolved oxygen concentrations in the stream. Due to the improved dissolved oxygen concentrations from this project, another future project costing $100,000 is no longer necessary. This benefit has a one-time value of $100,000.
Bacteria/ Contaminant Reduction		Avoided project; Change in bacteria/ contaminant concentration		**Project specific** To avoid double counting of habitat- and recreation-related benefits, the value of this benefit is equal to the costs of other potential future projects aimed at decreasing bacteria/contaminant concentrations that are avoided due to this project's impact. If there are not potential avoided future projects, this benefit may still have biophysical value, but does not necessarily provide an economic	A project involves planting 100 trees between a livestock operation and a stream. The decrease in runoff from the feedlot reduces bacteria concentrations in the stream. Due to the improved bacteria concentrations from this project, a future project costing $100,000 is no longer necessary. This benefit has a one-time value of $100,000.

[3] Hansen, L. and M. Ribaudo. 2008. Economic Measures of Soil Conservation Benefits: Regional Values for Policy Assessment. U.S. Department of Agriculture. Technical Bulletin No. 1922.

WATER QUALITY BENEFITS					
Potential Benefit	**Physical Amt of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Applying Economic Units**
				benefit.	
Additional Water Quality Projects Avoided		Avoided projects		**Project specific** To avoid double counting of habitat- and recreation-related benefits, the value of this benefit is equal to the costs of other potential future projects aimed at improving water quality that are avoided due to this project's impact.	If the project improves water quality in other ways, it provides a benefit by improving aquatic habitat and recreational opportunities. To avoid double counting, the value of habitat- and recreation-related benefits are calculated elsewhere. To the extent that this project can replace other efforts aimed at improving water quality, it provides an additional benefit equal to the costs of avoided projects.
Avoided Water Treatment Costs		Gallons per year; Acre-feet per year		**Project specific: Difference in water treatment costs per unit of water per year** If a local value for water treatment costs is available, multiply it by the relevant quantity to estimate the annual benefit.	A project involves lining a reservoir that holds municipal drinking water, resulting in improved water quality and decreased treatment costs for the water supply. The value is the difference between what the utility paid to treat the water before the project and after the project.

WATER QUALITY BENEFITS					
Potential Benefit	**Physical Amt of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Applying Economic Units**
Avoided Culvert Failures		Number of culvert failures avoided		**Project specific: Cost of avoided culvert failures** Use local values describing historical costs associated with culvert failures to estimate the value of reducing future culvert failures. These might include costs of: fixing/ replacing pipes at emergency rates; flood damage to land owners; and user delays for motorists. This is a one-time value applied when the culvert would likely have failed.	A project involves excavating and reinstalling one culvert that is at a risk of immediate failure. Culvert failures in the area have cost an average of $10,000 per failure in emergency repairs and localized damage to roads and structures. This one-time value can be applied to describe the benefit of this project.
Flood Damage Reduction		To determine flood damage reduction benefits, see specific instructions below.		**Project specific** Calculate expected annual damage using relevant model, such as U.S. Army Corps of Engineers HEC-Flood Damage Assessment or the Flood Rapid Assessment Model (F-RAM).	If the project decreases the frequency and/or magnitude of potential future flood events, it provides a benefit equal to the value of avoided flood damages. The economic costs associated with expected annual damage may include avoided physical damage; avoided costs associated with loss of functions such as income and wages; avoided emergency response and cleanup; and avoided, but unquantifiable, public safety and health impacts.

OTHER ECOSYSTEM SERVICE BENEFITS					
Potential Benefit	**Physical Amt of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Calculating Economic Value**
Fishery Improvement *See also* Increased Instream Flow for Environmental Purposes; Habitat Restoration		Number of fish per year; Percent population increase; Density (fish/m^2)		**Project and species-specific values; Partially captured by other benefits** Some of the value of this benefit is captured in the value of increased instream flow for environmental purposes. If the project makes targeted efforts to improve fish populations, there are several species-specific values applicable from the literature that reflect the commercial, recreation, Tribal subsistence fishing and existence values of improved fish populations. These values are dependent on site conditions and are not straightforward calculations.	A project installs 50 pieces of large woody debris in a river resulting in a 5% increase in local salmon and steelhead populations over 30 years. The value of this salmon-specific benefit is based on the commercial, recreation, Tribal subsistence fishing and existence value of this increase in fish populations.
Increased Quantity or Quality of Recreation or Public Access		Number of recreation days, by type of activity		**$128 per camping day,** **$54 per fishing day,** **$28 per hiking day,** **$33 per motorboating day,** **$61 per mountain biking day,** **$79 per picnicking day,** **$25 per sightseeing day,** **$33 per swimming day,** **$89 per wildlife viewing day.**[4] These represent the net value associated with a day spent participating in different recreational activities (not including the costs of participating in the activity). Generally, increases in quality of recreational opportunities are not easily quantifiable, but should be discussed qualitatively.	A project creates a new hiking trail along a river. This new trail attracts more individuals to hike in the area and encourages people who already hike in the area to take more hiking trips. Recreation managers in the area count an average of 10 hikers per day using the trail. Assuming all of these people would not have gone hiking but for this new trail, the value associated with the trail is approximately $280 per day or about $100,000 per year. It is important to recognize that some of these people may have hiked elsewhere, so they would have benefited from their hiking trip either way. For this reason, it is easy to overestimate this benefit, so care should be taken to clearly document assumptions.
Improved Fish Passage *See also* Fishery Improvement; Increased Instream Flow for Environmental Purposes; Habitat		Number of fish per year; Percent population increase; Density (fish/m^2)		**Project and species-specific values; Partially captured by other benefits** Avoid double counting with the value of increased instream flow for environmental purposes (and, if calculated, the improvement in fisheries). If the project makes targeted efforts to improve fish populations, there are several species-specific values applicable from the literature that reflect the commercial, recreation, Tribal subsistence fishing and existence values of improved fish populations. These values are dependent on site conditions and	A project installs an additional culvert under a roadway resulting in 5 stream miles of new steelhead rearing habitat. This is expected to increase steelhead populations in the watershed by 10 percent over 10 years. The value of this salmon-specific benefit is based on the commercial, recreation, Tribal subsistence fishing and existence value of this increase in fish populations.

[4] Loomis, J. 2005. Updated Outdoor Recreation Use Values on National Forests and Other Public Lands. U.S. Forest Service. General Technical Report PNW-GTR-658.

OTHER ECOSYSTEM SERVICE BENEFITS					
Potential Benefit	**Physical Amt of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Calculating Economic Value**
Restoration				are not straightforward calculations.	
Habitat Restoration *See also* Fishery Improvement; Increased Instream Flow for Environmental Purposes		Acres of habitat type		**$120 per acre per year (riparian habitat)**[5] **$2,000–$4,000 per acre per year (wetland habitat)**[6]**; Project-specific** These values represent estimates of the total annual economic value associated with riparian and wetland habitat. Other values may be available from the literature to apply to other habitat types and may differ considerably from these values (e.g., upland forest ecosystems, scrubland, etc.).	A project involves removing an abandoned development alongside a river. In the process, trees are planted and the native riparian conditions are restored, increasing riparian habitat by one acre. The value of that new habitat would be $120 per year.

[5] Chaibai, A., C. Travisi, H. Ding, et al. 2009. Economic Valuation of Forest Ecosystem Services' Methodology and Monetary Estimates. Fondazione Eni Enrico Mattei Working Paper No. 2009.12.

[6] Woodward, W. and Y. Wui. 2001. "Economic Value of Wetland Services: A Meta-Analysis." Ecological Economics. 37:257-270.

OTHER ECOSYSTEM SERVICE BENEFITS					
Potential Benefit	**Physical Amt of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Calculating Economic Value**
Invasive Plant Removal		Acres of habitat improved		**$120 per acre per year (riparian habitat)[6] 2,000–$4,000 per acre per year (wetland habitat)[7]** To the extent that a project improves the functionality of habitat, it provides benefits proportional to the incremental improvement of the habitat. To avoid double-counting, habitat restoration benefits should not be claimed on the same land that receives benefits for removing invasive plants.	A project removes invasive blackberries from one acre of a riparian area, resulting in better growing conditions for native vegetation and improved wildlife habitat. Biologists estimate the changes improve the productivity of the landscape for supporting native species, from about 50 percent of optimal function to 100 percent of optimal function. The value of the benefit would be equal to half of the value associated with riparian habitat, or about $60 per year.
Flood Control *See also* Flood Damage Reduction		Area and type of land protected; Change in flood probabilities		**Project specific** In order to avoid double counting with previous flood-related benefits, the value of this benefit should be equal to historical costs associated with past floods minus those costs already accounted for in other benefit categories.	If the project decreases the frequency and/or magnitude of potential future flood events, it provides additional benefits beyond those estimated by F-RAM. These benefits are equal to avoided future flood-related costs (e.g., avoided displacement, avoided injuries, avoided municipal opportunity costs, avoided flood preparation costs).
Reduction in Shellfish Closures		Number of days per year of reduced closures; Change in quantity of commercial shellfish production; Change in shellfish-related recreation days		**Project specific** The value of this benefit relies on the type of shellfish closure, its duration, and its total effect on commercial shellfish production and recreational shellfish activity.	Historically, high bacteria levels in a river have resulted in annual closures in a nearby shellfish-producing area. A project effectively reduces bacteria levels resulting in no more shellfish closures. The value of the value of the benefit is equal to the value of commercial and recreational shellfish activities adversely affected by the closure.

OTHER ECOSYSTEM SERVICE BENEFITS					
Potential Benefit	**Physical Amt of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Calculating Economic Value**
Decreased Operation and Maintenance Costs		Project specific		**Project specific: Avoided costs associated with labor and capital for operations and maintenance.** If the project decreases any operation and/or maintenance costs not accounted for in other benefit categories, count those benefits here. The value of the benefit is equal to the avoided operation and maintenance costs per year.	A project upgrades a municipal reservoir, resulting in a reduction in treatment and conveyance costs of $50,000 per year. Insofar as these values have not been accounted for elsewhere, the value of this benefit is $50,000 per year.
Avoided Costs of Road Maintenance		Miles of road;		**Project specific: Average road maintenance costs per mile including labor and capital.** In order to avoid double-counting with previous maintenance-related benefits, the value of this benefit should reflect only those avoided costs not yet accounted for.	A project re-grades a segment of roadway, decreasing annual costs associated with runoff and erosion. Historically, an average of $5,000 was spent addressing problems related to poor grade. The improvements reduce the annual maintenance efforts by half for 10 years. The value of this benefit is equal to $2,500 per year over 10 years.
Enhanced Fire-Fighting Capabilities		Area protected per year; Avoided costs associated with other sources of water; Avoided costs of delays associated with responding to fires		**Project specific** FEMA has developed a benefit-cost model that uses project-specific characteristics to estimate the value of avoided costs associated with natural disasters such as fires. If the project improves fire-fighting capabilities, it provides a benefit equal to the avoided costs associated with bringing in water from other sources to fight fires, the costs of delays in responding to fires, and fire-related damage.	A project increases the annual storage capacity of a pretreatment reservoir and reduces annual water demand, expanding the community's capacity to provide water for fighting wildfires in the region. The benefit is equal to the costs of fighting fire associated with hauling water from farther away, and potentially the damage avoided from being able to respond to fires more quickly. If these benefits are difficult to quantify monetarily, describe qualitatively.
Reduced Risk of Wildfire		Amount of fuel load reduced; predicted reduction in annual fire risk		**Project specific; Non Monetized** This benefit may be difficult to quantify. Factors to consider include probability of large fire and changes in potential damage costs, fire fighting costs, insurance costs, etc.	A project thins forests, reducing the risk of a catastrophic wildfire. The benefit is equal to the reduced annual probability of fire times the costs associated with fighting fires, the costs of delays in responding to fires, and fire-related damage.
COMMUNITY and SOCIAL BENEFITS					

Potential Benefit	Physical Amount of Benefit	Suggested Units	Estimated Economic Value	Potential Economic Units	Example of Calculating Economic Value
Education or Technology Benefits		Number of people reached; Description of effects of technology (e.g., saved labor, better accuracy, etc.)		**Project specific; Not monetized** This benefit may be difficult to quantify in monetary terms. If the project provides opportunities for people to enhance their education or to develop, test, or document a new technology in a way that should result in water supply, water quality, or flood reduction benefits it results in a benefit associated with education or technology.	A project uses youth volunteers from the local community to conduct stream restoration. The students learn about the river's ecosystem. This represents an investment in the region's human capital, which may improve the individual success of the students and the community's capacity to address related issues in the future.
Avoided Public Water Resources Conflicts		Describe and quantify the conflicts		**Project specific; Not monetized** This benefit may be difficult to quantify in monetary terms. Evidence of an effect may be illustrated through reduced litigation costs or reduced enforcement or regulatory costs.	A project provides opportunities for public collaboration around water conservation efforts. This allows stakeholders to share information, identify and agree on problem definitions, and address issues before they rise to official levels. This may avoid short-run costs and builds a region's social capital, which may increase its capacity to address similar problems more efficiently and cost-effectively in the future.
Social Health and Safety		Describe the effects		**Project specific; Not monetized** These types of benefits are difficult to quantify in monetary terms. If the project reduces the public's exposure to water-related hazards not captured by the benefit categories above, it might provide additional benefits to social health and safety.	A project reinforces a critical water main whose failure, given a seismic event, would disrupt the fire-fighting capacity of the community. The benefit is reduced risk of incurring emergency costs and improved resilience if disruptions occur.

CLIMATE CHANGE MITIGATION					
Potential Benefit	**Physical Amount of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Calculating Economic Value**
Carbon Emissions Reductions from Reduced Electricity Use		Reduction in emissions of CO2 equivalent (CO2E) per year, in tons. Reduced electricity use per year in kWh. To calculate emissions for the project area, go to http://oaspub.epa.gov/powpro/ept_pack.charts		**$15 per ton of carbon dioxide equivalent** (increases at a real rate of 2.5% per year)[7] Reducing emissions has a benefit equal to the value of these avoided costs. If the weight of avoided carbon dioxide equivalent is known, apply the first value to the weight of avoided emissions. If only the amount of avoided electricity is known, apply the second value ($22 per MWh) to the amount of avoided electricity. The value of this benefit accumulates annually.	A project reduces leakage from irrigation piping resulting in a reduction in electricity used to pump and convey water for irrigation. The reduction in energy use results in a reduction in electricity generation, which reduces greenhouse gas emissions by one ton of CO2 equivalent per year. The value of the benefit is $15 for the first year, increasing by 2.5 for every year thereafter.
Carbon Emissions Reductions from Other Reduced Energy Use		Reduction in emissions of CO2 equivalent (CO2E) per year, in tons. Reduced energy use per year (e.g., gallons of diesel fuel). To calculate emissions reductions from different energy sources, go to http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results		**$15 per ton of carbon dioxide equivalent** (increases at a real rate of 2.5% per year)[8] Reducing emissions has a benefit equal to the value of these avoided costs. If only the amount of energy is known, convert the energy to carbon dioxide equivalent, and multiply by the value above. Additional resources for these calculations are available at http://www.eia.gov/oiaf/1605/emission_factors.html	A project reduces the need to transport water by truck, resulting in a decrease in diesel used for transportation, which reduces greenhouse gas emissions by one ton of CO2 equivalent per year. The value of the benefit is $15 for the first year, increasing by 2.5 for every year thereafter.
Carbon Sequestration		Number of trees planted, by type; Volume of CO2 sequestered per year (in tons)		**$15 per ton of carbon dioxide sequestered**	A project involves planting 1,000 coniferous

[7] California Environmental Protection Agency, Air Resources Board. 2014. *California Air Resources Board Quarterly Auction 6, February 2014: Summary Results Report.* Retrieved April 29, 2014, from http://www.arb.ca.gov/cc/capandtrade/auction/february-2014/results.pdf; Nordhaus, W. 2008. A Question of Balance: Weighing the Options on Global Warming Policies. New Haven: Yale University Press.; U.S. Department of Energy, Energy Information Administration. 2007. Appendix F. Electricity Emission Factors. Retrieved on October 29, 2012 from www.eia.gov/oiaf/1605/emission_factors.html.

[8] California Environmental Protection Agency, Air Resources Board. 2014. *California Air Resources Board Quarterly Auction 6, February 2014: Summary Results Report.* Retrieved April 29, 2014, from http://www.arb.ca.gov/cc/capandtrade/auction/february-2014/results.pdf; Nordhaus, W. 2008. A Question of Balance: Weighing the Options on Global Warming Policies. New Haven: Yale University Press.

CLIMATE CHANGE MITIGATION					
Potential Benefit	**Physical Amount of Benefit**	**Suggested Units**	**Estimated Economic Value**	**Potential Economic Units**	**Example of Calculating Economic Value**
		May use the Tree Carbon Calculator to estimate carbon dioxide sequestration from tree planting projects: http://www.fs.fed.us/ccrc/tools/ctcc.shtml		(increases at a real rate of 2.5% per year)[9] If estimates of carbon sequestration are not available but an estimate of number of trees planted is available, use the following value estimates: $0.64 for per hardwood planted per year; $0.49 per conifer planted per year; These values represent the average annual value of carbon sequestered by different kinds of trees, assuming a moderate growth rate over 50 years, discounted at a rate of 3 percent.	trees along a riparian area. As these trees grow they sequester and store carbon dioxide. This benefit is roughly equivalent to $490 per year.

[9] California Environmental Protection Agency, Air Resources Board. 2014. *California Air Resources Board Quarterly Auction 6, February 2014: Summary Results Report.* Retrieved April 29, 2014, from http://www.arb.ca.gov/cc/capandtrade/auction/february-2014/results.pdf; Nordhaus, W. 2008. A Question of Balance: Weighing the Options on Global Warming Policies. New Haven: Yale University Press.; U.S. Department of Energy, Energy Information Administration. 1998. *Method for Calculating Carbon Sequestration by Trees in Urban and Suburban Settings*. Retrieved April 29, 2014, from https://www3.epa.gov/climatechange/Downloads/method-calculating-carbon-sequestration-trees-urban-and-suburban-settings.pdf

BENEFICIAL USES OF WATER FOR ALL BENEFIT TYPES		
Note: These descriptions provide information that helps inform the economic value of the benefit categories listed above, but the economic value for these categories is not calculated independently.		
Potential Benefit	**Suggested Units**	**Description**
Enhancement of Beneficial Uses	Number of downstream water bodies affected	
Enhancement of Beneficial Uses	Water body names and volumes	
Enhancement of Beneficial Uses	Percentage of each water body affected	
Enhancement of Beneficial Uses	Beneficial uses affected by project	
Enhancement of Beneficial Uses	Change in beneficial use activity expected for the affected portion of each water body	
Enhancement of Beneficial Uses: Sport Fishing	Increase in sport fishing days per year	
Enhancement of Beneficial Uses: Tribal Subsistence Fishing	Increase in quantity of fish available for catch and/or an increase of the frequency or duration of fish runs per year	
Enhancement of Beneficial Uses: Tribal Cultural Uses	Increase the ability for Tribes to utilize waters and adjacent resources for cultural uses	
Enhancement of Beneficial Uses: Water Contact Recreation	Increase in open days per year	
Enhancement of Beneficial Uses: Wildlife Habitat	Acres of riparian habitat restored per year	
Enhancement of Beneficial Uses	Number of downstream water bodies affected	
Enhancement of Beneficial Uses	Water body names and volumes	