FY22 EBTJV Project Application Addendum

This addendum is not a stand-alone document; it is to be used along with the application submitted and on file with EBTJV for FY21

Culvert Retrofit for Aquatic Passage Restoration, Kirby Brook, Washington, CT

Project Location (State, County, Town): Connecticut, Litchfield County, Washington

Congressional District of Project: CT District 5

Congressional District of Applicant: CT District 5

NFHP/EBTJV Funding Request: $26,598

Total of Other Federal Funding Contributions: $29,884

Total of Non-Federal Funding Contributions (see I.I below): $26,928

Total Project Cost: $83,410

Applicant

Project Officer: Lindsay Larson, Conservation Projects Manager
Organization: Housatonic Valley Association
Street: 150 Kent Road S
City, State, Zip: Cornwall Bridge, CT 06754
Telephone Number: (860) 672-6678 x 112; Mobile: (443) 417-7319
Email Address: lkeenereck.hva@gmail.com

Briefly describe the mission of your organization:

HVA is a watershed conservation organization whose mission is to protect the natural character and environmental health of the entire Housatonic River Watershed for this and future generations. HVA fulfills its mission by establishing partnerships with agencies and organizations, conducting research, education, advocacy, and providing technical assistance to communities and neighborhood groups. We have a strong, credible record of land conservation and river monitoring, cleanup and relationship building. HVA partners with business and community leaders to achieve its mission through three major programs and associated projects: 1) Land Protection; 2) Water Protection; and 3) Community Education and Events.

I. PROJECT DESCRIPTION, SCOPE OF WORK, AND PARTNER INFORMATION

E. Updated Project Timeline:

Note that FY22 funds may not become available until as late as summer 2022.

Activity	Partners Involved	Time Period
Baseline biological monitoring (electrofishing surveys)	CT DEEP Fisheries Division	Year 1/Phase 1: August 2022
Prepare and submit all required permit applications	HVA, Town of Washington	Year 1/Phase 1: September 2022 – January 2023
Make any necessary modifications to designs and prepare final plans	Trout Unlimited	Year 1/Phase 1: January – April 2023
Construction execution (must be completed before October 1, 2023)	Trout Scapes, HVA	Year 1/Phase 1: June – September 2023
Key stakeholders invited to tour completed project	Town of Washington, HVA	Year 2/Phase 2: October 2023 – November 2023
Conduct as-built survey and follow-up geomorphic assessment	HVA	Year 2/Phase 2: October 2023-March 2024
Conduct post-construction biological monitoring to assess project effectiveness	CT DEEP Fisheries Division	Year 2/Phase 2: August – September 2024 and 2025
Develop and implement outreach programming and signage	HVA, Steep Rock Association	Year 2/Phase 2: December 2023 – August 2024

I. Partner Information updated for non-federal contributions:

All NFHP requested funds are now required to have a 1:1 non-federal match. Non-federal match can include cash and/or in-kind labor, materials, equipment if there are no federal ties to those funds. State agency funds can be used for the non-federal match if labor and/or materials are not being charged to another federal grant. State agency funds that are used to match other federal grants would not be eligible as NFHP match. Once the NFHP grant funds are matched with non-federal cash or in-kind, an unlimited amount of other federal contributions to the project are allowed. Match dollars must be accrued during the project agreement period.

	Non-Federal Contributions		**Federal Contributions**		
Partner Name	**In-Kind Contribution (In-hand or Requested)**	**Cash Contribution (In-hand or Requested)**	**In-Kind Contribution (In-hand or Requested)**	**Cash Contribution (In-hand or Requested)**	**Partner Category***
Trout Unlimited[1]					Conservation group (local)
Trout Scapes River Restoration, LLC[2]					Business/ Corporation
Housatonic Valley Association	$3,838 In-kind Services pledged				Conservation group (local)
CT DEEP-Inland Fisheries	$3,000 In-kind Services pledged				State Agency
Town of Washington	$13,625 In-kind Services pledged	$5,000 Cash contribution pledged			Local government
Steep Rock Association	$465 In-kind Services pledged	$1,000 Cash contribution pledged			Conservation group (local)
National Fish and Wildlife Foundation New England Forests and Rivers Fund				$10,904 (from a 2019 award for $151,510 to advance priority culvert replacement and retrofit projects in the Berkshires and the Litchfield Hills)	Conservation group (national)
USDA NRCS Regional Conservation Partnership Program				$18,980 (from a large regional 2021 award)	Conservation group (national)
EBTJV Fund		$26,598 requested			Conservation group (Regional)

[1]Project Engineer- not contributing to the funding of the project

[2]Construction Contractor- not contributing to the funding of the project

*Partner Categories - Federal Agency, State Agency, Local Government, Conservation Group (Local), Conservation Group (National), Native American Tribe, Private Landowners, Corporations/Businesses

IV. UPDATED Project Budget Narrative and Table Please fill out one table for EACH deliverable. A deliverable is a direct and immediately measurable activity of the project. Each deliverable has an ecological, restoration, or outreach outcome associated with it.

Deliverable	**Outcome**
1 culvert retrofitted	1.8 miles of in-stream habitat re-opened
BKT assessment	200 m of stream reach assessed for Brook Trout presence and abundance, above and below the structure, annually over a 3 year period
2 workshops held (1 for municipal officials and other key stakeholders, 1 for the general public), signs installed	At least 20 municipal officials and decision-makers reached, and at least 30 members of the general public reached through a workshop (and thousands of people reached through educational signage)

Deliverable name	Construction completed to specifications required to restore fish passage and re-open 1.8 miles of in-stream habitat
Outcome(s) of action (circle mile or acre)	1.8 miles of in-stream habitat

a. Budget category	b. Individual, Staff, or Contractor Organization name	c. Task or Item	d. EBTJV NFHAP Request	e. Non-federal contribution		f. Federal contribution		Total contribution (e + f)
				In-kind	cash	In-kind	cash	
Administration/technical services								
Design	Trout Unlimited	Final design development	4,000				1,000	5,000
Permitting	HVA	Permitting		1,515			3,080	4,595
Project/Contract management	HVA	Project management/partner coordination					3,400	3,400
Project/Contract management	HVA	Construction oversight	1,468					1,468
Monitoring	HVA	As-built survey and geomorphic assessment- HVA		808				
Travel miles	HVA	Travel to and from project site					294	294
Personnel Services								
Agency Labor								
Contractor Labor – Trout Scapes	Trout Scapes	Actual construction- portion of Trout Scapes fee + contingency	14,000		6,000		18,980	38,980
Volunteer Labor								
Supplies/Equipment								
Materials	Trout Scapes	Geotextiles and native seed mix - TS	7,130					7,130
Materials	Trout Scapes	Stones & boulders for step rocks and footer rocks		13,625				13,625
Contractual								
A. Contractor Salaries								
B. Other Contractual								
Other								
TOTAL			**26,598**	**15,948**	**6,000**		**26,754**	**75,300**

Deliverable name	Baseline and post-construction biological monitoring conducted
Outcome(s) of action (circle mile or acre)	200 meters assessed for Brook Trout presence (above and below the structure), annually for 3 years

a. Budget category	b. Individual, Staff, or Contractor Organization name	c. Task or Item	d. EBTJV NFHAP Request	e. Non-federal contribution		f. Federal contribution		Total contribution (e + f)
				In-kind	cash	In-kind	cash	
Administration/technical services								
Monitoring	CT DEEP Fisheries	Baseline Biological monitoring		1,000				1,000
Monitoring	CT DEEP Fisheries	Post-construction biological monitoring		2,000				2,000
Personnel Services								
Agency Labor								
Contractor Labor								
Volunteer Labor								
Supplies/Equipment								
Contractual								
A. Contractor Salaries								
B. Other Contractual								
Other								
TOTAL				**3,000**				**3,000**

Deliverable name	Education/Outreach: Key stakeholders receive tour of site, at least 1 educational program is conducted in collaboration with Steep Rock Association, 1 or more educational signs are installed at the site
Outcome(s) of action (circle mile or acre)	50 people reached/educated (thousands more will view the signs)

a. Budget category	b. Individual, Staff, or Contractor Organization name	c. Task or Item	d. EBTJV NFHAP Request	e. Non-federal contribution		f. Federal contribution		Total contribution (e + f)
				In-kind	cash	In-kind	cash	
Administration/technical services								
Outreach	HVA	Educational programming/workshops		1,515			3,130	4,645
Outreach	Steep Rock Association	Educational programming/sign deployment		215				215
Personnel Services								
Agency Labor								
Contractor Labor								
Volunteer Labor								
Supplies/Equipment								
Materials	Steep Rock Association	Sign materials		250				250
Contractual								
A. Contractor Salaries								
B. Other Contractual								
Other								
TOTAL				**1,980**			**3,130**	**5,110**

Complete this table for each deliverable and estimate acreage or mileage of any and all planned habitat improvements that will result from the deliverable. Add rows as needed. Indicate if project partner contributions are in-kind or cash along with which funds are in-hand (committed) and which have been requested but are still pending. Estimated Value of Volunteers In-Kind contributions is $27.20 per hour **(Source).** For each of the project partner funds or in-kind contributions, please specify whether the funds/contributions are from a federal source or non-federal source. To meet the 1:1 non-federal match requirement, non-federal contributions must not be tied to a federal source (see I.I above).

V. UPDATED PROJECT EVALUATION QUESTIONS (Many evaluation questions will remain the same in FY22, and since we have your application from FY21, repeat questions are omitted from this addendum. FY21 questions that carry over with edits/amendments are italicized)

- **New question 2: List the main deliverables of the project and the conservation benefits expected (e.g. Deliverable 1) 2 culverts replaced; 10 miles of stream opened to fish passage. Deliverable 2) addition of large woody material; 1 mile of in-stream habitat); 3) Brook Trout restored to 3.8 km of stream). Note that each deliverable must have its own budget sheet and have its corresponding conservation benefits listed.**

Deliverable 1 (*Deliverable from Project Objectives 1 and 2 in FY21 application*): Construction completed to specifications required to restore fish passage and reopen 1.8 miles of in-stream habitat; 1.8 miles of in-stream habitat re-opened

As noted in our FY21 application, this project will reconnect populations of Brook Trout in the Shepaug River and Kirby Brook that are separated by a barrier culvert, approximately 50 feet upstream of the confluence. Brook Trout downstream of the project site have lost access to upstream habitat and are disconnected from other Brook Trout subpopulations in the watershed. Restoring habitat connectivity at this site will allow for the spread of genetic diversity among these isolated populations as well as improve access to habitat. Access to the coldwater habitat in Kirby Brook is particularly important for coldwater obligate fish in the Shepaug River during the heat of the summer. Based on data collected from a temperature logger in Kirby Brook (upstream of the barrier culvert), this stream can be classified as a coldwater stream, based on an average summer temperature in 2019 of 17.38°C.[1]

Installing the proposed retrofits will open up an additional 1.8 stream-miles upstream of this site, up to the next upstream barriers (small, privately-owned dams) on Kirby Brook and a tributary of Kirby Brook. Furthermore, there are approximately 6.5 miles of Shepaug River habitat from the Kirby Brook confluence, downstream to a small barrier dam in Roxbury. The completion of this project will result in a total of over 8 stream-miles of open aquatic habitat in the Shepaug River and Kirby Brook (with even more open stream-miles in the Shepaug River, upstream of the Kirby Brook confluence).

Deliverable 2 *(Deliverable from Project Objective 3 in FY21 application):* Baseline and post-construction biological monitoring conducted; 200 meters assessed for Brook Trout presence (above and below the structure), annually over 3 years.

Fisheries biologists from Connecticut Department of Energy and Environmental Protection (CT DEEP) will conduct biological monitoring, using electrofishing methods, over a minimum of 200 meters of Kirby Brook (from the confluence with the Shepaug River, through the structure, and just past the Spring Hill Road bridge. Biological monitoring will be conducted before construction in 2023 and for up to 2 years after construction completion. Post-construction survey data will be compared to other baseline monitoring fish data from 2019, 2021, and 2022.

[1] Beauchene, M., Becker, M., Bellucci, C. J., Hagstrom, N., & Kanno, Y. (2014). Summer Thermal Thresholds of Fish Community Transitions in Connecticut Streams. North American Journal of Fisheries Management, 34(1), 119–131.

Deliverable 3 *(Deliverable from Project Objective 3 in FY21 application):* Education/Outreach: Key stakeholders receive tour of site, at least 1 educational program is conducted in collaboration with Steep Rock Association, 1 or more educational signs are installed at the site; 50 people reached/educated, and upwards of 60,000 people may view the signs

See response to FY21 question 22, edited as new question 21, for more details on education/outreach benefits.

After construction is completed, HVA will organize a minimum of two educational events: one site visit for northwestern Connecticut municipal officials, highway managers, and other municipal decision-makers, including commission members, and one educational program for the general public, in collaboration with Steep Rock Association (SRA).

We anticipate that at least 20 municipal officials, highway managers, and other key town decision-makers will attend the site visit. We will be utilizing the newly created Litchfield Hills Municipal Culvert Replacement Cooperative (MCRC; see below) to recruit for and facilitate this workshop. Depending on the timing, we may combine the Kirby Brook site visit with 1 or 2 other site visits in the area (based on how many projects have been completed by that time).

HVA will also work with SRA to schedule a collaborative educational program and hike, after construction is completed, to discuss the project and benefits of improving aquatic habitat connectivity. We anticipate that at least 30 people will attend this program. Furthermore, we anticipate working with SRA to install at least one educational sign at the site. SRA estimates that approximately 60,000 people per year cross over the Kirby Brook culvert, while hiking down that trail, so educational signage will be viewed by thousands of people.

- **New question 8: List which of the National Fish Habitat Partnership's National Conservation Strategies the Project addresses (Appendix C)**

  This project addresses the following National Fish Habitat Partnership National Conservation Strategy
  - Reconnect fragmented fish habitats

- **FY21 question 20, edited as New question 19: Does the public have access to the Project site?** ***Will the Project increase or maintain public access to land or water for fish or wildlife-dependent recreational opportunities? If so, describe.***

  Yes, the public has access to the project site. One of the major benefits of this project site is that the culvert runs under one of the most popular hiking trails in the Steep Rock Preserve. While Tunnel Road is a town-managed road, it is only open to car traffic seasonally (so people can access trails at the far end of the preserve). The more frequent use of the road is by hikers, bikers, and joggers, as it runs along the Shepaug River for approximately 2 miles. The heavy

hiker traffic proximate to the site makes it perfect for a regional demonstration site and educational signage advertising the project and the benefits to wild Brook Trout. While this project will not necessarily increase or maintain access to land or water, it could improve recreational fisheries opportunities in Kirby Brook by contributing to a stronger Brook Trout population over time.

- **FY21 question 22, edited as new question 21: Describe the outreach or educational components associated with the Project; *do these target the local and/or regional community?***

  A main objective of this project is to use the site as a demonstration area for design features that can restore fish passage at a barrier culvert. Our main goals for communication are to collaborate with our project partners to create outreach materials and events that focus on the following:

  - The benefits of connected aquatic habitat for our communities and ecosystems, with a focus on our coldwater obligate fish species
  - The benefits of design strategies that improve fish passage at a lower cost than an entire structure replacement (with an emphasis that full replacements are still preferable if there are multiple issues that can be addressed, e.g., fish passage, flooding, and/or maintenance)

  The most important audience for communication around this project will be municipal highway managers and decision makers in the Housatonic River watershed. In 2020, HVA was awarded a grant from the National Fish and Wildlife Foundation New England Forests and Rivers (NFWF NEFR) fund, to develop regional Municipal Culvert Replacement Cooperative (MCRC) in two geographic locations (Litchfield Hills in CT and the Berkshires in MA), in order to increase the rate of culvert replacements and retrofits that incorporate Best Management Practices (BMPs) for fish passage. The MCRCs in each region will work collaboratively to address common roadblocks to completing culvert replacement and retrofit projects, which HVA has identified over many years of working with local highway departments. The MCRCs will facilitate communication between towns, regulators and resource agencies, identify opportunities to reduce per-project costs for materials and services by coordinating multiple projects across the region, provide technical support for culvert project management to partner towns, and use ongoing replacement projects as case-studies to demonstrate the long-term benefits of culvert design BMPs and teach about the culvert replacement process. A key piece of this work will involve utilizing demonstration projects to show municipal officials and highway managers what culvert replacements and retrofits can look like and how feasible they can be.

  To that end, we will utilize the MCRC to coordinate a site visit at this completed structure for municipal officials, highway managers, and other municipal decision-makers, including commission members, in northwestern Connecticut. At this site visit, HVA staff and potentially Trout Unlimited staff will discuss the design and build process and answer any questions. HVA will discuss factors that contribute to pursuing a fish passage modification/retrofit as opposed to a complete structure replacement. HVA will

also prepare brief fact sheets to be distributed that list potential funding sources for fish passage projects. We anticipate that at least 20 individuals across at least 6 towns will attend the site visit.

For outreach to the general public and the local community, we have several strategies planned. This is the perfect site to use as an educational demonstration site due to its location on one of the most heavily trafficked hiking trails in the Steep Rock Preserve. The culvert is located approximately 300 feet from the intersection of Tunnel Road and Spring Hill Road, where many people park to hike down an extremely popular hiking trail in the Steep Rock Preserve. The trail (yellow circle trail; "Steep Rock Loop") is actually a seasonally-open dirt road that runs along the Shepaug River and eventually leads to the old railroad tunnel, a very popular destination. SRA estimates that approximately 60,000 people per year cross over the Kirby Brook culvert, while hiking down that trail. HVA will collaborate with SRA to create 1 or 2 educational signs to post at the site, encouraging hikers to stop and note the improvements that were made and describing the benefits to fish and other aquatic organisms. Signs will be in English and Spanish and will utilize colorful graphics and simple text (e.g., "why did the fish cross the road?" to attract viewers. We may also utilize QR codes to link to videos that show the construction process. These signs will be viewed by thousands of people.

Additionally, we will work with SRA staff to schedule a collaborative educational program. SRA Conservation Science Manager, Rory Larson, along with HVA staff will discuss the benefits of improving aquatic habitat connectivity. We will then hike from the Kirby Brook site over to visit another fish passage restoration project on Curtis Brook, which was completed in Fall 2020. (An old barrier culvert under a hiking trail was removed and the stream channel was rebuilt to allow for full fish passage. Steep Rock Association was the lead on the Curtis Brook culvert removal project, HVA conducted stream surveying, and Trout Scapes was the contractor who completed the work – another example of a successful collaboration between our three organizations.) We anticipate that at least 30 people will attend this program. If there is enough interest, we will work with SRA to schedule additional educational programs.

Finally, we will use long-term monitoring data to demonstrate the value of stream simulation design elements as best management practices for restoring stream habitat connectivity and potentially reducing flood risk. Pre- and post-construction electrofishing surveys above and below the crossing will be conducted by CT DEEP Inland Fisheries Division for at least two years after construction. Any evidence that fish, specifically Brook Trout, are moving freely up and down Kirby Brook will indicate the success of the replaced structure. This data will be shared during strategic communication with target key stakeholders and the general public.

All outreach efforts will target the local/regional community.

- **FY21 question 24, edited as new question 23: Explain how this Project is a good investment of funds, particularly in terms of its recreational *and economic benefits for the local community?***

This project is part of a larger on-going effort by HVA to communicate to watershed municipalities that the same BMPs that are good for fish passage can also allow structures to better pass floodwaters and debris, ensuring longer lifespans and less maintenance (i.e., more resilient ecosystems and more resilient infrastructure systems). A key part of this effort is creating town-scale Road-Stream Crossing Management Plans. These plans contain information about BMPs, a detailed inventory of all the bridges and culverts in a town, and results of a prioritization process that ranks structures based on conservation value, condition, and whether or not they are town priorities. This project site was identified as a high priority in the Town of Washington's 2019 Road-Stream Crossing Management Plan. HVA was awarded funds from the Connecticut Community Foundation for design development to further move the project along. Now we are in the final stages and looking to complete a project that has clear demonstrated support from a wide variety of partners and multiple funders.

As noted above, a retrofit is an excellent choice for this structure as it is in decent condition and is not considered a flood risk. We intend to show that retrofits such as this proposed design can restore passage at a fraction of the cost of a full replacement and may be a viable alternative when a full replacement is not needed or feasible. The location of this structure makes it a great regional demonstration site, both for nearby municipalities and the general public. Site visits and design demonstration events will be organized through the newly formed Litchfield Hills Municipal Culvert Replacement Cooperative (MCRC). Members of the Litchfield Hills MCRC include 8 towns in northwestern Connecticut (Canaan, Colebrook, Kent, Norfolk, Roxbury, Salisbury, Washington). Across those 8 towns, 12 priority culverts replacement/retrofit projects have been identified and are in various stages of completion, including the Kirby Brook structure. Through the MCRC, we will work with towns to identify opportunities to cut costs and overcome barriers throughout each phase of project development (design, permitting, construction, and post-construction monitoring). This completed project will be an excellent opportunity to showcase fish passage restoration methods that can also improve structure resiliency and are considerably more affordable than full structure replacements.

The completed project will be used as a demonstration project for adjacent municipalities; showcasing the combined benefits of BMPs that utilize stream simulation design principles. The primary goal of HVA's overarching project is to institutionalize the utilization of stream simulation principles when replacing road-stream crossings. Investing funds in this project can have an impact throughout our region far beyond the Kirby Brook watershed.

- **FY21 question 15, edited as new question 24: Describe the plans for *evaluating* 1) the Project's success in meeting its objectives (*functionality*), and 2) the effectiveness of the project's conservation actions, *including improvements to fish population and recreational fishing opportunities, and economic benefits. Mention how the Project***

will be amended if its objectives are not being met. Note: EBTJV will require a post-project report of these findings.

1) To evaluate the project's success in meeting objectives, we will determine whether all deliverables have been completed. The project will have successfully met the objectives, if: a) the retrofit was fully designed, permitted, and constructed to the specifications to restore fish passage, b) if biological monitoring is done to monitor Brook Trout presence across 3 years (before and after construction), and c) if at least two educational events are planned and executed (one for municipal decision-makers and other key decision-makers, and one for the general public).

2) In order to evaluate the effectiveness of the project's conservation actions, HVA and its partners will conduct at least two years of site monitoring starting with pre- and post-construction surveys. This is outlined in detail in our FY21 application, under Objective 3 in section D. These efforts will include in-stream surveys to document any geomorphological changes and electrofishing surveys at the site to observe any changes in species presence or abundance. Success can be measured by seeing increased numbers of wild Brook Trout above and below the project site. CT DEEP Fisheries has pledged to conduct these surveys utilizing their established protocol. HVA will also conduct a site survey post-construction using the NAACC protocol for assessing stream habitat connectivity. Success will be clearly demonstrated by this effort if the barrier status of the structure moves from "Severe" to "Insignificant" or "No Barrier". Barrier status of "Insignificant" or "No barrier" essentially mean Brook Trout will be able to freely move up- and downstream of the site in varying stream levels and conditions.

As part of the MCRC initiative, HVA will also document cost-savings, using this method to restore fish passage, as compared to a full culvert replacement.

If objectives are not being met, the project will be amended in the following ways:

- If fish passage has not been restored after construction, Trout Scapes will consult with the Trout Unlimited project engineer to determine how to remedy the structure to fully restore passage (***Note: we do not anticipate that this will be the case, as a comprehensive design process will ensure that passage will be restored.)***

- **Do your answers to the FY21 questions, not including the above list, remain the same? Please list any major changes to your answers to the FY21 questions.**

16. Does the Project support any goals in existing action plan(s) (e.g. state fish & wildlife, watershed protection, water quality improvement, land or water-use plan(s), or other regional plan(s))?

In addition to our responses in our FY21 application, we also wanted to note that this project directly supports Steep Rock Association's 2020 Strategic Plan. Specifically, this project supports the following key priorities listed in that plan:

1. **Stewardship**
   d. Enhance riparian corridors within the Town of Washington to encourage biodiversity and the proliferation of native flora and fauna.

3. **Outreach**
   a. Present a diversity of high-quality educational programs and special events which actively involve participants in exploring the natural, historical and cultural resources we protect and promote environmental awareness and engagement.

19. Describe the current status of the Project. Is it planned, permitted, and ready to begin?

In addition to our response to this question in our FY21 application, we also wanted to note that HVA staff conducted a site visit to the Kirby Brook site in December 2020, with staff from the CT DEEP Land and Water Resources Division (Regulatory) and Habitat Conservation and Enhancement Division. At that time, CT DEEP staff provided additional comments on how to smoothly move through the permitting process for this particular project. Based on those comments, HVA has since started to complete the Request for Natural Diversity Data Base (NDDB) State Listed Species Review Form (DEEP-APP-007), in order to complete that portion of the permitting process sometime in 2021.

VI. NEW SUPPORTING DOCUMENTATION:
Appendix C

National Fish Habitat Partnership Conservation Strategies

Protect intact and healthy waters
Restore hydrologic conditions for fish
Reconnect fragmented fish habitats
Restore water quality