

Stream Restoration Information

Organization	Website	Notes
Federal Interagency Stream Restoration Working Group	www.usda.gov/stream_restoration	Site to download FISRWG's <i>Stream Corridor Restoration: Principles, Processes, Practices</i>
BLM Riparian Land Recovery Initiative	www.-a.blmgov/riparian/tech.htm	A list of riparian technical references produced by the BLM and available online in PDF format.
California State Water Resources Control Board	www.SWRCB.ca.gov go to Regional Boards, go to Region 2, go to Available Documents, go to <i>Stream and River Protection...</i>	Ann L. Riley is a foremost expert in urban stream restoration. Go to this site to download Riley's <i>Stream and River Protection for the Regulator and Program Manager: A Technical Circular</i> .
California Department of Water Resources	www.watershedrestoration.water.ca.gov/urbanstreams/	Information on Department's Urban Streams Restoration Program
American Rivers	www.amrivers.org/streamrestorationtoolkit/	Learn how to survey your stream and design a restoration plan.
Coalition to Restore Urban Waters		Contact Ann L Riley at: California Natural Resources Foundation, 1250 Addison St 3107, Berkeley, CA 94702
Nolte Media	www.noltemedia.com	An educational documentary, <i>Urban Stream Restoration: A Tour of Ecological Restoration Techniques</i> through seven urban stream restoration sites in Northern California. Led by Ann Riley, a nationally known hydrologist and stream restoration professional, the documentary is full of examples of restored streams with detailed instructions and graphic illustrations. It includes examples of Crib Walls, Rock Walls, and other bank stabilization techniques; Creek Daylighting, Soil Bioengineering, and Ecological Flood Control Projects. Urban neighborhoods and downtowns are transformed into vital community centers and parks by restoring neglected waterways in cities.
Fish and Wildlife Service	www.fws.gov/r5cbfo/stream	U.S Fish and Wildlife Service's Chesapeake Bay Field Office developed a stream restoration program which provides assistance to landowners and local, state and federal agencies in evaluating and restoring stream systems. The program focuses in three areas: Training and education in stream assessment

		and restoration; Technical assistance; and, Design and construction of demonstration projects.
Izaak Walton League	www.iwla.org/sos/sostools.html	The Izaak Walton League 's Save Our Streams program has created highly effective tools to educate volunteers how to monitor streams, stabilize streambanks and address changes in their watersheds. These tools are on their website.
Rocky Mountain Institute	www.rmi.org/sitepages/pid277.php	Downloadable publications including <i>Daylighting Creeks: New Life for Buried Streams</i> .
Sotir Associates Homepage	www.sotir.com	Go to publications and look for two recommended publications: <i>Retrofit Opportunities for Urban Waters using Soil Bioengineering</i> and <i>Use of Riprap in Soil Bioengineering Streambank Protection</i> .
Napa County Resource Conservation District	www.naparcd.org/streamrestoration.htm	Learn about two demonstration stream restoration projects funded by CALFED.
Mono Lake	www.monolake.org/newsletter/97fall/trush.htm	Interview with Bill Trush on Mono Basin stream restoration.
Bodeganet	www.bodeganet.com/watershed/alistairarticle.html	Great article by a Marin County farmer about his experience with stream restoration after the March 1995 flooding.
Creekbank.com	www.creekbank.com	Creekbank.com is the flyfishing angler's resource for preservation and restoration of cold water streams.
River Restoration Funders Directory	www.rivernetwork.org/library/index.cfm?doc_id=117	River Network's Directory of Funding Sources 2001-2002 for grassroots river and watershed conservation groups. The Directory contains sample foundation proposals, tips, and links to many other online funding sources.

Suggested Streambed Restoration References: Annotated

Bentrup, G and J.C. Hoag. 1998. *The Practical Streambank Bioengineering Guide: a User's Guide for Natural Streambank Stabilization Techniques in the Arid and Semi-arid Great Basin and Intermountain West*. Interagency Riparian/Wetland Project, Plant Materials Center, USDA-NRCS, Aberdeen, ID. This document is downloadable at: www.nrcs.usda.gov/technical/streams.html. This 55-page publication was written to provide guidance for those interested in streambank bioengineering. It was also written to increase awareness of streams and riparian areas, their importance, and

their interconnectedness with other resources. The guide consists of chapters: Chapter One – Introduction defines riparian areas and describes their value; Chapter Two – Understanding your Stream and Watershed addresses proper land management; Chapter Three – Streambank Bioengineering discusses the advantages and one disadvantage of bioengineering and includes basic planning, design and implementation principles; Chapter Four – Vegetation Selection and Procurement discusses plant selection, procurement and planting techniques; and, Chapter Five – Maintenance and Monitoring.

Leopold, L.B. 1994. *A View of the River*. Harvard University Press, Cambridge, MD.

Grounded in hydraulics, geomorphology, and surveying, as well as extensive fieldwork on rivers in the eastern and Rocky Mountain states, Leopold's *View of a River* is at once technical and personal, providing both a firm foundation for understanding the behaviors of rivers – including instructions for getting started in backyard hydraulology- and a wealth of firsthand observations by a thoughtful and experienced scientist. It will be of immediate interest and great use as we seek to develop, preserve, and appreciate our most fluid natural resource. Approximately 275 pages.

Pinkham, R. 2000. *Daylighting: New Life for Buried Streams*. Rocky Mountain Institute. Snowmass. CO.

The most radical expression of the new ethic of stream restoration is the relatively recent movement to "daylight"—expose—formerly culverted or buried streams. This report reviews daylighting benefits, challenges, and costs, and includes case studies of several dozen projects from around the U.S. and internationally. Softcover, wirebound, 64 pages.

USDA. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*.

This document encapsulates the rapidly expanding body of knowledge related to stream corridors and their restoration. It responds to a growing national and international public interest in restoring stream corridors and includes the full range of possibilities facing restoration practitioners, including no action or passive approaches, partial intervention for assisted recovery, and substantial intervention for managed recovery. It is comprised of three parts: Background (providing an overview of stream corridor structure, processes, characteristics and disturbances), Developing Stream Corridor Restoration Plans (getting organized, identifying problems and opportunities, setting goals, etc), and Applying Restoration Principles (a more in depth discussion of corridor analysis and restoration installation and management).

Additional References

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- Firehock, K. and J. Doherty. 1995. *A Citizen's Streambank Restoration Handbook Save our Streams*. Izaak Walton League of America, Inc. Gaithersburg, MD.
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Fish Migration Barrier Removal

- **Links to websites and online documents and bibliographies**

A multi-agency partnership that includes the California Department of Fish and Game maintains an excellent website that includes a compendium of useful information on fish migration barrier removal: <http://www.stream.fs.fed.us/fishxing/> **Fish Crossing** (or "FishXing" as the website is entitled) includes software for the evaluation and design of fish passage at culverts, videos and other multimedia, an annotated bibliography on fish passage through culverts, and extensive links to design guides, regulatory and management guidelines, literature on fish migration characteristics, and websites for agencies and organizations.

A new section (2003) to the **California Salmonid Stream Habitat Restoration Manual** addresses fish passage evaluations at stream crossings (roads, bridges, etc.) and Data Collection for evaluations using the FishXing software. The manual, published by the California Department of Fish and Game and commonly called the Green Book, details many aspects of stream restoration and watershed monitoring and is the de facto standard (in California) for in-channel and in-stream structures for fisheries habitat improvement. The new section, **Part IX "Fish Passage Evaluation at Stream Crossings"** can be downloaded at www.dfg.ca.gov/nafwb/pubs/2003/FishPassage.pdf

In 2001, the Southwest Region of NOAA Fisheries published its final draft of **Guidelines for Salmonid Passage and Stream Crossing**. They can be downloaded at <http://swr.ucsd.edu/hcd/NMFSSCG.PDF>.

The San Francisco Bay Regional Water Quality Control Board has published a technical reference circular, **A Primer on Stream and River Protection for the Regulator and Program Manager**, that advocates using an interdisciplinary approach to repairing ecological damage to stream channels. The 118-page manual, written by Ann Riley, emphasizes the importance of channel stability and includes discussions on site design, watershed restoration, and various components of stream restoration projects. It's available at <http://www.swrcb.ca.gov/rwqcb2/Agenda/04-16-03/Stream%20Protection%20Circular.pdf>

A **Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual**, published by the Washington Department of Fish and Wildlife offers guidance on how to locate, assess, and prioritize fish passage problems at culverts, dams, and fishways. It can be downloaded at <http://wdfw.wa.gov/hab/engineer/fishbarr.htm>. Another manual published by the Washington DFW in 2003 is intended for property owners and engineers who are designing new, retrofitted or replacement culverts at permanent road crossings to facilitate upstream fish migration: **Fish Passage Design at Road Culverts: A Design Manual for Fish Passage at Road Crossings**, is available as a pdf file at <http://wdfw.wa.gov/hab/engineer/cm/index.htm>

The British Columbia Ministry of Forests publishes a **Fish Stream Crossing Guidebook** (2002) that serves as a design manual for culverts, fords and low-water bridges. It can be downloaded at <http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/FishStreamCrossing/FSCGdBk.pdf>.

The US Corps of Engineers has published a technical paper on **Design Considerations for Siting Grade Control Structures** (2001) that includes a discussion of geotechnical, hydraulic, and environmental considerations, as well as factors regarding type, location, spacing and potential upstream and downstream impacts from such structures. It's available at <http://chl.wes.army.mil/library/publications/chetn/pdf/chetn-vii3.pdf>.

Natural or nature-like fishways are ones whose designs are based on simulating natural stream characteristics, use natural materials, and provide suitable passage conditions over a range of

flows for a variety of fish and other aquatic species. A brief paper on the subject, ***An Illustrative Handbook on Nature-Ilike Fishways: Summarized Version***, which includes a collection of photographs of projects in European, Canadian and American streams, is available at www.amrivers.org/doc_repository/AFS_Paper.pdf

An excellent paper by Janine Castro, a geomorphologist with the US Fish and Wildlife service in Portland, offers guidelines for implementing culvert replacement and removal projects. The paper, ***“Geomorphologic Impacts of Culvert Replacement and Removal: Avoiding Channel Incision,”*** addresses the vertical stability of the stream channel and changes in the channel profile that could result from such projects. It can be downloaded at <http://pacific.fws.gov/jobs/orojitw/document/pdf/guidelines/culvert-guidelines.pdf>

The H. John Heinz III Center for Science, Economics and the Environment has published two studies on dam removal, which are each available in either hard copy or in a pdf version that can be downloaded from the Center’s website: ***Dam Removal: Science and Decision Making*** (2002), and ***Dam Removal Research: Status and Prospects*** (2003). Each volume is a compilation of papers; the first discusses the potential environmental, economic and social science aspects of dam removal and the second reviews the adequacy of scientific knowledge available to support such management decisions. They can be downloaded or ordered in hard copy by going to <http://www.heinzctr.org/publications.htm>.

An extensive study of the fish migration barriers along Santa Barbara County’s South Coast is available on line. Matt W. Stoecker and Conception Coast Project, ***Steelhead Assessment and Recovery Opportunities in Southern Santa Barbara County, California*** (June 2002) can be downloaded as a pdf file from the Conception Coast Project’s website at www.conceptioncoast.org.

- ***Annotated bibliography***

Clay, Charles H. ***Design of Fishways and Other Fish Facilities*** (CRC Press/Lewis Publishers, Boca Raton FL, 1994) describes the main types of fishways and other fish facilities that are used around the world to facilitate fish migration over dams and other obstructions; the book synthesizes much of the research on design and operations considerations as well as selection of facility to be used, and emphasizes collaboration between biologists and engineers on solutions.

Fish Passes: Design, Dimensions and Monitoring (FAO and DVWK, Rome, 2002) provides guidelines and design criteria to improve salmonid migration from a European perspective. It is based on solutions developed by German experts and agencies to improve fish passage on the Rhine, but the booklet has been used recently in fish passage workshops in the US. A copy can be ordered from the website for the UN Food and Agriculture Organization at <http://www.fao.org/icatalog/inter-e.htm>

The River Alliance of Wisconsin publishes an educational handbook, ***Dam Removal: A Citizens Guide to Restoring Rivers***, and a companion video that can be ordered from its website at <http://www.wisconsinrivers.org/SmallDams/toolkit-order-info.html>. The handbook offers a step-by-step process for pursuing dam removal as a river restoration tool. It includes chapters on researching a dam of concern, gathering information on repair/removal options, tools to use in pursuing a dam removal, and developing a strategy and tactics to advocate for removal.