



Ann Riley

Director of the Waterways Restoration Institute
and Western Regional Director of the Coalition to
Restore Urban Waters

Ann Riley has years of experience organizing, funding, designing, and executing urban stream restoration projects throughout the United States.

During her keynote address, Ann Riley showed slides of other urban stream restoration projects. The slides she used are copyrighted for her book, "Restoring Streams in Cities: A Guide for Planners, Policymakers, and Citizens", published by Island Press in January 1998. The transcript was revised to take out direct references to her slides.

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It's nice to be in Pittsburgh. Coming from California, being in Pittsburgh means automatically that I am an expert because the definition of an expert is somebody who's from out of town. Now actually, it's difficult for somebody from out of town, from a completely different landscape to be able to sit here and tell you what you need to do to fix all of your problems. So I think there's two things I'm going to concentrate on here. One is to inspire you with what other people are doing across the country so that you discover you are not alone—that you are one of many in the "Trashed Rivers Club." Another thing I think I need to do is to give you my professional perspective on some of your restoration options. But I'm going to talk about the physical aspects of the watershed. You've been very pollution oriented, as you should, but there is the physical aspect of the watershed, the stream and the floodplain and the terrace that runs along Nine Mile Run and I want to talk about that a little bit.

First, let me tell you about the Coalition to Restore Urban Waters. It was people coming together for the first time from 24 states in San Francisco in about 1992. The conference was called Friends of Trashed Rivers. Now I think all of you qualify to be members of Friends of Trashed Rivers. We have subsequently had conferences in New York and Chicago and next June, in New Orleans, we will have Trashed Rivers IV. These are people from the Los Angeles River, the Chicago River, from New York City, from the Lake Pontchartrain Foundation in New Orleans, Friends of the Don (Toronto — we are going international as part of our group), and what we do is we talk about horse trading. We are folks who get on the ground and clean up the pollution and replace the floodplains and replace the riparian forests and we talk shop. The group has expanded to 375 local citizen organizations nationally. A rule of our conferences is that only citizens are presenters at the workshops. We very much invite our government friends and our consulting friends and they are very important to us, and they're a part of the audience. Most of our conference expenditures

are for a scholarship fund so that citizens who normally don't get to go to a conference and normally don't get to present or speak, get to do that. As a result, they are very high energy kinds of conferences.

Yesterday, Tim Collins asked, "How trashed out is Nine Mile Run, really? How bad is it?" I said, "Hey, I think you're only about a six point five or a seven on the trashed rivers scale." Just take a look at the Los Angeles River for comparison. The Friends of the Los Angeles River is working with the Army Corps of Engineers to try to actually jackhammer up the concrete lining and to restore many of the environmental values along the Los Angeles River. The Los Angeles River is restoring itself, through a concrete lined channel which we will talk about a little later on. I want to talk about the long-term maintenance that you face in terms of keeping massive concrete structures, even like this, in one piece because it's the old "Nature bats last" maxim that concrete and water end up being two not very compatible mediums. The water generally wins in the end. On the Los Angeles River, the water and the plant material are breaking up the concrete.

The Hackensack Marshes in New York/New Jersey are ending up that just like yourselves, the remaining wetlands and the remaining rivers in urban areas are becoming exceedingly important to people because there are so few left. I think there is no accident that this coalition of urban environmentalists from around the country formed in 1992 at a time when we have very few of these environments left. So, when Mary [Kostalos] this morning said, "Look, this is our one open waterway in Pittsburgh. This is one of our most important open spaces and greenbelts...." I think you need to treat this resource as a treasure.

One of the issues, too, is whether the urban waters are safe for recreation and fisher people. One thing that is characteristic of this movement is that those cities, like Pittsburgh, that are concerned about losing people to the suburbs, are focusing on their waterways large and small to increase the

quality of life in the urban centers to bring people back or keep the population in the central city areas. Now, this is a huge concern to Pittsburgh, but you share it with all these other cities in the United States from which our membership comes.

In Chicago, on the Chicago River, when you visit that area, all the buildings have put their backs to the river, even the huge 1930s art deco opera house. So people are turning their buildings around to face the rivers and even putting in trails. There's a trail between that brick building and the Chicago River, and there are now riverbank luxury lofts coming back to downtown Chicago.

The Friends of the Chicago River are building accesses to the Chicago River. This is something for you to think about. The more trails and the more stairways and the more observation points you can build with conservation corps or volunteer groups (this was done by a neighborhood group in Chicago) increases people's awareness of the rivers and waterways and their use. Laurene Von Klan is Executive Director of the Friends of the Chicago River. I was recently invited to speak before the Chambers of Commerce in a community forum in St. Paul, Minnesota along with the Mayor of Chattanooga, Tennessee to talk about, for this area, a river-based identification for St. Paul, Minnesota.

In Cleveland, the Cuyahoga River that burned in the 1960s. Makes Nine Mile Run look pristine. They had similar kinds of problems (to yours) and they put in a city-wide effort with the participation of the Minority Environmental Association to clean up the river. So, here we all are now with a new tourist industry on the banks of the Cuyahoga River that had been on the front page of *Time* magazine in the '60s. It was actually—this river was credited with the start of the Clean Water Act in 1972.

Then there's the Endangered Mermaid Restoration Movement of downtown Boulder. Again, another one of these cities who wanted to bring back recreation, bring back the life of the downtown economy. They had flood issues and they had terrible erosion issues. They wanted to restore their fisheries. They replaced an Army Corps Flood Control Project with this restoration project, and it has now greatly increased the quality of life for the city of Boulder. It now has an Olympic run for kayaking down this river.

Probably one of the keystones of the urban restoration movement is the San Antonio River. Actually, some little old ladies in tennis shoes in the 1920s saved this river from being put under a huge concrete culvert that would have been a highway. Later on, you see the WPA (Works Progress Administration) type rock work along the river banks.

So the '30s was the next wave of restoration. And then, the last one really began in the '70s when the city of San Antonio said, "Gee, we better do something about the quality of our life in downtown San Antonio. We need to prevent this middle class flight to the suburbs." They started to restore sections of a very, very urban river in the '70s. They did surveys of the population, where over 90 percent of them said, "Hey, I'm starting to come downtown to do shopping now. Downtown is a nice place. I'm gonna go visit this because the river has been restored." The bonus was it brought in an unexpected tourist industry.

Ketchikan, Alaska has a small creek, Ketchikan Creek, which ran through the town's famous red light district, which was active in the '30s. The creek was very polluted. It's where the sex industry was located. It was filled—it was full of garbage. They restored it. And that's the way it is today; it's a tourist trap. Of course, they moved all the whores to the outlying area and opened whorehouse museums in the old town around the creek.

Napa Creek in Napa, California—the wine belt. You've got housing and all kinds of urban development on top of a large concrete culvert in upper Nine Mile Run, and this area here was a housing development on top of a concrete culvert over this creek. In the 1970s the City Council of Napa said, "It's very difficult to keep housing on top of culverts from cracking and settling." They basically tore everything down, moved the housing, lifted the lid off the culvert, and restored Napa Creek and downtown...again, as a way of restoring the economy.

The city of Berkeley, California has lost most of its creeks underground to culverts. They were relegated to flying flags with the creek names on them in the downtown area. Now the city of Berkeley is doing what they call "daylighting" their culverts. In a derelict part of West Berkeley, with drug trading, uhm, anything you wanted, you could get there. It's along an old industrial area which now has an abandoned railroad right-of-way. Keep your eye on the center of the slide. The city has sent in bulldozers to dig up the culvert underneath the railroad right-of-way. The culvert is about six feet thick because it was put in before reinforced concrete. I think some of your culverts are just like that too.

Strawberry Creek [in Berkeley] was what existed after they "daylighted" from the culvert beneath the railroad right-of-way. That's where my office is now. The area has completely gentrified as a result of opening up that creek and turning it into a park. It is almost counter intuitive—people go, "Oh, you're

gonna have an open space in this drug dealing zone? Your gonna dig up a creek and expose people to sewage and the hazards of a creek?" The history of this site is that once the park came into being, people collected there because it was attractive. Industrial buildings were rehabilitated; new offices were put in and a youth employment program was started to maintain the park.

San Luis Obispo, California, is trying to stem middle-class flight to the suburbs. The Chamber of Commerce organized a Downtown Creek Restoration project. They turned their business fronts around to face the creek. They put sidewalks along the creek, and they brought back downtown San Luis Obispo. What is so interesting to me, is that the leaders in these creek and river restoration movements are often the Chambers of Commerce in the business communities. I'm on a retainer right now by the Napa Valley Economic Development Corporation and the Napa County Flood Control District to stop an Army Corps channelization project on the Napa River, and restore the floodplains and the channel of the Napa River so that they can bring in a tourist industry from San Francisco and the Napa Valley Area. Concrete lining of streams and rivers has been common. It was the rage in the 1930s through the concrete era of the 1950s and '60s, trapezoidal channels were preferred. We have discovered (and the Army Corps knows this now, as well as local districts) that you do not need to put waterways in concrete, for either handling flood flows or erosion. We have a much more sophisticated knowledge now of the dynamics of waterways and how to keep them stable without using concrete.

At Wildcat Creek, instead of being put in a trapezoidal channel, we designed a natural low flow channel on a floodplain and riparian forest and berms. It helps protect the adjacent residents and has a natural environment. We don't have any erosion problems. We could restore some floodplain along Nine Mile Run. This is an example of a floodplain in which there has been a restoration project and we bulldozed some of the floodplain to restore it. The native riparian vegetation has grown back in. This is something we could do at Nine Mile Run, the lower areas. It appears to me that you have such an entrenched channel because of how the floodplain has been intruded on by the slag filling in the floodplain in the lower areas. The only way the channel has been able to adjust to all the urban runoff is to degrade. So the stream channel doesn't overflow onto the floodplain like it used to. We do have ways of figuring out how we could shape that channel, so that it would be more natural and to

shape the floodplain so we could return the function of it overflowing more. It could provide you with water quality benefits as well.

We recommend watershed councils and team approaches to solving these problems. Throw everybody in the same room together. You could even bring in the Army Corps. These days they have a new restoration mission. In the 1996 Water Resources Development Act, Sections 206 and 503, provides the Army Corps with new missions to do restoration. You can bring them on and cost share with them 50/50 to come up with watershed restoration plans. Put that on your list of possibilities. We have the Army Corps, the National Resources Conservation Service, the U.S. Fish and Wildlife Service, the EPA on the Wildcat Creek team. We have about five state agencies, neighborhood groups, environmental groups, staff from our local congressmen and our state representatives all in one room to come up with a watershed plan.

Now, my other recommendation to you is, DO NOT plan to plan. NO. Plan to ACT. If you are going to set up a watershed council and throw all the players into the room—GIS systems are great. What you are doing here is good. Mapping is good. You need your inventories, but your reason for being is to have projects. You want to go out immediately and put in a demonstration project, so that people can see you are actually doing something. There's something to go see and there's something to do. You can pull in the school kids and you can pull in the Girl Scouts and the Boy Scouts and you can pull in your grandmothers, the gray panthers and whoever else, and go out and plant trees. You will capture people's imaginations because you are doing something. Water quality monitoring is something people can do. That's important. You've already started that and I would continue it.

In the Pacific Northwest all the fisheries have been decimated. I don't know how relevant that is for Nine Mile Run, but sometimes you can really bring people together by saying we want to bring back the animals or we want to bring back the fish. There is this attachment, this emotional attachment, people have to that. Also, you need a "there there" (a local identity or landmark). In Pittsburgh, your rivers are the "there there". They're who you are—a river city—you are a stream city. It helps people to reattach to where they live and identify with their local geography. Observation platforms. You can put these along Nine Mile Run. You can put them along the river. Reconnect people with the resource; it creates jobs, too, to build these things and for raising money. People like to fund projects. Government agencies like projects. Foundations like

projects. Politicians like projects; they get to cut ribbons. Don't just study. Do things. Education. Several people have brought up the importance of schools. We have reached families through their schools. The kids will come out to clean up the garbage. The kids will come out and do water quality monitoring. The kids will come out and plant trees. The kids will come out and work on trails, and their parents find out about it. So it goes beyond the value of the kids. It's a way you can infiltrate the community.

Typical treatment of streams. Rip-rap. Concrete that is failing because concrete fails over time. The water pressure builds up behind the concrete and ends up breaking it apart. You could build that big culvert on the bottom of Nine Mile Run and you could regrade those slag slopes, and you could pile housing on top of it, but you're going to have a long, long-term maintenance regime to keep that huge concrete tunnel going. Do you really want to do that? Along Lincoln Creek in Milwaukee, they stopped the maintenance for two years and got three inch tree trunks starting to grow through the concrete channel with roots attacking it.

Some restoration alternatives to consider. We're taking cuttings off of branches (much as you might take a cutting off a coleus or a houseplant and put it in a pot to start a new plant). That is the basis of many of our river restoration projects. One of the best things you have going on Nine Mile Run is your riparian forest. It's very valuable. Whatever ill's Nine Mile Run has—your pollution, your flash flows, your detritus, your sewage. I'm going to add a fourth, which is that the shapes of your channels and your floodplains are pretty badly screwed up. But the trees, the forest, can help with all of that. They can slow down the erosion, they can slow down the widening, they can slow down the deepening. They can help your stream attain what we call a new equilibrium and be in balance with itself, so it's no longer excessively eroding or depositing. The trees are doing the work for you to hold that watershed together. If something were to happen where you were to start stripping those out or cutting them down, Lord help you. The best thing you can do, is just keep planting those things in your floodplain and in your watershed.

We have planted completely denuded river with cuttings. You can do that. You can take cuttings from your nearby riparian trees and stick them in the ground. They don't cost anything and they'll start to grow. Willows grow very well. But you can use willows, dogwood, some species of—I don't think you have alder here. Uhhmm, anyway, we can get into more of the species if you want to talk about

that later. Some of them you can start from seed and some of them you can start from pots.

We use a fascine where we bundle native riparian plants together and plant them in trenches on stream banks. They will cover the entire stream bank and grow very quickly.

We also use what we call poles. Remember I was talking about cuttings before? In Minnesota we used large branches cut off of native riparian trees, then sticking them in the ground. We're planting these huge branches in these very destroyed environments. These sites completely revegetated in three to four months, by using what are called soil bio-engineering techniques.

We have also worked on completely caved in stream bank. If you can imagine a vertical bank, like you have on Nine Mile Creek, a vertical bank five feet high, caving in. We've come in with a neighborhood group and some local conservation corps people. We've regraded it using brush layering that sticks out of the ground. We've put some organic fabric made out of coconut on the slopes.

We've saved a lady's house from falling in and we've trained the neighborhood in how to help each other all along the creek. Now, these could be community projects; they don't have to be big government projects.

In an inner city area of Oakland, California, a creek was bulldozed by the public works department. They were going to put in a retaining wall. Now we're rebuilding this stream bank. You do not have to use rip-rap. You do not have to use concrete. You do not have to use gabions. You do not have to use rock. Plant-based systems help take out the pollutants and they are more sustainable and they are more long term than concrete. It's the concrete that keeps me in the business of river restoration.

We work on a very large scale using these plant systems along rivers. In some areas, we emulate the old WPA work. We're bringing a staircase down to a creek. We use a log cribwall, that is alive. It's built with logs, soil and plants. The project was built with youth from Oakland, who brought their parents to come see their work on the weekend. They're at risk youth, dropping out of high school who are getting real restoration skills and now finishing their high school careers.

Those sewer lines that are going across Nine Mile Run are acting as reservoirs or dams. They're collecting sediment and they're creating erosion immediately downstream. It is being impacted by huge velocity flows and the trees are falling over. It's all storm sewer impact. What we need to do is allow the creek to widen itself, allow the trees to fall

over, keep those forests intact. Keep planting trees. It will help the river establish a new equilibrium based on your conditions here. I want to talk about the shape of your river a little bit on Nine Mile Run.

Active channels is where the water is flowing in a creek. We call the point that the stream reaches during high storm flows as the 'bank full discharge' or the 'bank full flows'. It ends up that your creek is formed by the frequent one and a half year storm. You've all heard of the one every 100 years flood? That's a very rare storm; it only happens, on the average, once every one hundred years. So it means any given year you have a one in 100 chance of that size happening. It's a very big storm. Okay. A one year flood would happen, on the average, once every year. So, the flood that happens on the average of two times every three years is the flood that forms your creek channel and that is a good national average that we can apply to many places in North America. Now, what's happening to your river right now is that it has gotten much, much deeper because of the huge urban runoff from the culverts upstream. The channel has been squeezed too much in the lower part, and the floodplain has been cut off from those flows. So, maybe, now the floodplain area is flooded on the average once every five years or once every ten years instead of the average of twice every three years. I don't know. That's something you need to find out. So, what I think you should do, down by your trailer or down toward Duck Hollow is put up a stream gauge and go out when it's raining and measure how high the water gets. Then measure how fast its going and then you're going to have some discharge quantity information. You have some good pollution parameters, I think, but you want to know how high the flows get, how often. Once you figure out where that one and a half year storm is, you're going

to know where that floodplain should be. In that area where your trailer is—in that meadow—you could start creating more floodplain, and if you need to, lower some of the landscape so you get more river or stream overflows to recreate the floodplain, and put in some riparian plantings.

This is an incredibly boring graph to put up here. I'm seeing how many people are going to doze off. Everyone seems to be awake. I'm not going to explain this graph to you, except to say this: that we fluvial geomorphologists study the relationships of the shapes of creek channels and river channels and their watersheds. You have a six square mile watershed. According to regional averages that I got off this graph, Nine Mile Run should be about 20 feet wide and about two feet deep. We went out and measured (by eye) yesterday (we didn't use tapes) but the creek is about 30 feet wide and about four to five feet deep. So you can tell your creek has been greatly, physically, impacted in addition to being polluted.

Okay? So I'm going to wrap up. Wetlands for water treatment. Other communities are doing this. Maybe there's some—you could create some wetlands on the south—I don't know which bank that would be, it's the opposite bank of Duck Hollow as Nine Mile Run enters the river area. You could do a bottom land restoration environment down there. I don't know how practical that would be. Sewage can be treated by wetlands. Youth are getting jobs in wetland and river restoration.

So, you have many challenges ahead of you. My advice to you is to enjoy Nine Mile Run and have a good time restoring it because restoring it will pull the community together and will attract the attentions of the agencies and money and resources to you. Thank you.



Figure right, Henry Prellwitz, a Ph.D. candidate in geology at the University of Pittsburgh, examining an unstable stream bank.