

Gary Edwards worked for the U.S. Fish and Wildlife Service as the Assistant Director-Fisheries in Washington D.C. and as the Deputy Regional Director for the Alaska Region. Before joining the Fisheries Program, he worked for the Arizona Game and Fish Department. He retired in 2011.

I have been blessed to have spent 44 years working in a profession that is the best of the best. I have had the privilege to work for two outstanding organizations. I have had the opportunity to see wild places and wild things that few will have the chance to see. I have had joy in celebrating with others numerous natural resource accomplishments. I get to end a career in a Region where landscape conservation is the norm and the employees are the best. Most of all I have had the honor to have worked alongside the most dedicated professionals that you will ever find. However, all adventures must end for another to begin, and this one for me will come to an end June 30, 2011. Although I leave with some sadness, a little trepidation, and envy of those who will continue to work on behalf of fish and wildlife conservation, I look forward to have more time with family and friends (especially my wife Jan who has been my greatest supporter) and time to enjoy the great outdoors. I leave knowing that despite the many challenges that await wildlife resources just over the horizon, the men and women who remain will do their very best to ensure the resources that we all cherish have a lasting future.

A Free Flowing River Is a Beautiful Thing

By Gary Edwards

Keynote Address

June 27, 2011

*National Conference on Engineering and Ecohydrology for Fish Passage
University of Massachusetts, Amherst*

In my former position as Assistant Director for the Fish and Wildlife Service's Fisheries Program, when asked what I would tackle if I could do just one thing for the Nation's fishery resources, my unhesitating answer was always "fish passage". I said that then and I say it now with full understanding and appreciation of the historic and even the current importance of blocking, harnessing, and diverting flowing water. There was a reason why our fore fathers established most of the first towns here in the East alongside rivers or why Alaska Natives built villages along the banks of the Yukon River. It was to take advantage of the many benefits that flowing water provides. For that reason dams and other structures that impact a river's flow will probably need to be constructed in the future. There is no question that the West would look a lot different than it does today if dams and other water diversions had not been placed on major western rivers such as the Salt, the Sacramento, the Colorado, and the Columbia. In the West dams became the engines of commerce and literally allowed water to become liquid wealth. They turned worthless desert land into an agricultural oasis, they generated nearly free hydroelectricity, and they allowed major cities to grow over night. However, I think most people looking back would agree that this success did not come without significant cost to upstream and downstream ecosystems, to fish migration, and even resulted in extinguishing runs of fish in many drainages.

Even Teddy Roosevelt who, more than any other President, was an advocate for the conservation of natural resources, particularly fish and wildlife, also embraced the concept of multiple purpose dams. In 1907, as President, he created the Inland Waterways Commission to study development of the nation's rivers. **In the report the Commission produces Roosevelt wrote, "The Rivers of no other civilized country are so poorly developed, so little used, or play so small a part in the industrial life of the nation as those of the United States". He went on to say that "every stream should be used to the utmost".** Among members of the Commission, only the Army Corps of Engineers believed that navigation was the primary purpose of river development.

An interesting bit of historic fact is that Woody Guthrie was hired back in 1941 to promote the dams on the Columbia River. He spent a month traveling around the Columbia Basin writing songs about the river. In one of the verses in the song, The Ballad of the Grand Coulee, **he sang, “Uncle Sam took up the challenge in the year of thirty-three, For the farmer and the worker, and all of you and me, He said roll along Columbia, you can ramble to the sea, But river while your rambling, you can do some work for me”**. In those days conscientious decisions were made even though those making them knew that dams such as the Grand Coulee would block the access of wild salmon and steelhead to hundreds of miles of spawning grounds on the upper Columbia River, and would devastate the culture and economy of Indian tribes that depended on the fish these streams produced.

How many of you have ever been to Derby Dam in Nevada? Derby Dam is located about 20 miles downstream from Reno on the Truckee River and in 1903 was the first federal reclamation project to be authorized and constructed under the 1902 Federal Reclamation Act. The dam is located right off of Interstate Highway 80 and if you didn't know it was there you might drive by without even noticing it. The couple of times that I have stopped to take a look at it, I am amazed that this rather meager structure blocking and diverting the Truckee River was the beginning of what Marc Reisner wrote in his book Cadillac Desert, **was “the most fateful transformation that has ever been visited on any landscape anywhere was wrought”**.

We could dwell for a long time about how we could or should have treated our waterways differently in the past. We could talk for hours about the various impacts that past decisions and past water development projects have had on aquatic ecosystems and on the ability of fish to move freely. However, this conference is not about the past, but about how we move forward together to find opportunities and ways to correct past impacts and ensure that future projects are designed and built in a way that avoid and/or minimize impacts. If you are a totally “the glass is half full” kind of person, I suppose you could make the argument that if we had not done what we did yesterday we wouldn't have the challenge or know the success of fixing it today and doing better tomorrow.

That said; let's talk about the future and the importance of fish passage. Often people only associate fish passage with anadromous fish. While there is no question passage is critical to species such as salmon, it is equally important to all river fish that migrate between feeding and spawning areas and make seasonal movements to other habitats. Passage is not only just important to fish, but equally as important to riverine aquatic life in general, and to many nonaquatic species, including humans, who depend on riverine aquatic ecosystems. I am always amazed that once a fish passage project is completed, how quickly benefits follow.

Fish passage projects also have value that goes beyond restoring aquatic ecosystems. The Economic Policy Institutes estimates that every million dollars spent on restoration projects generates 20.3 jobs. Fish passage projects mean local jobs for engineers, surveyors, and construction crews, who then purchase gas, equipment, and materials that further stimulate the economy. Fish passage projects can increase the use of the river for fishing and boating which bolsters local tourism. They can eliminate safety hazards and benefit water quality, and they can also be a source of green-certified electricity. Investing in fish passage projects is a win – win for the environment and the economy.

Another thing that comes to peoples' minds when they hear the words fish passage, is fish ladders at big dams. Again, while big dams certainly impact fish passage, they are only a small part of the ways fish across the country are currently being prevented from moving freely. While there may be some misguided fish passage advocates who may dream of joining Edward Abbey's monkey wrench gang and look for a large dam to blow up, there is more than a lifetime of other fish passage projects to work on that will not land you in jail but still provide big benefits. I have great admiration for past Secretary of the Interior Bruce Babbitt. He played a major role in getting the Fish and Wildlife Service's Fish Passage Program started as well as pushing for the decommissioning and removal of dams that had out-lived their usefulness.

However his approach maybe could have been a little more tempered. In 1994 during a Trout Unlimited meeting in Yellowstone, he was quoted as saying he wanted "to be the first secretary to tear down a big dam". As one can imagine his quote immediately resulted in calls, mainly by Western legislators, to the White House asking if the Secretary had lost his mind. I have always suspected that his statement may have impacted the amount of money the Fish and Wildlife Service got that year to launch its fish passage program because of concerns about what Secretary Babbitt might do with the new funding if he was given a large amount.

We must continually remind ourselves that creeks, streams, and rivers are not like a water pipe which you can simply plug and expect that things will remain unchanged above and below the plug. What they are, are linear habitats that are easily fragmented. That is why fish passage is first and foremost about connectivity and any obstacle that interrupts or fragments that connectivity should be considered as a potential fish passage project.

A good example is my state, Alaska. One does not generally think of Alaska, a state with tens of thousands of streams and rivers, with hardly any dams, and with abundant world class salmon runs, as a place where fish passage is an issue. Surprisingly there are over 1,800 culverts underlying Alaska's access roads, major state highways, and neighborhood streets that block juvenile and adult salmon during all or certain times of year, as well as alter natural stream processes to which native fish are adaptive. As a result the U.S. Fish and Wildlife Service in Alaska has a very robust fish passage program with plenty of work to do.

The point I want to make is that fish passage is much more than exploring the possibility of removing or breaching some of the major dams out West. There are well over 2 million other structures impeding flowing water across the country many of which are suitable fish passage projects that can be accomplished without impacting the original purpose for which the structure was created. So we need to roll up our sleeves and get to work as there is plenty of work to do and go around. I don't mean to imply that there has not been a lot of great work already done.

As an example Since 1999 the Fish and Wildlife Service's National Fish Passage Program has been involved with the removal of 950 fish passage barriers, reopening access to 15,500 stream miles, reconnecting 82, 000 acres of wetlands, and benefiting over 90 species of fish and freshwater mussels. These successes only represent a small portion of the projects that have been accomplished by numerous partnerships and organizations. There is a great example of success here on the East coast that bears testimony to what can and has been done. The example is the Edwards Dam on the Kennebec River that was removed almost 12 years ago

today. I understand that evidence of the Kennebec's rebirth following removal of the dam, is everywhere. Eagles, osprey, and sturgeon are spotted daily, seals have been seen chasing striped bass as far inland as Waterville, and the river has hosted the largest alewife run on the East coast. The Kennebec's revival has been described as a true wonder of nature.

The other thing that fish passage is first and foremost about, is partnerships. One only has to Google a few fish passage success stories to quickly realize every one of them involved multiple partners who contributed something to make the project a success. Some projects involve well organized coalitions and forums such as the Kennebec Coalition that played a major role in the Edward's Dam removal, or the Kenai Watershed Forum in Alaska that is dedicated to reconnecting baby salmon nurseries to the ocean. Other partnerships come together to accomplish a single project. Some evolve out of consensus-based watershed planning processes. Some start with a small amount of coordination and support that multiplies into powerful partnerships. Some like California's Partners for the Rodeo Creek Watershed focus on a single watershed. Partnerships will become increasingly important in the future as local, state, and federal agencies find it more difficult to fully fund projects during these tough economic times. To address this problem some States like Vermont and New Hampshire are taking a task force approach that will allow for a consistent presence in the fish passage arena. However they are established or what form they take, the bottom line is that partnerships are the lynch pin to a successful fish passage program.

The great thing about fish passage projects is that they develop partnerships that involve individuals and organizations that may have never worked together before. My guess is that some of you in this room find yourself sitting next to someone who you never imagined that someday you may be working alongside of. However for most fish passage projects to be successful they need to be voluntary and non-regulatory and involve everyone that has a vested interest in the outcome, and especially involve those that have a vested interest in the fish passage impediment being addressed.

There are two additional areas I would like to touch on. The first is particularly relevant to this conference and where it is being held. The University of Massachusetts has announced that they are going to have a graduate engineering curriculum for fish passage. I think it's actually called ecohydrology, but as long as it involves getting fish around barriers, the University can call it whatever it wants. I applaud the University for taking this long overdue step. We have always had great tools in biology and great tools in engineering, and now this new graduate degree will bring these tools together.

One thing that made me nervous when we were getting our Alaska Fish Passage Program up and running was that our fishery biologist were making recommendations to communities and landowners on where to place bridge abutments or what type of culvert design to use, and I kept having these visions of a bridge washing out and doing a lot of damage to a landowner because we made the wrong recommendation. We solved that problem by hiring a talented engineer who has a civil engineering degree and a degree in hydrology. Creating this position has not only ensured that any recommendations we make regarding project design is being made by someone qualified to do so, but it has reduced the engineering cost for many projects. Additionally, the great thing about offering an advanced degree in fish passage is it will allow engineers to use their

talent and expertise to begin helping restore flowing waters instead of restricting them. Besides, if you're an engineer it has to be a lot more challenging figuring out how to engineer something that will accommodate a living thing like a fish then to engineer some static structure using a bunch of building codes and standard blueprints.

Lastly I want to put a pitch in for us not to forget that urban waters are also in need of fish passage related projects. As fishery biologist we have a tendency to want to focus on non-urban creeks and streams, we want to be out in the wild not surrounded by asphalt. While there is plenty enough work to do away from the cities there are good reasons for not ignoring urban waters. Environmental justice is one of the reasons. Streams used to flow freely in areas that are now part of the inter-city, but there is no reason why people living in these generally economically depressed areas shouldn't have the opportunity to experience first had the joys of a free flowing meandering stream that could even support a fish population. Restoring urban waters however can present some unique engineering challenges and constraints because traditional engineered structures and stream restoration designs may not be feasible due to the natural and sometimes violent process of stream adjustment in urban watersheds. A great example of restoring urban waterways is the 23 separate fish passage projects that were completed in association with the replacement of the Woodrow Wilson Bridge in the Washington D.C. area; that have opened up 26 miles of historic spawning habitat. This project was unique in that it was the first time that a fish passage project of this size was attempted in a highly urbanized area, and only natural fish passage measures were used instead of engineered artificial structures. By the first spring fish were spawning further upstream than they have in nearly a century.

In closing I want to tell you what my expectations are for this conference as well as issue a challenge. I'm assuming each of you came here with some level of expectation regarding what you hope to gain by attending, and those expectations probably vary depending on your role with fish passage. My expectations, however, are about what I expect from you and others rather than what I expect from this Conference. This week, Thursday to be exact, my career in this business comes to an end, so my expectations of myself are somewhat limited. However, for those of you that remain behind, I expect you to be able to look back and know that you played a part and did you're very best to take on projects that ensure that rivers run free and fish swim unimpeded to their ancestral habitats. My challenge therefore, is that you live up to my expectations.

I am going to end when a quote from an article by Pete Bodo titled Poetry In Motion that appeared some time ago in the Atlantic Salmon Journal. The article starts with a poem, the first lines of which are the title of my talk. It goes like this, **"A free flowing stream is a wonderful thing with an ecological mission and all; and magical music to massage the mind, too precious to kill with a concrete wall"**.