

Humility or Hubris – Restoration at the Crossroads

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Abstract

This article investigates the historical roots and modern practice of fisheries, watershed and habitat restoration and sounds a wake up call about the future of restoration. Examples of the Restoration Economy are drawn from the Klamath River Basin, the 2002 Farm Bill, the Northwest's Jobs-in-the-Woods Program and the National Restoration Science Synthesis. Information is presented indicating that, although restoration programs have proliferated, the promised restoration benefits have not been forthcoming.

The efforts of scientists and others to develop standards for river, forest and watershed restoration and to institutionalize effectiveness monitoring are discussed as is the politics influencing restoration funding decisions. Farm Bill conservation programs and the forces driving the future of these programs are investigated. The lack of standards and results evaluation, the collaborative structure of most restoration efforts and the fact that politicians and others often equate successful restoration with the establishment of programs and the funding of projects, rather than with results, are identified as major obstacles to effective restoration.

Introduction

On any given day in thousands of communities across the US you can find workers, students, volunteers and even corporate executives engaged in hands-on projects which aim to restore something natural – a forest, a river, a stream, a prairie or just an old lot between apartment buildings. Restoring natural habitats is now an ubiquitous activity in the United States and it has spawned a plethora of public non-profit organizations and private for profit businesses. Once disparaged, the Restoration Economy is now embraced, studied by economics professors and increasingly cited by chambers of commerce as an important component of local economies.

While the enthusiasm and funding for restoration projects continues to grow, there are signs that all is not well within the Restoration Economy. The problem is that, while funding for restoration plans, programs and projects continues to grow, the promised restoration benefits have for the most part not been forthcoming. Salmon restoration is a case in point and the Klamath River offers a prime example.

The State of California was already funding salmon restoration when Public Law 99-551, popularly known as “the Klamath Act” was passed in 1986. Heralded as both unique and a harbinger of things to come, the Act appropriated \$21 million dollars in federal funds and mandated matching state funds to be spent over 20 years on fisheries management and fisheries restoration. A small amount by 21st century standards, at the time \$40 million over 20 years was considered a major appropriation and among the largest earmarked for restoration of a particular river or landscape.

But the promise that Klamath Act programs would restore the once-great salmon fisheries of the Klamath River Basin has not been realized. While yearly counts of Chinook salmon (*Oncorhynchus tshawytscha*) returning to spawn have been up and down over the years, there

were fewer spawners at the end of the program (about 30,000 in 2005) than there were in the year before the Klamath Act was established (over 60,000 in 1985). More importantly, the trend in wild or natural spawners has been down slightly over the 20-year course of the Klamath Fisheries Restoration Program. (US Fish and Wildlife Service 2006).

The Klamath restoration experience is not unique. While some community-based restoration efforts have produced tangible results, most restoration programs have not delivered promised restoration benefits. Several aquatic ecosystem and restoration scientists have become so concerned that they launched efforts to develop standards and criteria for determining the “success” of river and stream restoration projects. Lead by Margaret Palmer of the University of Maryland, Emily Bernhardt of Duke and J. David Allen of the University of Michigan, a team of scientists and graduate students has been working for several years to develop standards for stream and river restoration, link restoration and ecosystem science to restoration practice on the ground and encourage project monitoring and evaluation. Among other accomplishments they have developed a database of over 37,000 projects (USGS, 2007).

A similar effort to develop restoration principles and guidelines for forest restoration is coordinated by the American Lands Alliance. The National Forest Restoration Collaborative is “comprised of environmental and community-based forestry groups dedicated to providing national leadership to advance comprehensive forest and watershed restoration that is ecologically sound and benefits rural communities” (American Lands Alliance, 2007). The Collaborative has collected information on a number of efforts toward principles and standards for forest restoration (American Lands, 2007).

A quote from one of the papers published by the scientists promoting restoration standards sums up the situation across the US: *“Billions of dollars are currently spent restoring*

streams and rivers, yet to date there are no agreed upon standards for what constitutes ecologically beneficial stream and river restoration” (Palmer, M.A., et al, 2005: 484). Clearly, the restoration failure seen on the Klamath River is not unique.

The effort of aquatic and restoration scientists to develop and promote restoration standards appears to have stalled in 2007 (M. A. Palmer, University of Maryland, personal communication). We should not find that surprising. Those who hold the purse strings are clearly more interested in distributing restoration funding according to political criteria rather than according to whether or not the proponents are using good restoration science or have included provisions for effectiveness monitoring and results evaluation.

In this paper I examine the historical roots of habitat restoration in the United States as well as the social and political forces which operate to prevent the application of restoration science, effectiveness monitoring and results evaluation.

The Roots of Restoration

This country’s fascination with restoration has its roots in the idea of American Exceptionalism – the assertion that America and Americans embody specialness that allows this country and its people to accomplish things which are impossible for other countries and peoples. As historians have pointed out, the idea of American Exceptionalism has been applied to a multitude of situations in a number of time periods. Application of the idea to restoration of nature appears to have first emerged in the late 19th century along with the rise of government sponsored science. Its classic expression is the book Man and Nature by George Perkins Marsh. First published in 1864, Man and Nature “called for a new kind of pioneer – ‘a coworker with

nature in the reconstruction of the damaged fabric which the negligence or the wantonness of former lodgers had rendered untenable’.” (Worster, D. 2001:484).

In his biography of John Wesley Powell explorer of the Colorado River and founder of the US Geological Survey, historian Donald Worster documents the early efforts to bring science to bear to inform not only conservation of natural resources but also active human involvement in rehabilitating past damage (Worster, D. 2001). While these efforts registered successes (for example, by establishing the national forests to assure “favorable conditions of flow” in western rivers and streams and founding the USGS to advance scientific land and resource management) the hopes of Marsh, Powell and a host of other academic and government scientists were in the main not realized. The political and industrial forces which favored optimism over science and development over conservation were simply too strong. Marsh, Powell and the others were given honors but their ideas about conservation and restoration were swept aside by the tide of manifest destiny and the flood of unrestrained development.

The Modern Restoration Movement

Like a seed long dormant which is awakened by fire or other disturbance, the idea and practice of restoration resprouted in the U.S.A. in the latter half of the 20th Century. In the 1970s restoration appears to have emerged independently in a number of US communities. This was probably one of the indirect results of Earth Day which energized the stodgy conservation community and transformed it into the modern Environmental Movement. But it was apparently in Northwest California that the concept and practice of restoration first expanded beyond annual Arbor Day tree-planting and hands-on fish rearing type projects into comprehensive, watershed-based programs that could be replicated.

The Mattole Restoration Council was formed in 1983 after residents who had been raising and releasing salmon since 1978, realized that “salmon do not live just in streams, they live in watersheds” (Mattole Restoration Council, 2007). In 1989 the Restoration Council published a handbook for watershed restoration and the first salmon restoration plan to take into account conditions throughout the watershed – from the headwater ridges to the sea. *Elements of Recovery* not only guided restoration projects in the Mattole River Basin, it also inspired formation of watershed councils throughout the region and beyond. But the genesis of the watershed restoration movement in Northwest California goes back even farther. In the late 1960s and early 1970s urban hippies began moving out of San Francisco, LA and other urban centers and back to the land. Many of the urban refugees landed along the Northcoast and in Southwest Oregon where the timber industry had already been hard at work for three generations denuding the forested hills. I was among the urban refugees who came to the area looking for a home in the wilderness.

Watching helicopters fly by with logs dangling and hearing the logging trucks engine break for the next bend, the back-to-the-landers soon realized they had not moved to paradise; industrial society had indeed already inhabited our back-to-nature back yards. But it was the end of the Viet Nam War – perhaps to some extent augmented by the lack of intellectual stimulation in our newly adopted rural communities - that led to the theory and practice of restoration.

It happened this way. When the Viet Nam War ended abruptly, the military industrial complex had an excess of both helicopters and Agent Orange - the chemical defoliant which has since been linked to cancer, birth defects and a host of other health problems. Boeing and Sikorski needed to sell helicopters originally built for the military and Dow needed a new market for the chemicals in their Agent Orange brew. The West’s industrial forestlands and the national

forests provided new markets. On the national forests, for example, rangers who had been trained as industrial foresters found that by spraying the clearcuts twice they could assert that the next “crop” of trees would be ready for cutting much sooner. These “treatments” could thus be used to justify more Old Growth logging. And so the helicopters went to work spraying clearcuts and plantations in the steep, forested mountains of the American West.

The problem, however, was that there were real people living downstream of those clearcuts, including Native Americans who were just finding their voices and the back-to-the-land hippies some of whom had been educated at places like Yale, Stanford and the University of California at Berkeley. Some of the urban refugees found work through tree planting cooperatives like Oregon’s Hodads and Northern California’s Ent Forestry Cooperative. Tree planting brought workers into the clearcuts and plantations which the Forest Service and Bureau of Land Management had recently sprayed with Agent Orange. While Native American health workers documented miscarriages and birth defects, hippies and forest workers organized protests and civil disobedience to prevent the helicopters from flying. Lawsuits were filed which challenged and eventually brought an end to aerial herbicide spraying.

But the hippies and natives also created alternatives to spraying. It was within the work crews which manually prepared clearcuts for planting and manually removed the brush and hardwood trees competing with commercially valuable conifers that the idea that humans could restore watersheds and ecosystems reemerged. Native Americans on the work crews told the hippies that the original inhabitants had been taking care of the forests and streams for uncounted eons; that they had been charged with this care by the Creator. It was only a short distance from the clearcut slopes above to the damaged streams below and the salmon in those streams were

disappearing. The idea that we could put humans to work restoring the damaged forests and salmon streams took hold.

The Restoration Economy took a great leap forward in the 1990s with President Clinton's Northwest Forest Plan. The battle over the remaining Ancient Forests ultimately brought some of the same back-to-the-land hippies to sit with President Clinton at the Portland Convention Center to discuss how to end the battles over forest management within the range of the Northern Spotted Owl, the national forests of Western Washington, Western Oregon and Northwest California. In the months following the big event those of us who sat with the President (I was one of them) enjoyed unprecedented access to those in the Clinton Administration responsible for putting together a Northwest Forest Plan intended to end the Ancient Forest battles.

One of the issues the Clintonites insisted conservationists address was how to mitigate job losses which would accompany a drastic reduction in national forest logging. Led by Pacific Rivers Council, some of us argued strenuously that loggers had the very skills needed to restore forests and salmon watersheds which logging had damaged and degraded. Thus was born "Jobs in the Woods" – at the time the most visible and likely largest appropriation of government funds ever earmarked for stream and forest habitat restoration. The Restoration Economy was quickly embraced and neither the politicians nor the forest and salmon communities of the American West have looked back.

Problems in Paradise - Restoration as Pork

Even as Restoration became fashionable and wide-spread, something fundamental was going wrong. Neither "Jobs in the Woods" nor the billions for watershed and salmon restoration that have been spent since have reversed the decline of western forest and stream ecosystems or

the decline of wild salmon fisheries. And while the dollars are still flowing from federal and state treasuries, a small but growing number of scientists and activists are questioning both the restoration practices and the assumptions which underlie those practices.

We have seen that Restoration – the idea that, through active intervention, humans can reverse damage to natural ecosystems – is an example of American Exceptionalism. Like all such examples, when we examine it critically we find that the idea of Restoration is on its face absurd, a form of hubris. Humans can not restore nature nor is such restoration necessary. Native ecosystems are self-regulating and – if the damaging activity ends – most ecosystems will restore themselves in time. Of course we now realize that humans have the capacity to fundamentally alter the physical conditions of the planet. As a result, restoring some of what we have lost is probably no longer possible. Still it remains true that natural systems are resilient and that much of what has been lost can be regained if only over generations and subject to shifting patterns of vegetation and species ranges.

The best humans can do is to rehabilitate the damage our species has done and then get out of the way to let nature take its course. Well conceived and executed rehabilitation work can in most cases accelerate the natural process by which ecosystems recover from disruption and degradation. Coupled with a more enlightened approach to resource extraction and use, rehabilitation work conceived in humility and focused on the causes of degradation can result in real restoration.

The difference between the word *Restoration* and the word *Rehabilitation* is only a few letters. And that is the way most restorationists react when presented with the idea that they are actually using the wrong term for what they do. For the most part, restorationists think the distinction is unimportant. That attitude is dangerous. For one thing, if we humans can restore

ecosystems then we don't have to worry so much about damaging them. In fact, environmental damage is the raw material on which the Restoration Economy is built; if humans did not damage and degrade ecosystems there would be no restoration projects, no restoration jobs, no Restoration Economy. So it is not too surprising that most "restorationists" do not concern themselves with the philosophical implications of the terminology used nor do most show real interest in evaluating the effectiveness of their work. Just give us the money they tell us and we will do good work.

But the danger inherent in the attitude toward nature which use of the term *restoration* conditions extends much farther. Most "restoration" work is financed with government funds and politicians treat restoration funding just as they do any other fund appropriation – as pork. Indeed, bringing home the restoration dollars is now important to hundreds of senators and representatives, thousands of governors and state legislators and hundreds of thousands of town councils, resource conservation districts, watershed councils, economic development councils and chambers of commerce.

There is strong evidence that the growth of the Restoration Economy and in particular of government funding for restoration is having a negative impact on the type and quality of work being done. The California Department of Fish & Game, for example, once evaluated proposed stream restoration projects in terms of "properly functioning" stream condition. The idea was that if a proposed project was not aimed at restoring the stream to properly functioning condition the project should not be funded. But over time the agencies funding decisions have become increasingly political and decreasingly science-based. For example, in 2006 CDFG provided salmon restoration funding for two Resource Conservation Districts to "develop capacity" to administer programmatic Incidental Take Permits for California ESA listed Coho salmon

(*Oncorhynchus kisutch*). That funding - like the Incidental Take Permits themselves - is about regulatory compliance rather than restoration. Officially CDFG does not use restoration funds for regulatory compliance but in reality that is exactly what is taking place.

There are also cases in which restoration funding appears to actually facilitate more ecological damage rather than aiding in ecosystem rehabilitation and recovery. Example of this are found within the Klamath EQIP program. EQIP stands for Environmental Quality Incentive Program. Established and funded through the federal Farm Bill, EQIP is administered by the Natural Resource Conservation Service, an agency of the federal Department of Agriculture.

Part of the 2002 Farm Bill, Klamath EQIP began as a plan endorsed by fishermen, conservationists and tribes to use federal restoration funds to reduce agricultural demand for Klamath River water and thus leave more water in streams and lakes to sustain and restore Klamath River Basin fisheries. But by the time the final language was written in a Senate-House Conference Committee, Klamath EQIP had been transformed into a program that could and has been used by Klamath Basin irrigators to exploit groundwater and extend the irrigation season while prohibiting the public from gaining details about the taxpayer funded projects because they are designated by the Farm Bill as the equivalent of “trade secrets” of the irrigators receiving the funds.

Restoration, the Farm Bill and the Future

It is because of issues like those found in the Klamath EQIP program that a group of river and restoration scientists came together to develop and promote science-based principles and standards for restoring rivers and streams. The National River Restoration Science Synthesis (<http://www.restoringrivers.org/>) led to publication of major papers in Science (Bernhardt et al.

1995) and the Journal of Applied Ecology (Palmer et al. 2005) and to the book Foundations of Restoration Ecology: the Science and Practice of Ecological Restoration (Faulk et al 2006). A major part of the effort is the watershed and river restoration database mentioned earlier which is part of the National Biological Information Infrastructure (NBII) coordinated by the US Geological Survey (<http://nrrss.nbii.gov/>). The database includes 14,641 projects which together cost \$7.3 billion dollars. But only 15% of these projects included any type of effectiveness monitoring or evaluation.

Study of watershed/river restoration project databases makes it clear that most taxpayer restoration funds are spent on private agricultural lands. Because farmers and ranchers only want certain agencies involved on their lands, most federal restoration funding for agricultural land is funneled through the Department of Agriculture. These restoration programs (Ag folks prefer the term “conservation”) are, for the most part, authorized and funded via the Farm Bill which is reauthorized with changes once every five years or so.

As this article is being written, a new Farm Bill is being crafted in Congress. Like the 2002 Farm Bill before it, the 2007 Farm Bill will include a Conservation Title with dozens of programs ostensibly targeted to restore water, streams, soil and wildlife habitat on America’s private agricultural lands.

The new Farm Bill’s Conservation Title is receiving more attention than usual. That is because of globalization. In return for opening markets to American bankers, developing nations want to end US crop subsidies which they say distort markets and result in their farmers not being able to compete with US Ag corporations. Because the top US trade priority is opening world financial markets, the crop subsidies on which US Ag corporations and family farmers both depend are likely going away, albeit probably not in this year’s Farm Bill. But Big

Government will not abandon Big Agriculture or the few remaining family farmers; the question is what type of government support will replace trade-distorting crop subsidies and price supports.

The Conservation Title – direct government funding to Ag corporations and family farmers in return for restoration projects and habitat protection – is the #1 candidate to replace crop payments and price supports as the means by which the American Taxpayer subsidizes agriculture. As a result we are likely to see even greater efforts to manipulate legislative language and agency regulations to maximize dollar return to Ag interests while minimizing the actual conservation benefit of Farm Bill Conservation Programs. One of the most bizarre recent examples of restoration pork is a proposal from Senator Tom Harkin who chairs the Senate Agriculture Committee. Mr. Harkin has suggested that land dedicated to raising corn for bio-fuel should be eligible for government rental payments under the Farm Bill's Conservation Reserve Program. Senator Harkin is from Iowa, the cornhusker state.

In spite of the political obstacles, Farm Bill reauthorization presents a major opportunity every five years to improve the performance of conservation/restoration projects on agricultural lands. Because agricultural interests have become more dependent on conservation funding, those who want standards and accountability have potentially enhanced leverage. That leverage could be used to advance what all restoration programs and projects need to be truly effective: application of good restoration science including standards that have been developed with input from research scientists and restoration practitioners and the monitoring and evaluation of effectiveness on the ground. Not just the Farm Bill but all restoration legislation, appropriations and regulations should mandate effectiveness monitoring to assure that boondoggles are discouraged and are discovered if they do manage to get funded. Such efforts, however, are

likely to be opposed by those who have grown comfortable with the assumption that simply funding projects assures that restoration or conservation will be effective.

Improving restoration/conservation programs on agricultural lands through the Farm Bill depends in part on whether environmental groups make standards and results evaluation top priorities. But most environmental groups working on the Farm Bills limit their involvement to cheerleading for more Conservation Program funding rather than on the details of bill language and committee reports. As a result, it is unlikely that we will see much progress toward restoration principles and standards in the 2007 Farm Bill. What is likely is more shenanigans of the kind we saw with Klamath EQIP – obscure Farm Bill language that turns good sounding conservation into boondoggles that may actually do more damage to streams, rivers, soil and habitat. When a Farm Bill with increased funding for conservation becomes law the major environmental and farm organizations will declare that passage and increased funding represent great gains for the environment. The reality on the ground, however, will likely be much different.

The collaborative nature of most restoration programs also works to discourage adoption and application of standards and effectiveness monitoring. Cross-interest collaboration is often necessary when restoration occurs on private lands. But collaborative restoration almost always focuses on the easy projects - the so-called "low hanging fruit" - and avoids the tough issues and projects - those in which there is no win-win. The problem is that, as Aldo Leopold pointed out half a century ago, the first rule of intelligent tinkering (with nature) is to do no harm. Ending degrading activities, however, almost always means that someone must change. In the agricultural community this sort of change is stubbornly resisted.

We would like to believe that we can convince landowners that while they must change practices in the short term they will garner benefits in the longer term. But this is a hard sell with farmers and ranchers who typically do not plan more than a year or two in advance. These folks want to see benefit to them and their operations now. And they do not like the idea of an independent entity coming in to evaluate what occurs on the land they own or manage. Said another way, the restoration projects farmers and ranchers are willing to implement usually do not address the key factors which limit the ability of the ecosystem, river or stream to recover from degraded condition.

While appearance over substance continues to dominate the Restoration Economy, there are examples of projects that faithfully address key restoration needs and there are communities which have truly embraced the socially difficult tasks on which successful restoration depends. Bringing integrity and effectiveness to the Restoration Economy requires that we identify and promote these examples as well as expose restoration boondoggles. Success will also depend on whether those scientists campaigning for standards and reform are supported professionally and are successful in forming alliances with restoration practitioners and environmentalists. Scientists need to convince major environmental organizations that they must pay attention to the details of restoration legislation and not just to the dollar value of restoration appropriations. If it is to be successful, the movement for standards and accountability will likely require sustained effort. The 2012 Farm Bill should be a focus for that effort starting today.

Conclusion

Restoration is at a Crossroads; from humble beginnings it has grown into an important component of rural economies across the United States. From here one road leads via science-

based principles, standards, results monitoring and effectiveness evaluation toward a society which invests in rehabilitating past damage caused by humans in order to support and accelerate the natural process of ecosystem restoration. The other road leads toward landowners, communities, bureaucrats and politicians viewing restoration more and more as pork to be delivered, received and used to the benefit of individuals and interests but with limited or even negative impact to the streams, rivers and ecosystems that are supposedly being restored. As demonstrated above, it is more likely that we will take the second road; indeed we are already well along that path.

It will take much more robust alliances among scientists, restoration practitioners and environmental organizations to reverse the current trajectory. There is, however, one factor that will aid those working to reform restoration. As farmers and ranchers become more dependent on conservation grants and rents, they will be more likely to agree to standards and third party effectiveness monitoring. The majority of farmers and ranchers, as well as ag and timber corporations, will produce real restoration results if that is what is required to keep government funding flowing.

It has been remarked that Americans are uniquely ahistorical in their approach to life and consequently that we have a tendency to make the same mistakes over and over. As humans we have the impulse to act, to take charge, and to believe that we have the power to make things the way we would like them to be. In restoration, as in other areas, ignorance of history and hubris are a deadly combination. Unless we change course, what is likely to continue to die is our streams, rivers, ecosystems and the myriad beings which depend on those streams, rivers and ecosystem, including our own human species.

References

American Lands Alliance. 2007. National Forest Restoration Collaborative .
<http://www.americanlands.org/issues.php?subsubNo=1118326972>

American Lands Alliance. 2007 Restoration principles and examples.
<http://www.americanlands.org/issues.php?subsubNo=1086876105>

Bernhardt, E.S., Palmer, M.A., Allan J.D., Alexander, G, Barnas, K., Brooks, S., Carr, J., Clayton, S., Dahm, C., Follstad-Shah, J., Galat, D., Gloss, S., Goodwin, P., Hart, D., Hassett, B., Jenkinson, R., Katz, S., Kondolf, G.M., Lake, P.S., Lave, R., Meyer, J.L., O'Donnell, T.K., Pagano, L., Powell, B., Sudduth, E., 29 April 2005. Synthesizing U.S. River Restoration Efforts, *Science*, 308: 636-637.

Falk, Donald A., Palmer, M.A., Zedler, J. (eds). 2006. Foundations of Restoration Ecology: The Science and Practice of Ecological Restoration, Island Press.

Mattole Restoration Council. 2007. History.
http://www.mattole.org/about_us/history/index.html.

Palmer, M.A., Bernhardt, E.S., Allan, J. D., Lake, P.S., Alexander, G., Brooks, S., Carr, J., Clayton, S., Dahm, C.N., Follstad-Shah, J.F., Galat, D.L., Loss, S.G., Goodwin, P., Hart, D.D., Hassett, B., Jenkinson, R., Kondolf, G.M., Lave, R., Meyer, J.L., O'Donnell, T.K., Pagano, L., Sudduth, E. 2005. Standards for ecologically successful river restoration, *Journal of Applied Ecology* 42: 208–217.

US Fish and Wildlife Service. August 2006. Klamath River Basin Conservation Area Restoration Program Activities, 1986-2006.

U.S. Geological Survey, National Biological Information Infrastructure. 2006. National River Restoration Science Synthesis: (<http://nrrss.nbii.gov/>).

Worster, D. 2001. A River running west: The life of John Wesley Powell. Oxford U. Press.