

# WORLD RIVERS

# REVIEW

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## Klamath Dam Removal Takes Step Forward

by Craig Tucker

Today, there is light at the end of the tunnel in the long and contentious battle over the management of the Klamath River near the California-Oregon border, where dams and diversions have decimated once-healthy fisheries, left behind poisonous waters contaminated with algae, and angered tribes, farmers and fishing communities.

In mid-November, a diverse group of stakeholders in the region agreed to a plan that advocates for removal of four dams on the Klamath River, opening up a path to the biggest dam removal in the US, and possibly the world.

Although the non-binding agreement is only a preliminary step to a binding long-term agreement with more than two dozen stakeholder groups – including Federal,

state, local and tribal governments, and farm, ranching, conservation and fishing groups – most parties to the agreement saw the announcement as a bold step forward in the struggle to restore one of America's greatest rivers.

According to Karuk tribal leader Leaf Hillman, "The salmon aren't in the smokehouse yet, but I'm more optimistic than ever that these dams' days are numbered."

What's more, the dam removal plan would provide the missing element of the more comprehensive Klamath Basin Restoration Agreement which provides a means to balance irrigation needs with the needs of fish, a plan for reintroducing salmon to the upper Klamath basin, and a host of other benefits for the basin's struggling rural economies. This plan was released

by a coalition of stakeholders that included the Karuk, Yurok and Klamath tribes, two irrigation groups, and a host of fishing and conservation organizations.

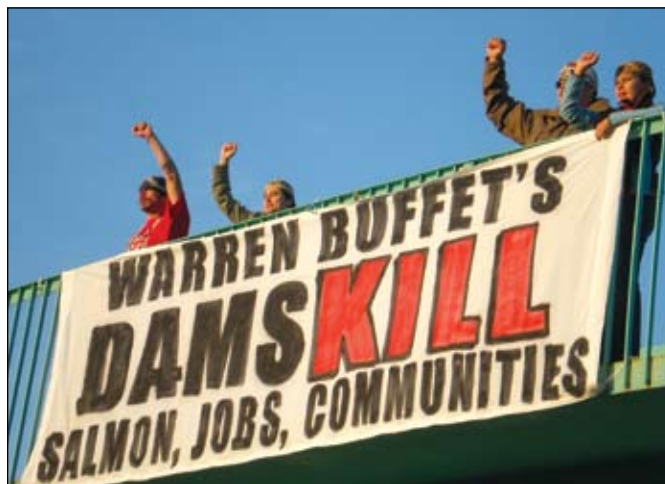
Significant hurdles remain to dam removal. The Agreement in Principle to remove the dams must be finalized, federal legislation must be passed, the current view that dam removal is in the public interest must be confirmed by a scientific analysis, and the US Secretary of the Interior must approve the deal.

Removing the dams would open up some 300 miles of river that has been inaccessible to salmon for nearly a century. Klamath salmon are now at less than 10% of their historic populations, according to fishery experts. The Klamath deal came a few days before the release of a report showing almost two-thirds of native freshwater fish in California are on the brink of extinction.

The Bush Administration was jolted into action by back-to-back disasters in 2001 and 2002. These were drought years in the region. In 2001, farmers were denied irrigation water in order to protect endangered fish. Farmers and ranchers staged dramatic demonstrations culminating in the militant seizure of the irrigation head gates.

In 2002, irrigation flows were restored but resulted in a massive fish kill that fall on

*Continued on page 5*



Tribes have been pressing for the removal of the fish-killing Klamath dams for years. The four dams are now owned by billionaire Warren Buffett. Photo: Klamath Justice Coalition

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# Commentary

## AN AGENDA FOR CHANGE

The financial crisis is sending shock waves throughout the global economy. Stock markets are plunging around the world. Governments are bailing out banks and other companies at a staggering pace. Many people are losing their jobs, houses, and retirement accounts. The free enterprise system has lost its luster. Global power is shifting to China and other cash-rich countries which are now expected to bail out Western banks and companies.

Even while the financial crisis has absorbed our attention, the world's ecosystems have moved closer to collapse. According to a new WWF report, climate change is happening "faster, stronger, sooner" than predicted by the Intergovernmental Panel on Climate Change as late as 2007. Climate change, water stress and growing demand are contributing to the global food crisis. And almost half of the 45,000 species on IUCN's latest Red List are extinct, threatened or near-threatened.

In normal times, such bad news might be a cause for despair. But we don't live in normal times. The recent election in the US has created enthusiasm for social and political change, and mobilized a new generation of activists. Barack Obama has made the promotion of clean energy one of his top priorities. Parliaments in several countries have approved huge bailout packages for their banks, and the conditions under which these funds are invested can still be defined.

The economic meltdown and impending political change are a huge opportunity to redefine global economic policies in ways that address rather than deepen the environmental crisis. The time is ripe for a Green New Deal. Here is an agenda for change:

- A program to promote renewable energy and to increase energy efficiency in housing, transport and industry could create millions of jobs and de-carbonize the economy. Barack Obama promised to create five million jobs by investing \$150 billion in clean energy and energy efficiency.
- Banks need to be re-regulated so they can become the servants rather than the masters of the global economy. Speculative practices that create excessive risks should be outlawed. Strict environmental standards should be incorporated into the regulation of the banking sector.
- Taxing carbon emissions and cutting existing subsidies for oil, coal and nuclear energy can provide the resources needed to invest in a green economy. Carbon taxes can also create a safety net to cushion the social impacts of the transition to a low-carbon economy.

Groups like the New Economic Foundation, BankTrack and Friends of the Earth have prepared detailed proposals on how a Green New Deal might work. Even the UN Environmental Programme has launched a Green Economy Initiative to create green jobs and combat climate change. "Now that the once-dominant forces of market fundamentalism have been discredited, a new, equitable and sustainable future can be built on the rubble of past excesses," the BankTrack network comments in its "Bank to the Future" statement.

The global financial crisis is also affecting our own work. Banks are tightening their lending for risky projects such as large dams. The Xalala Dam, a controversial hydropower project in Guatemala, failed to attract foreign investors at an auction in November. And in December, the World Bank's private sector arm, the IFC, announced a delay in the Kafue Gorge Dam in Zambia due to the global financial crisis. The IFC says it believes some potential investors will pull out of the project entirely. Yet the meltdown on Wall Street also threatens to dry up credit for large solar power projects now in the pipeline. Internationally, new financiers from China, India, Thailand and Latin America are offering to fill the gap. They have deep pockets, but often no social and environmental guidelines.

While we at International Rivers are tightening our budgets and freezing our salaries, we are also investing in programs that address the current environmental challenges and opportunities. We are strengthening our climate and communications departments. We are expanding our work on new dam builders and financiers. The financial crisis has demonstrated that self-regulation is not working, and so we are pushing for stricter standards for the global dam industry. Finally, we will move into Berkeley's Brower Center in a few months, a model green building that exemplifies the new economy we are working toward.

As Barack Obama's new chief of staff said, a crisis should never be allowed to go to waste. Now is the time to push for the breakthrough of a green economy. At International Rivers, we intend to be part of the global agenda for change.

Peter Bosshard

# MAKING WAVES



## Too hot to handle

Shortly after Indian authorities issued an environmental clearance letter for the 1,500 MW Tipaimukh Dam in October, hundreds of water rights activists in five cities across Bangladesh torched dummy copies of the letter to show their displeasure with the Indian government's approval of the controversial dam on the shared Barak River. They fear that people who live downstream of the planned dam will be at the mercy of Indian authorities who will be able to control the river flow and will ignore the agricultural water needs of millions of Bangladeshis living downstream of the project. Concerns about the dam are also shared by Indian activists, including the Action Committee Against Tipaimukh Project in Manipur.

## In the News

“Time and again, Africa’s large hydro development schemes falsely promised public benefits, but instead resulted in a slowed expansion of energy access for citizens, and the privatization of the benefits provided by rivers while also reducing the many free ecosystem services they bring. Building the world’s largest dam in a nearly failed state as part of a grand scheme to ‘light up Africa’ is not only unlikely to avoid such pitfalls, it is rapidly becoming a *cause celebre* that threatens to divert attention from the kinds of incremental projects that might actually bring light to Africans.”

**From a chapter on the privatization of Africa’s rivers and the Grand Inga Dam, by Terri Hathaway and Lori Pottinger, in the new book *Electric Capitalism: Recolonising Africa on the PowerGrid* (Earthscan 2009, ed. David McDonald)**

## The Lumber Link

Customers are leaving The Home Depot because of its support for plans to dam rivers in Chilean Patagonia. More than 4,000 consumers have pledged to not shop Home Depot because its suppliers include two Chilean companies invested in the damming of the Baker and Pascua rivers. Transmission lines and reservoirs for these dams would destroy unique Patagonian forests Home Depot promised to protect. To meet future demand for electricity, Chile could use efficiency measures, solar and wind energy, rather than large dams that would displace families, disrupt livelihoods and spoil local tourism income. Join the wave to save Patagonia’s rivers, communities and forests: [internationalrivers.org/patagonia](http://internationalrivers.org/patagonia)



## Another historic vote

To defend the wild Pacuare, one of the most beautiful rivers in the world, communities living along the river held a vote in 2005 to weigh in on the issue of proposed dams. The tally: 97% opposed damming the Pacuare. In February 2008, the government renewed plans to build dams on the river and said it would reject the local vote. But in November, the nation’s Electoral Tribunal ruled that the communities’ vote must be respected and that a new referendum could take place two years after the first one. This action has created a great precedent for validating communities’ decisions regarding resource development projects in their areas.

# Dam Removal: Learning from the Pros

by Elizabeth Brink

*We talked with some of the world's best experts and advocates for dam removal to find out what lessons they have learned on this complex topic, and what hopes they have for reviving the world's dammed rivers. Below are their answers to a few questions about what it takes to create a successful dam decommissioning campaign.*

## 1 When approaching a dam removal project, what is the first thing you have to know, the first thing you would tackle?

Helen Sarakinos, whose group the River Alliance of Wisconsin has helped remove many obsolete dams in that heavily dammed state, put it most succinctly: “Is there a local voice willing to speak for the river? If you don’t have a local champion, you don’t have a prayer. No one wants to hear city folks tell them what to do with their dam,” she says.

Craig Tucker’s work on behalf of the Karuk Tribe in the very heated effort to remove four dams on the Klamath River has taught him that the more political the battle is, “the more diverse and broad a coalition you need” to win. “We have tribal leaders, scientists, farmers, and commercial fishermen working to forward our message,” he notes. The Klamath coalition has had a clear plan of action for information gathering as well: “First, clearly define the ecological impacts of the project. Although to most of us it’s obvious that fish need water and spawning habitat, dam removal advocates typically have to prove these points in court. Make sure your science is extensive and legally defensible. Compare the costs of dam operations to dam removal.”

A number of our respondents said that the first step is find out if the dam owner will be a willing partner in a dam removal or decommissioning effort. Brian Graber, who has worked on at least 20

successful and 45 in-progress dam removal campaigns for American Rivers, said, “You can’t just pick a dam and remove it. You have to have the dam owner on board. Usually it doesn’t take expensive feasibility studies to assess whether a dam owner will be amenable to removal. If they need to see an expensive feasibility study, they usually aren’t going to consent. Presenting a well-thought-out set of conceptual reasons, including both economic and ecological benefits to removal, is usually enough to determine if a dam owner is truly interested.”

Sara Strassman, also of American Rivers, says it’s not enough just to know who owns the dam: “Go see the dam, understand what it was used for and how it impacts the river dynamics and ecosystem, and to know what steps must be taken to remove the dam and who your partners might be.”

## 2 What makes the strongest argument for dam removal?

Nearly all our respondents said that economics is the key argument. Says Brian Graber: “Dam ownership requires costly maintenance and repairs and carries liability. Dam removal is a one-time expense. In addition, there are many funding sources available for river restoration, while there are few to none available for dam repair. Considering long-term costs, dam removal will almost always be cheaper than keeping a dam.” Adds American Rivers’ Sara Strassman, “Why maintain something that provides no services?”

Helen Sarakinos agrees that “it almost always comes down to money. But I’ve also come to realize that it also comes down to someone believing in the river that could be. It’s a huge leap of faith to imagine a river where a lake used to be. If someone can imagine that, and it’s a more affordable solution, then dam removal can happen.”

Adds Sara Strassman, “Most people will want to do something beneficial for river health if they can understand the process and if it doesn’t cost them money. Dam removal, like any other social decision-making, has tensions around economics and the distribution of real and perceived gains and losses, and these tensions manifest themselves differently in every case. It is important not to argue over emotional attachments to a dam.”

Dam safety is another top factor listed by many. “Safety and structural obsolescence are the two most important criteria,” asserts Ercan Ayboga. “For example, Krebsbach Dam in Germany had to meet new flood safety criteria, which required a comprehensive expensive rehabilitation, so the owner – a regional public water supply agency – decided to remove it.”

In the case of the Klamath, it’s not just the project’s poor economics, but the added liability of a toxic reservoir. Says Craig Tucker, “On the Klamath, the reservoirs erupt each summer with massive blooms of toxic blue-green algae. In addition, the Klamath dams generate little power, while bringing the facilities into compliance with modern environmental laws by building fish ladders and other modifications would cost ratepayers nearly \$500 million.”

## 3 In your campaigns, how important was it to have alternatives or replacements for what was lost in decommissioning?

Many campaigners said the dams they have worked to remove no longer provide the services they once did. “Generally, we are removing dams that have not served their original purpose for



The Sandy River in Oregon is undergoing a restoration transformation since the Marmot Dam was removed.

50-100 years,” says Sara Strassman. Yet even obsolete dams are not always a “slam dunk” for removal. Notes Helen Sarakinos: “In our part of the country, dams often don’t provide many benefits to the communities around them. They’re remnant dams, and often expensive to maintain. And yet, people keep pouring money into them. In this work, you have to understand that fear of change is a powerful motivator. People will choose the devil they know over the devil they don’t.”

Brian Graber told us that even when the removed dam no longer provided reliable services, “in some cases we have replaced a dam’s uses during removal anyway. For example, at one site, we replaced an impoundment water supply with nearby underground tanks, which are ultimately proving to be a more reliable source of water.”

Pedro Brufao of Spain’s Rios Con Vida states, “Alternatives are always basic to our campaigns. Demand-side management is the best tool. Water and energy needs can be met using less electricity and water. The use of economic arguments is also a constant.”

#### 4 What are some of the most important lessons you’ve learned in this work?

“I learn something new on every single project,” says Brian Graber. “Perhaps the best lesson is to expect that every project is going to have some unique challenge that you haven’t faced before, from engineering constraints, to finding creative ways to replace dam uses, to regulatory challenges, to working on social issues. But a constant is that almost every single project is going to have some vocal opposition. You should not expect that you will be able to sway opinions despite your best public-participation efforts. It seems 10% percent of the people will always disagree with you, even on projects you would initially expect to be non-contentious. I recommend anyone in this work get training in mediation, conflict resolution and facilitation.”

Laura Wildman of American Rivers says that public participation can make or break a campaign. “Don’t underestimate the power of public opinion and perception. Be prepared to deal with an often-slow public education process on dam removals that catch the public eye. Often the numbers and facts alone will not convince anyone.” She adds a bit of perspective to keep in mind: “the history of the river extends far beyond man’s perception of history.”

Pedro Brufao has learned that overcoming preconceived notions is harder than it looks. “For most of the public, there are many myths surrounding dams: dams are forever, dams are good, dams are monuments of our civilization, every dam is necessary,

engineers never fail, dams cause no harm, rivers have surpluses of water, polluted rivers clean themselves, fish are less important than humans, levees provide safety from flooding. We have to reject those myths by using rational arguments such as economics and alternatives. We need a lot of patience to change minds.”

Some resources, like funding, can be modified based on the objectives and the scale of the project. According to Sara Strassman, the most important resource is time, and it is finite. “Putting together a timeline for the project and its various components is a worthwhile investment because it creates the best opportunity for effective time management.”

Brian Graber agrees: “Have a reasonable expectation for project timing. Dam removal projects can take a long time – we start off with the expectation that it is at least a three-year process, even for a small dam.”

Laura Wildman has learned that complex technical fixes on engineered rivers aren’t always the best approach. “We need to back off and give the river more room. Rivers need to move and often with river restoration less is more. We often do more bad than good when we constantly tinker with rivers.”

#### 5 Can you anticipate any repercussions for river restoration efforts from the US and global financial crisis?

Here, some see opportunities while many others see constraints in the crisis. In the “glass is half empty” camp, Craig Tucker notes that “it certainly will be more difficult to fund our campaigns and on-the-ground restoration efforts. I hope that the corollary to that is that it will be more difficult to fund new dams and diversions as well!”

Helen Sarakinos believes it could cut either way. “Cost may become an even stronger bottom line in repair-versus-removal decisions.”

Sara Strassman agrees; “On one hand, funding opportunities through the traditional restoration funds may decrease as federal and state budgets and philanthropic giving retract. On the other hand, economically efficient solutions to infrastructure problems may become more attractive in an era of restricted resources. Free services provided by functioning natural environments are cheaper, and more attractive, than engineered solutions.”

Pedro Brufao says he is not going to take this lying down: “Environment and human rights related to water are always put aside when crisis shows up. We’ve got to let the public know that river restoration is cheaper, healthier and much more profitable than the alternative of doing nothing or going forward with our mad ‘fluvicide.’” ●

#### Klamath Dam Removal *continued*

the Yurok reservation where as many as 68,000 adult salmon died before spawning. “We all have those images of what happened in the Klamath,” Secretary of the Interior Dirk Kempthorne told the *San Francisco Chronicle*. “Nobody wants to see those images again, so we were motivated to find a solution.”

According the Agreement in Principle, PacifiCorp will contribute \$150-\$200 million to dam removal, and California will chip as much as \$250 million. The larger Basin Restoration Plan calls for nearly \$1 billion in spending over the next 12 years, although only half of this figure requires new funding.

By two separate estimates, dam removal would be cheaper than modifying them with fish ladders.

The dams’ owner, PacifiCorp (owned by billionaire Warren Buffett), says it is committed to seeing the deal through to dam removal, and argues that its customers will pay less under the terms of the agreement than they would if the dams are relicensed. Federal agencies have mandated the construction of \$300-\$400 million worth of fish ladders if the dams remain.

A number of groups have not signed on to the deal, including the Hupa Indian tribe and a group of farmers. Some environmental groups not directly involved in the process condemned the deal as taking too long to save the fisheries, leaving too many loopholes for the dams’ owners, and other problems.

But Steve Rothert of American Rivers said, “This agreement really is a big step forward. Two years ago PacifiCorp said they would only consider removing the dams if somebody gave them a billion dollars. Today, they have agreed to pay \$200 million to get rid of these old dinosaurs and all the problems they cause. A restored Klamath River will pay off that investment many times over as healthy salmon runs return each year, in perpetuity.”

The next step is for the parties to sign a binding agreement by June 30, 2009. Then the federal government will study the feasibility of dam removal and make a ruling by March 2012, when the Secretary of the Interior would make a final decision. The target date for removal is 2020. ●

# Feeding a Hungry River

by Elizabeth Brink

When the nearly 50-foot-high Marmot Dam was removed from the Sandy River in Oregon last year, some estimated it could take two to five years for the river to process the rocks, gravel and sand that had collected in the reservoir for decades. Instead, the river cleaned itself out in months.

In fact, the day after the dam was removed, federally protected Coho salmon were migrating past the former dam site.

This summer, the Little Sandy Dam was also taken out, fulfilling a cooperative agreement between the Bureau of Land Management (BLM) and dam owner Portland General Electric (PGE) to remove the Bull Run Hydroelectric Project (which includes both dams) and restore the free-flowing character of the Sandy River.

The project was built in 1913 to power a trolley that carried city dwellers out to the countryside, but PGE decided in 1999 that the costs of modifying the dams to help declining fish runs were higher than their energy value.

The big question on Marmot Dam quickly became, should they attempt to remove the sediment behind the dam or simply blow it up and let it go.

They blew it up.

Before they did, the Fish and Wildlife Department converted its Sandy fish hatchery to raising only fish stocks native to the Sandy, rather than the more generic hatchery fish.

While Marmot Dam had a fish ladder, and therefore did not completely block migration of anadromous species, its removal

does allow faster, easier fish access to 100 miles of river above the dam. The Little Sandy was only 16 feet high, but that was enough to completely block six miles of salmon stream.

Bill Bakke, executive director of the Native Fish Society, said one of the most important values of this project is that it “lays more groundwork for a lot more dam removals, which have value for our rivers.”

Gordon Grant, a research hydrologist with the US Forest Service’s Pacific Northwest Research Station, has documented the results of the Sandy River decommissioning project. Due to a strong global interest in dam removal, Grant recently returned from giving his Sandy River restoration talk at the newly formed Chinese Center for River Restoration, a presentation he has taken on the road across the US and to Europe.

Internationally, Grant has found that interested audiences are often surprised that we are taking down even fully functional dams in the US, and tend to assume that dam removal is motivated by a high economic value of fishing. Grant believes that the power of the US regulatory structure is what primarily paves the way for river restoration.

Though viewing the project through the lens of a scientist, Grant is quick to note “all restoration occurs within a cultural context.” However, if you have a strong core scientific process, that can translate across cultural lines. ●

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## A Life of Rivers: William Dvorak by Tim Kingston

Water and rivers have always been a part of Wil Dvorak’s life. He was born three blocks from a river in Cedar Rapids, Iowa, and built his first kayak at 13. When not busy at International Rivers putting together the *River Revival Bulletin*, Dvorak can be found camping and kayaking the western states alone, or with his grown daughter. He became interested in conservation and water issues early. “It was irritation, I guess, anger at the pollution of our rivers that set me on course for environmentalism for the rest of my life.”

Dvorak says his work on the *River Revival Bulletin* gives him hope for the future. “I’m the good-news guy most of the time!”



Wil Dvorak, International Rivers’ volunteer extraordinaire

he says with a grin. “Its focus on the positive restoration of water systems around the world is very uplifting and hopeful in a world full of negative environmental news.” He has been working on that good news for six years now, making him a veteran volunteer for International Rivers.

Dvorak is 69 but you would never guess it from his appearance – or activity level. He has the build and bearing of a marathon runner, combined with the weathered appearance of a man who has spent most his life outdoors. Even his unruly mustache and tousled grey hair jammed under a baseball cap looks like it is dying to be outdoors.

Dvorak has been in California since 1965. “I guess my love of clear streams sent me west,” he says. After 30 years as an engineer and surveyor in the San Francisco Bay Area, retirement rolled around. “I had more time to volunteer and my daughter had grown up, so I looked up [International Rivers] and they needed a volunteer and they took me in.”

“I remember a vivid experience near Monterey when I hiked up the Carmel River and came upon the face of a dam. There was a fish ladder and huge steelhead trout going up it, but the fish ladder was poorly constructed and the fish could jump out. They would jump over the side and fall on the rocks below and get stranded. I would put them back in the stream to rescue them,” said Dvorak. “It seemed cruel for humans to deprive the fish of their habitat.”

Dvorak is continuing that rescue mission with his work at International Rivers’ *River Revival Bulletin*, for many more years we hope! ●

# Dam Removal on a Roll in Spain

by Pedro Brufao

In Spain, dam removal is booming. Water oversight committees, municipalities, anglers and environmental groups are pressing for healthier ways to manage rivers.

Almost all of the demolitions in Spain have been small dams, but some larger dams are currently under review, such as Alcalá del Río and Cantillana dams in Seville, which eliminated the sturgeon population in the Guadalquivir River; and the Palombara Dam on the Nansa River, which caused the extinction of local salmon runs. These dams are safety risks as well. So far, no success: they are mammoths, and will not go down easily.

In the past decade, around 50 dams have been torn down in Spain, mainly on northern rivers, for two purposes: to eliminate the risk of floods, and to protect salmon stocks. Water oversight committees are in charge of reforming the water permit process to abide by the EU Water Framework Directive. So far, in the North Basin, more than 6,100 water permits have been cancelled and 38 small dams have been removed. The last dam to be removed was the Presa de Rubeiras on the Eo River, whose Atlantic salmon stock had dwindled to a rate too low to ensure survival. This hydropower dam was bought by the North Basin Water Body and decommissioned this summer.

New demolitions are scheduled in 2009 near the city of Oviedo, to reduce flooding and allow salmon to migrate to spawning areas.

The Bidasoa river system, on the frontier between France and Spain in Basque country, has had five dams demolished for environmental purposes in the past two years. Nearly 500 water permits in this basin have been cancelled to protect salmon and brown trout. This river is blocked a hundred times in 120 kilometers.

Elsewhere, numerous dam removals are planned, including:

- Two dams in the Güeña River in the National Park of “Picos de Europa” will be removed shortly.
- In the South near Seville, the Guadaira River suffers from high levels of pollutants, and reduced flows from 95 dams on its main-

stem; 25 of them will be decommissioned.

- Near Madrid, an abandoned dam was removed in 2007 to restore riparian habitat in the regional park of Manzanares River.

- One more dam will be removed next year to free 40 km of river in Cáceres province and restore trout populations.

- Around 100 new removals are planned by the “Estrategia Nacional de Restauración de Ríos,” passed by the Ministry of the Environment.

We will continue to work to restore even more of Spain’s rivers through dam removal, using the new tools to protect water resources under the EU and nationally. The law is helpful, but the definitive weapons are political and social pressure. It takes a village to protect a river! ●

*The author is the president of Rios Con Vida ([www.riosconvida.es](http://www.riosconvida.es)). Watch a documentary on the effort to restore the Bidasoa River: [www.youtube.com/watch?v=nMkKdQafiOk](http://www.youtube.com/watch?v=nMkKdQafiOk)*



## Restoring US Rivers Step by Step by Susanne Wong

This year alone, 64 dams have been removed or are slated for removal in the US. The removal of these dams will help improve water quality, increase populations of fish and wildlife and improve flood protection and public safety. “It is time to rethink our nation’s water infrastructure. These dam removals are an example of how our communities can reap multiple benefits when we let nature work, and when we let rivers be rivers,” said American Rivers President Rebecca Wodder.

- Eels, darter fish, redfin pickerels and creek chubsuckers have returned to a branch of Connecticut’s Eightmile River since a small dam was removed last year. The dam was built in the early 1900s to power a mill that has long since been shuttered. Observers

have noticed the rapid recovery of riverine plants and animals. “Last year, we counted 40 different plant species here, and now there are 80,” said Adam Whelchel of the Nature Conservancy. “There’s been a doubling of the diversity.”

- The Cahaba River is teeming with life since a dam was removed in October 2004. When dams were built on Alabama’s large rivers, millions of snails and mussels were killed. Biologists recently observed thousands of snails in the river basin.

- The restoration of native fisheries to the Penobscot River is one step closer to reality. Permit applications were recently filed by the Penobscot Project to remove two dams and install a fish passage at another dam. The unlikely coalition of conserva-

tion groups, the dam owner, the Penobscot Indian Nation and government agencies is working to restore 11 species of sea-run fish on a nearly 1,000 mile stretch of river, while also maintaining energy production. The coalition has raised \$25 million to purchase the three dams to allow this innovative restoration work.

“The Penobscot people and the river have shared this place for thousands of years, and the health of our people is directly tied to the health of this river. Opening up this waterway will revitalize a significant part of our culture and bring back health to our sacred river,” said Chief Kirk Francis of the Penobscot Indian Nation. “We are so grateful to all the people who are helping to make this project a reality.”

# Freeing the Rivers: A Life's Calling

## Inspired by Free Rivers: Serena McClain



Serena McClain was tooling along at a public relations agency when one day she realized she just couldn't work in a corporate setting any longer. She had ideals and values that were all being shoved aside in the name of paying clients and billable hours. Now, as an Associate Director of the River Restoration Program in American Rivers' Washington, DC, office, Serena is inspired

daily by the work of her colleagues and the people whose lives they impact. Attending a public meeting where a grandfather gives an impassioned plea to be able to take his grandson fishing much as he used to do is a vast improvement, she says, from lobbying on behalf of insurance companies.

"I was personally inspired by the Rivers for Life gathering in Thailand in 2003, where we listened to personal testimonials from people all over the world fighting dams. Those stories make me question what right I have to ever give up hope," she says.

The majority of Serena's work has been national in scope, focusing more on communicating the broader messages of the dam removal movement, and developing tools that will help communities succeed in their restoration projects.

All told, the picture is positive: dam removal is now a more widely accepted tool in restoring rivers, and states all across the country are removing dams.

**"Standing on the banks of a river as I watch the water pouring through a breached dam inspires me to work so that I can witness that freedom again and again."**

At the individual project level, Serena tries to find out what motivates individuals interested in pursuing a dam removal. By tapping into the passions and drive of that one activist or agency employee or dam owner who wants to make a difference, she finds she can better help them focus their campaign.

"I've learned to accept that there is always going to be someone who disagrees with what I do or a project I'm working on, and the reasoning behind their opposition might defy logic. I have to be okay with that because I'm not going to win over everybody. I am better served focusing on what I can change and how I can help the greater project and community."

Given the current global economic situation, Serena believes it will be increasingly important to build multifaceted campaigns that talk about the multiple benefits of dam removal. Stressing the pressure of aging infrastructure and making a strong economic argument, including project lifecycle estimates, can help make the case for continued river restoration activities, she says.

"Continuing to invest in unsustainable technologies and practices isn't a smart use of limited resources. We should work at making communities more resilient and look to forward-thinking solutions to get them there. In the end, dams will be the solution in very few cases."

## Born to the River: Leaf Hillman Fighting



Leaf Hillman did not choose to get involved and still lives in the ancestral Karuk village hunting, fishing, and gathering the natural bounty. He is the owner of the sacred white deerskin dance. He is an advocate of traditional environmental stewardship.

**"This is why I say my involvement in is something I do, it's the only life I have and time to go home now."**

As a young man, Leaf adopted the dream of his ancestors, their religious practices, and spiritual belief systems. He says that without the genocidal policies of the 1800s, only to have their religious ceremonies removed from their homes and taken to government schools where they were held in spite of these seemingly insurmountable burdens, today you will find Karuk people having restored and revived our ceremonies that were given to us by the ancestors.

"Now, as a result of our hard work, our strong beliefs, and our agreement with Mr. [Warren] Buffett's Klamath River dams, and are offering to assist the ancestors, by reminding myself of what they were able to overcome. That makes me, it actually drives me harder."

Leaf notes that throughout time the Karuk have been known as "fixers" in the conduct of annual world renewal ceremonies.

"We believe that all of the non-human spirit people, the rocks, trees, and man spirit people on this earth. Taking care of the fish is just as natural as taking care of the people."

## Thai Fisher Never Gives Up Hope: Somkiat



"Were there still plenty of fishes in the river to do," says 57-year-old Somkiat Singhakham,

"Por Somkiat" ("Por" means father, a term of respect for the Mun River. A farmer and fisherman, he dedicated his life to the fight against the Dam started in 1992. He said that villagers have been affected villagers have still not been properly compensated.

Por Somkiat is just one of more than 20,000 people who were highly controversial from the start because of its impact on the tributary of the Mekong. Between 1990 and 1992

living along the Mun River. Some, like Por Somkiat, have continued the fight.

He described the various stages of the villagers' fight, starting with the loss of fisheries livelihood, allocation of new farmland, and finally to permanent relocation. Villagers have had incremental victories along the way, but successive governments in 2002, after a long campaign, the government agreed to open the gates to the dam. In recent years it has not complied with this agreement. Nevertheless, the dam's impacts, and the government says it would be difficult to build a new dam.

Por Somkiat earned more than \$440 monthly from Mun River fisheries. It was even enough for daily food. His six children, ages 18 to 35, had only six children. They had no other option but to become laborers in big cities.

**"Everything was so much more plentiful in the past. I caught and sold them for future use. Now it's all gone. Fishes are not even in the river."**

Por Somkiat says he is disappointed over the lack of concrete plans for the dam's removal. He has suffered by the affected villagers.

"This is really a lifetime pain for all of us. We are swallowing our own words. We are saying we will open again." Now that the government is talking about building another hydroelectric dam on the Thai-Lao border, it seems he will never be able to rest in his work to protect the river.



by Elizabeth Brink

## ts for Klamath

ved in the campaign to restore the Klamath River. He was born, raised, of Kotiphiruk on the Klamath. His earliest childhood memories are of county which surrounded him. He is a ceremonial leader and hereditary He is a practitioner of traditional Karuk culture and language, and an ardship and management practices.

**this work was not a choice: fighting for my people and the river ever known. It's not something I can shut off, like it's five o'clock**

ns of his mentors, the restoration and revival of ancient ceremonies, em. He was taught that these are the foundations upon which Karuk from the face of the earth," he says. The Karuk people survived overt and cultural practices outlawed. Then their children were forcibly y were forbidden to speak their language or practice their religion. "In ruk people still practicing their ancient ceremonies and religious rituals, e creator at the beginning of time," says Leaf.

ssive campaigning, people all around the world are aware of the issues ist with this struggle. It is fair to say that I also draw inspiration from my king on the richest man on the planet is not something that intimidates

the world" people, for their ardent and stubborn adherence to the

, air, water, fishes and animals are our close relatives, as are all the hu- to us as taking care of our children and elders, it is our responsibility."

## nkiat Singhakham

r, all my children would have been better educated and had a decent job a veteran of the campaign to remove Pak Mun Dam in Thailand.

of respect in Thailand) has lived most of his life in a village along scribed how things have changed since construction on the Pak Mun ve been fighting for over 15 years for justice, but the majority of the compensated for what they have lost.

00 villagers affected by the Pak Mun Dam. Completed in 1994, the dam se of its impacts on the rich fisheries of the Mun River, the largest 1997, there was intense opposition to the dam by thousands of people struggle even today.

compensation for flooded farmland, followed by compensation for loss ently open the dam gates and restore the Mun River fisheries. The governments have often reneged on their commitments. For example, es of the dam for four months per year to allow for fish migration, but the villagers' struggles have helped widen the understanding of dams' am in Thailand because of the huge opposition to such projects.

es before the dam. He is struggling now on merely \$30 a month – not years of formal schooling. Now that fishing is no longer a possibility,

**lots of fishes. I sold them, exchanged them for food, and fer- n enough for day-to-day eating," he said.**

from the authorities to help heal the economic and emotional setbacks

flesh and blood for a living every day. I hope that this would never hap- dropower project, Ban Kum Dam, on the mainstream of the Mekong on protect rivers. He vows to fight on for the rights of the villagers.

## Following the River of Life: Mark Angelo



Mark Angelo has been an avid paddler and fly fisher for more than four decades. His great affection for rivers and awareness of threats to them began when he was a young boy. During his younger years, Mark lived near the Los Angeles River, which had been fully en- cased in a concrete culvert, and even at an early age he realized this wasn't the way it was supposed to be.

**"I've always believed that rivers are the arteries of our planet. They are lifelines in the truest sense and they have immense value from a natural, cultural and recreational perspective."**

"While virtually everyone who has been active in the field of river conservation has experienced some lost battles, it's those times when a river might be saved or restored, or when you see some tangible signs of progress, that inspires you and keeps you going."

Shortly after university, Mark moved to Vancouver, Canada to become part of the Fish and Wildlife Program at the British Columbia Institute of Technology. He was happy to live in a place with a great river heritage and, ever since, has been an avid river advocate. He also serves as Rivers Chair for the Outdoor Recreation Council of British Columbia, which works to conserve and enhance outdoor settings and resources and to secure public access to them for recreation. Mark worked with both organizations to found BC Rivers Day, which is now World Rivers Day, held annually on the last Sunday in September; it has been celebrated by more than 30 countries since its inception in 2005.

Mark emphasizes the importance of communication in river advocacy. "Once you can demonstrate public support and media interest, the chance of making some real progress is greatly improved," he says.

His hopes for the future run deep. "Having spent some time in the Varanasi, India with one of my river restoration heroes, Dr. Veer Bhadra Mishra, it was wonderful to see the great reverence that locals and pilgrims had for the Ganges River, their country's holiest waterway. Yet, despite this, the Ganges, like so many rivers in different countries, is polluted and remains troubled in many ways. My hope is that we'll see a time when we not only revere rivers – but we also actually treat them in a way that's consistent with that devotion."

# Defending the Danube

by Suzanne Ebert

**C**rossing through ten countries and draining the territory of 19 countries, the Danube is the most international river in the world. In addition to the 83 million people living in the river basin, the Danube is home to globally important species of flora and fauna.

In its 2,780 km course from Germany's Black Forest to its outlet at the Black Sea, the Danube basin supports a diverse system of natural habitats and unique biological diversity. The Danube River Basin has more than 100 different species of fish – including five sturgeon species – and it is home to rare birds like the white pelican, white tailed eagle and black stork.

While large sections of the Upper Danube in Austria and Germany have been regulated, the middle and lower Danube and the Danube Delta feature a highly rich and unique biological diversity that has been lost in most other European river systems. These floodplains provide multiple ecosystem services, such as water purification, nutrient sinks, flood protection, fisheries and tourism.

## The river's history

Over the past 150 years, the Danube has been much abused. Dikes, dams and dredging have straightened large sections of the river. More than 80% of the Danube's wetlands have been lost, and with them the rich diversity of fish and other species on which they depend.

Nearly two decades have passed since the fall of the Iron Curtain. In that time, huge changes have swept the Danube region. The top-down control of Communist regimes has been replaced by a multiplicity of actors in politics, economy, environment and protection of nature. The region is being increasingly integrated into the global economy.

The sudden collapse of Soviet industry and agriculture did the environment a good turn. Pollution suddenly dropped dramatically. Tougher environmental standards and massive investment in sewage and waste treatment became the norm, especially in the EU's newest member states. The International Commission for the Protection of the Danube River (ICPDR) and the EU Water Framework Directive have given the world's most international river a framework for governance and integrated river basin management that has become an example of good practice.

Many former floodplain and wetland areas are being restored, demonstrating benefits not only for fishing, tourism and recreation, but also for flood and water management. In 2006, WWF published a comprehensive study that shows how restoration of wetland areas could significantly contribute to flood mitigation on the Danube.

The Danube has in the past 20 years significantly recovered from decades of abuse. Today, the river is largely swimmable, and many of the worst environmental hot spots have been addressed. But while there have been notable successes for environmental protection, there are also many new and persisting challenges. One of the bigger challenges is reconnecting the Danube up and downstream.

## Plight of the sturgeon

In the Middle Ages, giant Beluga sturgeon the size of a small bus migrated up the Danube as far as Germany. Dams – nearly 60 block the Upper Danube – cut off the sturgeon's migration routes. But the Iron Gates dams on the Danube between Serbia and Romania are the one barrier stopping sturgeon from migrating the 2,000 km from the Black Sea to Slovakia.

WWF is now working with the ICPDR and the governments of Serbia and Romania to examine options for making the dams



Pelicans in the Danube Delta, Romania. Photo: Daniel Petrescu

passable to sturgeon and other species. A Sturgeon Action Plan was adopted by the ICPDR, giving the Danube sturgeon priority for conservation on the river.

A basin-wide approach is vital for the success of any conservation or restoration measures for sturgeon. This includes requirements to re-open sturgeon migration routes by enabling upstream and downstream sturgeon passage at dams and other barriers to sturgeon movements, and at the same time taking measures to maintain or restore their spawning and feeding habitats.

## Unsustainable development

Despite these efforts, significant threats to the sturgeon and the Danube's ecological well-being remain. One of the biggest threats today comes from EU and government plans to dike and dredge the river to allow for ever-larger ships.

As part of the EU's Trans-European Transport Networks, new infrastructure projects are planned that threaten many of the Danube's last free-flowing sections, and hence the most ecologically valuable areas. Important wetlands along 1,000 kilometers of the river could face destruction if these plans are realized.

In December 2007, representatives of Danube governments, the European Commission, navigation lobbies and a small group of Danube advocates, including WWF, agreed to a common vision for environmentally sustainable navigation on the Danube. But the proof will be in the pudding.

The first projects that are now moving forward provide little ground for optimism. A plan by the Romanian government to increase navigation between Calarasi and Braila would unnecessarily cut off the most important migration routes for Danube sturgeon and destroy highly valuable nature areas.

In the meantime, Bavarian plans to build dams on the last free-flowing section of the Danube in Germany between Straubing and Vilshofen suffered a setback in recent months. German Federal Ministers for Transport and Environment have emphasized that only improvement of navigation through river regulation – without construction of dams – is an option.

Closer to being implemented are plans for a section between Vienna and Bratislava flowing through the Danube Floodplain National Park. This project represents a compromise between shipping inter-

*Continued opposite*

# Hope and Renewal in the Iraqi Marshlands

by Berklee Lowrey-Evans

The modern story of the Iraqi Marshlands begins tragically – with intentional environmental destruction used as a political weapon – but today is one of miraculous renewal, international cooperation and hope. Once at the brink of total collapse, the area has been restored to a point where it will soon be proposed as a UN World Heritage Site.

The Iraqi Marshlands, said to be the location of the Garden of Eden, are also home to a 5,000-year-old civilization and rich biodiversity. Located at the confluence of the Tigris and Euphrates rivers in southeastern Iraq, with a small extension into Iran, the wetlands used to cover up to 20,000 square kilometers and supported a population of over 500,000 Ma'dan, or Marsh Arabs.

In the early 1970s, Saddam Hussein began rerouting water from the marshes to agriculture in the north, and by the 1980s was forcibly resettling entire Ma'dan villages. After the 1991 Shi'a insurrection, Saddam persecuted the Ma'dan for allegedly harboring Iranian guerrillas and Shi'a insurgents, eventually killing tens of thousands of people. He also created a diabolically effective water diversion project. Multiple canals, dams, levees, and even a new "river," the Um-Al-Maarik (Mother of All Battles – named for the 1991 Kuwait war) were created to divert water away from the marshes. By the time of the US invasion in 2003, nearly 200,000 people had fled their homes. The marshlands, formerly twice the size of the Everglades, had shrunk to a mere 760 square kilometers.

Even amid the chaos in Iraq after the US invasion, many recognized the importance of restoring this wetland before it was too late. Shortly after Saddam's overthrow in 2003, southern Iraqi farmers began blowing up dams and dikes to let water back in. Azzam and Suzie Alwash, scientists and directors of Nature Iraq, are leading the official

charge for restoration in conjunction with US universities, the US Agency for International Development (USAID), the Italian Ministry of the Environment, and a number of Iraqi ministries.

As of September, 65% of the wetlands have been reflooded, with over half of them revegetated, and some 90,000 Ma'dan have returned. Native macro-invertebrates, fish and birds have also returned to re-flooded areas. The marshes are a key part of the lifecycles of migratory fish and shrimp that move through the Tigris and Euphrates basins; they also serve as an annual resting place for millions of birds migrating between Siberia and Africa. The Iraqi Marshlands are home to the rare Sacred Ibis and the threatened Iraq babbler, which has finally returned after decades.

*Continued on page 15*



Marsh Arabs in the restored wetlands. Photo: Heathcliff O'Malley

## Defending the Danube *continued*

ests and the environment, and includes deepening the river channel as well as directing water to the floodplains of the national park, which have been slowly drying out. WWF and others are concerned about the great depth that is planned for the river channel, which will set a precedent for river regulation further downstream.

The Ukrainian government has started construction on another project of major concern, a navigation canal for large vessels that runs through the heart of the Danube Delta, Europe's largest remaining natural wetland. Despite international protests and the canal being in breach of international conventions for nature conservation, the first phase of the project has already been implemented. If continued, the canal will cause significant damage to the Danube Delta, both in the Ukraine and Romania.

If shipping on the Danube is indeed to be promoted as an environmentally friendly mode of transportation, then there must be a balance between protection and use along the entire stretch of the river. To date, however, there has been no strategic assessment of the impacts of planned projects on the Danube as a whole. Without such an evaluation, sustainable economic development is a farce and the future of the Danube as a living river is in question.

Existing navigation could be significantly increased with "soft" measures such as improved logistics, modernized fleets, and river

information systems for skippers without sacrificing the Danube's most valuable wetlands and benefits.

"National and EU plans threaten to turn the living Danube into a shipping canal," said Dr. Orieta Hulea, head of Freshwater for the WWF Danube-Carpathian Programme. "This is expensive and unnecessary. We need to use proven technology, logistics and innovation to start fitting our ships to the river, not our river to the ships."

The Danube region has developed tremendously over the past two decades – from an environmental perspective, both for better and worse.

The world is heading toward an ecological credit crunch as human demands on the world's natural capital reach nearly a third more than earth can sustain. That is the stark warning in the latest edition of WWF's Living Planet Report.

This is just one of the many reasons we need to seek smart solutions that balance different uses of our rivers while preserving the essential ecosystems on which we all depend. ●

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*The author is the Freshwater Officer with the WWF International Danube-Carpathian Programme.*

# News Briefs

by Susanne Wong



People moved for Inanda Dam already had their lives turned upside-down by resettlement; now they have to contend with mercury poisoning, too. Photo: Liane Greeff

## Mercury rising in South Africa

Communities living around one of South Africa's largest drinking-water reservoirs are suffering from mercury poisoning, according to a recently revealed report. Researchers found evidence that the contamination has spread throughout the food chain.

The government has tried to reassure residents of Durban and those living around Inanda Dam that there is "no reason to panic." Still, a government task force told people not to eat fish or locally grown vegetables as a precaution. Mercury is highly toxic to the human nervous system and can damage the lungs, brain and kidneys. Children are particularly vulnerable.

Researchers from the Medical Research Council made the discovery after analyzing fish, mud and human hair samples from the reservoir area. According to the South African newspaper *The Mercury*, nearly 20% of hair samples from people in Mshazi, Nqetho and Madimeni villages contained mercury levels above the World Health Organization's recommended limit.

When the report was completed nearly a year ago, the researchers said the findings warranted urgent action from authorities. However, the report was not publicized, and officials seem to have taken no remedial action.

Finding the source of the pollution is proving challenging. Possible sources include a chemical plant which stored mercury waste, airborne mercury pollution from coal-fired power plants, and small-scale gold mining.

A more likely explanation lies in the water. Studies have shown that flooding land for dams can release mercury naturally present in soils. In the dark depths of reservoirs where oxygen levels are low, mercury is converted into a more toxic form known as methylmercury. Plankton then take up the contaminants, are consumed by larger and larger fish, and are in turn consumed by humans.

People in the region are organizing themselves to discuss the contamination and pressure the government to take action. At a recent meeting, government officials agreed as a first step to place signs at the dams warning people of the potential danger of eating the fish.

## Judge suspends second Madeira Dam

Brazil's environmental protection agency, Ibama, granted a "preliminary" construction license in mid-November for the Jirau Dam on the Amazon's principal tributary, the Madeira River. Ten days later the license was suspended by a Federal Court judge, who stated that Brazilian law does not allow the granting of a preliminary license. The judge said that construction couldn't start on the project until a final license was issued by Ibama.

The preliminary license gave a consortium led by French energy giant Suez permission to begin construction on the 3,300 MW project, although Ibama wasn't planning to issue the final license for two months. Jirau is the second of two dams being built on the Madeira. Construction on the first, the Santo Antonio Dam, started earlier this year.

Ibama granted the preliminary license despite the fact that the consortium announced after winning the project auction that it was planning to move the dam nine kilometers from the area specified in the original bidding rules.

Although it appears that no additional environmental impact assessments were carried out to determine the impacts of this move, Ibama authorized construction with few contingencies, only requiring some additional environmental analysis prior to construction of the coffer dam. A petition for an injunction was filed by the Brazilian Forum of NGOs and Social Movements for Environment and Development, which requested revocation of the preliminary license granted by Ibama.

Ibama's creation of the phony license is the latest in a series of decisions by the Brazilian government that demonstrates its determination to move forward with large dams in the Amazon Basin at any price. A number of other lawsuits are also working their way through the Brazilian courts challenging the approval of the new dam site, any of which could put further obstacles in front of the project developers.

The Madeira River dams have been the subject of intense controversy in Brazil because they would block the transport of sediment and the passage of fish, and threaten the river's unique biodiversity. The project would affect the land and livelihoods of thousands of river-bank dwellers and indigenous people.

## Brazilian tribes shut down dam site

Members of the Enawene Nawe tribe occupied and shut down the site of a huge hydroelectric dam in October. They argue that plans to build 77 dams on the Juruena River will pollute the water and block fish from reaching their spawning grounds. Fish play an essential role in the rituals and diet of the Enawene Nawe.

The dam is being promoted by the Maggi family, which owns the world's largest soya companies.

"If the fish get sick and die, so will the Enawene Nawe," said one of the tribe's 500 members. The relatively isolated tribe has faced increasing incursions onto their lands. For the past decade, cattle ranchers have invaded and deforested the region, according to Survival International. Invaders have used weapons and violence to intimidate the tribe.

Survival is encouraging people to write to the Brazilian government urging them to stop the dam. More information: [www.survival-international.org](http://www.survival-international.org).

## Guatemalan dam finds no bidders

Cancelled twice before, the proposed 82-meter-high Xalalá Dam proposed for Northern Guatemala found no bidders on its third try in early November.

A number of prominent companies – including US firms AES International and Duke Energy, the Brazilian firm Odebrecht, and others – purchased the project bidding rules, but none offered a proposal for the estimated \$400 million project.

The president of the government's National Institute of Electrification said the lack of interest is due to the global economic crisis. The winning company would have been expected to conduct the feasibility studies, build, operate and maintain the project for 30 years.

Fifteen minutes before closing the bid, an Odebrecht representative came to excuse the company for not presenting an offer. The representative said that the company had identified "high risk" in the project.

The dam would displace more than 2,000 people along 26 miles of the Chixoy River and impact the livelihoods of 8,000 Maya-Qechí farmers. The communities of the Ixcan held a local vote on April 20, 2007 to weigh in on the project, and almost 90% said "no" to the dam. Nevertheless, the government said it does not recognize a municipal referendum as binding in a case that involves national priorities. There might be legal challenges at the constitutional level on recognizing the results of the vote as binding.

## Energy efficiency good for the economy

California residents saved nearly \$56 billion in energy costs between 1972 and 2006 by using energy more efficiently, says a new report. Through a series of innovative mandates and incentive programs, Californians now use 40% less energy per person than the national average, according to a new study by economist David Roland-Holst of UC Berkeley's Center for Energy, Resources and Economic Sustainability.

These savings have translated into a huge economic boost. Since household consumption accounts for 70% of gross state product, the energy savings has freed up billions of dollars that residents have spent on other goods and services. The author estimates that 1.5 million full-time jobs have been created, with a total payroll of \$45 billion.

"By revenue, energy is the world's largest industry, and energy efficiency can become to this sector what IT was to management, biotech to medicine, a way to revolutionize traditional practices and increase real living standards around the world," said Roland-Holst.

This is welcome news to policymakers in California who recently approved the Global Warming Solutions Act, the first law in the nation to limit greenhouse gas emissions. The state air resources board is poised to adopt a draft plan that details how these emissions targets will be reached. Given the current economic crisis, many are concerned about the plan's potential economic impacts.

Roland-Holst estimates that the new state policies will reduce emissions while increasing the gross state product by \$76 billion and create as many as 400,000 new efficiency and climate-related jobs.

"If the country can follow California's example, it will have a dramatic effect on our future emissions and energy independence," he said.

## Green job boom ahead?

Millions of new "green energy" jobs will be created over the coming decades as countries shift to renewable energy development, says a new UN report. The authors estimate that the biofuel industry could increase by over tenfold – from one million jobs now to 12 million by 2030. The solar industry could add 6.3 million jobs by 2030 and the wind industry two million, says the report.

The report, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World," was commissioned by the UN's Environment Programme.

UNEP Director Achim Steiner told the BBC that if the world does not transform to a low-carbon economy, it would "miss a major opportunity for the fast tracking of millions of new jobs." He argued that a continued focus on renewable energy development is crucial to strengthen economies that are currently struggling and heavily reliant on fossil fuels.

If the world waits 10 years to take serious action on greenhouse gases, the costs for moving to a green economy will be much higher, he said.

## Eating wisely

The world can save trillions of gallons of water by simply eating all the food we grow, according to a report from the UN Food and Agriculture Organization, International Water Management Institute and Stockholm Water Management Institute. While enough food is produced around the world to feed the world's population, up to half is wasted, along with the water that went into producing it. In developing countries, food rots or is damaged by pests. In industrialized nations, it is often just thrown away.

The report states that 30% of food is tossed away annually in the US and other industrialized countries. That corresponds to 10.6 trillion gallons of irrigation water, "enough water to meet the household needs of 500 million people." Currently, an estimated one billion people lack access to clean water.

The organizations are calling for cutting food waste by half by 2025. "Unless we change our practices," says the FAO's Pasquale Steduto, "water will be a key constraint to food production in the future."

## Hawaii says aloha to green energy

The state of Hawaii announced a bold agreement to achieve 70% of its energy from clean sources by 2030. Governor Linda Lingle announced the agreement with the state business department, consumer advocates and electric companies in October.

"We don't have years and years anymore to make these changes," said Governor Lingle. "These are not dreams or wishes, these are our specific plans that we hope to achieve." Currently, the state gets 10% of its power from renewable sources.

The plan takes a multi-faceted approach, including a ban on the construction of new coal-fired power plants; a commitment to develop 1,100 MW of renewable energy, including a 400-MW wind plant on Maui; a "feed-in tariff" to encourage renewable energy development; conversion of existing fossil fuel plants to biofuels using locally grown crops, and "demand-management" incentives to encourage customers to use power in off-peak hours.

# In Print

**Two films on dammed rivers, and hopes for restoration, reviewed by Colin Carpenter.**

## **“River of Renewal: A Native Journey”**

Directed by Carlos Bolado;  
Written and produced  
by Stephen Most  
[www.terrapinpictures.com](http://www.terrapinpictures.com)

## **“River Ways”**

Produced, directed, and edited  
by Colin Stryker  
[www.sawgrassproductions.com](http://www.sawgrassproductions.com)

With the 2007 removal of Marmot Dam on the Sandy River, the Pacific Northwest established itself as a leader in the national dam decommissioning movement. Now, two new films bring us up to date with portraits of the Klamath and the Snake, two Northwestern rivers with dams whose futures hang in the balance.

Stephen Most, author of the 2006 book *River Renewal*, offers up a clear and thorough hour-long documentary that illuminates the multifaceted battle for water and livelihoods on the Klamath River in Northern

California. It comes at an opportune moment (see cover story). The film does a commendable job of painting the picture with only lightly biased strokes. In the century-old battle involving Native American communities, commercial fisherman, farmers, and dam-builders, it's clear that the biggest loser has been the river itself.

The film follows Jack Kohler, a self-described “sidewalk Indian” who grew up in the city, unaware of his ancestral culture, as he embarks on a mission to learn more about his roots in the Yurok and Karuk tribes. His journey, like that of his people, is closely interlinked with the salmon that once thrived in the Klamath's waters. Kaleidoscoping between the river's natural beauty, the political firestorm surrounding it, and the heart-breaking human struggles resulting from its damming, Kohler leads us up the river step by step, checking in with all of the players in this fierce environmental drama. It's a compelling tale, made even more poignant by intimate moments

with members of the tribal council, fifth-generation commercial fishermen, and salt-of-the earth farmers upstream – all of whom depend on the Klamath's diminishing flow for survival.

The ongoing debate over dam removal on the Snake closely parallels that of the Klamath (though it lags several years behind in coming to fruition), and Colin Stryker delivers a film of similar perspective in his patient and thoughtful portrait of life along the Snake's course in Eastern Washington. Scarcely taking sides in the controversy, “River Ways” steers refreshingly clear of blame. The film presents a meditation on the slow pace of life along the river, far from the environmentalists and lawyers of Portland, the river's ultimate destination.

The film follows three very human characters, all of whom depend on the river for their livelihood: Frank Sutterliet, a tribal fisherman and member of the Yakama nation, who is barely able to catch enough salmon to get by; Mark Ihander, a commercial fisherman upended by

diminishing fish populations and misguided government regulation, and Ben Barstow, a farmer further upstream whose business requires the much-dammed river to efficiently transport his wheat to the big city.

The filmmaker spends quality time getting to know each of these intriguing men, none of whom claims to have the answer to the big question on the table – should the four lowest Snake River dams be removed in order to revive the salmon and steel-head runs (and hopefully the economy along with them), or should the dams stay?

As in the Klamath story, “River Ways” on the Snake are complex and interdependent. Communities fighting for their survival want to know what's more valuable: human lives or a healthy river full of fish? Hung up on the horns of a dilemma, people in both watersheds continue to search for a viable third option, where everyone wins. While neither of these films offers a solution, they both hint that if we keep looking hard enough, one just may rise to the surface. ●

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## South Asia's Most Costly Dam Gets an Infusion

by Ann-Kathrin Schneider

**P**akistan's National Economic Council has approved US\$1.5 billion toward the construction of the 4,500 MW Diamer-Bhasha Dam on the Indus in the North of the country. With this decision, the government gives the go-ahead for a project with a 200-square-kilometer reservoir and a price tag of \$12.6 billion. The \$1.5 billion is earmarked just for the acquisition of land.

According to Raja Pervez Ashraf, federal minister for water and power, Chinese companies are interested in constructing the project and “some Arab countries” want to form a consortium to help Pakistan build the project. Pakistan has already signed a memorandum of understanding with the China International Water and Electricity Corporation for the construction of Diamer-Bhasha Dam, however, no international financier has officially associated themselves with the most costly project currently planned in South Asia.

In August 2008, a fact finding team of four water activists from Pakistan visited six villages near the dam site to assess the situation on the ground. They found widespread fear among the local people that the project would eat away all fertile land in the area, and that only those paying bribes would be compensated for their losses.

While preparing for the visit, the activists had immense problems accessing information about the planned dam. “Transparency levels are very poor and therefore it is very difficult to get information for educated citizens of the country, and almost impossible for illiterate laymen to access information,” they said.

In the villages around the planned dam site, residents complained that nobody had consulted them on a project that would flood their homes and force them to leave their villages. The only officials who talked to them were there to measure their land to assess compensation, they said.

Land matters greatly in this hilly area: steep slopes and bare mountains leave only small tracts of flat land for people to grow food and graze their animals. With the reservoir flooding 11,400 hectares, 150 hectares needed for workers' colonies and 200 hectares for the construction workshop and equipment, locals doubt whether enough fertile, flat land would be left for them.

The fact finding team reports: “People think they will be having no land to settle and become *Mohajareen* [‘People who migrate’].” ●

# New Independent Review Documents Failure of Narmada Dam

by Peter Bosshard

For decades, the Sardar Sarovar Dam on India's Narmada River has been a powerful symbol of what is going wrong with large dam projects. A new independent review shows that the project's benefits have not been realized, while the social, environmental and financial costs are even more serious than expected.

Dam proponents are promoting Sardar Sarovar as "the lifeline of Gujarat." They say the project will irrigate large swathes of land, generate electricity and provide drinking water to the thirsty cities of this dry state in western India. If completed, the project will displace more than 300,000 people, including many indigenous communities in the Narmada Valley.

The World Bank approved \$450 million in loans for Sardar Sarovar in 1985 even though the project did not comply with the government's conditional environmental clearance. Under strong public pressure, the World Bank withdrew from the Narmada Valley in 1993. India's Supreme Court ordered the project to be suspended in 1995, but later allowed construction to continue under the condition that the displaced people were properly rehabilitated. Even though these conditions have never been met, the dam height has been raised to 122 meters. If the dam is completed, it will reach 139 meters, and flood out thousands more people.

In August, one of India's leading think-tanks, the Tata Institute of Social Sciences (TISS), published a detailed analysis of the costs and benefits of the Sardar Sarovar Project. The conclusions of this independent review are damning:

- The project's irrigation system has never been completed, and the Narmada waters do not reach the intended beneficiaries. Even in the area closest to the river, the distribution channels don't bring water directly to farmland. Instead, farmers are lifting water from the canals with diesel pumps and pipes – something which only rich land owners can afford.

- The project authorities are renegeing on their promise to supply drinking water to Gujarat's population. They have increased industry's share of the water to industry from 0.20 to 1.00 million acre feet (MAF), while drinking water for domestic use has been reduced from 0.86 to 0.06 MAF.

- The project was supposed to generate electricity at a capacity of 1,450 megawatts. In practice, the hydropower plant will only have a capacity of 425 megawatts, and once the irrigation system is fully operational, this capacity will drop to 50 megawatts.

- If the dam is completed, its reservoir will submerge 376 square kilometers of land and displace approximately 240,000 people. The canal network will displace even more people. The Supreme Court decided that the dam oustees need to receive cultivable replacement land and housing plots. The TISS report finds that the state governments have never complied with this binding order, and that the replacement land for the oustees is not available.

- India's Environmental Ministry ordered that the reservoir's catchment area needed to be treated in order to prevent soil erosion. In addition, the forest land which was going to be submerged needed to be replaced. None of this has happened. The TISS team found that 86% of the area which was supposedly afforested had "little or no tree cover."

- Even though the dam and irrigation network have not been completed, affected people have not been rehabilitated and environmental mitigation measures have not been carried out, the project costs have gone through the roof. The original project cost in 1986 was 64 billion rupees (or slightly more than US\$1 billion). In the meantime, the cost has skyrocketed to 457 billion rupees

(more than \$9 billion), and is expected to reach 700 billion rupees by 2012.

The TISS report finds that keeping the dam height at 122 meters would only marginally affect power generation, and "would have no effect whatsoever in realizing the targets on irrigation and drinking water." At the same time, not raising the dam height would save approximately 150,000 people from being displaced.

The independent review concludes as follows: "It is strongly recommended that the dam height at 121.92 m should not be raised further ... at least until the past obligations are fulfilled, the benefits of 121.92 m are completely realized, and an honest comparative analysis of future costs and benefits is carried out. Such a decision would also ensure that concerns on social and ecological impacts are addressed, responsibility for non-compliance is fixed, and violators are penalized."

The World Bank kick-started the Sardar Sarovar Project at a time when India's Environmental Ministry was still warning against it. Thousands of poor farmers still pay the price for this decision. The World Bank should publicly support the recommendations of the TISS review. And it should not approve any further support for hydropower and irrigation projects in India as long as the problems of the Sardar Sarovar Dam have not been resolved. ●

## Iraqi Marshland *continued*

Although USAID's Iraqi Marshlands Restoration Program was phased out at the end of 2006, it still supports marshland restoration as part of a three-year agribusiness program in Iraq. The other organizations are still hard at work, aiming for the creation of the Mesopotamian Marshlands National Park. If approved, the Marshlands of Mesopotamia could become a World Heritage Site in 2011. The park will work to protect the environment, promote socio-economic development, protect and re-introduce endangered species, preserve cultural heritage, and establish ecological corridors.

Local indigenous knowledge of how to live sustainably in this unique ecosystem still exists. The marshlands have never been pristine; they have been abundantly occupied and well-tended. The new national park proposes to restore them to this state, integrating nature and culture in a seamless balance.

"We can't live without the marshes or without the water. We belong to this. So you can imagine our feelings when the water came back," said a Marsh Arab who was forced into exile and returned when the water was let back in.

While there is much hope for the future of the Iraqi Marshlands, they are still in danger from proposed development projects. It has been estimated that three billion cubic meters of water are needed to restore the marshes entirely, yet this much water doesn't exist in the whole of Iraq. Making matters worse, over 30 dams have been built or proposed for the Tigris and Euphrates rivers since the 1990s. It has been estimated that Turkey's Southeast Anatolia project alone will cut Iraq's current water resources by half. There are also a growing number of irrigation projects upstream in Syria and Turkey that will divert much-needed water away from Iraq and its marshlands. So while much progress is being made, serious international water rights issues still pose a threat to this important and unique ecosystem. ●

# Everglades Restoration Plan: Ambitious and Slow

by Stacy Lee

**P**rogress in restoring Florida's Everglades, said to be the largest ecosystem restoration project in history, may be held back for another decade by numerous budget and procedural problems. Since the approval of the Comprehensive Everglades Restoration Plan (CERP) by Congress in 2000, not one of the 60 proposed components of the plan has been completed, bringing serious concern for the continued loss of endangered ecosystems and dwindling public support.

"The process is a mess," says Sara Fain, National Co-Chair of the Everglades Coalition. "All the regulations governing CERP projects need to be re-evaluated given what we've learned over the past eight years... We've recognized that ecosystem restoration doesn't neatly fit into a box made for planning a civil works or flood protection project."

Nicknamed the "River of Grass," the Everglades is the largest subtropical wilderness remaining in the US and a World Heritage Site. In the late 1880s, efforts to drain the land for development set the marsh off on a slow decline. The marsh supports at least 68 species listed as threatened or endangered, with some remaining only inside the national park. Almost three million acres of these iconic wetlands have been drained, threatening a \$20 billion tourism industry, more than 365,000 jobs, and the only source of safe clean drinking water for South Florida, according to the Everglades Trust.

The Everglades plan has been burdened by approval processes at both state and federal levels, meeting success only recently. In 2007, Congress finally passed legislation authorizing three projects to go through. Of these, the closest to fruition is a project to re-

store the wetlands in Indian River Lagoon (estimated to cost \$1.2 billion). Picayune Strand, a scam housing development that largely failed in the 1960s, will have its canals and roads removed to restore water flow across the tract. A recent proposal by the state to purchase 187,000 acres of land from the US Sugar Corp. will also allow storage of water over large areas of land.

Funding remains a key obstacle. In November, the U.S. Sugar Corp. deal was modified to 181,000 acres, reducing the price tag by about \$4 million. Even so, the cost of the full restoration plan remains projected at \$10-12 billion, and is expected to grow with more delays.

"Unfortunately, the Everglades have not been a priority to the Bush administration or to the previous governor of Florida, Jeb Bush," says Fain. "But the current governor, Charlie Crist, is making efforts. The state has repeatedly put money forward to start the projects, but the federal government has to do its part."

A key step is to revise the federal approval process to multiyear budgets to release more funding, and also review multiple projects at once. "A project-by-project analysis is fundamentally flawed. We need to do this comprehensively because each of the projects alone does not restore the Everglades, and has difficulty standing alone in its individual benefit to the ecosystem."

If such changes occur, CERP will have numerous implications, not only for Florida. "We know that there are people throughout the world watching us," says Fain. "At the same time, we don't know all the answers and may make some missteps along the way. It will be difficult, but not insurmountable." ●



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