# River Crossings

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## Solving the Asian Carp Problem

*Heartland Processing* in Havana, IL is developing a new, innovative way of dealing with Asian carp. At a new plant, located on the banks of the Illinois River, they will use the *Agricultural By-Product Value Recovery System* (ABVRS), developed by Auburn University, to render the carp into fish oil and fishmeal without producing any waste water or foul odors. "It's much more energy efficient than the 4,000-year-old rendering process. It's neighbor friendly and environmentally friendly," said Dr. John Holden, a Rockford reproductive endocrinologist and environmentalist who heads the operation.

When Holden, who hails from Michigan, learned that Asian carp could eventually find their way into his beloved Great Lakes, he and his business partner, Dr. Timothy Leeds, an Iowa-based obstetrician, set out to do something about it. One of the first things they learned was that the carp have little commercial value, so no one has bothered to do much with them. But in their research, they also found that Asian carp are an extremely oily species, which means that they contain a lot of Omega-3 fatty acid — a very hot commodity these days, as the oil is believed to reduce the risk of coronary heart disease and to have anti-cancer effects. But when they *Googled* 'fish rendering for fish oil' they found out that it is a dirty, smelly process that no one wants in their backyard.

Then they came across Auburn's environmentally safe rendering technology that had been developed years ago to deal with catfish offal but had been "mothballed" due to lack of funding. So Holden contacted Auburn and had them build him a pilot machine. Then he had them put some Asian carp through it, and send the resulting product to a lab in New Jersey. "We were looking for heavy metals, pollutants, etc., things that would downgrade the quality," Holden said. But the stuff that came out was pristine. "It's worth its weight in gold," he said.

***Heartland Processing's ABVRS Machine - Heartland Processing Photo***

Auburn's ABVRS uses flash desiccation to remove 90% of the water content, venting an emission that is virtually odorless and harmless. "The whole fish is put in, steamed off and then the fishmeal and fish oil are separated," Holden said. The machine essentially heats the fish until excess water turns to steam and within 45 seconds the end product is a material that looks like sawdust. The resulting high quality fishmeal (69% protein + 14% oil) is then pressed to extract approximately one half of the fat from the meal. This meal (36% of the starting weight of the fish) and oil (another 4%) constitute the sellable finished products. "There's no stink, and no water, because it is instantly vaporized," Holden said. "What comes out is actually a pasteurized product."

Holden said the fishmeal will be marketed to animal feed producers, while the Omega-3 oil will be sold to pharmaceutical interests. Already, *Heartland* is reportedly developing contracts with *Purina*, *Carnation* and *ADM*. Holden has also signed a contract with

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Auburn to build five plants over the next five years. "The plants will be located in the Mississippi River Basin, and in economically depressed areas with the greatest fish populations," he said. "I'm not interested in taking government money or taking handouts. I just care about myself and my investors," he said. "This is something my friends and I decided to do. There's been a whole lot of, hand wrangling, but it came down to who is going to do it. We're environmentalists, and that's what motivates us. The fact it'll be profitable, that's good for the community," he said.

Holden hopes to put money into the pockets of those who need it. "While the Havana plant will employ about a dozen people, the bigger plants will have three to four times that — and that's just people processing the product," he said. "We're going to need a lot of fishermen to supply us with a great amount of fish." In fact, an official at Schafer's fish market (Thompson, IL) told *River Crossings* that he thinks Asian carp are the "fish of the future." He said numerous families are already being supported by the species.

*Heartland's* business model differs significantly from that of conventional fish markets who are paying $0.10 to $0.20/lb. for Asian carp and selling the product as fish fillets, steaks, dressed and boned fish. Dr. Leeds told *River Crossings* that *Heartland* doesn't plan on paying anything for the carp they render. Instead they have requested a government subsidy to be used as payments to fishermen.

*Heartland* considers themselves environmentalists and hopes to help eliminate the Asian carp or to at least knock them back from their current position of dominating the fishery to just another species in the system. *Heartland's* goal is thus to create a nonsustainable industry, Leeds said. "We hope to survive on a $0.10/lb. profit from our fishmeal and fish oil business, and to break even in four years," he said.

Leeds said that beginning in July *Heartland's* Havana demo plant will handle 0.5 ton of Asian carp per hour, but their plans call for reaching a capacity of 2.5 tons/hour. In five years, he said, they hope to be processing 800 million tons of Asian carp. He said the ABVRS is very mobile and can be transported on a flatbed truck. *River Crossings* asked him if they had considered placing one of their machines on a barge to create a mobile operation that could bring the ABVRS to the fish and thereby eliminate some of the transportation and handling costs. Leeds said they really hadn't thought of that, but it seems like a good idea. It may, however, not fit entirely in with their plans of placing plants in economically depressed areas, he said. But under such a mobile operation employees could still come from economically depressed areas, and most small river towns, would likely benefit significantly from periodically docking such a mobile facility in their communities.

The ABVRS unit can also be transported and set up to assist the USDA in on-site processing of viral aviary disease outbreaks, Leeds said. Whole birds, including feathers and infected litter, could be processed. "In fact we may shut down our carp operation and move during a disease outbreak to assist the USDA and then return to deal with carp when the outbreak is over," he said. The ABVRS' high heat kills the virus, and the resulting meal can be used as a fuel source for the ABVRS burner. Biomass is reduced to <10% safely and is disposed in a landfill as sterile ash.

"*Heartland Processing* will be the core of a nationwide rendering operation," Holden said. "This is a $160-billion-a-year industry, dominated by a company that cares nothing for the environment or for the public. But no one could get rid of them because they were the only choice. Not anymore," he said.

Sources: Lisa Coon, *Peoria Journal Star*, 2/21/09; Tara Mattimoe, *Pekin Daily Times*, 4/20/09; and http://heartlandprocessing.com/solutions.php

## New Chicago ANS Barrier Activated

The U.S. Army Corps of Engineers (Corps) activated the new electric barrier, known as Barrier IIA, in the Chicago Sanitary and Ship Canal (CSSC) near Lockport, IL in early April. The Corps has been operating a similar demonstration barrier in the CSSC since 2002. Both Barrier IIA and the demonstration barrier will now operate at the same time to provide redundant back up. Both will operate at a field strength of one-volt per inch. The purpose of the barriers

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is to block the passage of aquatic nuisance species between the Great Lakes and Mississippi River basins. Currently, the greatest concern is preventing Asian carp from moving upstream into the Great Lakes.

Chicago District Commander, Col. Vincent V. Quarles, hailed activation of Barrier IIA as a significant step forward in halting the spread of invasive species via the CSSC. However, he cautioned that much more work remains to be done. "The barriers are not a panacea," Quarles said. "They serve to plug the biggest hole, but much more work needs to be done and we all need to start looking at options for blocking other pathways."

Activation of Barrier IIA was delayed because of significant corrosion observed on piping in the barrier's cooling system in January. The corrosion had not yet led to leaks in the pipes, but left unaddressed the corrosion could eventually lead to leaks that could damage electronic equipment, resulting in significant system downtime and costly repairs. The Corps analyzed the corroding piping and determined the corrosion was primarily due to high concentrations of chlorides in the canal water used in the cooling system. The corroded piping was then removed and replaced with a higher grade of stainless steel piping that is better able to resist chloride-induced corrosion.

Although Barrier IIA was designed to be able to operate at levels higher than one-volt per inch, the barrier has not yet undergone safety testing at those levels. Larger fish are repelled by an electric field operating at a maximum in-water field strength of 1 volt/inch, but higher voltages may be required to deter fish smaller than 5 inches in length. So the Corps will now complete research to expand on previous studies and identify the barrier operating voltage that best repels all sizes of fish. This research has been planned in consultation with others including the U.S. Fish and Wildlife Service, U.S. Coast Guard, Illinois Natural History Survey, and Wisconsin Sea Grant. Initial results of the laboratory and field studies are expected by Fall 2009, although the research will likely continue into 2010.

The Corps also plans to complete additional field safety tests with Barrier IIA operating at higher voltages. These tests will be similar to tests already completed at the 1 volt/inch level. They will likely take place by early Summer after the barrier has been operated for an extended period of time. Corps officials will be working with the U.S. Coast Guard and marine industry waterway users to complete these tests.

In the interim, Col. Quarles said the Corps and the Coast Guard are developing potential options for operating at higher voltages if juvenile carp are detected in the barrier area. The Coast Guard has established a regulated navigation area and safety zone in the CSSC around the navigable waters located adjacent to and over the barrier system. The temporary interim rule places navigational and operational restrictions on all vessels transiting those navigable waters, including the requirement for all commercial red flag vessels to be escorted through the area by Corps-provided bow boats. All boaters are reminded to exercise extreme caution while traveling in the CSSC from the *Midwest* generation power plant to the pipeline arch, an approximately 1400-foot section of the canal from river mile 296.1 to 296.7. While traveling through the area boaters are advised to remain seated, stay out of the water, keep hands and feet out of the water, and closely supervise children and pets or send them below deck. Boaters are also advised not to linger or attempt to moor in the restricted area.

Design of Barrier IIB (a duplicate of Barrier IIA) is ongoing. Results from the higher voltage safety testing and optimal voltage research will be considered in the IIB design. The Corps plans to stage the construction in phases with initial site preparation and construction beginning this Summer.

In cooperation with a variety of state and federal agencies, an enhanced Asian carp monitoring plan was scheduled for completion by the end of April, and monitoring efforts for 2009 have already begun. New monitoring activities and techniques will be implemented throughout the summer as additional equipment is acquired.

There is also concern that the neighboring Des Plaines River and Illinois and Michigan Canal may develop hydraulic connections with the CSSC during high water events that could allow fish in those waterways to move into the Canal bypassing the barrier system. Consequently, the Corps has begun a hydrologic study to identify the frequency and level of flooding that would allow such bypassing. It will continue into 2010.

The FY09 Omnibus Appropriations bill signed in March 2009 includes $6.25 million in appropriations for the barrier system. The Corps will use these funds to complete the studies and monitoring described above. The bill also appropriated $287,000 for a feasibility study of the range of options and technologies available to prevent the spread of aquatic nuisance species between the Great Lakes and Mississippi River basins through the CSSC and other aquatic pathways. That study is a separate project from the barrier system project. The Corps will begin the inter-basin feasibility study once funds are received.

Sources: U.S. Army, Corps of Engineers, *Chicago District News Release*, and Chicago Sanitary and Ship Canal Dispersal Barrier System March 24, 2009 *Status Update*, Contact Lynne Whelan, (312) 846-5330 or Chuck Shea, (312) 846-5568

## Arkansas Snakehead Eradication

Arkansas' Northern Snakehead Eradication Project conducted in late March involved over 130 personnel from the Arkansas Game and Fish Commission (AGFC), U.S. Fish & Wildlife Service (FWS), Tennessee Wildlife Resources Agency (TWRA), National Park Service, Tennessee Tech University, and University of Central Arkansas. Over 39 miles of the main stem of Piney Creek, 2800 acres of backwaters and 400 miles of ditches were treated with 3,000 gallons of liquid rotenone and approximately 15,000 lbs. of cube-powder rotenone. Indiana's Division of Fish and Wildlife contributed liquid rotenone and antimycin to the project. Final cost of the project was estimated at between $750,000 and $1 million.

The rotenone was applied from the ground by amphibious vehicle and from the air by helicopter. Rotenone is made from the powdered roots of certain South American plants and has been used there for centuries to kill fish for human use. Over 800 dead adult and juvenile northern snakeheads were recovered after the eradication effort by the University of Central Arkansas, which was contracted to evaluate the impact of northern snakeheads on the Piney Creek fish community.

"A lot of people are watching us," said Mike Armstrong, Chief of Fisheries for the AGFC and one of the lead planners of the snakehead eradication program. "They're concerned about this thing eventually breaking out, getting into the Mississippi River and eventually populating the Mississippi River Basin. The fish is extremely hardy and adaptable. It can withstand the environmental conditions of the entire Mississippi River drainage, all the way up to Wisconsin and Iowa," Armstong said. "This is big news in the conservation area because nobody's

attempted an eradication of this scale or complexity on an invasive species," he said. Armstrong said the largest snakehead recovered weighed about 8 pounds. But he said, "We saw quite a few juveniles that were spawned last year; in fact, more than what we'd like to see. The flooding last year triggered a good spawn and they were probably about ready to expand their presence in that drainage with all those juveniles." Because of the terrain and difficulty in recovery, only a portion of the total kill, which should easily number in the thousands, was likely recovered, he said.

The treatment area was divided into three zones each containing 60 miles of ditches and about 300-500 acres of creek. The air and ground crews had to work in concert to prevent snakeheads from escaping. Armstrong said no landowners complained, and only three people sustained minor injuries. The problem is geography, he said. The watershed surrounding Big Piney may appear flat and relatively simple from a map, but driving over the gravel roads or along nearby Interstate 40 reveals just how much water there is to cover: creeks, small lakes and swamps in addition to roadside ditches, culverts, flooded farmland and acre after acre of mud.

Adding to the problem, snakeheads can thrive in notoriously little water, meaning they can survive in just a few inches of brown, muddy scum. That's what makes the Arkansas snakehead eradication project one of the most complex and ambitious that organizers say they have ever seen. Bobby Wilson, TWRA Assist. Chief of Fisheries said snakeheads often leave a body of water if it becomes too shallow or the food supply has run low. Northern snakeheads are capable of breathing air and living on land for up to three days. They use an air bladder that is like a primitive lung not found in most fish. They have voracious appetites, feed mostly on fish, including their own young, but also can wipe out frogs and other marine life in a lake or pond. No doubt, they would feed heavily on native fish like crappie and bluegill.

The northern snakehead arrived in Arkansas in 2001-2002. The snakehead invasion is thought to be the result of escapees from a fish farm near U.S. Highway 79 south of Brinkley. Some years ago the fish farm raised snakeheads in response to requests from suppliers to the Asian food markets where the fish are considered a delicacy. The fish farm disposed of its snakeheads in 2001 just before Arkansas, along with the rest of the nation, banned the species. Then about a year ago, a neighboring farmer in the watershed, Russell Bonner, found a strange fish wiggling across a road on his farm. He took it to AGFC fisheries personnel, who identified it as a snakehead. More snakeheads were then found in a ditch on the Bonner farm, and others were found in streams and ditches to the north leading to the need for eradication.

Even though the Arkansas' snakehead eradication project was considered successful, Armstrong said, "We'll be lucky if we got them all, but we knew that going in because of the complexity of the habitat. If we could knock them back and keep them contained where they don't get into the White River, then it will be a success. It's not present-day fishermen we're doing this for, but for the guys 20 years from now who will have to deal with them if we don't get them contained." Dennis Sharp, manager of the White River National Wildlife Refuge said, "We're hopeful we can keep the fish from reaching the refuge. We certainly do not want to see them established here. This opens the door to the whole lower Mississippi Valley."

***Northern snakehead (top) and bowfin (bottom) - USGS and USFWS Photos***

So now the wait begins. Arkansas fisheries biologists will keep looking for the snakeheads, both inside the watershed and further downriver, long after the current eradication program ends. They'll know they've done their job, Armstrong said, as long as they never find that first snakehead, alive and wriggling. AGFC officials will also soon begin restocking the watershed with native fish species that were also killed by the rotenone.

But John Odenkirk of the Virginia Department of Game and Inland Fisheries who has dealt with the snakehead in his state is skeptical. He said that once the snakeheads show up, they're there for good. "Even if we tried to mobilize and do everything known to science and fisheries to remove these things, we wouldn't come close," he said.

Sources: Bryan Hendricks, *Arkansas Democrat-Gazette*, 4/12/09; and Bryan Brasher, *Memphis Commercial Appeal*, 4/5/09; Mike Organ, *The Tennesseean*, 4/2/09; Joe Mosby *Arkansas News Bureau*, 3/28/09; Gene Mueller, *Inside Outside*, 4/1/09; Jake Bleed, *Special to ESPNOutdoors.com*, 3/24/09; and Scott Noll, *WREG-TV*, 3/20/09

## Snakehead Humor

Despite the seriousness of Arkansas' snakehead invasion, we humans always seem to find a lighter side to any situation, and Bryan Hendricks of the *Arkansas Democrat-Gazette* seems to have found one for his state's snakehead problem. We found his article entitled "*Snakehead Eradication Robs Town of Opportunity*" on the internet at http://www2.arkansasonline.com/news/2009/apr/19/arkansas-sportsman-snakehead-eradication--20090419/ and thought you might enjoy reading it as we did. It reads as follows:

"The recent extermination of a vibrant northern snakehead community near Brinkley has left me with a profound sense of loss.

'The slaughter reflected a loss of innocence, and a betrayal of the ideals upon which this great nation of ours was founded. When it was over, the masses of dead, bloated snakeheads filling the ditches and backwaters of eastern Arkansas made me wonder about the future of our grand republic.

'For those who haven't heard, the Arkansas Game and Fish Commission recently spent about a week and nearly three quarters of a million dollars eradicating a community of snakeheads from their enclave in the Piney Creek watershed near Brinkley. The area covered nearly 60,000 acres and included Piney Creek, its maze of backwaters, willow brakes, cypress brakes and drainage ditches. The AGFC attacked these areas with a two-pronged, coordinated assault between its infantry and air corps, applying thousands of gallons of rotenone to root thousands of undocumented, exotic "rough" fish from their hiding places in the swamp.

'Native to Asia, the snakehead's only crime was to yearn for a better life here in America, where clean water and food are plentiful. Besides, they filled a biological niche that native fish were no longer willing to fill because of low pay and unsafe, unsanitary swimming conditions. Sure, the neighborhoods aren't as ritzy as those on the Buffalo River or Lake Ouachita, but the snakeheads added a needed touch of biodiversity to an

otherwise stagnant, even decaying, environment.

'Those who knew them say the snakeheads were some of the most industrious, hardest-working fish they ever met. Some also say they were delicious, much more so than their distant cousins, the bowfins, which, coincidentally, endure their own indignities in the form of slurs such as "cypress trout" and the spiteful and demeaning "choupique."

'It is true that leaders of the snakehead community expressed a desire to someday migrate into the White River watershed, where the full promise and potential of the American Dream awaited. That proved too much for the AGFC, which quickly deployed its armed forces to squash this exodus before it mobilized.

'Naturally, there was plenty of collateral damage from this campaign. In addition to killing snakeheads, the AGFC killed everything else in those waters, including bream, bass and crappie. The agency promised to restore those native communities, but it dismissed pleas from various snakehead advocacy groups to grant clemency to the few snakeheads that might have escaped the maelstrom. In fact, the AGFC has identified these organizations as "extremist" groups and reported them to the Department of Homeland Security.

'Several fish welfare groups protested the AGFC's campaign, demanding to know why some exotics, like trout and stripers, are welcome in Arkansas while snakeheads are so conspicuously unwelcome. Trout are among the so-called "beautiful fish" and have found sympathetic patrons among the state's fishing elite, and also among the Hollywood illuminati, most notably Brad Pitt and Robert Redford. They write books and make movies about trout, and their smiling faces adorn billboards all over northern Arkansas. Anglers even have to buy an extra license to fish for them.

'The snakehead, in comparison, is an ugly fish with an ugly name and an ugly attitude that inhabits muddy, mosquito-infested water in the shadow of Tommy Robinson's liquor store.

'To his credit, AGFC commissioner Ron Pierce made an impassioned plea on behalf of the snakeheads at the AGFC's last meeting. He tried to impress upon his colleagues that snakeheads have become respected members of their communities in the Potomac River, and that they actually anchor a very popular sport fishery there. "People actually take guided fishing trips to catch them," Pierce said.

'Unmoved, the rest of the commission shouted him down and pelted him with trail mix. Commissioner Ron Duncan of Springdale started to voice support for Pierce's appeal, but thought better of it.

'Mike Armstrong, the AGFC's fisheries chief, brought an ice chest full of dead snakeheads to show the commission. He offered a strapping 3-pounder to Pierce and said it would "fry up good" if he just wanted some fish to eat.

'So now, in the aftermath of the AGFC's eradication campaign, the ditches where snakeheads used to play are quiet and barren. Sadly, the snakehead seems to have gone the way of the ivorybill woodpecker, just as Brinkley was on the eve of launching a marketing campaign proclaiming itself "Snakehead Capital of the South."

'So now, amid the ruins of its latest dream, that eternally optimistic Delta town remains unbowed and unbroken. It looks to the horizon, patiently awaiting the next big thing."

Thanks Bryan for helping us see the lighter side — we needed a good laugh!

Source: Bryan Hendricks, *Arkansas Online* in association with the *Arkansas Democrat-Gazette*, 4/19/09

## Tilapia Problem in Louisiana

Biologists in Louisiana recently discovered their own invasive fish problem. Tilapia were found in waters around Port Sulphur, near the Mississippi River in a series of drainage canals and ditches on the west bank of Plaquemines Parish from the community of Diamond south through Port Sulphur. The waterways are between the Mississippi River levee on the east and the hurricane protection levee, known as the back levee, on the west, which protects communities from Barataria Bay.

The sight of tilapia in the wild sent Louisiana Department of Wildlife and Fisheries (LDWF) officials into crisis mode, and biologists familiar with the species said eradicating the tilapia in that closed system with heavy applications of the fish toxicant rotenone seems possible. So as in Arkansas (see previous article on snakehead), teams of biologist and fisheries workers now plan to use rotenone to eradicate everything swimming in those waters in the hope of killing what may be hundreds of thousands of tilapia, a native of Africa that could devastate native species important to recreational and commercial fisheries.

Tilapia have the ability to rapidly reproduce, crowding out native species and disrupting the food chain for other animals, biologists said. "Tilapia are fine in a controlled environment like aquaculture, but they can overtake all native species in the wild, and that's exactly what's happening down there" in Port Sulphur, LDWF Secretary Robert Barham said. Using emergency authority, Barham in early May closed the area to commercial and recreational fishing until further notice.

***Nile tilapia, native to Africa, has been found in the Chicago Sanitary and Ship Canal and other northern locations - USGS Photo.***

But some tilapia were also collected on the marsh side of the back levee, meaning they had access to the vast, open tidal system, which could make containment almost impossible. Biologists said they hope the tilapia on the marsh side are close to the levee, where they can find the fresher water they prefer. "Most of those fish on the marsh side were clustered around the rocks at the pumping stations, because we don't think they can handle the salinities in the marsh right now," Barham said.

Most tilapia species have a rounded bullet shape reminiscent of sunfish or bass and can grow to 18 inches and 3 to 4 pounds on a diet of grasses, plankton and invertebrates. The fish can thrive in fresh and salt water, and also in low dissolved oxygen waters. The one enemy of most tilapia species is cold weather; they typically die in water temperatures below 50 degrees. So unlike with the snakehead, states in the northern portions of the Mississippi River Basin should be safe from invasion by most tilapia species.

It is thought that tilapia were first introduced

into North America for use in aquaculture operations, which valued the fish for its white, mild-tasting flesh and its great adaptability. Louisiana law prohibits possession of tilapia except by licensed aquaculture operations. But no such operations occur in Plaquemines Parish. "They are only allowed to use certain species (of tilapia) and only in closed systems," LDWF biologist Mark McElroy said. "All movements of the fish off the property must be permitted by this agency."

Tilapia now thrive in California, Florida and Texas. Florida has been dealing with tilapia in the wild for at least 35 years, said Paul Schafland, director of the *Non-Native Fish Laboratory* at the Florida Fish and Wildlife Conservation Commission. He said history has taught the Florida agency to manage the populations, rather than eliminate them. "Non-native species are bad. You never want them, because they can impact native species. They can spread disease. They can change the energy in the entire aquatic system," he said. "But having said that, our experience has been there is no way to get rid of them entirely once they are here. We try to manage their presence, because that's really all we can do."

McElroy said the LDWF will continue to sample the waters on the marsh side of the back levee where escape into the open tidal marsh could present uncontrollable problems. The department is also waiting for results from Louisiana State University labs to determine the exact species that has infested the Plaquemines Parish waterways. "Tilapia readily hybridize, and finding out exactly what we're dealing with will help us plan a course of action," McElroy said.

Sources: Bob Marshall, *New Orleans Times-Picayune*, 5/7/09; and *Greenwire*, 5/8/09

## Spawning of Hatchery Propagated Pallid Sturgeon in the MO River

U.S. Geological Survey (USGS) scientists confirmed spawning of a female pallid sturgeon over the weekend of April 25-26, 2009. The event serves to corroborate 2008 documentation of spawning of hatchery-origin pallid sturgeon in the Lower Missouri River, and to increase understanding of habitat conditions selected for spawning.

This fish was captured on April 18, at river mile 180, and measured 985 mm (38.78 in) fork length and weighed 4,345 g (9.58 lb). Based on the presence of a coded wire tag, it is known to be a hatchery-propagated fish, probably from the 1992 or 1997 year class. Reproductive assessment of the fish when it was implanted with a radio tag indicated that spawning was imminent (i.e., egg polarization index was less than 0.06).

The fish was tracked approximately 26 miles upstream to an outside, revetted bend at river miles 206.1-206.5. Water temperature was approximately 17 °C, and water flow was steady to slowly falling at 55,000 cubic feet per second. The fish moved over short distances along the bend, appearing to show a preference for some of the deepest, most turbulent flow. It stayed at that location for approximately 24 hours and began moving downstream at mid-day on April 26.

***Pallid sturgeon - Steve Krentz, USFWS Photo***

The fish was recaptured late that afternoon, evaluated with endoscopy and ultrasound, and documented to have completed spawning. Its weight had decreased by 22.2% to 3,380 g (7.45 lbs.) during spawning and egg deposition. This is approximately equivalent to 35,000 eggs. A few remaining eggs found in its oviducts were sampled and preserved, and blood was sampled for hormonal analyses.

Fish behavior during spawning was documented using an acoustic camera (DIDSON), and the data show that multiple sturgeon were present at the spawning site. USGS crews thoroughly documented habitat at the site using acoustic Doppler current profiling, multibeam echosounding, and side-scan sonar. USGS and Nebraska Game and Parks Commission crews are continuing to track seven other reproductive sturgeon this spring, including six males and one additional female.

The USGS has also been assessing the sensitivity of habitat availability in the Lower Missouri River to discharge variation, with emphasis on habitats that might support pallid sturgeon spawning. Copies of their report and hydrodynamics model can be found online at: http://pubs.usgs.gov/sir/2009/5058/.

Source: Robert B. Jacobson, Ph.D., Research Hydrologist, US Geological Survey – CERC 4200 New Haven Road, Columbia, MO 65201, (573) 876-1844, rjacobson@usgs.gov

## Hatchery Fish Stocking Doesn't Equal Recovery

A federal appeals court in mid March upheld the federal government's discretion to use salmon raised in hatcheries to bolster wild runs, but not as a substitute that would lift Endangered Species Act (ESA) protections. The ruling by a three-judge panel of the 9th U.S. Circuit Court of Appeals in San Francisco included the last of a series of lawsuits on behalf of a coalition of builders, farmers and property rights advocates to remove restrictions on development and agriculture that protect salmon.

"We are satisfied that the Hatchery Listing Policy is consistent with both the plain language of the (ESA) and with the statutory goal of preserving natural populations," Judge Diarmuid F. O'Scannlain wrote in the opinion. "We are also convinced the decision was based on the best scientific evidence available." The high water mark for the *Pacific Legal Foundation* (PLF), a property rights public interest law firm representing the coalition, had been a 2001 ruling by U.S. District Judge Michael Hogan in Eugene, OR that tossed out threatened species protection for the Oregon coastal coho because hatchery fish were not listed along with wild fish, when they were considered part of the same population group.

"This was the single most important legal case we were faced with under the Endangered Species Act," NOAA Fisheries spokesman Brian Gorman said from Seattle. "Unlike, say, the hydropower issues we are wrestling with in the Pacific Northwest, this hatchery issue affected virtually every single listing in the country for salmon," he added. "This means that questions over whether or not we can get on with things that move toward recovery have been answered."

Earlier, NOAA Fisheries officials came up with a new policy, allowing for hatchery fish to be used to bolster dwindling populations of wild fish, but not count them equally with protected wild fish. If there are surplus hatchery fish, they can be harvested, even when wild fish must be put back unharmed. Studies have concluded that fish raised in hatcheries do not survive in the wild as well as fish spawned in the wild. While the fish

may be genetically similar, the wild fish have behavioral differences that make them more successful.

Lawyers for both property rights advocates and conservation groups said the U.S. Supreme Court is not likely to consider the issue. PLF lawyer Damien Schiff said from Sacramento, CA, that there remained a possibility they could ask the full appeals court to reconsider the cases, and future lawsuits could be brought attacking the issue from a different angle. But efforts to expand the Oregon coastal coho ruling to other salmon species by arguing hatchery fish can be counted along with wild salmon, "are probably not going to get anywhere in the future," he added.

Jan Hasselman, a lawyer for *Earthjustice*, which represented the conservation groups, said the good news was that the appeals court recognized that the objective of the ESA was to restore wild salmon, not just replace them with fish raised in hatcheries. "The building industry and PLF have engaged in a 10-year effort to reduce protections for wild salmon based on numbers of hatchery fish," he said from Seattle. "That effort is conclusively a failure. The people that supported it within the government are gone. It has been rejected across the board by numerous courts. And wild salmon remain protected. Let's move on to restoring their habitat and put this chapter behind us."

The ruling stemmed from two cases. One involved a decision by NOAA Fisheries to downgrade protection for Upper Columbia River steelhead from endangered to threatened because hatchery stocks were helping to restore the wild population. Conservation groups sued, and U.S. District Judge John C. Coughenour in Seattle agreed with them. In the other, PLF sued on behalf of the building industry, farm and property rights groups to undo the listings of 16 West Coast salmon and steelhead populations, arguing that abundant hatchery fish made it unnecessary to protect the wild ones, or to impose restrictions on development and agriculture to maintain habitat. Judge Hogan had rejected that challenge, saying the government was not required to treat hatchery and wild fish the same under the new policy.

The new ruling should have implications for supplemental stocking of other threatened and endangered species nationwide.

Sources: Jeff Barnard, *Anchorage Daily News*, 3/16/09; and *Greenwire*, 3/17/09

## Idaho Fish and Game to Reduce Pelican Numbers

Idaho Department of Fish and Game (IDFG) officials want to halve the population of pelicans nesting in southern and eastern Idaho by 2013 to help boost sport fisheries and protect native Yellowstone cutthroat trout. The pelicans prey heavily on spawning trout in the Blackfoot River. Migrating trout have become vulnerable to greater risk of predation as they swim up narrow, shallow pools lined by rocks that make good feeding perches for hungry pelicans. Some anglers also complain the birds eat too many sport fish, and some anglers have taken matters into their own hands. Over the years they have illegally released pigs or even badgers on the islands to eat pelican eggs.

Agency officials plan to oil the eggs and shoot the adult pelicans at the Blackfoot Reservoir — activities that would require permission from the U.S. Fish and Wildlife Service (FWS), which protects pelicans under the Migratory Bird Treaty Act of 1918. In the past, the FWS has approved limited lethal control of as many as 50 pelicans along the Blackfoot River.

Pelicans likely arrived in Idaho before European settlers, but the creation of vast water-storage reservoirs in the early 1900s to support human habitation also produced ideal island habitat for the ground-nesting birds. Pelican numbers at Lake Walcott on the Snake River increased from about 400 breeding birds in 2002 to more than 4,000 breeding birds last year. Meanwhile, the Blackfoot Reservoir colony has increased since 2002 from 1,400 to 2,400 breeding birds.

IDFG's plan calls for maintaining viable populations of 700 breeding birds at the Blackfoot Reservoir and 2,100 in Lake Walcott. Rex Sallabanks, IDFG conservation sciences program manager for the Bureau of Wildlife said the department's primary concern is for the native Yellowstone cutthroat trout and impacts on sport fish in important recreational fisheries throughout southern Idaho are secondary.

***Yellowstone cutthroat trout - Margaree River Fly Fishing Specialists Photo***

Lethal control measures will be focused on the Blackfoot Reservoir, and pending approval of the state Fish and Game Commission and the FWS, the state agency hopes to begin control efforts this spring, Sallabanks said. But lethal controls could be unpopular with bird advocates who maintain pelicans play an important role in the ecosystem and eat primarily non-sport fish. In fact, according to the IDFG's own pelican plan, "The fish community in Blackfoot Reservoir is dominated by abundant populations of nongame fish, and 90 percent of pelican diets were composed of suckers, carp and chubs."

Sallabanks said a successful management program would mean increased numbers of Yellowstone cutthroat trout returning to the Blackfoot River to spawn as well as fewer sport fish in the bellies of wide-ranging pelicans that frequent the region's other lakes, streams and reservoirs. "It would also be the long-term existence of a viable pelican population in Idaho, with productive breeding colonies at Blackfoot Reservoir and Minidoka National Wildlife Refuge," he said.

Wildlife managers have already begun addressing the problem by changing fish stocking patterns and releasing rainbow trout only during periods when the birds aren't present.

Sources: John Miller, *AP/Idaho Statesman*, 4/7/09; and *Greenwire*, 4/9/09

## Mussel Shellers Found Guilty

All eight defendants in a Tennessee case have now been found guilty or pled guilty to felony violations of the Lacey Act involving the illegal harvest and sale of undersized fresh water mussels, according to Lawrence J. Laurenzi, U.S. Attorney for the Western District of Tennessee. William Salyers, 55 of Holladay, TN was the most recent to plead guilty. The charges resulted from a multi-year, joint undercover investigation led by the U.S. Fish and Wildlife Service that culminated in 2006. The Tennessee Wildlife Resources Agency (TWRA) and Alabama Department of Conservation and Natural Resources assisted.

In this case alone, investigators documented that 75,000 pounds of illegal undersized washboard mussel shells with a retail value of over $230,000 had been exported to Japan during a two-year period, the announcement said. The commercial mussel shell industry is an important source of jobs to rural economies, it said. Harvested shells are processed

and graded before being shipped overseas for use in the cultured pearl industry.

Most of the mussels in the multi-million dollar industry come from Tennessee and surrounding states. Regulations setting minimum size-limits are the main management strategy to maintain the fishery for the various roles mussels play in the state, TWRA officials said. The point is to allow mussels time to produce enough offspring to keep the populations up for economic and environmental reasons. Mussels perform as a biological filter for streams, rivers and lakes, and they also are food for fish, waterfowl and other wildlife, said TWRA's Don Hubbs, mussels program coordinator. Many mussel species can live more than 20 years, so they're also used as indicators of environmental health of waterways and to track pollution levels. Also, the shells of dead mussels provide cover for other aquatic creatures and spawning grounds for small fish species.

A conservative estimate for the replacement cost for 75,000 to 140,000 pounds of washboard mussel shells would be $900,000 to $1.8 million, Hubbs said. The defendants face up to five years in prison and a $250,000 fine on each count of conviction.

Sources: Anne Paine, *The Tennessean*, 4/22/09

## USDA Releases $45 Million for 'High Hazard' Dam Repairs

The U.S. Agriculture Department (USDA) in early April released $45 million to repair 27 aging dams and other flood-control structures as part of the $787 billion federal economic stimulus act. The projects in 11 states primarily will repair and upgrade dams in "high hazard" areas with significant downstream development that would be at risk if the dams broke, according to the USDA. State and local sponsors will match federal funds to provide 35 percent of the funding for the projects.

The USDA predicts the projects will create more than 1,000 jobs. "Many of these dams are in a race against time when it comes to their ability to protect people and property against flooding," Agriculture Secretary Tom Vilsack said. Most of the projects are in rural areas, and many of the targeted dams date back to the 1940s and '50s and were built under a public law that provided federal funding for dams in rural areas, with the understanding that the local community or municipality would maintain them.

"A lot of the structures really deteriorated over time because local government did not have the finances to maintain them in safe condition," said Stephanie Lindloff, director of river restoration for *American Rivers*. Other dams need to be upgraded to larger structures because of significant new development that has occurred in the now-dry areas that surround the structures. "For some of these, when they were built, there was just a cornfield or a cotton field, and now there is a development around it," said Dave White, director of the Natural Resources Conservation Service (NRCS), the arm of USDA that oversees the program.

Development in areas that once were floodplains concerns some environmental groups, which want the federal government to take a closer look at removing some dams to restore the natural habitat for fish and birds. In fact, one of the projects receiving funding under the stimulus will go to decommission and remove a dam in Oklahoma. "In some cases, it may be a better long-term strategy to consider the removal of some of these dams, if they are only contributing to downstream development in areas that really should not be developed," Lindloff said.

The 27 identified projects will likely use all of the $50 million USDA received for dam repair in the stimulus. The agency's total estimate for the dams was slightly less than the stimulus's allotted amount in case the bids come in higher than expected, White said. The USDA program is the only one in the stimulus that directly targets money to dams, according to the *Association of State Dam Safety Officials*. The association was hoping for significantly more funding for various dam upgrades and improvements. Nationwide, the total need for dam repair is about $50 billion, according to the group's executive director, Lori Cannon Spragens. The group identified more than $375 million worth of "shovel ready" projects it hoped to see funded in the stimulus.

The funding for dam repair is one of three NRCS programs that received funding under the stimulus act. The other two programs are larger — NRCS received $140 million for floodplain easements and $140 million for other watershed programs.

Source: Allison Winter, *Greenwire*, 4/7/09

## Mountaintop Removal Mining Issues

In early April the U.S. EPA seemed poised to crack down on "mountaintop removal" coal mines saying it had "significant concerns" about the mines — in which mountain peaks are legally blasted off to get at coal seams underneath — because nearby streams are buried under displaced rock. "Even though ephemeral and intermittent streams may go dry during a portion of the year, they continue to provide habitat for macroinvertebrates and amphibians that utilize the interstitial water flows in the substance below the stream," EPA said in its letter about the Frasure Creek mine, which would fill almost 3 miles of stream. "Such aquatic resources have been significantly impacted by mining in Southern West Virginia," EPA said.

But later that same day, the EPA suddenly seemed to play down its worries, saying it thought the bulk of the projects would "not raise environmental concerns." The episode has been seen as an early unsteady attempt by a White House with environmental ambitions to confront one of its most vexing problems: polluting, carbon-heavy, economically vital coal. EPA Administrator Lisa P. Jackson said her agency did not intend to send a mixed message. She said that the EPA was not trying to stop all mountaintop removal but that it "is going to do its job" in checking 150 to 200 projects for environmental impact. "This was not about making any kind of value judgment on the practice of mining," Jackson said. "This is about science. And what the law tells us to do is review these permits."

Jackson said that the EPA had just begun to review the permit applications and that although "the sense right now is that the vast majority of them are not significant" concerns, she could not predict the final outcome. She said that the White House Council on Environmental Quality has convened officials from the EPA, the U.S. Army, Corps of Engineers (Corps) and other federal agencies to talk about the future of mountaintop mining more generally.

As Washington has become more focused on climate change, coal has become something like the new tobacco: publicly reviled, at least by some, but still deeply embedded in the economy. Coal produces dirty water when it is mined and greenhouse gases when it is burned, but it also accounts for about half of U.S. electric power, and coal mining provides about 82,000 jobs.

But some environmentalists think the science is overwhelming that mountaintop removal mining is harmful. "You know 'Almost heaven, West Virginia'? Well, now it's 'Almost level, West Virginia,' " said Teresa Perdue, 50, a resident of Ashford, WV, who has spoken out against mountaintop removal. "Who said it's okay to bury streams, it's okay to cut the tops off mountains to get coal?" Perdue said. "The days of reckless, unchecked destruction of Appalachian mountains are numbered," said Mary Anne Hitt, deputy director of the *Sierra Club's Beyond Coal Campaign*, in a statement. "There is much more work to do, but President Obama's EPA has taken bold action on mountaintop removal coal mining, and we applaud their intervention." But Carlos Gore, 57, also a mountaintop mining opponent, said previous experience shows that mining companies usually win: "They take the rules, and they bend it and twist it like a pig's tail."

Jim Taylor, a 73-year-old pro coal person who manages a hydraulic and machine repair shop in Logan, WV said, "There's nothing to replace [coal] right now.." Kentucky Gov. Steve Beshear (D) said in late March that he was concerned about EPA's review, asking the agency to clarify its announcement. "For some time, there has been a lengthy backlog of ... permits awaiting action from the Army Corps of Engineers as a result of litigation and bureaucratic red tape," Beshear said in a statement. "Those permits should be reviewed in a timely manner, regardless of the outcome of any one application for mining." The *National Mining Association's* senior vice president, Carol Raulston, said additional permitting delays could affect the more than 60,000 mining jobs. "This is a continuing concern throughout Appalachia because of the potential job impacts," she said. "You have to have these permits to operate."

EPA spokeswoman Enesta Jones said she could not rule out that more permits would soon be reviewed. "The EPA has the ultimate authority under the Clean Water Act to determine what activities are permitted, and it's up to EPA now to exercise that authority and ensure that the Army Corps is adhering to Obama administration policies," Joan Mulhern, legislative counsel for *Earthjustice* said.

At the EPA's last count, in 2001, mountaintop removal "valley fills" had buried 724 miles of stream valleys, about 1.2 percent of the region's total. The practice is centered in eastern Kentucky and southern West Virginia, although there are some mines in Tennessee, southeast Ohio and southwest Virginia.

Sources: ; David A. Fahrenthold, *Washington Post*, 4/11/09; *E&ENews PM*, 2/13 and 3/24/09; Katherine Boyle, *Greenwire*, 3/26/09; Eric Bontrager, *Greenwire*, 4/9/09; and *Greenwire*, 4/1 and 4/13/09

## Mountaintop Removal Activist Wins Major Environmental Award

Maria Gunnoe, a West Virginia woman who battled mountaintop removal mining near her home has been awarded a *Goldman Environmental Prize*. Gunnoe has lived most of her life at her family's West Virginia homeplace, fishing in the streams, playing in the creeks and picnicking at family reunions on nearby Cazy Mountain. But in 2000, a mountaintop removal mine began blasting, digging and dumping on the ridge above her home. And her house now sits below a huge valley-fill waste pile and she has to live with periodic flooding and water pollution that she blames on the *Magnum Coal* operation.

"It has devastated our property," Gunnoe said two years ago, when she testified in federal court, despite threats she had received from local miners. Like many other Southern West Virginia residents, the experience turned Gunnoe, a 40-year-old former waitress and medical technician, into a full-fledged citizen activist. She speaks out at rallies, testifies in lawsuits and writes letters as part of the growing campaign against mountaintop removal mining. For these efforts Gunnoe was honored as one of seven winners of the annual *Goldman Prize*, a prestigious award given to grassroots environmental heroes from around the globe by the *Goldman Environmental Foundation.*

In 2004, after a flood destroyed her ancestral home and covered her yard with toxic sludge, she began volunteering for the *Ohio Valley Environmental Coalition*, to educate her neighbors about mountaintop removal. She organized monthly meetings, created neighborhood groups to monitor coal operations, and encouraged other residents to speak out. Then in March 2007, the coalition and other groups won a federal court ruling meant to block or slow new mining permits.

So when the U.S. Army, Corps of Engineers went ahead and issued a new permit for the operation above Gunnoe's community, the groups sought an injunction to block it. Days before the hearing, Gunnoe organized a media training session for 20 local residents, some of whom were scheduled to testify with her. But about 60 coal miners showed up at the meeting intimidating most of her neighbors, so Gunnoe was the only resident who went forward to testify at the hearing. But the environmental groups won an injunction anyway and *Magnum Coal* later closed the entire mining complex, citing not only the strip mining injunction, but problems finding workers for a related underground mine, increased government safety inspections, and "difficult geologic conditions."

Later, Gunnoe reported that threats against her and her family continued. "They want me out of here for many reasons and the main reason they want me out is because I am successful in organizing the community members here to fight their activities," Gunnoe said. "I live on my family property and refuse to give up the only memories I have of my family before me. They want me out at all cost and I refuse to go, dead or alive."

"Grassroots environmental heroes too often go unrecognized. Yet their efforts to protect the world's natural resources are increasingly critical to the well-being of the planet we all share," says the *Goldman Environmental Prize Web Site*. Richard N. Goldman and his late wife, Rhoda H. Goldman, San Francisco civic leaders and philanthropists, created the *Goldman Environmental Prize* to honor grassroots environmental heroes from the six inhabited continental regions: Africa, Asia, Europe, Islands and Island Nations, North America, and South and Central America.

The Prize recognizes individuals for sustained and significant efforts to protect and enhance the natural environment, often at great personal risk. Each winner receives an award of $150,000, the largest award in the world for grassroots environmentalists. Through recognizing these individual leaders, the Prize seeks to inspire other ordinary people to take extraordinary actions to protect the natural world.

Announced every April to coincide with Earth Day, the *Goldman Environmental Prize* winners are selected by an international jury from confidential nominations submitted by a worldwide group of environmental organizations and individuals. Prize winners participate in a 10-day tour of San Francisco and Washington D.C. — highlighted by award ceremonies in both cities — including news conferences, media briefings and meetings with political and environmental leaders.

For additional information on the Goldman Prize, see their Web Site at: http://www.goldmanprize.org/theprize/about

Sources: Ken Ward Jr., *Charleston (WV) Gazette*, 4/19/09; and *Greenwire*, 4/20/09

## Oklahoma-Arkansas Poultry Wars

A federal appeals court has rejected Oklahoma's bid to stop poultry growers in Oklahoma and Arkansas from spreading poultry waste in the Illinois River watershed while an environmental lawsuit winds its way through the courts. In its opinion issued in mid May, a three-judge panel of the 10th U.S. Circuit Court of Appeals ruled a federal judge was within his discretion in denying an injunction. The appellate court said the state failed to link the poultry waste — which is used as fertilizer — to bacteria in the watershed.

The poultry industry argues that cattle and human waste could also be causing elevated levels of bacteria in the watershed. Oklahoma argues that the state doesn't have to prove contamination, only that 345,000 tons of chicken waste dumped there annually "may" cause contamination. A trial in the larger lawsuit is scheduled for September. Oklahoma Attorney General Drew Edmondson is suing 13 Arkansas poultry companies, including *Tyson Foods Inc.*, *Tyson Poultry Inc.* and *Tyson Chicken Inc.*, over the effects of over-application of chicken waste in the watershed. Other companies named in Edmondson's lawsuit include *Cobb-Vantress Inc.*, *Cal-Maine Foods Inc.*, *Cargill Inc.*, *Cargill Turkey Production L.L.C.*, *George's Inc.*, *George's Farms Inc.*, *Peterson Farms Inc.*, *Simmons Foods Inc.*, *Cal-Maine Farms Inc.* and *Willow Brook Foods Inc.*

State officials estimate the application of untreated poultry waste in the watershed is the equivalent to untreated human waste from between 4.2 million and 10.7 million people. The case is closely watched because it could increase the cost of raising chickens and lead to higher meat prices. "The people an injunction would have harmed are the hardworking, independent farmers and cattle ranchers who depend upon poultry litter as an economical and beneficial source of fertilizer for land," Tyson said in a statement.

The appellate court also upheld the lower court's rejection of two of Oklahoma's expert witnesses, whose testimony was deemed "not sufficiently reliable" because their work had not been peer-reviewed or published. "We find no abuse of discretion in the court's determination," the panel wrote.

Sources: Solomon Banda, *AP/Forbes*, 5/13/09; and *Greenwire*, 5/14/09

## Western Water Issues

Every time it rains in some western states homeowners and gardeners knowingly violate the law by collecting the rainwater or snowmelt that falls on the roofs of their homes. Such water collected in barrels placed underneath rain gutters is used for watering plants and gardens. Collected rainwater is generally considered "gray water," or water that is not reliably pure enough to drink but can be used to water yards, flush toilets and power heaters. In some states, developers try to include a network of cisterns and catchment pools in every subdivision, but in others, those who catch the rain tend to do so covertly. The practice of "rainwater harvesting" is increasingly in vogue among environmentalists and others who pursue sustainable lifestyles.

But according to the state of Colorado, for example, the rain that falls on your property may not be yours to keep. It should be allowed to fall to the ground and flow unimpeded into surrounding creeks and streams, the law states, to become the property of farmers, ranchers, developers and water agencies that have bought the rights to those waterways. "If you try to collect rainwater, well, that water really belongs to someone else," said Doug Kemper, executive director of the *Colorado Water Congress*. "We get into a very detailed accounting on every little drop."

Frank Jaeger of the *Parker Water and Sanitation District*, on the arid foothills south of Denver, sees water harvesting as an insidious attempt to take water from entities that have paid dearly for the resource. "Every drop of water that comes down keeps the ground wet and helps the flow of the river," Jaeger said. He scoffs at arguments that harvesters only take a few drops from rivers. "Everything always starts with one little bite at a time," he said.

Rights to westeren bodies of water are held by entities who get preference based on the dates of their claims. And in many Western states there are more claims than available water, and even those who hold rights dating back to the late 19th century sometimes find they do not get all of the water they should. "If I decide to [take rainwater] in 2009, somewhere, maybe 100 miles downstream, there's a water right that outdates me by 100 years" that's losing water, said Kevin Rein, assistant state engineer.

But increasingly states are trying to make rainwater harvesting more welcome. Bills in both Colorado and Utah would adjust their laws to allow it in certain scenarios, over the protest of people like Jaeger. State Sen. Chris Romer became active in the issue when he built his ecological dream house in Denver, entirely powered by solar energy. He also wanted to install a system to catch rainwater, but the state said it couldn't be permitted. "It was stunning to me that this common-sense thing couldn't be done," said Romer, a Democrat. So he sponsored a bill last year to allow water harvesting, but it did not pass. This year, Romer and Republican state Rep. Marsha Looper have both introduced new bills to allow water harvesting in certain circumstances. Armed with a study that shows that 97% of rainwater that falls on the soil never makes it to streams, they propose to allow harvesting in 11 pilot projects in urban areas, and for rural users whose wells are depleted by drought.

But organic farmers and urban dreamers aren't the only people pushing to legalize water harvesting. Developer Harold Smethills wants to build more than 10,000 homes southwest of Denver that would be supplied by giant cisterns that capture the rain that falls on the 3,200-acre subdivision. He supports the change in Colorado law. "We believe there is something to rainwater harvesting," Smethills said. "We believe it makes economic sense."

Meanwhile, energy companies in Colorado which use groundwater to relieve the pressures that trap methane gas in coal seams didn't need a water permit until recently. But the Colorado Supreme Court ruled in April that they now must obtain a water permit or replace the water they use if other water supplies could be affected. The court's decision concluded that well water pumped out during drilling is not just a waste product, a ruling that favors land and homeowners who feared their water supplies could be at risk by the companies' drilling operations.

So those who hold existing water rights now have priority over gas companies who use water for their drilling operations, meaning the companies will now have to replace the water they use if it belongs to others. Gas companies and the Colorado engineer's office have argued that water is a byproduct of drilling and should fall under existing

laws for oil and gas drilling. *BP America Production Co*. said it re-injects the water it uses into the ground. Meanwhile in northeastern Wyoming coal-bed methane wells release their wastewater into streams, raising concerns about high sodium levels that can damage vegetation and soil.

The *Colorado Oil and Gas Association* said the new Colorado rule would drive many of the companies that operate the state's 38,000 active oil and gas wells out of state or force them to cut back on production. About 5,000 of those wells are for coal-bed methane, and millions of gallons of water might be pumped over the life of each well.

Meanwhile, with regard to Colorado's oil shale deposits, oil companies hoping to extract that oil have collectively gathered up rights to more than 6.5 billion gallons of water in preparation for their future efforts according to a new report by a conservation group that opposes such projects. *Western Resource Advocates* used public records to determine that energy companies are entitled to billions of gallons/day of peak river flows and that they hold rights to store, in dozens of reservoirs, 1.7 million acre-feet of water, enough water to supply metro Denver for six years.

Industry representatives said they could not confirm the precise numbers in the report, but that they do have substantial holdings of water rights for future oil shale development. Extracting oil from shale is still in the experimental phase, and companies are trying to overcome technological, environmental and regulatory hurdles. But the potential payoff is huge: The federal government estimates that 800 billion barrels of oil, triple the known reserves of Saudi Arabia, lie under the Rocky Mountains.

Oil companies say that new technologies might reduce future water needs, and even if the oil companies use all of their entitlements, there is no risk of the Colorado River drying up. But if oil shale development takes off, it could use the last of Colorado's allotment of the river's flow provided by a 1922 compact among seven U.S. states and Mexico, said Eric Kuhn at the *Colorado River Water Conservation District*, leaving Denver's booming suburbs high and dry.

Finally, the U.S. Supreme Court in early March rejected claims by Kansas that it is owed $9 million in legal fees from Colorado over a water dispute stretching back 100 years. Colorado had already agreed to pay $34 million in 1995 for groundwater pumping that diverted millions of gallons of water in the Arkansas River that rightfully belonged to Kansas. It will now pay $163,000 in legal fees to the state, not the $9 million Kansas was requesting

Sources: Nicholas Riccardi, *Los Angeles Times*, 3/18/09; Judith Kohler, *AP/Casper (WY) Star-Tribune*, 4/21/09; Stephanie Simon, *Wall Street Journal*, 3/19/09; AP/Yahoo! News, 3/9/09; and *Greenwire*, 3/9, 3/18, 3/19 and 4/21/09

## Green River Water Diversion

An ambitious plan to build a 560-mile-long pipeline to pump water from southwest Wyoming's Flaming Gorge Reservoir to southeast Wyoming, the Front Range in Colorado, and the Mississippi River Basin is moving forward. U.S. Army, Corps of Engineers (Corps) officials said in late March that the agency is beginning work on an environmental impact statement that will analyze the impacts of the proposed regional water supply project.

Colorado-based private water developer, *Million Conservation Resource Group*, has been working on the project for four years and has now filed for permits to start the approval process. Aaron Million, project director, envisions building the pipeline at an estimated cost of $4 billion. The route would run from Flaming Gorge Reservoir on the Wyoming-Utah border, following Interstate 80 across the Continental Divide to Laramie. From there, it would head south along U.S. Highway 287 into Colorado. The pipeline would deliver about 250,000 acre feet of water to points as far south as Pueblo, according to project plans. The pipeline would operate on a perpetual basis through 2030 and beyond.

The water obtained from the Green River Basin would be part of the unused portion of water allocated to the states of Wyoming and Colorado under the Upper Colorado River Compact, according to plans. In Wyoming, about 25,000 acre feet of water would be delivered annually to users in the Platte River Basin. The remaining 225,000 acre feet of water would be delivered annually to the South Platte and Arkansas River basins in Colorado. The most conservative estimates predict it would take five years or more to permit and build the pipeline once it overcomes significant political and logistical hurdles.

The 45-year-old Flaming Gorge Dam is located about 70 miles south of the city of Green River just across the Utah border. The dam created the 91-mile-long Flaming Gorge Reservoir, a world-class fishery, and the Flaming Gorge National Recreation Area, which attracts more than 2 million visitors annually. Drawing water from Flaming Gorge — which can hold up to 3.8 million acre feet of water — and the Green River would affect few irrigators and other water users, Million contends. The potential water users for the proposed project would include agriculture, municipalities and industries in southeastern Wyoming and Colorado's Front Range, according to a Corps notice in the Federal Register.

The pipeline system would feature three water storage/flow regulation reservoirs along the route, including one in Wyoming at Lake Hattie west of Laramie. Officials said 16 natural gas-powered pump stations would also be constructed. Rena Brand, Corps Spokesperson, said the agency will examine a full range of reasonable alternatives as part of the environmental impact study, including alternatives with different withdrawal points or only one withdrawal point, and alternative storage reservoir locations.

Sources: Jeff Gearino, *Casper (WY) Star-Tribune*, 3/31/09; and *Greenwire*, 4/2/09

## Grazing Threatens Western Habitats

A study by a conservation group found that livestock grazing threatens a wide variety of fish and other wildlife across more than three-fourths of their shrinking habitats on federal land in the West. *WildEarth Guardians* (WG) used satellite mapping and federal records to match wildlife habitat and U.S. grazing allotments across more than 260 million acres of federal land. That includes almost all of the remaining habitat of the Greater sage grouse, a game bird that is under consideration by the U.S. Fish and Wildlife Service for listing under the Endangered Species Act in 11 Western states from California to Wyoming.

"The results confirm — in graphic form — previous research findings that incessant, ubiquitous public lands grazing has contributed to the decline of native wildlife," concludes the report entitled *"Western Wildlife Under Hoof."* Continued grazing on shrinking habitat hampers the recovery of fish and wildlife, threatening them with extinction in some cases, WG said. Cattle and sheep trample vegetation, damage soil, spread in-

vasive weeds, spoil water and deprive native wildlife of forage, the report said. It notes that then-Interior Secretary Bruce Babbitt said in 2005 that livestock grazing "is the most damaging use of public land."

Mark Salvo, WG's grazing program specialist and author of the report, said the new data suggest livestock have "done more damage to the Earth than the chain saw and bulldozer combined." But Jeff Eisenberg, director of federal lands for the *National Cattlemen's Beef Association*, dismissed the findings as part of an effort to eliminate grazing on federal land. "There's a number of environmental groups that have decided the best way to spend their time and the money of their funders is to eliminate the families and communities that have made the West what it is today," he told *AP* in an e-mail. "These groups don't deserve a dignified response."

Don Kirby, president of the *Society for Range Management* and director of North Dakota State University's School of Natural Resource Sciences, said livestock grazing is an important part of a "landscape management toolbox" that can be used to reduce wildfires and improve wildlife habitat. "Western rangelands and the wildlife species that live there have coexisted with grazing by large herbivores for tens of thousands of years," Kirby said.

The WG report found livestock grazing is permitted on 91 percent of the Greater sage grouse's habitat and that grazing operations are active on 72 percent of the habitat. Grazing is active on 55 percent of the federal range of the Gunnison sage grouse and is permitted on 84 percent of it. Likewise, grazing is permitted on about 80 percent of public land in the historic range of several cutthroat trout species, including 88 percent of the Lahontan and 76 percent of the Bonneville cutthroats. It's also permitted on about 75 percent of the federal habitat of four species of prairie dogs. "The species included in our report are representative of the hundreds of wildlife species that are threatened by public lands grazing," said Salvo, whose group has offices in Colorado, New Mexico and Arizona. Among other things, WG recommends buying out permits from ranchers and others willing to remove their livestock from grazing land. "There is a greater economic value in non-consumptive uses of public land — hunting, fishing, birdwatching, hiking, camping — than livestock grazing," the report said.

The Nevada Department of Wildlife shares concerns about dwindling wildlife popula

***Grazing exclosure right, grazed land left - Utah Environmental Congress Photo***

tions but believes there is a place for grazing on public land, spokesman Chris Healy said. If ranchers end up selling their land, it could be subdivided and lead to development even more problematic for wildlife, he said. "It behooves us to get everybody who uses the land to be part of the solution and that's what we've been trying to do with the sage grouse. If one sector or user of the land feels like they are being ganged up on, the odds of coming up with a solution that will work are not good," he said.

The bulk of the federal land studied is managed by the U.S. Bureau of Land Management (BLM), which issued grazing permits and leases to 15,799 ranchers and other operators covering 128 million acres of U.S. land in 2006. BLM spokesman Jeff Krauss said the agency has not fully reviewed the WG report but maintains "well-managed grazing provides numerous ecological and environmental benefits."

Sources: Scott Sonner, *Anchorage Daily News*, 4/30/09; and *Greenwire*, 5/1/09

## Prairie Partnership Formed

Four conservation groups announced in mid March that they are teaming up as the *Prairie Grouse Partners* (PGP) to try to restore some of the country's original grasslands and preserve the wildlife that depends on it. Members say that only 10 percent of North America's 585 million acres of original native grasslands remain, putting wildlife that live there at peril. The goal is to improve 60 million acres of habitat. Terry Riley, of the *Theodore Roosevelt Conservation Partnership* (TRCP) said the project's focus will be on grouse because those birds are a bellwether of the prairie's condition. "We have found that prairie grouse are one of the most sensitive (species) to change," said Riley, formerly a wildlife biologist with the U.S. Forest Service and the Iowa Department of Natural Resources.

Other groups in the PGP are the *Mule Deer Foundation*, *Pheasants Forever* (PF) and the *North American Grouse Partnership*. With help from U.S. Department of Agriculture data, the groups identified all the counties with prairie and assessed the condition of the grasslands. The area stretches from the plains in Montana, Wyoming and Colorado, east as far as Ohio and south to the Gulf of Mexico. The groups say farming and ranching, construction, oil and gas development and drought have carved and covered up the habitat through the years. Their plan explores habitat needs of the sharp-tailed grouse, greater prairie-chicken and the lesser prairie-chicken.

The lesser prairie-chicken is a candidate for the federal endangered species list, which means there is sufficient reason to give them federal protection. But other species are higher priorities. The range of the lesser and greater prairie-chicken has shrunk by as much as 90 percent, according to the PGP. "All the wildlife species associated with the habitat have suffered pretty significant losses through time," Riley said. "They've declined to the point that if we don't do something pretty soon, we'll have a whole bunch of endangered species on our hands." Howard Vincent, president and CEO of PF, said in a statement that while all the current conservation issues are critical, time has almost run out for the grasslands. And the tall-grass prairie, which starts farther east, is the most threatened, Riley said. Much of the land has been converted to agriculture because it gets more moisture than the short- and mixed-grass prairie farther west and the soil is fertile, he added.

Riley said the PGP hopes to enlist more groups in the cause, including ones in Canada. He said conservationists and wildlife advocates started working with farmers and ranchers in the 1980s and lobbying for incentives in the federal farm bill to encourage agriculture producers to protect habitat through such methods as changing grazing patterns or when and how grass was mowed. Other areas, such as wetlands or bottoms of draws where vegetation abounds due to moisture that gathers there, have been conserved through easements or rental payments. Riley said the PGP hopes to better coordinate conservation efforts.

Sources: Judith Kohler, *Kansas City Star*, 3/18/09; and *Greenwire*, 3/18/09

## Still No Answers to Fish Deformities

More than 80 percent of male smallmouth bass in the Potomac River are growing eggs, but after six years of investigation, scientists are still not sure what is causing the problem. The abnormal bass have made the Potomac the focus of research into "endocrine disruptors," pollutants that interfere with an animal's natural chemical signals. In late April federal officials released the results of the largest-ever investigation into "intersex" fish in the watershed.

The study found 82 to 100 percent of the male fish in some locations exhibiting some female characteristics. Biologists tested fish both upstream and downstream from sewage treatment plants, hoping to find evidence that the fish are being altered by substances such as human hormones, soaps and personal-care products in processed sewage. But the male fish in both locations were producing eggs. "Right now, we're shooting in the dark," looking for other possible pollution sources, said Leopoldo Miranda-Castro, supervisor of the U.S. Fish and Wildlife Service (FWS) Chesapeake Bay Field Office.

Scientists believe the problem is caused by a mixture of pollutants, including some in sewage, animal hormones from farm manure and pesticide runoff. The survey examined fish in the Potomac in the District of Columbia, and in two Maryland tributaries — the Monocacy River and Conococheague Creek. Instead of illuminating a single cause, it made a tangled problem seem even more complex by revealing new changes in female fish. In the District, U.S. Geological Survey scientist Vicki S. Blazer said, female largemouth bass showed low levels of a protein called vitellogenin, which is used to produce the yolk in their eggs. In some cases, Blazer said, the levels of vitellogenin in females were actually lower than in the Potomac's male fish — which should not produce the protein. "That indicates that it's not just estrogenic compounds" in the river, but also some that mimic male hormones in female fish, Blazer said.

Maryland authorities note, however, that for now, the problem doesn't seem to affect the bass's ability to reproduce. The Potomac's smallmouth population is at a 20-year high, one biologist said. The FWS is now beginning to look for intersex fish and amphibians in wildlife refuges along the East Coast.

Sources: David A. Fahrenthold, *Washington Post*, 4/22/09; and *Greenwire*, 4/22/09

## Tons of Pharmaceuticals in U.S. Waterways

Major manufacturers and drugmakers in the U.S. have legally released at least 271 million pounds of pharmaceuticals into waterways, but the federal government has consistently overlooked the contamination, an *Associated Press* investigation found. But while federal and industry officials say the extent of the contamination is unknown because it is not tracked, a close analysis of 20 years of federal records found the government unintentionally keeps records on a few, allowing a glimpse into the issue.

There are 22 compounds that the U.S. Environmental Protection Agency (EPA) monitors as industrial chemicals that are released into rivers, lakes and other bodies of water under federal pollution laws, and which the Food and Drug Administration (FDA) classifies as active pharmaceutical ingredients. The data do not detail how much of the 271 million pounds comes from drugmakers versus other manufacturers, and the figure is a massive undercount because of the limited tracking by regulators. But the list of 22 includes troubling releases of chemicals that can be used to make drugs and other products: 8 million pounds of the skin bleaching cream hydroquinone, 3 million pounds of nicotine compounds that can be used in quit-smoking patches, and 10,000 pounds of the antibiotic tetracycline hydrochloride. Others substances include treatments for head lice and worms.

Also, trace amounts of a wide range of pharmaceuticals — including antibiotics, anti-convulsants, mood stabilizers and sex hormones — have been found in American drinking water supplies. Residues are often released into the environment when manufacturing equipment is cleaned. And a small fraction of pharmaceuticals leach out of landfills where they are dumped. Pharmaceuticals released onto land include the chemo agent fluorouracil, the epilepsy medicine phenytoin and the sedative pentobarbital sodium. The overall amount may be considerable, given the volume of what has been buried — 572 million pounds of the 22 monitored drugs since 1988.

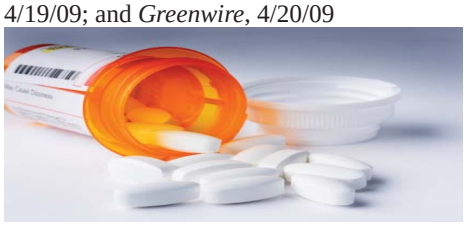
While drugmakers and federal drug and water regulators dismiss the suggestion that pharmaceutical manufacturing contributes significantly to the drug levels being found in water, some researchers say the lack of required testing amounts to a "don't ask, don't tell" policy about the extent of the manufacturers' contribution to the contamination. "It doesn't pass the straight-face test to say pharmaceutical manufacturers are not emitting any of the compounds they're creating,'' said Kyla Bennett, who spent 10 years as an EPA enforcement officer before becoming an ecologist and environmental attorney. In fact, some scientists say that wherever researchers look, they will find pharma-tainted water.

But FDA spokesman Christopher Kelly said his agency is not responsible for what drug factories release into the water, and acting EPA assistant administrator Mike Shapiro did not mention factories as a source of pharmaceutical pollution when asked how drugs get into drinking water. Shapiro said in a written statement that, "Pharmaceuticals get into water in many ways — It's commonly believed the majority come from human and animal excretion. A portion also comes from flushing unused drugs down the toilet or drain; a practice EPA generally discourages.'' Consumers are thus considered the biggest contributors to the contamination — we consume drugs, then excrete what our bodies don't absorb. The *AP* also found that an estimated 250 million pounds of pharmaceuticals and contaminated packaging are thrown away each year by hospitals and long-term care facilities.

Additionally, drugmakers rarely have to submit an environmental review for new products and the FDA has yet to reject a drug application based on its potential environmental impact. Regulators feel pressure not to delay potentially lifesaving drugs, and because the EPA has not determined whether or how bad pharmaceuticals are for the environment and people, manufacturers almost never have to report the release of pharmaceuticals they produce.

But researchers have found that even extremely diluted concentrations of drugs harm fish, frogs and other aquatic species. Also, researchers report that human cells fail to grow normally in the laboratory when exposed to trace concentrations of certain drugs. Some scientists say they are increasingly concerned that the consumption of combinations of many drugs, even in small amounts, could harm humans over decades.

Sources: *AP/Charleston (WV) Gazette*, 4/19/09; and *Greenwire*, 4/20/09



## Oil Spill Cleanup Deadly for Fish

A new study suggests that chemicals commonly used to clean up oil spills make oil far more toxic to fish, particularly for eggs and young fish. Scientists have long debated about how best to clean up spills, but this new work makes those decisions even more complicated and controversial. "While you can see the risk on the surface, appreciating risk under the surface is much more difficult," said Peter Hodson, a fish toxicologist at Queen's University in Kingston, Ontario. "You're trading off one set of risks that are fairly clear for another set of risks that are not so clear."

Oil and water don't normally mix. So, when a truck, train, or ship accidentally dumps its cargo into a lake, stream or sea, the oil sits on top of the water and spreads across its surface. The slick substance then flows with the currents and tides, poisoning the animals it encounters along its way. On the scene of a spill, difficult decisions need to be made quickly, and in an ideal world, the rescue team would simply skim all the oil off the surface, said Nancy Kinner, co-director of the *Coastal Response Research Center* at the University of New Hampshire in Durham. But in reality, even the best equipment leaves a lot of oil behind. What's more, most spills happen during storms, making cleanup dangerous and difficult.

Another way to get oil off the surface is to use a chemical dispersing agent. These detergent-based substances cause oil to bead up into tiny droplets that can mix into the water and disperse into deeper layers. Underwater currents can then theoretically dilute the oil and its risk to the environment. But while such dispersion spares surface-dwelling animals, such as birds and otters, as the oil drifts downward, it falls on fish and on the eggs that are stuck to surfaces or buried in the sediment.

To find out just how dangerous dispersed oil might be to fish, Hodson and his colleagues performed a series of laboratory experiments with beakers that were meant to simulate contaminated lakes. In all of the beakers, the scientists mixed water with diesel oil, then added newly hatched trout embryos. In some beakers, the scientists added a dispersing agent. Their analyses, published in the journal *Environmental Toxicology and Chemistry*, showed that dispersants greatly increased the amount of hydrocarbons that could affect fish. In turn, that extra dose of exposure made the oil 100 times more toxic to the animals. Toxicity was measured as an elevated enzyme response in the livers of the fish.

Exposure to dispersed oil doesn't kill a lot of fish, Hodson added. Instead, it either kills eggs before they hatch or leads to damage or deformities in juvenile fish. Compared to the horrifying appearance of oil-drenched birds on beaches, it can be hard to catch the attention of the public — or even of cleanup managers — with such subtle and hidden health effects. "What he's saying, and he's correct, is that it could be way more fish fingerlings or eggs that are impacted than you'd ever impact birds," Kinner said. "It kind of adds fuel to the discussion."

Another message of the study, Kinner added, is that, when it comes to accidents that involve oil, there are no easy answers and no happy endings. "Once the petroleum product is spilled, there is going to be damage no matter what," she said. "It's already a bad situation. The question is: How are we going to minimize the risks as much as possible?"

Sources: Emily Sohn, *Discovery Channel/MSNBC.com*, 4/10/09; and *Greenwire*, 4/14/09

## Algae, Catfish Farmers and Biofuels

Algae could become a new cash cow for beleaguered catfish farmers in the Mississippi Delta region as farmers, suffering from the rising cost of fish feed and fuel, give up their fish ponds to become landlords of algae. Hall Barret III once hated to see algae in his catfish ponds, saying it tainted farm-raised catfish with a musty off-flavor and cost him time and money. But now, he's hoping the pond scum will pay him huge royalties through his lease agreement with *PetroSun BioFuels Inc.*

"Never in my wildest dreams would I have ever thought that I would be doing this," said Barret, who has for decades operated a fish farm with his sister Liz Jordan near Belzoni, MS, the self-proclaimed *Catfish Capital of the World*. Barret and Jordan have agreed to lease their old catfish ponds to *PetroSun* to grow algae used in biodiesel, ethanol and livestock feed production. The wild algae that used to grow on Barret's catfish ponds is not suitable for alternative fuel production, but *PetroSun* says it can grow some that is. There are skeptics, though, who think that algae for biofuel production can only be produced in closed environments where there are few challenges to harvesting.

Still, once the capital costs drop and dewatering technology improves, some say the aviation industry and the military could become viable markets for algae-based fuel. Tom Byrne, a Minnesota-based renewable energy consultant and member of the *Algal Biomass Organization*, predicts it will take five to 10 years before the industry makes a real difference. "Which is faster than you can drill off the coast," he said.

NASA is also already into the algae biofuel business. They are testing a technology of producing biofuels by growing algae in plastic bags filled with sewage floating in the ocean. The OMEGA (offshore membrane enclosures for growing algae) bags are semi-permeable membranes that NASA developed to recycle astronauts' wastewater on long space missions. In this case, the membranes let freshwater exit but prevent saltwater from moving in. Then the algae in the bag feast on nutrients in the sewage. The plants clean up the water and produce lipids — fat-soluble molecules — that will be used later as fuel. Just as in algae biofuel production on land, the floating OMEGA bags use water, solar energy and carbon dioxide — which in this case is absorbed through the plastic membrane — to produce sugar that algae metabolize into lipids.

Jonathan Trent, the lead researcher on the project at NASA's *Ames Research Center* in California, said "Algae are the best source of biofuels on the planet that we know about." Trent envisions the OMEGAs producing enough fuel to fill U.S. aviation needs — 21 billion gallons a year. Doing so would require about 10 acres of ocean, he said.

Meanwhile, researchers studying the green algae, *Chlamydomonas reinhardtii*, have discovered a new way to increase its natural production of hydrogen that could be used as a renewable fuel. The algae, which is commonly found in soils, naturally produces small amounts of hydrogen when it is deprived of oxygen. But the amount of hydrogen produced is typically small. However, a new study, published in the *Journal of Biological Chemistry*, reports that by genetically blocking certain metabolic processes in a mutant strain of the algae, production yield could be increased significantly. "These are really exciting times in the field," said Matthew Posewitz, a researcher at the Colorado School of Mines and the *Colorado Center for Biorefining and Biofuels*, in a statement.

Scientists have been studying algae's energy potential for decades, but most efforts have

focused on producing biodiesel or ethanol. The hydrogen produced by the *C. reinhardtii* algae could be used to power clean-energy fuel cells that combine hydrogen with oxygen to give off energy and water. "This discovery effort will lead to the development of novel ways to produce renewable hydrogen and other biofuels, which will benefit all of us," said Michael Seibert, a biologist at the *National Renewable Energy Laboratory* and the study's principal investigator.

Sources: Timothy R. Brown, *Associated Press*, 3/11/09; Katie Howell, *Greenwire*, 3/25/09; Katie Howell, *Greenwire*, 5/12/09; and *Greenwire*, 3/11 and 3/25/09

## Climate Change Update

An ice bridge that held Antarctica's vast Wilkins ice shelf in place throughout recorded history shattered in early April, according to British scientist David Vaughan. A satellite picture from the European Space Agency showed a 25-mile strip of ice believed to hold the Wilkins ice shelf in place had shattered releasing the shelf. The Wilkins, which is the size of Jamaica or Connecticut, is one of 10 shelves on the Antarctic Peninsula to have shrunk or collapsed. The ice bridge anchoring the Wilkins was 62 miles wide in 1950.

Global warming is also changing the size and behavior of polar bears. "We don't have hard evidence about climate change but we have evidence about the numerous symptoms of climate change on polar bears," said Andrew Derocher, chairman of the *Polar Bear Specialist Group*, at a gathering of top experts in Norway in mid March. Experts agree that polar bears are not growing as large as they used to — females are lighter in weight and shorter than they were in 1980. This may, in part, be because the ice season is now three weeks shorter than it was 30 years ago in places like Canada's Hudson Bay, truncating the bears' essential seal-hunting season. Melting ice also means that the bears, which number 20,000 to 25,000 worldwide, have to cross greater distances to reach frozen hunting grounds. This is impairing the bears' health, impacting their reproductive capacities and the cubs' chances of survival, experts said. Climate change also seems to be altering the bears' behavior, with observers noting several recent incidents of cannibalism in Alaska.

But despite these observations, Interior Secretary Ken Salazar announced in early May that he will retain the Bush administration's controversial rule on polar bear protections, rejecting special authority given to him by Congress to overturn it. While keeping the rule — which limits use of the Endangered Species Act (ESA) to curb emissions of greenhouse gases (GHGs) — Salazar held open the possibility of adding habitat protections for the polar bear later. Interior will now be forced to defend the rule in court because environmental groups that sued to overturn the rule said that they now plan to press their lawsuit. "Thank God for the courts," said Bill Snape, an attorney with the *Center for Biological Diversity*. We feel pretty good that we're going to knock out that rule in litigation; it will just take more time and spend everyone's resources." Even though the Obama administration has pledged to address climate change, Salazar said such action should not come through the ESA — the same position taken by the Bush administration.

Meanwhile, the ice that covers the Great Lakes also has been diminishing by 1.3 percent per year for the past three decades, scientists say. In total, they calculate winter ice has declined by 30 percent. But despite the overall trend, this winter's ice was more expansive and extended later into the spring than usual. The variation, according to a trio of scientists at the *Great Lakes Environmental Research Laboratory* (GLERL) in Ann Arbor, MI, is because the lakes are affected both by global patterns and regional cycles, such as the one extending ice this winter. "We are seeing the impact of global warming here in the Great Lakes — but the natural variability is at least as large a factor," said Jia Wang, an ice research climatologist at the GLERL offices.

Coral reef fossils in Mexico demonstrate that rapid jumps in sea level are possible and have happened before, scientists say. About 121,000 years ago, sea levels jumped 6.5-10 feet within 50 to 100 years, according to a study published in mid April in the journal *Nature*, and melting ice caps could cause the spike to repeat, scientists said. "The potential for sustained rapid ice loss and catastrophic sea-level rise in the near future is confirmed by our discovery of sea-level instability" in that period, the authors wrote. The scientists say the fossil record indicates many reefs died because sea levels rose too quickly for them to build themselves toward surface sunlight. When growth did resume, it shifted inward toward areas that previously had been dry land. Other researchers are questioning the study's assumptions and methodology, saying the study leaves open the possibility of a dramatic sea level rise but does not prove the case.

In the Northeast U.S. , two natural phenomena are already causing sea levels to rise faster than almost anywhere else on earth. First, the mid-Atlantic is sinking, which is an echo of the last ice age, when huge glaciers pushed down on the Earth's crust to the north. The land along the mid-Atlantic was lifted like the other end of a seesaw, and now it's slowly dropping. Second, research presented in early March shows that climate change will alter the dynamics of the ocean, weakening a system of currents that pulls water away from the mid-Atlantic shore. As a result state and local governments are spending millions to cope with rising sea levels, and many towns whose economies are built around beaches are watching as their beaches wash out to sea. Virginia and Maryland continue to build bulkheads to prevent seawater from overrunning their towns, but that means the death of some beaches as the bulkheads prevent the ocean from moving sand to higher ground. Recent estimates are predicting average sea level rise will be close to 3 feet by 2100.

Scientists are also now saying that warmer than usual waters in the Atlantic in 2005 were responsible for severe storms — including Hurricane Katrina — and a drought in the Amazon rainforest. Mild waters in the Atlantic led to arid conditions in the southern and western parts of the Amazon, killing many young trees and slowing the growth of older ones, researchers found. The results of their study — "*Drought Sensitivity of the Amazon Rain Forest*" — appear in the latest edition of *Science*. The drought caused the rainforest, usually a carbon sink, to emit 900 million tons of carbon dioxide ($CO_2$), according to University of Leeds ecologist Oliver Phillips. Scientists are studying whether the trees quickly returned to their usual role of absorbing carbon after the drought. The study raises questions about how current climate change will affect forests' ability to capture future emissions. Worldwide, an area of forests equivalent to the size of Washington, D.C., disappears every day.

A report released in mid March during a climate conference in Copenhagen suggests that global warming could provide the "killer blow" to trees in the vast Amazon forest, not deforestation. The report forecasts what would happen under a 2-, 3-, and 4 $^{o}$C rise in world temperatures. A 4 $^{o}$C rise would result in the deaths of 85 percent of trees, while 20-40 percent would die with a 2 $^{o}$C rise, the report says. "The impacts of climate change on the Amazon are much worse than

we thought," said Vicky Pope, of the *Met Office's Hadley Center*, which carried out the study. "As temperatures rise quickly over the coming century the damage to the forest won't be obvious straight away, but we could be storing up for trouble for the future."

Climate scientists are also saying that Australia, suffering from drought and fires in the south and monsoons and mosquito epidemics in the north, is experiencing the early effects of global warming and that its troubles could be a preview for maladies coming to nations worldwide. "Something is happening in Australia," firefighter Dan Condon of the Melbourne Metropolitan Fire Brigade wrote in an open letter after watching more than 4,000 gray-headed flying foxes drop dead out of a Melbourne park's trees during a February heat wave. Also in rural areas, land that once grew crops has desiccated, and as the land dries, the people who depend on it are also suffering. In rural Victoria, an average of one rancher or farmer per week commits suicide, usually by hanging, public health officials say. The continent's natural wonders are withering as well. Higher ocean temperatures are bleaching the Great Barrier Reef, and the U.N. *Intergovernmental Panel on Climate Change* (IPCC) projects it will be "functionally extinct" by 2050.

Snowpacks from the San Juan Mountains to the Front Range of the Rockies melted early this year according to Tom Painter, director of the Snow Optics Laboratory at the University of Utah and a leading expert on snowmelt. The rapid melting is linked to a spate of intense dust storms, accelerated by a warming climate, that kick up dirt and sand that in turn are deposited on snow-topped mountains. The dust darkens the snow, allowing the surface to absorb more heat from the sun. This warms the snow — and the air above it — significantly, studies show. The problem has been particularly acute in the semiarid Colorado Plateau region encompassing parts of Utah, Colorado, New Mexico and Arizona. An unprecedented 12 large dust storms have occurred so far this year in the region, and at least two more are projected in the coming months, officials say, worrying them about drastic water shortages by late summer.

Global warming has now surpassed infectious disease, poverty and water shortages as the largest threat to public health, according to a new study from climatologists and medical professionals. While poorer countries will be the first to feel the effects, the problem will later cause real and lasting damage in wealthier Western nations, said Anthony Costello, a pediatrician at University College London, which published the report in mid May in *The Lancet* journal. "Climate change is a health issue affecting billions of people, not just an environmental issue about polar bears and deforestation," Costello said. "We are setting up a world for our children and grandchildren that may be extremely frightening and turbulent." The researchers said disruptions in climate could cause food, water and energy shortages and population shifts, resulting in wars over increasingly scarce resources.

Climate change also has the potential to significantly worsen smog pollution in many regions, U.S. EPA said in their *Global Change Research Program* report released in mid April. Ozone is formed by a chemical reaction between nitrogen oxides and volatile organic compounds in the presence of sunlight. Ground-level ozone — which can come from tailpipes, coal-fired utilities and other industries — can trigger health problems including chest pain, coughing, throat irritation and congestion, according to the EPA. It can also damage vegetation and ecosystems. Climate change has the potential to boost ozone concentrations in extreme years and increase the number of days with dangerous air quality levels, the report says. However, climate change is expected to cause a decrease in ozone concentrations in some remote regions with low concentrations of nitrogen oxides, such as oceans, the report says, because areas with more water vapor increase ozone destruction.

Meanwhile, a research team has discovered that plants are able to absorb and convert $CO_2$ more efficiently under polluted and hazy skies. The findings from the *Center for Ecology & Hydrology*, the *MET Office Hadley Centre*, *ETH Zurich* and the University of Exeter were published in mid April in *Nature* magazine. The study revealed that clouds and microscopic airborne particles scatter sunlight, meaning plants are exposed to more light for photosynthesis and growth, and are able to extract significantly more heat-trapping $CO_2$from the atmosphere. "Surprisingly, the effects of atmospheric pollution seem to have enhanced global plant productivity by as much as a quarter from 1960 to 1999," said lead author Lina Mercado, from the *Center for Ecology & Hydrology*. "This resulted in a net 10 percent increase in the amount of carbon stored by the land once other effects were taken into account."

Some climate scientists and activists such as NASA's Dr. James E. Hansen are warning that we may be nearing a "tipping point" after which the disasters of global warming will be irreversible, but others say the term could be misleading and fuel a public backlash against actions to prevent global warming. The theory behind tipping points is that temperature increases and other products of climate change will set off positive-feedback cycles that cannot be undone through future action. The term reminds the public of the immediacy of the climate crisis and some say this is more likely to spur action. But critics say the specific thresholds are difficult, if not impossible, to determine. They say public support for action on global warming will be undermined unless scientists are honest about what they do and do not know. "I think a lot of this threshold and tipping point talk is dangerous," said Kenneth Caldeira, an earth scientist at Stanford University and the *Carnegie Institution* and an advocate of swift action to reduce $CO_2$ emissions. "If we say we passed thresholds and tipping points today, this will be an excuse for inaction tomorrow," he said.

And speaking of a desire for inaction, more than 100 scientists, including Canadian government scientists and university professors, signed a full-page newspaper ad denouncing as "untrue" a statement President Barack Obama made about climate change last November. "Few challenges facing America and the world are more urgent than combating climate change — The science is beyond dispute and the facts are clear," Obama said. But the ad by the *Cato Institute*, a think tank that advocates against government intervention in the free markets and people's individual lives, denounced Obama's statement. The ads ran in late March in *The New York Times*, *The Washington Post*, *The Washington Times*, *The Chicago Tribune* and *The Los Angeles Times*. They cite evidence from four scientific papers that there is no significant change in the climate. "Mr. President, your characterization of the scientific facts regarding climate change and the degree of certainty informing the scientific debate is simply incorrect," the ads said. Patrick Michaels, senior fellow of environmental studies at the *Cato Institute*, said the ads are intended to open up debate.

The chairman of the Republican National Committee denied the existence of global warming on a nationally syndicated radio show in early March. Filling in for the conservative talk-show host of "*Morning in America*," Michael Steele agreed with a caller who mocked the concept of global warming. "We are cooling. We are not warming," Steele said. "The warming you see out

there, the supposed warming, and I am using my finger quotation marks here, is part of the cooling process. Greenland, which is now covered in ice, it was once called Greenland for a reason, right? Iceland, which is now green. Oh I love this. Like we know what this planet is all about. How long have we been here? How long? No[t] very long."

For more than a decade, the fossil-fuel industry group the *Global Climate Coalition* (GCC) led an aggressive lobbying and public relations campaign against the notion that GHG emissions could lead to global warming. But a document filed in a federal lawsuit now shows that the coalition's own scientific and technical experts were advising that the scientific evidence that GHGs contribute to global warming was irrefutable. "The scientific basis for the Greenhouse Effect and the potential impact of human emissions of GHGs such as $CO_2$ on climate is well established and cannot be denied," the experts wrote in an internal report compiled for the coalition in 1995. Environmentalists have long said the industry purposely ignored scientific evidence for the sake of the companies' fight against curbing GHG emissions, and in 1997, the year the *Kyoto Protocol* international climate agreement was negotiated, the coalition — which was financed by large corporations and trade groups representing the oil, coal and auto industries — had a $1.68 million budget, according to documents obtained by environmental groups. William O'Keefe, former leader of the GCC, said the group's leadership had not been aware of a gap between the public campaign and scientific advisers' views. The coalition's leaders had felt that uncertainty in the scientific community justified a cautious approach to the issue, he said.

Meanwhile, nearly 2000 leading scientists attending a mid March meeting in Copenhagen warned that global warming is accelerating beyond the worst predictions and threatening to trigger "irreversible" climate shifts on the planet. Saying there's no excuse for inaction, the climate researchers urged policy-makers to "vigorously" implement the economic and technological tools available to cut emissions of heat-trapping GHGs. Their stark message came at the end of a three-day conference aimed at updating the findings of a 2007 IPCC report. "The worst-case IPCC scenario trajectories (or even worse) are being realized," the scientists said in a statement. "There is a significant risk that many of the trends will accelerate, leading to an increasing risk of abrupt or irreversible climatic shifts." The climate change panel predicted a sea level rise of 7 to 23 inches by the end of the century, which could flood low-lying areas and force millions to flee. But more recent research presented at the conference suggested that melting glaciers and ice sheets could help push the sea level up at least 20 inches, and possibly as much as 39 inches, or about 1 meter. "Recent observations show that societies are highly vulnerable to even modest levels of climate change with poor nations and communities particularly at risk," the statement said. It noted that policy-makers already have a range of tools to mitigate global warming. "But they must be vigorously and widely implemented to achieve the societal transformation required to de-carbonize economies," it said. The conclusions of the congress will be presented to politicians when they meet in Copenhagen in December to discuss a new global agreement on GHG emissions to replace the *Kyoto Protocol*, which expires in 2012.

As to the official U.S. position on global warming, President Obama told U.N. Secretary-General Ban Ki-moon in mid March that the U.S. would move forward on global warming action despite the economic crisis. Obama, speaking to Ban at the White House, said the potential ecological damage from climate change would have a greater impact on the world economy if action isn't taken.

Unfortunately, official data indicate emissions of heat-trapping GHGs from industrialized countries rose nearly 1 percent in 2007. U.S. emissions rose by 1.4 percent and we emitted the equivalent of about 7,125 million metric tons of $CO_2$. Overall, U.S. emissions climbed 17.1 percent between 1990 and 2007. Fuel combustion remained the leading U.S. source, producing 94.4 percent of our $CO_2$ emissions in 2007. Increases in Canada and Japan also contributed to the emissions rise, and nations that have ratified the *Kyoto Protocol* increased emissions by about 0.1 percent in 2007, the data show. "The numbers are ... a bit depressing," said Knut Alfsen, research director at the Oslo-based *Center for International Climate and Environmental Research*. The numbers indicate that powerful economies have not been able to shake their dependence on fossil fuels. "It shows that we are not able to de-link economic growth from emissions," he said. The biggest net decrease in emissions was from Germany, which slashed 23.9 metric tons of emissions, or 2.4 percent. Largest percentage decreases came from Liechtenstein and Denmark, which erased 10.8 and 6.2 percent of their annual outputs respectively, much of that riding on the successful investment in renewable wind power.

Big cities have always been vilified as major GHG polluters even though their per-capita emissions are often a fraction of the national average, according to a study by the *International Institute for Environment and Development*. "Although the concentration of people, enterprises, vehicles and waste in cities is often seen as a 'problem,' high densities and large population concentrations can also bring a variety of advantages for ... environmental management," the report said. In 2006, per-capita emissions in London were only 6.18 tons per person, or 55 percent of the United Kingdom's 2004 per-capita average of 11.19 tons. Per-capita emissions in New York City were 7.1 tons in 2005. U.S. per capita levels were more than triple that at 23.92 in 2004. The report noted the density of the city's buildings, the small dwelling sizes and the reliance on public transportation as reasons for the large difference.

Meanwhile, in the villages of developing countries, where $CO_2$ emissions are close to zero, soot from primitive cooking stoves is emerging as a major and previously unappreciated source of global climate change. Recent studies estimate that soot — also called black carbon — is responsible for 18 percent of the planet's warming, second only to $CO_2$, which is responsible for 40 percent. So replacing primitive cooking stoves with modern versions that emit far less soot could be a cheap, short-term way to significantly rein in global warming as nations tackle the more difficult challenge of enacting programs and developing technologies to curb $CO_2$ emissions. Even better, reducing soot could have a rapid effect as black carbon stays in the air for only a few weeks, as opposed to $CO_2$, which lingers in the atmosphere for years. The United Nations and the federal government are now trying to determine how to include black carbon in climate change programs.

NASA and *Cisco Systems Inc.* announced in early March that they are developing "*Planetary Skin*" — a marriage of satellites, land sensors and the Internet — to capture, analyze and interpret global environmental data. Their online collaborative platform will process data from satellite, airborne and sea- and land-based sensors around the globe. The goal is to translate the data into information that governments and businesses can use to mitigate and adapt to climate change and manage energy and natural resources more effectively, NASA and *Cisco* officials explained. "There are a lot of data out there, but we have to turn that into information," explained S. Pete Worden, director of NASA's *Ames Research*

*Center*. "What we are trying to do is use Cisco's expertise in data handling, put our data in there and explain what's really going on in the rainforests." Indeed, the partners' first project, "*Rainforest Skin*," will focus on integrating a comprehensive sensor network in rainforests around the world. The project will examine how to capture, analyze and present information about the changes in the level of $CO_2$ in the Amazon and other areas. Information will be posted on the project's Web site. Other projects during the next 18 months will look at changes in land use and water, Worden noted.

After an era of declining production, the U.S. is suddenly swimming in natural gas, leaving open the possibility of a political shift toward putting the resource on the front lines of the fight against climate change. A massive field discovered in northern Louisiana could hold more than 200 trillion cubic feet of natural gas — the equivalent of 33 billion barrels of oil, or 18 years' worth of current U.S. oil production. Huge new natural gas fields have also been discovered in Texas, Arkansas and Pennsylvania, with one industry-backed study estimating the U.S. has yet to tap more than 2,200 trillion cubic feet of gas, enough to satisfy nearly 100 years of the country's natural-gas demand.

Finally, a controversial video highlighting the environmental consequences of Americans' high level of material consumption has been seen by millions on the Internet and is now being shown in classrooms nationwide. "*The Story of Stuff*" is a 20-minute video created by Annie Leonard, an environmental activist and former *Greenpeace* employee. The video traces material goods from resource extraction to production, consumption and disposal, highlighting the environmental and social consequences at every step. More than 7,000 schools, churches and other organizations have ordered the DVD, and hundreds of teachers have written to Leonard, saying they have assigned their students to view it. But not everyone loves the video, which blasts the federal government for military spending and is highly critical of large corporations. The Missoula County, Montana school board said screening the video infringed on academic freedom after a parent said its message was anticapitalist. But other teachers say the video is a welcome update to outdated textbooks that do not reflect recent discoveries about the threats of climate change and human contributions to it. "Frankly, a lot of the textbooks are awful on the subject of the environment," said Bill Bigelow, the curriculum editor of *Rethinking Schools*, a quarterly magazine that has promoted "*The Story of Stuff*."
Sources: Alister Doyle, *Reuters*, 4/6/09; Pierre-Henry Deshayes, *Agence France-Presse*, 3/19/09; Michael Scott, *Cleveland Plain Dealer*, 3/23/09; Seth Borenstein, *AP/San Francisco Chronicle*, 3/15/09; *Land Letter*, 5/15/09; Cortez/Morales, *Bloomberg*, 5/14/09; David A. Fahrenthold, *Washington Post*, 3/19/09; Andrew C. Revkin, *New York Times*, 3/29, 4/16 and 4/24/09; David Adam, *London Guardian*, 3/11/09; Jeremy van Loon, *Bloomberg*, 3/6/09; Julie Cart, *Los Angeles Times*, 4/9/09; *CBC News*, 3/30/09; Eoin O'Carroll, *Christian Science Monitor*, 3/18/09; Jan M. Olsen, *AP/AOL-News*, 3/12/09; Varner/Nichols, *Bloomberg*, 3/10/09; Szabo/Doyle, *Reuters*, 4/24/09; Michael Szabo, *Reuters*, 3/23/09; Henry Fountain, *New York Times*, 3/31/09; Elisabeth Rosenthal, *New York Times*, 4/16/09; *CNN*, 4/22/09; Ben Casselman, *Wall Street Journal*, 3/30/09; Jonathan Weisman, *Wall Street Journal*, 5/12/09; Leslie Kaufman, *New York Times*, 5/11/09; Robin Bravender, *Greenwire*, 3/4 and 4/17/09; Michael Burnham, *Greenwire*, 3/3/09; Allison Winter, *Greenwire*, 5/8/09; and *Greenwire*, 3/6, 3/11, 3/12, 3/16, 3/19, 3/23, 3/30, 3/31, 4/6 4/9, 4/16, 4/23, 4/24, 4/30, 5/12, 5/14 and 5/15/09

## Meetings of Interest

**July 12-17:** International Society for River Science (ISRS), St. Petersburg, FL. See: www.stpt.usf.edu/coas/espg/riverconference/schedule.asp

**July 20-24:** 3rd National Conference on Ecosystem Restoration, Westin Bonaventur, Los Angeles, CA. See: www.conference.ifas.ufl.edu

**July 22-27:** 33rd Annual AFS Larval Fish Conference and American Society of Icthy ologists and Herpetologists Conference, Portland, OR. See: www.dce.k-state.edu/conf/jointmeeting

**July 29-30:** MICRA Executive Board Meeting, La Crosse, WI. See: http://wwwaux.cerc.cr.usgs.gov/MICRA

**Aug. 10-13:** Visions of a Sustainable Mississippi River, Collinsville, IL. Contact: ngrrec@lc.edu

**Aug. 30 - Sept. 3:** 139th Annual Meeting of the American Fisheries Society, Nashville, TN. See: www.fisheries.org

**Aug. 30 - Sept. 3:** Monitoring, Characterizing and Managing Big River Fish Communities - 1 -1.5 day symposium to be held in conjunction with the 139th Annual AFS Meeting. Sponsored by ORSANCO and the Electric Power Research Institute. Contact: ddixon@epri.com.

**Sept. 29-30:** Mississippi River Basin Panel (MRBP) on Aquatic Nuisance Species, Sheraton Station Square, Pittsburgh, PA. Contact: MRBP@fws.gov

**Nov. 9-12:** 2009 Annual American Water Resources Association Annual Water Resources Conference,, Red Lion Inn on Fifth Ave., Seattle, WA. See: www.AWRA.org

## Congressional Action Pertinent to the Mississippi River Basin

**Climate Change**

**S. 137.** Brown (D/OH). Creates jobs and reduces U.S. dependence on foreign and unsustainable energy sources by promoting the production of green energy, and for other purposes.

**H. R. 232.** Baldwin (D/WI) and 3 Co-Sponsors. Provides for creation of a Federal greenhouse gas registry, and for other purposes.

**H. R. 391.** Blackburn (R/TN) and 9 Co-sponsors. Amends the Clean Air Act to provide that greenhouse gases are not subject to the Act, and for other purposes.

**H. R. 594.** Stark (D/CA) and McDermott (D/WA) Amends the Internal Revenue Code of 1986 to reduce emissions of carbon dioxide by imposing a tax on primary fossil fuels based on their carbon content.

**H. R. 1666.** Doggett (D/TX) and 21 Co-sponsors. Amends the Internal Revenue Code of 1986 to establish an auction and revenue collection mechanism for a carbon market that ensures price stability with environmental integrity.

**H. R. 1760.** Inslee (D/WA) and 2 Co-sponsors. Mitigates the effects of black carbon emissions in the U.S. and throughout the world.

**H. R. 1862.** Van Hollen (D/MD) and 3 Co-sponsors. Caps the emissions of greenhouse gases through a requirement to purchase carbon permits, to distribute the proceeds of such purchases to eligible individuals, and for other purposes.

**H. R. 2192.** Grijalva (D/AZ) and 9 Co-sponsors. Establishes an integrated Federal program to protect, restore, and conserve the Nation's natural resources in response to the threats of climate change and ocean acidification.

**Conservation**

**H. R. 404.** Grijalva (D/AZ) and 23 Co-Sponsors. Establishes the National Landscape Conservation System, and for other purposes.

**H. R. 631.** Matheson (D/UT). Increases research, development, education, and technology transfer activities related to water use efficiency and conservation technologies and practices at the U.S. EPA.

**H. R. 1080.** Bordallo (D/GU). Strengthens enforcement mechanisms to stop illegal, unreported, and unregulated fishing, and for other purposes.

**H. R. 1328.** Bishop (D/NY) and 2 Co-sponsors. Amends the Internal Revenue Code of 1986 to allow an unlimited exclusion from transfer taxes for certain farmland and land of conservation value, and for other purposes.

**Endangered Species Act (ESA)**

**S. 724.** Barrasso (R/WY) and Vitter (R/LA). Amends the ESA to temporarily prohibit the Secretary of the Interior from considering global climate change as a natural or manmade factor in determining whether a species is a threatened or endangered species, and for other purposes.

**Energy**

**S. 531.** Bingaman (D/NM) and Murkowski (R/AK). Provides for the conduct of an in-depth analysis of the impact of energy development and production on the water resources of the U.S., and for other purposes.

**H. R. 2227.** Murphy (R/PA) and 6 Co-sponsors. Greatly enhances America's path toward energy independence and economic and national security, to conserve energy use, to promote innovation, to achieve lower emissions, cleaner air, cleaner water, and cleaner land, and for other purposes.

**H. R. 2300.** Bishop (/UT) and 34 Co-sponsors. Provides the U.S. with a comprehensive energy package to place Americans on a path to a secure economic future through increased energy innovation, conservation, and production.

**Federal Water Pollution Control Act (FWPCA)**

**S. 696.** Cardin (D/MD) and Alexander (R/TN). Amends the FWPCA to include a definition of fill material.

**S. 787.** Feingold (D/WI) and 23 Co-sponsors. Amends the FWPCA to clarify the jurisdiction of the U.S. over waters of the U.S.

**S. 1005.** Cardin (D/MD) and 3 Co-sponsors. Amends the FWPCA and the Safe Drinking Water Act to improve water and wastewater infrastructure in the U.S.

**H. R. 700.** McNerney (D/CA) and Tauscher (D/CA). Amends the FWPCA to extend the pilot program for alternative water source projects.

**H. R. 1262.** Oberstar (D/MN) and 9 Co-sponsors. Amends the FWPCA to authorize appropriations for State water pollution control revolving funds, and for other purposes.

**Invasive Species**

**S. 237.** Levin (D/MI) and 4 Co-Sponsors and **H. R. 500.** Ehlers (R/MI) and 20 Co-Sponsors. Establishes a collaborative program to protect the Great Lakes, and for other purposes.

**S. 462.** Boxer (D/CA) and Vitter (R/LA). Amends the Lacey Act Amendments of 1981 to prohibit the importation, exportation, transportation, and sale, receipt, acquisition, or purchase in interstate or foreign commerce, of any live animal of any prohibited wildlife species, and for other purposes.

**H. R. 48.** Biggert (R/IL). Amends the Lacey Act, to add certain species of carp to the list of injurious species that are prohibited from being imported or shipped.

**H. R. 51.** Kirk (R/IL). Directs the Director of the USFWS to conduct a study of the feasibility of a variety of approaches to eradicating Asian carp from the Great Lakes and their tributary and connecting waters.

**H. R. 669.** Bordallo (D/GU) and 9 Co-Sponsors. Prevents the introduction and establishment of nonnative wildlife species that negatively impact the economy, environment, or other animal species or human health, and for other purposes.

**Mining**

**S. 140.** Feinstein (D/CA) and **H. R. 699**. Rahall (D/WV) and 20 Co-sponsors. Modifies the requirements applicable to locatable minerals on public domain lands, consistent with the principles of self-initiation of mining claims, and for other purposes.

**S. 409.** Kyl (R/AZ) and McCain (R/AZ). Secures Federal ownership and management of significant natural, scenic, and recreational resources, to provide for the protection of cultural resources, to facilitate the efficient extraction of mineral resources by authorizing and directing an exchange of Federal and non-Federal land, and for other purposes.

**H. R. 493.** Rahall (D/WV). Directs the Secretary of the Interior to promulgate regulations concerning the storage and disposal of matter referred to as ``other wastes'' in the Surface Mining Control and Reclamation Act of 1977, and for other purposes.

**National Environmental Policy Act (NEPA)**

**H. R. 585.** Lee (D/CA) and 5 Co-sponsors. Directs the President to enter into an arrangement with the National Academy of Sciences to evaluate certain Federal rules and regulations for potentially harmful impacts on public health, air quality, water quality, plant and animal wildlife, global climate, or the environment; and to direct Federal departments and agencies to create plans to reverse those impacts that are determined to be harmful by the National Academy of Sciences.

**H. R. 996.** Nunes (R/CA) and McCarthy (R/

CA). Temporarily exempts certain public and private development projects from any requirement for a review, statement, or analysis under the NEPA of 1969 (42 U.S.C. 4321 et seq.), and for other purposes.

**Public Lands**

**S. 22.** Bingaman (D/NM). Designates certain land as components of the National Wilderness Preservation System, to authorize certain programs and activities in the Department of the Interior and the Department of Agriculture, and for other purposes.

**S. 32.** Spector (R/PA) and Casey (D/PA). Requires FERC to hold at least one public hearing before issuance of a permit affecting public or private land use in a locality.

**S. 452.** Crapo (R/ID) and Risch (R/ID) and **H. R. 2025.** Minnick (D/ID) and Simpson (R/ID). Ensures public access to Federal land and to the airspace over Federal land.

**H. R. 1041.** Melancon (D/LA). Directs the Secretary of the Interior to study the suitability and feasibility of designating sites in the Lower Mississippi River Area in the State of Louisiana as a unit of the National Park System, and for other purposes.

**Public Service**

**S. 277.** Reid (D/NV) and 32 Co-sponsors. Amends the National and Community Service Act of 1990 to expand and improve opportunities for service, and for other purposes.

**H. R. 1612.** Grijalva (D/AZ) and Rahall (D/WV). Amends the Public Lands Corps Act of 1993 to expand the authorization of the Secretaries of Agriculture, Commerce, and the Interior to provide service-learning opportunities on public lands, help restore the Nation's natural, cultural, historic, archaeological, recreational, and scenic resources, train a new generation of public land managers and enthusiasts, and promote the value of public service.

**Water Quality**

**H. R. 135.** Linder (R/GA) and 3 Co-Sponsors. Establishes the 21st Century Water Commission to study and develop recommendations for a comprehensive water strategy to address future water needs.

**H. R. 276.** Miller (R/MI). Directs the Administrator of the USEPA to convene a task force to develop recommendations on the proper disposal of unused pharmaceuticals, and for other purposes.

**H. R. 631.** Matheson (D/UT). Increases research, development, education, and technology transfer activities related to water use efficiency and conservation technologies and practices at the USEPA.

**H. R. 1145.** Gordon (D/TN). Implements a National Water Research and Development Initiative, and for other purposes.

**Water Resources**

**H. R. 172.** Salazar (D/CO) and Markey (D/CO). Provides for the construction of the Arkansas Valley Conduit in CO.

**S. 637.** Baucus (D/MT) and Tester (D/MT). Authorizes the construction of the Dry-Redwater Regional Water Authority System in the State of Montana and a portion of McKenzie County, North Dakota, and for other purposes.

Sources: http://www.gpoaccess.gov/bills/index.html; and http://thomas.loc.gov/cgi-bin/thomas

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***River Crossings***

*Mississippi Interstate Cooperative Resource Association*
*9053 Route 148*
*Marion, IL 62959*

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