



*Eluid Martinez, Commissioner
Carrie C. Kemper, Bureau Editor*

Randle Named Reclamation's Engineer of the Year

Theresa Taylor and C. Ted Yang

Timothy J. Randle, a hydraulic engineer for the Technical Service Center in Denver, Colorado, is Reclamation's Engineer of the Year. Technical Service Center Director **Felix Cook** presented Randle his award at the National Society of Professional Engineers Awards Luncheon on February 21. Randle, who was accompanied at the luncheon presentation by his wife Kathy, also is one of the 10 finalists for the National Society of Professional Engineers' Federal Engineer of the Year Award.

Randle has been recognized for his management of the interdisciplinary, interagency team that produced the environmental impact statement for the operation of Glen Canyon Dam and its impacts on the river-related ecosystem of the Grand Canyon.

Randle also managed the interagency team investigating sediment management alternatives for the Elwha River Restoration Project in Olympic National Park, Washington.

Interior is proposing to purchase and remove two privately-owned hydroelectric dams on the Elwha River in order to restore the river's ecosystem and famous salmon runs. Randle



1996 Reclamation Engineer of the Year Tim Randle, seated with his wife, Kathy, and flanked by supervisor C. Ted Yang.

conducted a study showing that sediment management costs associated with removing the dams and the nearly 18 million cubic yards of sediment trapped behind them would be only \$2 million compared with previous estimates of \$50 million to \$200 million.

Denver Awards Ceremony Honors Bureau Standouts

Jim Malila, Reclamation Service Center Director, welcomed **Commissioner Eluid Martinez** to the Denver Awards Ceremony held on March 12. The Commissioner kicked off the ceremony by thanking Reclamation employees for the work they do every day and reminding everyone of how important it is to find a balance in one's work life and personal life.

Dam Safety Office Chief **Dave Achterberg** presented an award to **Mark Baker** for his work on the Dam Safety Peer Review process of the other Department agencies and his work with the Bureau of Indian Affairs. **Jan Henry**, disaster response program manager for the Federal Emergency Management Agency, presented awards to Team Leader **Jeff Hart**, **Jerry Sharman**, **Fred Tan**, and **Bob Davis** for their work in New York for FEMA.

Austin Burke, director of Program Analysis, presented awards to the following people who worked on the Environmental Impact Statement for the Reclamation Reform Act: **Bob Black**, **Roger Burnett**, **Richard Crysdale**, **Darrell Dyke**, **Robert George**, **Christine Pfaff**, **Richard Gaines**, **Val Rohde**, **Rusty Schuster**, and **Al Kashinski** of the Solicitor's Office.

Awards also went to **Joe Brummer**, **Les Haussler**, **Kate Puckett**, and **Don Treasure**. **Joy Nelson** received an award for her outstanding performance as a secretary in the Environmental Group, **Dave Morrow** for his work on the Western Rivers Aquatic Ecosystems in the Reclamation Report, and **Kathy Marsh** for initiating and implementing the Curb Stencil Program.

Margaret Sibley, the director of Human Resources presented Women in Science awards to **Christi Young**, **Paula Makar**, **Cassie Klumpp**, and **Trudy Germann**. Awards also went to **Alice Comer**, **Billy Cummins**, and **Jan Oliver** who were not present.

The Commissioner closed the program by again thanking everyone for their dedication to Reclamation's future. "Keep up the good work," he said, "It makes my job a lot easier."



Environmental Education Program Coordinator Kathie Marsh receives a Quality Award from Austin Burke, left, while Commissioner Martinez looks on.

Engineers Cheer as Bridges Collapse

Bob Bell, Reclamation Service Center

Hundreds cheered as the intricately constructed bridges succumbed to mounting pressure and crumpled under the strain. Even the designers and builders, who put in many hours of hard work on their spans, applauded.

More than 100 high school students applied their math and physics skills to compete in the 30th Annual Colorado High School Bridge Building Contest. The Grand Prize winner was **Jacob Ely**, who attends Cheyenne Mountain High School in Colorado Springs. His mighty 28.40 gram (1 ounce) bridge withstood 175.12 kilograms of pressure from a Bureau of Reclamation hydraulic press, for an efficiency rating of 6166.30 times its own weight.

This year's top winner from Region 1 was **Chad Meyers** from Ponderosa High School. His bridge, weighing only 26.71 grams (less than an ounce), was able to withstand 144.32 kilograms (about 319 pounds), or 5403.37 times its own weight before it buckled.

For the past 30 years during National Engineer's Week, students have come together to compete in this annual event hosted by the Bureau of Reclamation, Professional Engineers of Colorado, and the Colorado Department of Education. The purpose of the contest is to encourage students to pursue careers in the engineering field. Finalists from individual school competitions came to Reclamation's Research Laboratory on February 22 to compete in the statewide competition.

This year the specifications called for a model of a pedestrian bridge, weighing no more than 30 grams (equal to the weight of about 6 nickels). The students were allowed to use only bass wood, glue, and non-metallic cables. The top three winners from each school competition were eligible to compete in the state competition. More than 120 students competed from 54 high schools throughout Colorado, with the top two winners from each region eligible to compete in the national competition in Chicago in May.



Civil Engineer Jack Touseull presents the first place trophy to high school student Chad Meyers. Photo by Bonnie Harper

Upon arrival at the contest site, the students had to register, weigh, measure and, if necessary, make minor modifications and repairs to their bridges before starting the competition. Then the bridges were placed in a hydraulic press and crushed, with their efficiency measured by computer. Maximum efficiency is calculated by the maximum load carrying capacity compared to the weight of the bridge.

...And Try Their Luck in Nevada

Steve Belew, Lower Colorado Region

The best bridge in the eighth annual Southern Nevada Student Model Bridge Building Contest was constructed by a student from Basic High School. The 12-inch, one ounce structure had an efficiency rating of 4972 and supported 261 pounds.

The contest, held at the University of Nevada—Las Vegas on February 22, was sponsored by the American Society of Civil Engineers and supported by Reclamation, the Clark County School District, the University, and several local engineering firms. **Paul Matuska** of the River Operations Group was co-chairperson of the event along with **Wendy Fenner** of a local engineering consulting firm.

This year, 14 high schools, 11 middle schools and 13 elementary schools competed for prizes and trophies in their respective divisions with a total of 209 bridges entered. The annual contest gives students an opportunity to apply science theories learned in the classroom by planning, designing, and constructing a project to given specifications. Using materials from an official kit, students must design and construct a wooden bridge that is 300 millimeters (11.81 inches) in length and weighs no more than 25 grams (less than one ounce). On the day of the competition, the bridges were weighed, tested to failure under a load, and rated by their efficiency, which is the load carried divided by bridge weight.



The diving platform in the foreground provided life support to divers while they installed the temperature control device under water at Shasta Dam. On the left are the low-level intake structures. The three steel frames to their right are part of the shutter structure.



The efforts of key Phoenix Area Office staff to maintain good relations between the National Federation of Federal Employees and management during a major reorganization earned the runner-up award from the Labor-Management Partnership Council. From left, Employee Relations Specialist Charlotte Crawford (retired March 30), President NFFE Local Union 376 Jerry Mantzey, Area Manager Dennis Schroeder, former Assistant Area Manager Larry Morton, and former Resources Management Specialist Eileen Nistetter.

Shasta Dam Improvements Save Salmon, Money

Louisa Beld, Reclamation Service Center, and Richard LaFond, Mid-Pacific Region

A Reclamation team that designed a dam improvement as tall as the Statue of Liberty and as heavy as three World War II destroyers was recently recognized by Mid-Pacific Deputy Regional Director **Kirk Rodgers** for its engineering achievements. The team, from Reclamation's Technical Service Center, designed the Shasta Dam Temperature Control Device—a massive structure that allows cooler water from Shasta Reservoir to be sent down the Sacramento River for the benefit of the chinook salmon.

The steel framework, which weighs 7,935 tons, encloses the dam's five powerplant penstock intakes, permitting selective level withdrawal of reservoir water. That gives dam operators the flexibility to provide cooler water temperatures without bypassing the powerplant.

The two major components of the framework—a shutter structure and low-level intake structure—are attached to the upstream face of Shasta Dam. The shutter design is a larger scale adaptation of a concept used at the Flaming Gorge Dam in Utah.

Shasta Dam and Reservoir, located in northern California, are 15 miles north of Redding. The primary area influenced by the Shasta water releases into the Sacramento River is between Keswick Dam and Red Bluff Diversion Dam, a distance of about 60 river miles.

All runs of chinook salmon in the Sacramento River have declined because of several factors, including warm water temperatures in the upper reaches of the river. Since 1987, Reclamation has bypassed the Shasta powerplant to provide cooler water for the fish. The cost of replacing power lost by that diversion is more than \$35 million over seven years.

Despite the diversion, the winter run chinook salmon was listed as a protected species in 1989. Three years later, the Central Valley Project Improvement Act—Public Law 102—575—directed Reclamation to install and operate a Temperature Control Device at Shasta Dam to reduce the loss of salmon. Reclamation engineers had worked on the design since 1988. After assessing several alternatives, the team recommended the shutter-type device.

High level withdrawal from the reservoir is controlled by the 250-foot-wide by 300-foot-high shutter structure that projects about 50 feet upstream. The structure is open between shutter units to permit cross-flow in front of the existing trashrack frames. Three openings with hoist operated gates and trashracks on the front of each shutter unit allow selection of the reservoir withdrawal level.

To the left of the shutter is the low-level intake structure, which is 125 feet wide by 170 feet high and also projects about 50 feet upstream. It acts as a conduit extension to access the deeper, colder water near the center of the dam.

The Flaming Gorge Dam construction used a float and sink technique, but because of the huge scale of the Shasta Temperature Control Device, the contractor decided to build the device piece by piece.

For the shutter, three individual steel structures were constructed above the water and lowered into place. After these units were attached to the dam, structural members, cladding, gates, and trashracks were installed.

Because the construction called for a large amount of deep underwater work, the subcontractor used saturation diving. The divers spent up to 25 days working and living in pressurized environments. The 4-diver system required a 29-member crew to support the divers, who worked eight-hour shifts, seven days a week. The support crew worked two 12-hour shifts, seven days a week.

One diver would work four hours out of the bell, while another tended the working diver from inside the bell. Then they would switch. After eight hours the bell would be recovered and docked to the pressurized living quarters located on a barge.

The divers would then trade places with two other divers who were spending their time resting and eating their meals in the cramped living quarters. This cycle continued for 25 days. It took three days to decompress the divers before they could breathe fresh air.

Reclamation Engineers Win Dam Patent, Cash Awards

Louisa Beld and Tracy Vermeyen, Reclamation Service Center

Kathleen Frizell, Brent Mefford, and Tracy Vermeyen, and Douglas Morris recently were granted a patent from the U.S. Patent and Trademark Office for a dam spillway system to protect an embankment dam from overtopping flows.

Frizell, Mefford and Vermeyen are hydraulic engineers at Reclamation's Technical Service Center. Morris is with the Electric Power Research Institute. In accordance with Interior regulations, each received a Patent Award of \$800.

The spillway system, known as concrete step embankment protection, is comprised of a layer of free-draining gravel filter material and rows of overlapping, tapered, concrete blocks that

are assembled over the filter material in a shingle-like fashion. The rows extend from the toe of the dam to its crest.

The spillway system is designed principally to provide erosion protection from high velocity water flows for embankment dams that may be subject to overtopping. Providing protection for an embankment dam is challenging because earth materials are extremely susceptible to erosion.

The block shape of the spillway system uses hydraulic forces to enhance the spillway's stability, thereby greatly improving the overtopping protection.

The concrete blocks were designed and tested in Reclamation's Water Resources Research Laboratory and large-scale tests were performed at Colorado State University's Engineering Research Center.



Hydraulic engineers, from left, Tracy Vermeyen, Kathleen Frizell, and Brent Mefford shown with a concrete block component from their recently patented dam spillway system designed to protect an embankment dam from overtopping.

Bureau of Land Management



Sylvia Baca, Interim Director
Patrice Junius, Bureau Editor

BLM employees and volunteers install the first of three water catchments for wildlife in the BLM's Devil's Backbone Wilderness Study Area in New Mexico. Photo by Rem Hawes

Endangered Bighorn Reintroduced in New Mexico Under Grants to BLM



Rem Hawes, New Mexico State Office

BLM To Amend Hardrock Mining Regulations

Tom Gorey, Washington, D.C.

The BLM has resumed an effort begun in the late 1980s to update its hardrock mining regulations on BLM-managed public lands.

Secretary Babbitt recently directed the BLM to revise and update its 3809 hardrock regulations to ensure better protection for public lands affected by hardrock mining activities. In response to this directive, BLM Interim Director Sylvia Baca has established a task force composed of BLM and Interior Department personnel who are familiar with hardrock mining issues. The task force will develop a timeline and proposal for completing the new rule.



Sylvia Baca

In announcing the action, Baca cited a January 6, 1997, memorandum of Secretary Babbitt, who said that the time has come to resume the process of modernizing the 3809 regulations first promised at the end of the Carter Administration and begun at

the end of the Reagan Administration.

The task force will address: 1) the use of best available technologies to prevent unnecessary and undue degradation of public lands; 2) performance standards for the conduct of mining and reclamation activities; 3) alternatives to the current exemption from reclamation standards for mining operations of five acres or less; and 4) ways to improve coordination between the BLM and state regulatory programs.

"Given the significant public interest we expect in this proposal, especially from the mining industry and environmental community, we want meaningful public input," Baca said. The effort will likely require the BLM to prepare an Environmental Impact Statement. The timeframe for completing this task will be determined by procedures set forth in the National Environmental Policy Act.

Dinosaur Skin Fossil Touts New Mexico's World Class Sites

Mike O'Neill, Paleontologist, Albuquerque District

The recent discovery of dinosaur skin impressions has again put New Mexico on the map of world class fossil sites, making it one of only 14 other localities known to science where dinosaur skin impressions have been found.

More significantly, the skin impressions were discovered in association with dinosaur skeletal elements making it a rare find. This specimen—a type of duckbilled dinosaur—was recovered from the Ringbone Formation on BLM land in southwestern New Mexico and is dated from the Late Cretaceous Period—70 million years ago.

Geologic evidence at the site suggests that the dinosaur died in the shallows of a quiet tropical lakeshore. A fossil of this kind, which preserves evidence that a dinosaur was present without actually being a piece of the dinosaur itself, is called a trace fossil. All of the material will be curated at the New Mexico Museum of Natural History in Albuquerque, New Mexico.

The majority of the specimen will be displayed in an exhibit while some small portions will be taken back to the Mesa Southwest Museum of Natural History in Phoenix, Arizona, for detailed laboratory analysis to determine the exact taxonomy of the specimen.



Excavating rare dinosaur fossils on BLM land in the Southwest has made the bureau one of the most knowledgeable and skilled federal agencies in the management of fossil beds and some of the bureau's land world class fossil sites.



Currant Creek, Little Mountain Rehabilitation

Above, Currant Creek as it flowed through Jane's Meadow in 1989. At right, the same section of Currant Creek in 1995 after riparian habitat improvements created an enhanced trout habitat.

Public meetings this spring will hear comments on the proposed opening of Currant Creek for fishing next year. The creek, which has undergone extensive rehabilitation in the past several years under an area partnership, flows westerly off Little Mountain, about 35 miles south of Rock Springs, Wyoming, and empties into Flaming Gorge Reservoir.

Proposed regulations would allow the use of only artificial lures and flies. Brook trout could be kept, but the sensitive Colorado River Cutthroat Trout would be managed on a "catch and release" basis under the proposed regulations.

Currant Creek and Little Mountain were nominated as the Wyoming Showcase Habitat Management Plan in 1990. This watershed and ecosystem project has incorporated intensive management of more than 200,000 acres of public lands administered by the BLM. To date more than 42 logover structures and stream revetment structures have been built along Currant and Trout Creeks, and more than 30,000 acres of various vegetative communities have been treated with prescribed fire.

These improvements have enhanced trout habitat by stabilizing streambanks, deepening and narrowing the stream channel, developing spawning habitat and wintering areas, cooling water temperatures, creating overhanging banks, and encouraging new growth of willows along the banks. Colorado River Cutthroat Trout numbers have increased from eight per mile in 1989 to 400 per mile in 1995. Beaver reintroduction is beginning in some locations of the project area.

A grant from the **Foundation for North American Sheep** is developing water sources to make possible the reintroduction of endangered desert bighorn sheep in southern New Mexico. The first of three water catchments was installed in the Devil's Backbone Wilderness Study Area in New Mexico's BLM Socorro Resource Area, February 22-23.

The **New Mexico Department of Game and Fish** identified the Devil's Backbone area as a reintroduction site for state endangered desert bighorn sheep in 1994. However, the state's evaluation also identified the need for additional water sources in the area in the form of rainwater catchments.

In 1996, the BLM received a grant of \$9,000 from the Foundation for North American Wild Sheep for construction of three catchments. **Wildlife Forever**, a hunting and conservation group, matched the donation with an additional \$9,000. The grants were used to purchase and transport the catchments to the necessary sites in the area. Members of the **New Mexico Wild Sheep Foundation**, local outdoor enthusiasts, and hunters volunteered their labor for the project.

In addition to constructing water catchments, the BLM exchanged approximately 13,000 acres of land with the State of New Mexico in 1996 to consolidate and enhance public land bighorn sheep habitat. A fourth site, identified by the state as needing a catchment, was acquired by the BLM in the exchange. That water catchment will be constructed in 1998.



The Little Mountain area also is important to citizens of southwest Wyoming for wildlife habitat. The most sought-after elk tags in the state are within this area. The prescribed burns carried out during the past six years on the Little Mountain ecosystem have improved forage for elk, deer, and antelope, as well as livestock.

In burned-over areas, there has been a dramatic new growth of grasses, forbs, and shrubs such as mountain mahogany, bitterbrush, and serviceberry. Aspen, chokecherry, and cottonwoods are also doing well. In fact, elk gravitate to aspen sprouts like kids to a candy store. Deer are using the mountain shrubs, especially as snow covers the ground. In the areas where sagebrush was burned, antelope are finding forbs and grasses to their liking, and sage grouse also have been seen there.

The rehabilitation of Little Mountain watershed and riparian (streamside) habitat along Currant Creek were accomplished through the cooperative efforts of the Bureau of Land Management, the Wyoming Game and Fish Department, the Rocky Mountain Elk Foundation, Trout Unlimited, the Bowhunters of Wyoming, the Sweetwater Wildlife Association, the National Fish and Wildlife Foundation, the Wyoming State Grazing Board, and the grazing permit holders in the vicinity. Through consensus agreements, the habitats for fish, big game, and livestock were improved.

Eastern States Office Promotes Education Partnerships

Work with Elementary School Nurtures Resource Stewardships

Charles Bush, Eastern States Partnership Coordinator

With the announcement of the President's Summit for America's Future scheduled for April 27-29 in Philadelphia, federal agencies have begun to reexamine their involvement in local communities. Agencies that want a prototype of how to proceed need look no further than BLM's Eastern States Office.

Under the guidance of State Director, '**Pete**' **Culp**, the Eastern States has nurtured a healthy array of mission-based relationships with the local community. For example:

A wild horse & burro adoption was conducted in Herndon, Virginia;

Office volunteers have participated in the annual Northern Virginia and the National Kids Fishing Day events;

Clothing and gifts are donated annually to the Northern Virginia Training School;

The office represents BLM in the D.C. Urban Tree House, a community-based environmental education center in Anacostia Park in a traditionally under-served section of Washington, D.C. BLM has provided the Project Manager, on detail from Eastern States, to the Tree House. In this role, Eastern States has been responsible for much of the success of the Tree House during the past year.

However, the crown jewel of Eastern States' community partnerships is its 3-year old association with **Miner Elementary School**, which is located near the Anacostia section of Washington, D.C. The two organizations became partners in 1995 with the signing of a Memorandum of Understanding by State Director Carson Culp and Principal **Angela Tilghman**.

Since then, their collaboration has blossomed into a unique and rewarding relationship involving a wide variety of activities aimed at promoting responsible environmental stewardship and increasing student awareness and appreciation of natural resources.

In late April, sixty students from Miner will join office volunteers for the annual Eastern States Kids Fishing Day. The event, co-sponsored by Virginia Bass Anglers Sportsmen's Society (B.A.S.S.) and the Northern Virginia Regional Park Authority, affords the students an opportunity to learn about aquatic habitats and sustainable recreation practices such as "Catch and Release."

Other cooperative activities stemming from the Miner Elementary School partnership include, Bring-A-Child-To-Work Day, a visit to a Wild Horse & Burro Adoption, Career Day, and joint celebration of Special Emphasis Programs.

However, the highlight of this partnership involves weekly tutorial sessions conducted by Eastern States volunteers for Miner students. Last year the volunteers helped fifth graders prepare for the Comprehensive Test of Basic Skills. This year the tutors have focused on accelerating the reading skills of a select group of first graders.

Especially effective in improving reading skills has been the use of BLM natural resource activity books that impart an awareness of natural resource issues. This year's tutors from Eastern States include **Tim Best, Charles Bush, Ed Cooper, Ronnye Mayes, Tony Mayfield, Patricia Tyler, and Theresa Walls**. Eastern States has also donated computers to the school and will assist in the wiring of the school's network.

In the culminating event of this year's activities, two Miner Elementary students will attend Eastern

University of Maine Agreement Enriches Career Experience

Stephen Kopach, Deputy State Director, Cadastral Survey and General Land Office Records, Eastern States

BLM's **Kenneth D. Roy** successfully defended his Master's thesis in surveying before his academic advisory committee, BLM officials, colleagues, family, and friends in February 1997. Roy's thesis, entitled *Automation of Cadastral Survey Field Notes Within The Cadastral Measurement Management Survey System*, is the latest of five such theses to emerge from the partnership between BLM and the University of Maine, Orono.

Roy completed his dissertation while employed by the BLM under the **Student Education Employment Program through the Student Career Experience Program** (formerly referred to as the CO-OP Education Program). Under the ongoing BLM-University of Maine Cooperative Agreement, students in the Survey Engineering Department can choose to focus their research on enhancing the automated handling of land and surveying information in support of resource management.

When he decided to return to the University to pursue his Master of Science degree in Surveying Engineering, Roy resigned his permanent position as Cadastral Surveyor for the BLM Eastern States. After more than a year as a full-time student, he was able to continue his research and re-establish student-employee status with BLM, Eastern States through the Student Education Employment Program.

His field assignments included conducting cadastral surveys for the Bureau of Indian Affairs and the Penobscot Nation on the Alder Stream Township near Stratton, Maine. Using his previous BLM survey experience and insights gained on the job, Roy developed a key link in BLM's Cadastral Survey field to finish automation efforts. His applied research has significantly improved the efficiency and accuracy with which a surveyor collects and reports field data.

The partnership between BLM and the University of Maine has been exceptionally fruitful. Being strong proponents of BLM's student employment program, Faculty-Advisors at the University encourage their survey students to pursue opportunities in cadastral survey. Over the span of the partnership, BLM, Eastern States has employed several undergraduates from the University of Maine for summer survey crews. And after graduation, Roy will again join the ranks of BLM with the Eastern States Division of Cadastral Survey and General Land Office Records in Springfield, Virginia.

Community Involvement Models



Surrounding one of the computers donated through the Partners in Education alliance are, at left, Pete Culp, State Director for Eastern States, and Angela Tilghman, Miner Elementary School Principal, third from left. Also pictured are Miner Elementary Student Council representatives Tatiana Anderson, Steve Minor, Joshua Ross, Roderick Griggs, Krystle Grier, and Stefan Wormley with Veronica Cotton, Student Council Advisor, and Charles Bush, from BLM Eastern States.



Ken Roy prepares for his orals with Cory Rodine, left, BLM cadastral surveyor, and Dr. Ray Hintz, right, from the University of Maine Surveying Engineering Department.

States' Environmental Education Camp this July at the Piney Woods School just outside of Jackson, Mississippi. Upon their return, they will make environmental education presentations on behalf of BLM at the D.C. Urban Tree House.

Both State Director Culp and Miner Principal Tilghman have expressed immense satisfaction with the mutual benefits of this alliance and its effectiveness in helping each partner accomplish a part of its mission.

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