

# THE WEB



NEWSLETTER OF THE UTAH SOCIETY FOR ENVIRONMENTAL EDUCATION

Volume 7, Number 4

## WETLANDS ARE WONDERFUL!

by Cecile LeBlanc, Wetland Specialist

USEE  
350 S. 400 E. #G4  
SLC, UT 84111

paste wetland photo here

# 1A

Three environmental characteristics are common to wetlands:  
Hydrophytic Vegetation,  
Hydric soils,

NON-PROFIT  
ORG.  
U.S. POSTAGE  
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### A Note from the Editor:

Water is a basic necessity. And so it goes that since the dawn of society, man has slaved to tame it for his purposes.

On our lawns, in our homes, and for our businesses we need fresh water, a precious resource. Utah is the second driest state in the nation. Water is always on the agenda. Rethink (another "R") the habits and amount of water we use at home. Take a swim in a home water census (page 10), and float down the top ten list of downstream ideology. Hose down with some wise landscape mitigation.

The population in Utah continues to grow. Growing pains are felt across the spectrum of the world around us and each living organism is affected. Drink up our wetlands story: As this complicated ecosystem becomes more widely understood more decisions with a positive impact will be made. Wetland Environmental education is going strong at the CUP. Splash in some info from the Utah Rivers Council as well. Learn about Hydropower. The dams give us electricity, storage, and recreation. How much more will we need?

USEE provides the link of environment to education statewide. An informed citizenry will make difficult decisions for the whole with all important considerations at heart. Enjoy this Web and share it with a friend.

Wetlands have historically been considered wastelands, obstacles to progress, and a place for mosquitoes to multiply. As a result, during the 18th, 19th, and early 20th century landowners were encouraged to fill or drain wetlands on their property. This practice contributed to the loss of 50 percent of the wetlands in the United States (except Alaska) and 30 percent in Utah. In 1972, Section 404 of the Clean Water Act strengthened the protection of wetlands by regulating the placement of material into wetlands. We are becoming more and more aware of the importance of wetlands.

### What Is a Wetland?

Wetlands are lands that are transitional between aquatic and terrestrial habitats. Most people picture a marsh when they think about wetlands. Many of the wetlands in Utah are not as easily identified as a marsh but are equally important.

Playas, riparian corridors, wet meadows, seeps, and springs are all common wetlands in Utah. Playas are seasonally flooded shallow depressions found in the west desert and near the Great Salt Lake. For most of the year, they appear to be dry salt or mud flats. In the spring, shorebirds feed on invertebrates that hatch in these

shallow water basins. Riparian corridors are the belts of vegetation along rivers, streams, and lakes. These green belts are important for preventing bank erosion and for providing habitat for many species of wildlife including songbirds.

Three environmental characteristics are common to wetlands:

### Hydrophytic Vegetation

Hydrophytic(\*water-loving\*) vegetation is adapted for growing in waterlogged conditions. Cattails, common reed, sedges and rushes are all typical wetland plants. Wetland plant species have varying degrees of tolerance for salinity and water levels.

### Hydric soils

Hydric soils are formed under waterlogged conditions. Under these conditions the soil is chemically changed as compounds, such as nitrates, are reduced. Hydric soils are typically gray, greenish-gray, or blue-gray.

### Hydrology

Wetlands do not always have water present, but at some point water is required to maintain the hydrophytic vegetation and hydric soils. The water in wetlands can

*continued on page 10*

The Utah Society for Environmental Education is a nonprofit organization which provides environmental education support to educators, natural resource interests, environmental organizations, and business and industry.

USEE's mission is to develop public awareness and knowledge about the environment and to provide the public with the skills needed to make informed decisions, to solve problems and to take responsible actions.

The Web is published six times a year for members by the Utah Society for Environmental Education, 350 South 400 East #G4, SLC, UT, 84111. We distribute 2000 copies for our readers and many schools share this publication among educators. Bulk mail permit number 6274. Membership information can be found on page 8.

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**THE WEB IS PRINTED  
WITH SOY-BASED INK  
ON RECYCLED PAPER.**

THE WEB - PAGE TWO

**USEE adopts a new Mission Statement**

USEE's newly worded mission statement is "to develop public awareness and knowledge about the environment, and to provide the public with the skills needed to make informed decisions, to solve problems and to take responsible actions." Also new is USEE's logo. Again, there isn't much difference between the old and new. The new logo is circular, and easier to use on a variety of items including letterhead, promotional material and maybe even t-shirts.

**paste new usee logo here**

A more significant change has taken place with USEE's Articles of Incorporation and By Laws. These are legal documents required by law. The problems with the old documents were twofold. First they were 15 years old and needed to be updated. Second, they were written as a single document, making changes to the By Laws an awkward process. For USEE to adopt new documents, the membership was required to vote. Forty percent did so and ninety-five percent of those voting approved the changes. The new documents are separated and in agreement with those of many other non-profit organizations.

USEE's President, Peggy Zemach, will be leaving us soon. Peggy and her family will be relocating to Durango, Colorado. Peggy has been a good leader and helped USEE accomplish much in a relatively short time. We will miss her and wish her luck. Thanks for all your help.

**PRESIDENT'S MESSAGE**

by **Peggy Zemach**

This is my last message to USEE members through the WEB. My husband, three kids, and I move to Durango, Colorado in July. I feel fortunate to have been President during a period in which USEE has accomplished so much. I thank the board members for their dedication and hard work. USEE has a new logo, mission statement, and strategic plan to carry the organization through the next few years (see the USEE

**Outdoor Learning Center Dedicated**

Students, their parents, teachers, local businesses and USEE worked together to create an Outdoor Learning Center (OLC) at Brookwood Elementary School this spring. A strip of lawn 250 X 50 feet was replaced by 40 species of native trees and connected by trail. The school, in Jordan S.D., is at 8640 South Snowbird Drive (2450 E.) Project leaders Julie DeLong (944-5814) and Carolyn DeRose (944-2962) invite you to visit. Editor's Note:: As project coordinator for the Outdoor Learning Center I understand the extent of volunteerism necessary for this type of project. I would like to extend a huge thank you to USEE's Vern Fridley for his tireless assistance in almost every facet of

this community project. He conducted teacher training and provided us with the expertise and direction necessary to properly complete the plantings. We look forward to working on curriculum for the OLC throughout the next year using the extensive resources that USEE has available to accomplish this goal. Thanks, too, to the numerous families, businesses, scouts, and school supporters who gave so generously of their time and resources to create this wonderful place for the education and enjoyment of our

Thanks to Mr. Norm Tanner, Mr. Owen Hogle, Ms. Jeanne Moe, the Salt Lake Tribune, Gary DeLong, Chevron Companies, SISNA Communication and Take Pride in Utah for supporting USEE

**School Wetland**

A wetland pond is the centerpiece of a nature study area in the central courtyard of Northwest Middle School, S.L. School District. The 22 foot concrete pond was built years ago and is now being out-fitted with a pump, filter, stream recirculating system and many

new wetland trees and other plants. Science teachers John Henning and Ken O'Brien are leading the project (578-8547) with the assistance of USEE's Vern Fridley.

**photo for northwest middle school**

Photo by Tim Brown

*Students plant Cattails with the help of Vern Fridley at the Northwest Middle School wetland pond in Salt Lake School District.*

update for more details.) Tim Brown and the other USEE staff are friendly, easy to work with, and are always looking for opportunities to promote USEE and increase it's financial stability.

I think USEE's most unique and exciting project is the Jordan River Stewardship Project. It has brought together the minority community in Salt Lake City to learn about and take care of the Jordan River, a precious resource. It has received praise

and recognition from Mayor Corradini and other cities in the U.S. I thank Kelly Letts, a USEE member, for doing such a great job in making it happen and succeed.

When I return to Colorado, I will take with me many fond memories of Utah and USEE. As President, I have learned a great deal about how non-profit organizations operate. In his book, How To Manage Non-

*Continued on page 3*

# THANK YOU THANK YOU

in 1997. Thanks, too, to Ms. Katy Byrom, our WEB layout artist extraordinaire, who has moved to Seattle. We wish her the best of luck and much success. We will definitely miss the special touch she added to the Web. Thank you to the University of Utah Service Learning Students who helped USEE on special projects during the last few months.

## Audubon Binoculars a Big Hit!

Thanks to the Greater Salt Lake Audubon Society for their donation of binoculars and guides! Numerous students have had the opportunity to use the binoculars and they are an instant hit! The binoculars are a wonderful addition to the field equipment that can be checked out by educators to assist in environmental education activities. Middle school students, on a trip to Antelope Island, were able to view American Bison and Great Horned Owls. The wildlife seemed as close as they would be in a zoo, yet the animals were still in their natural habitat displaying their natural behaviors. Fifth grade Parkview Elementary students used the binoculars during a recent field trip to Tanner Park. After learning how to use the easy to follow birding guides and binoculars, students were led into Parley's Gulch to identify birds, plants, and explore. Teachers and students alike have taken great pleasure with these fun observation tools that have been used on field expeditions and right on the school grounds. USEE extends our sincerest thanks to Donna Rigby and the Greater Salt Lake Audubon Society for their generosity and commitment to Environmental Education.

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## *President's Message Cont'd from 2*

profit Organizations, Peter Drucker stated, "non-profits are the essence of community involvement- they are what bring people together to improve the quality of life." I and many people in Utah have certainly benefited from USEE.

## Jordan River Stewardship Project

# 3A

Photo by Tim Brown

### *Students enjoy new binoculars at Jordan River Celebration*

On May 15 USEE hosted the first annual Jordan River Stewardship Celebration for 160 students from 7 elementary schools that participated in the Jordan River Stewardship Project during the 1996-97 school year. The celebration was in recognition of the student's commitment to being stewards of the Jordan River. Smith's provided refreshments and several groups engaged students in fun activities. USEE thanks Ruthie Smith of HawkWatch, Project WILD, Linda Smith of Repertory Dance Theater, Fred

Montague and the many University of Utah students, Ken Reid of Amoco, Mike Letts, Sandy of Utah Barrel, Venetia Bolz (aka Grandma Nature), Vaughn Lovejoy of TreeUtah, Jack Wilbur of Utah Dept. of Agriculture and Food and USEE's President Peggy Zemach. A sincere thank you is also extended to Kelly Letts, who did a great job organizing the event and serving as the JRSP Project Leader in 1996-97. Thanks Kelly!

## USEE welcomes new staff

Ben Gaddis and Venetia Bolz have joined the USEE staff. Ben volunteered with USEE last summer and decided to work as an Intern this summer. Ben recently graduated from Willamette College. Venetia Bolz is on loan to USEE via a Forest Service program. Venetia has a wealth of EE experience and is helping USEE in many ways. Welcome Ben and Venetia.

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# UTAH NEWS

## Is it the Water?

For some unexplainable reason, there has been a lot of turnover in Utah's EE community recently. Mary Cox has decided that its time to try new things and has stepped down as the Ogden Nature Center's Director. Under Mary's watch, the Center grew tremendously including a new building and an increase in educational offerings. Carl Palmer, most recently of the Teton Science School has replaced Mary. Best of wishes Mary and welcome Carl! Good luck to both of you.

Utah's Project WILD Coordinator, Bob Ellis, saw a job he couldn't refuse at Prescott College in Arizona. Out of hundreds of applicants, including several PhDs, Bob was Prescott's choice. It looks like they saw what we've known for a long time, that Bob is a special person and a fantastic educator. Keep us informed of what's going on down there Bob and good luck. The Project WILD position closed June 20 and Bob's replacement was not known at the time this issue went to press.

As if Mary and Bob leaving wasn't enough, Virginia Jensen, Utah's Project WETCoordinator has decided to join

her husband in the envious field of retirement. Virginia was instrumental in bringing Project WET to Utah. She now plans to spend time doing her artwork and visiting her daughter in North Carolina. Asked when she'll return from North Carolina, Virginia replied "I don't know, this is the first time in my life I haven't had to return from a trip to go to work." The Project WET position closed June 13 and Virginia's replacement was not known at the time this issue went to press.

Bob Yerzy, recipient of USEE's Environmental Educator of the year in 1996 and founder of L.A.B. ALIVE is headed to California and Steve Reed is leaving the country to teach in a warmer climate.

TreeUtah is announcing the arrival of their new Executive Director, Meryl Redisch. Meryl, a resident of Utah since 1994, is originally from New York City. There she served as the Director of Natural Resources for Forest Park in Queens and was engaged in grant writing, strategic planning, management, and volunteer coordination. Meryl's experience is extensive in the areas of urban forestry, community nature centers, special events, volunteer coordination and training, public education and outreach, and staff management. Upon asking why she moved

to Utah from New York City, Meryl explained that she could no longer find a parking place there and decided to move where the mountains grow tall!

Now if you're feeling a little dismayed that all of these great positions have already been filled, get your pens out because there are a couple still open. The Logan Canyon Nature Center is looking for an Executive Director and a Resident/Caretaker (two different positions). The Logan Canyon Nature Center, located one mile east of Logan, is a new private 501(c)(3) non-profit educational facility, operating under a lease agreement with the National Forest Service. Review of applications will begin on July 1, 1997 and the position will remain open until a suitable candidate is found. Position start date is ASAP. Contact Dr. Sharon Ohlhorst at 801-797-2580 for more information.

# NATIONAL NEWS

## Weaving Connections: Cultures and Environments

The 26th Annual Conference of the North American Association for Environmental Education, will focus on Environmental Education and the Peoples of the World.

Join with teachers, leaders and others in enriching educational experiences in beautiful Vancouver. Enjoy hearing renowned EE professors, participating in environmental workshops and seminars, VINE Network and other special activities, live entertainment with fantastic local cuisine, and special events. Join in field trips like whale watching at Sidney, Vancouver Island and exploring rainforest and seashore. Registration fees vary from \$60/day to \$200 for non-members. For forms or further information contact USEE: the deadline is July 13, 1997.

## Donna Asbury hired as new Project WILD Director

On May 5 the National Project WILD Office welcomed Donna Asbury as it's new director. With over 15 years of experience in the areas of youth development education, program planning, management, and fund raising, Asbury will be supporting the state network and expanding the conservation and environmental education program designed for teachers of kindergarten through high school youth. Asbury comes to Project WILD from directing corporate and foundation relations with the Chesapeake Bay Foundation. Previously she also served with the University of Illinois Cooperative Extension Service, the National 4-H council, and was Director of Campaign Operations for the American

Association for the Advancement of Science.

Project WILD will get the benefit of Donna's strong editing and writing skills combined with a proven track record in education, fund raising, management, affiliate relations, and program planning. She holds a Master of Science degree in Family Life and Child Development from Indiana University, Bloomington. Her office is located in the National Project WILD Office in Bethesda, Maryland.

## CELEBRATE BACKYARD STEWARDSHIP

This year the National Association of Conservation District (NACD) theme for education is "Backyard Stewardship" and emphasizes what each of us can do in our own backyard or neighborhood to practice and promote positive stewardship. The materials include a 16 page full color educators' guide, an eight page pre-K through 3 activity guide, and eight page activity guide for grades 4 through 6, a poster, a bookmark, and a place mat. The cost for the sample kit is \$4.50. Also, two videos are available for purchase: "Landscaping for Wildlife", produced by the Missouri Department of Conservation, is designed more for the adult audience and shows how to turn your backyard into a rich home for wildlife and, "Exploring School Nature Areas" suggests how to develop outdoor learning centers and how to use them. To order a sample kit or any of the above materials separate, contact your local conservation district or the NACD Service Center in Texas at 1-800-825-5547.

## HYDRO POWER: Harnessing water for

by Jim Burrus, Environmental Scientist

Electricity has intrigued mankind for many years and has now become something most of us just expect as part of our everyday life. In 500 BC, Thales, a Greek philosopher first observed that by rubbing two pieces of amber together it would attract pieces of straw and paper.

This was the first mention of static electricity. It wasn't until the mid 1700's that people like Peter Van Musschenbroek (inventor of the first battery) or Benjamin Franklin began to experiment with electricity. The first electrical generator was created by Michael Faraday in 1831, with the first water powered electric plants coming on line about fifty years later.

The Stairs Station in Big Cottonwood Canyon built in 1894-1896, was the first hydroelectric plant in Utah. It was constructed by the Big Cottonwood Power Company to provide electricity to the business section of downtown Salt Lake City. The additional electricity was used to light the streets and power the street cars. By utilizing power from the Stairs plant, the Salt Lake and Ogden Gas and Electric Company had hoped to reduce the demand for power at its steam plant. The coal-fired plant had drawn the ire of local citizenry due to the smoke emissions which "were polluting their air". Even 100 years ago people were thinking of using hydropower to reduce pollution from burning fossil fuels.

By the mid-1950's major rivers were being "tamed" through out the west and northwest "to improve economic opportunities and add to the quality of life". Although untamed rivers are part of the cultural heritage of the United States, virtually every river in the lower 48 states is now regulated by dams, locks, or diversions. These reg-

photo of a dam

4A

ulated rivers have become an integral part of our twentieth-century landscape and livelihood by providing cheap electricity, navigable waters, flood control, municipal and agricultural water storage and recreational opportunities.

Society values its rivers in a more comprehensive manner now than it did when most of the major dams were built. We still count on the traditional products of dams - water, power, flood control, but are even more aware of the environmental values of our rivers. We enjoy whitewater recreation and blue-ribbon trout fisheries in the tailwaters of dams. However there are also adverse effects of

*continued on page 12*

## BACKYARD CONSERVA- TION EDUCATION COMICS AVAILABLE

The National Association of Conservation Districts (NACD) has released two new educational comic books that help children learn about birds and butterflies and observe each in their own backyard habitats. Bird Basics introduces young people to bird life showing how birds fly and eat, their life cycles, and the mysteries of bird behavior and bird song. Backyard Butterflies presents information about butterflies, their life style, and their habits. Copies are available for use by any EE group wanting to teach children to observe nature. Prices for the comic book are 70 cents each for 1 to 249 copies, 65 cents for 250 to 499 copies and 60 cents for 500 or more copies, plus shipping costs. For information on using Bird Basics or Backyard Butterflies, contact Maxine Mathis at 800-825-5547, extension 32.

# We all live downstream

## What does it mean?

WE ALL LIVE DOWNSTREAM means just that. You live downstream from someone. Someone lives downstream from you. Whatever you do affects someone else (including fish and wildlife). During the next rain storm, follow runoff water down the gutter. It will enter a catchbasin, a gutter inlet, an open ditch, or something similar. After that, it will flow through pipes and empty into a creek, canal, and eventually the Jordan River. Everything on the street, driveway, or sidewalk; oils, greases, pet wastes, fertilizers, soaps, dirt, litter, leaves, "flush" into the storm drain system. But it doesn't go the same place as when you flush your toilet. Toilet water is treated. Stormwater goes directly into the creeks and the river without any treatment! Residents can be one of the main pollution preventers in the County. We just don't fully realize it. Yet.

Salt Lake County is responsible for the quality of our runoff waters. We have

developed Best Management Practices (BMP's) for controlling pollutant sources. One of these is to ensure that residents are well informed concerning stormwater quality.

The logo and slogan WE ALL LIVE DOWNSTREAM are part of a Public Information and Education (PIE) program underway to help residents understand their responsibility in keeping our waters clean. As a citizen, there are a few easy and low cost activities you should follow to protect the water in our environment. We call these our TOPTEN LIST. For more information, call the Salt Lake County Engineering Division (801) 468-2711.

## we all live down stream logo

### TOP TEN LIST

...of things you can do to improve water quality.

- 1. Recycle used motor oil and antifreeze at automotive centers.**
- 2. Properly dispose of household hazardous waste - (call 944-6700).**
- 3. Sweep sidewalks and driveways. Do not hose down the gutter.**
- 4. Minimize the use of pesticides, herbicides and fertilizers: apply carefully & sweep up excess.**
- 5. Control sediment migration and erosion, don't let it reach the gutter; sweep up and re-use it.**
- 6. Do not litter; pick up stray litter, keep litter bags in your car and garage.**
- 7. Do not over-water - Don't be a "gutterflooder."**
- 8. Clean up and dispose of pet waste - in the garbage or toilet.**
- 9. Collect leaves, grass clippings and other yard waste and recycle it.**
- 10. Remember, WE ALL LIVE DOWNSTREAM!**

## NAAEE conference ad

# Utah Rivers Council

*by Zach Frankel and Eric Wilden*

Utah's rivers are arteries of life. Rivers support more plant and animal species than all other habitat types combined. Rivers support 80 percent of all Utah's wildlife species for a portion of their life cycles.

Streamside vegetation purifies runoff by removing nutrients to benefit human water sources. Rivers also provide vital migration corridors for fish, birds and mammals. Rivers also generate more than \$500 million each year for the Utah tourism industry through fishing, rafting and hiking activities.

Faced with the highest per capita water use in the country and rapid population growth, Utah's rivers face a tumultuous future. Nearly a dozen proposed dams would divert our last wild rivers into sterile canals. The

Utah Rivers Council was formed two years ago to protect Utah's last free-flowing rivers and the ecosystems they support through grassroots advocacy, education, lobbying and litigation.

This summer, the URC will be spending a lot of time and energy working to stop a proposed dam on the Diamond Fork River. This dam would not only silence the cascading currents of the last free-flowing river entering the

Wasatch Front, but would also cost state and federal taxpayers hundreds of millions of dollars to provide the same amount of water used by a city of 250,000 to a handful of alfalfa farmers. The bulk of the state taxes funding the Diamond Fork Dam come from Salt Lake County residents, who will not receive one drop of water from the project. An alternative proposal would pipe water north to Salt Lake and Utah Counties and eliminate the need for this dam altogether, saving taxpayers hundreds of millions of dollars. Citizens are urged to voice opposition to the Diamond Fork Dam and urge the Central Utah Water District to consider the less destructive and more economically sensible alternative.

For more information, call the Utah Rivers Council at 486-4776, or email at [urc@wasatch.com](mailto:urc@wasatch.com).

# ENVIRONMENTAL EDUCATION CALENDAR

Calendar submissions can be made anytime until the 10th of the month prior to publication. We invite environmental education submissions that are of interest to your fellow educators and/or their audiences, will happen within the next six months, and are open to persons outside of your own organization. We need the event name, location, description, cost, organization, contact person, and phone number.

## JULY

**5 Rail Trail Summit County - Community Service Month;** Park City Parks, Recreation and Beautification Advisory Board will guide visitors on a flora and fauna tour of Alexander's Canyon at Blue Sage on the Rail Trail south of Wanship. For more information, call Holly Carlin at 649-6920.

**7-11 Young Naturalist Program;** For youths ages 5-8. Touch, Taste, See, Hear, Smell. Learn about our senses. Learn how important our senses are in our lives. Eat lunch with no elbows. Talk with your hands. Explore nature blindfolded. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**7-11 The Adventurers; For youths ages 9-12.** Art, Photography, Music, and Poetry. Explore Nature's Art, make your own musical instrument from nature, write poetry in the nature journal designed by you, photograph with and without a camera, create nature sculptures. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**8-23 Rocks and Minerals of Salt Lake County; Earth Science Education.** Teachers of all levels are welcome especially 2nd and 4th grade teachers interested in strengthening their teaching of "Rocks and Minerals" and "Utah Rocks and Minerals." Content: the rock cycle; minerals as building blocks of rocks; major rock types; and rocks, minerals, and fossils of Salt Lake County. Skills: how to differentiate sedimentary, metamorphic and igneous rocks; how to tell the story of the rocks; how to respond to "what is this rock." Call Kenna Theriot, 268-8541, for more information.

**8-9 Disappearing Amphibians;** Within the last decade, scientists have noted a global decline in amphibian popu-

lations. We'll primarily be discussing amphibians and other herps, we'll also discuss how teachers and parents can capitalize on that interest to captivate young and old with these engaging creatures of the natural world. Learn how you can adopt a monitoring site near your home or school. Cost: \$35.00 per class day. Contact the Sawtooth Science Institute at 208-788-9686, for more information or registration.

**10 Poet on the Plaza;** Utah Arts Council poet, Stan Tixier is "not your average cowboy poet." He will share his humorous, nature-oriented poems on the Ogden Nature Center plaza, 7:00 pm. Light summer refreshments will be served. Contact the Ogden Nature Center, 621-7595 for more information.

**10-13 Desert Canyoneering;** For youths ages 15-19. Paria River Canyon. Pre-trip meeting Monday, July 7. Backpack through miles of twisting slot canyons just wide enough to squeeze through. Encounter rock steps to rappel down and water holes to swim across. Observe Native American ruins and petroglyphs. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**11-12 Map and Compass; Teacher or Adult workshop.** Sponsored by the Utah Museum of Natural History. Cost: \$73.00, or \$67.00 for UMNH members. Contact Kara Edwards, 581-4887, for registration/information.

**11-12 Trailside Wildflowers;** Join us in July for the peak of the spectacular wildflower season in the high country of south-central Idaho. The ecological functions, wildlife forage value, and historic uses of the plants will be emphasized to familiarize students with their role in the ecosystem. Cost: \$35.00 per class day. Contact the Sawtooth Science Institute at 208-788-9686, for more information or registration.

**11-20 Environmental Education Teacher Training Institute;** Sponsored by the EPA, this workshop presents facts from the experts, field trips, classroom activities, and much more. Enjoy the Denver area. \$350 stipend, free room and board at the Denver Holiday Inn. Travel scholarships are possible. Available for K-12 teachers. Call Ron Hellstern, 753-8750, for more information.

**12 Millcreek Bigwater Trail Hike;** Sponsored by the Utah Nature Study Society. Leader will be Carl Lagerberg.

Contact the Society at 486-8755 for more information.

**12 Annual Dinosaur Day;** Many dinosaur activities, fishing pond for children and a bakesale fundraiser; Sponsored by Dinosaur Gardens Committee of the Vernal Area Chamber of Commerce. Free to the public. For more information, please call 789-3799.

**12-13 Fielding Garr Ranch Opening;** Historic 1848 ranch house open from 10am to 6pm daily. Entrance Fee to Antelope Island is \$6.00 per vehicle or \$2.50 for walk-ins and cyclists. For more information, call 773-2941.

**13-28 Following the Scientific Trail of Lewis and Clark - Two Weeks as an Expedition Member;** Join us for a once-in-a-lifetime experience as we follow the route of Lewis and Clark from Eastern Montana to the Oregon Coast! Cost: \$1,495.00 includes lodging, 1/2 of meals, instruction, transportation, a one day boat excursion on the Missouri River, materials, and two nights at the Teton Science School. Contact Steve Archibald, 307-733-4765, for more information or registration.

**14-18 Young Naturalist Program;** For youths ages 5-8. What are Rain Forests all about? Why do rain forests exist? What is happening to their beauty? Do trees have their own habitat? Make a rain stick, play in sprinkler misters. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**14-18 The Adventurers; For youths ages 9-12.** Park City Activity Week, join us daily. Rockclimb, mountain bike, canoe, and orienteering, let's give back to nature with a community service day. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**14-18 Nature Trek;** For 7-9 year olds. American Indians and Gearly pioneers lived in close contact with plants and animals every day. Nature Trek Campers will experience some of that closeness while learning how early area inhabitants ate, treated illnesses, decorated their homes and clothing, and entertained themselves with nature as their only aid. Camp will include crafts, plant collection and preparation, cooking over a fire, and an overnight in a tipi. Cost: Members \$60, non-members \$70. Contact the Ogden Nature Center, 621-7595, for registration and more information.

**14-18 Utah Plants;** Sponsored by Weber State University, this workshop will be held at the Great Basin Environmental Education Center. For more detailed information, contact GBEEC at 283-4021 ext. 300 or 299.

**15-17 The Voyagers;** For youths ages 13-14. Mountaineer, Rockclimb and Backpack the Uinta Mountains. Pre-trip meeting Tuesday, July 8. Backpack in and set up base camp by beautiful mountain lakes. Become one with the mountain as we spend time rockclimbing and mountaineering. Learn and have fun with map and compass, route selection, low impact camping, and more. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**15-17 Intrigue of the Past - An Archaeology Education Program for 4th - 7th grade educators;** Workshops are taught by qualified educators teamed with professional archaeologists. Participants receive an activity guide which can be used by classroom teachers, scout leaders, environmental educators, and museum docents. A subscription to the Intrigue of the Past newsletter keeps you in touch with archaeologists and other educators using the program. Contact the Great Basin Environmental Education Center at 283-4021 ext. 300 or 299 for more information.

**16-17 Project WILD Workshop;** Granite District Inservice, 7-12. To be held at the Division of Wildlife Resources, 1594 W. North Temple. Cost: \$10.00 registration fee. Contact Diana Vos at the Division of Wildlife Resources, 538-4719, for more information or registration.

**17-18 Threatened and Endangered Species of Idaho;** Island Park is home to many rare and threatened species. Lectures will provide the background about the Endangered Species Act, and the conservation and recovery of species. Time will be spent in the field. Cost: \$35.00 per class day. Contact the Sawtooth Science Institute at 208-788-9686, for more information or registration.

**20-25 Heartland Peaks Workshop;** Payette Lake, Idaho. K-12 teachers, natural resource professionals, youth group leaders and other interested individuals come together in a resident camp environment to experience the outdoors in new and exciting ways. This workshop is limited to the first 30 applicants. Two semester-hour credits, undergraduate or graduate, can be earned in biology or education through Boise State University. Cost is approximately \$35.00 per credit. The cost

# ENVIRONMENTAL EDUCATION CALENDAR

for the workshop is \$225.00. A \$75.00 registration fee is required by July 15 to reserve your spot. For more information, contact Dr. Richard McCloskey at 1-800-632-6586 ext. 3490.

**21-25 Young Naturalist Program;** For youths ages 5-8. Native American Culture, Climate, & Lifestyles. Learn what life was like for a young Native American. learn what it was like to live in interdependence with nature. Forest, grassland, where would you choose to live? Catch fish and weave a basket. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**21-25 The Adventurers;** For youths ages 9-12. Utah's Heritage. Experience the traditions while on the Mormon Pioneer Trail, explore Pioneer State Park and Golden Spike Monument, mountain bike the Pony Express Trail, and spend the night under the stars. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**23-25 Keepers of the Earth;** This class is for 5th grade students. Held in beautiful Logan Canyon. Students will participate in a variety of outdoor/nature activities with Native American themes. Canoeing, night hikes, star gazing, hiking, learning about the plants and animals, art projects and a lot of fun! Limited to 30 students. Cost: \$45 includes everything. Call Ron or Wendy Hellstern, 753-8750, for more information.

**26 Albion Basin;** Sponsored by the Utah Nature Study Society. Leader Dot Platt. Contact the Society at 486-8755 for more information.

**28-Aug. 1 Young Naturalist Program;** For youths ages 5-8. Who Lives in the Desert? Tortoises, snakes, owls, kangaroos, people? Learn about survival, Aborigines, plants and the desert we live in!. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**28-Aug. 1 The Adventurers;** For youths ages 9-12. Park City Activity Week, join us daily. Rockclimb, mountain bike, river raft, and orienteering. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**28-Aug. 1 Nature Trek;** For 7-9 year olds. American Indians and early pioneers lived in close contact with plants and animals every day. Nature Trek Campers will experience some of that closeness while learning how early area inhabitants ate, treated illnesses, decorated their homes and clothing, and entertained themselves with nature as their only aid. Camp will include crafts, plant collection and preparation, cooking over a fire, and an overnight in a tipi. Cost: Members \$60, non-members \$70. Contact the Ogden Nature Center, 621-7595, for registration and more information.

**28-Aug. 1 Central Utah Outdoor Education Workshop;** This 40-hour workshop focuses on small-group problem-solving activities and natural resources investigations. Nestled on 80 acres in an aspen-fir forest 3,000 feet above the valley floor, the Great Basin EE Center provides a breath-taking setting for a five day workshop. K-12 teachers, natural resource professionals, youth group leaders and other interested individuals

will benefit from the experience. The workshop is designed to accommodate participants with little to advance knowledge about natural resources. Participants apply approaches and investigations on an operating farm. Planning for EE events and outdoor classrooms is included. A full PLT or WILD workshop is part of the week. Cost: \$150.00 per participant. Contact Bill Wood, 896-6441, for more information or registration.

**30-31 Wildflowers and Pollinators;** Fascinating tales of insect and wildflower adaptations. We'll discuss ecology, behavior, life history, and proper collection techniques for both wild plants and their pollination partners. In the field, we'll search for common and rare Rocky Mountain wildflowers and their butterfly, bumblebee, and other insect pollinators to observe their intricate interaction in detail. Discussion of biodiversity and evolution will further round out this fascinating ecological saga. Cost: \$35.00 per class day. Contact the Sawtooth Science Institute at 208-788-9686, for more information or registration.

## AUGUST

**2 What's Currant on the Rail Trail - A Berry Picking Festival;** Pick golden, red and black currants in Silver Creek Canyon. For more information, contact Sally Elliott at Utah Escapades, 649-9949.

**2-5 Desert Canyoneering;** For youths ages 15-19. Black Box Canyon. Pre-trip meeting Tuesday, July 29. Backpack through miles of twisting slot canyons just wide enough to squeeze through. Encounter rock steps to rappel down and water holes to swim across. Observe Native American ruins and petroglyphs. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**4-6 Nature Quest;** This is for 10-12 year olds, sponsored by the Ogden Nature Center. Experience some of the closeness to nature that American Indians and early pioneers lived with. This year's class will experiment with some of the ways early inhabitants of this area found and prepared food, decorated their homes and clothing, treated stomach aches, related to animals, and played games. Cost: \$60 for Members, \$70 for Non-members. Call 621-7595 for more information.

**4-8 Young Naturalist Program;** For youths ages 5-8. Wild Woolly Animals. Where do they live, what do they eat, what do they do to live as one with nature? What is the food pyramid? Create a new breed of animals. Make a

beaver hut and puppet. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**4-8 The Adventurers;** For youths ages 9-12. Hike, Climb, and Canoe. Put all your new skills together and spend five days and four nights in the Uintas. We will set up a base camp and have fun from there. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**4-8 Teaching AP Environmental Science;** In-Service Workshop. The course is designed to be environmental science rather than environmental studies. The workshop will present an intensive 5 day program in teaching science in a field setting. Included will be techniques for formulating scientific hypotheses, examples of model exercises, and developing activities appropriate for a diversity of sites and school settings. The workshop is open to all interested high school science teachers, but preference will be given to those teachers planning on presenting AP Environmental Science in the 1997-98 school year. Contact the State Office of Education for more information. The workshop will be held at the Great Basin Environmental Education Center.

**5-6 Elementary Economics;** The Economics of Eating; Social studies workshop for 4th, 5th, and 6th grade teachers, sponsored by Ag in the Classroom. "You mean McDonald's could run out of food?" This workshop will make it easy for you to translate the core objectives into real world examples and activities for your students. All activities will be hands-on and participants will take home many free samples, lesson plans, and activity information. Cost: \$20 for class, \$10 recording fee for credit. Contact Debra Spielmaker, 797-1657, for more information.

**5-20 Geologic Features of Salt Lake County,** Including Earthquakes; Earth Science Education. Teachers of all levels are welcome especially 3rd and 5th grade teachers interested in strengthening their teaching of "Geological Features" and "Physical Features of Earth." The goal is to teach skills of how to read the geology of landscapes. Content: landform recognition; landforms of Salt Lake County; tectonic processes; erosion and deposition; Utah's earthquake hazard and how to teach it. Teachers receive maps for their schools. Call Kenna Theriot, 268-8541, for more information.

**7-9 Primitive Pottery; Anasazi State Park.** Teacher or Adult workshop

**USEE Calendar** *continued on page 8*

USEE  
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# USEE CALENDAR

August - continued from page 7

sponsored by the Utah Museum of Natural History. Cost: \$132, \$112 UMNH Members, price does not include lodging or meals. Contact Kara Edwards, 581-4887, for more information.

**9-10 Fielding Garr Ranch Opening;** Historic 1848 ranch house open from 10am to 6pm daily. Entrance Fee to Antelope Island is \$6.00 per vehicle or \$2.50 for walk-ins and cyclists. For more information, call 773-2941.

**11-15 Young Naturalist Program;** For youths ages 5-8. Islands, the who, what, why and how. Learn the hula, slide down a natural water slide. Make a mask, build a volcano. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**11-15 The Adventurers;** For youths ages 9-12. Water, Water, Everywhere. Examine water life, wetlands, lakes, streams, hot springs, rivers. Come hiking, canoeing, rafting with us this week. Spend a night near the hot springs. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**11-15 The Voyagers;** For youths ages 13-14. Backpacking with Llamas! Pre-trip meeting Tuesday, Aug. 5. Spend a unique five days backpacking in the Uinta Mountains with Llamas. Become buddies with our new-found four-legged friends. Participants will be responsible for working and caring for the Llamas, loading and unloading their panniers, and leading them on the trail. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**15-19 Weaving Connections;** Cultures and Environments; NAAEE Conference brings people together to learn about and experience different cultural perspectives and relationship, allowing them to deepen their understanding of how culture shapes thinking and acting. Conference to be held in Vancouver, BC. Contact Richard Kool, 250-356-6464, for more information.

**16 Fremont Indian State Park 10th Anniversary party and Children's Fishing Derby;** Park entrance and derby are free, however children must preregister for the derby. Park birthday party is open to all visitors and includes cake, refreshments and guided tours. For more information and to register for the derby, contact Pete Weimer, 527-4631

**18-22 Young Naturalist Program;** For youths ages 5-8. Learn about animal tracks. Where do you find tracks? What do different animal tracks look like? We will camp overnight in the Uinta Mountains, parents are invited to attend.

Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**18-22 The Adventurers;** For youths ages 9-12. Utah Natural Wonders. Investigate Utah's incredible lands, Bridal Veil Falls, Timpanogos, Mt. Baldy, Antelope Island, Donut Falls. Spend a night under the stars. Contact the Norwegian School of Nature Life, 801-649-5322 for registration and cost. Space is limited.

**18-22 8th Annual Nonpoint Source Water Quality Conference;** To be held in Park City, the conference will include training, tours, paper presentation, awards banquet. Sponsored by the Soil and Water Conservation Society, Utah Chapter. Contact Dee Cummings, 524-5054, for more information.

**22-23 Coral Reef Ecology;** Teacher or Adult Workshop sponsored by the Utah Museum of Natural History. Cost: \$46, \$38 UMNH Members. Contact Kara Edwards, 581-4887, for more information.

**23 Herb Day; Demonstration** explaining how pioneers used herbs in cooking, medicine and creating fragrances. Also, discussions on identifying and growing herbs. For more information, call 584-8391.

**23-24 Fielding Garr Ranch Opening;** Historic 1848 ranch house open from 10am to 6pm daily. Entrance Fee to Antelope Island is \$6.00 per vehicle or \$2.50 for walk-ins and cyclists. For more information, call 773-2941.

## SEPTEMBER

**5-6 Sandhill Crane Days '97;** The weekend of events includes a Friday presentation in Logan by biologist Kent Clegg, who flew "his" small band of cranes from southern Idaho to New Mexico last fall. He escorted them in his ultralight aircraft. Saturday morning, we will take folks afield in buses or canoe down the river to see cranes close up. In the afternoon, we will travel to the Bear River Migratory Bird Refuge and discover the incredible autumn bird life there. Saturday night we will enjoy a catered Dutch Oven Dinner and a short program to celebrate the cranes. Cost: \$35. Call 245-6747 for more information.

**10-25 Geologic History of Salt Lake County;** This summer inservice course simplifies the fascinating and complex story of Salt Lake County's geologic history. It encourages teachers to: understand our area's geology; understand how landforms were developed; appreciate challenges faced by scientists in the past and present; apply earth systems concepts; and put global environmental change into a Salt Lake County perspective. Call Kenna Theriot, 268-8541, for more information.

# Wise Landscape

by Richard O. Jackson & Earl K. Jackson, Ph.D., Certified Water Auditors

Utah residents have the second highest per capita culinary water use rate in the country. On the average, each of us use 308 gallons of water per day. Recent changes in the Utah plumbing code for new construction will help us use water more wisely indoors with low-flow showers and toilets, but what about our poor water use habits outdoors? Most water experts agree that at least half of all irrigation water applied to lawns (landscapes) is wasted. This is a real concern considering that most Salt Lake County landscapes are watered using municipal-treated (culinary) water. How much water is wasted at your school, church or home by over irrigation? To find out how much water (and money) can be saved by proper irrigation scheduling call Utah State University Extension in Salt Lake at 468-3180 and ask for a free irrigation water audit.

There are several benefits of having an efficient landscape irrigation system. The most obvious benefit is reduced water use (conservation) which equates to fewer dollars spent on water. This savings becomes more important with the scheduled summer water rate increase which goes into effect July 1. However, efficient

irrigation systems also improve the landscape appearance by eliminating wet and dry spots and promoting deep root growth. Efficient irrigation minimizes lawn fertilizer requirements, prevents deep percolation of water carrying chemicals into the groundwater and reduces water runoff to the storm water drains. Utahns probably kill more plants due to improper irrigation than anything else.

A landscape irrigation audit is a series of field tests that determines the distribution uniformity (how evenly the water is applied), precipitation rate (how fast the water is applied), root zone depth, soil intake rate, and soil water holding characteristics of a specific irrigation site.

Soil texture is the term used to describe the size of the individual soil particles such as sand, silt and clay. Soil texture classes have been established to describe the relative amounts of sand, silt and clay in a particular soil profile. The most common soil texture classes are: silty clay, clay loam, loam and sandy loam. The soil texture has a major influence on the amount of water that can be stored in a soil against the pull of gravity and how often a lawn needs to be watered.

Infiltration rate is the measure of how quickly the irrigation water enters the soil. The infiltration rate is an important factor in landscape management because it determines how long you can run your sprinklers without having water runoff. Major causes of low infiltration rates are compacted soils, thick thatch, low organic matter content and slopes in the landscape.

Weather factors also play an important role in determining an irrigation schedule. Evapotranspiration (ET) is the sum of all the water lost from the soil surface (evaporation) and through plants (transpiration). The rate of water lost from the landscape (evapotranspiration) depends on the weather conditions of wind, temperature, relative humidity, solar radiation and other factors such as plant species, soil composition and the amount and quality of the available water. Weekly evapotranspiration information can be obtained from Salt Lake County Extension Services. Water use prediction for lawns is published every Monday afternoon.

Most lawn watering systems are only about 50% efficient in delivering water only to the lawn. Simple adjustments and minor tune-ups can improve the distribution uniformity of an irrigation system by about 20 percent. A 70% distri-

*Continued on page 10*

RIVER AD W/ PHOTO

9A

**Adopt-A-Waterbody**

*by Shelly Quick*

The Adopt-A Waterbody (AAW) Program was established by the Division of Water Quality (DWQ) to promote education and on-site pollution prevention and restoration projects for adopted waterbodies. The program was designed to make the "adoption" of reservoirs, lakes, groundwater aquifers, springs, streams, ponds and wetlands a simple process. Individuals, businesses, school classes, local governments, civic groups and non-profit organizations have become active stewards for a specific resource area. Stewardship involves a great diversity of activities depending on the interests and talents of the adopted group.

Educational activities have included identifying the watershed of the waterbody, mapping pollution sources within the watershed, touring a wastewater treatment facility, learning about water quality, or producing a fact sheet about the waterbody. On-site projects have included organization of a clean up day, establishment of a monitoring program, and revegetation for erosion control or for habitat improvement.

The DWQ has formed partnerships with other government agencies that have a proactive philosophy to preserve and restore the quality of water in Utah. The AAW program overlaps with the Adopt-

A-Stream program implemented by the Utah State Division of Wildlife Resources. This program emphasizes fishery habitat restoration. Because much of the state's water quality problems are due to agricultural practices, DWQ has also partnered with the Utah Department of Agriculture.

The AAW program is a simple, yet effective, method of educating the public about the state's water resources. 'Adoption' is the first step toward preventing pollution and enhancing Utah's surface and ground water resources through promotion of personal stewardship projects involving interagency cooperation. The first step to adopting a waterbody is to complete an application and submit it to the DWQ. The DWQ will assist the adopting group by providing information and education, suggesting activities, and referring them to other agencies for additional assistance. DWQ will recognize each group with an AAW certificate. A limited amount of federal grant money is available to help some groups with materials and supplies. For information on how you can Adopt-a-Waterbody, contact Shelly Quick at 538-6516 or Jack Wilbur at 538-7098.

The Utah Reclamation Mitigation and Conservation Commission, a relatively new federal agency, is providing a \$100,000 matching grant to develop a wetland ecosystem education master plan. Work is underway to get people involved and acquire matching funds to bring this project to fruition.

The Commission's vision is to develop linked messages promoting wetland ecosystem understanding and support and provide the education to a variety of population segments. The project includes the area from Cache County (Logan), down the Bear River, along the Great Salt Lake, up the Jordan River to Utah Lake and up the Provo River to Jordanelle Reservoir, including important tributaries along the way.

The wetland ecosystem education master plan goals include not only increasing public knowledge, but moving people beyond awareness into active participation in wetland preservation; to develop a network of interests committed long-term to maintaining ecosystem messages; and, to deliver the messages in a way that is meaningful and understandable to the public.

A steering committee to develop and implement the plan includes representatives from: Utah Reclamation Mitigation and Conservation Commission; Utah Division of Forestry, Fire and State Lands; Utah Division of Wildlife Resources; Utah Division of State Parks and Recreation; State Office of Education; National Audubon Society; Utah Association of Counties; USU Extension Services; Utah Association of Conservation Districts; U.S. Fish and Wildlife Service and Utah Travel Region Association.

This committee is cooperating to gain their organizations' support, serve as a network contact with groups, agencies and other interests, and enable some members to solicit agency and organization financial support and needed matching funds. If you want to know more, contact Catherine Quinn, Utah Reclamation Mitigation and Conservation Commission, 524-3146.

More about The Commission. The Utah Reclamation Mitigation and Conservation Commission was established under the Central Utah Project Completion Act of 1992. The Commission is charged with implementing projects to help offset Central Utah Project (CUP) and other federal reclamation project impacts to Utah's fish and wildlife resources. (The CUP captures water in the Uinta Basin that would normally flow to the Colorado River and transports it through tunnels, canals and reservoir systems to the Wasatch Front.

Environmental effects from CUP and other such developments have either never been addressed or not addressed adequate-

ly. The Commission, consisting of five presidentially appointed commissioners, an executive director and a handful of technical and support staff is dedicated to balancing this mitigation debt. In accordance with a comprehensive plan, the Commission implements a variety of mitigation and conservation efforts through agreements with state and federal resource management agencies, universities and non-profit conservation organizations.

The Commission developed its first comprehensive Mitigation and Conservation Plan in 1996, which was just recently revised. It describes selected projects and budgets. While the plan will provide a significant boost to Utah's fish, wildlife and recreation, it is not a panacea for resource ills. The Commission received project requests for \$225 million its first round of planning; it is authorized to spend approximately \$170 million throughout its life. Actual funding depends on the amount Congress annually appropriates.

The plan includes riparian, wetland, bird, and fish habitat restoration targeting Provo River/Utah Lake, Strawberry/Duchesne, Diamond Fork, Great Salt Lake and Jordan River watersheds, as well as resources found across watershed boundaries. Projects encompass entire ecosystems in order to achieve \*desired future conditions,\* which are visions of how ecosystems could best function to support a variety of living things. Commission projects, such as the Wetland Ecosystem Education Project, contribute to achieving this vision over time, but clearly many partners and complementary programs are needed to achieve the entire vision.

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# WETLANDS

*continued from page 1*

come from a number of different sources, including precipitation, flooding, and ground water discharge.

## **Why Protect Wetlands?**

The dramatic decline in waterfowl numbers in the early 1900s, attributed to loss of wetland habitat, led to a new appreciation of wetlands. Further research has shown that wetlands perform flood control, water quality, and wildlife habitat benefits that are of value to us.

Wetlands can retain flood waters and reduce velocity of surface waters. During high river flows wetlands provide an area for the water to spread out and slow down. Also, wetlands store this water, decreasing the amount of water flowing down a river or into a lake during peak flows. Flood damages have been shown to increase after wetlands have been removed.

As water slows down through a wetland, sediments, excess nutrients and other toxins drop out and settle to the bottom. Harmful pollutants are often altered into harmless forms by soil organisms and/or taken up by wetland plants. Also, the wetland plant mass traps pollutants and keeps them from moving further downstream. In Denmark, farmers are cooperating in an experiment to determine if wet meadows will assist in removing nitrates from agricultural runoff before it reaches rivers and streams.

Wetlands provide food, shelter, and water for a variety of animal species. The various plant and invertebrate animal species constitute a large base in the wetland food chain. Plants such as willows, bulrushes, and cattails provide materials or places for nesting and/or resting.

Wetlands in arid regions are often the only source of water. The spotted frog, a candidate for listing as threatened under the Endangered Species Act, lives only in springs in the West Desert and other wetland habitats along the Wasatch front. Migratory birds depend on wetlands, such as those around the Great Salt Lake as a place to feed, rest and congregate (stage) before their continued migration north or south. The world's largest concentration of Wilson's phalaropes, over 500,000, use Great Salt Lake wetlands as a staging area. Hundreds of other wildlife and bird species rely on Utah's wetlands.

Wetlands have numerous other values.

Wetland plants stabilize banks of rivers, streams, and lakes preventing soil erosion. Wetlands store excess water and recharge ground water. Wetlands provide recreational opportunities such as birdwatching, hunting, canoeing, and fishing. A healthy wetland is very valuable to people and wildlife.

For more information on wetlands and how to protect them contact Cecile LeBlanc, Wetlands Specialist, Utah Division of Wildlife Resources, (801)538-4864.

# fundraiser bash ad

## **Do A Home Water Census!**

Measure your faucet and shower water flow by turning on a steady stream with gallon containers underneath. In one minute's time, what is the total flow amount? Next, measure it all!

## **IRRIGATION *Cont'd from 8***

bution uniformity is considered a good system. In Salt Lake County, a lush, green lawn historically requires 27 inches of water during the growing season. With a 50% efficient system, the water requirement is 54 inches, but with a 70% efficient system, only 38.5 inches of water are required.

The way to save money by using less water outdoors is to improve your irrigation system's performance and to alter your watering schedule based upon weather factors (evapotranspiration recommendations). The key to schedule based upon the data obtained in your landscape irrigation audit. For a free audit or assistance in landscape irrigation practices call USU Extension @ 468-3180.

Wiser Water Use is supported by the Master Water Auditors Association, Salt Lake City Public Utilities, the Utah Water Conservation Forum, the Bureau of Reclamation and Utah State University Extension.

# PROJECT

Take the Plunge.... Get WET! by Virginia Jensen, Dept. of Water Quality.

Utah WET (Water Education for Teachers) is a dynamic water education program. Seventeen excellent facilitators in various state areas, are conducting workshop sessions throughout the state. An excellent comprehensive, interdisciplinary water education program for grades K-12, WET is making a splash in Utah and around the world.

The Division of Water Resources is the Utah WET sponsor. Project WET programs are now in place in every state, Canada and the Philippines, with additional international connections joining rapidly. National and International WET headquarters are in Bozeman, Montana; a program of the Watercourse and the Council for Environmental Education.

Because water is the life-blood of our world, it is important that its human inhabitants understand and manage this resource wisely. The State Office of Education Science CORE recognizes this need through water-related standards and objectives in grades 1,4, and 5. Project WET materials fulfill the need for diverse and exciting ways to teach important water principles. WET materials have been widely field tested and include lessons which can be used across the curriculum. The Project WET Activity and Curriculum Guide is a golden resource.

Teacher workshops are arranged by facilitators and coordinated through Virginia Jensen, Utah coordinator. The workshop guide is received when an individual completes a minimum 6 hour course. Extended workshops are also available and offer participants university credit. Most Utah workshops are 10 hours in length. In addition to the regularly scheduled workshops, tailor-made classes can be arranged for teachers in individual schools or districts, community leaders, etc. A list of facilitators is available upon request.

For additional information call: Virginia W. Jensen Division of Water Resources (801) 538-7299.

# RESOURCES FOR TEACHING

## WATER EDUCATION RESOURCES

This listing includes materials on hand for loan at USEE Headquarters unless another source is given. Many of the materials are also available at SORCE in St. George (call Sandy Safford @ 801-635-8329) or at North SORCE in Logan. (call Sharon Ohlhorst @ 801-797-2580 or Amy Orchard @ 801-755-3435)

**CITIZEN'S STREAMBANK RESTORATION** Handbook. 1995. Contents include: Understanding Your Watershed; Diagnosing Stream Health; Planning a Restoration Project; and Case Studies.

**CLASS Project - Wetlands Section.** Teaching materials. Grades 7-12. Students analyze and interpret topographic maps and associated symbols. While working in groups, they design a map and build a corresponding model. Students use maps to identify and study wetlands.

**CLEAN WATER, CLEAR CHOICES** - Challenge of Nonpoint Source Pollution. Video. 13 min. 1991. This video highlights results of EPA, state agencies and local conservation districts working together to provide innovative, cost-effective solutions to non-point source water pollution.

**DIVIDING THE WATERS:** Food Security, Ecosystem Health, and the New Politics of Scarcity. Book. 1996. A blueprint which focuses on using water more efficiently, sharing it equitably, and protecting the health of freshwater ecosystems.

**DRINKING WATER ACTIVITIES FOR TEACHER'S AND STUDENTS.** Packet. 1995. Grades elementary-high school. Includes background on groundwater and hands-on activities, games, fact sheets, conservation suggestions and several demonstration projects. Some are in French and Spanish.

**EDUCATING YOUNG PEOPLE ABOUT WATER** - A Guide to Goals and Resources. Booklet. 1992. Lists teaching resources for High school to general public.

**HANDS ON SAVE OUR STREAMS (SOS).** Binder. 1995. Grades 1-12. Teacher's manual. Students learn about rivers and streams through hands-on experience. The manual is designed for both science and other teachers through the use of interdisciplinary lessons.

**IMPERILED WATERS, IMPOVERISHED FUTURE:** The Decline of Freshwater Ecosystems. Book. 1996. WorldWatch publication on issues involving freshwater including biodiversity loss, river restructuring, inputs and outtakes, fisheries, exotic species, habitat loss, and solutions. 80 p.

**NATURESCOPE,** Wading Into Wetlands. Booklet. Grades K-6th. Learning about wetlands. Includes: background for teachers; resource listings, references; and teacher friendly pages to copy. Nat Wildlife Fed, 8925 Leesburg Pike, Vienna VA 22184-0001

**OBIS: Ponds And Lakes.** Activities. 1980. Ages 5-15. Includes "Attract a Fish, Can Fishing, What Lives Here, Water Breathers" and 3 more. One of the 27 module sets of Outdoor Biology Instructional Strategies materials. Activities are games, investigations and arts/crafts projects. Published by Delta Education, Box M, Nashua, NH 03061, 800-258-1302. About \$18.50 a set.

**OUR URBAN WETLANDS:** An Endangered Resource. Video. Time 21:25. Views several local wetland sites within Rocky Mtn. States. Includes interviews with people, including kids, who value and want to protect the wetland areas. (Part of EPA Repository)

**PROJECT WET:** Program. Curriculum & Activity Guide 1995, 581 pages. Pre K-12th grade guide is free to those taking a one-day workshop. The 86 activities are organized into 7 water themes: Characteristic, Essential for Life, Earth Systems, Natural Resources, Management, Social and Cultural Constructs. Project WET, Virginia Jensen, Utah Div. of Water Resources, Box 146201, SLC, UT 84116-6201. Call (801) 538-7299.

**PROJECT WILD:** Aquatic. Curriculum Guide. 1992. Grades K-12. Addresses aquatic systems, appreciation, diversity of values, ecological principles, management and conservation, culture, and issues. 40 hands-on activities. Guides are free to those who attend training on their use. Contact Bob Ellis, WILD Utah, 1594 W. North Temple, No. 2110, SLC 84114-6301, or call 538-4720.

**SCIENCE FRIDAY ON LOCATION:** Water, Wetlands and Weather. Two Cassette Tapes. 1993. 7-9th grades. Teacher's guide. Based on National Public Radio's Talk on the Nation Science Broadcast. The material examines South Florida's weather and ecology as a aid to understanding and protecting the environment. (Lessons are relevant to all regions of the United States.)

**SOME WATER INVESTIGATION:** Lesson Plans. Grades 4-general public. How to conduct investigations of a stream or river. Answers the question, "What is the value of the stream to the environment, and to people?" Part of the I.Y.E. Series. Field equipment for this on loan at USEE.

**THE COMPREHENSIVE WATER EDUCATION BOOK.** Teacher's Guide. Grades K-6. Lessons use a learning cycle format, i.e.: exploration; concept development; and concept application. Produced by International Office for Water Education (IOWE), Utah Water Research Lab., USU, Logan, Utah 84322-8200. Call 922-4693. \$8.75 ea.

**THE WETLANDS ISSUE:** What Should We Do With Our Bogs, Swamps, and Marshes?. Book. 1992. One of the Environmental Issues Forum books. Designed to stimulate discussion and challenge participants to consider a variety of approaches to resolving wetland issues. 46 p.

**THE WONDERS OF WATER:** Video. 15 min. Produced by Utah Div. of Water Resources and USDI Bureau of Reclamation. Explores the uses and reuses of water in Utah. Get from Virginia Jensen, Utah State Division of Water Resources, Box 146201, SLC, UT 84116-6201. Call (801) 538-7299.

**WATER: A Never Ending Story.** Video. 20 minutes. A brief introduction to eight steps in the hydrologic cycle: evaporation, precipitation, water storage, water treatment, distribution systems, water use, sewer systems and waste treatment. Get from Virginia Jensen, Utah State Division of Water Resources, Box 146201, SLC, UT 84116-6201. Call (801) 538-7299.

**WETLANDS OF UTAH.** Booklet. Describes the various wetlands in Utah including lacustrine and palustrine. Gives brief discussion of conservation. 20 p.

**YOUNG SCIENTIST'S INTRODUCTION TO WETLANDS.** Children's booklet. 1985. Corp of Engineers describe the nature and values of wetlands. Order from US Army Engineers Waterways Experiment Station; Wetlands Research and Technology Center; Attn: CEWES-EP-W (TTS); 3909 Halls Ferry Road; Vicksburg, MS 39180-6199; (601) 634-4217.

# HYDRO

dam operations.

Native fish may be harmed from the introduction of other fish species or the release of cold, clear waters below the dam. Riparian vegetation can either be enhanced or degraded depending on the dams operations. Sedimentation and sediment deposits are also issues which can impact a river and the adjacent habitat. We also treasure wilderness and insist as a society that we provide some protection for our rivers.

Some of the laws that have been passed since the dams were built include the Wild and Scenic River Act, Endangered Species Act and the Electric Consumers Protection Act.

The way utilities operate their hydroelectric plants is regulated by the Federal Energy Regulatory Commission (FERC) and societal values. Utilities are required to obtain licenses from FERC which mandate how the plants will be operated. FERC requires the utility to balance power generation with protection or enhancement of environmental resources. The licensing process which takes at least 5-10 years, requires that the plant owner conduct assessments of project operations on environmental resources; consults with resource agencies

and the public; and recommends enhancement or protection measures for the various resources.

PacifiCorp owns 53 hydroelectric projects that operate under 27 FERC licenses in the seven western states we serve. The electricity generated from these 53 plants produce about 7% of our energy resources required for our 1.4 million customers. While only a small percent of our energy resource, it is still very important to PacifiCorp because it provides a reliable, relatively inexpensive, renewable energy source.

PacifiCorp joined other utilities and consultants in 1994 to form the Foundation for Water and Energy Education (FWEE). FWEE's purpose is to gain public support for hydros by providing the public accurate, balanced, and credible information regarding the use of water as a renewable energy resource. FWEE has developed several approaches to educate the public depending on the age and education level of the audience. Much of the material is hands on and includes posters, a video, a hand crank model of a hydroelectric pro-

ject, a paper pop-up model of a dam and power plant that children build; and a science curriculum for middle schools. The "Nature of Water Power" science curriculum (which includes a teachers guide and experiment kit), explores the scientific and social links between the hydrologic cycle, rivers, generation of electricity, and the environment. FWEE has also developed a homepage about hydropower called "Puzzled about Hydropower?" which can be found on the Internet at [www.fwee.org](http://www.fwee.org). PacifiCorp has been working with USEE to make the FWEE materials available.

PacifiCorp believes that hydropower is an important energy resource for the present and the future. We are also committed to helping educate the public on the values and benefits of hydroelectricity. PacifiCorp will be sponsoring the six hour "Nature of Water Power" workshop for 25-30 middle school science teachers this year. If you are interested in the workshop, FWEE materials or additional information on hydropower contact Jim Burruss @ (801)220-2535.

Jim Burruss has worked for PacifiCorp for 13 years in the Environmental Services Department. His current job is a Lead Scientist, responsible for supervising environmental studies associated with hydro relicensing, bird/powerline management and land use programs. He graduated from Utah State University with a BS degree in Wildlife Science. Jim worked for the Utah Division of Wildlife Resources as a wildlife biologist prior to working for PacifiCorp. His interests include camping, hiking, fishing, hunting and skiing..

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