



ARIZONA
ASSOCIATION FOR
ENVIRONMENTAL
EDUCATION

AAEE is a nonprofit organization working to enhance the quality of environmental education in Arizona and to advance professionalism among all who are involved with environmental education, whatever the topic or setting.

INTRODUCING... AAEE's News Journal

Based on member feedback, we redesigned our communication tools. The News Journal is a bi-annual journal of environmental education in Arizona published in September and March, and the E-Newsletter is a monthly electronic update on events, job opportunities, and links to our website for breaking news. See page 12 for information on how you can contribute to these publications.

www.arizonaee.org

SUN CATCHER

NEWS JOURNAL of AAEE

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EDUCATION FOR SUSTAINABILITY:

What can it contribute to the goals of EE?

-Jaimie P. Cloud, President of the Cloud Institute for Sustainability Education

The goal of Education for Sustainability (EFS) is, "to develop in young people and adults new knowledge and new ways of thinking needed to achieve economic prosperity, participate democratically, secure justice and equity, and all the while regenerate the health of the ecosystems, the gift upon which all life and all production depend." (The Cloud Institute for Sustainability Education www.sustainabilityed.org) The Environmental Education movement has been instrumental in bringing awareness, knowledge, heart and political capital to the plight and to the beauty of our natural systems and has forced many of us to think more deeply and profoundly about our relationship to nature. What then can the Decade of Education for Sustainable Development, and more specifically how can Education for Sustainability contribute to the goals of EE?

In order to address this question, it is useful to have an understanding of the core content and habits of mind of Education for Sustainability (EFS) that has evolved over many years. The essays, thoughts, and opinions of David Orr, author of *Ecological Literacy* and *Earth in Mind*, have been instrumental in shaping the emerging American understanding of education for

sustainability. Books such as Huckle and

Sterling's *Education for Sustainability* and Wheeler and Bijur's *Education for a Sustainable Future*, which are comprised of articles that contain case studies, research, and proposed frameworks, have also been influential.

More specific frameworks than the ones proposed in these books, some tied to particular projects, have arisen. Various organizations have evolved and refined their own sets of principles and standards for sustainability education. In view of all this work, what is our current understanding about what is necessary for and characteristic of EFS core content for Americans in the U.S.?

If we examine the goals of theoreticians and practitioners of sustainability education, we can see a broad consensus about key K-12 student outcomes and essential knowledge, skills, and dispositions. The following list is best understood as a "whole system" of interdependent content areas and habits of mind that are mutually beneficial to one another.

Recognizing that EE and EFS are not the same, but do share a common interest in achieving a quality of life for all within the means of nature, I think one of the greatest opportunities that EFS can offer to EE that will strengthen its capacity over the next ten years is the contribution of the tools, concepts, archetypes and "habits of mind" of systems thinking and system dynamics education—a core content area of EFS.

"Systems thinking" and system dynamics serve as both content areas and as habits of mind that characterize teaching and learning for sustainability. The content areas include

(Continued on Page 10)



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LETTER FROM THE PRESIDENT

Dear AAEE Members,



Greetings and welcome to my first "state of the state address" as your new AAEE president. I feel fortunate to be newly (re)elected to the

Board of Directors after a two-year hiatus in which I: moved from Flagstaff to Page (to student teach), moved to New Zealand (to finish student teaching and conduct some of my thesis research), moved back to Phoenix (and into my parents' house to figure out what to do next), got a fabulous job at the Desert Botanical Garden as the Children's Programs Coordinator, defended my master's thesis at Northern Arizona University, bought a house in Phoenix, and got married (to a lovely man who was also my research assistant in New Zealand). Phew!! It's been an intense couple of years, but I'm enjoying settling back into the Arizona life and thrilled to be a member of AAEE Board of Directors again.

In my departure, I knew I was leaving the organization in extremely capable hands.

Still, I find it truly stunning to realize how very much AAEE has accomplished in just two years. AAEE now has a five-year strategic plan, a revamped and well distributed newsletter, and a comprehensive membership communication strategy. We've supported dozens of professional development opportunities across the state.

Most importantly, these efforts have strengthened our infrastructure and strategically prepared AAEE to promote environmental literacy in Arizona. We're looking forward to hosting *The Arizona Crossroads Summit* in April, thanks to a generous grant from the Nina Mason Pulliam Charitable Trust. It will ultimately help us achieve our goal of advancing environmental literacy within our state.

I'm honored to help lead AAEE during such an exciting time for the organization and building upon the legacy of the past. I look forward to seeing you at the Spring Event on May 6 and thank you for this opportunity to contribute to EE in Arizona!

-Julie Blake Gidley

OUTSTANDING LEADERSHIP

Leadership development and professional training are the focus of AAEE's recent efforts to serve environmental educators in Arizona. Larry McBiles, out-going president of AAEE, set a high standard for leaders coming along in his footsteps.

Serving as Executive Director of the Arizona Foundation for Resource

Education since 2001, Larry contributed his expertise in formal education and organizational management while serving as president of AAEE.

His humor, drive, and inspiring example set AAEE on firm ground to navigate the challenges ahead.



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SUMMIT AIMS TO FIND COMMON GROUND ON ENVIRONMENTAL LITERACY

AEE to Host Arizona Crossroads Summit in April

- Hayley Ivins, ASU Student

This spring, leaders from all sectors of society will have the opportunity to share ideas on increasing environmental literacy. The Arizona Association for Environmental Education will play host to the 2006 *Arizona Crossroads Summit* on April 18. The AEE's mission of making environmental education more relevant and significant will drive the Summit. This conference comes at a time when the benefits of environmental education are not always visible to those inside and outside the education field. Conference organizers hope to change this through a cross-disciplinary approach. The Summit will integrate economics, the

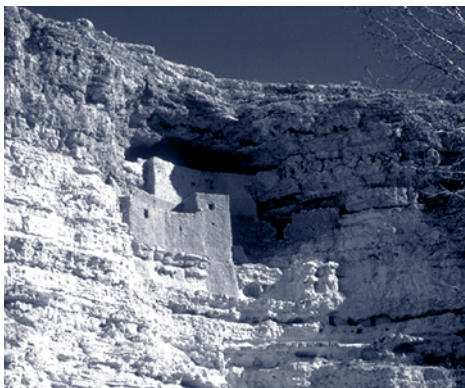
environment and education by engaging government, industry, education and environmental leaders in practical discussions. With these discussions, Co-Coordinator Patricia Olson and Derk Janssen, and the organizing committee intend to work towards a practical "Call to Action" for educators and policymakers around the state. Organizers, with the belief that "education can be the bridge by which divergent sectors of our society can come together to find common ground and innovation," aim to create a diverse working group. This group will work to find creative solutions to pressing economic, educational and environmental challenges facing the state. Longtime lawyer and public official

Grady Gammage Jr. will open the one-day Summit, which is supported by a generous grant from the Nina Mason Pulliam Charitable Trust. The event will be held at the Heard Museum, located at 2301 North Central Avenue in Phoenix. To find out more about the Summit, visit <http://www.arizonaee.org/events/summit.html>. Participation is by invitation and is limited to 100.

Since the focus will be on insuring that leaders from a variety of societal sectors are present, it will not be possible to invite all AEE members. There will be follow-up opportunities for AEE members for further learning and participation.

CONNECTIONS: PEOPLE AND ENVIRONMENT- *Discovering Arizona's Transition Zone* *Montezuma Castle National Monument and Montezuma Well* May 6-7, 2006

The Arizona Association for Environmental Education invites members and non-members to spend the weekend in the mild Verde Valley among the juniper-mesquite woodland below the Mogollon Rim. On Saturday geologists, natural and cultural historians, wildlife specialists, national park interpreters, archaeologists and education specialists will lead groups through activities designed to explore the land between the plateau and desert regions of Arizona.



On Sunday participants may elect to join one of several tours. Some of the activities being considered include visits to Tuzigoot National Monument, Fort Verde State Park, the historic mining town of Jerome and Arcosanti.

Registration (Early Bird):

\$50 for current members
\$40 for students
\$70 for non-members, (which includes a one-year membership to AEE.)

Early Bird deadline is April 10, 2006, prices go up by \$10 after that.

Registration forms can be downloaded at our website www.arizonaee.org. Hardcopy can be sent on request.

For questions, concerns or registration materials, contact Erin Morris at 602-266-4417 or erin.morris@afre.org

SUSTAINABILITY

A Concern for Wildlife Too



- Carol Madeheim, *Environmental Educator*

The sun rises over the Tucson Mountains and my yard turns into a busy wildlife community. Topknots bobbing, dozens of strutting Gambel's quail come for their morning drink. A crimson-coated cardinal and his dusky mate search for seeds under mesquite and cholla. A hyperactive, bushy-tailed Harris' ground squirrel climbs up the spiny barrel cactus ladder and enjoys the golden fruit. Costas hummers make "light-saber" sounds as they dive and chase each other from feeder to feeder.

To quietly sit and observe the interactions of these small lives is a source of a quiet interlude, a daily enjoyment. They adapt, survive, and, with good luck and a sustainable habitat, thrive.

PLANTS AND ANIMALS IN TROUBLE

But large areas of native habitat are being threatened. Sustainable wildlife "real estate" is dwindling as human development expands. When animal homes are invaded and destroyed, what happens to the refugees? Many don't survive. Some pack up and move to more hospitable environs. Even migratory animals suffer through habitat fragmentation and use of pesticides. Important habitat and nectar and travel corridors are becoming increasingly endangered. Amazingly, some migratory pollinators travel tremendous distances; the tiny Rufus hummingbird makes a pilgrimage of over 2000 miles each year from Alaska to South America.

Many of our Sonoran Desert plants depend upon animal pollinators to exist and so do approximately 80% of the world's crops. Without pollinators, many types of food, drink and medicine would not be available for human use today.

Much is happening with animal populations that we can't control, especially in countries to our south, but we can do things in our

neighborhoods to help. By helping pollinators and other wildlife, humans make the world a better place for themselves: a healthy animal habitat is a healthy human one too.

WHAT CAN WE DO TO HELP?

Schoolyard habitats offer hope as they help replace lost and needed habitats that have been destroyed by cement or blacktop playgrounds and sidewalks. Through planning and developing wildlife and pollinator friendly sites, students and community members become more ecologically literate and sensitized toward the protection of natural resources. Such places create islands of good habitat for a variety of local and migratory pollinators, and other small wildlife. They offering a variety of pollinator attractant plants and meet basic wildlife needs - food water, shelter and space.

What wonderful outdoor learning opportunities and small corners of the "wild" these living laboratories are. Such animal- and plant-friendly places fulfill a basic need of children for wild places to enjoy and explore. As children connect with wildlife, they learn first-hand not only about the "critters" and plants observed, but also about when and what to plant, use of native plants, and the responsibility of caring for the garden. They experience the wonder and joy of seeing hummers close up as they sip nectar and catch small insects. They are amazed at the variety of "flutterbys" that taste with their feet and drink nectar with long uncoiling proboscises. Such settings inspire budding curiosity and creative spirits.

By using the outdoor classrooms to teach "across the curriculum" teachers can develop projects in math, art, composition, journaling, and of, course, natural history. By actively developing questions and then designing methods to find the answers, children and teachers experience science inquiry in its best and purest form.

A sustainable schoolyard habitat design can be a complex undertaking and requires work and commitment, but the potential rewards are great. Listed below is a small sampling of resources for further information and help. Each will lead you to many more!

WEBSITES

www.wildneighbors.org

Humane Society site suggests ways for humans and wildlife to coexist.

www.hsus.org

Humane Society information on helping wild animals.

www.azgfd.gov/w_c/heritage_apply.shtm

Arizona Game and Fish Department. A current listing of Heritage Grant School Yard participants and funding opportunities.

www.desertmuseum.org

ASDM Research and Conservation Department "Migratory Pollinators Project." Education Department teacher resources: "Plant and Animal Partners," a downloadable activity packet for the school program at the museum.

www.nwf.org/backyardwildlifehabitat

National Wildlife Federation backyard wildlife habitat programs, educator resources, and wild school site certification.

FOR READING

Arizona Native Plant Society. *Desert Gardening Booklets* - Series of nine booklets with information on desert gardening and plants to attract birds and butterflies. Tucson, AZ: 1990-1997.

Arizona-Sonora Desert Museum, International Sonoran Desert Alliance, The Bee Works. *Pollinators of the Sonoran Desert*. Tucson, AZ: 2004.

Buchman, Steve L. and Gary Paul Nabhan. *The Forgotten Pollinators*. Island Press. Washington D.C.: 1996.

Nabhan, Gary Paul and Stephen Trimble. *The Geography of Childhood*. Beacon Press. Boston, MA: 1994.

Tucson Audubon Society. *Dr. Strangeplant*. Tucson Audubon Society, Tucson, AZ: 1989.

Tufts, C. and P. Loewer. *Gardening for Wildlife*. Rodale Pres. Emmaus, PA: 1995.

University of Arizona. *Schoolyard Habitat Design*. Sponsored by Arizona Game and Fish Department Tucson, AZ.

Western Regional Environmental Education Council, Inc. *Wild School Sites*. A guide to developing wildlife habitats on school grounds. Project Wild. Bethesda, MD: 1993.

LAST CHILD IN THE WOODS: OUCH!!!

- Karen Schedler, *Heritage Environmental Education Program Manager, Arizona Game and Fish Department*

In *Last Child in the Woods*, Richard Louv describes this “new relationship between nature and children.” How can we build a sustainable future if children believe that spending time with computers is more important than clean air or water? Who will make wise land-use decisions that accommodate native species if no one has experienced an “aha!” moment within the natural world?

It is imperative that we understand the **immediacy and urgency** of our role as EE providers and nurturers. No time for mistakes here - rekindle that flame for EE!

Louv addresses the third frontier of *electronic detachment*:

- The severance of public and private mind from our food's origins.
- A disappearing line between machines, humans and other animals.
- An increased *intellectual* understanding of our relationship with other animals.
- An invasion of our cities by wild animals.
- A rise of a new kind of suburbia (HOAs with rules on adults and children), giving rise to poor land use decisions, overuse of resources, fear of litigation.

Sound familiar?

WHY DO WE NEED NATURE?

1. Natural landscapes are therapeutic, restorative.

2. Green space fosters social interaction, promotes a social support structure, increases physical and emotional healing, enhances learning and creativity.
3. There is a direct childhood link between outdoor activity and physical health. (Is the rise of childhood obesity on anyone's radar screen?)
4. Nature can provide sound therapy for ADHD by creating a restorative environment, counteracting the impacts of cultural autism.
5. Play is becoming commercialized: more dollars and time are invested in sports than in multi-choice space for free play.

“...COMPUTERS WERE MORE IMPORTANT THAN NATURE, BECAUSE COMPUTERS ARE WHERE THE JOBS ARE.”

“Time in nature is not leisure time; it's an essential investment in our children's health.”

Media exaggerates real dangers in nature, creating an ecophobia which can overwhelm. Public education is enamored by silicon faith - a myopic focus on high technology. (Ironically, this creates fewer

students of natural history since more associate nature with fear and catastrophe.)

NORTHERN ARIZONA UNIVERSITY RESEARCH

An NAU study of national parks sheds light on why parks across the nation suffer from a decline in visitation: shortage of family time, perception that parks are for “viewing scenery”, shorter vacations, shrinking American road trips, growth of immigrant groups with no prior experience in wilderness parks, increased entrance fees (\$20 per car), perceptions that national parks are for the affluent, 'windshield tours' replacing camping experiences. Add one more deterrent: in Australia, insurance for Girl Guides and Scouts Australia skyrocketed by 500% in one year!

WHAT IS THE ECOLOGICAL MODEL OF CHILD DEVELOPMENT?

Louv's best quote? “We need to draw an important distinction between a constructively bored mind and a negatively numbed mind.”

We have much to celebrate - but our work has never been more real, immediate, urgent, and important than at this very moment.

FOR READING

Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder by Richard Louv (Algonquin Books of Chapel Hill, 2005)

GETTING OUT

Notes From the Field

- Tricia Oshant Hawkins

I almost overlooked it as I crossed the tiny stream on the backside of the Huachuca Mountains. But there, in the muddy bank, I saw it. I carefully measured it, photographed it and recorded the data according to protocol. But most of all, I loved it. A mountain lion track! A mountain lion had walked here, right here where I was standing! And I had found the evidence. No, I didn't see the living, breathing creature right there. But that was ok, I knew the lion was not too far and in these very mountains-it was a pretty fresh track.

Just knowing that such a large, wild carnivore roamed nearby was very fulfilling and somehow, reassuring. I was in awe and I was happy.

What's happening to me? I mean, I've had a lot of close encounters with wildlife. I've ridden a

whale shark, released bald eagles into the wild, handled jaguars, touched a polar bear (ok, it was behind the scenes in a zoo), witnessed the first return of condors back into the wilderness and had a sea lion fall asleep on my feet. So with all these amazing experiences, I'm all excited about a mere track?

I'M PLEASED TO SAY, "YES!"

It is with that enthusiasm that I introduce this new column for the AAEE newsletter. Getting Out: Notes From the Field will bring information and inspiration about Arizona's wildlife and wild places. Places we long to be, wildlife we long to see. It's about what we can see and what we can

do in this amazing state of ours and hopefully, it will inspire us to get out!

Which is exactly where I was when I saw the track. I was outside, in the field, tracking wildlife. Tracking is something entirely new to me. It's humbling to learn there is still so much to learn, especially when you've studied wildlife for many years. Instead of looking down, I was busy trapping or counting or especially, looking up at birds. That time I was birding in Colorado and saw a huge, very fresh mountain lion scat with tiny deer hooves in it, did I even think to look for tracks?

No, but I did see that western tanager fly over.

So when the team leader for the tracking study said, "No binoculars on the transect," I gasped. My primary piece of field equipment! My surprise was even greater when this whole new world at

my feet began to reveal itself and even start to make sense. I forgot about my binoculars. That same excitement I feel when birding began to well up while tracking. In addition to all those great birds up there, there's all this activity down here!

Wildlife tracking is used as a tool to monitor the presence or absence of wildlife. When using tracking in a field study, tracks are carefully measured, photographed and their position is noted using a GPS unit. The data allows reviewers to confirm the identity of the track and use the information for such things as to inform land management and



GETTING OUT

(Continued)

policy. I learned all this at a recent training put on by the Sky Island Alliance for their Wildlife Monitoring Program. Based out of Tucson, the organization trains volunteers to gather data to determine the presence or absence of key wildlife species in areas that are potential corridors between mountain ranges in southern Arizona.

For many however, wildlife tracking is an outdoor pastime, a hobby, even a way of life. And once you

experience it, you might agree. It's not just seeing a specific paw or hoof print in the ground and identifying it. It's noting the habitat, the direction of travel, or the spacing of the tracks (which can tell you how fast the animal was moving). It's being out in the environment and reading the landscape. With a good guide book and practice, you'll be able to discern a bobcat's tracks from a coyote's or the track of a coati from that of a raccoon. And it's fun. And kids enjoy it. It's a great excuse to get out and you can do it just about anywhere. From an educator's point of view, tracking incorporates math, reading and science skills. It's one more way to experience the outdoors.

So, yes, I am excited by a mere track - even with all I've seen and done. There is this track on this day and it means there is that animal roaming here, now. It is a sign that there are wild things and wild places to sustain them. And I am rejuvenated by such experiences. As environmental educators, we all need to refresh ourselves with our subject. It helps sustain

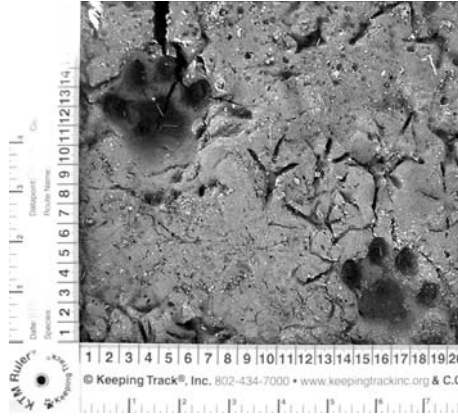
our own energy and abilities to educate about that for which we are passionate. We all need to be getting out more often!

There are many opportunities in Arizona to get out and experience wildlife and the

outdoors. Tracking is just one of them. In the next issues, look for articles on experiencing Arizona's wetlands, wildlife migrations, invasive species and endangered species. There will also be articles on special places or natural phenomena unique to our state. If you

would like to contribute ideas or articles, contact the columnist, below.

Trica Oshant Hawkins
Education Director,
Environmental Education Exchange
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If you are interested in learning more about wildlife tracking or participating in Sky Island Alliance's Wildlife Monitoring Program, check out the following resources:

Animal Tracks of Arizona and New Mexico (Lone Pine Tracking Guide) by Ian Sheldon

Scats and Tracks of the Desert Southwest, A Field Guide to the Signs of 70 Wildlife Species by James Halfpenny

Tracking and the Art of Seeing: How to Read Animal Tracks and Sign by Paul Rezendes

Acorn Naturalists sells life-size animal track replicas that are cast in flexible vinyl. These make great learning and teaching tools. Check out their website at: acornnaturalists.com.

Sky Island Alliance offers training for their Wildlife Monitoring Program each spring and winter. Contact them at: (520) 624-7080 or send an email to: info@skyislandalliance.org.

The Willow Bend Environmental Education Center in Flagstaff hosts Ancient Pathways' Animal Tracking Club of Northern Arizona. Contact them at: (928) 779-1745.

ARIZONA PRELIMINARY FIRE SEASON OUTLOOK FOR 2006

- Heidi Schewel, Coronado National Forest

It looks like Arizona's forests are in for an early, prolonged and potentially severe fire season. A number of factors working in concert are responsible for the early onset of fire season throughout the Southwest.

The winter of 2004/2005 was relatively wet, resulting in an abundance of carryover fine herbaceous fuels which are now cured and ready to burn. We have experienced a significant precipitation deficit since the weak 2005 monsoon season. At a time when Arizona's mountains would normally be covered with snow, snowpack is non-existent in most cases. Deserts appear to be more dessicated than during the peak of the summer heat. Weather forecasts call for above-normal temperatures and below-normal precipitation levels through June. At the lower elevations, lighter fuel types are susceptible to fire through the winter and beyond. Higher up, heavier fuels are also dry and flammable.

Additionally, in most locations our forests are not in a natural condition. It is no news to many that our forests are overstocked. A century of fire

suppression has resulted in forests supporting more trees than would have been present under natural conditions. Historically, fire burned through Southwestern Ponderosa pine forests frequently and at low intensities, clearing dead and down material from the forest floor and keeping new growth in check. Now forests are choked with too many trees

competing for limited resources. Where forests of the past were open and park-like, with fires burning along the forest floor, presently the close-growing younger trees provide "ladders" for fire to get up into the treetops, or crowns. Such crown fires are those that can consume entire forests. This overcrowding, combined with drought conditions has rendered many forests susceptible to attack from bark beetles. Under dry conditions, trees are unable to produce sufficient sap to repel the beetles. Large tracts of trees have been killed by the insects, increasing the fuel available to burn dramatically.



Coronado Forest Service Photo

Fire season on the Coronado National Forest usually occurs from April or May through July of a given year. This year, however, we're into fire season in January. Is this unusual? It certainly is. Fire managers follow several indicies to predict how a fire would burn, should one occur, in a particular location at a particular time. As of early January, conditions were lined up just as they were in 2002, Arizona's worst fire-year in recorded history. (The 30,000 acre Bullock Fire and 469,000 acre

Rodeo Chedeki Fire occurred in Arizona in 2002.) Our fuels are the driest they have been in 30 years. Like many other land managers, we don't want to impose fire restrictions until it becomes necessary to do so. However, it appears that restrictions will go into effect earlier than usual this year. We are currently engaging in a lot of patrolling, and prevention education. When conditions are such as they are, it is imperative for people to be especially careful with fire. We remind our visitors never to leave a fire unattended until it's out - cold to the touch and to use ashtrays to extinguish smoking materials.

ARIZONA EE POINTS OF PRIDE PROJECT

- Lacey Wieser, AAEE WebMaster

The Arizona EE Points of Pride project is designed to help anyone interested in environmental education (EE) statewide. There are two components to this project:

COMPONENT 1: Identification of EE programs in Arizona.

This is intended to be a short description of environmental education (EE) programs across Arizona. These may include programs designed for K-12 educators, EE providers, and/or the

general public. Many of the providers are already included on the AAEE database on the AAEE Website.

For programs not in the database, volunteers interested in this project would identify exemplary programs and submit them or would review programs that are in the database and provide or update information that is missing.

COMPONENT 2: Spotlight articles about exemplary EE programs/providers in Arizona.

This is intended to be a general interest article for AAEE membership and the general public of approximately 300 words that spotlights exemplary EE programs/providers in

Arizona, published either in the newsletter or on the website.

FOR MORE INFORMATION please see our website under Membership; click on Get Involved and scroll down to **Arizona Points of Pride**, or call **AAEE at 520-319-1741**.



IMPERIAL NATIONAL WILDLIFE REFUGE

An interview with Sue McDonald, Visitor Services Manager

- Jean Contreras, News Journal Editor



U.S. National Wildlife Service photo by Sue McDonald

Imperial National Wildlife Refuge is 35 miles north of Yuma at Martinez Lake on the Colorado River. Sue McDonald is an AAEE member and a professional environmental educator. I had planned to visit personally with Sue. I was able to visit the INWR, but not during hours when the center was open.

Q1: The facility appears to be growing and using solar heating. How “green” are the buildings?

The visitor center was built in 1979 and has only expanded in ways to enhance the efficiency and visitor experience. In the mid-90's, exhibits were installed, in 2002 or '03, the solar panels were put in and provide 70% of the visitor center's electricity. Finally, this past year (2005) the visitor center was renovated to make it wheelchair accessible (new doors, paved parking area, and new bathroom facilities).

Q2: The observation deck is gorgeous and the ramp very easy to walk up. However, for someone with disabilities (wheelchair or cane assisted) getting there from the cement sidewalk is a challenge. Will there be a parking lot nearer to the deck or extensions of the sidewalks?

Ideally, we would like to extend the cement path to the tower trail. However,

we thought we used wheelchair accessible material for the ramp and trail.

I had a person in a wheelchair test it out before we opened and he thought it was good. I'd like to hear more from you about your concern on the trail.

Note: I responded to Sue on a personal basis as one who can walk, but required rest periods for longer walks. I suggested a bench halfway to the observation deck.

Q3: I remember a natural history weekend AAEE (AALE, then) gave at the Cibola Wildlife Reserve back in the early 1990's. It seemed like there were oxbow lakes. Is there another visitor center closer to Blythe?

A large section of Imperial is closed to the public for the benefit of wildlife. I would say that Imperial and Cibola NWR's have different wildlife viewing experiences. If you would like, I can send you a brochure about Cibola.

Q4: At a recent visit to the Imperial NWR, we visited the first two overlooks, Palo Verde and Mesquite before it got too dark for viewing. If we had traveled farther north during the daytime and visited the other sites, how would the viewing of birds be affected, better or about the same?

Cibola has more geese and sandhill cranes than Imperial NWR. I've not spent much time up there. I hear there is more access for wildlife viewing on ponds. Cibola National Wildlife Refuge (NWR) is

another Refuge on the River, administered by a separate manager. They have a visitor center near Blythe.

Q5: It appeared that the lake was very low, especially when we were at the Mesquite overlook. How is the drought affecting the preserve?

McAllister Lake, view from Mesquite Point, is being drawn down by the Bureau of Reclamation as part of an ongoing study to restore native habitat along the Colorado River. The draw down was to remove salty water and allow fresh ground water seepage back into the lake. I believe this is the second time they have done this. The idea is to mimic what the river use to do when it flooded periodically across the valley and “cleaned” things out. As for the drought, I don't realize it, except on the dusty roads.

Q6: Are you seeing a difference in the population of different kinds of migratory birds this year? In what way and is it across the board or just some species?

Per our biologist, Guy Wagner, “we are seeing what we would expect to see... same number of species and in the same

places”. The only unusual sightings are the shorebirds (Avocets, Sandpipers, etc.) attracted to the water draw down at McAllister Lake. That will change once the ground water filters back in.

For more information, contact Sue McDonald, Visitor Services Manager, Imperial National Wildlife Refuge, P.O. Box 72217, Yuma, AZ 85365, or telephone (928) 783-3371 ext.15. Email: Sue_McDonald@fws.gov



U.S. National Wildlife Service photo by Sue McDonald

the study of dynamics and patterns within systems; knowledge of concepts, tools, and systems archetypes; and the ability to develop and manipulate computer models. The Habits of Mind of a Whole Systems Thinker that are specifically germane to EFS appear below:

- Understanding of systems as the context for decision making
- Intergenerational responsibility
- Mindfulness of and skillfulness with implications and consequences
- Protection and enhancement of the commons
- Awareness of driving forces and their implications and consequences
- Assumption of strategic responsibility
- Ability to shift paradigms in response to new knowledge and applied insights

Ecological literacy includes an understanding of carrying capacity; basic facts about how the planet works (beautifully characterized by The Natural Step [www.naturalstep.org]); the resilience and yet the vulnerability of the Earth's self-regulatory systems and cycles; the value and irreplaceable nature of biodiversity; the management of renewable and non-renewable resources; the reliance of humans upon precious and irreplaceable ecosystem services; and the interconnectedness of humans and all the earth's systems.

Multiple perspectives includes the ability to truly value and learn from the life experiences and cultures of others; the ability to profoundly understand and respect, if not agree with, the conclusions of others and to see the relationship of those conclusions to the person's experiences, needs, values, and goals; the ability to uncover the reasonable human needs that underlie many seemingly unreasonable human demands and behaviors; and the

ability to work with people who present different perspectives to create shared visions, understandings, and policies far richer than anything that could have been achieved alone.

Place includes understanding the profound and complex interactions between geography, ecology, people, and their culture; knowing, appreciating, and being able to analyze (through the lens of sustainability) the many ways people have lived in places; abandoning the idea that we can always “move on” if a place seems too boring or damaged to provide a good life; valuing the local knowledge of a place; and becoming committed to restoring and improving the beauty, integrity, and health of one's native place.

Sustainable economics includes an understanding of appropriate and accurate indicators of well-being and a knowledge of market dynamics, market failures, and common-pool resources, including awareness of life cycle analysis and full-cost accounting. It also includes a rich understanding of progress and capital, the ability to discern human needs and to envision sustainable ways of meeting those needs given the resources and constraints of the Earth's natural systems. Finally, sustainable economics incorporates an allegiance to equity and universal human development as a human right but also as a crucial necessity to attaining sustainability; and understanding the wisdom of honoring the precautionary principle when implementing new human technologies and innovations.

Citizenship includes a concern for equity and justice, such that one works with others to develop effective, long-term solutions, informed by the knowledge, experience, and needs of a broad array of stakeholders, to social, economic and environmental needs and challenges. It also includes the ability to be a catalytic and participatory leader, to rationally negotiate mutually beneficial

relationships between economic and social goals and the natural systems upon which they depend, to place local problems in a national and global context, and to develop and negotiate the criteria used to reconcile the conflicts that exist between individual rights and our responsibilities as citizens of a participatory democracy.

Creativity and visioning include the ability to creatively combine knowledge from different fields to innovate and craft sustainable human practices and institutions; to think creatively about goals and indicators, problems and solutions; to see problems as opportunities; to work with others to create rich, complex, and hopeful visions of our future and then to invent that future; and to connect people emotionally and psychologically through the arts to one another, to our histories, our futures, and to the places in which we live.

So how can Education for Sustainability contribute to the goals of EE? Knowing what EFS is, is the first step. I invite you to take the next one. For your information, NAAEE launched an EFS Commission at the last annual conference in Albuquerque, and we are already working with many State EE organizations and associations including the “Living Institutions” (zoos, aquaria and botanic gardens) to provide professional development opportunities in EFS for staff, administrators and trustees to determine the next steps. The conversation is getting interesting. Welcome.

NOTES:

1 The Center for a Sustainable Future (<http://csf.concord.org>); The Cloud Institute for Sustainability Education (www.cloudinstitute.org); The Center for Teaching International Relations (<http://www.du.edu/ctir/>); Learning for a Sustainable Future (<http://www.lsf-ist.ca/en/home/>)

2 Whole Systems Thinkers' Rubric, The Cloud Institute for Sustainability Education (www.sustainabilityed.org), 2004.

www.cloudinstitute.org

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WHAT DOES IT MEAN TO BE ENVIRONMENTALLY LITERATE?

- Bora Simmons, Northern Illinois University

The National Project for Excellence in Environmental Education

initiated by the North American Association for Environmental Education (NAAEE) in 1993, is attempting to answer that question. Environmental education is a process that aims to develop an environmentally literate citizenry that can compete in our global economy; has the skills, knowledge, and inclinations to make well-informed choices; and exercises the rights and responsibilities of members of a community.

Through the National Project for Excellence in Environmental Education, NAAEE is taking the lead in establishing guidelines for the development of balanced, scientifically accurate, and comprehensive environmental education programs. Quality environmental education programs facilitate the teaching of science, civics, social studies, mathematics, geography, language arts, etc. These guidelines will help educators develop meaningful environmental education programs that integrate across and build upon the high standards set by the core disciplines.

The National Project for Excellence in Environmental Education is a multi-year program designed to identify and provide examples of high quality environmental education practice. The NPEEE materials posted on the NAAEE website are copies of the latest versions of the printed materials. Publication Information can be found on the

NAAEE Publications page. The Project has completed the following interrelated efforts:

1. Publication of *Environmental Education Materials: Guidelines for Excellence*; and its companion publication: *Environmental Education Materials: Guidelines for Excellence - The Workbook* (HTML and PDF versions are available) which leads educators, step by step, through the process of using the *Environmental Education Materials: Guidelines for Excellence*.
2. Creation of a series of educators' resource guides to quality environmental education materials: *Environmental Education Collection - A Review of Resources for Educators: Vols. 1, 2 & 3*; *The Biodiversity Collection* (produced by the World Wildlife Fund)
3. Development of environmental education learner guidelines "Excellence in EE - Guidelines for Learning (Pre K-12)", and its companion piece, the "Guidelines for Learning (Pre K-12) " Executive Summary & Self Assessment Tool.
4. Development of a set of recommendations for the preparation and continuing education of teachers and other environmental educators: *Guidelines for the Preparation and Professional Development of Environmental Educators*
5. Development of training materials for individuals who have completed a *Guidelines* workshop.

6. Development of recommendations for the design and implementation of comprehensive nonformal environmental education programs: "Nonformal Environmental Education Programs: Guidelines for Excellence."

The National Project for Excellence in Environmental Education is being funded by the U.S. Environmental Protection Agency through the Environmental Education and Training Partnership (EETAP) plus the National Environmental Education and Training Foundation, the National Fish and Wildlife Foundation, Northern Illinois University, and World Wildlife Fund.

For more information, go to www.arizonaee.org and click on "Resources."

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3. Use one space between paragraphs.
4. Your name, title, and contact information should appear at the end of your article.
5. If what you are submitting is a reprint, you need to tell us from what publication and send us the permission to reprint.
6. Photos must be sent as JPEGs; no other format can be accepted.
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8. Submit articles as an attachment NOT in the body of your email.
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