Using Citizen Science, Education and Community Involvement –

to Preserve, Protect and Restore the Unique Springs and Wetlands of the Southwest

Jeff Depew

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Professor Emeritus, Webster University
International Campus, St. Louis Missouri

Educator and researcher for over 40 years

Restoration Ecology since the groundbreaking 1988 conference 'Restoring the Earth'

Citizen Science Researcher and Educator since 1991

Professional Wetland Scientist since 1995.

Assisted in development of Missouri Stream Team, 1988

Field Research involving Bats, Caves, Springs 1998-2015

Researching Climate Change since 1998

EarthDesigns, llc Restoration Ecology, Natural Area Creation and Preservation, Consulting 1976

Current Collaborations

EarthDesigns, LLC, : consulting, education, research and practice since 1976 (www.earthdesigns.com)

Institute for Applied Ecology: environmental education and Summer 'Forest Bound' program (www.iae.com)

Santa Fe Botanical Garden: outdoor education courses at Leonora Curtin Wetland Preserve and horticultural education (www.santafebotanicalgarden.org)

Santa Fe Community College: teaching 'Wetland Ecology' and 'Global Climate Change' (www.sfcc.edu/continuing-education-schedule/)

Regional Xeriscape/Landscape Architects and Designers; consulting and collaboration

Regional Schools and Community centers: creating 'natural areas', consulting for 'out of the classroom' activities and education

Today's Topics

Making Connections/ 'connecting the dots':
Science communicates with the public……

Citizen Science is a 'vehicle' for science (and scientists) to reach the public and youth…..

Community involvement and interaction with research…..

Restoration Ecology and Science, as a source of education and citizen science research opportunities.

Springs, Marshes and Seeps ARE wetlands….

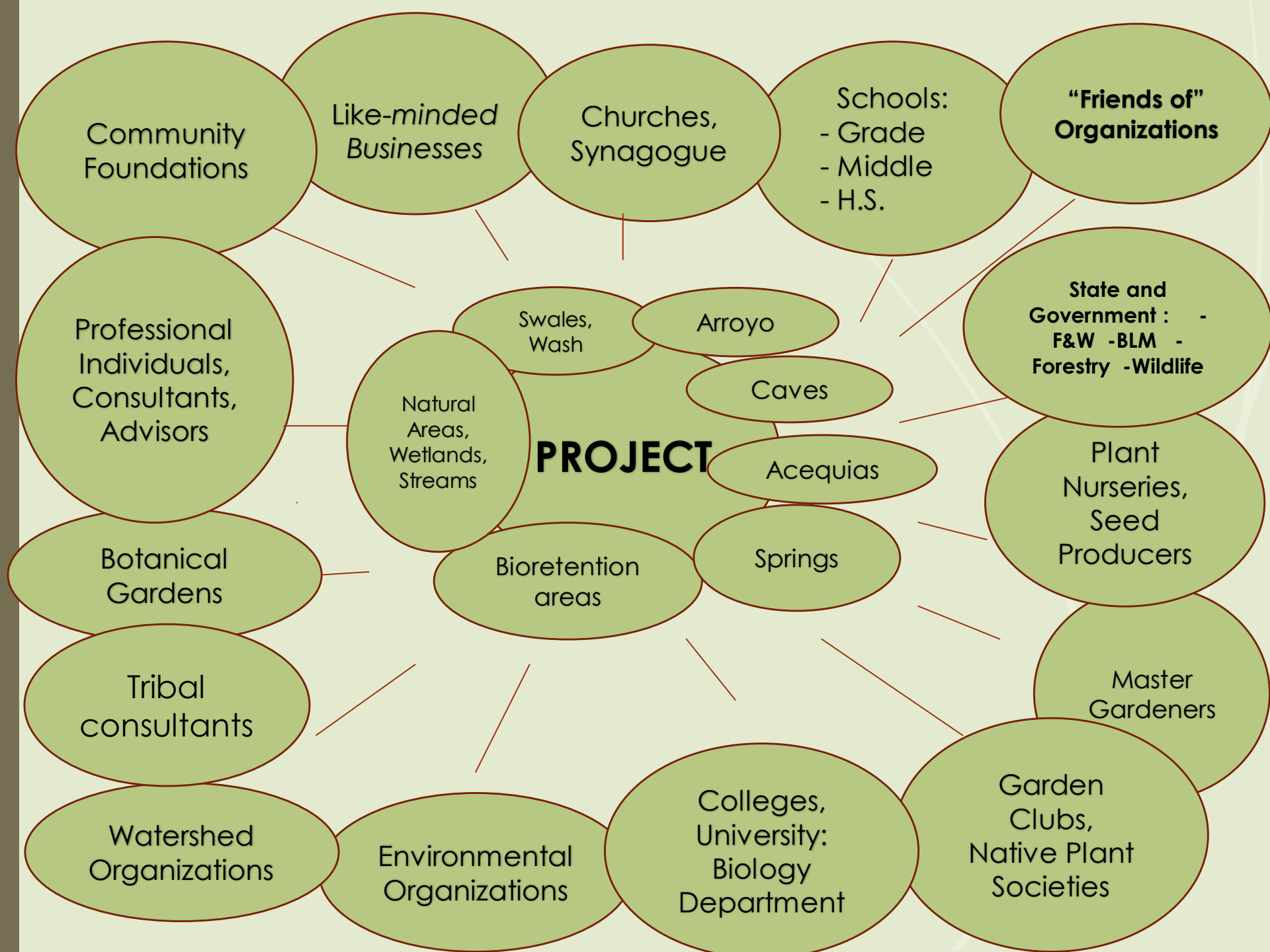
Restoration Ecology as a source of education and citizen science research opportunities…..

"Postage Stamp Habitats" / "Migratory Waystations"….

Education : "Out of the four walls"…..

Preparing for our collective future…..

Advocacy……


Community Foundations
Like-*minded* *Businesses*
Churches, Synagogue
Schools:
- Grade
- Middle
- H.S.
"Friends of" Organizations
Professional Individuals, Consultants, Advisors
Swales, Wash
Arroyo
Caves
Natural Areas, Wetlands, Streams
PROJECT
Acequias
State and Government : - F&W -BLM - Forestry -Wildlife
Plant Nurseries, Seed Producers
Botanical Gardens
Bioretention areas
Springs
Tribal consultants
Master Gardeners
Watershed Organizations
Environmental Organizations
Colleges, University: Biology Department
Garden Clubs, Native Plant Societies

Step 1: Identify project- what will it be used for? The Question.

a) historical descriptions.
b) Examine historical and recent photographs and verbal histories.
c) Assess scope of project idea and its ramifications.

Step 2: Background information/data. Assess current conditions

a) quality of available data? determine extent of field surveys required.
b) Determine sites to be surveyed.
c) i.d scientists/expert that would benefit from the data and collaboration.

Step 3: assemble scientist(s), experts, Community members, organizations

a) Prepare inventory 'tool' and methods.
b) Develop 'advisory panel'.
c) Public meetings, presentations, collaborations and connections.

Step 4: begin project

a) Maintain connection with scientists and advisory panel

* Why is it important?

* How is it used?

* What do you do with all that data??

* Collaborations with ……

(www.citizenscience.org)

Citizen Science Association

* The essence of 'out of the 4 walls thinking and education' – 'Experiential Education'

* Collaboration with schools, organizations, individuals …and research scientists around the country and the world

Several Citizen Science Organizations

Cornel Lab of Ornithology (www.birds.cornell.edu)

Nature's Notebook - National Phenology Network (www.usanpn.org/natures_notebook)

NestWatch (www.nestwatch.org)

MonarchWatch (www.monarchwatch.org)

BumbleBeeWatch (www.bumblebeewatch.org)

Project Budburst (www.budburst.org)

Habitat Network (www.yardmap.org)

Pond Watch (www.pondwatch.org)

Xerces Society Migratory dragonfly partnership (www.migratorydragonflypartnership.org)

Early Detection and Distribution Mapping System (for invasive species) (https://www.eddmaps.org)

Reporting Invasive Species across US and Canada (https://bugwoodcloud.org)

Finding Science projects: (https://scistarter.com)

International Naturalist – Nature Observations: (https://www.inaturalist.org)

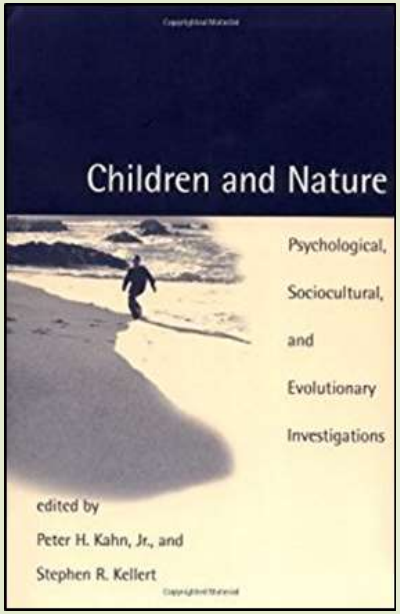
National Geographic Society : (https://www.nationalgeographic.org) "The Great Nature Project' and ' FieldScope'

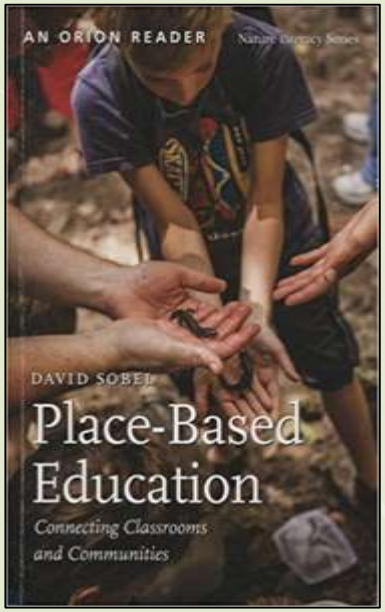
The Scientific American: Connecting researchers and the public (https://www.scientificamerican.com) : 'The Plastic Tide'; 'Michigan Herp Atlas'; 'Plants of Concern'; 'Weather-IT' .....

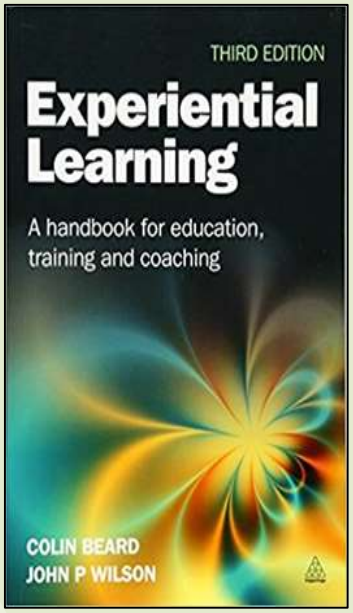
Bat Detective- researching Pipistrels around the world (https://www.batdetective.org)

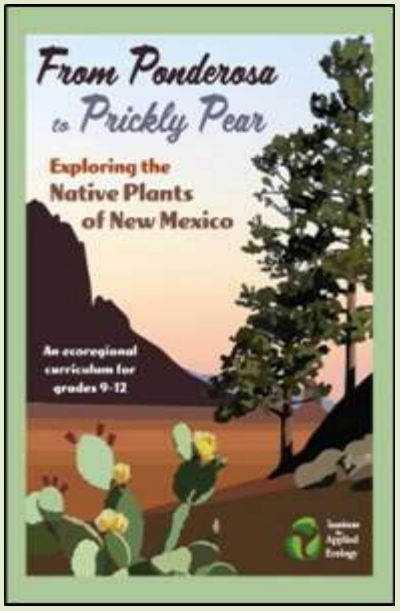
The Wonder of Fireflies- FireflyWatch: (https://legacy.mos.org/fireflywatch)

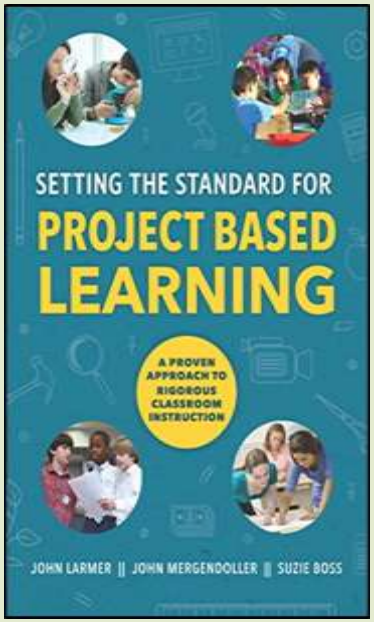
Education, Curriculum and Citizen Science Resource Books

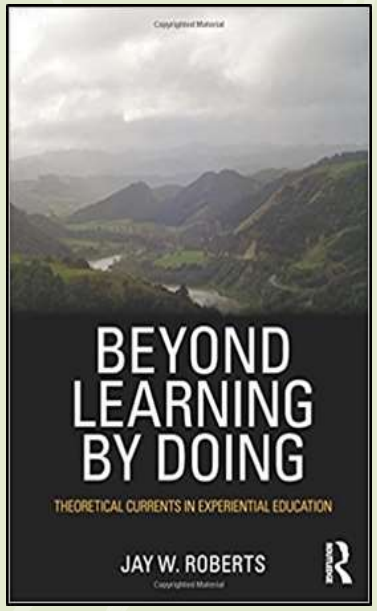


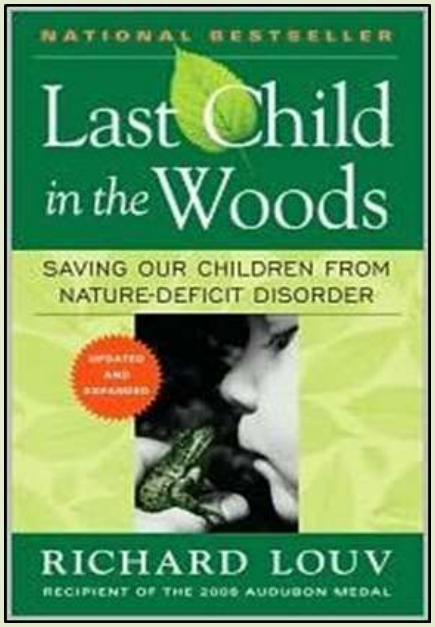


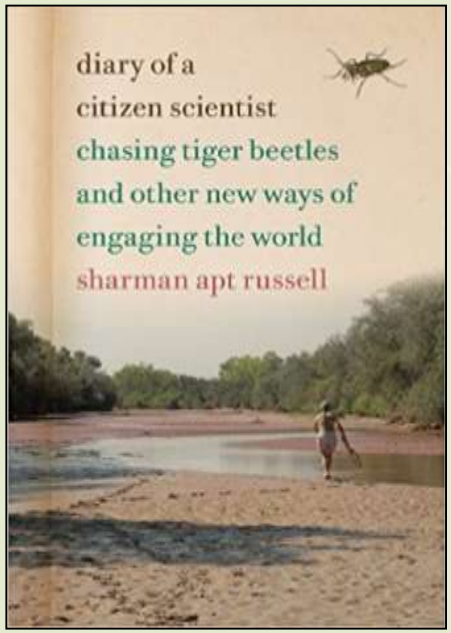


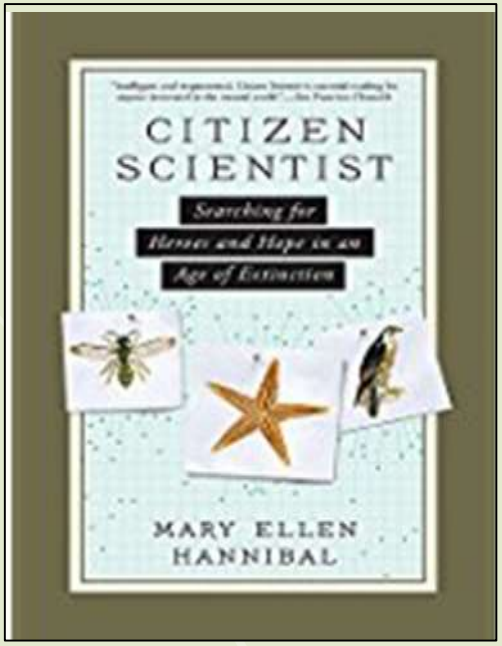


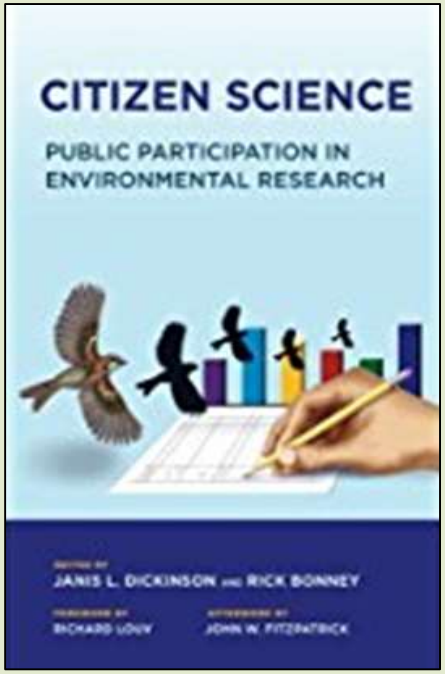


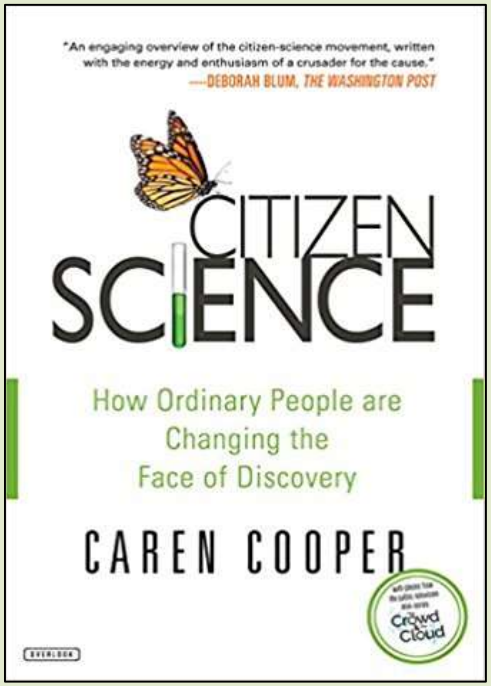


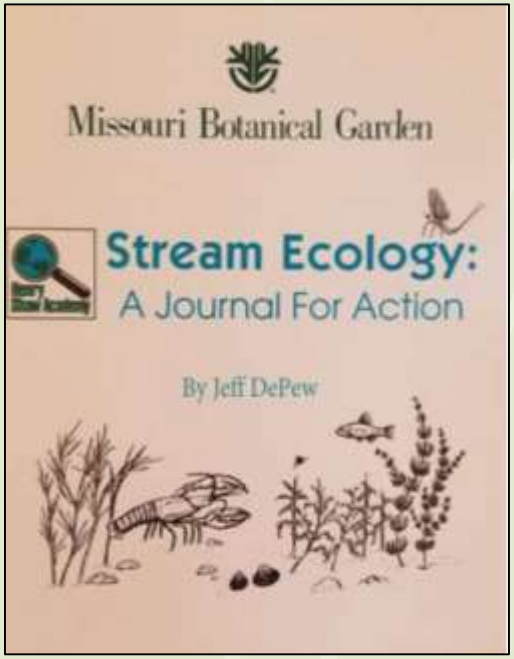

NATIONAL BESTSELLER
Last Child in the Woods
SAVING OUR CHILDREN FROM NATURE-DEFICIT DISORDER
UPDATED AND EXPANDED
RICHARD LOUV
RECIPIENT OF THE 2006 AUDUBON MEDAL


diary of a
citizen scientist
chasing tiger beetles
and other new ways of
engaging the world
sharman apt russell


CITIZEN SCIENTIST
Searching for Heroes and Hope in an Age of Extinction
MARY ELLEN HANNIBAL


CITIZEN SCIENCE
PUBLIC PARTICIPATION IN ENVIRONMENTAL RESEARCH
JANIS L. DICKINSON AND RICK BONNEY
FOREWORD BY RICHARD LOUV
AFTERWORD BY JOHN W. FITZPATRICK


"An engaging overview of the citizen-science movement, written with the energy and enthusiasm of a crusader for the cause."
—DEBORAH BLUM, THE WASHINGTON POST
CITIZEN SCIENCE
How Ordinary People are Changing the Face of Discovery
CAREN COOPER
Crowd Cloud
OVERLOOK


Missouri Botanical Garden
Stream Ecology:
A Journal For Action
By Jeff DePew

Southwest Ecoregion:

Acequias, Swales, Arroyos, Cienegas, Streams, Springs, Vernal 'ponds' ….and Bioretention Ponds

Acequia

Arroyo Chamisos - Santa Fe

Leonora Curtin Cienega

Stormwater - Querencia Green

Hembrillo Canyon Swale

Restoration and Preservation of habitats:

Opportunities for collaboration –

Research, Education, Citizen Science and community involvement

*Water catchment; bioretention ponds and wetland areas become 'natural areas' for education, community and increased biodiversity

*Adapted acequias to hold more native plants – sharing biodiversity

*Riparian areas that are undergoing streambank stabilization , restoration and monitoring

*Short grass prairies that are being protected, reseeded and restored

*Arroyos and revetments that are going through communities

*Roadside areas where seed collection is taking place

*Springs that are identified, monitored, preserved and protected

*Caves and cave systems that are being monitored for biodiversity

*Cienegas that are undergoing restored water tables and increased biodiversity

‘Postage Stamp Habitats’

‘Migratory Waystations’

ESSENTIAL INGREDIENTS:

Water that is slowed down, held or pooled

Native plants (specific to habitat, ecoregion and zone) protected, seeded or planted

Wind breaks and perches for birds and wildlife- preserved/protected or created

Old growth trees , or simulated, for nesting and protection (existing snags, deadfall, birdhouses, decayed logs, etc)

Protection and monitoring of water quality

Research Opportunities

Pre and Post habitat restoration and/or 'natural area' creation – sampling, characterization, monitoring through quadrat sampling and transect studies, photographic monitoring, oral histories, inventory tools

Consistent monitoring of habitats, species, water quality and flow, restored areas, health

Using Citizen Science programs to collaborate, collect data and analyze data of different sites in different habitats and ecoregions

Examples of research and education:

Bioretention Pond, Vernal pools, Springs, Wetlands

Examples of Research, Education, Community Involvement and Citizen Science:

Habitat Restoration

Chihuahua chub habitat-Mimbres River

Middle Rio Grande Ecosystem Restoration

NM Fish and Wildlife Restoration

Rio Grande Water Restoration

Sky Island Alliance

Red River Water Restoration

Why is this important?

Why should we care?

Education of public and community – 'all hands on deck'

Community involvement in projects that they live with, are committed to and enjoy

Research, monitoring, inventory work – preservation and protection of springs and wetlands

Habitat Creation, Restoration, Preservation = increased biodiversity

Creation of 'natural areas' for biodiversity, study and community enjoyment

Providing protection/habitat/safe spaces for insects, pollinators, migratory animals and wildlife

Bird habitat creation providing additional protected migratory and nesting spaces

Consistency of protected 'natural areas' – monitoring and inventory

Educational use - getting students, adults and young people 'out of the 4 walls'

Contact Information:

Consulting, Education, Practice

Creating and restoring habitats, natural areas and Biodiversity

Research and community involvement

www.earthdesigns.com
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314-422-1496
jcdepew@earthlink.net