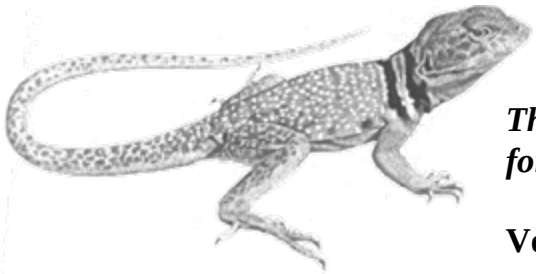

The Glade

The Newsletter of the Missouri Chapter of the Society for Conservation Biology http://www6.semo.edu/MOSCB/

Volume 11, Number 2 **Fall 2008**

Contents

News and Notes

•**MOSCB session at MNRC 2009!** MOSCB plans to sponsor a follow-up session at the 2009 Missouri Natural Resources Conference focusing on managing Missouri's natural resources in the face of Climate Change. We'll also be hosting another Silent Auction fundraiser. For more info on both these events, see the stories on Page 2.

•**MOSCB is looking for volunteers!** As the turn of the year approaches, it is time for us to consider nominations for chapter officers. All positions (President, Vice President, Secretary, Treasurer, and Editor of The Glade) are up for grabs. Please consider donating your time and effort to continuing the growth of our chapter. If you, or anyone you know, would like to be candidate for one of these offices, please let us know by contacting Alan Journet at (573) 651-2366 or *ajournet@semo.edu*.

•**Are you moving?** We've gone electronic, so be sure to notify us if your email address changes. Email Stephanie Manka (SGManka@mizzou.edu) with address updates.

•**Contribute an article to *The Glade*!** We welcome article submissions from our membership. If you have a topic you would like to write or read about, please email Todd Jones-Farrand (FarrandD@missouri.edu).

Managing Biological Resources in a State Undergoing Climate Change (MOSCB Workshop at MONRC 2009)

Alan Journet, Southeast Missouri State University, Email: ajournet@semo.edu

Following our successful workshop at the 2008 Missouri natural Resources Conference, the Executive Committee decided to organize a follow-up session for 2009. This decision was quite timely because the organizing committee for the Missouri Natural Resources Conference elected to dedicate the conference to the theme: *Global Trends, Missouri Impacts: Adapting to Climate Change.* For conference information, please visit http://www.mnrc.org/. The specific title of our workshop will be: *'Managing Biological Resources in a State Undergoing Climate Change.'* The format will be essentially the same as last year, with a series of short presentations followed by a general panel discussion and an audience question / answer period. As was the case last year, the Workshop should be scheduled for Friday morning (February 6th) 8:00 until noon.

The following presenters have agreed to offer their thoughts (not necessarily in this order): Paul Nelson, U.S. Forest Service – Mark Twain National Forest, will discuss impacts on Missouri's Natural Communities; Ken McCarty, Missouri Department of Natural Resources, will explore issues for Missouri's State Parks; Matt Albrecht, Missouri Botanic Garden, will discuss how ex-situ conservation and preservation techniques might help address the problem; Michael Leahy, Missouri Department of Conservation (MDC) will discuss impacts on our Natural Areas; Brad Jacobs, MDC, will explore ideas for managing bird populations; and, Tim Smith, MDC, will consider problems facing species of conservation concern and the management of exotics.

MOSCB Silent Auction at MONRC 2009

Nadia Navarrete-Tindall, Lincoln University, Email: navarrete-tindalln@lincolnu.edu

The number to beat at our next Silent Auction is $691.00, the total taken in at our last MO Natural Resources Conference fundraiser! We consider that to be a very successful event, but we aim to do even better in February, 2009.

The reason for our success was due to the variety of great contributions from our donors, including Dennis Figg, Brad Jacobs, Todd Jones-Farrand, Becky Erickson, the Shaw Nature Reserve, Esther Stroh, and many others. In no particular order, the items donated included a woven basket, a framed batik, miniature clay animals, a variety of books, turquoise jewelry, botanical prints, a wooden duck, a gift basket, shrubs, a cat basket, dog gift basket, and a backpack. Special items include several photographic prints by Alan Journet, a hand carved cane by Nels Holmberg, a photographic print by Randy Tindall, and a frog drawing by Bethany Williams. Nels also donated his own time to do a professional plant survey. Many thanks to everyone who contributed!

We are planning for our silent auction again next year at the MO Natural Resources Conference and we are seeking your donations. Art works, handcrafts, food items, donations of your skills are all great contributions---use your imagination! If you want to send your items in advance or you need more information about the auction please contact Nadia at 572-681-5392 or at navarrete-tindalln@lincolnu.edu. You can also bring your items the first day of the conference.

Composition of Missouri River Fishes Accessing Eagle Bluffs Conservation Area Through a 'Fish-friendly' Passage Structure.

Meagan D. Montgomery, University of Missouri, Email: mdm01a@mizzou.edu

Inundated floodplain wetlands provide spawning, feeding, and refuge habitat for a diversity of riverine fishes.[1,2,3] The degree of connectivity between the main channel and floodplain determines the floodplain's ability to support riverine fish assemblages. Timing, duration, frequency, and magnitude of the flood-pulse are critical components of lateral connectivity.[1,2,3,4,5] Lateral migrations of fishes into wetland habitats are influenced by the degree of surface connectivity combined with each species' habitat preferences and tolerances to physiochemical parameters.[1,6] Timing of the flood pulse when properly coupled with the thermal cycle of the river (increasing discharge timed with increasing temperature) has been shown to be an important component for reproduction and feeding of river-floodplain fishes (Figure 1).[2,7]

Anthropogenic modifications to the Missouri River have greatly reduced lateral connectivity with its floodplain and thus the level of habitat diversity within the system. Alterations aimed at controlling flooding, improving barge navigation, and generating hydropower have resulted in construction of numerous impoundments, levees, and channelization and bank stabilization structures that have disconnected the Lower Missouri River (LMOR) from its natural floodplain.[4] Lack of connectivity with the main channel has removed the benefit of the flood pulse by making much of the floodplain inaccessible to riverine fishes.[8] Movement of fishes among habitats is essential for population sustainability and alteration of the timing, duration, or frequency of flood events can affect species recruitment.[9,10] This habitat loss has resulted in listing many fishes as imperiled and without adequate restoration efforts this trend is likely to continue.[11,12]

Restoring fish and wildlife habitat is the goal of the Army Corps of Engineers' Missouri River Fish and Wildlife Mitigation Project. The Mitigation Project's objective is to reestablish hydraulic connectivity between the Missouri River main channel and its floodplain through wetland construction and restoration.[13] Eagle Bluffs Conservation Area (EBCA) is a constructed wetland complex developed by the Missouri Department of Conservation to aid wetland restoration along LMOR. Two wetland pools (# 14 & 15) were built at EBCA in 2001 as part of the Mitigation Project. These pools were built with water-control structures to facilitate fish passage into EBCA for spawning and nursery.

Research objectives include: (1) modeling the discharge-stage relationship between LMOR and wetland pools to determine connectivity; (2) predicting fish species that would potentially use wetland pools based on reproductive guilds and timing of connectivity events; and (3) quantifying ingress and egress of LMOR fishes to and from EBCA during periods of LMOR connection.

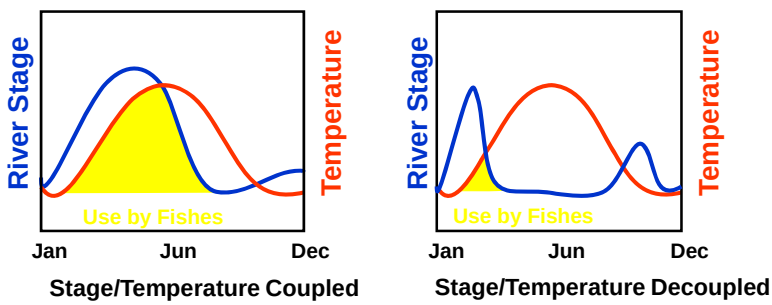

Figure 1. Schematic of combinations of river stage & water temperature in temperate river-floodplain ecosystems as depicted by the "flood pulse concept". Source: Junk et al. 1989.

Methods

We compared river stage (USGS Boonville, MO gauge) with EBCA pools 14 and 15 water-stage data to determine the LMOR stage necessary for connection and frequency of flood events. Predictions of fish use were based on habitat use and reproductive guild information, and LMOR water temperature, discharge, and stage-height data. We quantified ingress and egress of fishes through the water control structures during river connection in spring-summer of 2007-2008 using a trap net. We calculated composition and abundance of the fish assemblage using the wetland complex during connectivity events. We also compared fishes collected from ingress and egress events and from an overbank flood with predictions of fish immigration into EBCA. Only results from the 2007 field season are reported here.

Results

River stage initiating connectivity of LMOR with EBCA pools was 177.2 m above mean sea level (Figure 2). Highest probability of a connectivity event occurred in May (93%) and June (86%). Thirty-six fish species were predicted to use EBCA as spawning or nursery habitat (Table 1). Twenty-five fish species were recorded using the wetland complex during 2007. River water temperature during connectivity events ranged from 15.6 to 26.7°C. The fish assemblage using EBCA was numerically dominated by non-native silver carp (21%), native gizzard shad (19%) and orange-spotted sunfish (16%; Table 2).

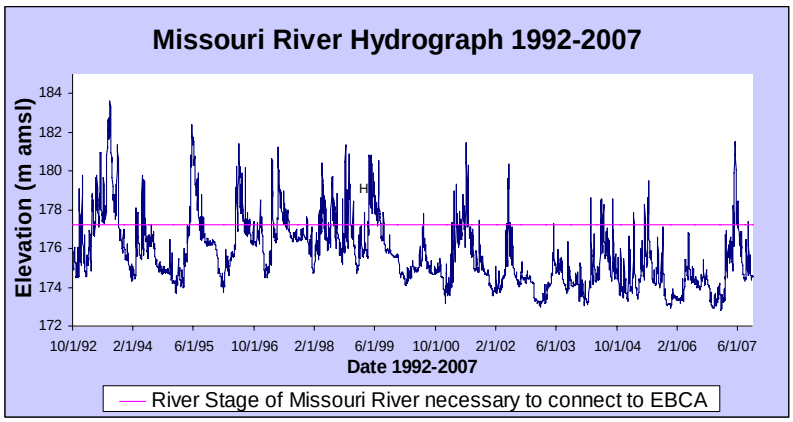

Figure 2. Missouri River daily stage at Boonville, MO, between October 1992 and September 2007 and river stage necessary to connect dry pools at EBCA (horizontal line).

Table 1. Representative fishes predicted to use EBCA pools for spawning and nursery and criteria used to make predictions.

Species name	Common name	Habitat Use Guild	Spawning Temp. °C	Peak Spawning Temp. °C	Reproductive Guild
Lepisosteus platostomus	shortnose gar	Macrohabitat generalist	16.5-24	N/A	Phytophils
Dorosoma cepedianum	gizzard shad	Macrohabitat generalist	10.0-29	18.8-28.9	Lithopelagophils
Cyprinus carpio	common carp	Macrohabitat generalist	13.9-28	18-27	Phytolithophils
Hypophthalmichthys molitrix	silver carp	Fluvial dependent	15.5-26.9	15.5-18.8	Pelagophils
Gambusia affinis	western mosquitofish	Macrohabitat generalist	15.6-18	N/A	Facultative internal bearers
Ictiobus bubalus	smallmouth buffalo	Macrohabitat generalist	15.6-18.3	N/A	Lithopelagophils
Ameiurus melas	black bullhead	Macrohabitat generalist	21-30	N/A	Speleophils
Lepomis humilis	orange-spotted sunfish	Macrohabitat generalist	18-31.7	N/A	Lithophils
Pomoxis annularis	white crappie	Macrohabitat generalist	14-23.9	16-20	Phytophils
Aplodinotus grunniens	freshwater drum	Macrohabitat generalist	15.5-28.5	20-27	Pelagophils

Discussion

The fish assemblage using the EBCA pools in 2007 was a mixture of native and introduced species. As predicted, timing EBCA access was related to species-specific spawning temperature ranges. The majority of species entering the complex during inflow events had spawning temperature ranges encompassing the corresponding LMOR water temperature. Therefore, coupling of the rise in water temperature with the flood pulse allowed multiple species to access the managed wetland and potentially use it as a spawning and nursery area.

Predictions of fish use of floodplains will enable managers to design for promotion or regulation of targeted species. Our results strengthen knowledge of fish use of LMOR floodplain areas by coupling species-specific immigration and water temperature during actual immigration with generic reports. The stage-discharge model can help agencies manage for future flood events by determining optimal dates for river inflow to EBCA pools via the fishway. This can be used in conjunction with area management plans to integrate fish and waterbird use.

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References continued at the bottom of page 7.

Table 2. Total abundance estimates for fishes passing through EBCA water-control structures during three connectivity events in spring-summer 2007, ordered by decreasing abundance.

Species Name	Common Name	Abundance	Proportion
Hypophthalmichthys molitrix	silver carp	8638	20.8
Dorosoma cepedianum	gizzard shad	8011	19.3
Lepomis humilis	orange-spotted sunfish	6809	16.4
Lepomis macrochirus	bluegill	4034	9.7
Lepomis cyanellus	green sunfish	3009	7.2
Cyprinus carpio	common carp	2973	7.1
Gambusia affinis	western mosquitofish	2448	5.9
Lepisosteus platostomus	shortnose gar	1803	4.3
Carassius auratus	goldfish	999	2.4
Hypophthalmichthys nobilis	bighead carp	857	2.1
Ctenopharyngodon idella	grass carp	800	1.9
Aplodinotus grunniens	freshwater drum	492	1.2
Pomoxis annularis	white crappie	204	0.5
Ameiurus melas	black bullhead	173	0.4
Ictiobus bubalus	smallmouth buffalo	126	0.3
Ictiobus cyprinellus	bigmouth buffalo	62	0.1
Carpiodes carpio	river carpsucker	42	0.1
Ameiurus natalis	yellow bullhead	40	0.1
Ictalurus punctatus	channel catfish	24	0.1
Notropis atherinoides	emerald shiner	14	<0.1
Hiodon alosoides	goldeye	14	<0.1
Carpiodes cyprinus	quillback	14	<0.1
Morone chrysops	white bass	14	<0.1
Notemigonus crysoleucas	golden shiner	3	<0.1
Micropterus salmoides	largemouth bass	1	<0.1

Update: The No Child Left Inside Act of 2008

Esther Stroh, MOSCB Treasurer, email: edstroh@gmail.com

At the 2008 Missouri Natural Resources Conference, plenary speaker Richard Louv discussed "nature deficit disorder," a term he coined in his book, *Last Child in the Woods* (Louv, 2005). According to Louv, nature deficit disorder is the result of the lack of a connection between children and the natural world. He suggests that contemporary American children have not developed (as previous generations have) a bond with nature as a result of their spending less time outdoors and more time in front of television and computer screens. In his address, Louv attributed children's decrease in time spent outside to parental fears for safety, restricted access to natural areas, and suburban neighborhood covenants discouraging activities such as children playing in or building tree houses in local woods. Louv further argued that the lack of connection between children and the natural world explains childhood trends such as rises in obesity, attention disorders, and depression. Louv mentioned that pending legislation aimed at addressing this phenomenon was under consideration by the US Congress. He referred to the legislation as the "No Child Left Inside Act." Louv did not give further details about this legislation; I provide here a few details about the legislation, its supporters and its current status.

Passage of the No Child Left Inside Act is the primary focus of the No Child Left Inside Coalition (NCLI), which was formed in 2006 to encourage and facilitate children's access to and experiences with nature. The NCLI Coalition is made up of approximately 740 organizations representing environmental, educational, business, public health, conservation, and other groups (NCLI Coalition 2008). Missouri-based members of the NCLI Coalition include:

- Cedar Hill Elementary
- Conservation Federation of Missouri
- Missouri Environmental Education Association
- Playgrounds of Peace
- School District of University City
- Southwest Missouri Fly Fishers
- Springfield Plateau Chapter of Missouri Master Naturalists
- St. Louis Audubon Society
- Stream Team 882
- The Green Center
- Wildcat Glades Conservation & Audubon Center

Family in the field.
Source: Treehugger.com
http://www.treehugger.com/files/2007/08/no_child_left_i_1.php

The No Child Left Inside Act of 2008 (H.R.3036) was introduced by Representative John Sarbanes (D-MD) on July 12, 2007 to the House Committee on Education and Labor. The bill seeks to amend the National Environmental Education Act. Among other things, the bill requires states that receive Federal Environmental Education funds to "have peer-reviewed state environmental literacy plans or develop state environmental literacy plans that describe: 1) how the state will measure student environmental literacy; and 2) programs of professional development to improve teachers' environmental knowledge and teaching skills" (Congressional Research Service 2008).

The bill currently has 64 bipartisan co-sponsors, including Russ Carnahan and William Lacy Clay of Missouri. The bill was passed by the US House of Representatives on September 18, 2008 by a vote of 294-108. It was received in the US Senate on September 22, 2008. The Missouri members of the US House of Representatives voted as follows:

Ayes: Clay, William [D], Carnahan, Russ [D], Skelton, Ike [D], Cleaver, Emanuel [D], Graves, Samuel [R].
Nays: Akin, W. [R], Blunt, Roy [R], Emerson, Jo Ann [R].
No Vote: Hulshof, Kenny [R].

Source: celestialdreams.wordpress.com
http://celestialdreams.wordpress.com/2008/04/23/environmental-education-educating-our-children-preserving-our-future/

A corresponding Senate Bill, S.1981, last received action in August 2007 when it was read twice and referred to the Committee on Health, Education, Labor, and Pensions. It is difficult to project the future of this legislation given the late stage of the Congressional calendar. Updates on Senate action can be monitored at http://thomas.loc.gov/cgi-bin/bdquery/z?d110:SN01981.

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The Missouri Master Naturalist Program

Robert A. Pierce, II, State Extension Fisheries and Wildlife Specialist, email: PierceR@missouri.edu
Syd Hime, Master Naturalist Program Coordinator, Missouri Department of Conservation

"Through the Master Naturalist volunteer program, you can help youth and adults in your community learn about Missouri's natural resources and you can help local conservation partners implement a variety of educational projects that benefit the natural resource base in your area..."

The need for an increased number of dedicated and well-informed volunteers and citizens is often cited as important for the success of community-based conservation efforts. One challenge facing Missouri communities in both rural and urban areas is sustaining the natural resource base and the quality of life those resources provide. The Missouri Master Naturalist Program (MN), developed as a partnership between the Missouri Department of Conservation, MU Extension and the MU School of Natural Resources, addresses this need by training a local corps of "master volunteers" to provide education, outreach and service dedicated to the beneficial management of natural resources within their respective community.

The Program's Mission is a simple one: ***to engage Missourians in the stewardship of the state's natural resources through science-based education and community service.*** To accomplish this mission the Program combines education and volunteer service at the community-level and empowers citizens to become more involved in natural resource management and education. MN volunteers are trained and certified at the local level through their respective chapters.

"I want to share the diversity of natural habitats with children and adults so they can fully appreciate our natural resources and participate in future decisions about them with knowledge and a sense of the importance of place."

Objectives include:

1. Improve public understanding of natural resource ecology and management by developing a pool of local knowledge that can be used to enhance and expand educational efforts within local communities
2. Enhance existing natural resources education and outreach activities by providing natural resources training at the local level, thereby developing a team of dedicated and informed volunteers
3. Develop a self-sufficient MN volunteer network.

An increasing number of communities and organizations across the state have relied on these skilled volunteers to implement natural resource educational programs for adults and youth audiences, for the expertise of these volunteers in implementing a variety of conservation projects, and for providing leadership in local natural resource conservation efforts. For more information on the MN Program visit our website at: http://extension.missouri.edu/masternaturalist/

Becoming a Certified Master Naturalist

To become a Certified MN participants must complete the following within 15 months (all of which is provided through local MN Chapters):

- The state committee-approved training with a *minimum* of 40 hours of combined field and classroom instruction.
- A *minimum* of 8 contact hours of chapter-approved advanced training in the subject of their choice.
- A *minimum* of 40 hours of chapter-approved volunteer service.

"I received in-depth training in natural resource ecology and management from real experts!"

--In return, participants provide volunteer service in the form of educational activities, research projects, or ecosystem management for local partner organizations.

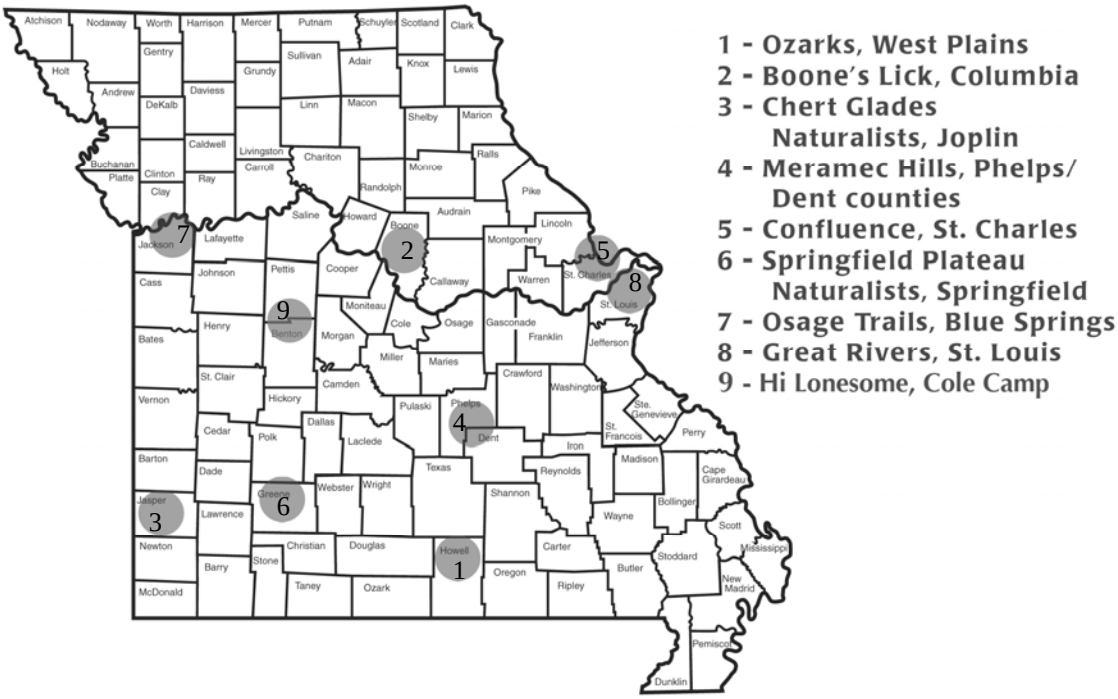
The 40 hour course covers a wide variety of topics, including basic ecological concepts, Missouri's ecoregions and ecosystems, wildlife population and natural community management, rural and urban conservation issues, plant and animal identification, and much more. Special attention is focused on local ecosystems and field sessions are an important part of the training. Learning objectives are outlined for each specific class and the supporting curriculum is in the form of selected publications provided to each participant in a "tool box" of materials at the beginning of the first session.

Volunteer service projects provide further educational opportunities, as well as benefiting a number of local agencies and organizations within the community. Local partner organizations participate and support local chapters in a variety of ways, and in return receive the benefit of volunteer service. To retain the title of Certified MN each subsequent year, volunteers must complete a minimum of 8 hours of approved advanced training and provide a minimum of 40 hours of approved volunteer service.

Program Development and Partnerships

MU Extension and MDC personnel provide leadership for conducting the program within a particular community and work together in organizing an advisory committee made up of partner organizations at the local level to conduct the volunteer education program. In 2004, the

MN Program was piloted in West Plains (Ozark Chapter) and Columbia (Boone's Lick Chapter) with over 50 volunteers graduating from these initial training programs. Building on these successes, MN became a statewide "named and branded" MU Extension educational program in 2005. In the next 3 years the program expanded and now there are 9 Chapters located throughout Missouri.



Program Impacts

Impacts resulting from the program are summarized in Table 1 (these do not include information from the Hi Lonesome and Great Rivers Chapters, which were organized in 2008).

- Over 400 Missouri citizens have become trained natural resource volunteers through the MN Program.
- Over 300 volunteers have obtained over **3,800 hours of advanced training**.
- Over **18,000 hours of volunteer service** have been provided to organizations within the local community resources.
- The economic impact of MN volunteer service through 2007 is valued at over **$400,000**[1]

During 2007 Caroline Broun completed her thesis entitled, "**An Evaluation of the Missouri Master Naturalist Program: Changes in Volunteer Knowledge and the Relationship Between Motivations and Changes in Volunteer Knowledge**". This research investigated the changes in volunteer knowledge and attitudes that occurred as a result of their participation in the Missouri

[1] The value of volunteer service calculated using Independent Sector's $18.04 per hour. The hourly value is based on the average hourly earnings for private nonagricultural workers as determined by the U.S. Bureau of Labor Statistics. This figure is then increased by 12 percent to estimate fringe benefits. http://www.independentsector.org

Master Naturalist Program and has provided the template for evaluating the ongoing Program. Results from this study may be found at the following web link: http://edt.missouri.edu/Winter2007/Thesis/BrounC-050407-T7446/

General conclusions indicate:

- Training improved volunteers overall knowledge of ecological and management concepts
- Volunteers were able to retain key concepts that were learned during the program
- Values and learning were important motivators for enrolling in the program

Table 1. Master Naturalist Program statistics.

Chapter (year established)	Number of Participants (# Certified)	Advanced Training Hours (cumulative)	Volunteer Service Hours (cumulative)
Ozarks (spring 2004)	66 (24)	377 (1257)	2406 (5206)
Boone's Lick (fall 2004)	41 (33)	338 (919)	2998 (6334)
Chert Glades Naturalists (spring 2005)	30 (21)	490 (951)	1694 (3450)
Meramec Hills (spring 2005)	57 (22)	528 (1035)	2261 (4015)
Confluence/Great Rivers (fall 2005/07)	88 (33)	433 (889)	1650 (2994)
Springfield Plateau Naturalists (spring 2006)	42 (27)	237 (424)	1382 (2586)
Osage Trails (fall 2006)	56 (36)	941 (941)	3400 (3400)
Total	**380 (196)**	**3,344 (6,243)**	**15,791 (27,172)**

National Network Established For Master Naturalist Programs

The Missouri MN Program is a model for new programs being established across the United States. In fact, a new national network has been established for MN Programs. Now, over 27 states have developed MN type programs. The **Alliance of Natural Resource Outreach and Service Programs (ANROSP**) was formed in 2006 to facilitate networking and resource development for member programs with a goal to establish educational programs in all 50 states. Additional information can be obtained at www.nralliance.org.

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When one tugs at a single thing in nature,
he finds it attached to the rest of the world. --John Muir

Membership Information

The goal of MOSCB is to promote communication among conservation biologists throughout the state of Missouri. Membership in MOSCB is $5.00 (estroh@usgs.gov). Please contact one of the Board members for more information – and bear with us as we transfer web site locations.

The Glade Vol. 11, No.2 was edited by Todd Jones-Farrand (FarrandD@missouri.edu). Special thanks to the authors in this issue for their time and thought in writing their articles. Funding for this issue of *The Glade* was provided by contributions from members of MOSCB.