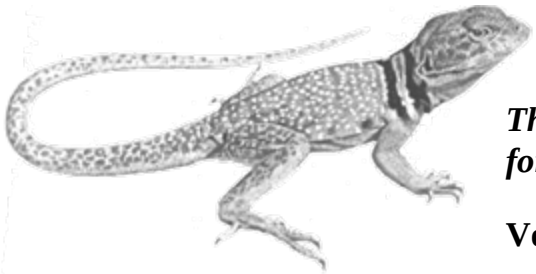

The Glade

The Newsletter of the Missouri Chapter of the Society for Conservation Biology

Volume 11, Number 1 **Spring 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 on the effect of Climate Change on Missouri biodiversity. Next year's session will focus on managing Missouri resources in the face of Climate Change. If you know someone who is working on this, please let us know. To get involved, contact Alan Journet (ajournet@semo.edu).

•**MOSCB is looking for volunteers!** If you – or anyone you know – might be interested in managing our website or editing The Glade please let one of the Executive Board officers know. The time investment for either position is small.

•**Quail and Native Plant Day at Bradford Farm in Columbia on June 26th from 3 – 8 pm!** This event will feature native plant landscaping, quail habitat management, and an indoor seminar at 3. For directions and info, visit: http://aes.missouri.edu/bradford/events/quail-and-native-plant-fieldday.php or call Tim Reinbott at 573-884-7945.

•**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).

The Potential Impact of Climate Change on Missouri Biodiversity: Results of the MOSCB Workshop at MONRC

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

The Intergovernmental Panel on Climate Change (IPCC) started releasing its Fourth Assessment Report (AR-4) in February 2007 with the Summary for Policymakers. Three statements in the report were of relevance to this workshop:

- "Warming of the climate system is unequivocal."
- "Most of the observed increase in globally averaged temperatures since the mid 20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations." Very likely is defined as > 90%.
- "The understanding of anthropogenic warming and cooling influences on climate has improved since the Third Assessment Report [TAR 2001] leading to *very high confidence* that the globally averaged net effect of human activities since 1750 has been one of warming, with a radiative forcing of + 1.6 (range 0.6 – 2.4)." *Very high confidence* is defined as > 90%.

Considering that this report was subject to the review and modification of politicians (who tend to minimize the risks), these levels of probability likely represent underestimates of the confidence of the climate and atmospheric science community concerning these conclusions.

With the 2006 release of Al Gore's award-winning movie 'An Inconvenient Truth' and his gaining a Nobel Prize for the effort, the AR-4 could not have been released at a more timely moment. As a result, MOSCB decided at its 2007 Annual Meeting to organize a workshop at the 2008 Missouri Natural Resources Conference entitled, "The Potential Impact of Climate Change on Missouri Biodiversity." The session featured an introduction on Missouri climate history and predictions by state climatologist Pat Guinan (UM-Columbia). This was followed by Bill Eddleman (SEMSU) discussing the possible consequences for birds, John Landosky (UM-St. Louis) discussing insect responses, Bethany Williams (UM-Columbia) discussing herp responses and Nadia Navarrete-Tindall (UM-Columbia) exploring the same for plants. Tim Nigh (MDC) then discussed the consequences for Missouri's ecological land types, and Rick Thom (MDC; substituting for Dennis Figg) discussed the Missouri Comprehensive Wildlife Strategy in relation to climate change consequences. These presentations were followed by a lively question-and-answer panel discussion with audience members offering their thoughts and questions.

Pat Guinan started the workshop by pointing out that Missouri's long term temperature history indicated a slight warming over the last decade compared to the long term (100 year) average. However, he noted the current warming is no greater than experienced in the past. He pointed out that 1931-32 and the mid 1950s were actually warmer than recent overall temperatures. Guinan pointed out the warming we are currently experiencing is largely a consequence of warmer winters (Dec – Feb) and springs (Mar – May), with no detectable warming occurring during summers (Jun – Aug) and only slight warming during falls (Sep – Nov).

Guinan concluded his historical temperature account by noting that Missouri's warming trend began only as recently as 1998 compared to the global trend which began in 1977. He noted that four of the five warmest Missouri winters on record have occurred since 1991. Not surprisingly, winter snowfall has thus declined. However, Guinan indicated that from 1982 to 2005 Missouri enjoyed an unprecedented wet period with 17 of the 24 years experiencing above normal

precipitation. He closed with a cautionary warning that a drought period may be on the horizon.

Addressing the future, Guinan noted that Missouri has no independent predictive data. He based his estimates on computations by the Illinois State Water Survey using IPCC data, suggesting that Missouri will probably be equivalent. These models suggest that over the next 100 years Missouri will experience a temperature increase of 3^0F – 7^0F but no clear trend in precipitation. In terms of carbon dioxide concentration (the widely-accepted dominant driving force), Guinan offered three models that vary according to humanity's response. These estimates range from just under 550 ppm to 850 ppm by the end of the century, a 2-3 fold increase over the current value of 350 ppm and the pre-industrial revolution value of about 270 ppm (Wigley 1983).

In summary, by 2050, the climate of southeast Missouri may well emulate that currently evident in Central Arkansas, while by 2100 the southern tier of Missouri counties may be experiencing the current climate of Northern or Central Louisiana.

Bill Eddleman introduced the topic of possible bird consequences by reporting an American Bird Conservancy prediction (from a scenario based on a doubling of carbon dioxide) that the range of the American Goldfinch may shift so far north that Missouri is no longer included. Eddleman then suggested that impacts to birds could include range shifts, productivity changes (with greater, equal, or lower productivity as suggested consequences), habitat loss or alteration, and shifts in migration timing. Of 96 migrant species in Manitoba, he reported, 27 arrive significantly earlier, while only 2 arrive later. Meanwhile, of 13 North American species studied, 6 depart later; some species are even foregoing migration altogether at higher rates than previously. Clutch initiation may also be impacted; among a multiplicity of examples, Eddleman selected the tree swallow which has advanced clutch initiation 9 days during the last 30 years. This raises the specter that climate change is inducing asynchronicity between the migratory behavior – particularly arrival and clutch initiation of birds – and the availability of food. Long distance migrants (responding to photoperiod – a cue unaffected by climate change) seem less likely to adjust their patterns, while food availability (in many cases such as insects dependent on day-degrees for development) shifts earlier in the season. Thus, migrants may miss the peak food availability upon which successful nesting depends. In addition to average temperatures impacting birds, Eddleman noted that increases in the frequency of climatic extremes (such as drought) may well tip the scale against some species. In the category of synergistic effects, Eddleman pointed out that some species already in decline may well be 'pushed over the edge.'

As a perfect follow-up to potential bird consequences, John Landosky reviewed the possible impacts of climate change on insects, noting that in addition to the temperature effects, it was necessary to consider the direct consequences of increased CO_2 concentration. Landosky pointed out that increases may reduce both the Nitrogen composition and leaf water content of some plants, two factors important to the feeding insect. Reduction in these variables renders plant food less nutritious. This may have a negative impact on the growth and development of the insect, but may also induce increased feeding to compensate for the poor quality food. Additionally, elevated CO_2 may induce changes in the defensive chemistry and structure of the plant – either to the benefit or cost of the feeding insect – though generally the latter. By causing insects to spend more time feeding, elevated CO_2 may cause them to be more exposed to their natural enemies for

longer periods of time, and thus more susceptible to predation and parasitism.

Although increased temperatures may decrease the quality of the host plant as food, the primary affect of temperature on insects will probably occur through the impact on insect growth and behavior because these are generally enhanced by increased temperatures. In particular it is quite possible that current efforts to contain spreading insect outbreaks such as the Gypsy moth could be negated as a higher temperature promotes their growth and spread.

In concluding, Landosky also drew attention to the problem that higher temperatures may lead to asynchronous consequences. Biological events that are mediated by photoperiod (such as migrations) are less likely to be influenced by higher temperatures than are growth and development of exothermic organisms (such as plants and insects). Even among such organisms not all will necessarily respond to an equivalent extent, potentially disrupting community interactions that rely on synchronous events.

Next, Bethany Williams discussed the potential impact of climate change on Missouri's herpetofauna. Williams starting by indicating similar potential consequences for herps as for birds – range shifts, changes in phenology, morphology and behavior, and shifting genetic composition (allele frequencies). Referring to the summary by Parmesan and Yohe (2003), Williams noted that there is evidence of a 6.1 km per decade poleward and 1 m per decade upward shift among a wide diversity of taxa. A similar array of taxa, including amphibians, are exhibiting phenological advances of 2.3 days per decade. Root et al. (2003) noted that 80% of 143 species have exhibited the range shifts that would be predicted by climate change patterns.

Williams pointed out that the primary problems facing amphibians result from their ease of desiccation, their need for damp environments for reproduction, and the dependence of many on ephemeral wetlands. Reptiles, meanwhile, are generally less moisture dependent, having better mechanisms in adult and egg for resisting desiccation. However, for some reptiles gender is determined by temperature of incubation – so increased temperature potentially may shift the sex ratios in populations; an increase of just 4^0C could result in the elimination of male offspring. Although the evidence suggests a consistent response to the warming trend since 1900 with earlier anuran frog calling in New York and, over the last 17 years, earlier breeding of British amphibians, these patterns are not universal.

In terms of the necessary wetland breeding grounds, Williams noted that early drying out can result in zero recruitment for a season, and climatic changes could induce a transformation in nest site selection and phenology. Aided by a flow-chart, Williams suggested that climate change may cause amphibian decline through a number of routes, including reduced pond depth which might allow increased UV radiation and disease susceptibility, and decreased female body condition which might reduce egg production and increase female mortality.

Tim Nigh followed with a discussion of the potential impact of climate change on Missouri's ecosystems. Placing the future in historical perspective, Nigh pointed out that Missouri has long been in a shifting tension zone between forest to the east and prairie to the west. Building on the palaeoecological climate map of Delcourt and Delcourt (1991), Nigh described the historical

pattern of the last 125,000 years. The present interglacial is enhanced by carbon dioxide producing a super-interglacial with a global mean temperature reaching 63^0F before the subsequent drop into another glacial period. Looking at the more recent history of a few thousand years, Nigh noted the glacial period of 20,000 years ago when Missouri enjoyed a boreal forest, followed by spruce-jack pine dominated ecosystem up to 15,000 y.a. as the glaciations retreated, then a warmer oak savanna / oak hickory system, and then a warmer dryer period 5,000 y.a. when the state was occupied by glade, prairie and deciduous woodland. As a result of this history, Missouri now incorporates a mix of relicts of the past glacial period and past xeric period.

Looking to the future, Nigh built on the climate history and predictions of Pat Guinan's presentation to note that the future will potentially present Missouri with greater biomass due to enhanced growth resulting from increased CO_2 but also an increased chance of drought and fire. The climate is likely to reduce the abundance of white oaks (*Quercus alba*) and potentially eliminate sugar maple (*Acer saccharum*), while enhancing post oak distribution (*Q. stellata*) and promoting the distribution of pine-oak woodlands and savannas.

Nigh closed by offering some queries about the future: will dispersal occur between existing sites or from existing sites onto lands with appropriate physical setting? Are there distance limitations? How will humans influence the ability to disperse? He also wondered if we should be thinking about conserving dispersal corridors between all centers of biological diversity. In relation to mesic communities (fens, moist cliffs, caves), Nigh wondered if they will be able to disperse to cooler climes up river valleys, survive in refugia, or simply be eliminated.

The final presentation was authored by Dennis Figg who related climate change considerations to the Missouri Comprehensive Wildlife Strategy. While most of the contiguous forty eight states have Wildlife Action Plans that either address climate change directly or at least mention it, thirteen (including Missouri) do not. Figg's presentation explored Bailey's national ecoregions and the Atlas of Missouri ecorgeions as he pointed out where the hotspots of biodiversity at risk are in Missouri. Figg suggested that the climatic future of Missouri will tend to encourage the expansion of grassland, and - echoing the predictions of Tim Nigh – induce an expansion of Temperate Coniferous Xeromorphic Forest.

The session concluded with a lengthy and lively question and answer session involving audience and panelists exchanging thoughts and concerns about the issue of climate change and Missouri Biodiversity. It was suggested that, as a follow-up session, MOSCB might organize at next year's conference a workshop to explore (1) what goals and strategies might be adopted in managing Missouri's biological resources as climate change advances and (2) activities underway in the state that incorporate climate change into plans for managing our resources. If you – or anyone you know – might be interested in delivering a presentation on one of the above topics at the next MONRC please contact me with the suggestion: ajournet@semo.edu

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Macrofungi, Myxomycetes, and Soil Attributes Associated with Five Communities at Ha Ha Tonka State Park, Missouri.

Christopher Crabtree, University of Central Missouri, Email: CDCrabtre@hotmail.com

The composition of our natural resources, natural plant and animal communities, and ecosystems is maintained by fungi that function mainly as decomposers of organic matter, secondarily by forming mycorrhizal associations, or as parasitic plant pathogens (Dix and Webster 1995, in Trudell and Edmonds 2003). Fungi produce extracellular enzymes that decompose organic matter, making nutrients such as nitrogen and carbon compounds available for recycling. Numerous fungi form mycorrhizal relationships that play a major role in plant establishment, growth, and development by aiding in nutrient uptake. Fungi occur in every habitat and fill almost every conceivable niche on Earth, making them an important part of all ecosystems. The life forms fungi display range from non-descript microscopic organisms to the larger, observable fruiting bodies that we know as mushrooms and toadstools, also termed macrofungi. These organisms, along with the fungus-like myxomycetes, were the focus of an eighteen month study conducted as part of my Master's Degree thesis at the University of Central Missouri, Warrensburg.

This project investigated macrofungi and myxomycetes of various terrestrial natural communities at Ha Ha Tonka State Park (HAT) with support from research mentors Harold W. Keller and Joseph S. Ely, and funding provided by the Missouri Department of Natural Resources. Plants and plant communities were associated with specific macrofungi and fungal communities and soil characteristics. Terrestrial communities were also monitored for temperature, relative humidity (RH), and photosynthetically active radiation (PAR) using HOBO microstations. Precipitation data was gathered over time to relate fungal development and sporocarp formation to precipitation amounts. The working hypothesis stated that different fungal species will be present or absent and restricted to specific natural communities or microhabitats, and that these communities are distinguishable in terms of vegetation and soil attributes.

Plate 1. Elaphomyces sp. found in flatwoods communities at Ha Ha Tonka State Park.

Ha Ha Tonka State Park, located in Camden County, Missouri, is 1,501 hectares (3,709 acres) and encompasses the 385.6 hectare (953 acre) HAT Savanna Natural Area and the 28.3 hectare (70 acre) Karst Natural Area. The main communities at HAT included in this study were glades, open woodlands, forests, flatwoods, and karst areas. The communities of interest were defined as proposed by Nelson (2005) in The Terrestrial Natural Communities of Missouri.

The sampling method used was a stratified random sampling based on unit vegetation types. Sixteen sites were selected within the park with each community type being represented by at least three sites, with the exception of flatwoods having only two. From an initial random transect placed within each selected site, I placed three perpendicular 60-m transects. I established permanent plots at random points along the perpendicular transects. Each plot was a 0.01-ha (radius= 5.63 m) circle. Herbaceous vegetation was sampled during the summer of 2006 and the overstory/midstory was sampled during the summer and fall of 2007. I collected soils samples from late summer to early winter of 2007. I checked plots weekly for fungi and myxomycetes during the summers of 2006 and 2007 and on weekends in the fall and spring of those years.

This study documented 227 fungal, 36 myxomycete, and approximately 265 vascular plant taxa. Numerous fungi and myxomycetes were new records for Missouri. One fungus, a false truffle of the genus *Elaphomyces* (Plate 1), is being described as a new species, and the Crested Coral Root orchid (*Hexalectris spicata* var. *spicata*) was documented in the park for the first time (Plate 2).

Plate 2. *Hexalectris spicata* var. *spicata* (Crested Coral Root)

thin, alkaline soils, which karst areas have in common with glades, and the presence of talus slopes and rocky floors that have thin top soils. Karst areas did contain most of the saprophytic, wood-inhabiting species found within the park, and numerous saprobic species were confined to karst areas (Plate 3).

I used ordination techniques for nonnormal data to analyze species cover and macrofungal presence. Non-metric multidimensional scaling was used to analyze fungi, vegetation, and soil matrices. Joint biplots of fungi to vegetation revealed most fungi, especially mycorrhizal fungi were associated with forest, flatwoods, and open woodland communities, respectively. Glades lacked most mycorrhizal fungi; these areas lacked many mature overstory trees. Although karst sinks contained large, mature overstory trees, they also lacked most mycorrhizal fungi. This may be in part due to

Plate 3. *Sarcoscypha dudleyi*, one of the first ascomycetes to fruit in early spring, was found only in karst areas at Ha Ha Tonka State Park.

Few fungal species were located within glade habitats. Many of these were saprophytic fungi of herbaceous or woody plant material occurring predominantly on smaller glades with established overstory species. Two interesting species found only on glades (*Tulostoma lloydii and T. rufus*) were restricted to litter under *Juniperus virginiana* or around the bases of cut stumps (Plate 4).

Soil analysis showed that forests, flatwoods, and open woodlands at HAT were acidic; flatwoods were the most acidic (4.9), followed by forests (5.9), and open woodlands (6.2). Karst areas and glades had a basic pH with averages of 7.5 and 7.7, respectively. Associations of vegetation and fungi to soil attributes placed pH, calcium (Ca), magnesium (Mg), phosphorus (P), cation exchange capacity, and cation saturation of Ca and Mg in close proximity to glades and karst areas, with phosphorus strongly associated with karst areas. High phosphorus levels in karst sinks may be attributed to the lack of mycorrhizal fungi, which make phosphorus available to plants.

Preliminary analyses of precipitation showed that rainfall amounts during the fruiting season (March-October) varied between the two years. The park received approximately 12.1 cm of rainfall during the fruiting season of 2006, most of which came during March and April. The summer of 2006 produced a relatively small number of fleshy fungi during the height of fungal fruiting body production. The fruiting season of 2007 contrasted by having 15.6 cm of rainfall, most of which came between April and late June, and in August. Fruiting body production and species diversity was much greater during the summer of 2007. This supports the idea that the timing of rainfall and the amount of rainfall is related to fruiting body production and the number of species fruiting. The analysis of the abiotic characteristics (temperature, RH, PAR) is underway to see how these various habitats differ, though general observations of the data have found few noticeable differences between the areas.

Plate 4. *Tulostoma lloydii* growing in *Juniperus virginiana* leaf litter on glades.

The multitude of abiotic variables that have allowed for the diversity of habitats, and the multi-faceted gradients of those habitats, has led to a rich diversity of fungi, myxomycetes, and vegetation. This diversity is apparent in the communities of Ha Ha Tonka State Park. This project builds upon the knowledge and understanding of our natural communities in terms of the biotic and abiotic features, and in turn helps to define habitat attributes for some macrofungi, myxomycetes and vascular plants of central Missouri. Though the field research for this project has ended and the project was short in duration, future studies with multi-variable approaches will allow us to put together the intricate pieces that form the working natural communities around us.

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The Missouri Strategy – Better Than a Plan

Dennis Figg, Missouri Department of Conservation, email: Dennis.Figg@mdc.mo.gov

With the development and subsequent implementation of wildlife action plans across the nation, one state stands out because there is no plan. Missouri. No plan??

The Missouri Comprehensive Wildlife Strategy (CWS) is a strategy…….a way to go about the business of conservation planning and implementation …… not a plan. The Missouri CWS is an approach to conservation planning and implementation that uses ecologically-based assessments and existing plans to integrate conservation action for all wildlife. Or perhaps more simply, multiple species conservation in the places most likely for success. Or simplest of all, Strategic Habitat Conservation.

So, what is Strategic Habitat Conservation? SHC integrates all the facets of conservation necessary to deliver the highest conservation priorities. SHC is biological planning with measurable landscape-level outcomes. It's conservation design that integrates biological objectives for different wildlife species, management practices, and ecological functions. It's conservation delivery on the ground. It's decision-based monitoring that emphasizes evaluation and appropriate decision making throughout the process to enhance knowledge and bolster results. Finally, SHC takes advantage of assumption driven research grounded in the best science available.

One of the significant challenges of SHC is that no one person or group manages all of the steps of the process. That makes is difficult, because people need to understand the process and trust the people tending the other steps are doing their job well. This approach demands communication and collaboration about our conservation interests.

One of the important messages about the Missouri CWS is that the Directory of Conservation Opportunity is one product of the strategy – but it is not the Strategy. The framework of Conservation Opportunity Areas (COAs) helps both the Department and our conservation partners. All wildlife will benefit from conservation efforts in these areas. At the time the CWS was accepted by the FWS, 33 of these COAs had a stakeholder team and a profile that describes the conservation initiative. The CWS is designed to add more COAs when new initiatives develop, and remove COAs when the conservation objectives are met or if the interest in conservation is not significant enough to warrant stakeholder-led conservation. This year, 3 new COA profiles will be added to the Directory.

COAs are simply priority places to work for all wildlife conservation. They are recognized by the Department as priority geographies and the best places to invest in comprehensive wildlife conservation. Since the COAs were selected by a broad coalition of conservation partners the framework is recognized and supported by our partners because it represents their conservation interests as well. The Department should invest in COAs and periodically revise the COA map and supporting materials so that it continues to respond to the broad conservation community in Missouri.

Implementing the Missouri CWS requires agreement that the present landscape is not equally valuable to wildlife diversity. Some places in Missouri are better suited to deliver wildlife diversity conservation than others, and we need to focus additional conservation action to those places. The glades and woodlands in and around Roaring River State Park is one example. This is one of the highest priority places to conserve glade wildlife. Grassland wildlife is a high priority for Missouri too. Focus Areas identified by the Grasslands Coalition and by the prairie chicken recovery plan are the most likely places to be successful for grassland wildlife and prairie chicken recovery. Everyone agrees that river and stream health is a priority to Missourians. Smallmouth bass management emphasis areas and CWS geographies intersect to identify high priority stream reaches to meet the goal of conserving clean and healthy Ozark streams.

One of the ways that SHC can help state agencies, federal agencies, and conservation partners is that part of the assessment is to evaluate the role of all of the "conservation lands" and better understand the context of any one managed area. This is sometimes different thinking, as most managed areas have been viewed in isolation from other managed areas. How can we all move forward together?

Wildlife diversity conservation will not be successful if we try to conserve plants and animals one species at a time. Wildlife diversity conservation requires the conservation community to conserve habitats, hopefully within a plan for a reserve network. SHC, a continuous process for evaluating and redefining conservation action in relation to changing threats, is far better that a static plan that lays out what we need to do today and requires a "plan revision" to make course corrections. The conservation landscape is changing fast and we need collaboration for conserving wildlife more than ever.

Implementation of the Strategy will improve delivery of conservation if we think of it as an information system that informs and guides decision-making in concert with conservation partners. The Strategy is a resource to integrate existing plans and initiatives so that our conservation actions are more coordinated and comprehensive. The Strategy is to apply Strategic Habitat Conservation (SHC) to conserve and restore habitats for all wildlife.

Without knowing it, we utilize hundreds of products each day that owe their origin to wild animals and plants. Indeed our welfare is intimately tied up with the welfare of wildlife. Well may conservationists proclaim that by saving the lives of wild species, we may be saving our own."

-- Norman Myers

The Conservation Federation of Missouri

Dave Murphy, Conservation Federation of Missouri, email: dmurphy@confedmo.org

Editor's Note: *At our annual meeting in February, Dave Murphy, the Executive Director of the Conservation Federation of Missouri, invited MOSCB to join the Federation. Here he describes the organization and what they work to accomplish. After reading the article, please contact the board (ajournet@semo.edu) and let us know what you think.*

"Missourians for the conservation of natural resources and the protection of our outdoor heritage." Our mission statement is intentionally broad and inclusive. For nearly 73 years, ordinary folks in Missouri have worked effectively together to accomplish extraordinary things through CFM.

We were organized in 1935 for the express purpose of removing favoritism and partisan politics from forest, fish and wildlife conservation. Folks were outraged at the absence of game species and the sorry state of our forests. They worked to amend to the Missouri Constitution to create a new state agency, to educate people about the value of this agency, and to encourage our citizens to vote for it. From their successful efforts, the Missouri Conservation Commission was born.

In the 1970's revenues from license sales and excise taxes on sporting goods began to fall behind the pace of growth in our human population. Up to that point, these were the only revenue streams for delivering conservation programs in Missouri. Once again private citizens decided to amend our constitution to provide the perfect funding mechanism to solve the problem. The Design for Conservation Sales Tax was born and continues to produce for Missouri to this day. Other big items, like formation of the KATY Trail, passage of the Parks and Soils Conservation Sales Tax, youth development via the Conservation Leadership Corps, the Share The Harvest Program, Archery in the Schools Program, and most recently the Teaming With Wildlife initiative all have their roots in and were brought to life by the dedicated folks at CFM.

We are the voice of citizens committed to natural resource conservation in Missouri. We represent the private sector on the Governor's Task Forces on Feral Hogs, Gypsy Moths, and Chronic Wasting Disease. We also serve on the Missouri Forest Resources Advisory Council, and as an advisor to the Missouri Legislative Sportsmen's Caucus, the largest at the Capitol. We have a large and diverse membership of over 80 affiliated organizations, including professional organizations (e.g., AFS, SWCS, SAF, TWS), sportsmen's organizations (e.g., NWTF, BASS, DU, TU, QU), and conservation organizations (e.g., Forest Releaf of Missouri, the Greenway Network, Missouri Prairie Foundation, and the Open Space Council).

Each year at our annual meeting, various resource committees meet to discuss current issues. They frequently develop resolutions to advocate actions or policies to address those issues. A formal review process results in final versions, which are then submitted to our general membership for consideration. At this point, most resolutions are approved and then directed to the agencies or organizations impacted. Responses come back to CFM with either the requested action documented or an explanation offered. Beyond the resolutions process, we actively engage in many current and long-term conservation initiatives. Our bi-monthly publication, *Missouri Wildlife*, and our website www.confedmo.org are two excellent sources of timely information. Our staff are readily accessible by phone 800-575-2322 or e mail me directly dmurphy@confedmo.org.

The Glade
attn: D. Todd Jones-Farrand
302 A-B Natural Resources Building
Department of Fisheries & Wildlife Sciences
University of Missouri
Columbia, MO 65211

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

Membership Information

MOSCB is a state chapter of the Society for Conservation Biology (SCB). Our goal is to promote communication among conservation biologists throughout the state of Missouri. Membership is $5.00 for SCB members (www.conbio.org). Please contact Esther Stroh (esther_stroh@usgs.gov) for more information –and bear with us as we transfer web site locations.

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