

LOUISIANA



Wildlife

FEDERATION

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Monarch Magic

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CONTENTS

DEPARTMENTS

- 5 From The President and Executive Director**
- 7 For Your Information**
- 11 From the Managing Editor**
- 42 Conservation Line**
- 50 Club News**

FEATURES

- 8 Conservation Award Announcement**
- 41 Texas Water Plan**
- 46 Editorial: Conservation Partnerships**
- 48 Greening America's Campuses**
- 50 Duck/Goose Calling Contest Winners**

MONARCH SECTION

- 13 Monarch: What's in a Name?**
- 17 Gardening for Monarchs**
- 20 The Circle of Life**
- 23 Migration and the Louisiana Connection**
- 30 Mexico's Winter Hideaways**
- 33 Conservation**
- 39 Nuptial Monarchs Versus Butterfly Stewardship**
- 40 Monarch-Wise**
- 40 Other Wanderers**

On the Cover...

Outside Front: Migrating monarchs cling to a rope during a rest stop on an energy production platform in the Gulf of Mexico.

Inside Front: On the wintering grounds in Mexico thousands of monarchs obscure the trunk of a fir tree.

Centerfold: Atop Mt. Magazine, Arkansas, a monarch sips nectar from a blazing star flower.

Inside Back: An arduous journey, some monarchs don't survive the Gulf of Mexico crossing.

Outside Back: A freshly emerged monarch dries its wings; another awaits, still secure in its chrysalis.

According to Gary Noel Ross, Ph. D., pictured here in a field of blazing star (*Liatris* sp.), the monarch is the "quintessential butterfly." After reading the special monarch section starting on page 13, you may think so, too.



All monarch section photos and text copyright by Gary Noel Ross, PhD.



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Editorial Creed: To create and encourage an awareness among the people of Louisiana of the need for wise use and proper management of those resources of the earth upon which the lives and welfare of all people depend: the soil, the air, the water, the forests, the minerals, the plant life, and the wildlife.

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FROM THE PRESIDENT



*Keith
Saucier*



I hope you're enjoying this "enhanced" edition of *Louisiana WILDLIFE Federation* magazine. Thanks to award-winning writer/photographer, Dr. Gary Noel Ross, the sponsors, and our editorial staff for making this unique presentation about the "world's most popular butterfly" possible. The story of the monarchs and their migration is truly remarkable. I think that it is especially pertinent during this season of thanksgiving and recommitment to our faith and fundamental values that we remember and celebrate the blessings of America's wonderful wildlife heritage. Probably not everyone thinks of butterflies as "wildlife," but indeed they are. For those of us who love the outdoors, whether in the backyard or back country, our lives would be less without them.

Migration, be it waterfowl or warblers...or butterflies, the changing season with its slanted rays and falling leaves, the

barking of geese in the night, the warmth of the duck and deer camp, all bring a welcome certainty to our lives in these anxious days. In a very real sense, these are the things the Louisiana Wildlife Federation is all about. And so we will continue, with the support of our members and friends, to be steadfast in carrying on our programs and "conserving our natural resources and your right to enjoy them."

One of the ways we can advance the success of conservation is by recognizing individuals and organizations who display outstanding devotion to resource conservation and environmental quality through their volunteer or professional work. The Louisiana Wildlife Federation does this through its annual Conservation Achievement Recognition Program, widely regarded as the most prestigious conservation recognition program of its kind in Louisiana. There are 8 award categories for which nominations can be made. They are described in detail, along with the rules of the program and a nomination form on pages 8-9. The awards are primarily for efforts in 2001. Nominations are open through January 29, 2002. If you know of a person, organization, business, or school group that deserves to be recognized for their conservation efforts this year, please

nominate them. The awards will be presented at the LWF's 63rd Annual Convention on March 2, 2002.

The Louisiana Wildlife Federation's annual convention serves a very important



(L-R) Keith, Joe and Jack at a meeting of the Southwest Louisiana Wildlife Association.

function in addition to honoring outstanding conservation work. The convention is the forum for proposing, discussing and adopting resolutions that establish LWF positions on various conservation policy issues from water quality, fisheries management, and habitat conservation to coastal restoration, user fees, regulations, conservation education and agency programming, to

Continued on page 12

FROM THE EXECUTIVE DIRECTOR



*Randy
Lanctot*



Crisp air, tilting sunshine, thinning limbs – fall is the season of brightness... and of the rich aromas of wood smoke, of fallen leaves and fungi and marsh sedge, of fallow pineywoods grasses and musky buck scrapes (and of apple pie fresh from the oven, if you're lucky). It's a time of urgency, yet we're compelled to momentarily linger, beholding the landscape in the glinting autumn light.

Fall is a time of restless movement, and migration. With few exceptions it's the

favorite season of folks who love the outdoors. We hunt, we hike, we paddle, we scout for newly arriving birds. We take our time getting out on the water to fish – no need to rush to beat the heat. It's therapy for that unfulfilled urge we share with other creatures: the urge to wander.

Many years ago I worked a part-time job with a fellow who, by his own description, was a transplanted country boy from the South (we were in Illinois at the time). I was working my way through school, and he was working his way through retirement. That morning, the lawns had been brushed with the season's first frost. We got to talking about the weather and the season, and how he yearned to roam "wide open country behind good dogs." He said, "Boy, sometimes I get the wanderlust so bad..." he paused to wipe his eyes, "I don't know how I'll make it through this world." I knew the feeling. It's like that haunting,

"left behind" feeling we get when "goose music" drifts in through the bedroom window on a crisp fall evening. He yearned for the past, I yearned for the future. We were both stuck in circumstances where getting out to those big fields, woods and marshes wasn't an option. But the urge was so strong. Here in Louisiana we can be "country boys (and girls)" no matter where we live, and enjoy the outdoors during this wonderful time of year.

Through migration, wildlife connects us to the rest of the country, even the rest of the world. The migrations of waterfowl are truly inspiring, as are the peregrinations of other birds, some of which are incredibly prodigious. But ounce per ounce, you've got to hand it to the monarch butterfly. Weighing only half as much as a dollar bill,

Continued on page 47

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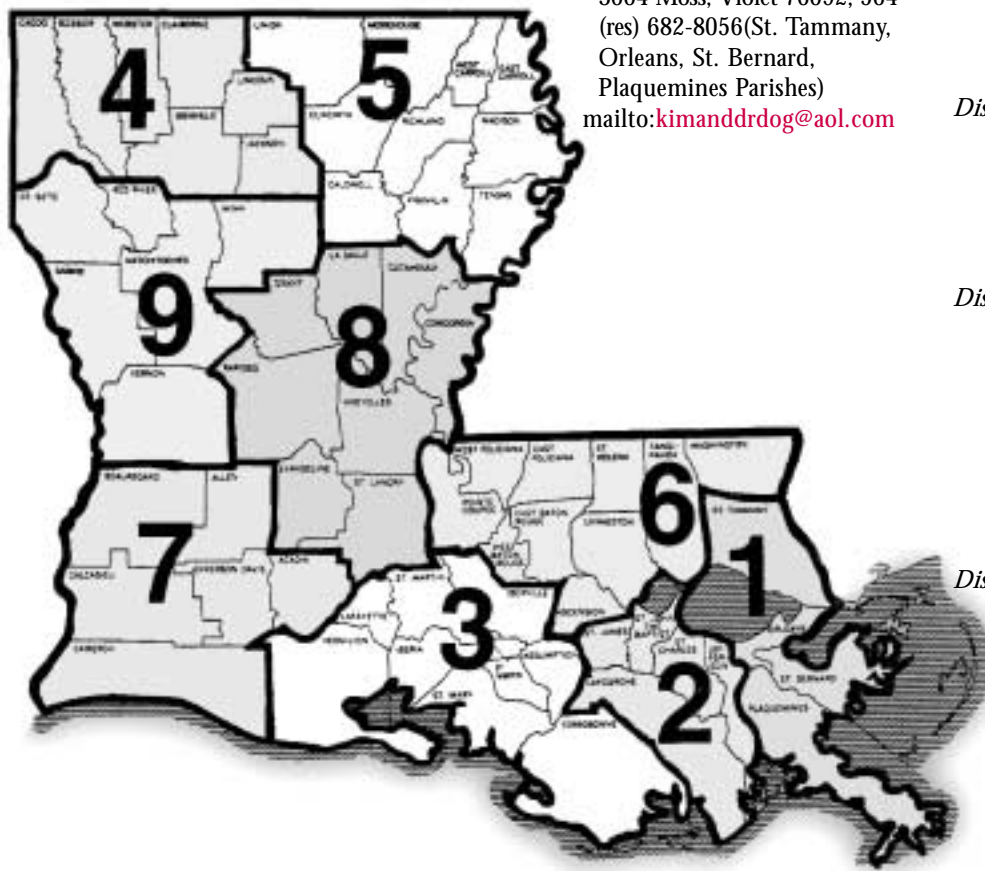
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Parishes)





Bill Ford



The first cold snap brought me out and into the woods, scouting earnestly for the first time this year. Came upon some good scrapes and rubs, but only saw does late that first evening. Although I used to be a big bow hunter, age and a shoulder injury have subdued that particular aspect of hunting. At the time of writing this article I am anxiously waiting the opening of the muzzle-loading season in Area 1. I have spent the last few Saturdays out practicing with the ole "smokepole" (a traditional .50 cal. Hawken) and feel confident that I can put my first (and only) shot consistently within 2 inches

He did make it the next few weekends and I've started giving squirrels away to people that aren't as fortunate as I am. The "critter dinner" at our church this weekend will not "want" for small game. We also managed to bag a young nutria, and I am anxious to see how that turns out.

Deer and ducks are really what I'm looking forward to. I didn't really get into the early teal season. Mosquitos and sweating aren't my idea of a good time. As I age, I must be setting my comfort level too high --- those things used to not bother me.

The "last chance" to enter the 5th Annual Adventure Sweepstakes was mailed the middle of October and I encourage everyone to get your sweeps tickets in ASAP, as the drawing is the 5th of December. Some lucky person will have the choice of hunting the Colorado mountains next winter - or taking a friend and enjoying fishing the high mountain Colorado lakes during the upcoming summer - or taking that same friend on a Carribean Cruise - OR last, but not least, the choice of hard, cold

help now more than ever. I know that there are a lot of worthy causes, but please remember what we have here in Louisiana - all the wonderful natural resources that we are able to enjoy, right here at home. It's up to us to see that our children and their children will be able to enjoy the outdoors in a clean and wholesome environment.

To the new members listed in this issue I extend a hearty welcome and thanks for your commitment and support of the state's leading conservation organization. You are the Federation and your membership makes a significant difference!

Thinking about new memberships reminds me that a membership in the Louisiana Wildlife Federation would make a good Christmas gift for those outdoor-loving friends and family members that seem to have everything. In keeping with the theme of this special edition of *Louisiana WILDLIFE Federation* magazine, all new memberships of \$50 or more that we receive between now and Jan. 1 in response to this offer will include (while supplies last) a poster featuring native butterflies signed and dated by our "Lepidopterist in Residence", Dr. Gary Noel Ross, along with a copy of this special edition of *WILDLIFE*. Use the membership form on page 48 to let us know that you want to take advantage of this offer.

In closing, I need to tell you that I will be leaving the Federation at the end of this year. I have been offered an opportunity to work for a company in my hometown of Clinton, LA and have accepted the offer. Among other considerations, not having to commute the 40 miles to Baton Rouge each day is very appealing. I start my new job in January, but I won't be leaving the Federation entirely. Like many of you, I will be involved as a member and look forward to playing an active role within the Federation's volunteer administration.

I am proud to have been associated with the Louisiana Wildlife Federation for the past 12 years and hope I have contributed to its rich tradition and accomplishments. Thank you for your support.



LWF Development Committee Chairman, Edgar F. Veillon (L) was in Lake Charles recently to present a framed quail print, "Coastal Covey Bobs" by Jack Cowen, to new LWF Corporate Sponsor Member Sheldon McManus, owner of McManus Construction.

of my aimpoint at up to 75 yards. That's good enough for the girls I go out with!

On opening day of the squirrel season I put a dent in the population although it took a while. Usually my son accompanies me, but this year, at 15 years old, those "other" two scents that seem to manipulate young lives kicked in — perfume and gasoline. Ahhhh, to be young again.

\$2,000.00 in cash. If you've already responded and sent in an extra contribution for more tickets, I have made a note on your check that I added the appropriate amount of tickets in your name.

You will soon receive our Year-End Appeal. The monies raised from this fundraiser play a vital role in keeping LWF on solid financial ground, and we need your



LWF ANNOUNCES 38TH CONSERVATION ACHIEVEMENT AWARDS PROGRAM

Honorable M.J. "Mike" Foster



With the knowledge and understanding that conservation, wise management and use of our State's natural resources is essential to the health, happiness, welfare, and economic well-being of Louisiana's citizens; and with the belief that proper recognition of conservation efforts promotes wise resource management and use.

I, M.J. "Mike" Foster, Governor of Louisiana, do hereby endorse the concept of the Governor's State Conservation Achievement Awards Program as conducted annually under the auspices of the Louisiana Wildlife Federation.

M. J. "Mike" Foster, Governor

The Louisiana Wildlife Federation is now accepting nominations for the 38th annual Governor's State Conservation Achievement Awards. The awards program seeks to recognize those individuals, organizations and businesses that have made significant and outstanding contributions toward the protection and wise use of the state's natural resources — its air, soil and minerals, its forests, waters and wildlife.

There are 8 award categories for which nominations can be made. The **deadline** for submitting nominations is **January 29, 2002**. Self-nominations are completely acceptable. Further, in nearly all cases it is necessary to enlist the cooperation of the nominee in order to provide the judging committee with adequate supporting information. So please do not feel awkward about nominating yourself or providing background material for someone who may wish to nominate you for one of these awards. We urge you to bring your accomplishments or those of others to the public's attention through this program.

Awards will be presented at a special Saturday evening recognition banquet to be held in conjunction with the Louisiana Wildlife Federation's 63rd annual convention set for March 1-3, 2002, at the Paragon Casino and Resort in Marksville, LA.

A nomination form, explanation of the award categories, regulations and procedures and other details of the program follow. Additional nomination forms are available from the LWF office — P.O. Box 65239, Baton Rouge, LA 70896-5239; fax/phone: 225/344-6707;

mailto:lawildfed@aol.com

Award Categories

Nominations will be accepted for the following categories. Winners may not be named in every category. Recognition will be based primarily on accomplishments during 2001. **Immediate past winners are not eligible to succeed themselves in the same category of accomplishment for which they were recognized the previous year.**

1.) PROFESSIONAL CONSERVATIONIST OF THE YEAR

For outstanding accomplishments during the year by a person who has made a significant contribution to the management, enhancement, or protection of Louisiana's fish, wildlife, air, water, soil or forest resources, or related recreational opportunities in a professional capacity. (For the purpose of this category a Professional is a person who receives monetary compensation for the work that has resulted in the accomplishments for which s/he has been nominated. This includes, but is not limited to, persons

employed in renewable natural resource management or recreation fields including biologists, enforcement officers, wildlife managers, administrators, scientists, researchers, etc.)

2.) VOLUNTEER CONSERVATIONIST OF THE YEAR

For outstanding accomplishments during the year in the management, enhancement, or protection of Louisiana's fish, wildlife, air, water, soil or forest resources, or related recreational opportunities by a person acting in a volunteer capacity.

3.) YOUTH CONSERVATIONIST OF THE YEAR

For outstanding conservation effort by a youngster (18 years old and younger). Youth groups acting together in a conservation program are also eligible. The winner should have demonstrated outstanding ability, leadership, and accomplishment in any phase of conservation either individually or as a group effort.

4.) BUSINESS/CORPORATE CONSERVATIONIST OF THE YEAR

For outstanding achievement by a business in pollution control, conservation, providing public recreation, habitat development, donating lands for public recreation, donating lands for public wildlife areas, etc. (This category is to honor a company and not an individual person. It covers a vast variety of possible achievements. If in doubt, submit an entry and let the judges consider your nomination.)

5.) CONSERVATION EDUCATOR OF THE YEAR

For outstanding effort in conservation education by a professional or volunteer. Instructors of hunter safety and outdoor ethics are eligible in this category as are teachers of the natural sciences, fish and wildlife management, environmental design and management, various aspects of environmental education, etc. Emphasis should be on teaching and working with students rather than research or other activities.

6.) CONSERVATIONIST OF THE YEAR - ELECTED OFFICIAL

For outstanding conservation effort by

an elected official. All Louisiana elected officials are eligible in this category.

7.) CONSERVATION COMMUNICATOR/COMMUNICATION OF THE YEAR

For outstanding effort by a writer, reporter, radio or T.V. broadcaster, photographer, artist, cartoonist, radio or T.V. station, or newspaper or other publication in creating a public awareness of the importance of environmental quality and natural resource conservation or making a significant contribution toward the solution of a major conservation problem in the state.

8.) CONSERVATION ORGANIZATION OF THE YEAR

For outstanding contribution to the conservation effort by a state or local organization. Bona fide organizations including but not limited to garden clubs, civic organizations, sportsmen's clubs, women's clubs, environmental groups, etc., are eligible. Recipients should have demonstrated keen interest on projects and programs within the state which deal with basic and serious natural resource problems and have evolved an action program from that interest. In special cases, where state, or federal or local agencies or institutions have accomplished extraordinary work above and beyond their normal responsibilities, such organizations will be given consideration for this award.

GOVERNOR'S AWARD

For the outstanding over-all conservation effort and achievement. The Governor's Award recipient is selected by the judging committee from among the top nominees for the 8 conservation award categories. Nominations are not accepted for this award.

Program Rules and Procedures

1.) The Thirty-eighth Governor's State Conservation Achievement Recognition Program shall be restricted to achievement completed prior to December 31, 2001. Awards will be presented based on efforts of the immediate past year; prior records may be considered but this will be left up to the judges.

2.) Nominations for the Governor's State Conservation Achievement Awards must be hand-delivered or sent by return receipt requested mail or other delivery service, to the Louisiana Wildlife Federation, P.O. Box 65239 Audubon Station, Baton Rouge, LA 70896-5239 (street address: 337 S. Acadian Thruway, Baton Rouge, LA 70806), and be postmarked on or before midnight January 29, 2002.

3.) The Conservation Achievement Awards shall be presented at the annual Recognition Banquet held during the 63rd Annual Louisiana Wildlife Federation Convention, Saturday, March 2, 2002, at the Paragon Casino and Resort in Marksville, LA.

4.) Please specify on the Nomination Form the category for which the nomination is made. No nomination will be accepted for the Governor's Award. Kindly attach to the Nomination Form the nominee's resume' of achievements. The resume' should be a narrative description of the nominee's accomplishments and include an explanation of their significance or impact, that is, why the nominee's accomplishments are important and worthy of recognition. It should not exceed 3 single-spaced typed pages. Information such as past recognition, organization memberships, etc. may be appended to the resume'. Documentation of accomplishments such as newspaper clippings, correspondences, etc. should be included as a supplement to the resume'. If a nomination is for more than one category, a separate nomination form and complete resume' must be submitted for each category entered.

5.) If possible, please include a photograph of the nominee with the nomination. Nominations without photos are acceptable, however, and submission should not be delayed due to unavailability of a photo which can be forwarded at a later date.

6.) All rules must be strictly adhered to. Nominations which do not meet all standards and criteria will be returned to sender to be resubmitted with appropriate additions/modifications. Program judges may declare any nomination ineligible if proper documentation and supportive materials are not included. The decision of the judging committee will be final.



NOMINATION FORM

Date: _____

Full Name of Nominee: _____ Category #: _____

Address: _____

Recommended By: _____

Address: _____

Phone: _____ Signed By _____

Title (if any): _____

Reply to:

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 Sam A. Monticello, D.V.M., Lake Charles
 John M. Muckleroy, Natchitoches
 -First Credit Corporation
 Vonell Parker, Robeline
 -Lotus Farm
 W. O. Paul, Haughton
 Joe Beck Payne, Natchitoches
 -Peoples State Bank, Many
 Javier and Ana Pere', M.D.s, Natchitoches
 -Natchitoches Pulmonary

Continued on page 49



Elizabeth DeLouise



"Interview with a Butterfly"

Children often know what they want to be when they grow up before they have the misfortune of being impeded by the realities of an adult world. Before they are swayed by salaries, expense accounts, 401K plans, company cars or titles, they tap into something that gives them joy to learn about— they like art in school so they aspire to be artists; they are fascinated by bugs and dream of becoming a scientist. Firefighters, astronauts, ballerinas, scientists, train conductors, horses and alligators, and for my sister a teddy bear named Teddy Rukspin, seem to be common and recurring desired professions among younger elementary aged kids. I say this with such authority because I am 4 and 9 years older than my sister and brother, respectively, and their childhood admirations for firetrucks and toy bears were observed with my more mature perspective. Further, babysitting was my first attempt at earning an income at the age of 10, so I have always been around younger kids as a sibling and as a caretaker.

My brother wanted to be a firefighter because the appeal of climbing around on a shiny truck with ladders was overwhelming. He wasn't aware of the danger; he didn't know what salary meant. It just appealed to his ideals of fun and excitement. For his 3 year old birthday party, my mother convinced the local fire department to attend the fete and bring along the illustrious truck. The partygoers were then encouraged to climb about, blow the horn and run the lights. How could you be a 3 year old party attendee and be adversely influenced by such splendor?? Many a career choice was made then and there at the cul-de-sac.

We still aren't sure why my sister wanted to be Teddy Rukspin, a mechanical stuffed bear that wore overalls.

In a way, you could say that Gary Noel

Ross, author and photographer of our special monarch section, has become what he wanted to be when he "got big." He can't remember a time not being fascinated by butterflies. From a very young age, Dr. Ross has studied and been mesmerized by lepidopterans. His attraction to butterflies has not diminished through the years, as his career has been devoted to the study of moths and butterflies.

"I don't remember a time when I was not interested in butterflies, and my first memory seems to go back to when I was 5 years old collecting caterpillars in my daddy's flower garden. I would bring them inside in jelly jars to see what would happen to them," Gary said during an informal interview.

Driving along on an errand one afternoon, Gary swerves dramatically to avoid, not a family reunion of white-tailed deer, but a dainty, flittering butterfly that breezes across the windshield. "Oops. Almost hit a Gulf fritillary," he observes, mostly to himself. "There's hardly a butterfly that I don't see. My eyes are trained to detect anything flying within my range of vision."

When he was fresh out of high school and headed towards college, Gary surveyed his possibilities and decided that the best way for him to be able to make a career out of butterflies was to teach at the university level. That way, he would have the summers and other time off to trek to Africa, South America, Southeast Asia and other exotic lands to research butterflies' life cycles and behavior in their native habitats. Dr. Ross first attended the University of New Orleans as an undergraduate in 1958, then transferred for his final year of college to LSU as a biology major. To be qualified to teach at the university level, he knew he had to get a masters and Ph.D. in entomol-

ogy (the study of insects), and he earned both from LSU. After receiving a Ph.D. in the spring, he immediately began teaching in the fall of 1967 at Southern University's Department of Biological Sciences. He remained there until he retired in 1992.

Dr. Ross' interest in monarchs first became piqued around 1964 while assisting graduate students studying bird migrations in Cameron Parish, LA. The students were tracking the southward migration of birds by pointing telescopes at the moon and counting the silhouettes that passed in a given amount of time. Some of the silhouettes were not birds at all, but butterflies. Monarchs were noticed in this migration route, distinguished by their eagle-like soaring flight and smaller stature. Assuming most scientists knew of this transition, Dr. Ross didn't research the issue further until in 1991 he got word that many offshore workers were noticing monarchs landing on the oil rigs. As it turns out, most professionals *didn't* know of the migration, so Dr. Ross retired in 1992 to study this phenomenon intensively; consequently, he can be credited with first documenting the trans-Gulf migration route of monarchs.

"The monarch is the quintessential butterfly," according to Gary. "Though I'm retired, I now spend my time doing what I like – promoting butterflies to the public, or evangelizing for butterflies." (Appropriately, his email address includes the phrase "butterfly evangelist.") He teaches a biology course at the Baton Rouge Community College and tries to instill the message that "true joy comes from turning your talents into your profession."

Much luck to you in creating a viable, income-earning career based on what gives you true joy. Now, experience the magic of the monarchs.



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Because the Mississippi runs through us, we are part of the migratory path for millions of butterflies and birds each year.

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Food & Drink for sale



Proceeds Benefit Baton Rouge Earth Day, Inc., a Non-Profit Organization.

President: Continued from page 5

name a few. If there is an issue you'd like your federation to address at the upcoming convention, please contact me or our executive director before mid-January. There will be more details about the convention in the next issue.

One of my favorite jobs as Federation president is welcoming new members and affiliates. I am pleased to announce the affiliation of the Hoy Hunting Club of Allen/Beauregard Parishes - Robert Ipes, President, and the Plaquemine Sportsmen's League of Iberville Parish - Jeff Willie, President. Please join me in welcoming them to the Federation. Also, thank you and welcome to all the individuals and businesses who have joined the Federation over the past few months. Many are listed in this issue.

Another thing I enjoy about being your president is having the opportunity to get around the state and visit some of our affiliates at their meetings. Most recently, I accompanied 1st Vice-president Joe Herring and our executive director Randy Lancot to a meeting of the Southwest Louisiana Wildlife Association in Kinder. There was a very nice turnout and excellent program about managing deer hunting leases. I don't think that I've ever seen so many jaw dropping slides of big bucks. Thanks to SWLWA President Keith Bell and Tom Miller, David Daigle and Cree Owen for their hospitality. A pleasant surprise for me was meeting for the first time the "legendary" Jack G. Surles of Lake Charles. Jack was LWF's District 7 Vice-president for many years and president of the Southwest Louisiana Birdhunters Association. The birdhunters association is now defunct, but Jack is hanging in there and doing well. He even renewed his long-lapsed contributing membership. Thanks, Jack.

My next opportunity to communicate with you through this column won't be until 2002. In the meantime, I hope you will be spending some time in the outdoors with family and friends, counting our natural blessings. Please accept our very best wishes for a safe, healthy and happy holiday season.

Yours in conservation,

Keith R. Saucier
President

THE MONARCH BUTTERFLY

MONARCH

What's in a Name?

How noble a creature! How noble a name!

Consider the following:

- The butterfly is now the de facto national insect of the United States, and as such has become a common household word and the poster child for the world of entomology and conservation.

- Monarchs are very conspicuous—medium sized, bright orange (a royal color) with black and white markings, and have a slow, soaring (majestic) flight.

- Monarchs (and other butterflies, too) are potent symbols of rebirth and hope.

- For decades, the monarch has been singled out in most textbooks to illustrate a typical butterfly life cycle as well as the phenomenon called metamorphosis.

- The monarch is found in all American states except Alaska and in all regions of Canada except Yukon Territory and Northwest Territories, and because the species is a notorious wanderer, monarchs have been observed as vagrants in many Caribbean, Pacific, and Atlantic islands (including Great Britain), and Mauritius in the Indian Ocean.

- The monarch's annual migrations are

the most epic of any animal on planet Earth.

- The monarch's concentrated winter

national ecotourists.

- The monarch and its dependency upon specific phytochemicals derived

from its milkweed host is frequently cited in many texts as a classical example of coevolution between animal and plant.

- The similarity in coloration between the monarch butterfly and the unrelated viceroy butterfly is often cited as the classic example of Batesian mimicry—a close resemblance between an unpalatable and an edible species.

- The relationship between the monarch and Bt corn, a genetically modified strain incorporating an insect toxin, is commonly cited as an omen of dangers inherent in genetic engineering.

- And finally, the very name monarch is easy to pronounce, easy to spell, and evokes a majestic, regal, and perhaps even superhero presence.

With such incredible credentials, it is easy to understand why scientists and the public at large have embraced this butterfly and its name as a perfect marriage, and why the monarch is well on its way to becoming an American, if not international, icon.

But our traditional interpretation may be putting the proverbial “cart before the horse” and blinding us to an important bit of history. You see, most of the qualities that we currently associate with the monarch were discovered long



Male

Female

refuges in coastal California and central Mexico have been featured over and over again by the global media, and each year are the destinations of thousands of inter-

national ecotourists.

THE MONARCH BUTTERFLY

AFTER the butterfly received its popular name. That's right! The first actual published usage of the name "monarch" dates to an article by the esteemed American entomologist Samuel H. Scudder titled "English Names of Butterflies" in 1874,

were impressed by the sight of such a magnificent butterfly, and so they named it 'monarch' after King William III, Prince of Orange, stateholder of Holland, and later king of England—its orange color no doubt suggesting the name. From

William III. Born in 1650 at The Hague in the Netherlands, William, a Protestant, ousted the Catholic king James to take the English throne. William reigned jointly with his wife Mary Stuart (Queen Mary II) as the monarchs of Great Britain from 1689 until William died in 1702 (Mary had died a few years earlier). William also was titled "Prince of Orange" because he was of the House of Orange, the name of the royal family of the Netherlands. The name "orange" actually comes from an ancient independent agricultural principality called Orange, today located in the lower valley of the Rhone in the Vaucluse Department of southern France. William was the last of the direct line of the House of Orange.

As the new reigning sovereigns of Great Britain, at the time a Catholic dominated land, William and Mary stressed tolerance and compassion for all. But although their rule enabled Catholics and Protestants to coexist, religious enmity continued, particularly in Ireland where large numbers of Protestants (especially Lowland Scots Presbyterians), had immigrated and settled in the northeastern part of the island where they formed a secret society of "Orangemen." (Recall the annual July media accounts of the parades of the "Orangemen" in Ireland.)

This endemic hatred between Roman Catholic and Protestant in Europe, and in particular Northern Ireland, has had a profound effect upon American history. The original colonies of the incipient United States were founded in large part by refugees from Western Europe and Great Britain seeking religious freedom and economic opportunities. Although many of the early immigrants to America settled in Virginia because of its good ports and freedom from Indian attacks, the first American swarming ground for the Scotch-Irish was the backcountry of Pennsylvania (later New York). Mostly Lowland Scottish in origin, these Protestants had been settled in Ulster (Northern Ireland) for two or three generations but were disturbed by high rents, recurrent crop failures, and, of course, egregious English discrimination.

So much for history. I find it difficult to accept that the following are pure coincidence and totally unrelated: a) a British sovereign named King William III, also



Male monarch resting on amaryllis flower.

published in the scholarly journal *Psyche*, an organ of the Cambridge Entomological Club. There, Scudder cites *Danaus plexippus* as "The Monarch." (The butterfly's current scientific taxon, *Danaus plexippus*, is credited to Carolus Linnaeus, the "father of taxonomy," who in 1758 described the species as *Papilio plexippus*, as he considered the genus *Papilio* to be appropriate for all butterflies. The monarch, along with other related species utilizing milkweed as hosts, is placed either within a separate family—Danaiidae—or else within a separate subfamily—Danainae—within the larger Nymphalidae family.) But other common names for this regal butterfly have been used throughout history, too. In her book *The Common Names of North American Butterflies*, Jacqueline Miller indicates that "Milkweed Butterfly," "Storm Butterfly," "Wanderer," and "Archippus" have all been used for *Danaus plexippus*.

But perhaps what is most interesting involves comments in two relatively recent books. In Fred Urquhart's *The Monarch Butterfly: International Traveler* published in 1987 we read: "The early settlers who came to North America from Europe, particularly those from England and Holland,

'William' we get the vernacular 'Billy,' and hence the name 'King Billy,' which has also been applied to this butterfly." In Robert Pyle's 1999 book *Chasing Monarchs: Migrating with the Butterflies of Passage*, Pyle relates, "Don Davis, a wonderfully knowledgeable monarch aficionado in Toronto, told me that his late grandfather knew these butterflies as 'King Billies.'" And so, it appears as if the butterfly we now know as "monarch" has been called "King Billy" as well.

My interest in history and academic sleuthing was piqued. First, I contacted Don Davis who eagerly shared with me some tidbits of family history. According to Don, his father (1915-2000) and his grandfather (1882-1962) both alluded to the monarch butterfly as "King Billy." Although born in Ontario, both ancestors were descendants of United Empire Loyalists who had migrated to Canada following the American Revolutionary War. Loyalists came into the Canadian provinces from all the American states, but the great bulk of them came from New York, with New Jersey and Pennsylvania also providing considerable numbers.

Next, I delved into British-Colonial America history and the role of King

THE MONARCH BUTTERFLY

titled Prince of Orange, and a staunch defender of Protestantism—in England and Ireland, b) Protestant English and

reasons for leaving the Motherland. Not surprisingly, death claimed many (life expectancy was a mere 35 years!) while

For the tenacious Protestant colonists, I think that the silver lining assumed the shape of a common, orange, nameless butterfly that graced the fresh landscapes each summer, caused no damage to crops, and as if by magic, disappeared each fall only to return en masse the following spring. I think that the presence, natural behavior and mythology of these butterflies not only entranced the very psyche of the colonists, but sparked what may have been their most nostalgic memory of the homeland: King William III, Prince of Orange as the single personage of wealth, power and authority. I think that someone, somewhere in some community settled by Protestant immigrants, perhaps in New York, Pennsylvania, or Virginia—out of respect, tribute, and endearment for the Prince of Orange—referred to those orange insect harbingers of life and hope as “King Billy.” As a sort of tribute and symbol for “Long live the King!” the name probably was an instant hit, becoming the lingua franca of the day.

How long “King Billy” remained in widespread usage is, of course, only conjecture. From Mr. Don Davis we do know that the name was popular within his Ontario based family until 2000. However, I think that as time passed and



Male monarch nectaring on native sunflower.

Irish immigrants settling in Colonial America, c) a bit of folklore from eastern Canada suggesting that a bright orange butterfly, common throughout eastern North America was referred to as “King Billy,” and d) the butterfly in past literature being referred to as “The Monarch” and in more contemporary times simply as “monarch.”

To explain the linkage between these facts, I called upon my imagination to step back in time. Of course, I cannot peer into the past, but existing evidence is compelling. The following is what I suggest as a plausible paradigm.

For Colonial Americans, life was tough. After all, food was scarce, winters severe. A myriad of nameless diseases and pestilence descended as cyclical plagues. Days were defined by hard work and hardships. But the “promise of life” must have been a powerful motivator. The pain of reality was most likely tempered by excitement sparked by adventure in a new world, but as the business of living was reduced to dire acts of survival, even those individuals exceptionally brave in heart and spirit must have experienced episodes of disappointment, sadness and loneliness. Memories of friends and relatives left behind must have clouded the original

others returned to the very land they had fled.

However, I am a firm believer in the adage “there’s a silver lining in every cloud.”



Male monarch nectaring on native dewberry.

THE MONARCH BUTTERFLY



Female monarch nectaring on Mexican flame vine.

memories faded, King William III became for most, a hero in legend, not a real life personage. Someone, somewhere in Colonial America eventually generalized the name to "The Monarch," which was then immortalized in the literature in 1874 by Mr. Samuel Scudder. Later, through everyday usage or perhaps even careless printing oversights, "The" was dropped from the title and we are left with the single word "monarch." And in an ironic twist of history, that name proved prophetic: the butterfly has become a unique scientific phenomenon as well as the world's most celebrated insect species. The butterfly has become a "monarch" in the true sense of the word.

I can't prove my interpretation, of course. The facts are lost in time and folklore. However, I am convinced that the vernacular name "monarch" for the butterfly known in science as *Danaus plexippus*, is the secondary name for "King Billy" and that both names were coined by colonial Americans to honor a friend and patron, King William III of Great Britain, Prince of Orange.

But for etymologists and entomolo-

gists alike, there is something more: The MONARCH is a traditional American butterfly with a decidedly European (British-Irish-Dutch) connection—a living nostalgic, international legend.

"And now you know the rest of the story."

(Modified from an article that appeared in "News of the Lepidopterists' Society," Spring 2001, Vol. 43:1, pages 20, 21, 31.)



Gardening Tips

To maximize your enjoyment from your butterfly garden, simply follow these rules:

- Locate plants in sunniest location available. Nectar production is dependent upon quality of sunlight, and butterflies enjoy sunny locations to maintain high flight temperatures.
- Design elevated flower beds for good drainage and weed control.
- If you have very limited space, use containers to house your plants. But remember, potted-plants dry-out faster than those in the ground.
- Use a soil mixture that is loose, but full of organic compost. This allows good drainage while at the same time maintains adequate moisture.
- Use artificial fertilizers sparingly. When the excrement of caterpillars, called frass, falls to the ground it becomes an excellent natural fertilizer that stimulates the regrowth of the host plant.
- Deadhead flowers (remove spent flowers)—this encourages your plants to continue producing flowers.
- Incorporate an area of sand or gravel that you keep moist (particularly during extended periods of drought) to supply water to those butterflies unable to secure adequate amounts of fluid from nectars. This is particularly important for migrant monarchs.
- Include an area in the garden where you can set out fermenting fruit for those butterflies that supplement their nectar diets or that are having a difficult time securing adequate nectars.
- And lastly, NEVER use insecticides in or near your butterfly garden—toxins do not discriminate between "bad" bugs and "good" bugs.

THE MONARCH BUTTERFLY

Gardening For Monarchs

Attracting monarch (and other) butterflies to your home turf is relatively easy. Two types of flowering plants are essential: plants that provide nectar for adults to eat (food plants), and plants that supply leaves for caterpillars to eat (host plants).

First, food plants. Monarchs feed (nectar) on a large variety of flowering plants, including natives, exotics, annuals and perennials. Throughout Louisiana, most varieties that have been recognized as “butterfly plants” are utilized readily by monarchs. Local spring and summer favorites include blazing star, butterfly bush or *Buddleia*, butterfly weed, cone-flowers, cosmos, daisies, lantana, Mexican flame vine, Mexican milkweed, Mexican sunflower or *Tithonia*, pentas and zinnias. In autumn, monarchs seem to be especially attracted to the yellow, purple, and white flowers of asters, goldenrod, ironweed, Joe-pye weed, sunflowers, and various species of *Eupatorium* (especially mist-flower).

Second, host plants. Monarchs lay their eggs mainly on plants within the Milkweed Family or Asclepiadaceae (other

species of butterflies utilize different hosts, including many varieties of trees).



Author's butterfly garden (summer) in Baton Rouge, LA. Conspicuous plants include zinnias, lantana, Mexican milkweed, black-eyed Susans, Mexican flame vine and impatiens (the latter is not particularly attractive to butterflies but does add long-lasting color to the garden).

For this reason, monarchs and their relatives are often called “milkweed butter-

and several other Old World “milkweed butterflies” require plants within the Mulberry or Fig Family (Moraceae). Within Louisiana gardens, monarchs seem to prefer the native antelope-horn or spider milkweed (*Asclepias viridis*), butterfly weed (*A. tuberosa*), and the exotic Mexican milkweed (*A. curassavica*)—the latter is the most available from garden centers and *A. tuberosa* grows best north of Alexandria. All species require sunny, well-drained locations. To quote a well-used phrase: “If you plant them, they will come.”

Since monarchs generally do not spend much time in Louisiana, watch for monarch eggs and caterpillars from late March, April and early May (coinciding with the spring migration), and again in September and October (coinciding with the fall migration). During mild winters, and particularly in the extreme southern part of the state—New Orleans, Grand Isle, and Cameron—monarchs may remain all winter and continue to reproduce. Unfortunately, Spring 2001 was an



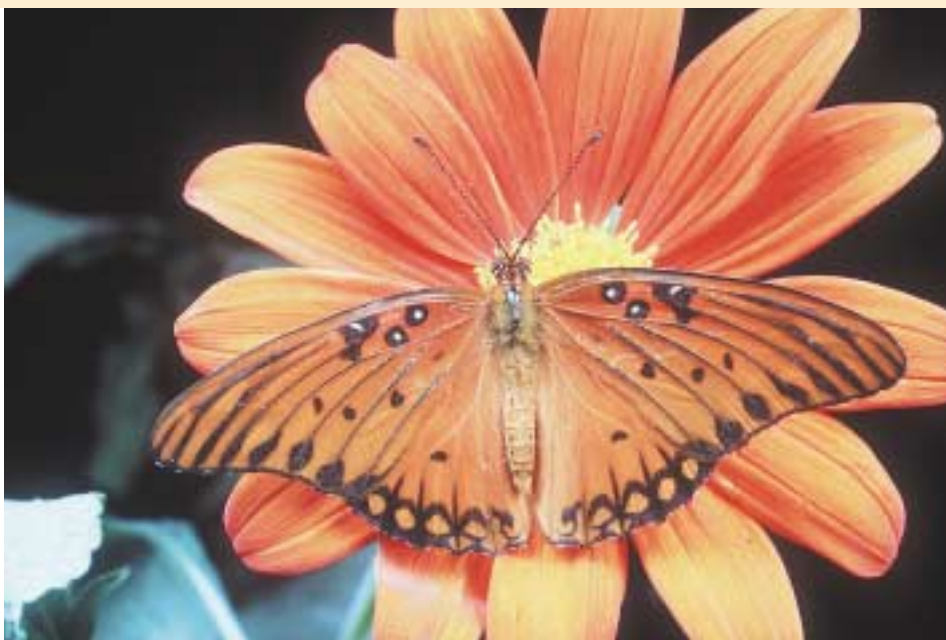
Author's butterfly garden (fall), in Baton Rouge, LA. Conspicuous plants include sunflowers, mist-flower, ironweed and goldenrod.

THE MONARCH BUTTERFLY

exception. Because of the significant reduction in the numbers of monarchs within the Mexican refuges (see "Mexico's Winter Hideaways," page 30) during the 2000-2001 winter, virtually no adults were seen within Louisiana, and I know of no gardener in the Baton Rouge area who observed a single egg, caterpillar or chrysalis.

Monarch caterpillars often spend much of the daylight hours resting in shady locations where they are inconspicuous to prowling predators. Chrysalises, also, are often a distance from their hosts and usually are attached to a sturdy substrate in a shaded, quiet location (see "The Circle of Life," page 20). Therefore, don't be too alarmed if at first you are unable to locate mature caterpillars and chrysalises.

Both larval and adult monarchs have been shown to benefit from reduced pre-



Gulf fritillary butterfly nectaring on Mexican flame vine, an easy-to-grow climber in the South.



A monarch trapped in the web of a common garden spider. Invertebrates are not affected by the monarch's internal arsenal of toxins.

dation. However, the concentrations of plant chemicals that confer the protection upon the monarch differ between species of milkweed plants. Therefore, monarch caterpillars exhibit varying degrees of protection. Furthermore, only vertebrates (animals with backbones) seem to be vulnerable; most invertebrates seem unaffected. But monarchs, as with all insects, are on the bottom of most food chains in that they serve as food for a variety of meat-hungry carnivores. In fact, the vast majority of monarch caterpillars in my garden are routinely decimated by a virtual army of ants, assassin bugs, ambush bugs, carabid beetles, dragonflies, lacewings, ladybird beetles, praying mantises, robber flies, spiders and wasps. (Tiny, young caterpillars are particularly vulnerable.) Although as butterfly gardeners we hate to loose even one caterpillar, we must remember that death for one animal means food for another. A healthy garden is in reality a mini-ecosystem where there is a balance between herbivores (plant-eaters), carnivores (predators), and scavengers. The carnivores are nature's in-house police force protecting plants from herbivores while scavengers are nature's clean-up crew. Bear in mind, from the hundreds of eggs that a female monarch may lay, only two must survive to keep the population at a stable level (if any more than two, the population would explode; if any less, it would become extinct).

THE MONARCH BUTTERFLY



Pentas, a favorite of most southern butterflies. The red-flowering variety is preferred.

But in spite of the necessary natural balance, I am undeniably partial to butterflies, and so I intervene with Mother Nature in order to tip the scales in favor of my scaly-winged visitors. Each day my strategy is to launch “garden patrol” for what I term “friendless heathens.” When a predator is found, I simply pick it off with my fingers, squash, and finally toss the lifeless body to the ground. I rationalize my actions by acknowledging that the victims benefit a bevy of ground scavengers. (WARNING: Never use insecticides within any butterfly garden!)

Before leaving the subject, I must mention that there is a vast array of other organisms such as parasites and pathogens that can attack monarchs in all their stages. These include bacteria, viruses, fungi, parasites (such as nematodes, protozoans, horsehair worms) and parasitoids (such as wasps and flies). (The latter lay their eggs either on or in their host, and their larvae slowly devour the hosts' internal living tissues). In addition, tiny flies and mites sometimes attach themselves to the wing veins of adult butterflies causing debilitation, and mosquitoes sometimes feed on the blood of larvae. Amongst the microbes, viruses are the most common pathogens of butterflies. A number of types have been identified, including nuclear polyhedrosis virus, granulosis viruses, and cytoplasmic polyhedrosis viruses. These viruses attack all stages but

are least common in adults. However, adults can transmit some viruses via the eggs to their offspring (incidentally, these insect viruses cannot be passed along to humans). Scientists have proven that the physiological state of the host plays an important role in susceptibility to disease. In other words, increased stress amplifies the potential for disease.

Monarch larvae seem to be particularly vulnerable to a very contagious nuclear polyhedrosis virus. Termed “wilt disease,” the pathogen attacks all internal body tissues, liquefying and reducing the host to a sack of black ooze (some bacteria produce similar symptoms). Adult monarchs can fall victim to an amoeboid protozoan that weakens its host. These diseases are extremely contagious, particularly in artificial conditions such as with container rearing. In order to forestall massive die-off, all rearing containers used to house immature butterflies should be kept dry and periodically cleansed with hot, soapy water followed by a five percent solution of household chlorine bleach. There should be a final rinsing with distilled water. New food leaves should be first dipped in five percent household chlorine bleach and then rinsed in distilled water, also. To reduce bacterial pathogens, some aficionados recommend the spraying of food plant material with a dilute mist containing Aureomycin or tetracycline (Cipro), however, some ecologists have

cautioned that the broad use and poorly supervised application of antibiotics can accelerate microbial resistance, creating the potential evolution of “super-bugs” for which we may have no control (remember, Cipro is now the preferred treatment for Anthrax and other potentially harmful microbes).

Now, good gardening!



Blazing star visited by painted lady butterflies, a common species during fall months.

THE MONARCH BUTTERFLY

The Circle of Life

The monarch butterfly, *Danaus plexippus*, is the quintessential example of insect meta-



Egg: 3-4 days.

The monarch butterfly has a metamorphic life cycle consisting of four separate stages: egg, larva (caterpillar), pupa (chrysalis), and adult. The entire life cycle takes approximately four to five weeks to complete. Host plants belong to the milkweed and dogbane plant families.

morphosis (change in body form). Consider: Monarchs have four distinct stages of development—egg, larva (caterpillar), pupa (chrysalis), and adult (butterfly). The entire cycle usually takes approximately 4-5 weeks. To begin, a female monarch searches out milkweed plants (family Asclepiadaceae), her major host plants (see “Gardening for Monarchs,” page 17). Milkweeds are endowed with specific plant chemicals or phytochemicals called cardenolides and cardenolide glycosides. These plant steroids are bitter tasting and can cause congestive heart failure in vertebrates. Throughout history, monarchs not only have learned how to get through the milkweeds’ deadly defense system but have become dependent upon them.

When a female monarch visually locates a possible milkweed plant, she investigates further by “tasting” the leaves with her feet. If she detects the telltale chemicals, she proceeds to lay eggs on the tender leaves or flower buds. These harbingers of life are tiny, football-shaped and cream-colored, and a female can deposit between 200-400 eggs

during her brief 2-3 week life.

Within 3-4 days an egg hatches into a caterpillar—often mistakenly referred to as a “worm.” This small crawler sports narrow multi-bands colored black, yellow and white. Additionally, each caterpillar brandishes a pair of thin, fleshy, black filaments at both its anterior and posterior end; these cannot sting but are thought to be sensory and possibly even protective by intimidating potential predators. The caterpillars are equipped with chewing mouthparts (they cannot bite us, however). After partially consuming their eggshells, the tiny caterpillars begin munching on the tender leaves and flower buds of their leafy banquet table. Monarch caterpillars are, for the most part, immune to milkweed toxins. Actually, the crawlers take advantage of the toxins by incorporating and storing them within their own body fluids and tissues. These sequestered chemicals are the basis for the monarch’s major defense against predators.



Larva: 11-15 days.

The brightly colored coat of each caterpillar advertises its hidden arsenal by warning: “I taste bad, leave me alone.” Vertebrates educate well, and the vile gift of the milkweeds has over time become one of the monarch’s hallmarks.

However, the accumulation of too much

toxin can have a negative effect upon caterpillar growth. To counteract this, caterpillars have developed a unique strategy: they often sever the petiole of the leaf on which they are feeding. As the leaf droops and “bleeds” its milky poison-laced latex the toxic content of the leaf is reduced, and the caterpillars are able to feed in relative safety. For butterfly enthusiasts, sagging leaves on a milkweed are a telltale sign of the presence of monarch caterpillars. Caterpillars are little more than eating machines. They grow quickly during their 11-15 day life span (mature caterpillars max out at approximately 1.5 to 2.0 inches in length). (NOTE: The fully grown caterpillar of the black swallowtail butterfly, *Papilio polyxenes*, looks similar to the monarch caterpillar; however, black swallowtails utilize plants within the parsley-carrot family as their hosts and never milkweed.) To accommodate this increase in size, each caterpillar sheds its skin (molts) 4 times producing 5 growth stages or instars. To reduce detection by invertebrate predators and to avoid overheating, caterpillars often feed during the night, resting during much of the day in quiet, shaded locations at the base of their milkweed hosts or other nearby objects.

When fully grown, a caterpillar ceases to graze. It abandons its host in search of a shaded, relatively undisturbed site that can provide protection from direct sunlight and predators. The wayward crawler then settles. After a day or so, the caterpillar begins to weave a small silken mat to which it attaches

THE MONARCH BUTTERFLY



Pre-pupa: 1-2 days.

its hind portion. The caterpillar suspends itself, assuming a J-shape. Inside, all larval tissues and organs are dissolved, reorganized and reassembled. After another day or so, the skin splits, peels back, and falls away as a crumpled cast, leaving behind a globular-like mass called the chrysalis. (This process of transformation is called pupation. Butterfly caterpillars have a "naked pupa." On the other hand, the caterpillars of moths—and some skippers—spin a silken cocoon to enclose their pupal stage.) The monarch has one of the loveliest chrysalides of any North American butterfly. Jade green in color, studded with several buttons that bear an uncanny resemblance to gold, and a single gold and black ring near the base, the chrysalis epitomizes the word's original Greek meaning: "gold box." The chrysalis hangs motionless, a bit of dew-speckled leaf as it were, but in reality a cleverly concocted camouflage designed by Nature to foil potential predators. While the pupa is to the outside world a "resting stage," internally there is a whirlwind of activity. Old genes are turned off. Latent genes are activated. After approximately 5-7 days the results of all this reshuffling become obvious. The green color switches to orange and black as the wings of the developing butterfly near completion, revealing themselves through the thin, transparent membrane of the chrysalis. Finally, after another day or so, and usually within the wee hours of the morning, the chrysalid membrane cracks. A new life form slides out, head first, and

clings with tiny feet to its former shroud, now nothing more than a cellophane-like wisp. Metamorphosis has worked its magic!

At first the adult bears little resemblance to a typical butterfly: the abdomen is swollen and the wings are diminutive and crinkled. Within seconds, the misshapen emergent begins to pump body fluids and air into its hollow wing veins. Aided by gravity, the wings rapidly unfurl and expand. Now there is no mistaking the adult monarch. But because the wings remain soft for another 2-3 hours the butterfly remains in its inverted posture, occasionally uncoiling its siphon-like tongue and fanning its oversized wings. Gradually, wing veins seal and wing membranes stiffen. The abdomen ejects a red-colored fluid—a sort of afterbirth. The adult is



Early pupa: 1 day

now fully primed. If temperatures are above 55 degrees F. (remember, butterflies and other insects are cold-blooded, that is, their body temperature is not held constant but depends upon ambient conditions), the butterfly launches and begins its new life as a gossamer creature of the heavens—the proverbial Phoenix reborn.

As with their larval stages, adult monarchs contain phytotoxins from milkweed plants. But that's not all. In addition to the milkweed toxins, the butterflies possess other bitter tasting and lethal compounds that they secure when feeding on flower nectars—particularly from plants within the aster family (Asteraceae). Labeled as pyrrolizidine alkaloids (PAs), these phytotoxins are remark-



Pupa: 6-10 days.

ably potent and contribute substantially to the chemical arsenal of adult monarchs. The striking wing coloration (described by a butterfly enthusiast as "wings of flame") advertises the butterflies' distastefulness and potential lethality. The similarly colored butterfly, viceroy (*Basilarchia archippus*), does not possess toxins. By resembling the monarch, the viceroy is able to confuse potential predators and therefore escape attack. This biological masquerade between the monarch and viceroy is termed Batesian mimicry and is often cited in textbooks.

The life span of an adult monarch (and most other butterflies) is a mere 2-3 weeks with females usually living slightly longer



Late pupa: 1 day.

THE MONARCH BUTTERFLY



Monarch emerges from chrysalis.

than males. The circle of life is closed when adults mate and females lay their eggs. Throughout the summer months, as many as 3, 4 or even 5 generations rapidly succeed one another. Autumn-emergent monarchs, however, usually have extended life spans—up to 5-7 months. Unlike most butterflies that mate quickly after emerging, these late season “Methuselahs” continue to produce small amounts of juvenile hormones (chemicals that are responsible for maintaining larval stages) that halt sexual development. Autumn virgins convert much of their sugar intake into high-octane fat reserves to use as energy for flying southward and westward as



The viceroy butterfly is a monarch look-alike. Viceroy is darker in color with a thin black band on the hindwings. The host plant for the viceroy is willow.

fall migrants. The following spring, the butterflies become sexually mature, reverse their previous treks, and return to northern milkweed meadows to lay their first eggs. NOTE: No single monarch lives long enough to witness its first birthday. (See

“Migration and Louisiana Connection,” page 23 and “Mexico’s Winter Hideaways,” page 30.)



The caterpillar of the black swallowtail butterfly is often confused with that of the monarch. However, black swallowtail caterpillars feed only on plants within the parsley-carrot family.

THE MONARCH BUTTERFLY

Migration and the Louisiana Connection

Within temperate North America, each autumn (September and October) hundreds



The author on a chenier in Cameron Parish, LA collecting monarchs to tag during his ongoing research. The cheniers (ancient beach ridges) of Cameron and Vermillion Parishes are excellent staging grounds for monarchs during spring and fall migrations.

of fresh, bright orange and black monarch butterflies begin moving southward (throughout eastern United States and Canada) and westward (throughout western United States and Canada). The spectacle is acknowledged as the world's greatest modern annual animal migration (only the historic passenger pigeon, with a population estimated at 2 billion, exceeded the monarch in number of individuals migrating). These featherweight travelers fuel their epic journeys by converting sugars from nectar into high-octane fat reserves (as much as 73 percent of their dry weight), and by suspending energy-sapping activities such as mating and laying eggs regulated through hormonal changes. Although scientists don't fully understand what signals the change in behavior or what orients the insects, shortening periods of daylight, declining air temperatures, polarized light, and the earth's magnetic fields all seem to be involved. In addition, monarchs seem to have some still-to-be-discovered system whereby individual butterflies are able to recognize the presence of each other;

migrants tend to move in massive groups (sometimes described as "clouds of butterflies") or at least, within close proximity to one another. The following spring, many of these same monarchs—now worn and tattered—return northward, mate, and begin

to lay eggs and then die, too. By autumn—and perhaps 3-5 life cycles removed from the first—the fresh butterflies instinctively turn toward the very lands that welcomed their forbearers the previous year.

But why an international odyssey?



For seven years the author participated in a tagging program for monarchs. Using an offshore UNOCAL gas production platform (WC-280) south of Cameron, LA, Dr. Ross tagged hundreds of monarchs during his documentation of what he has christened the "Monarch's Trans-Gulf Express."

laying eggs on their milkweed host plants, thus initiating the new-year's first generation. The adults soon die, but their caterpillars develop, metamorphose to become a second generation that continues northward

The monarch, one of many butterflies called "milkweed butterflies," are all truly tropical, that is, they lack the ability to hibernate through the winter in any stage of their development (see "Circle of Life," page



During their annual migrations, monarchs often rest at night on the leaves and branches of trees and Spanish moss. Before taking off the following morning, they expose their wings to the warmth of the new sun.



CH BUTTERFLY



THE MONARCH BUTTERFLY



A newly tagged monarch.

20 and "Gardening for Monarchs," page 17). Most temperate and polar butterfly species pass the winter in a prolonged, inactive mode as an adult or in one of the immature stages such as egg, caterpillar, or chrysalis. By exploiting the abundant milkweed plants that grow commonly throughout temperate United States and Canada, the monarch is the most northern representative of its kind. However, although the temperate regions sport a plethora of milkweeds, the latitudes pose a major flaw: a prolonged winter season when temperatures plummet to levels that are lethal to monarchs and temporarily destructive to their caterpillar food plants, milkweeds. To resolve this environmental conundrum, the monarch has devised a unique life strategy—migration. Defined as a periodic movement out of one area to another with a subsequent return, the monarch is the only species of butterfly in North America that engages in a true migration. Several other species (see "Other Wanderers," page 40) engage in more or less one-way movements that are

more properly termed emigration. Before killing frosts arrive each autumn, monarchs in temperate North America begin dispersing from their breeding grounds. The butterflies usually travel in massive waves. The migrants descend frequently to drink sugary

nectar—butterfly ambrosia—from the autumnal floral displays. Refreshed, they take off again. (Monarchs have been recorded by hang gliders at an altitude as high as 11,000 feet. Additionally, individual butterflies usually fly 11 to 12 hours and cover 200-400 miles each day—the longest verified distance is 265 miles.)

For many years, scientists could only guess at the migration routes utilized by monarchs. For instance, residents of the Midwest and central Texas often reported large numbers of the butterflies each autumn moving southward during the day and descending into trees at dusk to pass the night. Such sightings seemed to substantiate the existence of a land-based migratory route into Mexico. In addition, residents throughout the western states noted that monarchs habitually flew toward the Pacific coast each fall. Indeed, many aggregations of monarchs were identified within the coastal communities of California. Then in 1952, Fred A. Urquhart, a zoologist based



The butterflies often rest through the night clinging to pieces of machinery, ropes and railings.



When resting, monarchs orient to prevailing wind direction.

in Toronto, Canada, and long-time monarch researcher, perfected a system of tagging butterflies to accurately track their movements. Dr. Urquhart designed thumb-nail-sized paper labels, each with a specific number and an address for reporting, that could be glued to one of the forewings of a captured butterfly. These wing tags (also called alar tags) apparently do little damage and do not interfere with the butterflies' aerodynamics, even though an individual monarch weighs a mere 400-500 milligrams

THE MONARCH BUTTERFLY



During late October and early April, hundreds or even thousands of monarchs often descend to rest on man-made structures fanning out into the Gulf of Mexico from Louisiana's coastline. (3 photos this page)

– the weight of a U.S. dollar bill cut in half – and has a wingspan of only 4 inches. Since 1952, many citizens and organizations have engaged in capture-recapture programs involving thousands of monarchs. Tagging experiments have proven that individual butterflies from the East have traveled distances greater than 2,000 miles, measured as a straight line from point of origin to point of collection. To date, the maximum distance traveled by a single monarch is 2,595 miles, tagged in New Brunswick, Canada on August 19, 2000, and recovered in the Cerro Pelon colony in Michoacan on March 9, 2001. International tagging experiments have demonstrated another interesting but unexplained fact: most migrating monarchs

are male. However, the ratio between male and female in the Mexican winter refuges is about equal.

Until 1991, scientists had traditionally come to understand that the monarch travels along two distinct migration routes: toward the Pacific coast and toward the Gulf of Mexico. Monarchs west of the Rocky Mountains and the Continental Divide fly westward toward the Pacific coast. There within a span of about 650 miles between northern Mendocino County, California and Ensenada, on the Baja Peninsula, Mexico they concentrate throughout the winter in approximately 129 colonies within coastal groves of cypress, pine, redwood, and within the last few decades, the introduced eucalyptus or gum trees. (The largest clusters are found in Santa Cruz and Santa Barbara Counties, California.) The earliest account describing winter masses of monarchs was published by an anonymous author in the *Monterey Weekly Herald* on May 30, 1874. The account describes clusters of monarchs during a walk in the autumn of 1873 to the Point of Pines, near the present-day location of Pacific Grove: "On my ramble I passed through the favorite haunt of butterflies, a large, brown species, spotted with black, the only kind known to perch in flocks." However, a booklet titled *The Butterfly Trees*, published by Lucia Shepherdson in 1914 states that the butterflies were first noticed by locals about 1864. Within the western refuges,

numbers of individual butterflies range between 1-5 million and constitute approximately 5 percent of the world's monarchs (numbers within individual colonies range from a few dozen to a maximum of 171,000). The community of Pacific Grove, Monterey County, California is known as "Butterfly Town, U.S.A." Each October, the picturesque community is the setting for a festival celebrating the return of the monarchs. Although several of the winter roosts are within state parks and other preserves, many are on private lands, subject to future land development (see "Conservation," page 33).

East of the Rockies, monarchs numbering in the hundreds of millions fly in a south and southwesterly direction toward the Gulf of Mexico or the mainland of Mexico. Some local populations of monarchs in southern Florida, southern Louisiana, and southern Texas remain in place throughout the winter. But most of those monarchs that move through the American heartland usually continue southward through Texas, cross the Mexican border, ascend the Sierra Madre de Oriente and the Central Plateau, and eventually wind up



THE MONARCH BUTTERFLY

in the high coniferous forests of the Transverse Neovolcanic Belt of central Mexico, principally within the states of Mexico and Michoacan. There they spend the winter months in a state of reduced activity awaiting the return of the warmth of spring (see "Mexico's Winter Hideaways," page 30). Although the monarch population was traditionally believed to be distinctly split into subpopulations between the East and the West, noted lepidopterist Robert Michael Pyle recently documented that some monarchs west of the Rocky Mountains unexpectedly fly southeasterly and cross into Mexico. His conclusion: "the eastern and western populations are not after all monolithic quantities unto themselves that never shall meet."

Trans-Gulf Express

Between 1991 and 1994, I was able to document the existence of another pathway utilized by eastern monarchs: a flyway across the Gulf of Mexico between Louisiana and Mexico. With cooperation from UNOCAL Corporation and Petroleum Helicopters, Inc., I collected substantial data indicating that myriads of monarchs each October utilize Louisiana's cheniers—ancient dry beach ridges dominated by oak trees and unique to the state's southwest Cameron and Vermilion Parishes—as a staging ground. Then, shortly after the passage of a strong cold front from the north, these monarchs strike out in a south-southwesterly direction across the open waters of the northern Gulf. Most flights take place during daylight hours, but butterflies caught over open

water after dark frequently continue to fly throughout the night. If the butterflies encounter man-made structures such as oil/gas drilling rigs or production platforms, the insects descend to rest. After several hours or by dawn of the next day, the butterflies take off to continue their journey toward Mexico. The following March, large numbers of monarchs again descend on these same man-made structures in the Gulf as they backtrack northeasterly toward the Louisiana coastline.

Although this information has proven to be a showcase phenomenon in itself, analysis of the pinpoint data reveals an even more noteworthy discovery: the existence of a consistent and unmistakable over-water flyway approximately 90 to 100 miles wide and 400 miles long extending from the southwest coast of Louisiana to the northeast coast of Tamaulipas, Mexico. I theorize that this "highway in the sky"—now christened the "Monarch Trans-Gulf Express"—allows the migrating insects to substantially shorten, both in time and mileage, their fall and spring journeys.

Just how airborne monarchs navigate the Gulf and locate the offshore structures remains a mystery. Empirical data, however, suggest that magnetism and color play key roles. Past research has proven that the bodies of monarchs contain small quantities of magnetite, an oxide of iron that acts as a biosynthetic compass enabling the insects to orient to Earth's natural geomagnetism. Since these facilities generate substantial electro-magnetic fields, I theorize that the

insects are fooled by false readings from their microscopic internal compasses. Furthermore, research by others has indicated that monarchs are extremely sensitive to color, especially yellow (90 percent of my observations involve man-made structures painted bright yellow).

But how might this work?

Structures. Louisiana boasts over 3,400 man-made oil and gas structures that fan out nearly 170 miles into the Gulf. All generate powerful electro-magnetic fields because of their massive iron construction, as well as telecommunication and electrical generating equipment. These magnetic fields can be demonstrated by a simple compass.

Butterflies. Many newly emerged monarchs heading southward from more northern locations arrive at the southwest Louisiana coastline between late September and early October. Within the extensive marshy labyrinth, which is hostile to most butterflies, the monarchs find haven on the elevated and tree-covered land of the region's distinctive cheniers. There the butterflies interrupt their travel. During the day they feed on the luxuriant displays of wildflowers that thrive in the well-drained soils. At night, the insects take refuge in the boughs of the numerous trees. After days (sometimes weeks) of feeding, the butterflies gain weight due to an increase in their fat reserves. Now, they are primed for continuing their southward journey. (An excellent venue to observe monarchs is Pevoto Woods Sanctuaries near Johnson Bayou, Cameron Parish, and administered by Baton Rouge Audubon Society.)

Weather. In autumn, Louisiana experiences the passage of a southward moving cold front roughly every 10-14 days. Following frontal passage, winds prevail from the north, skies are clear, relative humidity low, and temperatures mild. Many monarchs that have gathered on the cheniers are now blown offshore by the prevailing northerly winds. Others take advantage of the tail winds to launch on their own in a south-southwesterly direction out to sea. However, once over open water, the insects' sensitive internal bio-compasses become confused by bogus readings generated by the numerous offshore structures. As a result of both the tail winds and false magnetic readings, the butterflies are drawn farther and farther into the open Gulf. Soon



A tattered male monarch during its spring migration from Mexico nectars on a thistle near Cameron, LA.

THE MONARCH BUTTERFLY

the butterflies become influenced by another factor: the colorful (often yellow) protuberances above the deep blue water are mistaken for patches of yellow wildflowers, a potential source for nectar and energy—"pit stops." The butterflies quickly descend to refuel. Of course, they find nothing to nourish them. However, once aboard, the confused butterflies take advantage of the opportunity to rest, often through the night, on the dangling ropes, metal gratings and railings, and heavy machinery. Eventually, the migratory imperative reasserts itself. The wayward butterflies abandon their perches to continue flying south to southwesterly over the Gulf. Beyond the range and influence of the offshore structures the insects' compasses are reset to a more westerly direction by the strong magnetic pull of the nearest landmass—Mexico. After another 10-13 hours of non-stop flight, they hit landfall where food and water are available. After replenishing with nectar and water, they continue toward their goal, the volcanic highlands of central Mexico.

In March and April, the trend is reversed. Although most of the northward bound eastern monarchs again travel a land route back to the United States and Canada, some fly eastward toward the Mexican coastline. There they launch out to sea where after several hours of non-stop flight they encounter man-made structures generating false electromagnetic fields that act as attractors.

As with fall migration, many spring monarchs seize the opportunity to alight on the platforms for rest.

Now the man-made structures can be even more critical to the butterflies than during fall. In Louisiana, spring often witnesses the passage of cold fronts. While northerly winds act as tailwinds assisting migrants moving southward in the fall, such winds act as negative headwinds for spring migrants tracking northward. To intensify matters, spring monarchs are severely depleted of fat reserves, and hence energy (measurements of individual butterflies in March indicate that fat accounts for only 37 percent of dry weight—down from 73 percent in November). This coupling of strong

headwinds and low energy reserves sets up a condition for disaster for returning migrants. In fact, during several spring seasons, I personally have witnessed large numbers of dead monarchs washed ashore on chenier beaches following frontal passages.



Monarch rests on UNOCAL WC-280, a gas production platform in the Gulf of Mexico.

Offshore structures can spell life or death for butterfly migrants during stressful weather—in much the same way research has shown the benefits of these open-water structures to migrating Neotropical birds. Since offshore structures gradually increase in number as spring monarchs move farther north, one might say that the protuberances serve as "flight guides." By playing a sort of "hopscotch" across the Gulf, the weary travelers eventually make landfall in southwest Louisiana. Upon reaching the cheniers with their sanctuary of high ground, trees and wildflowers, the aged, tired and emaciated

butterflies rest, feed and mate. There, too, females lay their first eggs on the area's abundant antelope-horn or spider milkweed (*Asclepias viridis*) to jumpstart the year's first generation of new monarchs. While many butterflies die within a few days, others move farther north before laying their eggs. But they soon die, too. The adults of each new generation continue to move northward so that by the next autumn, three to five short-lived generations have succeeded one another. The final brood then turns southward to begin the same epic journey undertaken by their deceased relatives the previous year.

To be sure, the final story of the Monarch Trans-Gulf Express has yet to be told. Although I am tantalized by the possibility that offshore energy development may have inadvertently sparked the evolution of the flyway, I find that concept difficult to accept, acknowledging that oil exploration in the Gulf of Mexico dates back only 50 years or so. I think the probable truth is that monarchs and Neotropical birds are simply exploiting man and our activities in the Gulf. I am convinced, though, that the role of the offshore structures should not be taken lightly. The rest-stops during both fall and spring make the Gulf crossing less perilous and more rapid to any weary flyer. Furthermore, Louisiana's coastal cheniers present fall migrants with abundant wildflowers for feeding and spring migrants with host plants for initiating a new (and perhaps even "extra") generation in

a location outside of Mexico in advance of their land-based cousins. These advantages certainly enhance survival of individual butterflies, increases in population size, and in time, survival potential for the species as a whole. The Monarch Trans-Gulf Express, which may have been initiated in some long-forgotten time and by only a few aberrant wanderers, is now probably being continually reinforced and expanded because of the presence of the petroleum industry in the Gulf of Mexico.

Time will tell.

THE MONARCH BUTTERFLY

Mexico's Winter Hideaways

We now understand that the vast majority of monarchs from eastern United States and Canada move southward each fall and

on page 23). Recent reports indicate that some western monarchs also wind up in central Mexico. Although scientists had sus-

bivouacs remained elusive. Though clues within the region abounded, they remained unrecognized because of nuances in language. You see, several rivers, mountain peaks and other geographic landmarks within the eastern mountains of the state of Michoacan include the words "Las Palomas" in their designation. Now, while the words translate literally from the Spanish as "the doves," in the region's local culture of Tarascan and mestizo, the words refer specifically to "monarch butterflies." In fact, for untold centuries the local *campesinos* (country folk) have viewed the butterflies as good omens since the insects arrive around November 1, the traditional celebration of the Day of the Dead (in Tarascan and mestizo myth, the butterflies represent the souls of the departed, especially children). Unfortunately, outsiders unfamiliar with the idiomatic meaning overlooked the significance of the place names. And so, due to a bit of cultural incompatibility, the monarch trove remained in limbo to the outside world.

However, on January 9, 1975, that changed. The "discovery," or more properly, revelation, is formally credited to the American research assistant Kenneth C. Brugger and his Mexican wife Cathy—volunteers working under the direction of Dr. Fred A. Urquhart, the same Canadian zoologist who perfected wing tagging for monarchs. The news quickly spread, making the front-cover of *National Geographic* magazine in August 1976.

Specifically, the butterflies home in on the Transverse Neovolcanic Belt, a mineral-rich mountain range composed of tall, inactive volcanoes stretching across the southern end of the central Mexican plateau within the neighboring states of Mexico and Michoacan. Between 200 to 300 million monarchs congregate in a dozen or so isolated colonies, chiefly in Michoacan, at an elevation of 9,000 to 12,000 feet; each colony occupies an area ranging from one-tenth of an acre to 10 acres, ranging within approximately 2,400 square miles. The butterflies converge—in densities of up to 5 million per acre—on the trunks, branches, and needle-leaves of the most common tree species found at those alpine altitudes, the oyamel



When the sunlight penetrates the cool fir forests, the sleeping monarchs awake and spread their orange and black wings to warm before taking flight. Often monarchs are so numerous that they cause branches and limbs of the fir trees to snap.

end up in central Mexico by November (see "Migration and the Louisiana Connection"

pected that eastern monarchs migrated to central Mexico for a long time, the winter

THE MONARCH BUTTERFLY

fir (*Abies religiosa*). The aggregations represent approximately 95 percent of all the monarchs within the North American mainland.

But why central Mexico? Why not Mexico's Pacific, Gulf, or Caribbean rivieras?

The answer lies with the species' tropical pedigree; in other words, the inability of individual butterflies to withstand extended

much and burning up fat reserves necessary for their spring return to the north).

The Transverse Neovolcanic Belt of central Mexico seems to meet all the criteria necessary for monarchs to survive until their return to their breeding grounds the following spring: the tropical geography (latitude is south of the Tropic of Cancer) insures a relatively stable climate (this provides monarchs with long-term accessibility to habitat) and a distinct "winter" dry season (the lack of rain reduces wing and body wear); the high elevations provide dependable cool, rarely sub-freezing, temperatures (these slow the butterflies' metabolism) and generate frequent low clouds and fogs (these slow dehydration in the butterflies); the dense forests and their underbrush reduce air movements and raise air humidity through leaf transpiration (these slow dehydration in the butterflies); the oyamel tree trunks, limbs, and needle-leaves provide the butterflies with numerous surfaces that are easy to grasp for extended periods of rest; finally, wildflowers and nearby creeks and seeps provide moisture for those butterflies in need of occasional sustenance. All in all, the oyamel forests of the Transverse Neovolcanic Belt are the ideal winter retreat, and monarchs have been exploiting them for untold millennia.

A visit to an overwintering colony can be a magical experience. Most visitors arrive in Angangueo (state of Michoacan) after a four to five hour drive (approximately 100 miles) west from Mexico City. Angangueo is a small, colonial mining town perched precariously on the sides of precipitous slopes dropping to a clear, rushing stream. The narrow, cobblestone streets and flower filled gardens and window boxes provide "Kodak Moments" for even the camera shy. From this base, a narrow winding road (first asphalt, then dirt) takes the visitor to either of the two sites open to tourists—El Rosario (Cerro El Campanario) and Sierra Chincua. El Rosario is the most accessible. Entrepreneurial residents in Angangueo can be engaged to furnish an assortment of vehicles for the 10-mile, hour-long transport up the bone-cracking road that leads to El Rosario. Transport to Sierra Chincua takes a bit longer.

El Rosario has two recently constructed parking lots. From there, the pilgrim snakes along a steep dirt and rock trail, often engineered with rope railings and wooden stair-like risers, for about another mile or so. A

morning visit is best. Then the air within the colony is cold, foggy, motionless, and silent. The high mountain slopes are precipitous and covered in majestic, dark green "Christmas trees"—the famous oyamel firs whose sap furnished the ancient Toltec with holy incense. One's initial gaze indicates that many of the shaded trunks, limbs, and leaves are covered in grayish inanimate slivers wedged together. However, closer inspection reveals that the encrustations are actually countless numbers of inactive butterflies shingled, one upon another, wings closed and vertical. Many of the butterflies seem organized into distinct clusters—globular masses so thick and heavy that tree boughs sag to the brink of breaking. As the morning progresses, the fog begins to lift



Tree trunks can be completely encrusted with sleeping monarchs. The undersides of the wings of monarchs are grayish and give the butterflies a ghost-like appearance.

subfreezing temperatures. The body fluids of monarchs do contain some biochemicals (glycoproteins) that act as a type of "antifreeze," enabling the butterflies to tolerate occasional temperatures that dip below freezing, but only for brief periods. In order for the butterflies to make it through the winter, preserving their genes from one year to another, the tropical-derived species must relocate during the northern winter to an ecosystem that is not too cold (preventing them from freezing in numbers greater than their population can withstand) and not too warm (preventing them from flying too



A Monarch Christmas!

allowing shafts of sunlight from the icy blue sky to penetrate the forest. Temperatures soon climb to near 50 degrees F. Now, the magic really begins.

Those butterflies bathed in sunlight suddenly unfurl their wings, revealing the characteristic, brilliant orange and black colors of the living monarch. Wings tremble and vibrate to generate internal warmth. The once dark, brooding firs unfurl a mantle of orange lace—twinkling like stars suspended

THE MONARCH BUTTERFLY

in a crisp, wintry heaven. When temperatures reach 55 to 61 degrees F and the shafts of sunlight broaden, the butterflies—as if on cue—launch. The air fills with myriads of orange gossamer wings, wheeling and reeling

same gradients northward. Also, the international voyagers probably take advantage of prominent geographical features such as large bodies of water, mountain ranges, and perhaps even our highways, to fine-tune

One program that has received widespread endorsement focuses on ecotourism. At present, two of the colonies, El Rosario and Sierra Chincua, are regularly visited by thousands of national and international pilgrims each year. In the winter season of 1985-1986, approximately 50,000 persons were recorded. This statistic has continued to swell: in the 1999-2000 season 200,000 individuals converged on the two public reserves, with a whopping 10,000 to the El Rosario colony alone during a single weekend. A sizable tourist-friendly center has developed around the El Rosario colony where a nominal fee of \$2.00 (US) is charged. Visitors can purchase butterfly memorabilia, secure hot food and drink, and negotiate for expert guides. In 2002 a small modern museum will open to facilitate education. At the Sierra Chincua parking site, a cleared meadow, smiling locals are eager to supply obedient horses and knowledgeable guides at nominal prices for those visitors unwilling to walk the nearly two-mile, steep, rocky trail to the colony. This ecotourism provides substantial income for local residents that heretofore have relied on the forests for lumber for construction and fuel for cooking and heating homes in the cool mountain realm.



Hiking at high, cool elevations is often tedious. Locals are eager to rent small horses for the 1-2 mile transport to the butterfly colonies.

about, spinning and floating and gliding. A distinct but faint rustle can be heard and golden flecks rain down. After a few moments you realize that the sound and “fairy dust” are the results of an incalculable number of wing membranes, veins and scales rubbing one upon another. As one of nature’s most spellbinding tableaux continues to unfold, the scene takes on a surreal presence. Youngsters become giddy. Adults stand transfixed. Breathing slows, eyes glaze over and the mind transcends the body.

How the autumn-emerged butterflies actually locate these mountain sanctuaries—and sometimes the exact trees used by their ancestors in year’s past—is still unknown. Remember, there are no survivors from prior years, no butterfly “guides” to lead them; individuals that arrive each fall are the progeny 3-5 generations removed from individuals of the previous year! To be sure, many factors are involved. For instance, a common theory is that decreasing amounts of daylight in the fall trigger the butterflies’ internal compasses to respond to the position of the sun and to geomagnetic gradients by moving southward. In the spring, each compass is reset to follow these

their orientation. Then, as the butterflies approach Mexico, the strong magnetic field (one of the highest in the western hemisphere) generated by the rich ore content of the Transverse Neovolcanic Belt acts as a strong beacon. Final orientation is probably controlled once again by local topography as well as the recognition of possible scents (from scales? secretions? body fluids?) left behind from previous butterflies (to date no such chemicals have been identified on the trees, however). Also, the current season’s ambient temperatures and availability of shade cover probably influence final touchdown.

Today, the region of Mexico hosting overwintering monarchs has been declared an International Biosphere Reserve—an area designated as having unparalleled biological significance (see “Conservation,” page 33). MONARCA, A.C., a Mexican based, private organization legally constituted in 1980, acts as a watch-dog and actively searches for practical solutions to conservation problems based on Mexican realities: Mexico’s political situation, existing economic constraints, and the cultural background of those communities involved.

If you wish to visit the monarchs in their overwintering sites, join Dr. Gary Noel Ross (Professor Emeritus, Director of Butterfly Festivals, North American Butterfly Association) and Dr. Thomas C. Emmel (Professor and Director, Division of Lepidoptera Research, University of Florida, Gainesville) on an ecotour this winter. The specifics are below:

January 18-22, 2002, price \$750.00/person—all inclusive for land travel from Mexico City.

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THE MONARCH BUTTERFLY

Conservation

The monarch butterfly is now widely distributed throughout the world (see "Monarch: What's in a Name," page 13). Consequently, the species is in no imminent danger of becoming extinct. In fact, in 1993



Although the monarchs' winter colonies are officially protected by Mexican law, deforestation continues immediately adjacent to the reserves—and often illegally in the reserves.

Dr. Richard I. Vane-Wright introduced the "Columbus Hypothesis" that suggests that the arrival of European colonists and the subsequent destruction and fragmentation of the eastern forests of the United States has encouraged the spread of milkweed plants—and monarch butterflies. (Dr. Vane-Wright suggests that the peopling of the United States and Canada is also responsible for the major 19th century range expansion of the monarch into the Atlantic and Pacific regions.) The population size of the monarch within North America is most likely greater now than at any time in recorded history.

While the species may not be threatened, the migration behavior is another story. And because of the fragile ecology of the overwintering sites, the monarchs are being chal-

lenged by a multitude of problems, including biology, culture and politics.

Although the monarch is our de facto national insect, there is no federal law providing specific protection. Even in California, where western monarchs numbering up to 5 million reside for the winter in scattered coastal forests, the butterflies are not singled out for protection. However, they can be indirectly conserved under state and local statutes dealing with natural resources and the environment. For example, the California Department of Parks and Recreation as well as several local communities manage a number of reserves. The community of Pacific Grove ("Butterfly Town, U.S.A.") even has a municipal code that protects monarchs from harm.

For the most part, citizens in California respect the monarch. Lately, however, with the increasing interest of butterflies for the release at ceremonies, unscrupulous entrepreneurs have begun to exploit relatively remote colonies. This has the potential to escalate and is a growing concern.

The greatest threat to the winter colonies of the western monarch is the potential development of sites that are in private own-

ership, and therefore, unprotected. Within the last few decades, at least 21 overwintering colonies have been destroyed while another 7 have been severely damaged. Ideal for monarchs, the sites are also prime land for motels, hotels and resort complexes catering to those sufficiently wealthy to afford coastal real estate and who demand clear, picturesque views of the Pacific Ocean. There is also an ironic twist: the eucalyptus (gum) trees, naturalized exotics imported from Australia during the early part of the twentieth century to reforest the coast line, have become one of the favored roost trees for monarchs. Recently, real estate developers with support from some environmentalists have advocated the removal of the trees for aesthetic reasons and for a return to native flora. In spite of it all, however, the long-term prognosis for the monarch in the United States has gone from uncertainty to one of guarded optimism.

For Mexico, the situation is more tenuous (See "Mexico's Winter Hideaways," page 30). The relatively small area within central Mexico where hundreds of millions of monarchs converge each year has been declared an International Biosphere Reserve. Also,



The majority of Mexico's rare high altitude fir forests have been severely logged. Today the oyamel fir forests exist only as a patchwork amidst agricultural fields. The colonial town of Angangueo (Michoacan) is the starting point for most tourists wishing to see the spectacular aggregations of monarchs.

THE MONARCH BUTTERFLY

the butterflies' plight has spawned no less than three international conferences in



Locals who just a few years ago were logging the fir forests, are now frequently employed by the Mexican government to serve as guides and rangers within the butterfly reserves.

Mexico and the United States, has engaged the energies of the World Wildlife Fund, Monarca, A.C. and the Xerces Society, has won the support of three Mexican presidents, has inspired numerous initiatives at every level of the Mexican, Canadian and U.S. governments, and has captured the attention of international film makers. Yet in spite of all this limelight, human exploitation in the form of random and commercial logging—both legal and illegal—continues in and around the Mexican reserves. Because the monarch aggregations occupy a habitat that literally pushes the butterflies' physiological tolerance to the edge, even minor changes pose the potential for tragedy. In fact, we now understand that the forested habitat not only provides adequate sanctuary but a buffer to occasional changes in temperature and humidity levels. Opening the forest is like cutting a hole in a blanket. The end result is an increase in extreme temperatures. For example, the removal of trees within the colonies and on the periphery permits cold temperatures during extra cool

periods and warm temperatures during extra warm periods to penetrate the sanctuaries more deeply. Consequently, the butterflies are forced to adjust their perches to accommodate the changes. Today, barely more than half of the historic extent of high-mountain forest remains intact. Deforestation and burning of areas adjacent to the colonies (and often within the colonies themselves) is common, and substantial human settlements now exist right up to the periphery of the El Rosario colony in Mexico. With more and more forest being logged and more land being cultivated, the butterflies are running out of places

to move—literally. Internationally renowned monarch experts Drs. Lincoln P. Brower, William H. Calvert and Robert Michael Pyle predict that if human activities are not controlled, within 20 years the habitat will be unsuitable for monarchs and that within 50 years the fir forests will be no more. In essence, the monarch migration as we know it is an endangered phenomenon and is listed as such within the Red Data Book of the International Union for Conservation of Nature and Natural Resources (IUCN). (In 1976, the IUCN named the migratory North American monarch as the number one priority in world butterfly conservation,



Occasionally, winter storms penetrate the dense fir forests. When nighttime temperatures drop below freezing, as much as 10 percent of the butterflies may die and drop to the forest floor. If they cannot ascend the trees, they often fall victim to bird and mammal predators.

THE MONARCH BUTTERFLY

and the species continues to receive special attention.)

Research seems to substantiate the dire predictions. For instance, ongoing surveys within the Mexican reserves indicate that while the colonies vary in area from year to

tripled the size of existing reserves to 140,000 acres. More significant, perhaps, a \$5 million fund was established by the Packard Foundation for a new "Monarch Fund" to serve as seed money to compensate landowners for relinquishing their logging

plowed to accommodate pasturing and the planting of grain crops.

Today, new attitudes and incentives have been spawned. *Ejidatarios*, who in the past were motivated to log just to survive, are now motivated to build fences around the



Once common throughout the agricultural lands of the Midwest, milkweed plants (monarchs' hosts and a favorite nectar source for most butterfly species) are now confined chiefly to roadsides and fencerows. In this photo, at least 5 species of butterflies, eagerly nectar on common milkweed.

year, lately there has been a general trend downward. The following data indicate the actual surface acreage occupied by monarchs in 5 major colonies over the past 7 years: 19.3 acres (1994-1995), 30.9 acres (1995-1996), 44.1 acres (1996-1997), 7.9 acres (1997-1998), 12.9 acres (1998-1999), 14.7 acres (1999-2000), 5.7 acres (2000-2001). Using a figure of 5 million butterflies/acre, the total number of butterflies for the 5 largest colonies in 2000-2001 computes to under 30 million—an exponential decrease from the hundreds of millions reported during research immediately following discovery in 1975.

In response to these grave concerns, the Mexican government in November 2000

rights and performing conservation work, an unprecedented move in Mexico. (Experts estimate that \$30 million and more may eventually be needed.) Further, non-profit international groups are assisting surrounding communities in developing an alternative source of income, namely international ecotourism. For example, Monarca, A.C. (established in 1977) has worked very hard to include members of the agrarian collectives (*ejidos*), which legally own the land where monarchs aggregate, as part of their conservation efforts. Historically, the collective members (*ejidatarios*) cut wood for construction to fuel their cooking fires, and to heat their homes. Instead of being reforested, the cleared land was then burned and

preserves and to act as interpretive guides within the public reserves for wages sufficient enough to allow them to purchase more than they ever imagined possible. Additionally, Monarca, A.C. has encouraged locals to open food and trading concessions to attract the tourist market. (The organization has even assisted with the design of souvenirs.) The trickle of visitors that began in the 1980s swelled to 200,000 in 1999-2000, with a whopping 10,000 recorded for one busy weekend alone. Tourism has proven to be an important source of alternative income for local residents and an impetus for educating both locals and public visitors alike. The influx of money has not only assisted individuals but has also sparked a variety of

THE MONARCH BUTTERFLY

community-centered projects, such as construction of schools and the acquisition of badly needed amenities including electricity, clean drinking water and health-directed services.

But balancing tourism and ecology is a tough call. Locals clamor for more and more tourists. Conservationists warn that a

all, we know that monarchs are capable of waging chemical warfare because of toxins acquired from leaves of their milkweed hosts and flower nectars from various asters (see "Gardening for Monarchs," page 17 and "The Circle of Life," page 20). But here's the problem: Laboratory experiments indicate that the degree of protection conferred

contents, and then discard cuticles and wings—the primary depositories of the phytochemicals. Experiments indicate that during severe winters, predation (and freezing) have contributed to as much as 15-25 percent mortality within the butterfly colonies. Obviously, if the microclimate continues to change, yearly butterfly mortality will increase, severely compromising the potential for long-term viability of the sanctuaries.

On March 6, 2001, a report from the Reuters news agency surfaced indicating that a large number of monarchs (approximately 300,000) were found dead within two peripheral sanctuaries (San Andres and San Isidro Las Palomas, state of Michoacan). Dead butterflies were reported 7-8 inches deep on the forest floor. At first the evidence seemed to indict a local logging company and its use of an oil-based insecticide to deliberately kill the butterflies. The move was presumed to be a "pre-emptive strike" against the new conservation policies for the Monarch Sanctuaries announced in the fall of 2000 by the Mexican government and the World Wildlife Fund. However, the Mexican government repudiated the allegation, claiming instead that the deaths were due to exceptionally cold temperatures. Indeed, investigations by responsible scientists concluded that a combination of logging, wildfire three years prior, and recent spring ice storms were the real culprits. Señor Roberto Solis, director of the San Andres Monarch Reserve, estimated that the refuge supported a population of about 1 million butterflies after it was established in November 2000, out of a total of 28.3 million monarchs that hibernated in Michoacan during the winter of 2000-2001. Although the death of 300,000 butterflies is ghastly, scientists studying Mexican preserves indicate that the death of approximately one third of a colony can be considered within normal parameters for butterfly deaths from natural cause. However, these same scientists have suggested that the San Andres forest is now so altered that it is inadequate to sustain monarchs.

And now the monarchs' principal breeding grounds in America's heartland may be threatened by new developments in agriculture. Once scientists learned to alter genes of plants and animals, they turned their attention to bioengineering, that is, the production of "genetically modified organisms," GMOs for short. Of course, man has been



Each April the nationally renowned Baton Rouge Earth Day celebration kicks off with a parade featuring hundreds of costumed children and adults. Butterflies are often featured.

carnival setting could inflict irrevocable damage to the fragile environment; in effect, tourists could wind up "loving the monarchs to death." However, we know that in general butterflies are not affected by casual human movements and sounds. With an enforced protocol restraining tourists to trails and to "hands-off" encounters with the butterflies, high-volume visitations may not be that harmful. And so, while profit-driven tourism may not be the ideal permanent solution, most scientists agree that it has positive short-term benefits and should be encouraged. Meanwhile, tourism is buying time—time for governments, locals and experts to compromise on a comprehensive and permanent management plan.

Along with the direct negative effects caused by deforestation and human intrusion into the winter colonies has come another—and unpredicted—assault on the butterflies: increased predation. When the Mexican winter colonies experience super-cooling, monarchs are easily preyed upon by several avian and mammalian predators. At first glance this may seem confusing. After

upon an individual monarch varies according to both the specific milkweed species utilized by the larva and the specific nectar sources of the adult. In other words, some monarchs—adults and larvae—are more protected than others.

As one might expect, these variations in palatability have not gone unnoticed by predators. Two species of birds, black-backed orioles (*Icterus galbula abeillei*) and black-headed grosbeaks (*Pheucticus melanocephalus*) regularly visit the monarch colonies to dine on butterflies. However, the birds feed most heavily during unusually cold periods when the butterflies are unable to take flight and escape. To make matters worse, the birds' dining habits frequently dislodge butterflies, which fall to the forest floor. Because the butterflies are too cold to crawl back to their arboreal perches, they become easy targets for a ground-dwelling predator: a common, small white-footed mouse known as *Peromyscus melanotis*. Both the birds and mice are adept at feeding on monarchs. For instance, the predators are able to eviscerate the butterflies, feed on the

THE MONARCH BUTTERFLY

manipulating nature long before recorded history—for example, domesticating plants for crops and animals for livestock and pets. Although bioengineering is now big business and its benefits have been promulgated by the agricultural community, U.S. Department of Agriculture, the U.S. Environmental Protection Agency and elements of academia, disturbing new scientific evidence suggests that one of these transgenic, or “designer,” crops may be killing monarch caterpillars on their principal breeding grounds.

Case in point: Bt corn. For several decades, agronomists have understood that the soil bacterium named *Bacterium thuringiensis* (Bt) possesses a chemical that acts as a toxin to insects. The commercial implications were immediately obvious. Industrial and academic scientists mobilized and began experimenting. Within a short time they had selected numerous Bt strains that proved toxic to different groups of insects. The “kurstaki strain” targets caterpillars of butterflies and moths. After exposure, the larval gut breaks down, and the host then experiences a gooey, black death.

Laboratories began producing and marketing the bacteria for use as a “natural insecticide.” Sold as Dipel, the powder was used in home gardens to kill tomato hornworms and cabbage caterpillars. Commercially, Dipel was sprayed to kill gypsy moth caterpillars throughout eastern deciduous forests,

spruce budworms in northern boreal forest, and tussock moth caterpillars in western Douglas fir forests. More recently, this “sci-

leaves and seeds of the new creations contained the Bt toxin. Agriculturists now had caterpillar (“worm”) resistant crops. In the-



Butterfly gardens are now being constructed on school grounds. Teachers have learned that observing the butterfly life cycle first hand is educational and fun for all.

entific tinkering” was upped a notch when the actual gene that produces the toxin from the bacterium was identified, isolated and then spliced into the genetic code (DNA) of a number of commercial crops including potatoes, soybeans, cotton and corn. Viola! The “God-play” worked: the roots, stems,

ory, the genetically manipulated plants would allow farmers to produce bumper crops while at the same time reduce their dependency upon insecticides. Again in theory, farmers, agriculture industries and environmentalists alike would be pleased. The new technology was lauded as heroic, and by 1998, twenty-five percent (80 million acres) of the total U.S. corn crop was planted with Bt corn and the future looked great.

But such was not to be. In May 1999, Cornell University scientists published a report (“Transgenic Pollen Harms Monarch Larvae”) in the British journal *Nature* claiming that pollen from a popular genetically engineered corn hybrid killed monarch caterpillars in laboratory tests. Apparently, the Bt caterpillar toxin engineered into the corn also was incorporated into the plants’ grains of pollen. When this pollen is dispersed by the wind, it lands on other plants, including milkweed, the exclusive food of monarch larvae and frequently found growing in and around cornfields (at least 22 species of milkweed have been recorded from the Midwest). Spokesmen from the biotech industries that had produced the Bt corn readily admitted that they had not tested their new product on monarch caterpillars since monarchs never feed on corn. And



Visitors to the memorial butterfly conservatory featured at the “Haynesville Celebration of Butterflies” (premiered in August 1999 as the state’s first butterfly festival) were able to experience a close encounter with monarchs in all stages of development.

THE MONARCH BUTTERFLY

of course, no one suspected that the toxin would be incorporated into the corns' pollen. (As an aside, at this same time genetic engineers were beginning to develop GMOs that were resistant to herbicides. In theory, these new GMOs would allow farmers to produce seedlings unaffected by herbicides frequently used to clear fields of undesirable plants or "weeds." The result of the use of herbicide-resistant crops is that agricultural fields can now be sterile to all vegetation except the desired crop species. While this may be a blessing for the farmer, the depletion of suitable habitat for native flora, and its interdependent fauna, is potentially disastrous to the overall ecology and ecosystem. Over and over again, we have learned that "playing God" can have serious and unpredictable ramifications.)

The Cornell report caused a media explosion. Environmentalists and lepidopterists sounded alarms about GMOs in general. The powerful agricultural industry responded by belittling the initial report. The debates sparked new experimentation by all parties concerned—this time in the field—to secure additional toxicological data. By November 2000, the assessment was that there was no conclusive evidence to prove that Bt pollen poses a significant detriment to the monarch butterfly. In fact, the fall 2001 migration of monarchs throughout the entire East and Midwest witnessed the highest numbers of butterflies in recent memory, and Dr. Orley "Chip" Taylor of MONARCH WATCH predicts that the monarchs may have recovered significantly enough to boost their 2001-2002 overwintering numbers back up to 80-100 million. As experimentation continues, the fate of Bt corn, other GMOs and the monarch butterfly remains uncertain. Everyone agrees that the GMO issue is indeed very, very complex. A resolution will require considerable time, capital and multi-disciplinary collaboration. And perhaps just as important, attention must include research to determine if sub-lethal doses of pollen ingested by monarch larvae affect the reproductive and/or migratory capacities of adult butterflies. If so, Bt corn has the potential to deliver the coup de grace for the migration phenomenon.

The Bt corn saga has far wider implications, though. In the spring edition (2001) of *Orion* magazine ("The Monarch's Metaphor"), three experts addressed the complex issue of monarch conservation.

One of the authors, Peter Sauer, states that what is actually killing the monarch butterfly is the U.S. economy. His argument ends with the admonition: "...the citizens of wealthy nations have a responsibility to understand the degree to which their lifestyles and financial security are dependent upon and contribute to the devastation of tropical forests and the oppression of the

("birders") have been doing for more than a century. This "butterflying" is the nation's fastest growing nature-based outdoor activity. Today, NABA oversees more than 400 annual "Fourth of July Butterfly Counts." Established in 1975 by the Xerces Society, and patterned after the National Audubon Society's "Christmas Bird Counts," these community-based surveys assess and moni-



A group of children prepare to march in the second annual "Haynesville Celebration of Butterflies." Fun events such as this help the public develop an appreciation for butterflies—and life in general.

forests' peoples. Unchecked, the current regime of international trade has the capacity to unleash a biotic holocaust unparalleled in human history."

Aiding the monarch's biotic potential is another empowering force: an international "butterfly renaissance" galvanized by the butterfly's remarkable aesthetics and millennia of mythology (the ancient Greek word *psyche* referred to both butterfly and human soul). For instance, butterfly gardening, butterfly conservatories, butterfly festivals, and butterfly ecotours are now commonplace and sought out by thousands of average citizens each year. In addition, the North American Butterfly Association (NABA) constituted in 1993 to "promote public enjoyment and conservation of butterflies" is growing rapidly. Throughout the warm months, butterfly watchers ("butterflyers" for short) fan out around the country with close-focusing binoculars in hand to engage in recreational butterfly watching in much the same manner as bird watchers

for butterfly populations in designated locales throughout the United States, Canada and Mexico. Teachers are including units on butterflies in their schoolrooms. And living butterflies and butterfly images are appearing in motion pictures, television sit-coms and media commercials advertising everything from wine to toilet tissue, from bleach to Internet providers.

In conclusion, the monarch seems to have emerged from its "cocoon" as a wonder of creation that inspires our psyche and empowers our conscience to act. As such, the monarch is a living treasure and a living legend—a true American icon and the "poster child" for twenty-first century conservation. Perhaps the insect's status is best described by Dr. Robert Michael Pyle writing in *Orion* magazine when he proclaims that the monarch "serves as a powerful metaphor...that stands for every fine and delicate thing that philistine force and greed would gladly eradicate from this bruised and beautiful world."

THE MONARCH BUTTERFLY

Nuptial Monarchs Versus Butterfly Stewardship

Within the last few years, the practice of mass releasing commercially farmed live butterflies (usually monarchs and painted ladies) at festive occasions, such as weddings, has become a New Age fad-much like the release of white doves was trendy in the past. The butterflies are shipped in small envelopes by mail and usually distributed to guests at the event. Then, at the appropriate time, the envelopes are opened and the insects fly away. At first glance, this may seem like a novel and appropriate way of celebrating. After all, isn't the butterfly the undeniable symbol of transformation and new beginnings? But this "magic in an envelope" is fraught with serious, inherent dangers. Let me explain.

For the most part, butterflies used in ceremonies are secured legally from commercial breeders, but there is some illegal trafficking in monarchs secured from their overwintering sites, especially in California. Prices range from \$5.00-10.00 per butterfly. In 1997, a "Letter of Position" was drafted and signed by leading lepidopterists, including the President of the North American Butterfly Association and the President of The Lepidopterists' Society, and widely circulated through the butterfly-oriented media. In effect, the letter denounced the release of commercially-reared butterflies. The opinion is based on the following facts:

- In the long run, the illegal removal of monarchs from their winter colonies can seriously reduce the individuals necessary for initiating the first generation of the follow-

ing spring.

- Wholesale commercial operations can foster the spread of microbial disease as well as parasites and parasitoids into areas previously unaffected, thereby spawning epi-

from the interbreeding between wild and capture-bred butterflies.

- Scientific studies and observations (particularly of complex migration phenomena) by professional lepidopterists and recreational butterflyers alike are confused by "unnatural" introductions and may spark erroneous data.

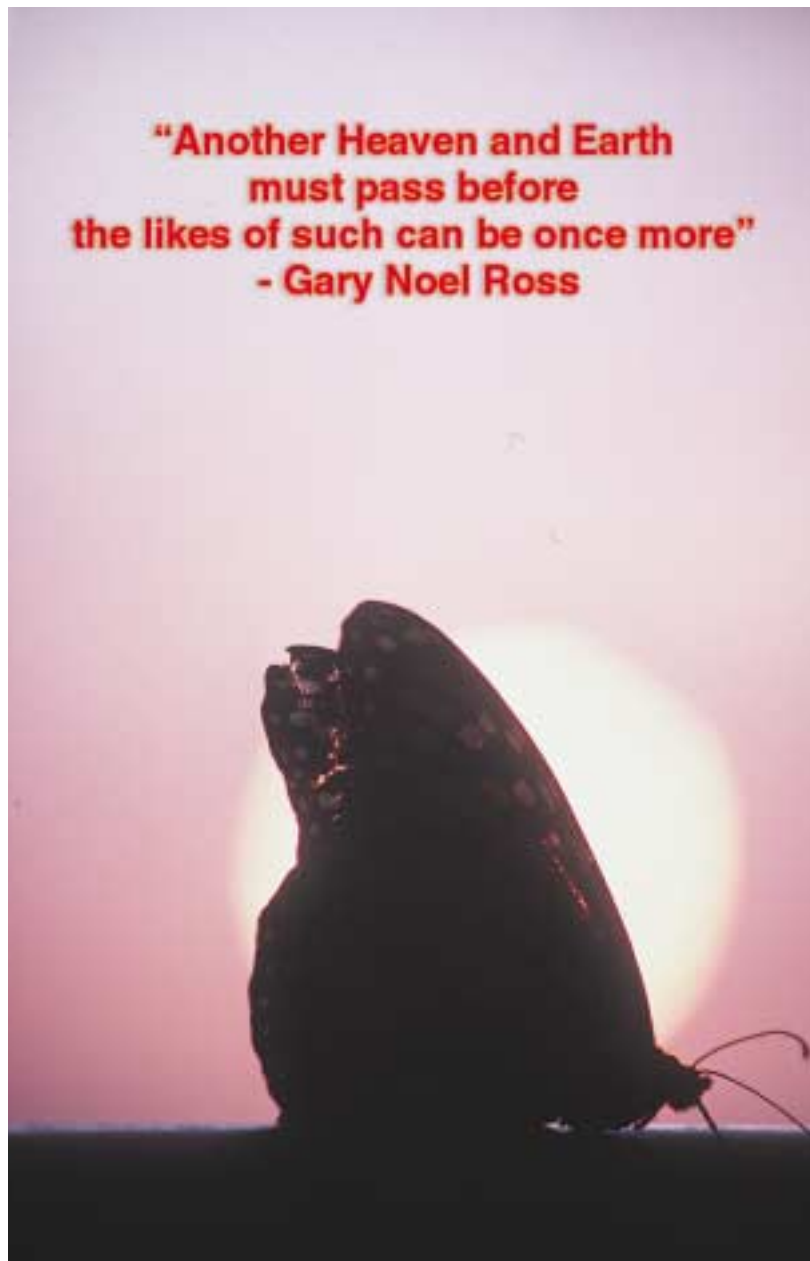
- Commercially-reared butterflies often suffer from poor handling and may in fact, arrive dead; after release, hostile environments such as inclement weather, inappropriate season and unsuitable habitats may prove detrimental.

- We don't allow native birds to be released throughout the country, so why should butterflies be excepted?

- Butterflies are living animals, not theatrical toys or trinkets, and as such deserve our respect and protection.

In conclusion, from both a scientific and ethical point of view, the release of artificially-reared butterflies into native environments poses the potential for serious (and perhaps even unimaginable) problems. A butterfly steward should discourage this practice. To be a butterfly steward, consider voicing the potential harm generated by releasing commercially-farmed butterflies by writing a letter to the editor of

your local newspaper, discussing with your friends and relatives, or by requesting that the USDA enact strict rules and regulations for the interstate transport of butterflies (in much the same manner as it regulates the transportation of most other commercial plant and animal products).



demics and massive die-offs that can not only impact wild species of butterflies, but the plants and crops dependent upon native butterflies for pollination.

- The fitness of local butterfly populations may be seriously compromised because of a reduction in genetic variation resulting

OTHER WANDERERS

Outside of North America, monarchs, as well as several other species of butterflies, engage in cyclical wanderings. Much of this activity involves population dispersal or emigration—a one-way movement out of an area (often referred to as a swarm and usually a response to locate additional food or breeding grounds). In contrast, a true migration is a periodic movement from and return to a given area, often triggered by changes in temperature.

Monarchs in Australia (introduced around 1870), which commonly breed in New South Wales and Queensland, move northward to coastal sites where they overwinter in wooded gullies and valleys in small colonies made up of 10-1000 individuals. Comparatively, in Costa Rica, monarchs often move from western sectors of the country during the annual dry season to more moist regions in the east, following the availability of their milkweed hosts. After the return of the

rains to the west, monarchs return westward to their refurbished breeding grounds.

Several milkweed butterflies other than the monarch are known to wander. In the Dominican Republic (West Indies) a species known as *Anetia briarea* seasonally moves up and down the island's highest mountain and aggregates in small numbers (75-250) during winter. In Taiwan, nine species of "tigers" and "crows" routinely have fall migrations of 180 miles or more from the temperate regions of the northern part of the island to warmer sheltered valleys in the south. Aggregations may contain 50,000 or more individuals. To date, these movements in Taiwan represent the closest parallel to the monarch migration phenomenon in California and Mexico.

Throughout the world, several butterfly species are known to have periodic population explosions, swarms or "blooms." When this occurs, the butterflies scatter—often in spectacular displays. In 1991, one such outbreak

occurred in Botswana, southern Africa. An estimated 1.5 billion individuals of a sulphur butterfly known as the African Emigrant (*Catopsilia florella*) moved northeast out of the country. Within the United States, at least 14 species have been recorded to move en masse—usually one way. These include: cloudless sulphur (*Phoebis sennae*), great southern white (*Ascia monuste*), little yellow (*Eurema lisa*), lyside sulphur (*Kricogonia lyside*), common buckeye (*Junonia coenia*), Gulf fritillary (*Agraulis vanillae*), American painted lady (*Vanessa cardui*), red admiral (*Vanessa atalanta*), dingy purplewing (*Eunica monima*), American snout (*Libytheana carinenta*), long tailed blue (*Lampides boeticus*) and ocola skipper (*Panoquina ocola*). In California, the California tortoiseshell (*Nymphalis californica*) moves up and down its mountainous habitats to where its host plants are in prime condition.



MONARCH-WISE

For more information about the monarch butterfly and its migration, consult:

Journey North:

<http://www.learner.org/jnorth/>

Tel: 952-476-6470

<mailto:ehoward@jnorth.org>

Michoacan Reforestation Fund

www.michoacanmonarchs.com

Monarch Butterfly Conservation Fund

<http://www.worldwildlife.org>

Monarch Butterfly Fund

<mailto:brower@sbc.edu>

Monarch Butterfly Sanctuary

Foundation

<http://www.mbsf.org>

Monarch Crisis Information:

Mastervision

<http://www.mastervision.com>

Monarch Watch:

<http://www.MonarchWatch.org>

Tel: 1-888-824-4464

Monarchs in the Classroom

<http://www.monarchlab.umn.edu>

<mailto:monarchlab@yahoo.com>

The Children's Butterfly Site

<http://www.mesc.usgs.gov/butterfly/butterfly.html>

Texas Monarch Watch

<http://www.tpwd.state.tx.us/monarch>

For further reading:

Chasing Monarchs: Migrating with the Butterflies of Passage by Robert Michael Pyle. Houghton Mifflin Company, Boston, Massachusetts. 1999. 307 pages, hard cover.

Everything You Ever Wanted To Know About Butterflies: 100+ Questions and Answers by Gary Noel Ross, Ph.D. Gary Noel Ross, 6095 Stratford Ave, Baton Rouge, Louisiana. 1995. 52 pages, soft cover, Baton Rouge, LA, tel/fax: 225-927-8179, <mailto:gmr-butterflyevangelist@juno.com>

Gardening for Butterflies in Louisiana: A Guide for Gardeners, Educators and Enthusiasts by Gary Noel Ross. Louisiana Department of Wildlife and Fisheries, Natural Heritage Program, P.O. Box 98000, Baton Rouge, LA 70898-9000, 225-765-2821. 1994. 41 pages, soft cover.

Orion, Spring Issue, 2001. "The Monarch's Metaphor"

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<mailto:editor@orionsociety.org>

The Monarch Butterfly: International Traveler by Fred A. Urquhart. Nelson Hall, Chicago, Illinois. 1987. 232 pages

National Geographic, August 1976: "Found at Last: the Monarch's Winter Home" by Fred A. Urquhart. The National Geographic Society 1145 17th Street N.W. Washington, D.C. 20036-4688 Fax: 202-775-6155

For educational/fun materials/supplies (especially for teachers and students) for butterflies and other insects, consult:

Insect Lore

P.O. Box 1535

Shafter, CA 93263-1535

Tel: 1-800-LIVE BUG

<http://www.insectlore.com>

<mailto:livebug@insectlore.com>

For educational materials, equipment, supplies (including collecting and preserving) for all insects, consult:

Bioquip Products

17803 LaSalle Avenue

Gardena, CA 90248-3602

Tel: 310-324-0620

Fax: 310-324-7931

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TEXAS WATER PLAN SETS BAD EXAMPLE FOR WILDLIFE STRATEGY NATIONWIDE

As human water consumption surges nationwide, and water shortages become more common, it becomes ever more critical for states to set aside enough of this precious resource for both people and wildlife when planning for the future.

Unfortunately, this is not the case in Texas. The second most populous state's proposed water allocation plan would meet human demands for water over the next 50 years -- but would leave wildlife high and dry. Under the plan, rivers and streams could be sucked completely dry during drought periods, devastating fish and wildlife within the state and impacting marine species in the Gulf of Mexico. Migratory wildlife such as the whooping crane would also lose access to critical habitat.

At a time when many other states are looking to the current Texas planning effort for guidance in developing their own water plans, they currently have an egregiously bad example to follow.

Plan Ignores Needs of Wildlife

Following a troubling national pattern, the draft Texas plan relies heavily on massive new reservoir projects and pipelines to move water from one region of the state to another. Although the plan acknowledges the need for more efficient use of existing water supplies, it fails to exploit the potential of water conservation measures to reduce demand and eliminate the need for new water diversions.

The failure to consider fish and wildlife demands is particularly troubling because in some rivers, the state has already authorized the withdrawal of so much water that some streams may completely dry up during periods between rainfalls. (Earlier this year, as a result of a combination of massive water diversions and drought conditions, the Rio Grande River failed to even reach the Gulf of Mexico!)

Reduced flows in the Guadalupe River, which nourishes the Aransas National Wildlife Refuge, have severely reduced blue crab populations. The whooping crane relies on the blue crab as a chief food source, and also relies on the Refuge for habitat during winter months. Many

Continued on page 48

Commission Proposes Turkey Season Date Change

The Louisiana Wildlife and Fisheries Commission decided Oct. 4 to move up the proposed statewide opening date of the 2002 turkey season from March 30 to



March 23, in response to public comments regarding season dates proposed in August. Since the season would open a week earlier in each of the three turkey hunting areas, it would also close a week earlier than originally proposed, and season dates for wildlife management areas would be adjusted accordingly.

Tom Prickett, wildlife division administrator for the Louisiana Department of Wildlife and Fisheries, told commissioners that available LDWF data did not indicate there would be any adverse impacts on turkey populations as a result of the changes.

Area A would have a 30-day season (March 23, 2002 - April 21, 2002). Area B would have a 23-day season (March 23, 2002 - April 14, 2002). Area C would have a 9-day season (March 23-31, 2002). The daily bag limit will remain one gobbler, with a season limit of two gobblers. The changes will be reflected when the commission ratifies season dates in December, subject to further public comment and deliberation in the interim.

Committee to Look at Future of Louisiana's Coast

Governor M. J. "Mike" Foster, Jr. has appointed members to the Governor's Committee on the Future of Coastal Louisiana, fulfilling a pledge he made to

the people of Louisiana at the Coastal Summit held last August to bring business and industry and other key constituents to the table as the state goes forward in its efforts to stem coastal land loss and establish a sustainable coastal ecosystem.

"The time is now to take our coastal restoration efforts to a new level," Governor Foster said. "This team of business, community and government leaders will help us focus on solutions and strategies to effectively administer an expanded coastal restoration program and secure the funds needed to restore our coast, which provides vital habitat for fish and wildlife and is critical in protecting our nation's energy supply."

R. King Milling, president of Whitney National Bank, will head the Governor's Committee on the Future of Coastal Louisiana. Milling presently



serves on the board of directors of the Coalition to Restore Coastal Louisiana and has emerged as a strong advocate of coastal restoration as the future of the state's economic well being.

Milling said, "The stakes are high for our state and our nation. Succeeding in restoring Louisiana's coast can mean the difference in a sound economic future and a disastrous one. Once these wetlands go, so goes the protection of our oil and gas industry, one of the most productive ecosystems in the world, our economy, our culture, our future. The loss of Louisiana's wetlands will have significant, negative economic impacts on the United States."

"The governor has asked this group to

look at a variety of issues, such as: how an unprecedented restoration effort like this can be consistently managed over an extended period of time; how to secure and coordinate the vast amounts of state and federal dollars needed to get the job done; and how to ensure that restoration is approached from a coast-wide perspective, as part of a single action," Milling said. "These are challenging, but necessary issues to address."

Plans are for the Committee to make its recommendations to the governor in early 2002.

The members of the Governor's Committee on the Future of Coastal Louisiana are Chairman R. King Milling - New Orleans; James M. Coleman - Baton Rouge; Nancy Jo Craig - Baton Rouge; Mark Drennen - Baton Rouge; Representative Charlie DeWitt - Lecompte; C. Berwick Duval - Houma; Senator John J. Hainkel, Jr. - New Orleans; William Jenkins - Baton Rouge; Alfred Lippman - Morgan City; Mayor Randy Roach - Lake Charles; Clifford Smith - Houma; James Tripp - New York, NY; Frank Walk - New Orleans.

2001-2002 Fur Trapping Season

The 2001-2002 statewide furbearer trapping season will run from Nov. 20, 2001, to March 31, 2002. The season includes all designated fur-bearing species: nutria, muskrat, raccoon, mink, opossum, river otter, skunk, red fox, gray fox, bobcat, beaver and coyote. The season dates, which are the same as last year, were developed with input from LDWF biologists and members of the Louisiana Fur and Alligator Advisory Council. The season



length reflects the burgeoning population of fur-bearing species, a direct result of

reduced trapping effort. The reduced effort can be attributed to lower prices paid to trappers.

Permits, maps and trapping season pamphlets may be obtained at district offices between 8 a.m. and 4:30 p.m. on normal working days. Requests for information on maps, permits and wildlife management areas may be directed to any LDWF district office. A list of offices follows. District I - P. O. Box 915, Minden 71055 (318/371-3050); District II - 368 Century Park Dr., Monroe 71203 (318/343-4044); District III - 1995 Shreveport Hwy., Pineville 71360 (318/487-5885); District IV - P. O. Box 1640, Ferriday 71334 (318/757-4571); District V - 1213 N. Lakeshore Dr., Lake Charles 70601 (337/491-2575); District VI - 5652 Hwy. 182, Opelousas, 70570 (337/948-0255); District VII - P. O. Box 98000, Baton Rouge 70898 (225/765-2360); District VIII - P. O. Box 1190, Lacombe 70445 (504/882 0027); District IX - 2415 Darnall Rd., New Iberia 70560 (337/373-0032).

Albertson's Charged for Selling Blue Marlin

Albertson's Corporation, of Boise, Idaho, was cited on Sept. 4, with 35 counts of selling blue marlin, a saltwater game fish, eight counts of violating interstate commerce regulations and 12 counts of failure to maintain records. These charges stem from an investigation by the Special Investigations Unit of the Louisiana Department of Wildlife and Fisheries Enforcement Division. On Aug. 13, a LDWF agent went to Albertson's Supermarket, located at 2678 Johnson St. in Lafayette, after a complaint that blue marlin was being sold through the seafood market of the store. A subsequent investigation revealed that the store and 24 other Albertson's stores located in Louisiana were selling blue marlin distributed from the Albertson's warehouse in Katy, Texas. It was determined that Albertson's Corporation illegally entered into commerce over 365 pounds of blue marlin in Louisiana to its stores for sale. Twelve of the stores did not have any records identifying the source of the Blue Marlin being offered for sale, or where the blue marlin was obtained, therefore agents were unable

to determine the exact origin of the blue marlin. Blue marlin is a state protected and highly regulated game fish that is illegal to be imported and sold in Louisiana except under special conditions. These special requirements exist to prevent the development of a commercial market, which can lead to exploitation of sport fish being sold for economic gain.

The penalties for selling saltwater game fish are \$350- \$500, up to 30 days in jail, or both, plus court costs. In addition to the fines and jail sentences, the license shall be revoked for the duration of the license year and for one year thereafter. The penalties for each offense of violating interstate commerce regulations are \$900- \$950, up to 120 days in jail, or both, plus court costs and forfeiture of anything seized. The penalties for failure to maintain records are \$250-\$500, up to 30 days in jail, or both, plus court costs.

Agents participating in the case were Sr. Agent Jay Diez, Sr. Agent Sean Green and Sr. Agent Jason Dreher.

Alligator Exhibit

A 10-foot diorama highlighting Louisiana alligators is now open to the public in the second floor lobby of the Lake Charles Civic Center.

The museum-quality exhibit, set up by the Louisiana Fur and Alligator

Advisory Council, explains the role of the alligator industry in preserving the species--as well as south Louisiana's wetlands habitat, culture and a way of life. It includes six panels of photographs, information about wetland conservation, a display of alligator products and a nest scene that features several mounted hatchling alligators emerging from eggs.

The exhibit was unveiled Oct. 18 at a reception attended by Mayor Randy Roach of Lake Charles; Darrell Dupont, chairman of the Louisiana Fur and Alligator Advisory Council; and Ted Joanen, alligator biologist. Fifth graders from the Episcopal Day School cut the ribbon after a presentation by Tanya Sturman, an educator with the Fur and Alligator Advisory Council, about the role of alligators in Louisiana.

"It is important to educate the public that alligators are not endangered, but are a renewable resource here in Louisiana," noted Darrell Dupont, chairman of the Louisiana Fur and Alligator Advisory Council. "By purchasing alligator products, we put money back into our wetlands and help preserve the habitat needed for alligators' long-term survival."

The mission of the Louisiana Fur and Alligator Advisory Council is to promote the conservation and management of Louisiana's fur and alligator resources. Additional information is available from the council's web site (<http://www.alligatorfur.com>).

Willamette Recognized/Jackson-Bienville W.M.A. Marks 50 Years

Gov. M. J. "Mike" Foster, Jr. presented a plaque to officials from Willamette Industries during an Oct. 2 ceremony at the Governor's Mansion in Baton Rouge recognizing the company's long-standing commitment to conservation. The event commemorated the 50th anniversary of the dedication of Jackson-Bienville Wildlife Management Area in Bienville, Jackson and Lincoln parishes.

Leased to the state at no charge since 1951, Jackson-Bienville WMA comprises 32,460 acres of pine-covered hills with upland streamside hardwoods. Willamette Industries owns 32,000 of those acres, which are prime territory for deer and turkey hunting.



"Partnerships such as this one between Willamette Industries and the Department of Wildlife and Fisheries have greatly improved public hunting opportunities here in Louisiana," noted Gov. Foster. "It is my pleasure to recognize Willamette for their dedication and diligence in preserving our state's hunting heritage."

"Willamette's participation in the national Sustainable Forestry Initiative has promoted sound land management by enhancing wildlife habitat and biodiversity on a large scale," said LDWF Secretary James H. Jenkins Jr. "Willamette is the founding cooperator in the Jackson Bienville Wildlife Habitat Program, which has generated nearly \$100,000 in non-department funds and in-kind services to enhance wildlife resources on Jackson-Bienville WMA."

Jackson-Bienville WMA has wide appeal to hunters across the state. According to LDWF Wildlife Division administrator Tom Prickett, 80 percent of deer hunters there hail from south of Alexandria, and over 9,000 deer have been harvested there since 1958.

The terrain on Jackson-Bienville WMA is primarily gently rolling hills bordering the Dugdemonia River and five intermittent streams. The area is managed for timber production and wildlife habitat by Willamette and other private landowners who allow their land to be used free of charge by Louisiana sportsmen.

Willamette Industries, a national forest products company based in Oregon, owns nine mills in Louisiana and manages timber and natural resources on 711,297 acres in the state.

Firearms-Related Crime/Accidents Decline

The number of firearm-related fatalities in the U.S. in all categories and for all age groups continued to drop in 1999 from the previous year, and preliminary figures for 2000 show they may drop even further. According to the National Center for Health Statistics (NCHS), the 28,575 fatalities in 1999 were the lowest since 1971, represent a 5.7% drop from 1998. The NCHS data reveal that the rate of firearm fatalities also declined 6.2% overall between 1998 and 1999, with the largest drop, 26.1% in the 10-14 year-old

age group. Firearm-related homicide declined 9.3%, and suicide dropped 6.2% across all ages. While the rate of accidental firearm-related fatalities remained



unchanged, the total number of such incidents declined from 866 in 1998 to 824 in 1999, the lowest ever recorded. Initial estimates from the NCHS for the year 2000 show unintentional firearm deaths at 808. Firearms were involved in only 1.2% of all deaths in 1999, with firearm accidents representing 0.8% of all accidental deaths. The number of accidental firearm fatalities for children under the age of 15 totaled 88 in 1999 according to the NCHS.

Hunter Education Course Schedule on LDWF Web Site

Hunter education certification is mandatory for persons born on or after Sept. 1, 1969, who seek to purchase a Louisiana hunting license. The free course is available throughout the state through the LDWF Hunter Education Program. Young people 10 years of age and older who attend the course will become permanently certified. Those younger than 10 will be certified for one year and must repeat the course annually until reaching that age.

Certification requires a 10-hour minimum of instruction; hunters must attend all classes within a scheduled course. Course topics include safety, outdoor ethics, wildlife management, habitat preferences of game species and selecting, handling and maintaining firearms. Students also participate in a supervised firing exercise after learning firearms safety.

The current schedule of LDWF hunter education courses can be accessed at LDWF's web site:

<http://www.wlf.state.la.us>

Information is also available at 225/765-2932.

Hunter Education Classes (as of October 30, 2001)

REGION 1 (Contact person: Jonathan Glasscock @ 318/371-3043)

Webster Parish

Nov. 27, 28, & 29; Minden Wildlife Office; 1400 Talton Dr.; Contact 318/371 3049

REGION 3 (Contact person: Mark Roy @ 318/487-5889)

Rapides Parish

Nov. 29, 30, & Dec 1 & last week (Thurs. Fri. & Sat) in every month starting in Feb.; Rapides Parish Sheriff's Office Shooting Range; Contact Patsy Netherland @ 318/442-9229

Natchitoches Parish

Every other week; Natchitoches Shooting Range; Contact Pop Hyams @ 318/356-9457

REGION 5 (Contact person: Kenneth Hebert @ 337/491-2183)

Calcasieu Parish

Signing up potential students NOW!!; Masonic Lodge on Sampson St., Westlake; contact Harvey Carlock @ 337/433-2953.

Feb. 2 & 9; S. J. Welsh Middle School, 1500 W. McNeese St., Lake Charles; contact Calcasieu Sheriff's Office Youth Division @ 337/436-3226.

Feb. 16 & 23; W W Lewis Middle School, 1725 Cypress St., Sulphur; contact Calcasieu Sheriff's Office Youth Division @ 337/436-3226.

Trio Arrested for Deer Violations

Acting on an anonymous tip, wildlife enforcement agents arrested three Houma men Oct. 17 on charges of possessing illegally taken deer and taking deer in excess of the legal limit. Ned Dantin, 33, Randall Sapia, 41, and Noel Williams, 38, were taken into custody as they left the drainage pumps off Woodlawn Ranch Road. Two deer were found in the vehicle.

Deer seasons open in Terrebonne Parish that day were archery and muzzle-



loader. A tipster told agents the deer had been taken with a conventional 7-millimeter centerfire rifle.

Dantin, Sapia and Williams were each cited for possession of illegally taken deer. Dantin was also cited for taking deer in excess of the legal limit. The penalty for possession of illegally taken deer is a fine of \$400 to \$750, up to 120 days in jail, or both. Taking deer above the legal limit is punishable by fines of \$250 to \$500, up to 90 days in jail, or both.

Agents participating in the case included Sr. Agent Thomas Dewitt, Sr. Agent Bryan Marie and Sr. Agent Richard Purvis.

Anyone who has information about suspected wildlife violations is encouraged to contact Louisiana Operation Game Thief at 800/442-2511 or by calling the nearest LDWF enforcement office. Callers may remain anonymous and cash rewards are available for information leading to the arrest of poachers.

W.M.A. Maps Now Available on the Web

Updated maps of Louisiana wildlife management areas (WMAs) are now available to the public electronically by visiting the Louisiana Department of Wildlife and Fisheries website. The maps, which can be downloaded in PDF format and printed, can be found by accessing the 'Hunting,

Fishing and Boating' section of department's website at <http://www.wlf.state.la.us> and clicking on 'Wildlife Management Areas.'

As always, printed copies of WMA maps are available free of charge at LDWF regional offices across the state or from the department's library. The library is located on the first floor of the LDWF headquarters building at 2000 Quail Dr. in Baton Rouge. A map of any WMA or a state map showing the locations of all Louisiana WMAs can also be requested by electronic addressed to:

mailto:WLF_LDWF@wlf.state.la.us

or by writing to Librarian, P. O. Box 98000, Baton Rouge, LA 70898-9000. In addition to the name of the WMA for which a map is requested, each request must include a name and a physical address to which the map can be mailed.

"Each year, LDWF revises maps for the 51 WMAs across the state to reflect changes in boundaries, roads and other features to facilitate public access and increase public hunting opportunities," noted Randy Myers, LDWF land acquisition program manager. "It's important that people have up-to-date maps when using the WMA system."

"Before downloading the maps, web users are encouraged to download the latest version of Adobe Acrobat Reader, which is available free on our website," said Nema Davis, LDWF webmaster. "This will ensure faster download time and minimize download problems."

Coastguard Advises Boaters

Since the events of September 11, members of the boating community have inquired what they can do to assist the Coast Guard in accomplishing its many missions in securing our nation's waterways.

Here are two ways mariners can help:

- The Coast Guard asks the boating community to remain vigilant in maintaining a heightened level of security and report any suspicious activities to the proper authorities.

- All boaters are asked to have everyone on board their vessel wear a life jacket to show their support for all Coast Guard men and women on patrol.

The Coast Guard has always provided

security on our nation's waterways. Since September 11th, we have worked vigilantly to reaffirm to Americans that their oceans, lakes and rivers are safe.

Forest Stewardship Program

Do you know exactly what you want for your property, but are unsure how to achieve your goals? If this is the case, then the Forest Stewardship Program (FSP) may be for you. The Forest Stewardship Program offers non-industrial private for-



est landowners a cost-free means of obtaining technical assistance. Landowners with a minimum of ten forested acres qualify. The first program requirement is a statement of multiple objectives for the property such as timber production, wildlife habitat enhancement, forest recreation enhancement, aesthetics, environmental enhancement, and/or grazing. Once the objectives are established, a LDWF biologist working with the FSP and/or a local Louisiana Department of Agriculture and Forestry (LDAF) representative will set up a site inspection with the landowner. After site evaluation and discussion with the landowner, foresters will develop a management plan. The

Continued on page 49

Editorial

by Mark Van Putten

Conservation Partnerships On Working Landscapes

A renewal rich in wildlife rewards has quietly been nourishing much of our nation's heartland for the past decade and a half in one of the most unheralded but significant conservation success stories of this generation. Streams and rivers have begun to run cleaner again. Wildlife has reemerged on



Mark Van Putten

restored land. Waterfowl and other migratory bird species have increased in number, their nesting habitats secure.

These gifts were forged from the conservation partnerships drawn up with America's farmers under the terms of legislation known as the Farm Bill. Like still water that runs deep, this partnership has spread its benefits with a calm forcefulness onto the nation's working landscapes.

As you would expect, the National Wildlife Federation was there at the outset. Long before the first Farm Bill, we learned from the bitter experience of the 1930s Dust Bowl about the conservation and wildlife costs of neglecting the lands that feed us. So when the opportunity arose to craft the 1985 Farm Bill, NWF was in the forefront helping to author what is today arguably the largest and certainly one of the most successful national conservation efforts, the Conservation Reserve Program (CRP).

The success of this partnership is firmly based in the soundness of its guiding princi-

ple. Men and women who work the land, whose sense of stewardship comes from tilling the soil, should have the tools and incentives they need to be good stewards of the land. That's the essence of common sense conservation. The wisdom of cultivating this partnership is apparent in the fact that nearly half our national landscape, close to 907 million acres, is worked as crop-, pasture- and rangeland.

Thanks to the incentives provided by CRP, about 35 million acres of what was once marginal farmland with highly erodible soils are now set aside for conservation and covered by wildlife-friendly crops of grasses and trees. Similar gains have been made as a result of adding to the Farm Bill new incentives designed to encourage protection of wetlands and other wildlife habitats.

We have enough experience now to quantify some of the rewards. Each year, CRP alone prevents the erosion of close to 700 million tons of soil. This not only translates to less sediment in rivers and streams, but due to the healthy, natural ground cover on CRP lands, this means less runoff of fertilizer and pesticides. It's been documented again and again that many waterfowl populations are flourishing due in large measure to Farm Bill safeguards for their Midwestern prairie pothole nesting sites.

I would venture that the unquantifiable rewards are just as great. What's the value of a child seeing a great stream of pintail ducks following their migratory course over land his or her parents - or even grandparents - have worked? How do you set a price on the satisfaction of the farmer who knows his or her land is nourishing others as well as wildlife?

In this Congress a new Farm Bill is being written. You can stay posted on developments via our Web site at <http://www.nwf.org>. As with any legislative measure, there will be pressures to strengthen, weaken or even omit specific provisions to benefit interest groups of every stripe. In evaluating them, our representatives must bear in mind the interest we all share: helping America's farmers to be true stewards of our natural heritage. We can keep the Farm Bill a partnership that keeps giving, so long as we recognize and nourish its potential.

Mark Van Putten is President & Chief Executive Officer of the National Wildlife Federation

Duck and Goose Call: Continued from page 50



(L-R) 2001 intermediate division duck calling contest winners Cade Jefers of Paradis, 1st place; Rene Dandry of Metairie, 2nd place; Aaron Melancon of Prairieville, 3rd place.

and ribbons at the close of the contest, the winners and runners-up in each competition drew for a Beretta 391 12 gauge semi-automatic shotgun. It was won by Lex Theriot. Bobby Jorden won a 12 gauge Winchester Black Shadow pump shotgun donated by Richard Lipsey which was raffled to help defray the costs of holding the contest.

Louisiana Wildlife Federation president, Keith Saucier of Gonzales emceed the contest. The East Ascension Sportsmen's League provided a tasty jambalaya for the enjoyment of the contestants and spectators.

The Baton Rouge Sportsmen's League and the Louisiana Wildlife Federation wish to thank the following persons, businesses and agencies for supporting the contest with their volunteer effort and financial contributions: contest judges Mike Barbier, Mark Conway, Fred Parnell, Harry Reed and Chuck Smith; Big Top Tents; Cajun



2001 intermediate and junior division blue/snow and speckle-bellied goose champs, Lex Theriot (L) of Grand Chenier and Hunter Canick of Cameron.

Constructors; East Ascension Sportsmen's League; Go-Devil Manufacturing of Louisiana, Inc.; Hunter's Run Gun Club; ISC Instrumentation and Electrical; Lipsey's,



2001 State Duck and Goose Calling Contest judges with the final scores in the senior duck calling competition. (L-R) Fred Parnell, Mark Conway, Chuck Smith, Mike Barbier, Harry Reed.

Inc.; Spillway Sportsman; Gremillion Mechanical; Academy Sports and Outdoors; Acme Refrigeration; Capital Rubber and Specialty; G. N. Gonzales; Haydel's Game Calls; Home Oil Company; Jim's Firearms; Louisiana Fish Fry; Reynerson's Gunsmith Service, Inc.; Louisiana Department of Wildlife and Fisheries.

Executive Director: Continued from page 5

it migrates thousands of miles each fall, many individuals crossing the open Gulf of Mexico. I'm proud to share the planet with a creature that succeeds at such a feat.

Migration is a risky endeavor. The species that undertake this wonder of Nature require secure habitat at both ends of the journey and at stopover points in between. They depend on us to provide that security. That's why conservationists have to care about what goes on far away from home, as well as in our own backyards. That's why we have to be staunch in our support for federal agriculture policy that encourages habitat conservation and improves water quality from border to border. That's why we have to work with state and federal land management agencies to make sure public lands can accommodate the needs of all species, including migratory species that aren't good (or at least legal) in a gumbo. That's why we need to make sure Louisiana is doing its part to conserve wetlands. That's why those who enjoy and cherish our wildlife resources need to be informed, and involved in funding and program decisions that affect those resources. The Louisiana Wildlife Federation is working to achieve these things and that is why, during this season of thanksgiving, we need to say "THANK YOU" for your support.

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Texas Water Plan: Continued from page 41

marine species, which form the basis of massive commercial and recreational fisheries, are also dependent on freshwater inflows that provide the right mix of salinity, nutrients, and sediments to keep bays and estuaries productive.

Bottomland hardwood forests may also suffer from increased water diversions and new reservoir projects. Texas only has one large natural lake and well over 7,000 artificial ones. Dams have resulted in the loss of hundreds of thousands of acres of bottomland hardwood forests through direct inundation and through the loss of critical overbank flows needed to support the forests. The Lone Star State's location on critical migration flyways makes the health of those forests vitally important to wildlife supporters across the country. ■

AMERICA'S CAMPUSES: WORKING FOR A GREENER FUTURE

America's colleges and universities have long been at the forefront of balancing human needs with sustaining the health of our environment. A new survey of 891 of the country's colleges and universities demonstrates how these important learning centers are implementing green programs in everything from energy conservation to landscaping. Responses to the survey included those from presidents, provosts, chiefs of administration and operations.

From the survey results, the National Wildlife Federation has devised a report card on national campus environmental performance showing areas in which leadership is strong as well as activities and programs that need more emphasis. The grades are promising and provide a valuable tool for facilitating positive change.

Energy and Water Conservation

Colleges and universities continue to demonstrate positive and practical solutions to the energy debate through conservation and efficiency. Nearly a quarter of campuses surveyed meet at least some of their energy needs from renewable sources, and almost all have programs in place or in the works to increase the efficiency of lighting, heating, ventilation and air conditioning systems.

Additionally, more than half the schools have developed efficiency design codes for new or existing buildings. Taken together, these initiatives represent crucial steps toward a cleaner and more sustainable energy future. Good practices for water conservation and

efficiency are also widely embraced by campuses. Seventy-two percent of respondents report they have installed efficient toilets, showerheads, and faucets and that they recirculate water. A few campuses even report using recycled water for campus landscapes.

Transportation: 'Needs Improvement'

Reducing congestion and pollution associated with travel to and from colleges and universities is one of the biggest opportunities campuses have to improve community relations and air quality. At many thousands of dollars per space, reducing the need for new parking is an added incentive. Yet, transportation management remains largely untapped territory on U.S. campuses. Fewer than 25 percent of campuses offer key initiatives for reducing single occupant vehicles such as discounted bus passes for students, faculty, or staff; carpooling programs; and incentives not to drive alone such as emergency rides home. However, most campuses do provide bike racks.

Environmental Lessons in the Classroom

Trends in curricula are mixed. On one hand, half the schools surveyed have programs supporting their faculty's professional development on environmental topics and 43 percent offer major or minor programs in environmental studies.

On the other hand, many students may graduate without basic environmental literacy. While environmental courses are integrated into many sciences and humanities programs, only eight percent of campuses require all students to take environmental studies courses regardless of major. Certain professions, such as education and engineering - where environmental literacy is crucial - benefit relatively little from environmental training at the undergraduate level. Only 12 percent of engineering and 11 percent of education programs, for instance, currently offer undergraduate environmental courses. This contrasts with 68 percent of biology departments and 33 percent of political science programs.

Curious about what your alma mater is doing to help protect the environment? Call them and ask! Tell them about NWF's National Report Card on Environmental Performance and Sustainability in Higher Education - and check on their plans for a greener future.

New Members: Continued from page 10

Bryan A. Picou, M.D., Natchitoches
-The Family Medical Clinic
James W. Pierson, Natchitoches
-City Bank & Trust Co.
Roy Raftery, Jr., Cameron
-Cameron State Bank
Honorable Ned Randolph, Alexandria
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CONSERVATION LINE

Continued from page 45

multiple-use plan will cover a ten-year period and is designed to assist the landowner with recommendations on how to accomplish his or her stated objectives. Once the plan is prepared a landowner is nominated for certification. A resource management professional is then required to acknowledge initiation of the owner's active forest management agenda. During the certification process, an inspection team made up of resource professionals is assembled and the property is reviewed to ensure that all management activities are conducted in a manner conducive to proper forest stewardship. After certification, the landowner will receive a sign to display on the property and a laser-engraved plaque recognizing him or her as an active member in the Forest Stewardship Program. A revised management plan and recertification are required at the end of each ten-year period. A recently-added benefit to the FSP is the Landowner Antlerless Deer TagProgram. Those properties involved in FSP are now eligible to receive assistance in deer management including the issuance of antlerless deer tags. For more information on the Forest Stewardship Program, contact Pat Beard, FSP coordinator, LDAF at 225/925-4500 or Cody Cedotal, FSP biologist, LDWF at 225/765-2354.

Wells Wins 2001 State Duck Calling Contest

Lyle Wells of Ponchatoula out-called twenty-one other contestants to become Louisiana's senior state duck calling champ. He was competing in the 33rd Annual



Lyle Wells of Ponchatoula became the first State Duck and Goose Calling Contest triple crown winner taking the senior duck as well as the blue/snow and speckle-bellied goose calling competitions at the 2001 event.

Louisiana Wildlife Federation State Duck and Goose Calling Contest hosted by the Baton Rouge Sportsmen's League. The event was held October 20, 2001 at the Waddill Wildlife Refuge and Outdoor Education Center owned by the Louisiana Department of Wildlife and Fisheries near Baton Rouge.

Wells edged out Rod Haydel of Bossier City by a mere two points after the two call-backs required by the World Duck Calling Contest, Inc. of Stuttgart, Arkansas, the sanctioning body for qualifying state contests. Haydel led after the first round, but Wells eased ahead with his performance in the final call-back. Wells is eligible to represent Louisiana in the World Duck Calling Championship competition Nov. 23-25 in Stuttgart.

In the intermediate (14-16 years of age) duck calling division, Cade Jeffers of Paradis was the top scorer while Bobby Jorden of Lafayette captured his second consecutive title in the junior (under 14) duck calling competition. Both may compete in Stuttgart in their respective divisions.

Wells became the first competitor to win three state champion titles in the same year when he successfully defended his senior blue/snow and speckled bellied goose calling titles earlier in the day. Ricky Canik of Grand Chenier repeated as champ in the voice calling category. Lex Theriot of Grand Chenier won both the blue/snow and speckle-bellied goose categories in the intermediate division and Hunter Canik, also of Grand Chenier took the blue/snow and speckle-bellied goose categories in the junior division. Theriot was also runner-up in the mouth calling for geese category.

Taking third place in senior duck was James Doxey of Cameron. Rene Dandry of Metairie and Aaron Melancon of Prairieville took second and third places, respectively, in the intermediate division of the duck calling category. Hunter Webb of Bossier City took second place and Adam Sturlese of Lafayette was third in the junior duck calling competition. Webb also was runner up in the junior blue/snow goose category.



(L-R) 2001 junior duck calling contest winners Bobby Jorden of Lafayette, 1st place; Hunter Webb of Bossier City, 2nd place; and Adam Sturlese of Lafayette, 3rd place. This was Jorden's second consecutive junior division state duck calling title.

Rick Canik and Mike Smith took second and third places, respectively, in the senior blue/snow goose calling category with James Doxey taking second and Joseph Dantin of Raceland taking third in the senior speckle-belly calling competition.

Altogether, forty contestants competed, traveling from all corners of the state to ply their calling skills in front of 100 spectators and five expert judges.

In addition to being awarded plaques

Continued on page 46

AFFILIATE CLUBS

DISTRICT 1

St. Bernard Sportsmen's League

DISTRICT 2

Clio Sportsman's League
Jefferson Rod & Gun Bass Club
Jefferson Rod and Gun Club
Lake Pontchartrain Basin Foundation

DISTRICT 3

Acadiana Bay Association
Iberia Rod and Gun Club

DISTRICT 4

Claiborne Parish Hunting and Fishing Club

DISTRICT 5

Waterways Access Association

DISTRICT 6

Baton Rouge Sportsmen's League
Citizens For A Clean Environment
CFACT
East Ascension Sportsmen's League
Hunters Against Poachers
Lake Maurepas Society
Plaquemine Sportsmens League
Point Clair Hunting Club
Central LA Chapter, Safari Club International
Triangle "T" Sportsmen's League

DISTRICT 7

Acadiana Sportsmen's League
Hoy Hunting Club
Southwest Louisiana Wildlife Association

DISTRICT 8

Avoyelles Wildlife Federation
Bayou Bassmasters of Alexandria
Rapides Wildlife Association

DISTRICT 9

Louisiana Toledo Bend Lake Association
South Toledo Bend Civic Association
Toledo Bend Bi-State Alliance

STATEWIDE

Association of Louisiana Bass Clubs
Bayou State Bowhunters Association
Louisiana Chapter, National Wild Turkey Federation
Louisiana Safari Club International
Louisiana Trappers and Alligator Hunters Association
United Commercial Fishermen's Association





The Louisiana Wildlife Federation



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