Monarchs and the Milkweed Community Quiz

What is the name of the program that collects data on the distribution and abundance of monarch eggs and larvae in the US?

What is the name of the fly parasitoid that kills many monarch larvae throughout the US?

What gregarious, fuzzy moth caterpillars can be found eating milkweed until it look like lace?

What is the Latin name for common milkweed?

Look for the answers inside!

Monarchs in the Classroom (MITC) began almost 11 years ago when we brought monarchs into Minnesota classrooms to promote hands-on science learning. While MITC was an appropriate name during our first several years, we’ve been rethinking this name as the program expands in scope and focus.

First, Monarchs. While we still raise 1000’s of monarchs for Minnesota and Wisconsin teachers and students (see page 6) and most of our educational material is monarch-centered, our summer courses are now called Monarchs and More: Insect Ecology for Teachers (see page 2). We study monarchs in these courses, but milkweed bugs, pillbugs (not even insects!), ladybugs and stream insects join the fun. The Monarch Larva Monitoring Project encourages citizen scientist volunteers to document all of the organisms they observe on milkweed plants, not just the monarchs. With naturalist-writer Ba Rea and Texas entomologist Mike Quinn we’ve just published a book called Monarchs, Milkweed and More: a Field Guide to Invertebrates in the Milkweed Community (see review on page 15).

Second, in the Classroom. The classroom may connote a rather narrow educational focus, bringing to mind a teacher conveying knowledge in a 4-walled room. But MITC is much more than that. Most of the monarchs we raise for our outreach program do end up in Minnesota or Wisconsin classrooms. (We also raise thousands for research that stay in our lab for feeding, mating or diapause studies and are then usually released after they’ve taught us more about themselves.) Many others go to homes, people’s gardens, or environmental learning centers. We’ve never calculated where all of our other materials (curriculum guides, slides, games, posters, videos, etc) go, but they are also used by people in classrooms, homes, outdoor education centers, museums and universities. The Monarch Larva Monitoring Project, an MITC program, is certainly not centered in 4-walled classrooms; while many teachers and students participate, the project requires that they move into the real world as they observe and count monarchs and other insects in gardens, fields, parks and roadides.

On some days it’s easy to talk ourselves into thinking our name is still appropriate. In defense of Monarchs, they were the tip of our science education iceberg; they pulled us into their community, introducing us (teachers, volunteers, scientists, students alike) to the fascinating connections that exist there. As we work to understand and teach about the connections between monarchs and their world, we are creating connections between humans and the natural world, fostering environmental concern and caring. Maybe it’s most appropriate that we continue to celebrate them in our name. In defense of the Classroom, we’re all learning, and are thus all students. If that’s the case, maybe it’s appropriate to think of the world as our classroom!

On other days our name feels a little confining. If anyone has a better suggestion, please let us know! To help you think, be sure to read about all of the great things going on inside this newsletter.

What’s in a Name?

Visit our website: www.monarchlab.umn.edu to view this newsletter in color!
2003 Summer Course - Monarchs and More: Insect Ecology for Teachers

Greg Childs and Rick Olson (see below) learned lots of biology that was directly applicable to their elementary classrooms last summer. We hope that you’ll consider joining us for Monarchs and More: Insect Ecology for Teachers; this year’s courses should be even better! Once again, we’ll have something for everyone: hands-on, classroom-friendly, and inquiry-based lessons that can be used with your students next year; the opportunity to work with colleagues to conduct an independent research project; collegial interactions with scientists and teachers; and plenty of time to observe the natural world.

We’ll have two courses. All costs—including free graduate credits, room and board, and materials—are covered by a grant from the federal No Child Left Behind Program administered by the Minnesota Higher Education Services Office. These funds are only for Minnesota teachers, but we do accept a few teachers from other states who can cover their own costs.

Our elementary teachers’ course will meet July 14-18 and August 11-15 on the St. Paul campus of the U of M, with field trips planned to natural areas within an hour’s drive of campus. We’ll explore insect biology; learn about the fascinating interactions between plants, herbivores and predators; and practice scientific inquiry. While each day will include activities that can be used in the classroom, the focus will be your own scientific development. During the second week we’ll focus on how to translate the concepts learned in July to your classroom. There will be plenty of time to interact with your colleagues as you develop ready-to-go plans for the 2003-2004 school year.

Upper elementary and middle school teachers will meet at the Eagle Bluff Environmental Learning Center July 21-25 and on the St. Paul campus August 11-15. This course will have a stronger research and outdoor focus; the first week, we’ll be immersed in science for 24 hours a day (just kidding, there is some time off for eating, sleeping and socializing) as we conduct a series of research projects designed to teach ecological topics and scientific processes. We’ll discuss the results and implications of these projects in informal evening sessions. The focus of the second week will be translating the concepts learned in July to your classroom.

Participants in both courses will conduct an independent research project on an insect system of their choice, with mentoring from U of M scientists and classroom teachers. These projects are carried out during the interim between the two weeks.

A course application is on pages 3-4. You may also download an application from www.monarchlab.umn.edu, or email Karen at oberh001@umn.edu to request a word file or faxed application.

Note: If you have already taken Monarchs in the Classroom, you can take this course. You may also want to check out the other great science classes at the U this summer (see page 5).

We asked teachers if they thought their participation in this course would affect their student’s interest and performance in science; here are a few of their responses:

♦ “Absolutely! My knowledge increased as well as the bag of tricks I would use with students.”
♦ “Most definitely, they will have science embedded throughout the day – how exciting!”
♦ “Absolutely, I will be more enthusiastic and that usually rubs off on students.”

Teachers in the Spotlight: Greg Childs and Rick Olson

Teachers Greg Childs and Rick Olson are Elementary Science/Gifted and Talented Specialists at Galtier Magnet School in St. Paul. Greg and Rick participated in the Monarchs and More Insect Ecology class for upper elementary and middle school teachers last summer at Wilder Forest and the U of M campus. The workshop made their monarch teaching experience more meaningful.

Last fall, Greg focused on using monarchs by assisting them with small group projects for the Insect Fair. “It was fun to see how dedicated the students became while working with their projects. They would come in before class, give up their recess, and eat lunch in the science lab to get more time on their projects.” Greg received many more special project proposals from his gifted and talented students because of their interest in the monarchs, which is what he had been trying to foster all along.

Rick used the various stages of monarchs to introduce the circle of life to his kindergarten students. This group made lots of observations; followed by many “wows” and, “Did you see that?” Rick further developed first grader’s observational skills by giving them multiple experiences with monarchs, from eggs to adults, using the Monarchs in the Classroom K-2 Curriculum Guide. According to Rick, the opportunity for students to view the life cycle of such an awe-inspiring insect is the best way to begin the school year.

To involve their whole school in monarch biology, Greg and Rick built a large cage, 12’ x 6’ x 4’, to house butterflies before they were released. They are now beginning work on the Galtier Insectarium, a museum for insects that will feature student-made insect projects such as collections, dioramas, videos and models.
MONARCHS and MORE: INSECT ECOLOGY
FOR ELEMENTARY AND MIDDLE SCHOOL TEACHERS
2003 Course Application

Please fill out both sides of this application and return by April 16 to Dr. Karen Oberhauser at the address on the back. Contact Karen if you have questions about the application or the workshop.

Name ______________________________
Home Mailing Address ______________________________________
____________________________________
Home Phone _________________________
e-mail ______________________________
Grade level(s) that you now teach ________
# of years teaching experience __________
Highest degree earned (with year) ________
# of credits beyond highest degree ________
Major of highest degree ________________
# of college science courses completed ___

School name _________________________
School mailing address _________________________
____________________________________
____________________________________
School Phone _________________________
School type (circle one)        Elem           MS
(circle one)      Private      Public

I am applying for the (circle one):

ELEMENTARY COURSE       UPPER ELEMENTARY & MIDDLE SCHOOL COURSE

I understand that this course meets July 14-18 (Elementary School) and July 21-25 (Upper Elementary and Middle School) and August 11-15 (both courses) from 8:30 a.m. to 3:30 p.m. each day. As far as I know now, I am available for all of these days and times, and plan to attend the course every day if I am accepted.

Signed _______________________________________________         Date: __________________

IMPORTANT: PLEASE READ AND SIGN THE FOLLOWING

% of students in your school that qualify for free lunch ______
If you are applying in a team with another teacher from your school or district, please indicate his or her name here, and send your applications together. Each team member must complete a full application.
Please answer the following 4 multiple choice and 5 essay questions. We are asking these questions to allow us to choose participants with a mixture of backgrounds and expertise—there are no “correct” answers! All answers will be confidential.

1. Given a choice, I would be the one to teach science to my students. (circle)
   a) definitely no
   b) probably no
   c) probably yes
   d) definitely yes

2. Compared to the amount of time I should spend teaching science, I spend:
   a) much less
   b) slightly less
   c) the right amount
   d) slightly more
   e) much more

3. My science instruction is spent in:
   a) textbook-based presentation only
   b) mostly textbook-based presentation
   c) equal amounts of textbook- and activity-based instruction
   d) mostly activity-based instruction

4. Please rate your effectiveness as a teacher of elementary or middle school science:
   a) superior: one of the best in my building
   b) above average
   c) average
   d) below average
   e) low: in need of professional improvement

Please use a separate piece of paper to answer the following questions, typing your answers if possible and limiting them to about 1/3 page or less per question (you don’t need a separate page for each question, just don’t answer them on this sheet of paper). Please staple the questions to the rest of your application.

1. Do you ever use living organisms in your classroom? If so, what organisms, and how? If not, why not?
2. How do students best learn science?
3. What makes your own science instruction successful or unsuccessful?
4. Please describe your best science teaching experience.
5. (Optional) Is there anything else you would like us to know?

Completed applications should be postmarked or faxed by April 16 to the address below. If possible, please mail both applications together if you are applying as a team.

Dr. Karen Oberhauser
University of Minnesota
Department of Ecology
1987 Upper Buford Circle
St. Paul MN  55108

fax: 612-624-6777
phone: 612-624-8706
e-mail: oberh001@umn.edu
Now more than ever, our nation depends on having informed teachers committed to delivering quality science education to students. The University of Minnesota is working to promote excellence in K-12 science education through access to cutting-edge University science research for teachers.

Courses described here are supported by The Improving Teacher Quality State Grants Program, administered by the Minnesota Higher Education Services Office, the University of Minnesota Summer Science Educators Academy and Monarchs in the Classroom (College of Biological Sciences). These programs focus on using practices grounded in scientifically based research to prepare and support high-quality teachers. All courses include free graduate credits and materials, and are based on best practice, inquiry-based methods. K-12 teachers are essential members of the design and instructional teams for all courses.

**Investigative Plant Biology: (K-6)**
Through observation and investigation, learn plant biology and practice ways to relay plant systems into the classroom.

- Course Dates: July 28 – August 8, Minnesota Landscape Arboretum & St. Paul Campus.
- Request an application from Jane Phillips at 612-624-2789 or janep@umn.edu

**Biology for Inquiring Minds: (K-6)**
Study fish, birds, insects, and plants, focusing on habitat and adaptation, basic anatomy and physiology, and seasonal cycles at the Belwin Nature Center.

- Course Dates: July 28-August 8, Belwin Nature Center & St. Paul Campus
- Request an application from Jane Greenberg at 612-626-2299 or green035@umn.edu

**Investigating Molecular Biology and Biotechnology: (9-12)**
Extract, characterize, and transfer DNA; learn techniques to study the structure and function of DNA; explore the implication of genetic engineering.

- Course Dates: July 14-July 24, St. Paul Campus
- Request an application from Mary Brakke at 612-625-1251 or brakk001@umn.edu

**Elementary Physical Science: (K-6)**
Teaching science doesn’t have to be intimidating; gain confidence in inquiry-based teaching while engaging in hands-on activities, data collection, and analysis using GLOBE and FOSS approaches.

- Course Dates: June 16-June 27, St. Paul Campus
- Request an application from Adrienne Todd-Walden at 612-625-2505 or science@umn.edu

**Biomolecular Lab Experience: (9-12)**
Gain experience in performing laboratory techniques and discuss ethical questions related to bioengineering.

- Course Dates: June 16-June 27, St. Paul & East Bank Campuses
- Request an application from Adrienne Todd-Walden at science@umn.edu

**Earth System Science: (6-12)**
Acquire experience in environmental field methods and sampling protocols using new digital teaching and learning resources to facilitate student inquiry about changing local environmental conditions.

- Course Dates: June 16-June 27, St. Paul & East Bank Campuses
- Request an application from Adrienne Todd-Walden at science@umn.edu

**Mathematics Within: (3-6)**
Build a teacher support system while exploring algebraic processes and their connections to geometric structures.

- Course Dates: July 7-July 18, East Bank Campus
- Request an application from Alexandra Janosek at 612-625-2861 or janos005@umn.edu

**Race, Science and Culture in the Diverse Classroom: (K-12)**
Develop a deep understanding of the biological basis of human physical variation, and link your scientific knowledge to our evolving understanding of how classroom practice can promote equity in the classroom.

- Course Dates: June 16-June 27, St. Paul & East Bank Campuses
- Request an application from Adrienne Todd-Walden at 612-625-2505 or science@umn.edu

**Monarchs and More: Insect Ecology: (K-6)**
Gain confidence and expertise in ecology using insects as model organisms; learn to observe, maintain and collect invertebrates appropriate for classroom use; and explore real world applications of insect ecology.

- Course Dates: July 14-July 18 & August 11-August 15, St. Paul Campus
- To apply, see pages 3-4

**Monarchs and More: Insect Ecology: (4-8)**
As a field biologist at the Eagle Bluff Environmental Learning Center, experience the process of scientific inquiry through hands-on activities with live insects!

- Course Dates: July 21-July 25, Eagle Bluff ELC & August 11-August 15, St. Paul Campus
- To apply, see pages 3-4

For more information on Summer Science at the U of M, see the Science CentrUM website: www.science.umn.edu or contact Karen Oberhauser at oberh001@umn.edu to request a catalog.
MITC Updates

2002 Egg and Larvae Distribution

“Last year I didn’t get larvae from the University, but found enough caterpillars in my yard at home in Superior, as well as in fields in Cable to raise and tag about 30. It was very exciting. I’m hoping to do the same next fall. The milkweed in my yard has been abundant, and so have butterflies. It’s been awesome, and draws curious neighbors and passersby like a magnet,” states Cec Peterson of Nettleton Magnet School. Although you may not be lucky enough to find monarchs in your own backyard, we encourage you to scout out a milkweed patch to search for eggs and larvae. Even if your hunt is unsuccessful, you’ll discover other amazing invertebrates in the milkweed community.

Those of you who ordered monarchs from our lab kept the MITC crew busy. Last Fall, a total of 53,207 immature monarchs left our lab and entered classrooms throughout MN and WI. Some mortality occurred, especially in larvae we shipped via Federal Express, but most teachers reported good survival. We think the mortality was due to sweltering temperatures that caused heat stress in the monarchs traveling by mail. We encourage anyone who can to visit us on the St. Paul campus to pick up monarchs. To help ensure delivery of healthy monarchs next fall, we will postpone shipping in extreme temperatures.

To ensure prompt delivery of monarchs to your classroom, we will affix live organisms stickers to their boxes to alert office personnel of the contents. If your monarchs don’t arrive when you expect them, please call us so we can track your order. We look forward to seeing you in the Fall!

2003 Newsletter

District Workshops

Our summer course is just one way to learn to use monarchs and other insects in your classroom. We also conduct workshops for individual schools and districts. Workshops can take place after school, on weekends, in the summer or on in-service days. The location is also up to you! MITC can come to you or the workshop can be held at the U of M. The length is tailored to your needs: as brief as two hours or up to three days. The more time you have, the more depth and hands-on experiences we can provide.

Workshop components include hands-on stations, where teachers become comfortable handling and caring for monarchs; an introduction to monarch biology: web-site connections, which expand the horizons of the unit far beyond the classroom; and practice using the MITC curriculum with experienced teachers. Workshops are conducted by a proven blend of scientists and expert classroom teachers.

Our curriculum offers a unique opportunity to team teachers in schools with monarch experience with teachers who have little or no monarch experience. Teams can be made up of specific grades or multi-grade levels. MITC will show any size group how to make science more accessible and exciting for teachers and students.

To schedule a workshop or receive a brochure, call us at 612-624-8706.

Distribution Pick-Up Notes

- Transfer larvae from the petri dish to fresh milkweed immediately.
- Use a paintbrush to transfer eggs in a petri dish to fresh milkweed once they have hatched.
- Remember…a monarch’s appetite does not subside over the weekend; take them home!
- Do not leave your monarchs in the direct sunlight or your hot vehicle!

Tips for Teaching with Monarchs

- Pupation Made Easy Chrysalids have a hard time attaching to smooth surfaces. To make your container pupa friendly, cover the lid with construction paper or rub sandpaper on it.
- Simply Sterile To keep cages bacteria free, empty out caterpillar frass and keep a 1/10 mixture of bleach water in a small spray bottle to use for daily cage cleaning.
- Minimize Student Devastation Raise extra larvae to replace any that die.
- Clearly Measured Create clear rulers by copying them on overhead sheets; the clear rulers can be laid on the larva to get a more accurate measurement.
- Milkweed Collector Recruitment Have students bring in milkweed for extra credit stars.
- Get A Good Look Once the larva have formed their chrysalis, hang them on a hanger from the ceiling above each groups area so they can make observations easily throughout the day.

Answers to the front page quiz: 1) Monarch Larva Monitoring Project (MLMP), 2) Tachinid flies, 3) Milkweed tussock moth, 4) Asclepias syriaca
2002 Monarch/Insect Fair

We celebrated insect biology and student achievement at the 6th Annual Monarch/Insect Fair November 23, 2002. The Fair, sponsored by the Medtronic Foundation, was a showcase for 169 students. Many of the projects reflected students’ interests in monarchs’ interactions with their environment: the effects of acid rain on monarchs, how long pupae can tolerate freezing temperatures, monarch predators, and effects of carbon dioxide. The non-monarch projects were exciting too: students learned that milkweed bugs are less active in the morning, and compared insect diversity in their school lawn vs. a restored prairie area. Duluth Middle School Students showcased several “good, bad and ugly” insects in their large display and Minneapolis students worked with the Bell Museum’s Kevin Williams to create a larger than life-size bee hive.

Many projects involved significant tolerance on the part of families. Katie Kust is a good example: In my experiment, I wanted to find out if monarch larvae go high, low, or in the middle, to spin their chrysalides. I let 30 monarch larvae out on our kitchen floor and watched where they went. Some larvae went as high as the ceiling, some went halfway up the wall or cabinets, and some stayed low near the floor to spin their silk buttons. 12 larvae went up “high” (160 cm or more), 10 went “middle” (88 to 112 cm), and 9 went “low” (0 to 42 cm) to spin and pupate. All pupated but 4 did not emerge. I learned that there does not seem to be a pattern for where they spin. They will spin almost anywhere, even on a rubber spatula!

29 teachers from 21 schools brought students to the 2002 Fair! This reflects a strong commitment to providing students with authentic research opportunities. We are grateful to the Medtronic Foundation and participating teachers, students and parents for supporting this program.

Great Question Awards

Anna Kuffel, Willow Creek MS: Does Acid Rain Affect the Developmental Stages of a Monarch Butterfly?
Melissa Brown, Katie Cochrane, Scott Hansen, Eryn Lansverk, B.J. Otto & Nathan Pederson, Sunrise Park MS: Monarch Chrysalis Frost Experiment
Chloe Barak-Ramer, Winona MS: Butterfly “Fingerprints”
Melissa Stephan, Skyview Community School: Drip, Drip, Drench
Devin Burri, Eugene Godnyuk, Elizabeth Robeck & Brigetta Roden, St. Michael Elementary: Where To Hang
Katie Kust, Woodland Elementary: Crawling High, Crawling Low, Where Do the Monarch Larvae Go?
Jorie Grizzle, St. Hubert MS: Prowling Predators
Nick Schafran, St. Hubert MS: Choices, Choices, Choices
Colin Hannigan, St. Hubert MS: It’s an Insect Eat Insect World: Ant-Aphid Relationships
Alyson Borrell, St. Hubert MS: Feeding Frenzy
Brigid O’Leary, St. Hubert MS: Monarch Oviposition and Growth
Bob Dietrich, Nicky Overby, Marlene Richter & Chris Saleh, Amery MS: Carbon Dioxide, A Killer of Monarchs?
Kari Schuetttler, Ordean MS: Effects of Wind on Butterflies
Michael Rydberg & Cody Evans, St. Odilia: Wild vs. Captive: A Battle of Growth
Chris Hammit & Matt Ellison, Cloquet MS: How Does Gender Affect the Strength of the Butterfly?
Laura Fristedt & Maria Littlewolfe, Amery MS: Caterpillars Reaction to Insects
Va Moua, Crossroads Elem: Dew Wings

Outstanding Design Awards

Samantha Ferbutey, Carah Kucharksi & Raquel Roschen-Wimmer, St. Michael Elem: Left, Right, or Middle, Where Do They Eat?
Gracie White, Emily Alper & Margit Westerman, Breck School: Monarch Larvae Get the Blues
Ashley Ehlers & Joshua Titus, Galtier Magnet: Monarch-A Life of Change
Emily Ales, Sara Buchanan, Kelli Fox & Denise Potz, Sunrise Park MS: Maintaining the Weight of Captive Adult Monarchs

Outstanding Project Awards

Robert S. Aldrich, Winona MS: Inverted Chrysalis Experiment
All Wolfe, Erica Nelson & Jessie Meyer, Sunrise Park MS: How Does the Form of Milkweed Affect Monarch Larva Choice?
Kayla Begin & Emere Peterson, Rust Creek Elem: Are you a Morning Bug or a Night Bug?
Jonathan Lantier, Ordean MS: Hungry Butterflies
Anna Kuffel, Willow Creek MS: Monarch Chrysalises: Light vs.Dark
Kaylea Brase, Skyview Community School: Counting Chrysalis Color Choices
Shannon Houg, St. Francis Intermediate: Will Monarch Butterflies Nectar from a Different Mixture of Honey Water?
Dakota-Rae Westveer, St. Francis Intermediate: Monarchs and Their Nectaring Habits
Nick Schafran, St. Hubert MS: Choices, Choices, Choices
Colin Hannigan, St. Hubert MS: It’s an Insect Eat Insect World: Ant-Aphid Relationships
Alyson Borrell, St. Hubert MS: Feeding Frenzy
Brigid O’Leary, St. Hubert MS: Monarch Oviposition and Growth
Anna Kuffel, Willow Creek MS: Does Acid Rain Affect the Developmental Stages of a Monarch Butterfly?
Melissa Brown, Katie Cochrane, Scott Hansen, Eryn Lansverk, B.J. Otto & Nathan Pederson, Sunrise Park MS: Monarch Chrysalis Frost Experiment
Jim Moorhouse, Bridget Foley, Adam Rousar & Zach Kingsley, Sunrise Park MS: Courtyard Insect Diversity: Prairie vs. Lawn
Jessica Palkert & Kelly O’Brien, St. Hubert MS: Egg-Sighting!

Nick Schafran: Choices, Choices, Choices. Nick’s Insect Fair Project advanced to the MN State Science Fair. CONGRATULATIONS NICK! Here’s his abstract:

In my first experiment, I visited Spring Peeper Meadow once a week for three weeks and looked at a total of 50 sprayed and 50 healthy milkweed plants. I recorded the numbers of monarch eggs and larvae on each plant. The sprayed milkweed plants received drift spray from Roundup herbicide used to kill reed canary grass. For the second part, I gave 15 female monarchs three types of milkweed to lay eggs on: healthy, drifted sprayed plants, and directly sprayed plants.

Females laid more eggs on unsprayed plants at Spring Peeper. In the second experiment, 14% of the eggs on directly sprayed plants, 20% of those on drifted sprayed plants and 60% of those on healthy plants survived. Of 213 eggs, 115 were laid on healthy plants, 79 on drifted sprayed plants and 19 on directly sprayed plants. I learned that females prefer healthy milkweed.
**New MITC Products!**

**Life Cycle Cards.** 16 laminated cards highlighting the metamorphosis of the monarch butterfly. Each digital color image is backed by a brief summary of the unique characteristics used for easy identification of the monarch in its four life stages: egg, larva, pupa, and adult. Take identification one step further by learning the key distinguishing characteristics of all five larval instars by comparing differences in size, tentacle length, color patterns, and eating techniques. Cards also list interesting monarch facts and vocabulary, and include methods for sex determination. Use the cards for a fun matching game for students, or as a classroom reference. $8 per set.

![Community Connections](image1.png)

**Community Connections poster.** This 2’ x 3’ display of the key components of a monarch’s habitat is sure to catch your students’ attention and give them insight into the diverse elements that make up an animal’s habitat. Milkweed and flowers on which monarchs depend, predator interactions and seasonal changes which help shape the unique life cycle of the monarch butterfly are all represented in color pictures. Poster comes both laminated and un-laminated. $8 un-laminated, $10 laminated.

![Milkweed, Monarchs and More Field Guide](image2.png)

**Milkweed, Monarchs and More Field Guide** is designed to help students, citizen scientists and others explore the milkweed community. It includes over 300 full-color photos and entries on insects and spiders, which include photos of representative individuals, scientific and common names, identifying features, life cycles, and ranges. Color coded symbols are used throughout the guide to indicate the animals’ roles in the milkweed community. There is an overview of insect and arachnid body structures and explanations of terms and concepts useful for organizing and sharing observations. It also includes an overview of the unique features of the milkweed family—including photos and range and identifying features for 10 of the 110 species found in North America. The information in this 96 page guide can be easily accessed through the table of contents, index, glossary, and references. And to keep hands free in the field, it conveniently fits in your back pocket. $9 per guide.
**LIVE ORGANISMS AVAILABLE FOR MINNESOTA AND WISCONSIN CUSTOMERS ONLY!!**

- **Larvae.** 5-10 per classroom recommended. Instructions for rearing and observing included. We cannot replace larvae that die after leaving our lab or fail to develop into adults.  
  - Summer/fall (each): $1.00  
  - Spring (each): $1.50

- **Eggs.** Approx. 30 eggs on potted milkweed plant or on milkweed leaves packed in a petri dish. Plants CANNOT be mailed. We cannot replace eggs that fail to hatch or that do not develop into adults.  
  - 30 on plant: $14.00  
  - 30 on leaves: $5.00

- **Life Cycle Kit.** Approx. 20 eggs on milkweed leaves, 25 assorted instars, 2 pupae, and 2 adults.  
  - Available June through September (and upon additional request). Orders must be made 2 weeks in advance. We cannot replace any organisms once they have left the lab.  
  - Summer/fall (each): $50.00

- **Overnight Shipping and Handling for Larvae or Eggs.** We only ship larvae or eggs on milkweed leaves in petri dishes. We no longer ship plants with eggs on them, or larvae in cages. Mortality in shipping sometimes occurs, and we encourage teachers to pick up larvae from our lab if possible.  
  - $15.00

**INSTRUCTIONAL MATERIALS**

- **Tub Cages.** Translucent plastic cages with screen top.  
  - $5.00

- **Third Edition Curriculum Guides.** 225+ page curriculum with lessons on life cycle, butterfly systematics, ecology, conservation, experiments, and migration. Separate guides for K-2, 3-6, and Middle School.  
  - $17.00

- **Monarch Larval Field Guide.** A spiral bound, plastic-covered field book with descriptions and drawings of larvae for use in identifying instars.  
  - $7.00

- **Monarch, Monarchs and More, A Field Guide to the Invertebrates in a Milkweed Patch.** A 96 page, full-color, field guide to invertebrates found in milkweed, with index, glossary and table of contents.  
  - $9.00

- **My Monarch Investigation.** A 32 page journal designed to be a permanent, personal record of each student's investigation of the life cycle of the monarch butterfly. The book includes illustrations and photographs covering caterpillar anatomy, habitat and community, life cycle, and migration.  
  - Individual journals: $5.00  
  - Classroom set of 20: $60.00  
  - Additional (over 20): $3.00

- **Classroom Slide Sets.** 23-24 slides per set with script:  
  - Yearly Life Cycle. Summary of individual and migratory cycles  
  - Ecology. Interactions between monarchs and their living and non-living environment  
  - Overwintering Biology and Conservation. Migration, winter in Mexico and CA.  
  - Each set: $20.00

- **Monarch Life Cycle Poster.** Produced by the Midwest Monarch Project, includes photographs of monarch stages from egg to adult. 17x22 inches, laminated.  
  - $9.00

- **Community Connections Poster.** Highlights the components that make up a monarch’s habitat  
  - Unlaminated: $8.00  
  - Laminated: $10.00

- **Life Cycle Cards.** A set of 16 laminated cards highlighting the metamorphosis of the monarch butterfly. Each color image is backed by a brief summary of the unique characteristics used for easy identification of the monarch in all stages of its life cycle.  
  - $8.00

- **Game of Monarch Life.** 22"x28" color, laminated game board. Students trace the life cycle of a monarch through all stages and migration, answering challenge questions as they play. Ages 6-adult.  
  - $17.00

- **Butterfly King Video.** 20 minute video on the development of two monarchs during the summer. Story highlights natural and human-caused risks faced by monarch larvae, and has excellent footage of all stages.  
  - $13.00

- **Saving the Monarchs Video.** 30 minute video produced by KSTP TV describes how students, teachers, and scientists are working together to promote monarch conservation. Beautiful footage of the overwintering colonies.  
  - $10.00

- **T-shirts.**  
  - Monarch Watch. Migrating butterflies front and back. Short sleeves only.  
  - Monarch in the Classroom. Long or short sleeves, butterfly logo on sleeve & quote on back.  
  - Short sleeve: $15.00  
  - Long sleeve: $18.00

- **Monarchs in the Classroom Pencils.** Two designs: monarch larvae and monarch adults on a white background  
  - Individually: $ .50  
  - Set of 30: $10.00

- **Classroom Visits.** 45-60 minutes. Travel costs extra.  
  - $60/hour

- **Teacher Workshops.** One hour to 3 days, before or after school, or on inservice days. Travel costs extra; we will provide curriculum guides plus 10 larvae/teacher for $20.00 per teacher if 10 or more teachers attend. Contact us for details!  
  - $100/hour

- **Monarch Classroom Starter Pack.** Use the life cycle of the monarch butterfly to teach the principles of science. Recommended age range 4th grade up. Includes: 1 Monarchs in the Classroom curriculum guide, 20 My Monarch Investigation journals, 1 Game of Monarch Life, and 1 Monarch Life Cycle poster.  
  - $95.00

**New Items**
MONARCHS
IN THE CLASSROOM
2003 ORDER FORM

NAME AND SHIPPING ADDRESS

__________________________________________________________

Home Phone # __________________________

__________________________________________________________

Daytime Phone # __________________________

__________________________________________________________

Grade level(s) __________________________

__________________________________________________________

E-mail address __________________________

PART 1. LIVE ORGANISMS
MINNESOTA AND WISCONSIN CUSTOMERS ONLY!!

Please place fall orders by August 15. We will fill late orders only if we have
extras. Contact us for availability and instructions if you are ordering larvae
in the spring. Be sure to fill in the box to the right!

QUANTITY COST/ITEM TOTALS

Larvae (see price list for ordering instructions):
summer and fall ___________ x $ 1.00 ______
spring (before 6/21) ___________ x $ 1.50 ______
30 Eggs on milkweed leaves in petri dish ___________ x $ 5.00 ______
30 Eggs on potted milkweed plant (Cannot be mailed) ___________ x $14.00 ______
Life Cycle Kit ___________ x $50.00 ______
Express shipping of live organisms (larvae or eggs) $15.00 ______

LIVE ORGANISMS SUBTOTAL: __________________________

FALL ORDER DELIVERY/PICKUP ARRANGEMENTS
Please check either a or b, and fill in the blanks.

☐ a. I will pick up my larvae/eggs (or __________________
will pick them up for me) at the St. Paul campus on
_________ (specify date before September 13, 2003) at
_________ (time between 9am & 5pm).

☐ b. Please ship my larvae to the address given above to
arrive on ______________ (specify date before September 13,
2003). **Make sure you have added the express shipping charge**

Please Note:
• Contact Monarch Watch (www.monarchwatch.org or
monarch@ukans.edu) if you would like tags.
• We will send you a postcard in August to confirm your order
arrangements and provide you with directions to the campus if
you’re picking up larvae.

PART 2. INSTRUCTIONAL MATERIALS

QUANTITY COST/ITEM TOTALS

Monarchs in the Classroom Curriculum, 3rd edition K-2 ___________ x $17.00 ______
3-6 ___________ x $17.00 ______
Middle School ___________ x $17.00 ______

A Field Guide to Monarch Caterpillars ___________ x $7.00 ______

Classroom slide set with script
• Yearly Life Cycle ___________ x $20.00 ______
• Overwintering Biology and Conservation ___________ x $20.00 ______
• Ecology ___________ x $20.00 ______

Monarch Life Cycle poster ___________ x $ 9.00 ______

Monarch Classroom Starter Pack ___________ x $95.00 ______

My Monarch Investigation
Individual Journal ___________ x $ 5.00 ______

Classroom set of 20 ___________ x $60.00 ______

Additional Journals (over 20) ___________ x $ 3.00 ______

The Game of Monarch Life ___________ x $17.00 ______

Butterfly King video ___________ x $13.00 ______

Life Cycle Cards ___________ x $ 8.00 ______

Monarchs in the Classroom pencils
individually ____ larvae ____ adults x $ .50 ______

Set of 30 ____ larvae ____ adult ____ mix x $10.00 ______

Milkwed, Monarchs and More ___________ x $ 9.00 ______

Saving the Monarchs video ___________ x $10.00 ______

Monarchs in the Classroom t-shirts
Long-sleeved:
QTY EA: ___M ___L ___XL

Total qty: _______ x $18.00 ______

Monarch Watch T-Shirts
QTY EA: ___M ___L ___XL

Total qty: _______ x $15.00 ______

Plastic tub cages ___________ x $ 5.00 ______

Community Connections poster
unlaminated _______ x $ 8.00 ______
laminated _______ x $10.00 ______

INSTRUCTIONAL MATERIALS SUBTOTAL: __________________________

TOTALS for ORDER:

INSTRUCTIONAL MATERIALS SUBTOTAL: __________

SHIPPING FOR INSTRUCTIONAL MATERIALS: __________

LIVE ORGANISMS SUBTOTAL: __________

TOTAL: __________________________

Dr. Karen Oberhauser
Department of Ecology, Evolution and Behavior
University of Minnesota
1987 Upper Buford Circle, St. Paul MN  55108
Fax 612-624-6777, Phone: 612-624-8706, e-mail oberh001@umn.edu.

Order recd _______ Date pd _______ Amt recd _______ Date mailed _______ PO#_________ Inv amt__________
Milkweed Community Matching Game

Test your knowledge of invertebrates commonly found in the milkweed community by matching the organism in the list with the statement describing its behavior or characteristic listed below. (Answers at the bottom of the page.)


a. This insect secretes honeydew through cornicles at the back of its abdomen.
b. This well-known beetle’s larvae resemble tiny alligators which prey upon aphids and small caterpillars.
c. A caterpillar predator, this insect feeds on the honeydew produced by aphids, in turn offering them protection from predators.
d. This orange Coleoptera with elbowed antennae is frequently mistaken for a milkweed bug.
e. The egg and larval stage of this butterfly can be easily mistaken for a monarch’s.
f. This Hemiptera (true bug) discharges a foul smelling fluid when disturbed and preys upon monarch caterpillars, dissolving their tissue with saliva.
g. The caterpillars of this insect feed in fuzzy clutches, skeletonizing milkweed leaves.
h. This insect’s nest can be found on eaves of buildings, porches or other outdoor structures. They often prey on large monarch caterpillars.
i. This Lepidoptera has aposematic coloration that mimics the monarch.

j. The only insect to migrate over 2000 miles to the same area each year.
k. The main food source for this insect is mature or maturing milkweed seeds.
l. With a long snout, the female of this species chews an elongated hole in the milkweed stem to deposit her eggs.
m. This Dipteran parasitoid lays its eggs on the caterpillar’s body and the developing maggots devour the monarch from the inside out.

Name that Milkweed!

Answers:
1) Common milkweed: *Asclepias syriaca*
2) Swamp milkweed: *Asclepias incarnata*
3) Showy milkweed: *Asclepias speciosa*
4) Tropical milkweed: *Asclepias curassavica*
5) Butterfly weed: *Asclepias tuberosa*
Our 2002 newsletter provided an update on the effects of a winter storm that killed millions of overwintering monarchs in January 2002 (see archived newsletter at www.monarchlab.umn.edu). Samples of dead butterflies collected after this storm led to estimates that up to 80% of the population died in the storm’s aftermath, and the Eastern migratory population may have been smaller than at any time since scientists began estimating monarch numbers. Since small populations are more vulnerable to environmental perturbations, there was great concern as the monarchs left their winter home for their spring and summer breeding grounds last March. Although numbers were lower than average, many observers reported seeing monarchs during this period. In the Upper Midwest, which is probably the origin of most monarchs that migrate to Mexico, numbers were lower than average, but still within the range of values found during other years of the project (see graph). Volunteers in the Northeast and East saw very low numbers and a late return to their region. Everyone waited eagerly to see how numbers would look during the fall migration and overwintering periods.

Mike Quinn, entomologist with Texas Parks and Wildlife and Texas Monarch Watch, reported that the fall migration through Texas got off to a bad start. Hardly anything was seen before October 1, which was later than in previous years. Texas observers usually see two somewhat separate migrations, one along a central corridor, and another, usually later, along the coast. According to Quinn: “In spite of occasional mentions of large numbers, the general consensus was that the migration along the central corridor was much diminished in comparison to years past.” However, “by the end of October thousands were being sighted in Monterrey Mexico and the coastal migration was beginning to heat up, also somewhat later than usual.” Quinn said that “the general consensus for the coastal migration was the opposite of that for the central flyway; the coastal migration appeared to be one of the largest ever.” These observations contradicted previous hypotheses about the origin of monarchs in the two Texas flyways; Dr. William Calvert had hypothesized that the central corridor migration consists of monarchs from the Midwest and the coastal flyway represents butterflies that have bred in the East. This doesn’t match the relative numbers of monarchs observed in the Midwest (high numbers of larvae but few adults in the central flyway) and the East (low numbers of larvae but many adults in the coastal flyway) during the 2002 breeding season.

Almost all monarchs from the eastern migratory population overwinter in Mexico (a few stay in the US), and winter is thus the time that we can most accurately assess the size of the population. The Monarch Butterfly Biosphere Reserve has monitored and mapped monarch colonies for the last ten years. This year, Reserve Director Marco Antonio Bernal and biologist José María Suárez led the monitoring project with assistance from a team of researchers and students headed by Calvert and Dr. Isabel Ramirez from the National Autonomous University of Mexico. This international research collaboration was supported by the Monarch Butterfly Sanctuary Foundation and World Wildlife Fund’s Mexico Program. The colonies occupied an area of approximately 8 hectares, or nearly 20 acres in the winter of 2002-2003. The average area occupied by the monarchs from 1993 to 2001 has been approximately 9.6 hectares, and just before last year’s storm reserve biologist Eligio García reported an occupation of 9.35 hectares. Thus, this year’s reported 8 hectares may be considered a recovery in the mid range in comparison to annual averages in past years.

The 2001-2002 winter and subsequent summer and winter provide a good example of how important it is to document monarch numbers at several stages during their annual cycle of breeding, migrating and overwintering. The dramatic mortality that occurred in 2002 also pointed out the vulnerability of monarch populations. Illegal logging continues in Mexico’s butterfly sanctuaries, making the monarchs vulnerable to storms and loss of habitat. It is important to support efforts to halt this logging, as well as protect the breeding and migratory habitats during the spring, summer and fall. Organizations working to do this include the Monarch Butterfly Sanctuary Foundation (www.mbsf.org) and the Michoacan Reforestation Fund (www.michoacanmonarchs.org).
The U of M Monarch Lab is a busy place, with lots of people doing research, keeping Monarchs in the Classroom and the Monarch Larva Monitoring Project going and conducting workshops. Here’s our “Christmas card” summary of some of the things that happened here during the past year.

Jolene Lushine graduated from the U of M with a Biology degree, and joined our lab full time as a research and outreach coordinator. She’s keeping track of orders that come in, making sure that we’ll have the right number of monarchs when we need them, and keeping everything running smoothly.

Cindy Petersen, on sabbatical from her job as a middle school teacher at St. Hubert’s school in Chanhassen MN, is also here full-time working on the Monarch Larva Monitoring Project, conducting workshops and participating in all of the day-to-day research and outreach activities.

Master’s student Beth Lavoie completed her degree. Beth studied how milkweed plants with different amounts of nitrogen affect monarch growth and development. Monarchs fed plants with less nitrogen took longer to develop than those fed nitrogen-rich plants, but they eventually were just as large.

PhD student Michelle Solensky is almost finished with her study of the factors that affect mating success and sperm utilization in monarchs. She spent long hours in the lab this summer doing a huge experiment that involved studying the outcome of matings between individuals with specific genotypes and phenotypes, collecting eggs, and assigning paternity.

Breck High School student Trisha Dwivedi worked in our lab all summer, and conducted her own study of the effects of common garden insecticides on monarch development. She found that although most larvae survived when fed milkweed that had been sprayed with pesticide 1 or 2 weeks earlier, their growth was impaired and emerging adults weighed less and had smaller wings than those that were fed unsprayed milkweed.

Radamas Gonzalez Ramos, an undergraduate student from Puerto Rico, spent the summer in our lab studying the number of sperm transferred by male monarchs. This entailed long nights in the lab, since he needed to catch mating pairs as they separated in the wee hours of the morning. He and Michelle Solensky learned a lot about the two kinds of sperm transferred by male monarchs: apyrene (without a nucleus) and eupyrene (with a nucleus). They found that males transfer about 1.5 million apyrene sperm and 70,000 eupyrene sperm on average during each mating!

Sonja Lin, a U of M undergrad, studied the effects of heat stress on male monarch fitness. She was particularly interested in whether a male’s genotype affects the ability of his sperm to fertilize eggs when males are subjected to either normal or extremely hot temperatures.

Erik Lam, another U of M undergrad, assigned the genotypes of tens of thousands of eggs, which allowed us to determine which male fertilized a female’s eggs after she had mated with two males.

Heather York, former U of M undergrad and current grad student at the U of KS, and Karen Oberhauser published a paper on the effects of heat stress on monarch larval growth and development. This study showed that short bouts of extremely high temperatures are not harmful to monarchs, but that long-term exposure, particularly in the pupa stage, is almost always fatal. This work has important implications for effects of global climate change on monarchs and other insects.

Liz Goehring, former Master’s student and current outreach coordinator for the RIDGE program at Penn State, and Karen Oberhauser published a study of environmental cues that trigger diapause in monarchs. They found that a combination of temperature, daylength and host plant age are all important factors.

Ted Sands (until September) and Brij Bhassin (after September) have taken care of all of the technology required to keep our databases and computers functioning. Ted also joined us in the field for larva monitoring last summer, and Brij plans to make the same foray from his world of computers to a milkweed patch next summer.

Karen Oberhauser and Michelle Solensky spent much of the year editing Monarch Butterfly Biology and Conservation (see book reviews), and are happy to have that job almost behind them. Karen also worked with Ba Rea and Mike Quinn on the new field guide to milkweed patch denizens (see book reviews).

Lis Young-Isebrand was here as a program coordinator until she left to have a baby in August. She and her growing family are doing well, and we look forward to having her back! Betsy Chastain, former program coordinator, just had a second son, and continued to work on MITC projects for much of last year.

Former grad students Michelle Prysby and Sonia Altizer are working at the Great Smokey Mountain Institute at Tremont (in Tennessee) and Emory University in Atlanta, respectively.

We’ve all worked on the Monarch Larval Monitoring Project, monitoring our own sites, conducting workshops all over the country, setting up the website and entering and analyzing data. We gave lots of Monarchs in the Classroom workshops over the course of the year, and are excited about everything that will happen in the next year.
More About Monarchs: Websites and Products

There are lots of great websites with information on monarchs and other butterflies. Here are some of our favorites:

**Monarch Sites**
- Monarch Lab [www.monarchlab.umn.edu](http://www.monarchlab.umn.edu) – Monarchs in the Classroom site, a forum for monarch research by scientists and students with background information, research reports, resources for teachers, and collaborative research opportunities
- Monarch Larva Monitoring project [www.mlmp.org](http://www.mlmp.org) – data sheets, directions and results from the MLMP; artistic contributions by participants
- Monarch Watch [www.MonarchWatch.org](http://www.MonarchWatch.org) – a comprehensive site dedicated to education, conservation, and research on monarchs
- Journey North [www.learner.org/jnorth](http://www.learner.org/jnorth) - a site devoted to tracking the migrations of many wildlife species
- Monarch Monitoring Project [www.concord.org/~dick/mon.html](http://www.concord.org/~dick/mon.html) – a history of past monarch migrations
- Monarch Butterfly Sanctuary Foundation [www.mbsf.org](http://www.mbsf.org) – dedicated to preserving the monarch overwintering grounds in Mexico

**Butterfly Sites**
- North American Butterfly Association [www.naba.org](http://www.naba.org) – a site dedicated to increasing public enjoyment and conservation of butterflies
- The Butterfly Website [mgfx.com/](http://mgfx.com/) – a source of good information on butterflies, from the best in the world.
- Journey North [www.learner.org/jnorth](http://www.learner.org/jnorth) – a site devoted to tracking the migrations of many wildlife species
- Monarch Migration Project West [mmpwest.com](http://mmpwest.com) – a site dedicated to increasing public enjoyment and conservation of butterflies
- MonarchWatch.org
- Monarch Migration Project West (MMPWEST) Monarch Migration Project West is a great opportunity for youth environmental groups in the western range to come up with a service or research project; they’ll provide funding for appropriate projects (up to $1000 per group) for youth environmental groups in the western range of the monarch butterfly. To learn more about the project contact Anna Marchini at MMPWest, Metrocenter YMCA, 909 4th Ave., Seattle WA 98104 or visit www.mmpwest.com.
- Monarch Watch Would you like to help learn more about monarchs’ fall migration and catch and tag butterflies each fall? If so, join Monarch Watch, an educational outreach program at the University of Kansas that includes a cooperative study of the monarchs' spectacular fall migration. Last fall, more than 100,000 students in 39 states and 3 Canadian provinces tagged and studied over 76,000 Monarchs through this program. Find out more at www.monarchwatch.org.
- Journey North Participate in a study (and celebration) of the return of spring by reporting observations of many migratory organisms and other signs of spring. Journey North provides frequent updates on all of the organisms that are part of the study as they migrate south in the fall, and overwinter in sites throughout the world. Journey North volunteers, who include thousands of schoolchildren, have made important contributions to our understanding of monarchs’ spring migration. Learn more at www.learner.org/jnorth.

**Great Stuff to Buy**
- Bioquip Products [www.bioquip.com](http://www.bioquip.com) - Equipment, supplies and books for entomology and related sciences.
- Butterfly Encounters [www.milkweedseeds.com](http://www.milkweedseeds.com) - A source of many kinds of milkweed seeds and good information on monarchs.

**Butterflies and Citizen Science: Opportunities Abound!**

**Monarch Larva Monitoring Project**
Do you poke around in the garden as soon as the perennials emerge looking for the first signs of milkweed? Is sighting the first monarch egg cause for celebration? If you answered “yes” to either of these questions, or wish you had, the Monarch Larva Monitoring Project (MLMP) is looking for you.

The MLMP includes volunteer citizen scientists from across the country collecting data on monarch egg and larvae distribution and abundance along with milkweed and habitat characteristics and parasitism rates. Joining this group of volunteers is an exciting way to contribute basic knowledge about monarch population dynamics and foster monarch and habitat conservation. To learn more, visit [www.mlmp.org](http://www.mlmp.org).

**North American Butterfly Association**
Monarchs are great, but there are thousands of other interesting butterfly species. One way to learn more about your butterfly neighbors is to join the North American Butterfly Association (NABA), a membership-based organization working to increase public enjoyment and conservation of butterflies. The NABA website has links to timely topics related to the survival of individual butterfly species or insects in general (such as insecticide spraying to kill mosquitoes that may carry West Nile Virus), background on conservation implications of Butterfly Releases, and a wonderful catalog of North American Butterfly Images.

Possibly the most popular NABA activities are their annual butterfly counts. During these summer counts, volunteers conduct a 1-day census of all butterflies sighted in their count area. The NABA website includes maps and tables with the location and compiler information for the counts, as well as highlights from recent counts. If there is no count in your area, you may start your own or inspire a nature center or butterfly club to start one for you! See [www.naba.org](http://www.naba.org).
Our attraction to monarchs and the conservation and scientific interest they have engendered have increased our knowledge of the natural world and our concern about preserving it. This strong connection between people and butterflies has led to four international conferences on monarch biology and conservation: in Morelos Mexico (1981), Los Angeles CA (1986), Morelia Mexico (1997), and Lawrence KS (2001). Excellent books were published on the 1986 and 1997 conferences, and Monarch Butterfly Biology and Conservation, a compilation of presentations from the 2001 conference, is forthcoming.

This summary of current knowledge of all stages of the monarch’s annual cycle includes contributions from the 1000’s of Citizen Scientists participating in the Monarch Larva Monitoring Project, Journey North, and Monarch Watch. MLMP and Journey North data are published for the first time in this volume. The book also contains the first full reports on the creation of a larger protected area in the Mexican overwintering sites and the 2002 winter storm in Mexico that killed hundreds of millions of overwintering monarchs.

The volume, edited by Karen Oberhauser and Michelle Solensky and published by Cornell University Press, will be of interest to all with a fascination with monarchs. It will be a wonderful resource for classroom teachers looking both to satisfy their own curiosity and teach their student more. Papers range from insightful descriptions of new findings to scientifically technical reports, and the volume as a whole presents fascinating information comprehensible to anyone with a modest science background. Introductory chapters to each section make the volume easy to navigate for non-scientists, bringing the reader up to speed with the biology covered in the section and touching on the highlights of each chapter.

Monarch Butterfly Biology and Conservation will be available in early 2004. Contact Karen Oberhauser (oberh001@umn.edu) if you’d like information on obtaining a copy.

A note from the author of Milkweed, Monarchs and More: A Field Guide to the Invertebrate Community in the Milkweed Patch

Karen Oberhauser, Mike Quinn and I would like to present Milkweed, Monarchs and More, a tool for anyone interested in exploring the milkweed patch.

I’ve been making annual pilgrimages to milkweed patches in search of monarchs for over 30 years. Lately, I’ve met a lot of other people with the same passion. Some joined Dr. Fred Urquhart’s migration study 1960s. Others were drawn in by personal experiences. Monarchs in the Classroom, Journey North and Monarch Watch have attracted monarch enthusiasts and given us a way to meet each other and share our observations. Milkweed, Monarchs and More is a product of this community.

Although it grew up on my computer, this guide contains the knowledge, experience and images of observers and experts from all over the continent. The project was Karen’s vision. She helped correct and fine tune my understanding of the phenomena I wrote about. Mike guided me through taxonomy and systematics, and tracked down experts to answer any questions he couldn’t. He found Pat Dailey, an entomologist who contributed high quality images. Images came in from many other people as well. Karen, Cindy Petersen and I have edited and re-edited the field guide to ensure its consistency and accuracy.

I’ve introduced many teachers and students to milkweed, monarchs, milkweed bugs, milkweed beetles, the voracious appetites of tussock moth caterpillars, the murderous tendencies of wasps and the sneaky tachinid flies. I spent hours in my milkweed patch identifying the visitors and noticed things I never had before, and discovered how little is known about many of these organisms.

I hope that this book will help you and your students better understand what is happening in your milkweed patch, and inspire you to discover things you have never seen before.

Mothering an Angel

By Patsy Keech (review by K. Oberhauser)

Mothering an Angel doesn’t have a strong science component, but it has a strong connection with monarchs. 5 years ago Patsy Keech called me to request butterflies to release at a fundraiser called Derian’s Dash. She briefly described the project, but I was only half-listening as I told her that we rarely provide adult monarchs for events, but would sell her eggs or larvae to raise herself for a fraction of what it would cost to buy adults. Most people requesting butterflies say ‘no thanks’ at this point, but Patsy persisted. About a month later she and her son Connor came to our lab to pick up over 100 larvae.

Two years before I met her, Patsy’s son Derian died from C.H.A.R.G.E., a syndrome that affects both physical and mental development. He underwent 11 surgeries during his 2.5 years. After his death, Patsy and her husband founded an organization that offers support to families with critically ill children. The Spare Key Foundation offers one-time grants towards mortgage payments, allowing parents to take time from work to be with their ill children.

Mothering an Angel, the story of Derian’s life, is painful, but Patsy channeled the unimaginable grief of losing a child into an energy that has benefited hundreds of other families. I cried as I read her story, but laughed with my daughters as I read aloud the story of her family’s experiences as they raised over 100 caterpillars. “The next morning we headed straight for the kitchen…. It was amazing to see how much the caterpillars had grown and eaten during the course of the evening... We used to joke with Connor, ‘One morning the caterpillars might wake you up by knocking on your door and asking you to get more milkweed.’ Connor kept an even closer watch on them.”

Patsy’s observations reflect the attentiveness with which she observes her world: “The head slowly popped out, then the legs, and then the body dropped from the chrysalis. Only the wings remained in the chrysalis. To complete this final separation, the butterfly planted its feet on the base of the chrysalis and pulled out one wing at a time.” As she watched this, Patsy wrote: “My pondering mirrored my journey with grief. The parallels between the transformations I had witnessed echoed the journey I began after Derians’ death.”

Sparke Key sponsored the 5th Derian’s Dash, a 5K Run/Walk, in 2002, and 5 families helped the Keeches raise 150 monarchs. Derian’s Dash 2003 will be on Aug 2nd. See www.sparekey.org to learn about the run or the Spare Key Foundation, or to order Mothering an Angel.
We’re On The Web!
WWW.MONARCHLAB.UMN.EDU

2003 Monarchs and More
Course Application Inside: Apply by April 16!
See our exciting new monarch products!