
INSECT MIGRATION STUDIES

Volume 27 1990



Annual Report

UNIVERSITY OF TORONTO . SCARBOROUGH CAMPUS

Annual Report to Research Associates

Insect Migration Association
1990

UNIVERSITY OF TORONTO SCARBOROUGH CAMPUS

Scarborough Ontario Canada M1C 1A4

TABLE OF CONTENTS

Page

To the Associates-----	1
Hurricanes and Tornadoes-----	3
Small Monarchs-----	3
Membership Renewal Form-----	4
Letter from Mary Henshall-----	5
Recapture Records for 1989-----	7
Sighting of Spring Migrants-----	9
First Eggs or Monarchs Observed-----	10
Fall Migration Observations-----	10
Miscellaneous Observations:---	11
Publicity-----	11
Breeding Ground Population Size-----	12
Use of the Word "Locus."-----	12
Yellow Pupa..-----	12
Population Distribution Map-----	13
Questionnaire-----	14
Special Donors-----	15
Special Activities-----	15
Alls Well in Mexico-----	17
Research Associates-----	18

THE MONARCH BUTTERFLY
THE UNITED STATES NATIONAL INSECT

We have been approached by Douglas Sutherland of the Entomological Society of America to assist in bringing to the United States government the proposal to establish the Monarch Butterfly as the United States National Insect.

Early settlers in America from England and Holland named the monarch butterfly after King William, Prince of Orange, Shareholder of Holland and later King of England - its orange colour no doubt suggesting the name. From William we also get the vernacular "King Billy."

The monarch butterfly is a unique insect because it migrates over thousands of miles from breeding grounds to overwintering sites in Mexico and California.

By far the largest populations of monarch butterflies breed in the United States; Hence, one may consider the United States its home.

The larvae, or caterpillars, feed upon a number of species of milkweed which plants are gradually being eradicated through the indiscriminate use of herbicides and the removal of arable land for the construction of buildings, roads and highways. As we protect the monarch butterfly on its overwintering sites it is necessary to propagate milkweeds otherwise there will be a marked reduction in population.

As the magnificent Bald Eagle has gained considerable protection as the United States national bird, so might the beautiful monarch butterfly be given protection.

IT IS PROPOSED THAT THE MONARCH BUTTERFLY BE DESIGNATED THE UNITED STATES NATIONAL INSECT. A BILL (H.J. RES. 411) HAS BEEN INTRODUCED INTO THE HOUSE OF REPRESENTATIVES BY CONGRESSMAN LEON PANETTA OF SANTA CRUZ, CALIFORNIA. FOR A COMMEMERATIVE BILL SUCH AS THIS ONE, IT IS NECESSARY TO HAVE 218 COSPONSORS IN THE HOUSE AND 51 IN THE SENATE JUST TO BRING IT TO THE FLOOR FOR VOTING..

MAY WE SUGGEST THAT YOU WRITE TO YOUR CONGRESSMAN SUPPORTING THE BILL. PERHAPS OUR ASSOCIATE TEACHERS MIGHT ARRANGE FOR THEIR STUDENTS TO WRITE TO THEIR RESPECTIVE CONGRESSMAN ABOUT THIS PROPOSAL.

WE WILL REPORT ON YOUR ACTIVITIES IN THIS REGARD IN OUR NEXT ANNUAL VOLUME OF INSECT MIGRATION STUDIES.

FOR FURTHER DETAILS PLEASE WRITE TO:

Dr. Douglas Sutherland,
Entomological Society of America,
9301 Annapolis Road,
Lanham, Maryland. 20706-3115.

Doug. Sutherland is one of our associates. He is Chairman of the National Insect Subcommittee. He will be most pleased to hear from you.

Sincerely: Fred and Norah Urquhart

To the Associates
From
Norah and Fred Urquhart

When we started the monarch investigation over 50 years ago we little realized the many side-effects our studies would engender. The monarch butterfly is now well known the world over as the "migrating butterfly" as a result of our efforts. Over 5000 magazine and newspaper articles have been written about it; Researchers have carried out numerous investigations on various aspects of the anatomy and physiology. Many schools now make the study of the monarch a part of their natural science course; Students having been introduced to the study of insects through participation in the tagging program, have graduated from universities, many with post-graduate degrees, to make the study of entomology their life's work; Conservation areas have been set aside in many localities throughout the United States and Mexico; Loci of the overwintering monarchs in Mexico are now protected; Thousands of tourists visit the overwintering monarchs in Mexico bringing a modicum of prosperity to the local inhabitants who cater to the tourists; Notepapers, cards and postage stamps now bear the monarch butterfly motif; The Entomological Society of America and other participating groups are approaching the U.S. government to establish the monarch as the National Insect. It all started in 1937 when the first monarch butterfly was alar tagged and flew the remarkable distance of 40 miles. The members of our Association, past and present, can take credit for this remarkable discovery, a butterfly that migrates like a bird.

Norah and I recently attended a symposium on "Animal Behaviour" held at the University of Montreal Quebec, Canada. Fred gave a short address concerning our studies of the monarch butterfly. A professor sitting in the audience directed a question: "I'm surprised that no one had previously reported on the presence of the monarch butterflies in Mexico," intimating that we had taken more credit for the discovery than was due. Fred succinctly replied: "So am I." which caused a ripple of laughter in the audience. This incident prompts us to give the following explanation of the discovery to our associates.

We were not the first to witness this amazing phenomenon of countless thousands of monarch butterflies clinging to the coniferous trees on the mountains in Mexico. Undoubtedly, the Aztecs knew about it. It has been written that they considered the arrival in the autumn of the monarch butterflies as the return of spirits from the dead. The native people now living in the area knew about it. So, to state that we discovered the site of the overwintering monarchs is the wrong use of the word "discover". Then what did we accomplish?

When we started our investigation no one knew where the monarchs went when they left the United States and Canada in the fall migration. Many suggestions were put forward all of them now known to be erroneous. By the use of the alar tagging system and the voluntary assistance of over 4000 research associates over the past many years we finally traced the migratory route to Mexico thus connecting the overwintering site to the breeding areas. In the course of the investigation we were able to learn a great deal more about the monarch as presented in the book: The Monarch Butterfly: International Traveller.

In the course of our investigations we travelled many thousands of miles across the United States and Mexico in search of the migrants. We made enquiries at secondary schools, colleges and universities in the southern United States and Mexico. We wrote numerous letters to individuals - especially entomologists. No one knew where the monarch butterflies congregated in great numbers. We wrote articles in Spanish and English which were published in Mexican newspapers and magazines. We asked for assistance in solving this mystery. One person, Kenneth Brugger wrote to us offering his assistance. Although Mr. Brugger knew nothing about butterflies - he worked in a garment manufacturing company as an engineer - he quickly learned to identify the monarch and its larvae. We hired Mr. Brugger and later his wife as our field assistants. With much correspondence - since university commitments prevented our taking part in the search - we finally guided the Bruggers to the Angangueo region where the first locus of countless thousands of monarchs were discovered. The rest is history.

But the investigation is far from complete. We still do not know the relationship between the twelve known loci and the various breeding areas. Do monarchs from one breeding area go to one specific locus? We still do not know where the migrants that pass down the Yucatan Peninsula of Mexico spend the winter - we suspect that they congregate somewhere in the mountains of Guatemala. We still do not know the final destination of migrants from breeding areas in the north-eastern United States. Of the many thousands of monarchs already tagged not one significant recapture has been obtained. We still have not been able to obtain a recapture of a spring migrant returning to the breeding grounds where it spent its larval period. We have, as indicated in the Monarch book, had recaptures of a few individuals that had spent the winter in Mexico and were returning to the original breeding area - this conclusion by extrapolating the route from Mexico to the place of recapture. We are hoping that some day a tagged specimen will be recaptured in the same area where it was already tagged.

Some day we may find the answer to the above. In the meantime the beautiful monarch butterfly continues to involve and interest thousands of people throughout the world who are amazed that such a seemingly frail creature could possibly travel thousands of miles from breeding grounds to overwintering sites and return.

HURRICANES AND TORNADOES

We have experienced the effect of strong winds associated with hurricanes on monarch butterflies while we were engaged in following their movements along the shore of the Gulf of Mexico. The majority of specimens we collected - intending to attach tags to their wings - were badly damaged many of them capable of flying only short distances. Hundreds of migrants are frequently washed up on the shore of Lake Ontario due to strong winds not associated with hurricanes and tornadoes.

Monarch butterflies in flight may be compared to ships at sea both capable of being buffeted by air or water. So long as the monarchs remain airborne they can withstand strong winds. However, downdrafts associated with hurricanes and tornadoes can force the monarchs into the water where wave action can cause damage to the wings or being dashed against objects such as bushes and trees. Under such strong wind conditions the monarchs seek shelter in the foliage of trees and bushes or among tall grasses. We witnessed such an event along the south shore of Texas in the vicinity of the Bolivar Peninsula. In the absence of trees and bushes along the sand dunes the migrants sought shelter in the tall grasses. With the passage of the storm and subsequent clear sunny weather thousands of monarchs passed down the peninsula in an awe-inspiring stream capable of flight thanks to the protection of the tall dune grass.

Migrants can forecast approaching storms (See Monarch Butterfly: International Traveller: Pages 134-136).

Thus these seemingly frail little butterflies have been able, over the eons of time, to survive the onslaught of storms as they travel thousands of miles from breeding grounds to overwintering sites.

SMALL MONARCHS

Some of our associates have reported having seen a considerable number of unusually small specimens. There are two possible causes for this: genetics or limited food supply at high temperatures.

Genetics: This occurs when a monarch with the gene complex SS mates with one with the same gene complex producing SS offspring. If N stands for normal then the following combination of genes would produce normal offspring: NS, NN.

Limited Food Supply at High Temperatures: When a larva issues from the egg metabolic activity commences immediately. It is as if the larva, like a mechanical toy, had been wound up ready for activity. The rate of growth starts slowly gradually increasing in speed during the last two instars accompanied by a voracious appetite (See Monarch Butterfly: International Traveller; Page 21). This entire process is slower at low temperatures as compared to high temperatures. If the larva is exposed to unusual high temperatures growth rate is accelerated. If food is abundant normal butterflies result. In the absence of a sufficient food supply growth rate continues but produces stunted individuals.

You can test the validity of this by placing larvae so that they are exposed to direct sunlight so as to absorb the maximum amount of radiation and limiting the food supply, especially during the last two instars (see Monarch Butterfly: International Traveller for instar description).

MEMBERSHIP RENEWAL FORM: 1990-1991

Please fill out the following form and send to:

Professor F. A. Urquhart,
Scarborough Campus,
University of Toronto,
1265 Military Trail,
Scarborough, Ontario, Canada: M1C 1A4.

Based on present costs of such items as postal charges, stationery supplies, translations, printing and preparation of the Insect Migration Studies report, secretarial assistance, etc. a donation to the research fund - held in trust by the University of Toronto - of \$20.00 for an individual and \$25.00 for group participation (schools, clubs, camps, etc.) is suggested. This research is carried out on a purely voluntary arrangement; it is not supported by any outside granting agencies.

Name: _____

Address: _____

_____ : Zip Code _____

If you live in a rural district please indicate the nearest town or city so that we may record release-recapture lines on the migration map. Nearest City or Town:.. _____

Occupation: _____

Since the Monarch butterfly has a wide appeal, it is of interest to members of the IMA to have a record of occupation: It is also of interest in popular articles.

Age if under 18: _____

Make donations payable to: Insect Migration Studies: Amount \$ _____

Number of tags required _____ If necessary please call: 1-416-287-3138.

Serial numbers of tags still on hand _____

When did you receive a copy of this report? _____

Please order alar tags prior to July 1st since we are usually on field studies and may not be able to fulfill your order until September.

We look forward to your continued participation:

Date: _____

A LETTER FROM MARY HENSHALL

We received the following letter from Mary Henshall who lives in Nampa Idaho addressed to the children who recaptured two of her butterfly. One of the butterflies was recaptured in Orem, Utah and the other in Ventura, California. We asked Mary if we might share her letter with our associates.

Dear Josh, Shayna, Brandy, Nicky:

My name is Mary Fujii Henshall, and I am excited to introduce us all around. Josh and Shayna Rosenberg live in Ventura, California which is 50 miles north of Los Angeles. Brandy and Nicky Oveson live in Orem, Utah, which is southeast of Salt Lake City. And I live in Nampa, Idaho, 25 miles west of Boise.

Brandy is 10 years old, has red hair, is 4 feet 10. Nicky is 13. I don't know how old you are, Josh and Shayna--let me make a wild guess--hm, let's see--Josh is 10 and Shayna is 8. Pretty wild? You must tell us! Me? Well...I am much older. I am a retired school teacher, a grandmother. Wow! But I am pretty lively. I walk or jog and ride an exercise bike. I am 5 foot one, weight 103 pounds.

Does my picture tell you why I am writing? I am the one who raised, tagged and released the Monarch butterflies you caught. I learned all about Monarchs from Fred and Norah Urquhart in Canada, and I think they have probably written you about your butterflies. To learn more about them find a copy of the August 1976 National Geographic with their excellent article and pictures. They have written many books and articles about the things they discovered about this amazing butterfly.

Their butterflies and the ones from the East coast and the midwest migrate to Mexico. The ones from Idaho migrate to California. #78237 that you found, Brandy and Nicky, was on his way. I released him and seven others on October 6. So he had been "on the road" for 15 days. Isn't that amazing?

Josh and Shayna, I released yours, #78203 on Sept. 26,

along with 5 others. You found him on New Year's Day, so he had been travelling and sight seeing for 3 months--enjoying your beautiful warm weather. Here in Nampa where he grew up the snow was 10 inches deep. ^{on Jan. 1} I had a terrible time getting to the Boise airport, 25 miles through snow and fog for my trip to visit my Washington D.C. daughter and little grandchildren.

The Urquharts told me it is the only record they have of a butterfly from Idaho getting that far south. They have millions of records, so our little traveller was one adventurous little guy!

I live 4 miles south of town and have a big garden in back--trees, fruit trees, shrubs, flowers, vegetables, and LOTS OF MILKWEED. In June about the time the milkweed starts to bloom the first Monarch sails into my garden. I watch her light on a tiny milkweed, curl her tail end under a leaf, then fly to another plant. I am always thrilled and excited when I find the tiny golden egg! I break off the leaf and bring in the precious egg. I bring them indoors

because I think they are safer here, and the tachnid fly can't destroy the larva.

In 3 or 4 days a caterpillar, which is a larva, hatches. Can you imagine how tiny a baby is when it hatches from an egg the size of a pinhead? Oh, but what an appetite--he loves milkweed! In just 2 weeks he is about 2 inches long. If you had grown that fast when you were born, in just 2 weeks you'd be the size of a huge elephant! Your poor Mom!

Suddenly he loses his appetite and starts looking for a safe place to perform an astonishing bit of magic. After hanging upside down for a day he sheds his yellow and black striped shirt and becomes a jade green chrysalis, beautiful! About 2 weeks later out comes a butterfly! I could tell you lots more details, but I'm sure you've seen it on TV.

I used to raise them in my 2nd grade classroom, and now that I'm retired I spend every day in September and part of October going to classrooms to show my caterpillars, as many as 35 chrysalids, and dozens of gorgeous butterflies. I show my own slides and tell classes how to raise their own. In Utah you should be able to find them--if you are really interested I can send you some chrysalids so you can watch them emerge.

I lived in Los Angeles long ago, have been in Salt Lake City many times. From June 18--24 I will be in Logan, Utah, where my Wn.D.C. daughter will be teaching piano.

It has been exciting to have my butterflies found. I do thank you, Josh, Shayna, Brandy and Nicky! I have copies of your letters, and I love them. Enjoy, respect and help all wildlife. They need our help to survive, and they reward us by bringing beauty and joy to our lives. And wonder! It is magic how a tiny golden egg can become a fat 2 inch larva with black and yellow stripes, that in just moments becomes a green chrysalis not even an inch long--from which an orange and black butterfly with a 4 inch wing span emerges, all in just a few weeks. The absolute amazing thing is that this fragile scrap of life can fly hundred or thousands of miles over deserts, mountains, cities, to his special wintering place where he has never been before.

Then without a calendar he knows when the milkweed is growing again up north (all the winter snow gone) so he takes off for another incredible journey. It blows your mind, doesn't it? Thank you, pretty Monarchs, for enriching our lives!

RECAPTURE RECORDS FOR 1989

The recapture records for 1989 have proved to be interesting and unusual, as witness those designated with a special note. All of the recapture records that could be verified have been listed below.

ASSOCIATE	TAGGED AT	RECAPTURED AT
1 Alfredo Arellano	Sierra Chincua, Mich. Mexico	Dallas, Tex.
Jean Breen	New Milford Ct.	New Milford, Ct.
2 Charlie Binkley	Brampton, Ont.	Cape May, N.J.
Ken Borisch	Miamitown, Oh.	Rosario, Mich., Mexico
Dale Clark	Dallas, Tex.	Dallas, Tex.
" "	" "	" "
" "	" "	" "
" "	" "	Irving, Tex.
" "	" "	El Rosario, Mich., Mexico
Don Davis	Toronto, Ont.	Toronto, Ont.
" "	" "	" "
" "	Presquile, Ont.	Presquile, Ont.
3 " "	" "	Austin, Tex.
4 Robert Hinkle	Garfield Heights, Oh.	Oxford, Oh.
Island Science School	Toronto, Ont.	Toronto, Ont.
Marilyn Kaestner	Northville, Mich.	Cincinnati, Oh.
Virginia Kietzke	Baraboo, Wi.	Weywauwega, Wi.
Marion Lopina	St. Francis, Wi.	South Milwaukee, Wi.
Robert McGrath	Robert Moses State Park, N.Y.	Oyster Bay, N.Y.
5 Ruth Milani	Meaford, Ont.	Wildwood, N.J.
6 Vicky Preston	Whiteford, Md.	El Rosario, Mich. Mexico
Vince Shane	Bloomington, Mn.	Bloomington, Mn.

RECAPTURE RECORDS cont'd.

Doris Stifel	Maumee Bay State Park, Oh.	Bourbonnais, Ill.
Faye Sutherland	Boise, Id.	Boise, Id.
" "	" "	Grover City, Ca.
" "	" "	Cayucos, Ca.
" "	" "	Between Mesquite, Ne. and
" "	" "	St. George, Ut.
" "	" "	Capitola, Ca.
" "	" "	Watsonville, Ca.

7. Amy Thompson	El Rosario, Mich. Mexico	El Rosario, Mich. Mexico
Cyril Zewe	White Oak, Pa.	White Oak, Pa.

Notes:

1. This butterfly was observed during the spring migration
2. This was an aberrant flight.
3. This butterfly was tagged in September 1988 and was recaptured and released in April, 1989. We therefore conclude that the butterfly must have spent the winter at the overwintering site in Mexico.
4. This butterfly was recaptured in the associates property on a roosting tree after having been tagged by one of our associates. This is a unique occurrence.
5. This record was omitted in error from the 1989 report.
6. This long distance southeast flight in September illustrates how monarch butterflies can be blown off course by strong equinoxial winds.
7. This butterfly remained at the overwintering site from February 7, 1989 to March 11, 1989 after being tagged.

The recapture records listed below were received just before we went to press:

James Brazil	Braham Mn.	El Campanario, Michoacan, Mexico
Dale Clark	Mesquite, Tex.	" " " "
Alexandra Tallamy	Wilmington, Del.	Wilmington, Del.

We are pleased to have K. Duffy of Moran Wyoming and Marilyn Lutz of Yellowstone National Park as associates. We know very little of the presence and abundance of monarchs in Wyoming and particularly in the Grand Tetons. Their observations and alar tagging by Marilyn Lutz supplies most important distributional data.

SIGHTING OF SPRING MIGRANTS

After a long hard winter we all look forward eagerly to the first arrivals of monarch butterflies on the spring migration. It seems truly incredible that such apparently frail wisps of creatures have been able to survive a long and difficult flight south, a cold wet winter in the mountains of Mexico and a long arduous flight north, sometimes bucking strong winds and always enduring inclement weather. Little wonder that we heave a sigh of relief when we see the first spring migrants-some worn and tattered, others, fresh and bright and we know that our favorite butterfly has returned to begin a new generation.

This year we have many interesting reports to pass on to you.

Listed below are the observations of the first monarch butterfly of the season:

Pearl Eslinger	Rockport, Tex.	March 23/89
Dale Clark	Dallas, Tex.	March 29/89
Walter Zimmerman	Mesquite, Tex.	April 1/89
Darlene Bamman	Jacksonville, Mo.	April 25/89
Cynthia Devenport	Jacksonville, Mo.	May 1/89
Marion Hill	South N.J.	May 9/89
Margaret Elliott	Muskegon, Mi.	May 18/89
Dick Nikolai	Appleford Wi.	May 24/89
Lee Ann Landstrom	Osseo, Mn.	May 25/89
Vince Shane	Bloomington, Mn.	May 27/89
Mary Henshall	Nampa, Id.	May 28/89
Doris Stifel	Toledo, Oh.	May 28/89
Cecelia Burnett	Ames, Ia.	June 19/89
Ruth Milani	Meaford, Ont.	June 5/89
Ann Irwin	Bloomfield Hills, Mich.	June 6/89
Wendy Kopley	Skaneateles, N.Y.	June 6/89
Ann Hughes	Helvetia, W. Va.	June 15/89
Paul Foster	Idaho Falls, Id.	June 19/89

FIRST EGGS OF MONARCHS OBSERVED

Walter Zimmerman	Mesquite, Tex.	April 1/89
Vince Shane	Bloomfield, Mn.	May 27/89
Joan Senghas	New Baltimore, Mich.	June 8/89
Lee Darst	Breckville, Oh.	June 9/89
Marion Hill	Lyndhurst, N.J.	June 10/89
Mary Banet	Calumet City, Ill.	July 8/89

FIRST LARVAE OF MONARCHS OBSERVED

Joan Senghas	New Baltimore, Mich.	June 12/89
Cecelia Burnett	Ames, Ia.	June 19/89

LAST MONARCHS OF THE SEASON SIGHTED

Steven Lee	Waynesville, Oh.	October 29/89
Dick Nikolai	Appleford, Wi.	November 3/89
Lee Darst	Breckville, Oh.	November 8/89

FALL MIGRATION OBSERVATIONS

Barbara Hagenson saw an overnight roost of thousands of monarch butterflies at Camanche, Ia.

Donna Kessler of Audubon, Ia. had calls from several people whose trees were loaded with migrants inviting her to tag the butterflies.

Jodi Newton and Martin McAllister, Oxford, Ohio reported a roosting tree in their backyard with 600 monarchs on it. Among them was a butterfly tagged by Robert Hinkle at Garfield Heights, Ohio. This is unique in our experience.

Doris Stifel, Toledo, Ohio commented that the monarch season was especially short in her area due to cold weather.

Dorothy Yeager, Pearsall, Texas sighted the first fall migrants in her yard on September 13/89. One of the females was laying eggs.

MISCELLANEOUS OBSERVATIONS

Bill Coleman, Ventura, California reported the best clusters of monarch butterflies that he has seen for the past many years.

Ann Hughes, Walnut Creek, California found fewer milkweed plants and no monarch larvae which she attributed to a very dry year.

Charlotte Hughes observed monarch butterflies flying over Delaware Bay between Milford, Delaware and Cape May N.J. from early June to late July. Once in a while the butterflies would land on the craft while sailing with the breeze.

Marilyn Ortt, Marietta, Ohio reported that monarch butterflies were late arriving in the spring probably due to extremely heavy rains. In spite of this she reported the best year in several for monarchs in her area.

Jean Stull, Waterford, Pennsylvania, reported, "each fall we find monarchs in sand along the water's edge at Erie, Pa. We rescue as many as we can and hope that they resume their long journey southwards".

PUBLICITY

Because of its beauty and its unusual life history, the monarch butterfly continues to be a source of fascination and wonder to many people. As a result, many news items have appeared in connection with its life history and many others in connection with its preservation and conservation.

A list of the associates who have generously sent us news items appears below:

Darlene Bamman, Joe Eddy Brown, Donald Davis, Mary Henshall, Ann Hughes, Gregory Glovas, John Glynn, Ann Irwin, Woody Keeney, Donna Kessler, Pat Kester, Rick Mikula, Helen Millward, Bob and Elaine Sabin, Jean Sinclair, Donna Southard, Jean Stull, Faye Sutherland, Bill Thomas, Amy Thompson, Lori Totman, Larry Totton, Roger Wilson, Doug Wood, Dorothy Yeager, Cyril Zewe.

Excerpts from the following publications were sent to us:

Ford Times, Mobery Monitor-Index & Evening Democrat, San Jose Mercury News, a Springfield newspaper, Brighton Independent, Globe and Mail, The Sunday Star, The Sunday Sun, San Francisco Examiner, The Morning Call, Los Angeles Times, The Journal Tribune, The Baltimore Evening Sun, The Globe Times, The Oakland Press, The Detroit News, Butterfly World, Times Herald, The Post Crescent, Times Leader, The Morning Call, Reno Gazette-Journal, Omaha World Herald, Charlottesville Daily Progress, St. Louis Post-Despatch, Erie Morning News, The Idaho Statesman, Herald, Wildlife Express, Pacific Grove Monarch, The Conservationist, National Wildlife Federation Bulletin, The Dawes Arboretum Newsletter, The Des Moines Register, The Sioux City Journal, The Washington Conservationist, San Antonio Light, The Evening Sun.

BREEDING GROUND POPULATION SIZE.

Early reports received from the associates seemed to indicate that in the past summer there existed an increase in population size in the vicinity of the Great Lakes and in the New England States. Later reports indicated that there was a decided increase in population throughout most of North America, as indicated on the accompanying map. This was in agreement with reports from California and Mexico where marked increases in population were reported.

During the past summer we experienced high temperatures and strong south-westerly winds. The high temperatures accelerated oviposition and flight with the result that the spring migrants were able to move rapidly to the breeding grounds producing an early generation and an extra generation in the late summer thus accounting for the marked increase in population.

We would appreciate observations on population size in your area to be included with your tagging report. A separate sheet is enclosed for your use.

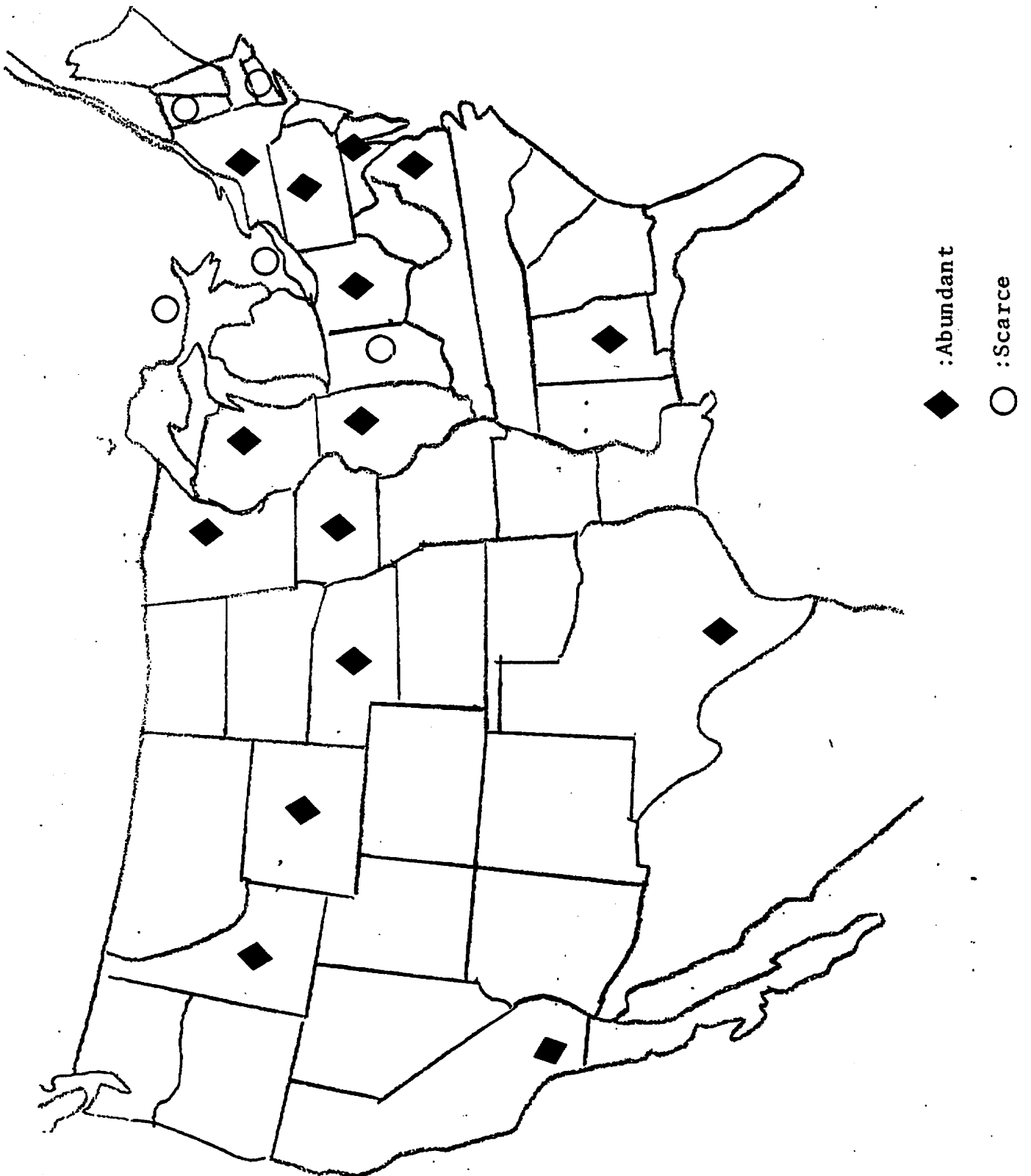
USE OF THE WORD "LOCUS" FOR DESIGNATING AREAS OF CLUSTERING ON THE MEXICAN AND CALIFORNIAN SITES.

There are two areas in North America where the monarch butterflies habitually overwinter: Along the Pacific coast of California and in Mexico. These overwintering areas are referred to as "Sites". Thus, there is the California Site of the western population and the Mexican Site of the eastern population. In each of these sites the monarch butterflies congregate in clusters in different localities. There are nine such clusters in California and 12 in Mexico. Such clusterings are often referred to as sites which leads to confusion when referring to the larger areas of Mexico and California as sites. To avoid such confusion we decided to use the word "locus" (loci), meaning places where clustering occurs. We refer to the clusters occurring in Angangueo as the "Angangueo locus"; the clustering at Monterey as the "Monterey locus." Thus, we have two overwintering Sites with a number of separate areas of clustering or loci. Each site is made up of a number of loci.

YELLOW PUPA

Mary richards sent colour photographs of a distinctly yellow pupa - no evidence of green coloration. The butterfly that emerged was of normal coloration. Since is the first we have ever seen we would appreciate hearing from any of our associates who have encountered similar yellow pupae.

DISTRIBUTION OF POPULATION ABUNDANCE AND SCARCITY _ SUMMER 1989



QUESTIONNAIRE

Would you please attach the following questionnaire, concerning your observations and conclusions, to your tagging report.

1. Were the monarch butterflies abundant (), Scarce ();
no change from previous summer ().
2. Did you find evidence of the polyhedrosis virus ?().
3. Did you find evidence of the presence of the tachinid fly parasite?
().
4. Were weather conditions during the summer unusually hot ();
unusually dry (); unusually wet (); unusually cold ().
Specify which period of the summer.
5. Did you experience strong winds: hurricane force ();
tornado ().

The purpose of this questionnaire is to obtain observational data that will help to explain the variation in population across the continent from year to year. Further observations will be appreciated.

FURTHER OBSERVATIONS: Use reverse side of the sheet if there is not sufficient room.

SPECIAL DONORS

This year we are fortunate in having many associates who have contributed more than the donation necessary to pay for the essentials of this research. This allows us a certain latitude in paying for Spanish translations and long distance telephone calls which we make in order to obtain extra information about recaptured tagged butterflies.

Listed below are the names of special donors:

Fred Armstrong	Denis Hahn	Roland Matson
Ron Austing	*Leon Harris	Micki McCabe
Laura Banet	Margo Harvey	Ruth Milani
David Beaudoin	Mary Henshall	Helen Millward
Yvonne Blanchard	Marion Hill	Molly Monica
Ken Borisch	Dorothy Hoskins	Emily Pendleton
James Brazil Family	Harvey&Lorraine Houck	Protectors of Pine Oak Woods
Betsy Briggs	Shirley Hupp	Elizabeth Radens
Duane Brown	Franne Jackson	Sally Rapoport
Dick Buegler	Joan Johnson	Millicent Scott
Gray Carter	Donna Kessler	Sally Spooner
Sally Chandler	Patricia Kester	Doris Stifel
Lanette Christensen	Joseph Klinkon	Edna Sutton
Lee Darst	John Knapik	Sonja Teraguchi
Erma DeWitt	Debbie Knutson	Bev Thames
Magaret Elliott	Wendy Kopley	Bill Thomas
Pearl Eslinger	Marion Lopina	Regina Van Scoy
Anne Firlit	Mary Lorimer	Elaine Warner
Russell Fontaine	Harold Mahan	Gary Williams
Jessie Glynn	Marjorie Mathes	Walter Zimmerman

*In memory of Dorothy Zewe

SPECIAL ACTIVITIES OF ASSOCIATES

It is always a delight to learn from our associates the number of activities that they have been involved in during the monarch butterfly season and the enthusiasm and energy that they devote to the study of this remarkable insect. Our mail is full of such accounts which we enjoy reading very much and which we would like to pass along to you in the following excerpts:

Darlene Bamman's husband used a "dot box" for dispensing tags efficiently.

Ann Burns conducted outings to tag monarch butterflies at John Henry Weber Park, Bellevue.

Blanche Emerson made a special trip from Jackson, Th. to Dauphin Island Al. where she tagged monarch butterflies during October 1989

Paul Foster reared monarch butterflies indoors and found that the butterflies were smaller and weaker than those collected in the wild.

Mary Henshall took monarch butterflies to schools where she demonstrated all stages of the monarch development and feeding techniques. These classes are now raising their own monarch butterflies and planting milkweed seeds.

Marion Hill made a study of different kinds of milkweed at Fort Worth, Texas Nature Center. Marion took pictures of the milkweed species to use in her programs on monarch butterflies.

SPECIAL ACTIVITIES cont'd.

Ann Irwin sent pictures of young students examining monarch butterflies--the students exhibited a wide variety of expressions--everything from pleasure to puzzlement to revulsion! Ann says she is invited to go to classrooms to make presentations.

Donna Kessler went to Audubon school where she tagged monarch butterflies and left a net cage with larvae in it for the children to watch.

Virginia Kietzke wrote, "Thank you letting me know about the recapture of one of my butterflies. It couldn't have come at a better time. I was in hospital recovering from back surgery. It was 'like a shot in the arm' and I really perked up after that....I have been planting Currasavica and Incarnata varieties of milkweed and find that the butterflies love it. I didn't have to leave our yard to collect all the eggs I could handle."

Joe Klinkon wrote an article on the monarch butterfly which appeared in "Science-scope" published by the National Science Teachers' Association, Washington, D.C. We have had a good response to this article from readers interested in joining our group.

Wendy Kopley sent us a looseleaf book prepared by her third grade class entitled "The Life and Travels of a Monarch". The book contained a collection of accounts by each student of the life of a monarch butterfly. The accounts were lively, accurate and humorous and do a great deal of credit to Wendy's teaching of natural history.

Tami Locher was able to increase the quality of programs at Geauga Park District by displaying her reared monarchs in all stages of development in addition to studying monarchs collected in the wild. Tami wrote, "I was able to present many monarch programs to both young and old and even incorporate monarch tagging into my 'Exploring Autumn' walks."

Marion Lopina gave each fifth grade student at Christ King School a butterfly to raise--each student kept a journal. She also conducted a Fall Hike at Wehr Nature Center. She has asked the Local Butterfly Gardening Club to start action towards establishing monarch butterfly habitats.

Martin McAllister and Jody Newton offered six programs about the monarch butterfly at two different parks in Ohio. 120 people participated in these programs.

Jean Sinclair sent a brochure announcing the issue by the Bermuda Monetary Authority of \$1 sterling proof crowns which "feature a most exquisite design of two monarch butterflies".

Faye Sutherland has been very active on behalf of monarch butterflies this past year. She took her fourth grade class to butterfly rearing grounds to collect eggs. Afterwards the students observed the development of the eggs into butterflies. Faye also got in touch with the weed and pest control manager in Boise, Id. to try to stop the toxic spraying of milkweed by his department. Faye is known as the Butterfly Lady in Pacific Grove, California where she made a week long visit in the autumn of 1989. She gave several presentations re monarchs to the local schools and participated in the 50th Monarch Butterfly Parade.

SPECIAL ACTIVITIES cont'd.

Edna Sutton showed slides to two grade eight classes, one grade four class and at a meeting of an Over 50 Club.

Sylvia Thompson presented a paper on studying the monarch butterfly in the classroom at the National Science Teachers Convention in Atlanta, Ga.

Lori Totman reported planting 97 acres of clover at the Dawes Arboretum, Newark, Oh. This was "highly attractive to monarchs. ..It was blooming wonderfully in September and October when the monarchs were moving through ... The best part about the project is that we're lending a hand in the conservation efforts of a magnificent creature."

PLEASE CHECK THE NUMBERS PRINTED ON YOUR TAGS

Most of the alar tags that we issue are very clearly printed, but occasionally the print is not very clear. Please check to see that the numbers and letters on your tags can be easily read before you use the tag.

Last season one flight record that might have been valuable to our research could not be verified because the associate had used a tag that was not properly printed- much to his regret and ours.

PLEASE STATE NUMBER OF TAGS THAT YOU NEED

When you request more tags to be sent to you, please indicate how many you would like to have as we have no way of predicting how many you will need. If you have some left over, simply wrap them tightly in plastic and keep them until next season.

ALLS WELL IN MEXICO _ SO FAR

In a recent telephone conversation with Carlos Gottfried, President of Monarca A.C. we were informed of the following:

Monarch butterflies arrived very early - some in late October. In the Chinqua-- Anganguero locus. There were tent times as many overwintering monarchs as in previous years with record numbers in all 14 loci. There was a marked increase in the number of unusually small specimens (see separate account). The amount of lumbering in the Anganguero area has been reduced by 80%. The local inhabitants are now involved in making thousands of bird houses for the Audubon Society, orders for which formerly came from Taiwan. The entire district in which the overwintering monarchs occur are experiencing marked prosperity as the result of the arrival of thousands of visitors from Mexico and tourists from other countries. Three small exhibits have been erected with photographs and motion pictures informing the visitors of the life and migrations of the monarch butterfly. Since the monarch butterfly is now of economic importance to the local citizens it will undoubtedly be well protected. It was most fortunate that the overwintering loci had been discovered and the uniqueness of the phenomenon demonstrated otherwise lumbering and forest fires might have decimated the eastern population.

Research associates

If your name does not appear on this list it is because your joined after this issue was submitted for printing. If there are other omissions or errors, please bring them to our attention. Names are removed from the list if we have had no response over a two year period.

Allgrove, Carl G.: Windsor, Connecticut,
Anderson, Carolyn : Madison, Wisconsin.
Argana, Bernadette: Caledonia, New York.
Armstrong, Fred: Red Bank, New Jersey.
Austing, Ronald: Dillsboro , Indiana.

Bamman, Darlene & Cynthia Devenport: Jacksonville, Missouri.
Banet, Sister Laura: Cicero, Illinois.
Banet, Mary: Calumet City, Illinois.
Baumgardner, Sally: Darien, Illinois.
Beaudoin, David: Whitehall, Michigan.
Benyi, David & Ryan: Columbus, Ohio.
Best, Dan: Chardon, Ohio.
Binkley, Charles: Brampton, Ontario.
Bires, Nancy: Sandy Lake, Pennsylvania.
Blacklock, Jeff: Wichita Falls, Texas.
Blanchard, Yvonne: Lake Shastina, California.
Blume, Leon & KaY: Marion, Indiana.
Borisch, Ken & Family: Cincinnati, Ohio.
Brazil, Susan and Family: Braham, Minnesota.
Breen, Jean: Brookfield, Connecticut.
Briggs, Betsy: Marshfield Hill, Massachusetts.
Brown, Duane: Kitchener, Ontario.
Brown, Joe Eddy: Lisle, Illinois.
Buegler, Richard: Staten Island, New York.
Burnett, Cecelia: Ames, Iowa.
Burns, Ann: Maquoketa, Iowa.

Carter, Gray: Perry, Florida.
Casson, Gail: Boston, Massachusetts.
Cavanna, Pedro: Norfolk, Connecticut.
Chandler, Sally: Birmingham, Michigan.
Christenson, Lanette: Minneapolis, Minnesota.
Clark, Dale: Dalas, Texas.
Clements, Marta: West Paris, Maine.
Cleveland, Roxanne: Rochester Hills, Michigan.
Clough, Harry: Hamburg, New York.
Coleman, William: Ventura, California.
Coller, Norene: Hyde Park, New York.
Connors, Grant: Topsham, Maine.
Craighton, LuAnn: Pine Mountain, Georgia.
Crane, Chad: Wilmington, Ohio.

Callas County Cons. Bd.: Perry Iowa.
Daniels, Jeanne: Center City, Minnesota.
Darst, Lee: Breckville, Ohio.
Davis, Donald: Downsview, Ontario.
Dawson, Adele: Marshfield, Vermont.
De Montes, Barbara: Can Cun, Quintana Roo, Mexico.

Den Boer, Kevin: Grandville, Michigan.
De Wind, Joan: Sherman, Connecticut.
De Witt, Erma: New Paltz, New York.
Doughty, Jean: Clarion, Pennsylvania.
Dreyer, Kay: Farragut, Iowa.
Duffy, Katy: Moran, Wyoming.
Durbin, Robbi: Nampa, Idaho.

Eels, Jean: Webster City, Iowa.
Eisler, Carolyn & Ronald: Reynoldsburg, Ohio.
Elliot, Margaret: Muskegon, Michigan.
Emerson, Blanche: Jackson, Tennessee.
English, Lane: New Haven, Connecticut.
Eslinger, Pearl: Terre Haute, Indiana.
Etheridge, Mark: Springfield, Virginia.

Firlit, Anne: Downers Grove, Illinois.
Flint, Veda: Glenwood, Iowa.
Flournoy, Jim: Kansas City, Missouri.
Fojut, Pat: Franklin, Wisconsin.
Fontaine, Russell: Davis, California.
Foster, Paul: Idaho Falls, Idaho.

Gill, Madeline: Covington, Louisiana.
Glovas, Gregory: Bethlehem, Pennsylvania.
Glynn, Jessie: Limehouse, Ontario.
Glynn, John: Bar Mills, Maine.
Godbout, - Bandal, Cheryl: St Paul, Minnesota.

Hagenson, Barbara: Clinton, Iowa.
Hahn, Denis: Bloomington, Minnesota.
Hamilton County Park, Dist.: Cincinnati, Ohio.
Harris, Linda: Hollis, New Hampshire.
Harvey, Margo: Middletown, Pennsylvania.
Haycraft, Amanda: Owatonna, Minnesota.
Hayes, Mike: Oakfield, Wisconsin.
Henshall, Mary: Nampa, Idaho.
Hill, Marion: Lyndhurst, New Jersey.
Hillman, Carol: White Plains, New York.
Hinkle, Robert: Garfield Heights, Ohio.
Hogan, Shawn: Kenosha, Wisconsin.
Hogg, Loretta: Mayfield, Ohio.
Holden, Joann: Birmingham, Michigan.
Holtzman, Lynn: Xenia, Ohio.
Horr, Alta: Dunbar, Nebraska.
Hoskins, Dorothy: West Dennis, Massachusetts.
Houck, Harvey & Lorraine: Decora, Iowa.
Hughes, Ann: Walnut Creek, California.
Hughes, Charlotte: Wilmington, Delaware.
Hupp, Shirley: Hinton, Virginia.

Inman, Virgil: South Bend, Indiana.
Irwin, Ann: Bloomfield Hills, Michigan.

Island Natural Science School: Toronto, Ontario.

Jackson, Franne: Dallas, Texas.

Johnson, Joan: Winchester, Virginia.

Kaestner, Marilyn: Northville, Michigan.

Kaplan, Paul: Middleburg, Vermont.

Karcher, Gregory: Souderton, Pennsylvania.

Karrow, Tom & Sheila: Waterloo, Ontario.

Keeney, Norwood: Newport, New Hampshire.

Kelley, Patricia: London, Ohio.

Kendrick, Eva: Sault Ste Marie, Ontario.

Kessler, Donna: Audubon, Iowa.

Kester, Patricia: Appleton, Wisconsin.

Kietzke, Virginia: Baraboo, Wisconsin.

Klinkon, Joseph: Girard, Kansas.

Knutson, Debbie: Fence, Wisconsin.

Konie, Donna: Barrington, Illinois.

Kopley, Wendy: Skaneateles, New York.

Krueger, Charity: Dayton, Ohio.

Kupcho, James: Woodbridge, New Jersey.

Laghetto, Bob: Zoarville, Ohio.

Landstrom, Lee Ann: Osseo, Minnesota.

Larsen, Kirk: Wooster, Ohio.

Larson, Donald: Minnetonka, Minnesota.

Lee, Steven: Waynesville, Ohio.

Lee Zieke-Lee: Decorah, Iowa.

Levine, Ilene: Roosevelt, New Jersey.

Libbey, Ian: Clarion, Iowa.

Lininger, Larry: Westerville, Ohio.

Lippencott, Carol: McMurray, Pennsylvania.

Locher, Tami: Chesterland, Ohio.

Lopina, Marion: Wawatosa, Wisconsin.

Lorimer, Mary: West Bloomfield, Michigan.

Lovallo, Patricia: Rochester, New York.

Lucille, Sister: Saukville, Wisconsin.

Lutz, Marilyn: Yellowstone National Pk., Wyoming.

Madison, Brenda: Jefferson City, Missouri.

Mahan, Harold: San Diego, California.

Mathes, Eldred & Marjorie: Pontiac, Michigan.

Matson, Roland: Minneapolis, Minnesota.

McCabe, Michi: Greens Farms, Connecticut.

McCouch, Theresa: Ft. Leonard Wood, Missouri.

McGrath, Robert: Smithtown, New York.

Meek, Bonnie: Lexington, Massachusetts.

Meredith, Greg: Guelph, Ontario.

Metts, Alice & Bryan: Cumberland, Virginia.

Mikula, Richard: Hazleton, Pennsylvania.

Milani, Ruth: Meaford, Ontario.

Millward, Helen: Fallon, Nevada.

Monica, Molly: Berkeley, New Jersey.

Morkin, Sharon: Bloomington, Illinois.

Naturalists Club of Broome County: Endwell, New York.
Newton, Jody & Martin McAllister: Oxford, Ohio.
Nikolai, Dick: Appleton, Wisconsin.
Nolin, Wendy: Sunapee, New Hampshire.
Norenberg, Marilyn: Duluth, Minnesota.
Northeimer, John: Davis, West Virginia.

O'Neil, Catherine: Whitmore Lake, Michigan.
O'Neil, Karen: Fenton, Michigan.
Ortt, Marilyn & Jennifer.

Pado, Kerry: Old Lyme, Connecticut.
Pendleton, Emily: Montevallo, Alabama.
Perry, Melanie: Atlantic, Iowa.
Perzanowski, Lee & Phyllis: Havre de Grace, Maryland.
Peterson, Patricia: Stillwater, Minnesota.
Pittis, Rebecca: Dennison, Ohio.
Post, Earle: West Milford, New Jersey.
Powell, Diane: New Britain, Connecticut.
Preston, Vicki: Whiteford, Maryland.
Protector of Pine Oak Woods: Staten Island, New York.

Radens, Elizabeth: New York, New York.
Ramey, Ralph: Yellow Springs, Ohio.
Rappeport, Sally: Brooklyn, New York.
Reese, Pat: West Hartford, Connecticut.
Reese, Randy: Greensboro, North Carolina.
Ritzenthaler, John: Dayton, Ohio.
Rongish, Kathy: Underwood, Iowa.

Sabin, Bob & Elaine: Bellevue, Nebraska.
Saehler, Edward: Iowa City, Iowa.
Sanders, June: Buchanan, Georgia.
Sanders, Mary: Morrison, Missouri.
Schmitz, Margaret: Fond du Lac, Wisconsin.
Scott, Millicent: Casper, Wyoming.
Seibel, Margaret: Fond du Lac, Wisconsin.
Senghas, Joan: New Baltimore, Michigan.
Sentiwany, Jennifer: Hazleton, Pennsylvania.
Shane, Vince: Bloomington, Minnesota.
Siegel, Russell: Danbury, Connecticut.
Simons, Don: Lake Village, Arkansas.
Sinclair, Jean: Earlysville, Virginia.
Slowik, Nancy: Staten Island, New York.
Smith, Janice: Indianapolis, Indiana.
Smith, Marion: Lyndonville, New York.
Smith, Trudy: Mumford Cove, Noank, Connecticut.
Southard, Donna: St. James, Missouri.
Spooner, Sally: Lakeville, Massachusetts.
Stifel, Doris: Toledo, Ohio.
Strike, Megan: Maplewood, Minnesota.
Strong, William: Novelty, Ohio.
Stull, Jean: Waterford, Pennsylvania.
Sullivan, Jerome: Fond du Lac, Wisconsin.
Sutherland, Faye: Boise, Idaho.
Sutton, Edna: Richland Centre, Wisconsin.

Teraguchi, Sonja: Cleveland, Ohio.
Thames, Bev.: Bay City, Texas.
Thomas, Bill: Springfield, Missouri.
Thompson, Amy: Stoneboro, Pennsylvania.
Thompson, Sylvia: Washington, D.C.
Tihen, William: Shaftsbury, Vermont.
Totman, Lori: Newark, Ohio.
Totton, Larry: Granger, Iowa.
Tribo, Mathew: Washington, West Virginia.

Upton, Richard: Platteville, Wisconsin.

Van Scoy, Regina: Limestone, New York.

Wade, Larry: Plymouth, Minnesota.
Wagner, Mark: Newton, Iowa.
Warner, Elaine: Rochester, New York.
Westwood Hills Environmental Center: St. Louis Park, Minnesota.
Williams, Betty: Kent, Ohio.
Williams, Gary: Glen Ellyn, Illinois.
Williamson, Carol: Clearwater, Kansas.
Wilson, Audrey: Cobourg, Ontario.
Wilson, Marsha: Jefferson City, Missouri.
Wilson, Roger: Merville, Iowa.
Wilson, Thomas: Pownal, Maine.
Winter, Ian: Rifton, New York.
Woodcock, Alice: Clifton, New Jersey.
Woodruff, Esther: Berlin, Connecticut.

Yeager, Dorothy: Pearsall, Texas.

Zewe, Cyril: North Huntingdon, Pennsylvania.
Zimmerman, Walter: Mesquite, Texas.