
INSECT MIGRATION STUDIES

Volume 30 1993

Annual Report

UNIVERSITY OF TORONTO SCARBOROUGH CAMPUS

Annual Report to Research Associates

Insect Migration Association

1993

UNIVERSITY OF TORONTO SCARBOROUGH CAMPUS

Scarborough Ontario Canada M1C 1A4

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TO THE ASSOCIATES

Fred and Norah Urquhart

GOOD NEWS

MEXICAN SNOW STORMS AND MONARCH BUTTERFLY MORTALITY:

Numerous reports appeared in newspapers and magazines this past year stating that 70% of the overwintering population of monarchs in Mexico was destroyed owing to heavy snow falls. As a result of these reports we received many letters asking if we had any definite information on what appeared to be a "drastic" event. As so often happens, newspaper reports are based on rumours rather than on scientific facts. Jürgen Hoth (see footnote) wrote in his report for the World Wildlife Fund: ".....the 70% mortality estimation may not be applicable to all the Mexican overwintering populations, as originally suggested by Aridjis. The information used to ascertain the mortality percentage of the monarchs was limited to one sanctuary only."

The 70% mortality figure published by Aridjis was originally estimated by W. Calvert in the Herrada site (considered a small secondary overwintering site).

One may conclude that the estimate of mortality for the entire Mexican site was based on this one small locus and hence of very little overall significance.

Every winter thousands of monarch butterflies perish in the overwintering site of Mexico due to snow storms on the mountains. This has happened for the many years of our studies of the monarchs.

The monarchs gather on the trees in thousands forming dense platforms on the overhanging branches which, at times, cause the small branches to break with the weight of the butterflies scattering the butterflies over the underlying ground, as we have previously reported in a previous IMS and also in the article in the National Geographic Magazine (Aug. 1976). In the winter a layer of snow settles on the masses of butterflies thus increasing the weight on the branches. If the branch breaks or is tossed about by strong winter winds the butterflies are cast onto the ground where they may be covered with a suffocating layer of snow. The degree of mortality varies from year to year depending on the severity of the winter weather.

It has been rumoured by some that by removing trees from the overwintering loci the butterflies are exposed to more severe winter weather and perhaps destroying the ecological conditions. Hence, the denser the tree cover the better chance the monarchs have of surviving. This, however, belies the true nature of the situation, as evident from our observations and those of Mr. Hoth. We had observed in our visits to the Angangueo locus that the butterflies tended to congregate in areas where the trees were spaced so as to allow the sunlight to penetrate to the overwintering clusters. Monarchs did not congregate in areas where the forest canopy was so dense that sunlight could not penetrate to the lower branches. This is most important for the survival of the butterflies since their bodies must be exposed to sunlight for short intervals so as to increase

body temperature thus allowing for metabolism to take place utilizing the stored fat. The increase in body temperature also permits wing fluttering which is most important in maintaining flight musculature. Mr. Hoth has concluded that a limited amount of tree cutting is therefore beneficial both for the monarchs and for the welfare of the local citizens.

Periodic fluctuations of climatic conditions occur over the entire earth. In any one area there may be periods of drought or periods of heavy precipitation." Over the years, a wide range of strange or severe weather anomalies have been blamed on El Nino, a pronounced warming of the Pacific Ocean current off the coast of South America. This was the case in 1992." (Canadian Geographic, Jan/Feb 1993). We have received reports of unusual weather conditions in Mexico with such diverse conditions as severe drought in some areas and heavy precipitation in others.

Whether the results of the heavy snow falls in the mountains of Mexico has had any effect on the population on the breeding grounds in Canada and the United states is discussed elsewhere in this volume.

We are pleased to announce that Jürgen Hoth , in a recent telephone communication, informed us that he could detect no appreciable change in population in Mexico this winter-(1992-93).

fn: Jürgen Hoth is a Mexican student now enrolled in the University of Waterloo, Ontario. His research will center on an intensive study of the overwintering monarch butterflies in Mexico. We will look forward to reports from Jurgen in the future.

A REPORT FROM AUDREY WILSON

Audrey is one of the original members of the IMA. In addition to her many years of alar tagging, with considerable meaningful recaptures, she acted as Secretary to the association and assisted in the preparation of annual reports. Retired from teaching, she decided to visit the overwintering monarchs in Mexico. We took advantage of this opportunity to find out what is happening to the monarch colonies in Angangueo and El Rosario since we have been unable to obtain information from those in charge at Monarca. We gave Audrey a number of questions to investigate. The following is her excellent report which will be much appreciated by all members of IMA.

--

"In 1955, almost twenty years after Dr. Fred Urquhart and Norah began studies on the monarch butterfly, I joined the IMA becoming a volunteer research associate. After long years of endless tagging and searching I and all members of our team were thrilled when in 1975 the winter home of the monarch butterfly was discovered in Mexico.

"In February, 1992, I was delighted to receive word that two of my tagged monarchs from Cobourg, Ontario had reached this precise and pre-destined place, the ultimate destination in Mexico. What an incredible journey these tiny, fragile winged insects must have experienced.

"A friend, Jennie Fellowes now living in Quéretaro, Mexico, encouraged me to visit Mexico to see the overwintering monarchs in the States of Michoacan and Mexico. On January 11, 1993 I left behind mounds of snow, treacherous black-iced highways and -22° C temperature for such an adventure.

"Leaving Quéretaro where we saw Vermillion Flycatchers, Wilson's Warblers and fascinating hummingbirds, we set out for Angangueo, approximately 200 km. to the southwest. Never having been to Mexico, everything was new to me. Range upon range of volcanic peaks rose against the blue skyline. Time seemed to turn back as one viewed teams of oxen working steep hillsides or observing women busily washing clothes on the river rocks. Numerous Loggerhead Shrikes and falcons perched on overhead wires while large buteos and T.V. birds soared on high. Cattle Egrets were present on land being worked. Large prickly pear cacti dotted the landscape creating fantastic sunsets.

"Twenty kms south of Angangueo we noted the first sign about the monarch butterflies. Angangueo had been an active mining town for zinc, lead, iron and silver from nearby mountains. Steamy hot sulphur springs cascaded down a ravine at the town's entrance. The American based silver operation pulled out about the time the monarch project was getting underway and the local citizens welcomed the alternative way of making a living with the monarch butterflies. We stayed at

El Bruno Hotel, situated on the main street, which catered to tourists interested in the monarch butterflies. Lovely, large double rooms were located around a central courtyard costing 104,000 pesos (\$25, US) each. Parking was provided free. A modern, clean restaurant, seating 50-60 had monarch motifs at each table. Beside the office was an artisan or craft shop with numerous tourist souvenirs, many emphasizing local crafts. This was one of three hotels in town.

"The road for public traffic literally ended in this town so we arranged for a guide, Jaimie Castro, to take us to the monarch site the next morning. He excitedly sent saludos" to Norah and Fred as he had guided them years before. His brother, Juan Diego Castro, also a driver, proudly showed us a tagged monarch that he always carried around in a cassette box in his breastpocket. The rugged road to the site was 9 kms. in length and took us about an hour. We climbed about 9000 feet, many times meeting donkeys laden with loads or men attempting manual road work with picks and machettes. Views were spectacular as we looked back on a patchwork of farms and villages circling the mountain base. The truck ride cost 120,000 pesos plus a tip. This was the going rate whether one or a dozen participated. Along the way Jennie conversed at length with Jaimie getting much information. He was most obliging and knowledgeable regarding the kinds of plants. He informed us that in January 2 or 3 trips a week are requested. However, in February and March, mostly on weekends, about 200 a day are transported to the site from the towns of Anganguero and El Rosario.

"The final 1000 feet had to be navigated on foot. This would place us 2 miles (3km) above sea level. Later in the season the monarchs would move down the mountain. Jamie took us to the admission area where each adult pays 10,000 pesos. One of some dozen Mexican guides then stepped forward to lead each group to the actual site.

"In 1986 the Mexican government, in a presidential decree, declared the butterfly's major wintering grounds to be an "ecological preserve". The decree banned logging in some 11,000 acres where the major monarch sites were located. It also limited the spread of agriculture in another 28,000 acres to function as a buffer zone around the protected areas. A Mexican organization called Monarca A.C. then set out to help Mexicans profit from the butterflies by acting as guides, trail maintenance workers, vigilantes, reforestation workers, sellers of refreshments and souvenirs, etc. Mexico, being a country with massive debts, severe pollution problems and a population growing at the rate of two million per year. Setting land aside for such a purpose would be a major achievement if accomplished successfully. It was imperative to establish a program to replace the livelihood of timber cutting and farming. Apparently the plan is working. Mexicans appreciate the fact that they must protect the monarch butterflies and they are truly proud of this unique phenomenon of nature entrusted to them.

" Our guide led us to an interpretative centre - an arts and craft building, washrooms and an A.V. centre. All structures were of simple wooden construction but quite adequate. Looking back towards the truck one could see thirty to forty small huts; some housed the guides, trail maintenance workers, or vigilantes. Others provided refreshments and tourist items such as local crafts made by the Otomi Indians. Our guide waited patiently as we stopped to catch our breath and rest our trembling legs, brought about by the change in altitude and temperature. The pathways were made of steps cut into the hillside along which were hand rails of rope to cordon off out-of-bounds areas. Posters provided good interpretation along the way as well as warning not to disturb the monarchs by noise. Finally we reached the site where every fir tree (oyamel), pine, spruce and live oak (encino) was literally alive with tens of thousands of monarchs. These extraordinarily beautiful forests are indispensable for the survival of the monarchs. Long masses of butterflies cloaked all the natural colour of the bark and giving the impression of masses of dead leaves. As the sunlight began to pour into the grove, the drapery of monarchs gradually changed to dazzling orange and black as wings began to tremble, open and shut. The sun's warmth made the whole area come alive. Some sought out nectar from the high shrubs of red, yellow, orange and blue salvia and pink lupines. Using my binoculars I searched the masses for a tagged specimen, to no avail but I did notice several pairs mating. A few more observers joined us - several Mexicans, an Oriental couple with expensive camera gear, a lady from British Columbia and another from Colorado. Completing my photographic efforts I gently picked up two male and one female monarch from the footpath and applied a Toronto University tag to each of them. The visitors were intrigued as they knew nothing of this procedure and how it had solved the mystery of where the monarchs spent the winter months.

" Walking through the interpretative center we viewed the many billboards explaining the history, life cycle, natural predators, man-made threats and solutions for their survival and the sponsors of this project. In the A.V. building a lady quickly put on a taped, slide show. Two carousels faded photos in and out as rather loud background music accompanied the comments in Spanish about each slide. Descending the path to our driver we purchased coke in a bag to quench our thirst. As Jaimie proceeded down the mountain he was stopped again by private property owners requesting compensation for crossing their lands. Apparently at the El Rosario approach landowners collect a modest sum from those driving through on their own vehicles.

"Back at the hotel the craft store was open. It was considerably more sophisticated than the one at the site. Pottery, baskets, woodcraft, typical tourist souvenirs, postcards, monarch photographs and good quality "sweat" and "T" shirts with monarch motifs were all available at tourist rates.

"Deciding to spend another session at the monarch site we made plans to enter the El Rosario route the next morning. We drove to Ocampo that afternoon lining up our driver. His rather ancient half

ton truck was parked under a leanto for shade in a small parking lot, a field that doubled as a pasture. Stones had been placed behind the back wheels to keep the truck from rolling away. The afternoon was spent in nearby Zitacuaro at Hotel de Mexicos. A large rather uninspiring room for two cost 90,000 pesos and proved quite adequate to rest our weary bones. Interestingly, at their reception counter we picked up the only brochure seen on the entire trip featuring Mariposa Monarca. The brief factual information also included traditional folklore about monarchs. This was later confirmed by Jenny's son-in-law Isauro a native Mexican who later reminisced how as a lad all the children were overjoyed to greet the mariposa's arrival for All Saints Day, the Day of the Dead, on November 1st with celebrations, feasting and school holidays.

"The next morning, arriving back in Ocampo, our new driver told us we could stay at the San Carlos Hotel in season. Ascending the mountains on this side was quite different; the road was relatively smooth and wide enough for vehicles to pass. The scenery was not nearly as breathtaking as the previous day since much of the area was reforested. The route took about an hour for 12 kms. Anyone concerned about safety would probably opt for this route. Indeed it would be feasible to navigate this route in your own vehicle. However, for the money I preferred the Angangueo route for sheer beauty and excitement. Except for El Rosario little habitation was evident on this side of the mountain.

"Since the government only operates one preserve with two approaches we arrived at basically the same location as the previous day. Other overwintering loci are off bounds and undeveloped to protect the monarchs. Our foot guide this time, an older Mexican, was very keen to share his knowledge of plants and their uses. The previous week someone had slipped on the steep path and fractured a leg. They carried the injured person down to a doctor in a clinic in Ocampo a distance of 12 kms. We were unable to ascertain if oxygen was available on the site; probably not since 80% of the visitors are Mexican and well acclimatized to these heights.

"Anyone contemplating a trip to this refuge for monarchs could achieve it by using the inexpensive public bus system. Buses from Mexico City, Toluca, Zitacuaro, Morelia, Maravatio go to Angangueo regularly. Accommodation is within walking distance from the bus station. Driver guides can be obtained at both Angangueo and Ocampo to take you to the actual site. Be certain to dress warmly for early in the morning visits and be certain to have sturdy footwear.

"It is truly an experience of a lifetime!"

RECAPTURE RECORDS FOR 1992

During 1992 we were fortunate to have many interesting recapture records of migrating monarch butterflies reported to us, demonstrating the high level of activity on the part of our associates. These records are a tribute to the careful way the tagged butterflies have been handled and the care with which the tags were applied to the butterflies' wings.

The fact that more tagged butterflies were found at the overwintering sites in Mexico probably indicates that the chances of a tagged butterfly being found are increased as the number of visitors to the sites increase.

All of those associates whose tagged butterflies have been reported to us have been so informed. Also, all those who reported the tagged butterflies have been informed of the flight record and have been sent information about the research being carried on by our associates.

ASSOCIATE	TAGGED AT	RECAPTURED AT
Darlene Bamman	Jacksonville, Mo.	El Rosario, Michoacan, Mex.
" "	" "	" " " "
Barb Bussenbarrick	Creston, Iowa	Creston, Iowa
Don Davis	Presquile, Ont.	Cerro Pelon, state of Mexico
"	"	" " " "
"	"	El Rosario, Mich., Mex.
"	"	" " "
"	"	" " "
Phil Gingrich	Middlefield, Oh.	El Rosario, Mich, Mex.
Robert Hinkle	Rocky River Reservation Oh.	North Olmstead, Oh.
Greg and Kari Keller	Cuyuna, Mn.	Spring Lake Park, Mn.
" "	" "	Crosby, Mn.
Patricia Kester	Appleton, Wi.	Appleton Wi.
" "	" "	" "
" "	" "	" "
Chris McKay	Covington, Oh.	Covington, Oh.
Dick Nikolai	Elm Grove, Wi.	Wauwatosa, Wi.

Cont'd...

recapture records, cont'd

Timoth Nowicki	Farmington Hills, Mich.	Farmington Hills, Mich.
Vince Shane	Bloomington, Minn.	Elgin, Ill.
" "	Richardson Nature Center Minn.	Humboldt, Ia.
* Doris Stifel	Maumee Bay State Park, Oh.	Walton, County, Fla.
" "	" " " " "	Ottawa, Oh.
Audrey Wilson	Cobourg, Ont.	El Rosario, Mich. Mex.
" "	" "	" " " "

*This is an aberrant flight perhaps due to the N.W. winds on the day of tagging the butterfly. Reported as being 28.8km. to 40 km. gusts.

NUMBER OF MONARCH BUTTERFLIES TAGGED IN 1992

Despite a magnificent effort on the part of our associates to tag a large number of monarch butterflies this past season, the numbers of monarch butterflies tagged dropped sharply from 24,494 in 1991 to 10,765 in 1992-making a percentage drop from 1991 to 1992 of 56.06%.

Many of our associates reported that they were unable to tag any monarch butterflies at all, and of the 117 associates who sent in reports, many had disappointingly few to record. The sharp drop in numbers of monarch butterflies is discussed in detail elsewhere in this report.

THANK YOU FOR REPORTS OF TAGGING

Because of extremely heavy correspondence last fall, we were unable to thank all of those who sent in reports of tagging. We do appreciate your efforts and the count of your tagged butterflies has been included in the total tagged by all associates. We shall try to answer all reports next year.

DISTRIBUTION OF TAGS TO MEMBERS OF GROUPS

If you are involved in distributing monarch butterfly tags to members of a group, please inform those who receive the tags to report their tagging directly to you. Please do not advise them to send their reports to us as this results in much confusion as we are not aware of those who received the tags nor how they were distributed nor by whom.

SIGHTING OF SPRING MIGRANTS

Only those who are really devoted to the study of the monarch butterfly can appreciate the sense of excitement and anticipation that we feel when it is time for the spring migrants to return to our part of the continent.

Wishful thinking makes us mistake the sight of a bird or a leaf blowing in the wind for the much desired sight of a spring migrant.

Listed below are the dates on which our alert research associates have recorded this happy event:

Sophia Godbout	Brownsville, Tx.	Mar. 2/92
Dorothy Yeager	Pearsall, Tx.	Mar. 7/92
Alta Horr	Dunbar, Ne.	May 1/92
Gene&Darlene Bamman Cynthia Devenport	Jacksonville, Mo.	May 5/92
Faye Sutherland	Boise, Id.	May 7/92
Pearl Eslinger	Terre Haute, In.	May 9/92
Melanie Perry	Atlantic, Ia.	May 10/92
Edna Sutton	Richland Center	May 11/92
Greg&Kari Keller	St. Paul, Mn.	May 15/92
Mary Henshall	Nampa, Id.	May 17/92
Richard Rowold	Wheatland, Ia.	May 17/92
Cele Burnett	Story, Ia.	May 18/92
Donna Kessler	Audubon, Ia.	May 18/92
James Brazil Family	Braham, Mn.	May 19/92
Millicent Scott	Casper, Wy.	May 21/92
Mary Lyons	Sleeping Bear Pk. Mich.	May 22/92
Alexander Garden	Malta, Il.	May 28/92
Dick Nikolai	Chilton, Wi.	May 29/92
Lee Ann Landstrom	Osseo, Mn.	June 9/92
Patricia Jewell Peterson	Stillwater, Mn.	June 2/92
Eva Kendrick	Sault Ste. Marie, On.	June 10/92
Lee Darst	Brecksville, Oh.	June 14/92
Judy VanHook	Keego Harbour, Mich.	July 1/92
Marion Hill	Lyndhurst, N.J.	July 15/92
Alice Davis	Charlottesville, Va.	July 20/92

FIRST EGGS OF MONARCHS OBSERVED

Faye Sutherland	Boise, Id.	May 9/92
Sharon Morkin	Bloomington, Il.	May 15/92
Mary Henshall	Nampa, Id.	May 19/92
Alexander Garden	Malta, Il.	May 21/92
Greg and Kari Keller	St. Paul Mn.	May 28/92
Donna Kessler	Audubon, Ia.	May 28/92
Randy Sylvester	Marshfield, Mass.	June 15/92
Pearl Eslinger	Terre Haute, In.	June 29/92
Marion Hill	Lyndhurst, N.J.	July 16/92

FIRST LARVAE OF MONARCHS OBSERVED

Greg and Kari Keller	St. Paul Mn.	June 2/92
Donna Kessler	Audubon, Ia.	June 2/92
Pearl Eslinger	Terre Haute, In.	June 4/92
Lee Darst	Brecksville, Oh.	June 21/92

FIRST Pupae Observed

Dorothy Yeager	Pearsall, Tx.	Mar. 31/92
Faye Sutherland	Boise Id.	May 30/92

LAST MONARCHS OF THE SEASON SIGHTED

Fraser Gibson	Waterloo, Ont.	Oct. 7/92
Dick Nikolai	Appleton, Wi	Oct. 8/92
Larry Wade	Minnetonka, Mn.	Oct. 15/92
Mary Beth Eberwein	Terre Haute, In.	Oct. 22/92

cont'd

last monarchs cont'd

Sally Baumgardner	Franklin Grove, Il.	Oct.23/92
Lee Darst	Brecksville,Oh.	Oct.23/92
Pearl Eslinger	Terre Haute,In.	Oct.24/92
Melanie Perry	Atlantic,Ia.	Oct.25/92
Richard Rowold	Wheatland,Ia.	Oct.25/92
David Faber,	Edgartown,Mass.	Nov.11/92

TRIPS TO OVERWINTERING SITES IN MEXICO

If you are planning a trip to the overwintering site in Mexico we would suggest that you contact:

Monarca A.C.
 Av.Constituyentes 345-806
 Mexico D.F. 11830
 Mexico

or contact your local travel agent re facilities available for your trip. See Audrey Wilson's account of her trip to Mexico elsewhere in this report.

QUETZALPAPALOTL -LA MARIPOSA SAGRADA

This is the title of a small book sent to us by Heidi Margaret McAllister, who is an environmental consultant employed by the states of Mexico and Michoacan to study the microclimates of the forests in the states which shelter the monarch butterflies in the winter.

The title of the book is the name given to the monarch butterfly by the Aztecs who believed it was sacred and that the monarch butterflies were little dead angels who came back to earth in the autumn-they also believed they saw a human face in the wings of the butterfly.

MARGARET DRAKE ELLIOTT HONORED AT PARK CEREMONY

Muskegon,Michigan's city commissioners honored Margaret Drake Elliott in May 1992 by re-naming a city park in her name as a tribute to her many years of work to preserve butterflies. Margaret has been a research associate in the I.M.A. since 1963 and has been very helpful to our research. Margaret was also "the driving force" for the holding of "Great Spangled Butterfly Days"- a butterfly awareness week held in Muskegon from July3-July 10,1992

PLEASE KEEP YOUR LEFTOVER TAGS

The reason for this is that the tag numbers that are sent to you are kept on permanent record here at our office and will not be issued to anyone else.

HELP!

Arlene Benham, one of our very active associates, is attempting to preserve a section of wetland in Cambridge which is being threatened by developers. Milkweed plants which now flourish in abundance in this area would be completely annihilated. Arlene has explained to members of her local council how important the area is to the survival of the monarch butterfly. The following are excerpts that have appeared in newspapers: "City residents Arlene Benham and Fatima Pereira Henson both argued against the development because of the impact it would have on North America's dwindling Monarch butterfly population"; "Benham told the committee that the butterflies are losing habitat right across the continent"; "Concern for the butterflies was echoed by several of the people who rose to speak against the development. An impassioned plea was made on behalf of the Monarch butterflies that inhabit the Devil's Creek area. The area's milkweed patches, critical to the butterflies metamorphic cycle would be lost if development proceeded."

However, Arlene is finding that that the developers are most persistent and have the backing of those who put financial gain ahead of the willful destruction of wildlife areas, especially wetlands.

We are asking the members of the IMA to write to Arlene encouraging her to continue her conservation battle.

Arlene's address is as follows:

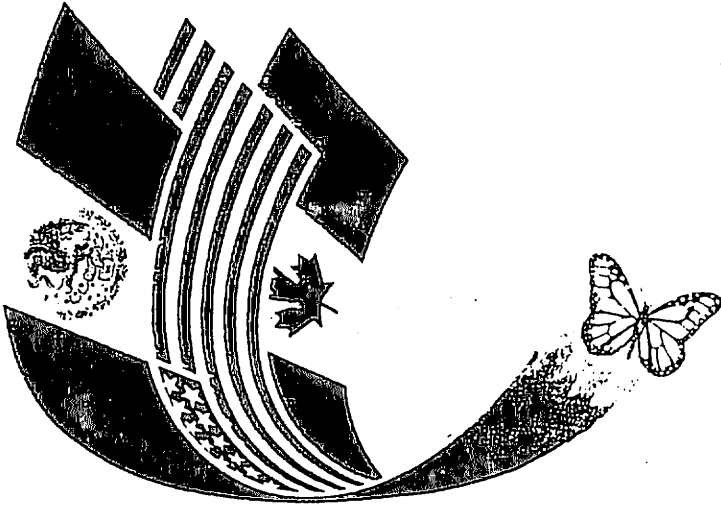
Arlene Benham,
14 Hillcrest Drive,
Cambridge, Ont. N1S 3L5
Canada.

Since Arlene will be involving school teachers and their students, perhaps our teacher members might have their students write to Arlene supporting her efforts. We have stated in former volumes of IMS the importance to protect the breeding grounds as well as the overwintering site in Mexico.

We would appreciate a copy of your letter or letters to Arlene or, if you wish, send the letters directly to us and we will forward them to Arlene after taking extracts from them for use in next year's IMS along with, we trust, a note congratulating Arlene on her success.

Perhaps we can assist others faced with the same situation. In the meantime continue to plant butterfly gardens and lots of milkweed plants.

NAFTA



Mexican Logo

Arrangements are currently being discussed by delegates from the United States, Canada and Mexico to establish free trade between these countries. The arrangement is designated NAFTA: North American Free Trade Agreement. The members of the Insect Migration Association will be interested in having the presence of the monarch butterfly included in the logo of Mexican correspondence. Thus, the monarch butterfly is a symbol uniting these three countries.

Thousands of visitors, many from countries outside of Mexico, journey annually to witness this remarkable phenomenon thus enhancing the economy of the country through travel by hiring local guides, by staying at hotels and by purchasing Mexican artwork many of which depict the monarch butterfly. The phenomenon of a butterfly travelling thousands of miles from breeding grounds to overwintering site and return has piqued the imagination of naturalists and conservationists around the world. Whether the governments of the United States, Mexico and Canada are aware of the contributions made by our dedicated research team or not, we, the members, can pat ourselves on the back.

We shall continue our investigations in order to solve other puzzling migratory paths of the monarch arriving in other countries and to fill in the gaps in our knowledge of the migrations in North America.

Our contributions will long be remembered in scientific articles in books and magazines for many year into the future.

At a meeting held in Mexico the follow recommendations were suggested for the protection of the fir forests where monarchs overwinter.

RECOMMENDATIONS FOR THE CONSERVATION OF THE
OYAMEL FIR FOREST
HABITAT OF THE MONARCH BUTTERFLY

Whereas the oyamel forest ecosystem is essential for the survival of the overwintering phenomenon of the Monarch butterfly; and whereas there is evidence that the areas currently protected by Presidential decree are being degraded or destroyed; and whereas extrapolation from existing data suggest that the probability of massive mortality of Monarch butterflies is increasing; and whereas new colonies of Monarch butterflies have been found since 1986 in areas not currently protected; the attendees to the Monarch Butterfly Mortality Workshop consider the adoption of the following recommendations to be of the utmost urgency:

A. Scientific recommendations

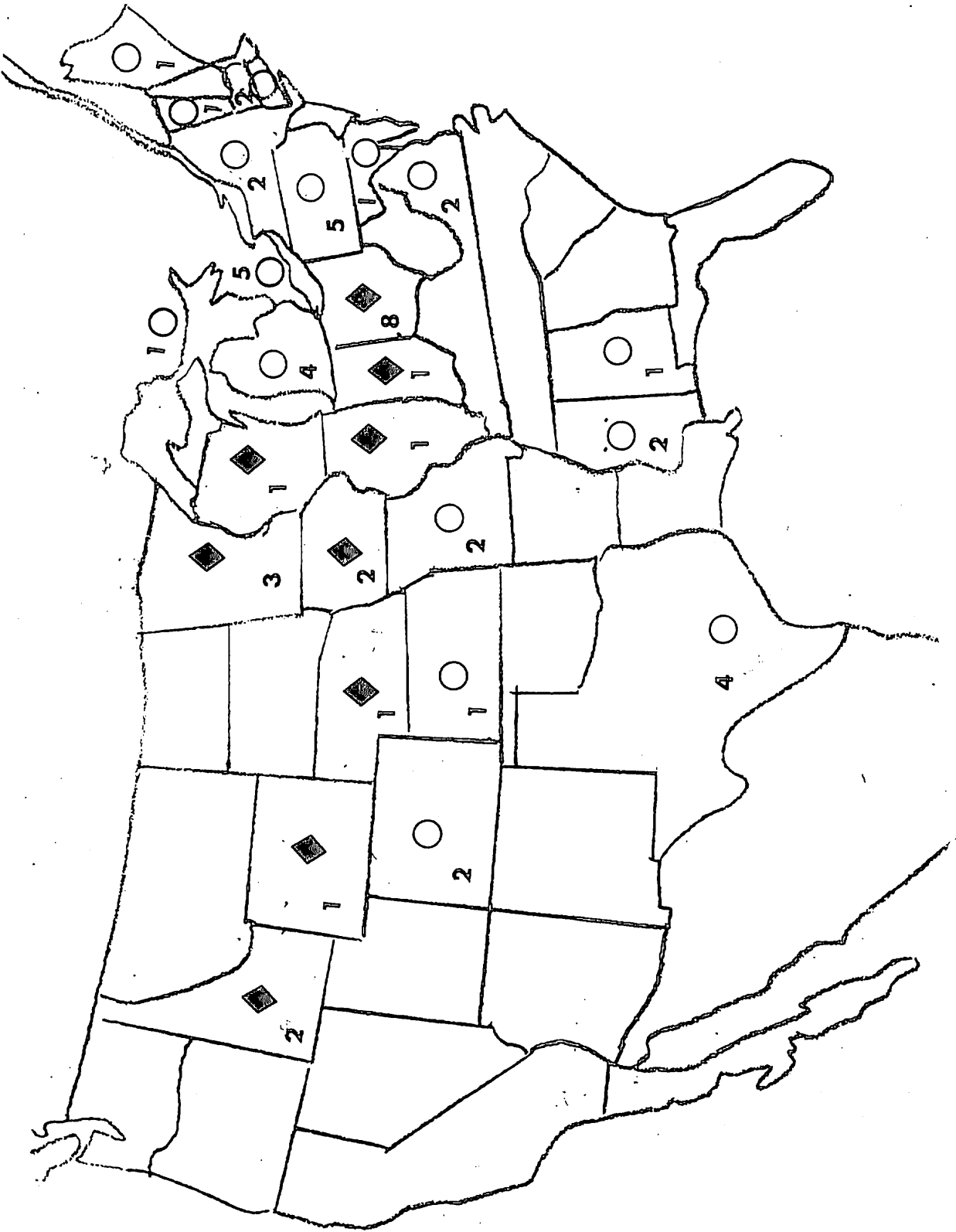
1. Redraw the boundaries of existing reserves based on new scientific evidence of butterfly overwintering biology.

There are two categories of overwintering sites: "island" colonies located on small, isolated mountains and larger colonies located on large mountain massifs. Different boundary criteria should be applied to these distinct categories of habitat. The larger colonies should be protected by including in the core area the drainages in which the butterflies form colonies plus one additional drainage on each side. The buffer zone should consist of at least one drainage beyond that. Smaller sites located on isolated mountains should be protected by delimiting the boundary based on the fir forest ecosystem.

2. Monarch overwintering areas not included in the 1986 decree should be protected according to the same criteria as described above.
3. In all Monarch overwintering areas, tree density and forest structure must be enhanced to provide optimum butterfly habitat under any stochastic climatic event.
4. No forest harvesting permits should be granted within any area (regardless of its location within or outside of core areas) where the Monarch butterflies have been observed to establish a colony, including a sufficient protective radius around the colony.

5. Until such time as a management plan is approved for the Monarch butterfly habitat areas, road construction or improvement and extension of roads within or around the reserves should be prohibited.
 6. House construction should be prohibited within the boundaries of the reserves.
 7. Grazing by livestock within the reserves should be suspended until such time as a management plan is approved for the Monarch butterfly habitat areas.
 8. In our opinion, if illegal and domestic cutting of trees in the reserve areas are not stopped, the Monarch overwintering phenomenon in Mexico could collapse within 15 years.
 9. We propose the establishment of a tri-national agreement among Mexico-USA-Canada of shared responsibility, for the protection of the ecosystems in which the Monarch butterfly breeds, feeds, and overwinters in the respective countries.
- B. In order to carry out the above recommendations, we recognize that an institutional structure and process must be defined. These are our suggestions:
1. A presidential commission should be established to oversee the protection of Monarch butterfly overwintering habitats. This commission should include representatives from government agencies (including SARH, SEDESOL, and the state governments of Michoacan and Mexico); representatives of the ejidos and communities involved; NGO's (e.g. Grupo de los Cien, MONARCA, A.C., PRONATURA, FUNDAREB); universities and research institutions.
 2. A tri-nation scientific advisory group should be established to advise the presidential commission described above.
 3. The presidential commission should provide terms of reference for a team of technical experts to design the management plan for the Monarch butterfly reserves.

4. The implementation of the management plan should be defined by the Commission.
5. It is essential that people living in the area surrounding the reserves participate in the design and implementation of the management plan.
6. We recognize that the provision of economic alternatives for the people living in and around the protected areas is crucial for the protection of the Monarch reserves.
7. We suggest the creation of seven regional centers of conservation and sustainable development, working under the supervision of the presidential commission, to be in charge of the execution of the ecological management plan, forest management, the monitoring of the conservation, and the development of productive ecology projects.
8. The local communities will be active participants in all activities of the centers and in the elaboration of the Management Plan.



◆ : Abundant

○ : Scarce

Figures: Number of reports

Summer Population Census: See p 19

BUTTERFLY GARDENS

We are pleased to report that many of our associates have established butterfly gardens in areas around their homes. Some of these gardens occupy several acres containing not only nectar producing flowers but also milkweed plants of various species. Primary schools involved in teaching natural science have established school gardens maintained by the students who are also involved in various projects such as the kinds of insects attracted to the flowers.

We recently received a videotape from Callaway Gardens concerned with various species of butterflies - a magnificent film. Callaway Gardens have many acres devoted to flowers that attract butterflies. If you wish to enquire about the tape and suitable flowers for such a garden you may wish to write to:
Callaway Gardens,
Ida Cason Callaway Foundation,
Education Department,
Pine Mountain, GA. 31822-2000

SUMMER POPULATION CENSUS 1992

Since there was a possibility that the reduction of the monarch populations in Mexico might have influenced abundance on the breeding grounds we asked our associates to report whether or not there was any reduction in population in their particular areas. The results are shown in the accompanying map.

The map indicates, along with written reports received, that there was scarcity in areas where inclement weather prevailed throughout most of the summer - cold, wet, and with frequent thunderstorms and the occasional tornado. Such unfavourable weather conditions occurred in states from Colorado east to Mississippi and Indiana and in the eastern United States from Maryland and New Jersey east to Vermont and Maine. Similar conditions existed in eastern Canada. In contrast, favourable weather conditions existed from Wyoming east to Indiana and Ohio.

Areas of scarcity, therefore, were the result of unfavourable weather conditions and not to any reduction in the population in Mexico.

We do not expect that the areas of low populations this past summer due to unfavourable weather will have any appreciable effect on the overwintering monarchs in Mexico during the winter of 1992-93.

THE MONARCH BUTTERFLY: INTERNATIONAL TRAVELLER

I have received a number of requests from our Associates asking about available copies of this book. I was informed by the Editor some time ago that they may consider a "re-run." So far I have had no further word.

I would suggest that you write to the publisher asking if there are any books available. You might also enquire at your local book store - some other book store may have a copy if your local store does not have one.

The address of the publisher is as follows:

Nelson-Hall Inc,
111 North Canal St.,
Chicago, IL. 60606

Address your letter to: Stephen A. Ferrara
President.

CONSERVATION OF THE MONARCH BUTTERFLY IN MEXICO

When the overwintering site of the monarch butterfly was discovered in the Angangueo locus, Michoacan, Mexico (after twenty-five years of intense investigations by alar tagging by our Insect Migration Association and numerous expeditions financed by the National Geographic Society) an article was published in the National Geographic Magazine (Aug. 19 76) announcing the discovery. At a luncheon held in honour of Fred and Norah Urquhart at the National Geographic Society, Washington D.C. the then Chairman of the Board, Dr. Melvin Payne sounded a warning note. He suggested that perhaps hordes of people might descend upon the area to collect the butterflies thus destroying the overwintering population. Dr. Payne pointed out that this happened with respect to a rare mollusc. We heeded his warning. Working closely with Sr. Ogarrio, a Mexican lawyer interested in the monarch butterfly, Monarca A.C. was established. Much has happened since leading up to the involvement of the Mexican government in the conservation of the monarch butterfly.

At a meeting recently held in Mexico, recommendations were presented for the conservation of the oyamel forests, habitat of the overwintering monarch butterflies. The proposals agreed to are included in this report.

MILKWEED - A FARM CROP.

Mark Etheridge sent the following newspaper item:

"WEED BECOMES A CROP: Natural Fiber Corporation is growing milkweed for the floss, which is reported to be a better insulator than goose down. The silky fibers can be used in facial tissues and disposable diapers. They also have the potential to be blended with cotton to make fabric and the oil from the seeds may have food value, reports The Avant Gardner. Surprisingly, milkweed is not easy to grow, weeds, insects and diseases threaten it."

I discussed the use of milkweed in The Monarch Butterfly: International Traveller, pp 3-5. The question has arisen: Will the larva of the monarch butterfly be considered a pest of this crop resulting in the use of an insecticide. Even if such should happen, the use of milkweed as a crop has beneficial effects. Regardless of how careful one might be to retain the "floss" there will be a considerable amount of seeds being scattered over the countryside giving rise to acres of milkweed plants outside of the farm lots. Thus, more food for the monarch larvae.

I purchased a pillow stuffed with milkweed floss and goose feathers. By the time I paid the various taxes, it cost \$96.00 in Canadian funds. I found that it is far too soft for me. It has one advantage: It puffs up again immediately you raise your head. If you like a very soft pillow then I am certain you would like this milkweed variety.

EL NINO

"El Niño", Spanish for "boy child" or "Christ child" is a weak, warm, ocean current in the Pacific Ocean off the coast of Peru that arrives each year around Christmas, hence the name "Christ child". The presence of El Niño has been linked to snow storms in western Canada, dust storms in Australia, starvation and mass migrations in drought-stricken Africa, floods in Brazil, etc.

It occurs every three to five years with occasional wider intervals from two to ten years. "In Canada and the northern United States the additional heat strengthens and alters the path of the jet stream, the high altitude, fast moving river of air that steers weather systems around the world. A diverted jet stream can wreak havoc with the weather wherever it goes (Canadian Geographic, Jan. 1933).

During the winter of 1991-92, El Niño was in its twelve year maximum resulting in weather anomalies over Mexico with heavy snow falls in the mountains resulting in the loss of many overwintering monarch butterflies. It should be emphasized, however, that the loss was not as great as reported in the press. Also, the heavy snow fall in the area where the monarchs were massed together, such as at Anganguero, had nothing whatever to do with excess lumbering operations,

Although there is perhaps a considerable loss due to the heavy snow fall, the loss to the monarch population was little as compared to the great loss during a virus epidemic, of unfavourable weather on the breeding grounds.

PLEASE KEEP YOUR LEFTOVER TAGS

We would like you to keep any tags that you have left over at the end of the season for use next year.

The reason for this is that the tag numbers that are sent to you are kept on permanent record here at our office and will not be reissued to anyone else.

Since the adhesive on the tags is permanent and will remain sticky for many years, their should be no problem with its drying out. However, if you live in a dry climate, we recommend that you keep the tags wrapped in plastic film.

When you renew your membership with our group, please list the numbers of your tags that are left over so that we may verify the numbers on the tags of recaptured butterflies that are reported to us.

DEFECTIVE TAGS

Although most of the tags that we issue are clearly printed, occasionally some are sent out that do not have clearly printed numbers. This may happen especially if a large number of tags are sent to one associate.

In any case, please examine your tags carefully before using them in order to be sure that all of the numbers are easy to read.

If you have been sent tags that are defective in any way, that is the printing is not clear or the backing is not sticky, please return them to us and we shall replace them.

CREASE THE TAG BEFORE REMOVING FROM BACKING

If you bend the alar tag in half before removing it from the backing you will find that it is much easier to place the tag over the edge of the wing. Mary Lyons brought this method to our attention to inform the associates. This is the method that we have used with considerable success. Another method is to place half the tag on the underside of the wing and then bend it over. This, however, often leaves too much of the tag protruding from the margin of the wing. Whatever method you use, always be sure that all scales have been removed from the wing membrane in the area to which the tag will be applied.

If you need to contact us about ordering alar tags or for information about our research, please telephone one of the following numbers:

1-416-282-1678 Our home phone and leave a message on our answering tape.

OR

1-416-287-7400 Scarborough College, University of Toronto and leave a message with the secretary who will contact us.

SPECIAL ACTIVITIES OF ASSOCIATES

We are constantly delighted and amazed at the variety of activities that our associates take part in because of their interest in the monarch butterfly.

We receive many very interesting letters from which the following reports and quotations are derived:

Ruth Addington of Abilene, Texas sent a video tape of herself tagging monarch butterflies and commenting on conservation. The video was made by a local TV station and shown on the News Hour. Ruth also sent a picture of herself on the front page of the Abilene Reporter-News together with a tagged monarch butterfly. Ruth says people in her area are becoming "quite monarch conscious" due to programs about the monarch given by her and her friends. Ruth also helped a college student to prepare a speech on the monarch and gave talks at "Zoo day."

Sally Baumgardner, Franklin Grove, Il. writes "On the down side my butterfly net was stolen in a house burglary- the bad guys used it to gather small items like jewelry. This was at the height of the season! Well, I bought a child's net and it worked pretty well. A little friend, age 6 caught butterflies for me with his bare hands!"

Lee Darst sent butterflies from Brecksville, Oh. to be released in Greenville, S.C. because of late hatching in November.

David Faber, Edgartown, Mass. and his students wrote letters to Congressmen and Senators encouraging them to consider the monarch butterfly as the U.S. national insect.

Alison Fuchs, daughter of Patience Fuchs of Short Hills, N.J., took two monarch butterflies to her school where they were tagged and released.

Alexander Garden, aged 9, of Malta Il. his brother and a friend have formed the Butterfly Brigade (mascot is the monarch butterfly). Alexander writes "We usually have our nets with us (especially when we get together). When we see a butterfly of interest we chase after it. Monarchs are nearly always of interest. If we catch it, I tag the monarch and release it".

Barbara Hagenson of Clinton, Ia. took 50 tagged monarch butterflies to Palm Harbour, Fla. where she released them.

Sophia Godbout of Brownsville Tx. & St. Paul Mn., writes, "I am trying to encourage the Dept. of Transportation (Minn.) and the local farmers to discontinue spraying and limit mowing roadsides.....I am gathering pods to plant seeds in our campground garden in the city". Sophia made a trip to the monarch refuge at Anganguero, Michoacan in February 1993. Sophia sent a picture of her and her daughters Cherie and Yvonne all dressed in T shirts with very realistic pictures of the larva, pupa and adult monarch butterfly printed on them.

cont'd

special activities cont'd

Lee and Polly Hall of Dayton, Oh. showed the metamorphosis process of the monarch butterfly to local elementary school classes through presentation of their narrated slide program "The Monarch Miracle". They included pictures of their visit to the overwintering site "which is the icing on the cake when we show the millions of monarchs to be seen there". Lee and Polly also presented programs to Senior Citizens groups, park district and Audubon Society members and to Elderhostel groups at Cape May, N.J. They distributed materials to the groups including a word puzzle about insects.

Mary Henshall of Nampa, Id. took monarch butterfly chrysalids to Rockville Md. so that her grandchildren could see the butterflies emerging. Mary receives many charming and amusing letters from students who have attended her talks on the monarch butterfly at two Montessori classes and two second grade classes. The following are excerpts from the letters:
 "When I grow up and get old, I will give all my money to help save the monarchs"...!I didn't know a larvae takes off his face"...!I'm glad you're helping them because I saw only two the whole summer..."

Donna Kessler, Audubon, Ia. travelled to Carroll, Guthrie Center and Clinton, Ia. (800 mile return trip) to speak to school children and a church group about the monarch butterfly. She reported a very enthusiastic response. Many people called her to inform her about the migration in her area.

Lee Ann Landstrom, Eastman Nature Center, Osseo, Mn. "we do much of our banding in a class for the public; 94 people attended, 4 sessions."

Judith Levicoff, Jenkintown, Pa. reported releasing a newly emerged monarch butterfly as part of a ceremony to open a new nature center at Cedarbrook school community. This was filmed by the school's television studio. Judith is encouraging the students to plant milkweed and butterfly weed to attract butterflies to their area.

Marion Lopina, Wauwatosa, Wi. released tagged monarch butterflies in California in September 1992 and had her son release others in New Orleans, La.

Patricia Lovallo, Rochester, N.Y. was session leader at a family camp in Lakeville, N.Y. She showed groups of children 6-17 years old butterfly eggs and tagging "the youngsters became really enthusiastic about insects....and much less squeamish about them..."

Harold and Laura Mahan, Asheville, N.C. have opened a nature shop called "The Compleat Naturalist in Biltmore Village. Both accomplished naturalists, the Mahans sell all kinds of equipment for nature study as well as giving classes to help people enjoy their natural environment.

Martin McAllister, Rarden, Oh. presented programs about the monarch butterfly to 5 groups.

cont'd

special activities cont'd

Barbara McGhee, Erie, Pa. took larvae and chrysalids to two elementary schools and left them for the children to observe. One first grader watching a butterfly emerge commented, "It was awesome!".

Diane Miner and her husband, Strongsville, Oh. visited El Rosario, Michoacan Mexico in December 1992. Diane says "What a thrill that was.." (visiting the sanctuary of monarch butterflies).

Sharon Morkin, Bloomington Il. was honored with the Jack Fishleder Photography Award by the National Science Teachers Association. Sharon will receive \$750 " for submitting the best illustration of exemplary science instruction and learning... Sharon photographs the students exploring a butterfly garden (at Oakland School) where students learn about, care for and then set free monarch butterflies... Still another photograph captures moments at the end of the butterfly garden project when children must let their monarchs go."

Sharon also writes "In mid-June I will once again be conducting three all day seminars regarding butterfly gardens & rearing butterflies..." "Since autumn I have been working with the Nature Conservancy restoring a prairie savannah in Funks Grove Il. I am officially the butterfly monitor....."

Tami Nielsen of Chardon, Oh. won the Grand Prize for Photography at the Rural Photography Contest with a very appealing picture of her young nephew gazing down at monarch butterflies clinging to his overalls. The prize entitles Tami to a free trip sponsored by the Country Tours Division.

Gary Ross of Baton Rouge, La. spent October 1992 monitoring and tagging monarch butterflies which came to the gas production platform located 72 miles south of Cameron, La. in the Gulf of Mexico. Gary has been making an extensive study of the migration of the monarch butterflies which migrate across the Gulf.

Jane Ruffin of Rosemont, Pa. is making a survey of the location of butterfly gardens. Once the list is completed she intends to make it available to anyone who is interested.

Jane Seibel, Fond du Lac, Wi. had monarch butterflies in her class room. She writes, "We had over 40 larvae in our room... The students even had the opportunity to see one make its chrysalis... they fed the butterflies on their fingers and watched them fly around the room... Several other classes visited our room...".

Doris Stifel, Toledo, Oh. was hampered with knee trouble during the fall migration. Despite having to use crutches at times she was able to tag a prodigious number of monarch butterflies on the country roadsides. Doris reports she got "some pretty funny looks" from passersby.

Faye Sutherland of Boise, Id. and her fourth grade students were responsible for having the monarch butterfly named the Idaho official state insect. Faye sent pictures of Governor Cecil Andrus signing the bill. He was surrounded by students dressed as monarch butterflies while Faye beamed happily at the scene. This event was covered by newspapers, radio, and T.V.

Fay also sent tagged butterflies to be released in Woodside, Ca. as the local weather was too cold for their survival.

cont'd

special activities cont'd

Edna Sutton, Richland Center, Wi. showed slides of the monarch butterfly to first and second graders at a local school and a local church. Edna cut the pointed end from 50 milkweed seeds that we had sent to her. After a friend planted the seeds for her all of them sprouted.

Randy Sylvester, aged 9 years of Duxbury, Mass. planted milkweed in his home garden and is trying to persuade teachers at his school to plant milkweed in the schoolyard.

Randy won second place with his project about raising monarch butterflies in the Battelle and Duxbury Mass. school science fairs. He called his project "Monarch Magic".

Bill Thomas, Springfield Mo. gave 15 talks to schools and other groups re the monarch butterfly.

Rosemary Thornton, Lincoln Ne. writes, "I have given several workshops to teachers on the topic of raising monarchs in the classroom. Everyone is quite interested. A junior high teacher gathered eggs and had her seventh graders raise the larvae. She said they were thrilled, as were the other teachers, custodians, etc. in her school."

Manon Van Schoyk, Dublin, Oh. sent us a picture of T shirt with excellent illustrations of the monarch butterfly life history and an alar tag printed on it.

Audrey Wilson, Cobourg, Ont. gave a slide presentation to the Grafton Horticultural Club and to Club "39" at Roseneath. Audrey commented that the slides from her trip to Mexico added a lot of interest to her talk.

ACCURATE AND PROMPT SUBMISSION OF REPORTS NECESSARY

A research project must be carried out as accurately as possible. In following the movements of a marked animal the records must clearly and accurately show where and when the animal was so identified by tag or other method. We keep accurate and permanent records of every tag issued. Before we can accurately record all information about a recaptured specimen we must have the accurate report from the associate. Occasionally an associate fails to submit a report. In this case we send a follow-up letter asking the associate for the report or to inform us if the report might have been lost in the mail. It is most disappointing to have what may be a meaningful recapture and no report. Fortunately this is of rare occurrence.

- * Please be sure to keep copies of your tagging report as occasionally the report is misplaced by the associate or is lost in the mail.

Also when you do report your tagging we would appreciate it if you would total up the number of butterflies that you tagged. Since we handle hundreds of reports it makes it much easier for us to take your total and add it to all of the others. Otherwise we must count up your tagged butterflies thus delaying preparation of this report.

PUBLICITY

Thanks to our many enthusiastic associates we have received clippings from various newspapers and magazines about the monarch butterfly showing the tremendous interest that its life history and conservation generates in so many people.

Listed below are the associates who sent in the clippings and the list of publications from which the clippings were taken.

Special thanks go to Martin McAllister whose article on the monarch was published in "The People's Defender."

Ruth Addington, Gene and Darlene Bamman, Laura Banet, Arlene Benham, Cheryl Benyi, Dan Best, Blanche Emerson, Pearl Eslinger, David Faber, Patricia Fuchs, Mary Henshall, Barbara Hagenson, Lee and Polly Hall, Alta Horr, Lorraine and Harvey Houck, Elizabeth Karrow, Woody Keeney, Donna Kessler, James Kupcho, Judith Levidoff, Patti Murray, Jodi Newton, Sally Rollins, Gary Ross, Richard Rowold, Joan Senghas, Marjorie Solien, Doris Stifel, Faye Sutherland, Edna Sutton, Randy Sylvester, Judy Van Hook.

The Optimist, Abilene Reporter-News, Monitor Index; Chicago Sun Times; The School House, Democrat and Chronicle, Times Leader, East Side This Week, The New York Times; Kitchener-Waterloo Record; Friends of the Monarch Newsletter; The Vineyard Gazette; St. Petersburg, Times; River Cities News and Advertiser; Clinton Herald; Tulsa World; Dayton Daily News; World; The Decorah Journal, The Topeka Capitol Journal, The Boston Sunday Globe, Sunday World-Herald; Times Chronicle; The People's Defender; Unocal; Audubon; Quad-City Times; Sierra; Michigan Out-of-Doors; International Wildlife; The Arizona Daily Star; Blade; The Idaho Statesman; United Methodist publication; The Oakland Press Duxbury Clipper; The Patriot Ledger; The Sunday Advertiser; The Times Picayune; The Advocate.

EVA KENDRICK AWARDED SAULT STE MARIE ONTARIO

CONSERVATION AWARD

It is difficult to know where to begin when describing Eva Kendrick and her contribution to our research on the monarch butterfly since she is such an unusual person. Eva, who was 90 years old at the time of receiving the award has been working with us since 1970. She has always been very active with monarch butterflies and we could always depend on her to let us know about them in her area; an important area since she is our most northern associate.

Eva has done a great deal of public education about monarchs. She has contacted 28 schools-Eva says "You can hear a pin drop when I speak to the students". She has also fought to end the poisonous spraying of milkweed in her area.

Eva's many friends and admirers presented her with the Conservation Award at a special dinner held in her honour in October, 1992.

SPECIAL DONORS

Listed below are the associates who have contributed more than the suggested donation to the research fund. These extra funds allow more latitude to use long distance calls to verify data, special delivery services of the post office when it is necessary to send tags quickly during the fall migration and Spanish translation services from time to time.

Our thanks to the following for their generous help:

Fred Armstrong	Marsha Hancock	Emily Pendleton
Linda Auld	Mary Henshall	Patricia Peterson
Laura Banet	Carol Hillman	Kristine Pierce
Mary Banet	Dorothy Hoskins	Stan Putthof
Brazil Family	Lorraine&Harvey Houck	Elizabeth Radens
Dan Burk	Shirley Hupp	Sally Rollins
Lanette Christensen	Karrow Family	Gary Ross
Dale Clark	Donna Kessler	Jane Ruffin
Marta Clements	Patricia Kester	Millicent Scott
Lee Darst	Debbie Knutson	Joan Senghas
Alice Davis	Wendy Kopley	Vince Shane
Erma DeWitt	James Kupcho	Jean Sinclair
Margaret Elliott	Stephen Kupcho	Doris Stifel
Pearl Eslinger	Steven Lee	Edna Sutton
David Faber	Judith Levicoff	Sonja Teraguchi
Dianne Fair	Marion Lopina	Bill Thomas
Pat Fairless	Mary Lyons	Louise Turner
Nathan&Dorothy Fischer	Harold Mahan	Manon Van Schoyk
Paul Foster	Marjorie&Eldred Mathes	Audrey Wilson
Jessie Glynn	Roland Matson	Douglas Wilson
Barbara Hagenson	Elizabeth McInerney	Marsha Wilson
Lee &Polly Hall	Patti Murray	Alice Woodcock
	Stacey Newbrough	Cyril Zewe

^
ANSERING CORRESPONDENCE
^

Since the preparation of the Insect Migration Studies requires our undivided attention, we must postpone answering your letters until the report is ready for the printer.

RESEARCH ASSOCIATES

The following Research Associates represent thirty states in the United States, Canada and Mexico.

A

Adams, Bob
Addington, Ruth
Allenbough, Billy
Allgrove, Carl
Anderson, Barbara
Anderson, Carolyn
Anderson, Jim & Susan
Argana, Bernadette
Armstrong Fred
Auld, Lynda

B

Bamman, Darlene & Gene
Bandal, Cherie
Banet, Laura
Banet, Mary
Barton, Patricia
Baumgardner, Sally
Beerbower, Bruce
Benham, Arlene
Benyi, David & Cheryl
Bertolini, Joseph
Best, Dan
Bires, Nancy
Blacklock, Jeff
Blackmer, John
Boer, Lavonne
Borisch, Ken
Bradstreet, Lois
Brazil, James & Family
Breen, Jean
Briggs, Marcia & Arnold
Brown, Duane
Brown, Joe Eddy
Buegler, Richard
Buresh, Gary
Burk, Dan
Burke, Art
Burnett, Cecelia
Burns, Ann
Busenbarrick, Barb

C

Cancross, Craig
Carpenter, Susan
Carter, Gray
Carter, Rick
Cavender, Kathy
Christensen, Lanette
Clark, Dale
Clements, Marta
Clough, Harry
Coleman, William
Collins, Marg & Jackie Nienow
Collins, Patrick
Coughlin, Lucille
Craighton, Lu Ann
Crandell, Tom
Czuchnicki, Lynn

D

Devenport, Cynthia
Davis, Alice
Davis, Melissa
DeMontes, Barbara
Den Boer, Kevin
DeWind, Joan
DeWitt, Erma
Dieterich, Jeanne
Dingus, Eve
Doughty, Jean
Duffy, Katy
Duffy, Sean

E

Eberwein, Mary Beth
Eells, Jean
Elliott, Margaret
Emerson, Blanche
English, Lane
Eppley, Vickie
Ermirio, Yvonne
Esclinger, Pearl
Espy, Niki
Etheridge, Mark

F

Faber, David
 Fair, Dianne
 Fairless, Pat
 Fenstermaker, Mary Lu
 Fiedler, Pat & Paul
 Fischer, Nathan & Dorothy
 Foster, Paul
 Francke, Chip
 Fuchs, Patience & Ailison

G

Gaiffe, Gary
 Garden, Alexander
 Gibson, Fraser
 Glovas, Gregory
 Glynn, Jessie
 Godbout, Sophia

H

Hagenson, Barbara
 Halbeisen, Margaret
 Hall, Lee & Polly
 Hancock, Marsha
 Harrigan, Sean & Julie
 Hayes, Mike
 Henninger, Raychel
 Henshall, Mary
 Herbert, Todd
 Herr, Elim
 Hill, Marion
 Hillman, Carol
 Hinkle, Robert,
 Hoffman, Theresa
 Hogg, Loreta
 Holden, Joann
 Horr, Alta
 Hoskins, Dorothy
 Houck, Harvey & Lorraine
 Hughes, Ann
 Hupp, Shirley
 Hussey, Laura
 Hutchinson, Ann

I

Irvine, William
 Irwin, Ann

J

Jackson, Franne
 Jackson, Richard
 Jahn, Susan
 Jaworski, Karen
 Johnson, Joan
 Johnson, Natalee & Annika
 Jones, Kent

K

Kaplan, Paul
 Karcher, Gregory
 Karrow Family
 Keeney, Norwood
 Keller, Greg
 Kelley, Patricia
 Kelly, Brent
 Kendrick, Eva
 Kessler, Donna
 Kester, Patricia
 Kietzke, Virginia
 Klinkon, Joseph
 Knapick, John
 Knutson, Debbie
 Koehler, Bill
 Kopley, Wendy
 Krueger, Charity Ann
 Krupp, Linda
 Kupcho, James & Linda Peterson
 Kupcho, Stephen

L

LaBarr, Richard
 Lacy, Sarah
 Landstrom, Lee Ann
 Langefels, Doug
 Larsen, Kirk
 Larson, Gary
 Lee, Stephen & De Ann
 Lee, Zieke-Lee
 Levicoff, Judith
 Lister, Paul
 Loewit, Irv.
 Loftrom, Mark & Dora
 Lopina, Marion
 Lorimer, Mary
 Lovallo, Patricia
 Lowenberg, Del
 Ludwig, Fran
 Lutz, Marilyn
 Lyons, Mary

M

Macy, Rita
 Mahan, Harold
 Mathes, Eldred & Marjorie
 Matson, Roland
 Matthews, Robert
 McAllister, Jody Newton & Martin
 McGhee, Barbara
 McInerney, Liz
 McKay, Chris
 McKelvin, Brenda
 Meek, Bonnie
 Meredith, Greg
 Meyer, Martha
 Mihalevich, Lois
 Mikula, Richard
 Milani, Ruth
 Millward, Helen
 Miner, Dianne
 Morehart, Cindy
 Morkin, Sharon
 Murray, Patti

N

Newbrough, Stacey
 Nichols, Suzanne
 Nielsen, Tami
 Nikolai, Dick
 Nolin, Wendy
 Northeimer, John
 Nowicki, Timothy

O

O'Connor- Conlin, Janie
 O'Neil, Catherine
 O'Neil, Karen
 Ortt, Marilyn and Jennifer

P

Palmcook, Kay Dreyer
 Page County Cons. Bd.
 Palmcook, Kay
 Patton, Miriam
 Pendleton, Emily
 Perry, Melanie
 Perzanowski, Lee & Phyllis
 Peterson, Linda
 Peterson, Patricia Jewell
 Phillips, Leslie
 Pierce, Kristine
 Pittis, Rebecca
 Post, Earle
 Pratt, Donna

Preston, Vicki
 Putthoff, Stan

R

Radens, Elizabeth
 Ramey, Ralph
 Ray, Sally
 Reed, Mildred
 Reel, Terry
 Reese, Pat
 Reese, Randy
 Reininga, Mark & Family
 Riska, Michael,
 Ritzenthaler, John
 Rollins, Sally
 Ross, Gary
 Rowold, Richard
 Ruffin, Jane

S

Saehler, Edward,
 Sanders, Mary
 Scancarelli, Joan
 Schaab, George
 Schumacher, Nora
 Schutz, Mary Ellen
 Scott, Millicent
 Seibel, Jane
 Senghas, Joan
 Shane, Vince
 Shock, Ruth
 Siegel, Lesli & Russell
 Sinclair, Jean
 Smith, Marion
 Smith, Trudy
 Solien, Marjorie
 Southard, Donna
 Stifel, Doris
 Strike, Megan Gange
 Strong, William
 Stull, Jean
 Sutherland, Doug
 Sutherland, Faye
 Sutton, Edna
 Sylvester, Randy & Family

T

Tawse, Merrill
Teraguchi, Sonja
Thames, Bev
Thomas, Bill
Thompson, Amy
Thompson, Sylvia
Thornburg, Lynda & Frank Siemon
Thornton, Rosemary
Tihen, Carol
Tomberlin, Nancy
Totman, Lori
Trafton, Sarah
Trafton, Willis
Trial, Linden
Turner, Louise

U

Upton, Richard

V

VanHook, Judy & Family
Van Schoyck, Manon
Van Scoy, Regina

W

Wade, Larry
Wagner, Mark
Warner, Elaine,
Williams, Gary
Williamson, Carol
Wilson, Audrey
Wilson, Doug & Adam
Wilson, Martha
Wilson, Roger
Wood, Doug
Woodcock, Alice

Y

Yeager, Dorothy

Z

Zewe, Cyril
Zimmerman, Helen
Zimmerman, Walter