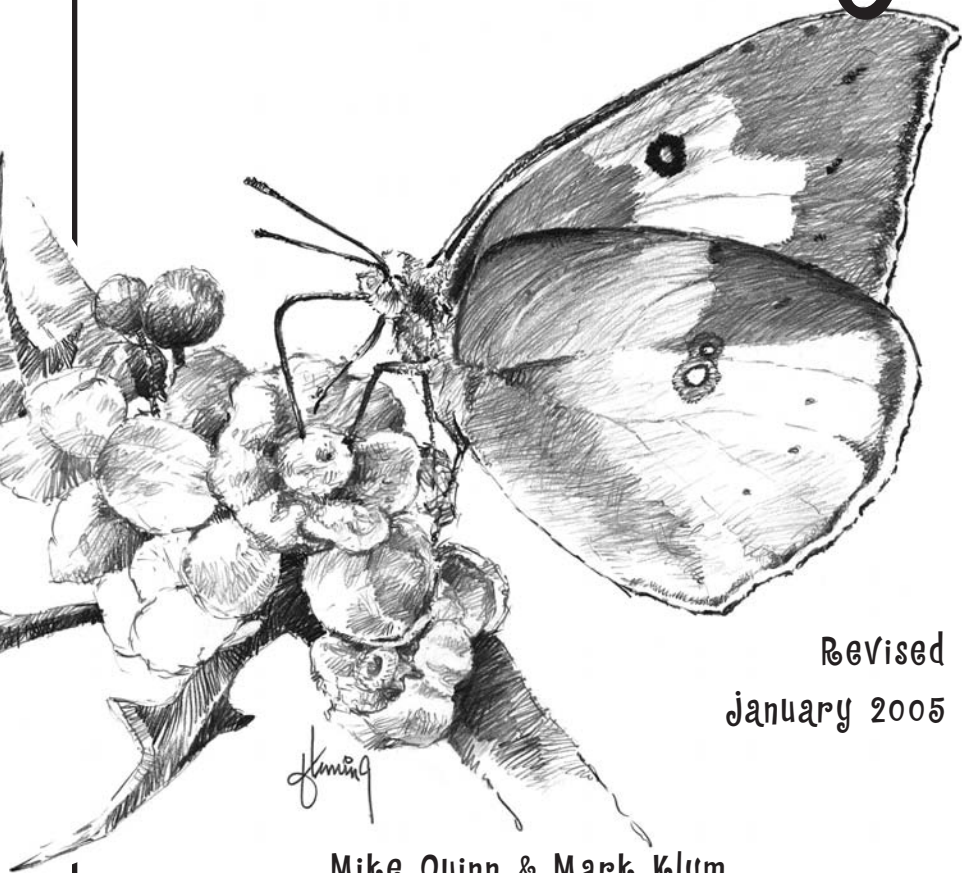


TEXAS PARKS AND WILDLIFE

An Introduction
to
**Butterfly
Watching**



Revised
January 2005

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An Introduction to Butterfly Watching

TABLE OF CONTENTS

Introduction	2
Texas' Place within North American Butterfly Diversity	3
<i>Graph: Areas of Greatest North American Butterfly Diversity</i>	4
Short History of Butterfly Watching in Texas	4
Close-focusing Binoculars	7
Photography	8
Checklists	8
Insect Classification	9
Overview of Butterfly Families	10
Butterfly Finding Suggestions	12
The Butterfly Life Cycle	13
Behaviors and Concentrators	15
Butterfly Gardening	16
Quality Nectar Plants	17
Caterpillar Food Plants	19
<i>Illustration: Parts of a Butterfly</i>	20-21
How to Identify Caterpillars	22
Rearing Caterpillars	23
How to Become a Better Butterflier	23
Butterfly Conservation	24
Texas Monarch Watch	25
4th of July Butterfly Counts	28
Festivals	29
Organizations Concerned with Butterflies	30
Bibliography	33
Checklists by Region	35
Butterfly Gardening Resources	37
E-mail Listserv Information	39

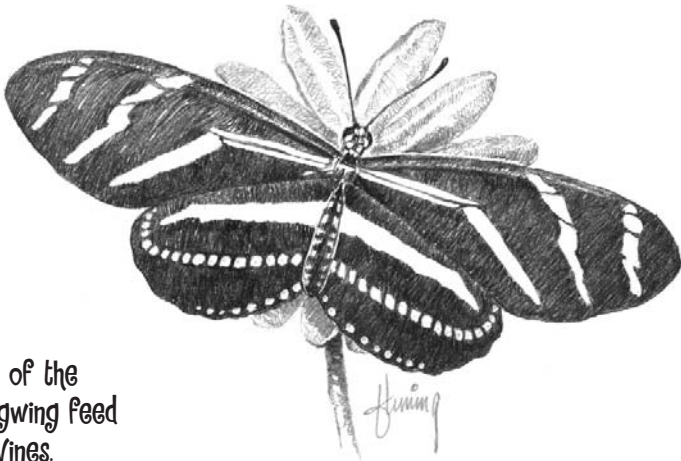
An Introduction to Butterfly Watching

INTRODUCTION

Butterfly watching is taking the country by storm! Naturalists for years have marveled at the beauty, grace and value of these wonders of nature and the increasing numbers of people now going into the field to look for butterflies demonstrates their charisma. The recent development of close focusing binoculars has allowed modern butterfly enthusiasts a luxury their predecessors did not have – the ability to closely observe their subjects in their natural habitat. As field guides, binoculars and cameras improve, the hobby will continue to grow. These developments have helped to bring butterflying to a status on par with birding, despite the latter's active growth since the 1930s.

Habitat is a prime concern of wildlife watchers and conservationists, and butterfly enthusiasts are no exception. Texas, with its many ecological regions and diverse geological and biological features, offers habitat for a great variety of butterflies. Of the 732 species recorded in North America (north of Mexico), approximately 442 have been recorded in Texas, the most diverse butterfly state in the nation. This diversity makes butterfly watching in Texas both rewarding and challenging.

We hope you'll enjoy this introduction to the fascinating hobby of butterfly watching and that this publication will inspire you to go, binoculars or camera in hand, into one of our many Texas parks and prairies or even your own backyard, looking for butterflies.



Caterpillars of the
Zebra Longwing feed
on passion Vines.

An Introduction to Butterfly Watching

TEXAS' PLACE WITHIN NORTH AMERICAN BUTTERFLY DIVERSITY

The tremendous butterfly diversity of Texas is strongly influenced by the many ecological regions that stretch beyond her borders. The Great Plains, Pineywoods, Tamaulipan Thorn-Scrub and the Chihuahuan Desert profoundly influence which butterfly species can be found in North, East, South and West Texas respectively. Considering the diversity of Texas' habitats, it shouldn't be surprising that Texas stands alone among states as the undisputed national butterfly champion in terms of the number of butterfly species recorded (see graph on page 4). Texas has recorded over 442 species of butterflies while Arizona is a distant second with approximately 325 species. New Mexico is the only other state whose butterfly diversity exceeds 300 species. By comparison, California has 250 butterflies and Florida has less than 200 species!

Within Texas, nearly 300 species of butterflies have been recorded in the Lower Rio Grande Valley alone. The three counties of south-most Texas, Starr, Hidalgo and Cameron, represent the greatest butterfly diversity of any similar-sized area north of Mexico. Incredibly, the number of butterflies recorded from the Valley is approximately equal to the total number of butterflies in all of eastern North America! Approximately 70 species of butterflies have been found nowhere north of south-most Texas. The principle reasons for South Texas' rich butterfly fauna are its mild winters, plant diversity and close proximity to Tamaulipas, Mexico's most biologically diverse northern state.

With this spectacular butterfly diversity and abundance, it's no wonder that the North American Butterfly Association (NABA) chose the Rio Grande Valley as the place to create the NABA International Butterfly Park, the premier butterfly gardens in the world. This gem of a park is being built on 84 acres of land fronting the Rio Grande River in Mission, Texas. The NABA International Butterfly Park will be in close proximity to the World Birding Center's Headquarters near Bentsen-Rio Grande Valley State Park. For more information, visit: www.naba.org/nababp.html

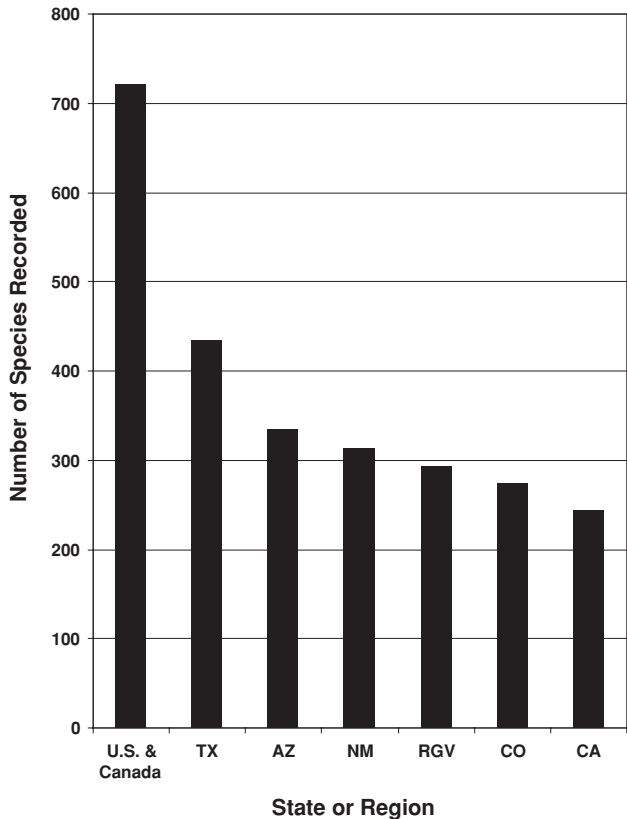
An Introduction to Butterfly Watching

SHORT HISTORY OF BUTTERFLY WATCHING IN TEXAS

Butterflies stand alone among all insect groups in that species-level identification guides have been available for more than 100 years. These early guides contain a wealth of important species-specific information yet suffer a few shortcomings in terms of their use as aids in field identification. Most specimen-based guides suffer to a degree from one or more of the following conditions: small image size, being in black-and-white, showing the wings spread when in life many butterflies fold their wings over their backs or showing butterflies cut in half occasionally with the dorsal and ventral halves side-by-side. Grass Skippers, a large subfamily of butterflies, when shown with their wings spread present a view particularly foreign to the way they hold their wings in the field.

Early butterfly guides also lack range maps, which depict the expected distribution of each species. Prior to the introduction of range maps for butterflies in the mid 1980s, the range of an eastern U.S. species might be described with vague wording such as "... west to Texas." Also, the early guides either completely lacked

Areas of Greatest North American Butterfly Diversity



An Introduction to Butterfly Watching

common names or they used non-standardized names that only partially agreed with other author's common names.

The first widely used butterfly field guide with pictures of living butterflies was Robert Michael Pyle's *The Audubon Society Field Guide to North American Butterflies* published in 1981. Though it lacked range maps and standardized common names, it was ahead of its time. Butterfly enthusiasts were still obliged to physically catch the butterfly to get a close enough look to make the correct identification of many species because the widespread manufacturing of close-focusing binoculars was still a decade away. Thus, "catch and release" for butterflies came into vogue. For an excellent early treatise on butterfly watching, see Pyle's 1984 field guide, *The Audubon Society Handbook for Butterfly Watchers*.

The 1990s were a decade of rapid popularization of butterflying. In 1992, the North American Butterfly Association (NABA) was formed. NABA's mission is to increase public enjoyment and conservation of butterflies. NABA focuses on "recreational butterflying including listing, gardening, observation, photography, rearing and conservation." There are currently more than 30 NABA chapters across 16 states. At present, Texas has three NABA chapters plus two other independent butterfly organizations; all five were formed since 1995. (See Organizations Concerned with Butterflies.)

The mid-90s kicked off an era of Texas butterfly field guide publishing that has yet to let up. Numerous field guides were published covering all or part of Texas. In 1996, Raymond Neck published *A Field Guide to Butterflies of Texas*. Though this field guide has since gone out of print, it is still an excellent source of Texas-specific butterfly information. Also in 1996, John and Gloria Tveten published *Butterflies of Houston and Southeast Texas*. This invaluable book for butterflying the upper Texas coast showcases the excellent photography and scholarly natural history writing for which the Tvetens are renowned.

In 1999, Jeffrey Glassberg wrote *Butterflies through Binoculars: The East* and followed quickly with *Butterflies through Binoculars: The West* in 2001. (The area of coverage of these two guides is roughly divided along a north-south line which runs through College Station.) The *Butterflies through Binoculars* field guide series is exceedingly user-friendly and has, in fact, revolutionized the way we look at butterflies. Like most recent field guides, Glassberg photographed liv-

An Introduction to Butterfly Watching

ing butterflies. But for the first time, he arranged similar species on the same plate, to the same scale and in the same positions. Range maps are shown opposite the plates and for the first time, standardized common names as promulgated by the NABA English Names Committee are emphasized. Grass Skippers are notoriously challenging to identify in the field due to the similarity of the numerous small butterflies within this group. Glassberg's field guides tackles Skippers head on by showing enlarged crisp photographs of both males and females from above and below with similar species arranged side-by-side for easy comparison. Most earlier guides failed to show many illustrations of female Skippers. As of 2004, there were at least ten butterfly field guides in print that cover some or all of Texas! (See Bibliography.)

Gardening

Although many people came to butterfly watching from a birding perspective, an equal number come from a gardening perspective. The increase in the popularity of butterfly gardening has gone hand-in-hand with an increase in butterfly gardening resources. In 1990, Geyata Ajilvsgi published *Butterfly Gardening for the South*. Although this tremendous gardening reference covers all of southeastern United States, the author resides in Texas, so our state is well treated. She even included a whole chapter on the unique plants and butterflies of the Rio Grande Valley. Most of Texas' butterfly organizations have lists of recommended regional plants. (See Butterfly Gardening Resources.)

Computers

The computer and Internet revolutions have also been a boon to the advancement of butterflying. Most Texas butterfly organizations now have Web sites with copious amounts of information on where to go, what to see and what to plant for local butterflies. Now, anyone with Internet access can get much Texas-specific butterfly information. Texas has one of the first regional butterfly-oriented listservs in the country. The TX-Butterfly listserv is a way to share one's butterfly sightings or to send queries to butterfly experts around the state. (For subscription guidance, see E-mail Listserv Information.)

An Introduction to Butterfly Watching

CLOSE-FOCUSING BINOCULARS

In addition to effective field guides, close-focusing binoculars have perhaps been the single greatest aid to the field identification of butterflies. Close-focusing binoculars are profoundly changing the way we look at the world around us and even our place within it, much as early telescopes changed our view of the universe. Until relatively recently, most binoculars were manufactured for birding, hunting or similar activities where the object being observed was a great distance from the observer. Most binoculars built for these purposes don't focus closer than 12 or even 16 feet. Such binoculars are nearly useless for butterfly watching even though some are of very high quality (and thus high priced). Without close-focusing ability, one has to keep backing up to be able to focus on the butterfly, defeating the whole purpose of having binoculars in the first place. Fortunately most binocular manufacturers began developing models that focus down to five or even three feet in the late 1990s.

If one is a novice at using binoculars, a pair with a wide field-of-view may facilitate locating critters. Low power binoculars generally have relatively wider fields-of-view. Another ease-of-use factor concerns ease-of-focusing, which involves how stiff the focus wheel is and how many rotations of the wheel are required to change from close to distant focus. Focusing wheel stiffness is a personal preference, but the fewer wheel rotations necessary to go from close to distant focus the better.

Two numbers, e.g., 7x35, characterize all binoculars. The first number always reflects the power, a 7 power binocular will bring the image seven times closer to you. The second number indicates how bright the image will be. Butterfly watching is most often conducted during times of ample lighting so brightness is generally not as critical a factor as for birdwatchers or hunters who are often in the field at dawn.

When purchasing optics, it is important that you are comfortable with the model you select. A quality pair of light weight, low power binoculars may be ideal for you. For more information including a comparison of various binocular models, see Gary Fellers' *Binoculars for Butterflying - 2001* at www.naba.org/binocs.html

An Introduction to Butterfly Watching

PHOTOGRAPHY

Butterfly photography can be as useful as it is enjoyable. With a photograph one can study at length an unfamiliar butterfly long after it has gone. Later examination often reveals shapes, patterns and even behaviors not noticed while in the field. Photography is also the easiest way to share one's butterflying experiences with others, particularly in group settings. Additionally, photographs can be an important tool for documenting many rare species. When attempting to document an unfamiliar or possibly rare butterfly, it is best to get several shots from above and below. An accurate record of when and where each photograph was taken is required for documentation purposes.

Butterflies inherently lend themselves to photography. Because of their flat profile, they can be fully contained within the camera's shallow depth of field. Furthermore, many species of butterflies are not camera shy. If moving slowly, a photographer can usually approach to within inches of most butterflies.

Digital cameras now outsell film cameras. Most four and five megapixel "digicams" are reasonably priced and provide more than ample sharpness for most uses. While film photographers have to wait until their film is processed, digital photographers can check instantly to see if a quality image was captured. When travelling to new areas, digital photographers can review their day's shoot and begin the process of identifying any new butterflies seen. With a digital camera and a computer with Internet access, one can photograph a butterfly in the backyard and with a relatively few keystrokes, the image can be seen around the world!

CHECKLISTS

Checklists are welcome aids to active butterflyers as they are a concise compilation of the species known to occur in a local area. More informative checklists go beyond listing species and include abundance codes, e.g. "A" for abundant, "C" for common and so on. (A word of caution here: butterfly populations are *highly* variable. Relatively common species one year might be seen only once or twice the next year at the same time and location.) Other useful checklist data includes each butterfly's expected flight time, e.g. July through September. Naturalists often talk of a "life list." This is the equivalent of a personal master checklist as it includes all the butterflies ever seen in one's life.

An Introduction to Butterfly Watching

Butterfly watching is still in its infancy, hence there are few butterfly checklists compared to bird lists. Most butterfly checklists are centered on either a large city or one of Texas' more popular parks, refuges or nature centers. Most checklists are available online. (See Butterfly Checklists of Texas.)

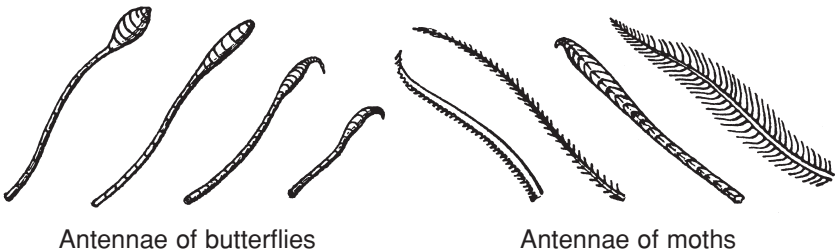
The United States Geological Survey (USGS) produces a checklist of reported butterfly species for every county in Texas, but most of these county checklists away from population centers are woefully incomplete. That's where you come in! Butterfly reports are needed from across the state to help fill in our knowledge of butterfly abundance and distribution. To report a possible new county record, please send documentation to Charles Bordelon, the Texas Coordinator of the Lepidopterists' Society, legitintellexit@earthlink.net

INSECT CLASSIFICATION

Differentiating Moths from Butterflies

Butterflies and moths compose the insect order Lepidoptera, meaning "scaled wings." A frequently asked question is, "How do I tell a moth from a butterfly?" To answer this question, it should first be pointed out that over 11,000 species of butterflies and moths occur north of Mexico and that a great deal of variability exists among them. In general, most butterflies can be separated from moths by the shape of their antennae. (See illustration below)

Butterflies usually have "club-shaped" antennae, which resemble tiny Q-tips. Female moths, on the other hand, have straight "thread-like" antennae while male moths generally have "feather-like" or plumose antennae. The increased surface area of the male moths' antennae facilitates their reception of the females' pheromones or scent. Unfortunately, there is no easy way to differentiate moth caterpillars from those that will turn into butterflies. Moth pupae that have silk encasing them are called cocoons. Butterfly pupae without silk are more correct-



An Introduction to Butterfly Watching

ly referred to as chrysalides. To go beyond knowing if a critter is a moth or a butterfly, we need a basic understanding of insect classification.

Classification

Biologists classify similar organisms by organizing them into groups. The smaller the group, the more characteristics are shared by all members of the group. Below is how biologists classify the Monarch:

Class - Insecta (all members of class Insecta have six legs)

Order - Lepidoptera (all Lepidoptera have six legs and wings with scales)

Family - Nymphalidae (all have six legs, scaled wings and reduced forelegs)

Genus - *Danaus* (in addition to the above, all *Danaus* caterpillars feed on Milkweed plants)

Species - *D. plexippus* (all can successfully mate with one another)

Together, the genus and species compose the scientific name, in this example, *Danaus plexippus*. Note that scientific names should always be either italicized or underlined.

Some 28,795 different species of insects are thought to occur in Texas and well over a million species occur worldwide. No one person can identify all members of this hyper-diverse class of animals. Entomologists, scientists that study insects, are trained to identify most insects to the family level. Butterflies are one of the few groups of insects for which species-level identifications can readily be made in the field. The starting point of butterfly identification, however, still involves answering the question, "what family does it belong to?"

OVERVIEW OF BUTTERFLY FAMILIES

The butterflies of Texas can be organized into the following families:

Swallowtails (Family Papilionidae)

Easy to recognize large butterflies with "tails" on their hindwings.

Swallowtails usually have some combination of black, yellow or blue markings. When landing on flowers for nectar, Swallowtails continue beating their wings instead of resting all their weight on it. All Swallowtail caterpillars have

An Introduction to Butterfly Watching

a Y-shaped gland called an osmeterium just behind their head that they can inflate. This pungent smelling gland is thought to repel predators. Some 20 species of swallowtails have been recorded in Texas.

Whites and Sulphurs (Family Pieridae)

These small to large butterflies are easy to separate into their two main sub-families: the Whites and the Sulphurs. Texas contains many species of Sulphurs, as their caterpillar food plants are among the widespread legumes. Ironically, White caterpillars mostly feed on plants in the mustard family. Sulphurs often imbibe on damp earth, an activity known as “mud puddling.” Seasonal variation is common within the Sulphurs. There are 48 Pierids recorded from Texas.

Gossamer-wing Butterflies (Family Lycaenidae)

These small gray butterflies usually perch with their wings closed. The antennae are dark with conspicuous rings around the shafts, a trait shared with the next family. The two main subfamilies in Texas are the Hairstreaks and the Blues. Hairstreaks have slight tail-like filaments attached to the outer angle of their hindwings. The Blues are named for the blue scales on the upper surface of their wings. Blues lack the Hairstreak’s hindwing filaments. The larvae of both groups are slug-shaped. Some form symbiotic relationships with ants. Approximately 67 Lycaenids have been recorded in Texas.

Metalmarks (Family Riodinidae)

Small sedentary butterflies that often perch on flowers or the underside of leaves in the vicinity of their caterpillar food plants. Metalmark migration is essentially unknown. These butterflies generally have brown backgrounds with silvery metallic markings paralleling their wing margins. Members of the *Calephelis* genus have overlapping ranges in Texas and are notoriously difficult to differentiate. Tropical members of this family such as Blue Metalmark and Red-bordered Pixie can be brilliantly colored. Seventeen species of Metalmarks have been recorded in Texas.

Brushfooted Butterflies (Family Nymphalidae)

Brushfoots are the most diverse family and can be divided into eight distinct subfamilies in Texas. Black, brown and orange are prominent colors here. The single character common to all Brushfoots is their greatly reduced forelegs, giving the appearance of having only two pairs of legs. Some adults

An Introduction to Butterfly Watching

specialize in feeding on tree sap, rotting fruit, carrion or even dung. Non-nectar feeding butterflies often have relatively short proboscises. Eyespots are commonly found on the wings of Brushfoots. Females lay eggs singly or in batches up to 500 strong! Brushfoot caterpillars are often covered with complex spines. In Texas, 109 Nymphalids have been recorded.

Skippers (Family Hesperidae)

Skippers are usually small to medium sized brown butterflies. Some Skippers resemble moths, but unlike moths, Skippers have clubbed antennae. The main subfamilies are the Spread-winged Skippers and the Grass Skippers. Grass Skippers are sometimes referred to as “folded-wing skippers.” They land with their wings closed or only partially opened, somewhat resembling a tiny jet airplane. Larvae and pupae protect themselves in a shelter or “refugium” made by folding over a leaf of their food plant. Most Skippers have long proboscises enabling them to feed at a wide variety of flowers. Due to their large muscle mass to wing area ratio, Skippers tend to be strong flyers, although very few are migratory. Grass Skippers can be particularly challenging to identify at first. Approximately 200 Skippers have been recorded In Texas.

BUTTERFLY FINDING SUGGESTIONS

As with any hobby involving wildlife, watching butterflies requires careful consideration of season, time of day and habitat to be most successful.

Habitat

Native prairies and open areas in state parks, wildlife refuges and nature preserves are some of the most productive habitats for butterfly. Other good butterfly locations include railroad and power line right-of-ways, abandoned fields and along dirt roads.

If a particular habitat feature is scarce, butterflies will tend to concentrate around that feature. Some examples of concentrators include hilltops, mud puddles or damp sand and gravel, trails and dirt roads through thicker vegetation, and caterpillar food plants. Butterfly gardens near areas of relatively undisturbed habitats work exceedingly well. The garden, rich in nectar, will attract the adults while the undisturbed habitat serves as an excellent source of caterpillar food plants!

An Introduction to Butterfly Watching

Season

Knowing when to look for particular butterflies is important. Some species are on the wing for only a month or so each year. The classic example of a butterfly with a “short flight period” is the Falcate Orangetip. Adults can be found flying from the end of February into April. The rest of the year, this species is in the egg, caterpillar or pupal stage. Annotated checklists can be particularly helpful for determining the “flight times” of the butterflies in your area.

Butterfly abundance is strongly tied to rainfall patterns, particularly in the more arid western half of the state. Spring and fall are the seasons of greatest abundance in Texas. Most plants are in peak condition at these times. Fresh leaves are preferred conditions for caterpillar development. Also, many plants are spring and/or fall bloomers and thus provide nectar for the adult butterflies at these times.

Time of Day

It is not necessary to get up with the chickens to see butterflies! Peak watching time is generally from 10 a.m. to 3 p.m. in spring and fall, while 8 a.m. until 2 p.m. is probably more productive in the summer months. Species diversity can change throughout the day, so sites that were productive in the morning may be revisited to find new species in the afternoon.

BUTTERFLY LIFE CYCLE

Insect metamorphosis is one of the world’s most fascinating biological phenomena. Butterflies undergo incredible changes as they pass through the following four distinct life stages: egg, caterpillar, chrysalis and adult. Observing these changes is to witness one of the greatest wonders of life.

Eggs (Ova)

Butterflies, like all animals, begin life as an egg. A female typically lays her egg on the underside of a leaf. Usually the plant to which the egg is attached is critical to the survival of the insect. The egg stage generally lasts about four days, with the egg darkening as it matures. Butterfly eggs vary in shape and appearance depending on the species. The basic shape is spherical though the egg may be compressed, resembling a disc or elongated resembling a cylinder. The surface of the egg may be smooth, or ornately decorated with ribs and small processes. Although the numbers can vary considerably, the average insect lays approximately 200 eggs.

An Introduction to Butterfly Watching

Caterpillars (larvae)

The caterpillar stage typically lasts for two to three weeks. Warmer temperatures generally induce faster development. Diet also influences development times; those that feed on flowers or leaves develop quicker than caterpillars that feed primarily on stems or roots. During the larval stage, the insect is essentially an eating machine and will grow as much as a thousand times its original weight. Note that most plants will fully recover even if fully stripped of their vegetation. Caterpillars that are able to feed on toxic plants and sequester those toxins in their body invariably have warning or “aposematic” coloration to deter predators that hunt by sight. Caterpillars typically shed their skin, or molt, four times as they pass from the egg to the pupal stage. Much remains to be known about the caterpillars and their food plants in Texas.

Chrysalis (Pupa)

Caterpillars frequently go through a wandering phase just prior to forming their chrysalis. During this phase, they may travel remarkable distances in search of an appropriate place to pupate – often under an overhanging object – to which they secure themselves with a silken anchor. While not a time of physical activity, the pupal stage should not be thought of as a resting stage as the insect is undergoing profound morphological changes during this period.

The pupal phase may last from a few weeks to several months depending on species, environmental conditions and individuals. When the change or metamorphosis is complete and the correct environmental conditions are present, the chrysalis will expand by breathing in air through its tracheal system and break the outer pupal casing, allowing a temporarily feeble butterfly to emerge.

Adult

This is the stage we all recognize – the winged jewels that flutter through our gardens pollinating flowers and bringing beauty to our lives. The adult butterfly emerges from the chrysalis with tiny, thick wet wings that must hang to expand and dry properly. Even the most plainly colored species can be truly beautiful creatures at this time.

The adult feeding habits are completely different from the caterpillar's. Thus butterflies do not directly compete with their caterpillars for food resources. No longer equipped with chewing mouthparts, the adult butterfly must satisfy the continuing demand for nourishment by using its proboscis or tongue – a straw-

An Introduction to Butterfly Watching

like sucking device that remains curled during flight. Adult butterflies feed primarily on flower nectar, though some butterfly species specialize in getting their nutrients from tree sap, rotting fruit, tears, sweat, bird and animal droppings and even carrion. Laboratory experiments have shown that carbohydrate availability will extend the animal's longevity.

The adult stage of most butterflies generally lasts only a few weeks, but species that overwinter as adults (such as Monarchs, Morning Cloaks and Red Admirals) can potentially live up to eight months. The few weeks of the average adult's life span are consumed with the need to mate, and in the case of the females, with searching for suitable food plants on which to lay the eggs of the next generation. Females have chemical receptors in their feet that allow them to taste the plants they land on in order to verify that it is indeed the correct host plant.

BEHAVIORS AND CONCENTRATORS

Knowledge of the following behaviors will help you to locate, identify and further appreciate butterflies.

Basking

Butterflies are "exothermic" meaning they must rely upon an external source for their body heat. On cool mornings they perch with their wings open toward the sun in an exposed location to warm their flight muscles sufficiently. This is an optimal time to get close enough to photograph some of the more skittish species before they can fly.

Hilltopping

Males of some species may be concentrated at or near the open top of steep hills. Freshly emerged females will often visit these areas to find a mate. Swallowtails are known "hilltoppers." Uncommon and rare species are sometimes concentrated on hilltops as well.

Mudpuddling

Adult butterflies operate on a salt deficit, as most caterpillar food plants are naturally low in sodium. Males often congregate at the edge of damp soil to collect salts concentrated there through evaporation. Males are able to incorporate some of these salts into the sperm packet that they pass on to the female during mating.

An Introduction to Butterfly Watching

Swallowtails, Yellows and Blues are some of the butterflies most frequently encountered mudpuddling. This behavior can be induced by watering a patch of earth during the dry summer months.

Courtship

Males of some species are very territorial – even to the point of chasing humans and birds that enter their territory; other males patrol widely looking for females. “Spiral flights” are a method of rejecting courtship. In an open area, a mated female and a male will spiral up over a field. Then when as much as 60 feet up, the female will suddenly drop like a dead weight. The male apparently loses track of the female and comes down more slowly. In other situations where the female is receptive, she may remain perched while the male literally hovers around her, releasing sex pheromones all the while. If disturbed while mating, butterflies will fly away still attached to one another.

BUTTERFLY GARDENING

A growing pastime in America, with conservation benefits, is the practice of developing your garden and landscape in a way that will be beneficial to wildlife. In Texas we call this practice *wildscaping*, and for the butterfly enthusiast it offers the opportunity to bring color and diversity to your home and yard.

Start your wildscape with “quality” nectar-producing plants in a sunny location. They will attract the greatest number of butterflies to your area. Most plants need butterflies and other insects to visit their flowers for the purpose of pollination. Flowers reward insect visitation by providing nectar or pollen.

When it comes to their foliage, most plants attempt to discourage insects from eating by making their leaves distasteful or even toxic. Over time, one or a few insects usually develop the ability to either detoxify or sequester the toxins of the plant and then the caterpillar feeds on that plant exclusively. This is one way species-specific relationships develop between plants and insects. A general knowledge of these relationships will enable the wise butterfly gardener to select certain plants that will attract specific butterflies such as Passionvines for the Gulf Fritillary or Milkweed for the Monarch. By planting the proper caterpillar food plants, gardeners can thus increase the abundance of particular butterflies.

An Introduction to Butterfly Watching

The use of plants native to Texas is to be encouraged, as they are best adapted to the local weather extremes such as droughts and freezes. Native plants generally require less supplemental watering than exotics, thus the prudent gardener can spend less time and money watering and more time enjoying.

Start your garden by selecting nectar plants from among the following families. Next, add the caterpillar food plants of the butterflies that you most want to frequent your yard. This is a list of butterfly attracting plants from across the state. If only the plant's genus is listed, use the species that is native to your region. For more detailed region-specific information, see Butterfly Gardening Resources.

QUALITY NECTAR PLANTS

The following nectar-rich plants will attract many species of butterflies.

Asteraceae – Sunflower Family

<i>Aster</i> sp.	Asters
<i>Berlandiera</i> sp.	Greeneyes
<i>Echinacea purpurea</i>	Purple Coneflower
<i>Eupatorium greggii</i>	Gregg's Mistflower
<i>Eupatorium incarnatum</i>	White Mistflower
<i>Eupatorium odoratum</i>	Crucita
<i>Eupatorium</i> sp.	Mistflower
<i>Gaillardia</i> sp.	Indian Blanket
<i>Helianthus</i> sp.	Sunflower
<i>Liatris</i> sp.	Gayfeather
<i>Palafoxia texana</i>	Texas Palafoxia
<i>Senecio</i> sp.	Groundsel
<i>Solidago</i> sp.	Goldenrod
<i>Verbesina encelioides</i>	Cowpen Daisy
<i>Verbesina virginica</i>	Frostweed
<i>Veronia</i> sp.	Ironweed
<i>Viguiera stenoloba</i>	Golden Eye Daisy

Boraginaceae – Borage Family

<i>Cordia boissieri</i>	Wild Olive (tree)
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An Introduction to Butterfly Watching

Ehretia anacua
Heliotropium sp.

Anacua (tree)
Heliotrope

Fabaceae – Legume Family

Coursetia axillaris
Eysenhardtia texana

Baby Bonnets
Texas Kidneywood

Lamiaceae – Mint Family

Monarda sp.
Salvia ballotiflora
Salvia coccinea
Salvia farinacea
Salvia sp.

Horse Mint
Shrubby Blue Sage
Scarlet Sage
Mealy Blue Sage
Salvia

Oleaceae – Olive Family

Forestiera sp.

Elbow Bush

Malvaceae – Mallow Family

Malvaviscus arboreus
Pavonia lasiopetala

Turk's Cap
Pavonia

Polemoniaceae – Phlox Family

Ipomopsis rubra
Phlox sp.

Standing Cypress (wet tree)
Phlox

Rubiaceae – Madder Family

Cephalanthus sp.

Buttonbush (wet)

Verbenaceae – Vervain Family

Aloysia gratissima
Aloysia macrostachya
Citharexylum berlandieri
Lantana microcephala
Lantana horrida
Lantana macropoda
Lippia sp.
Phyla sp.

Bee Brush
Sweet Stem
Fiddlewood
Lemon Lantana
Texas Lantana
Desert Lantana
Lippia
Frog Fruit (ground cover)

An Introduction to Butterfly Watching

CATERPILLAR FOOD PLANTS

These plants provide food for the caterpillars of the following butterflies:

BLACK SWALLOWTAIL:

Apiaceae – Parsley Family

Polytaenia nuttallii

Prairie Parsley

PIPEVINE SWALLOWTAIL:

Aristolochiaceae – Pipevine Family

Aristolochia sp.

Pipevine

MONARCH, QUEEN, SOLDIER:

Asclepiadaceae – Milkweed Family

Asclepias asperula

Antelopehorn Milkweed

Asclepias latifolia

Broad-leaf Milkweed

Asclepias oenotheroides

Hierba de Zizotes

Asclepias tuberosa

Butterflyweed

Asclepias viridis

Green Milkweed

Sarcostemma sp.

Climbing Milkweed

Cynanchum sp.

Milkweed Vine

BORDERED PATCH:

Asteraceae – Sunflower Family

Helianthus annuus

Common Sunflower

Verbesina encelioides

Cowpen Daisy

HENRY'S ELFIN:

Fabaceae – Legume Family

Cercis canadensis

Redbud

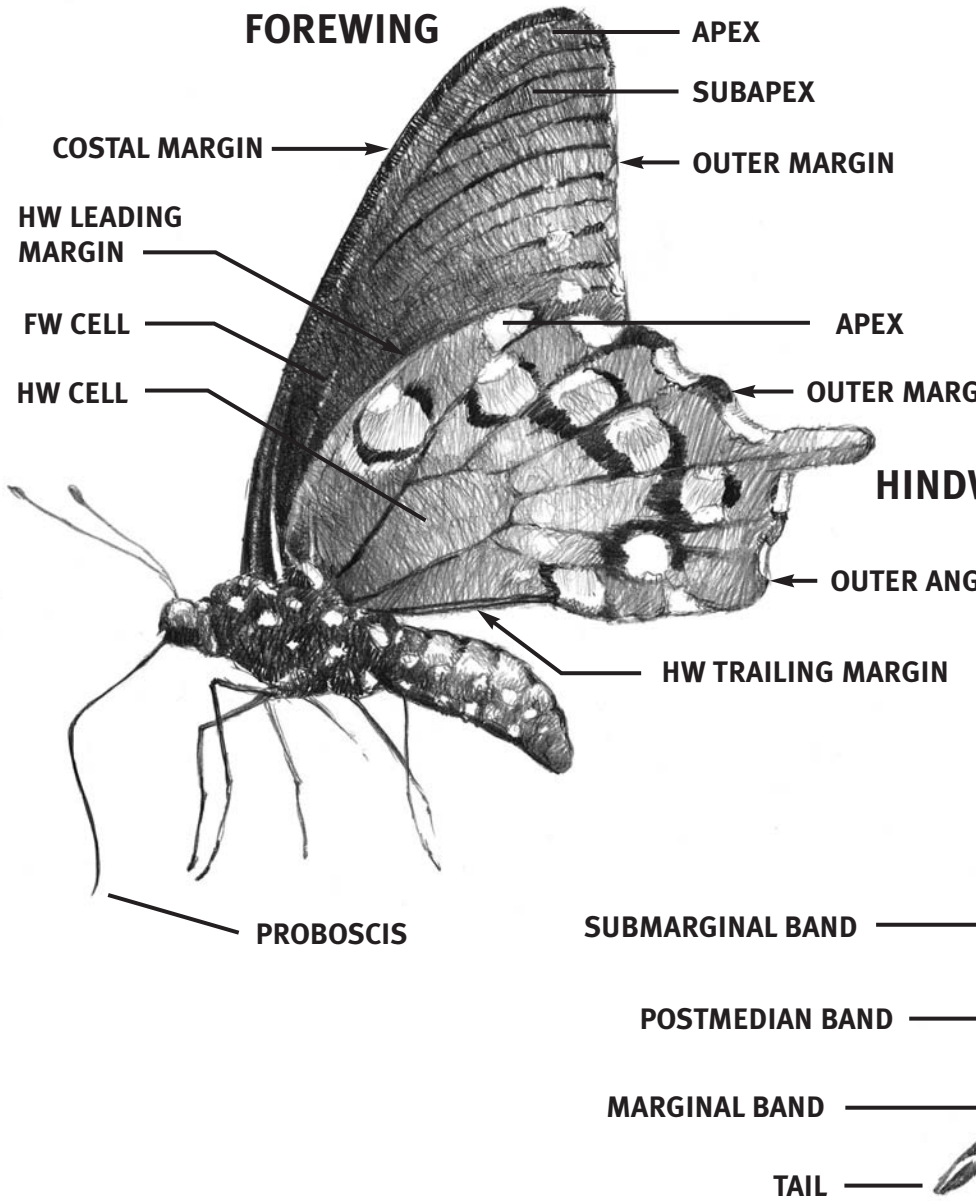
VARIOUS SULPHURS:

Fabaceae – Legume Family

Cassia sp.

Senna

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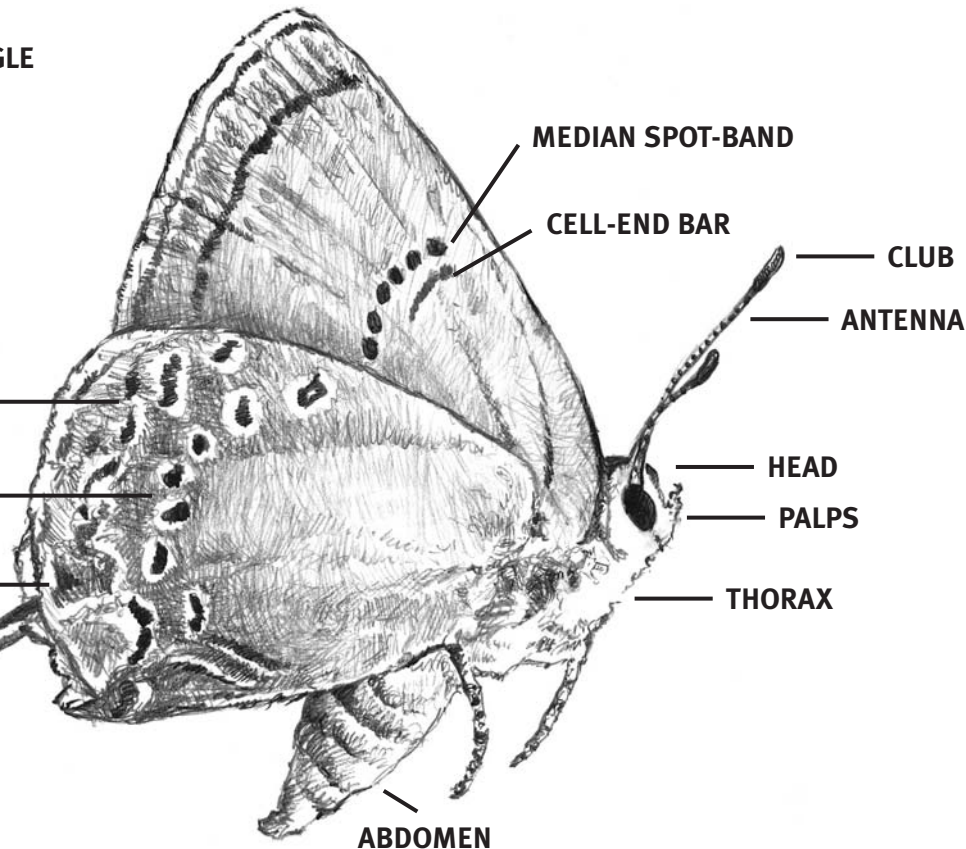


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An Introduction to Butterfly Watching

GULF FRITILLARY, ZEBRA, JULIA:

Passifloraceae – Passion Flower Family

<i>Passiflora filipes</i>	Spread-Lobe Passion Vine
<i>Passiflora foetida</i>	Corona de Cristo
<i>Passiflora suberosa</i>	“Corky” Passion Vine
<i>Passiflora lutea</i>	Yellow Passion Vine
<i>Passiflora incarnata</i>	Maypop

GIANT SWALLOWTAIL:

Rutaceae – Citrus Family

<i>Ptelea trifoliata</i>	Wafer Ash
<i>Zanthoxylum</i> sp.	Prickly-ash

BLACK SWALLOWTAIL:

Rutaceae – Citrus Family

<i>Thamnosma texana</i>	Dutchman’s Breeches Dill, Parsely
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HOW TO IDENTIFY CATERPILLARS

Probably the most commonly asked caterpillar question simply is “what is it?” or if it’s eating one’s plants, the question may be “how do I get rid of all these ‘worms?’” (Note: caterpillars are not worms. Caterpillars have eyes, legs and antennae which the much more primitive True Worms lack.)

Many butterfly caterpillars are beautifully depicted in John and Gloria Tveten’s *Butterflies of Houston and Southeast Texas*. A Field Guide to Caterpillars is scheduled for publication by Oxford University Press in spring of 2005. This will be the first field guide to depict every genus of butterfly caterpillar found north of Mexico.

However, the average caterpillar encountered in the wild is likely to be a moth caterpillar as there are approximately 10,500 species of moths north of Mexico. They outnumber butterflies by about 15 to 1. Not surprisingly, there is no comprehensive moth caterpillar field guide, nor is there likely to be one in the foreseeable future. The caterpillar stage of many moths is not even known to science! Therefore, the surest way to determine what kind of caterpillar you have is to rear it through to the adult stage. (See Rearing Caterpillars.) If the reared caterpillar produces an unfamiliar

An Introduction to Butterfly Watching

lar moth, it can be sent to the Texas Coordinator for The Lepidopterists' Society for identification. (See Organizations Concerned with Butterflies.)

As for caterpillars damaging plants, please note that the use of toxic insecticides and butterfly gardening are usually not compatible. Also, most plants fully recover following even a severe bout of caterpillar feeding.

REARING CATERPILLARS

Rearing caterpillars indoors can be a rewarding experience. Here are a few tips to get started. Provide a constant supply of fresh food. Maintain cleanliness by removing spoiled foliage and caterpillar droppings (known as "frass"). Avoid high moisture situations that induce fungal growth. Avoid overcrowding. Don't place the rearing container in direct sunlight. Do not disturb caterpillars in the process of molting or butterflies in the process of emerging.

Handle "spiny" or "hairy" caterpillars with caution. Most of these are innocuous, but some have stiff hairs or "urticating" spines that can cause skin irritation or painful stings. Caterpillars found late in the fall may require special techniques to rear indoors as they may need to be exposed to an extended period of cold temperatures before they can emerge as an adult. Release adults at the site where the caterpillar was collected. For more detailed rearing instructions, see Caterpillar Field Guides and Rearing Information.

HOW TO BECOME A BETTER BUTTERFLIER

Putting it all together

Taking notes is one of the single best practices to cultivate for anyone wanting to learn about the natural world around them. Notes should include the date, location and names of the species observed. Avoid abbreviations; you won't remember what they were and neither will anyone else! Be as detailed as possible, you'll thank yourself later.

Take pictures. Most species of butterflies allow close approach, even to within inches! Having photographed a butterfly well allows one to study it at leisure or at a later date when one has more knowledge, and/or access to more references.

An Introduction to Butterfly Watching

Get a checklist and thoroughly study the species with the highest abundance rating. These are the species that you will most likely encounter. Learn to recognize the males and the females if they are different. Learn which species are variable in their patterns. After learning the common species well, one will be more likely to have the skills necessary to find and identify a rarity among a “crowd of commoners.”

Learning the caterpillar food plant associations is *central* to understanding butterflies. If one observes an unidentified butterfly repeatedly visiting a plant that's not in bloom, it's probably a female laying eggs. If one knows the name of the plant, most field guides have an index of host plants that list the butterflies known to feed on that plant. Being able to identify the butterflies and the plants of an area will result in a much greater appreciation and understanding of the natural world.

BUTTERFLY CONSERVATION

A core value of most butterfly enthusiasts is the desire for butterflies to continue to fly. To that end, here are some suggestions:

Encourage the setting aside of undeveloped areas. Small populations of many species of butterflies can be conserved on an acre or less. Larger preserves can serve as reservoirs to replenish the smaller, less stable populations, particularly if they are near each other.

Encourage the use of native plants in new and existing developments. Avoid plants known to be invasive in your region. Native plants are adapted to local conditions and thus require considerably less water and other time and labor-consuming activities. Native plants also provide food and shelter for native wildlife. Exotic plants are often sterile.

Reduce the usage of pesticides. On average, homeowners use more pesticides per acre than farmers do. To overuse pesticides in an artificial habitat dominated by relatively lifeless exotic plants is to add insult to injury from a butterfly's point of view.

Don't collect rare species. In a colony of rare butterflies, each individual killed reduces the gene pool – a reduction that becomes more significant as the colony decreases in size. The one individual removed may have held a mutation that

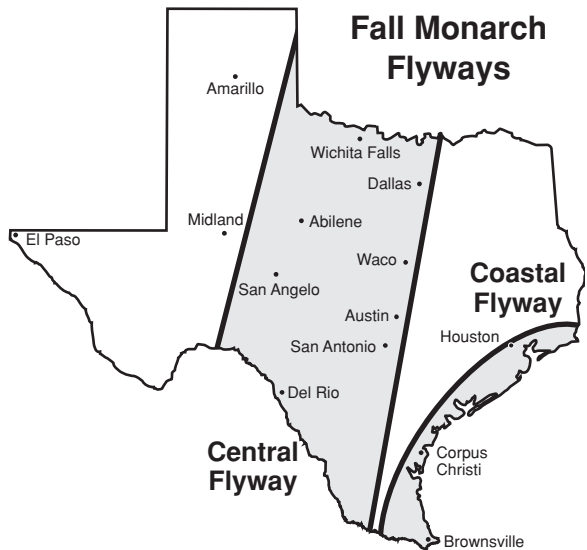
An Introduction to Butterfly Watching

would have allowed the colony to survive some future calamity. Although there are no species of butterflies (or moths) in Texas that are listed as threatened or endangered, there are some species that have limited distributions and are thus considered to be “species of concern.” Collecting in state parks requires a permit.

TEXAS MONARCH WATCH

The Monarch is perhaps the best known insect in all of North America. The Monarch is the world’s only insect to perform a continent-wide migration returning annually to a centralized overwintering location. Texas Parks and Wildlife Department conducts an active citizen-science Monarch monitoring project called Texas Monarch Watch. Volunteers are asked to report first sightings, to record number of Monarchs seen daily during the spring and fall Monarch migration and to e-mail or call if they observe any large roosting events. The fall migration can be particularly spectacular as

nearly the entire eastern North American population of tens of millions of Monarchs funnel down through Texas on their way to the overwintering mountains in Central Mexico. The majority of these Monarchs fly in a 300 mile-wide swath centered on a line running through Wichita Falls, Abilene, San Angelo and Del Rio. A second flyway runs along the Gulf Coast.



Monarchs enter North Texas in the last week of September, reach peak numbers in Central Texas around October 6, and stragglers can be found in the Lower Rio Grande Valley into December. A few Monarchs overwinter along the Gulf Coast.

An Introduction to Butterfly Watching

Spring migration is less stunning as the number of Monarchs decreases through winter. The leading edge of the northbound migration passes from the Rio Grande to the Red River during the latter half of March. Look for them to be especially abundant from the fourth week of March to the middle of April. The highest numbers are usually reported along the coast in the spring.

Texas Monarch Watch

www.tpwd.state.tx.us/monarch

For more information contact one of the coordinators or visit our web site. It has links to our monitoring packet and calendar.

The most important milkweed species in Texas are:

Asclepias asperula

Antelopehorn Milkweed

Asclepias latifolia

Broad-leaf Milkweed

Asclepias oenotheroides

Hierba de Zizotes

Asclepias viridis

Green Milkweed

Most nurseries carry Tropical Milkweed (*Asclepias curassivica*) which is native only as far north as the Rio Grande Valley.

Texas Monarch Watch, coordinators:

Mike Quinn, Invertebrate Biologist

Texas Parks and Wildlife Department

3000 South I-35, Suite 100

Austin, Texas 78704

(512) 912-7059 or (800) 792-1112, select 5, then 3

mike.quinn@tpwd.state.tx.us

Dr. Bill Calvert

503 East Mary Street

Austin, TX 78704

(512) 441-0387

wmcalvert@sbcglobal.net

An Introduction to Butterfly Watching

Texas Monarch Watch works closely with the following national organizations:

Monarch Larval Monitoring Project

Karen Oberhauser
Department of Ecology
University of Minnesota
1987 Upper Buford Circle
St. Paul, MN 55108
(612) 624-8706
www.mlmp.org

The Monarch Larval Monitoring Project encourages volunteers to make weekly surveys of wild Milkweed patches in an attempt to determine how many Monarchs are being produced across North America.

Journey North

Elizabeth Howard
Founder and Director
18150 Breezy Point Road
Wayzata, MN 55391
jn-help@learner.org
www.learner.org/jnorth/

Journey North tracks first sightings of spring and fall migrating Monarchs. They also track when Milkweed first emerges in an area.

Monarch Watch

Chip Taylor
Dept. of Entomology, Haworth Hall
University of Kansas
Lawrence, KS 66045
Monarch@ku.edu
(888) TAGGING
www.monarchwatch.org/

Monarch Watch is the center of much Monarch research activity. They run a tagging program each fall, host the Monarch Watch listserv and maintain a Web site with the most extensive information of any Monarch oriented Web site.

An Introduction to Butterfly Watching

4TH OF JULY BUTTERFLY COUNTS

Initiated in 1975, the 4th of July Butterfly Count is an ongoing program of the North American Butterfly Association (NABA) to census the butterflies of locations across North America and to publish the results.

Volunteer participants select a count area with a 15-mile diameter and conduct a one-day census of all butterflies sighted within that circle. In the U.S., the counts are usually held in the few weeks before or after the 4th of July. (Mexico and Canada count dates are centered around their own independence days.)

If you are interested in participating in a count in your area, please contact the regional editor or e-mail NABA at naba@naba.org and join that count for a day of fascinating butterfly counting. If there is no count in your area, you may start your own if you know how to identify the butterflies. For more information on the count program and how to conduct a count, please contact:

P. D. Hulce, Regional Editor
339 W. 23rd St.
Houston TX 77008
pd@chiricahuanaturalist.net
(713) 863-1142

Links to Texas' 4th of July Butterfly Counts
www.naba.org/counts/tx.html

In 2004, over 60 counts were held in the following locations:
Abilene, Angelina NF, Aransas NWR, Attwater NWR, Austin, Balcones-Canyonlands, Bay City, Baytown, Bentsen SP, Big Bend NP, Brazos Bend SP, Brazos Valley, Brownsville, Buescher SP, Choke Canyon, College Station, Colorado Bend SP, Conroe, Daingerfield, Danciger, Davis Mountains, Davy Crockett NF, Edinburg WBC, Franklin Mountains SP, Freeport, Galveston, Goliad SP, Government Canyon, Guadalupe Mountains NP, Guadalupe River, High Island, Houston, Indianola, Inks Lake SP, Katy Prairie, Kerrville, Kleberg Co., Laguna Atascosa NWR, Lake Somerville, Lubbock, Magnolia, Martin Dies SP, Mercer, Meridian SP, Midland, Orange, Palmetto SP, Raven, Rockport, Roy Larsen Sandylands Sanctuary, Sabine NF, San Jacinto Co., Santa Ana NWR, Sea Rim, Somervell Co., Spring Creek, Tarrant Co., Trinity River, Tyrell Park, Victoria, Waco, Williamson Co., Wright Patman Lake

An Introduction to Butterfly Watching

FESTIVALS

Butterfly festivals can be an intensive yet fun-filled way to learn about the butterflies of an area while interacting with renowned butterfly experts as well as fellow butterfly watchers. On-site vendors at festivals offer a large variety of butterfly plants, books, close-focusing binoculars, specialized clothing and artwork.

There are currently two festivals in Texas devoted primarily to butterflies. By far the largest of these is the Texas Butterfly Festival, held during the third week of October in the Rio Grande Valley. Top lepidopterists lead field trips and present seminars on topics such as field identification, photography and gardening.

Texas Butterfly Festival (annually since 1996)

Greater Mission Chamber of Commerce

220 E. 9th Street

Mission, TX 78572

(956) 585-2727 or (800) 580-2700

mission@missionchamber.com

www.texasbutterfly.com

Butterfly Flutterby (annually since 2001)

The Butterfly Flutterby is a half-day event of scheduled activities including costume parades, arts and crafts, displays, contests and live music in North Texas, in mid-October coinciding with the fall Monarch migration.

Grapevine Convention and Visitors Bureau

One Liberty Park Plaza

(817) 410-3185 or (800) 457-6338

www.grapevintexasusa.com/butterfly/

For information on other nature festivals that may have butterflying components, see the following Texas Parks and Wildlife Department publication:

Annual Birding and Nature Festivals of Texas

www.tpwd.state.tx.us/nature/birding/festivals/festivals.pdf

Some 29 events were listed in 04-05, up from 16 in 2000.

An Introduction to Butterfly Watching

ORGANIZATIONS CONCERNED WITH BUTTERFLIES

LOCAL ORGANIZATIONS

Austin Butterfly Forum

Doris Hill, Treasurer
1605 Broadmoor
Austin, TX 78723
(512) 452-7325
ento@austin.rr.com
www.austinbutterflies.org
(Monthly meeting at Zilker Botanical Garden Center)

Butterfly Enthusiasts of Southeast Texas (B.E.S.T.) NABA

David Henderson, President
dandewild@evl.net
(Monthly meetings at the Houston Museum of Natural Science)

Dallas County Lepidopterists' Society

Dale Clark, President
c/o Dallas Museum of Natural History
P.O. Box 150349
Dallas, TX 75314
(214) 421-3466 x232
daleclark@dallasbutterflies.com
www.dallasbutterflies.com/
(Meeting second Saturday of the month in Fair Park)

NABA-South Texas

Kim Garwood, President
verandasoft@earthlink.net
(Monthly meeting at the Valley Nature Center in Weslaco)
www.naba.org/chapters/nabast

NABA-Tarrant County Butterfly Society

Joann Karges, President
2533 McCart
Fort Worth, TX 76110-2228
(817) 923-8474
JoaKarges@aol.com

An Introduction to Butterfly Watching

REGIONAL TO INTERNATIONAL ORGANIZATIONS

North American Butterfly Association (NABA)

Jeffrey Glassberg, President
4 Delaware Road
Morristown, NJ 07960
naba@naba.org
www.naba.org

Formed in 1992, NABA's mission is to increase public enjoyment and conservation of butterflies. NABA focuses on the joys of non-consumptive, recreational butterflying including listing, gardening, observation, photography, rearing and conservation. One of very few international conservation organizations to have local chapters.

The Lepidopterists' Society

Kelly M. Richers
9417 Carvalho Court
Bakersfield CA 93311
www.furman.edu/~snyder/snyder/lep/

Worldwide scientific organization formed in 1947 that focuses on both moths and butterflies. Publishes both a quarterly newsletter and a journal. Annually publishes a "Season Summary" listing new or significant records.

Charles Bordelon, Texas Coordinator
The Lepidopterists' Society
8517 Burkhart Rd.
Houston, TX 77055
(713) 822-8731
legitintellexit@earthlink.net

An Introduction to Butterfly Watching

Southern Lepidopterists' Society

Jeffrey R. Slotten, Treasurer
5421 NW 69th Lane
Gainesville, FL 32653
(352) 338-0721
www.southernlepsoc.org

Scientific organization geared toward states in the southeastern U.S., from Texas to the Atlantic Seaboard.

Other Organizations Concerned with Butterflies

Audubon Texas

901 S. Mopac, Bldg. II, Ste. 410
Austin, TX 78746
(512) 306-0225
State chapter Links:
www.audubon.org/states/tx

Native Plant Society of Texas

P.O. Box 891
Georgetown, TX 78627-0891
coordinator@npsot.org
www.npsot.org

The Nature Conservancy of Texas

P.O. Box 1440 or 711 navarro
San Antonio, TX 78295-1440
(210) 224-8779
Lynn McBride
lmcbride@tnc.org

Texas Master Naturalists

Michelle Haggerty, Program Coordinator
111 Nagle Hall, 2258 TAMUS
College Station, TX 77843-2258
(979) 458-2034
michelle.haggerty@tpwd.state.tx.us
www.tpwd.state.tx.us/nature/

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An Introduction to Butterfly Watching

E-MAIL LISTSERV INFORMATION

Listservs are free e-mail systems set up to facilitate online communication among people with similar interests. Through a listserv, e-mail sent to a specific address goes to all the other subscribers. Only subscribers are able to send and receive such e-mails.

TX-Butterfly Listserv

TX-BUTTERFLY is just such an e-mail listserv! Established in January 1999 to be a forum for the discussion of all topics relating to the butterflies and other insects of Texas. TX-BUTTERFLY currently has more than 300 subscribers. Politeness is greatly appreciated!

To subscribe, send an e-mail to:

LISTSERV@LISTSERV.UH.EDU

with the following command in the body of the message:

Subscribe TX-Butterfly Yourfirstname Yourlastname

(Leave the e-mail subject line blank and turn off any automatic signatures that you may have.)

For more information, please contact Melinda Parmer at parmer@swbell.net.

Or visit www.texasento.net/TXBL.htm

TX-BUTTERFLY is hosted by University of Houston.

An Introduction to Butterfly Watching

Dplex-L E-mail List (Monarch Watch)

Dplex-L is the name of the electronic mailing list and discussion group for Monarch Watch. It was initiated in September 1995. Presently there are more than 500 subscribers from 11 countries on Dplex-L.

To receive more information about Dplex-L, just send an e-mail message to Listproc@ku.edu. In the body of the message type: info Dplex-L

Leave the e-mail subject line blank and turn off any automatic signatures you may have. Dplex-L is hosted by the University of Kansas.

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