

## Observing Wildlife through Windows: Techniques for Bringing Nature into the Lives of Hospitalized and Homebound Students

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### INTRODUCTION

Urban growth alters millions of acres of open space every year. Wildlife habitat is reduced in size and quality daily. Many of these habitats are left in disarray as concrete and pavement line the vast areas that once served as home for wildlife. As a result, beautiful creatures that were once abundant are rapidly disappearing from the urban landscape.

Many species face extinction due mainly to the loss of habitat. These habitats are defined by three factors: shelter, food, and water. Texas, as one of the fastest growing states in the country, stands to lose much of its wildlife due to urban expansion.

When I drive through Houston, I see huge apartment complexes, town homes, and business complexes, either completed or under construction. Beautiful trees are being uprooted. Wooded areas, once filled with wildlife, are bulldozed. Animals displaced



Figure One: Recently felled trees in Northwest Houston (2004).

from these natural habitats quickly become roadkill. For example, Figure One is a recent image of felled trees in Houston. These fallen trees are located at Wheatley and Desoto, an area of Northwest Houston that still boasts of aged trees that have defined the natural landscape of Houston since its inception. The picture shows tall, stately pines that were typically 60-70 feet tall and two to three feet in diameter, now lying in ruin. This habitat was not destroyed to make way for any large apartment complex, housing development, or new road. It

was destroyed for the same reason that much acreage in this area has previously been destroyed—greed. These trees are sold to commercial loggers. Some of the trees are found unsuitable after they are cut down and are left on the property by the loggers to rot.

As a result, the property is devalued and the habitat destroyed. Before the bulldozer, this corner was not only aesthetically beautiful, but was the home of many small mammals, bird, insects, and amphibians. Melodious singing mockingbirds, owls, blue jays, and cardinals are a few of the many birds that have been seen darting through these woods. Blue herons and white egrets are often seen along Wheatley, wading in the rain filled ditches.



Figure Two: Drainage ditch (water) alongside recently cleared area.

As illustrated by Figure Two, the ditches and nearby bayous will continue to offer ample supply of water for birds and other wildlife, but a comparatively limited amount of shelter and food will exist in the future for the wildlife that once thrived in this habitat. Since the destruction of the trees at the corner of De Soto and Wheatley, roadkill has become more common in the area as opossums, turtles, and snakes scramble to find shelter and food.

As these two images demonstrate, Houston, a major urban area, still has vast resources of natural space that add to the character and loveliness of the city. Not many years ago, I could hear owls hooting, toad frogs croaking, lizards and snakes slithering, squirrels scampering, and birds singing. If I listened very quietly, I could hear the flutter of a butterfly just as it brushed against my cheek. Opportunities for students to observe wildlife, as I did in the past, are less available now, partially due to the fact that wherever construction and population are increasing, the abundance of wildlife declines.

This unit will focus on creative ways of bringing wildlife to the educational setting. This creativity is necessary because my students are often quite ill and cannot get outdoors to observe wildlife by themselves. Because life for many of them is often challenging, they are receptive to any exposure to the natural processes that are inherent

in urban wildlife. Young people *do* respect and appreciate life once they understand interrelationships between living things and the environment, but too often they cannot learn this respect for nature due to lack of exposure. This curriculum unit will bring the outside into the students' homes. Students will observe wildlife in urban settings through windows in their homes and hospitals with the use of ocular instruments and imaging technology and will learn to respect and preserve them.

### **Student Population**

I teach in an alternative setting for students that have some type of a medical condition that requires that they be taught at locations other than their regular schools. Because these medical conditions are recognized by the Texas Education Agency, these students are serviced, one-on-one, in homes or in hospitals. They are placed on "homebound" by the Appraisal, Review, and Dismissal Committee (ARD) of Community Services High School for a period of at least four weeks, depending upon the medical request. This committee also approves educational services for students in the hospitals. Because of this time frame, my students are usually taught on a short-term basis and enter and withdraw from my curriculum throughout the year. Therefore, this unit will cover only six weeks and will probably be altered slightly on a case-by-case basis depending upon individual objectives and handicapping conditions. This six-week unit may be taught to students in environmental and life science classes in grades nine through twelve and may be adapted for use at lower grade levels.

### **Strategies**

Since this curriculum unit is designed for students who are somewhat immobile, I will identify wildlife in and around students' homes and hospitals. For homes, where opportunities for wildlife observation are limited, miniature habitats will be created. Students will observe wildlife by looking through windows. Tools such as spotting scopes, binoculars, and data loggers will be used to observe natural habitats. Students will analyze data collected by using the computers and calculators.

Students will use graphs generated from their data to explain the changes they observe in plants and animals. For example: why do the leaves of trees change color and drop readily in the fall? Are there more blue jays around at certain times of the day? Does a squirrel's fur appear thicker in the winter? In order to answer these and other questions, students will explore the nature of wildlife and wildlife habitats. Activities will include, but will not be limited to, the use of field guides, various types of scopes, data loggers, geographical maps, and biological classification keys. Another activity will require students to write a research paper on the impact Houston urban sprawl has had on the local wildlife population. The research paper will follow a format outlined in the student's lesson plan. The paper will show what the Houston landscape might look like in the next decade if the eradication of wildlife habitats continues at the present rate. The students will predict what percentage of wildlife will be lost at a certain time in the

future. They will contact a wildlife preservation organization for information on preserving wildlife and the requirements for joining the organization. Afterwards, they will write letters to local officials and share with them their results. Finally, students will prepare a PowerPoint presentation on a plant or animal from the local biome. This presentation will summarize what they learned while doing the activities of the unit. This summary will reflect the use of tools and technology and information from their individual field guides and research.

A field trip will be planned. This trip will provide an opportunity for students to observe animals in their natural habitats. Local parks and the Arboretum are good places for students to practice their skills in using scopes and binoculars. However, some students will be unable to attend field trips away from home. For these students, the Zoomobile will be scheduled. Another avenue I will consider is to ask experts to visit students in their homes and speak on aspects of wildlife and wildlife habitats. Since my student population is constantly changing, I must be flexible in planning lessons that will meet the needs of each individual student.

Upon completing this unit, students will be knowledgeable about the wildlife around them and the importance of the role that each organism plays in a balanced ecosystem that sustains the cycle of life. They will become keenly aware of the importance of managing our natural resources, because well-managed resources are productive. Students will take on a role in conserving our water supply as well as animal and plant life. For example, when water is protected, wildlife thrives, and our health- and water-related recreational activities are un-compromised. Hopefully, students will become activists for wildlife preservation who are inspired by the fact that approximately 85% of species at risk of becoming extinct are in trouble mainly due to the loss of habitats.

## **BACKGROUND**

This unit looks at ways to preserve wildlife by addressing actions that people can take to alter the present rate of destruction of wildlife habitats. Recycling is one thing that people can do to help save wildlife. Recycling has many advantages; for instance, it saves trees from being cut down. If each of us would recycle and buy recycled materials, thousands of trees could be saved. A tree saved is a habitat saved for a variety of species of wildlife. A tree alone is home to as many as 1,000 creepy, crawling things. Recycling also saves space in landfills. At this point in the unit, have students interview one of the Waste Management managers who recently cleaned the Reliant Center after the annual Rodeo to find out how much and what types of recycled material were removed. In addition, students should find out how many tons of waste were deposited in landfills.

### **Creating a Miniature Backyard Habitat**

There are over 600 species of birds in the Gulf Coast area, another bragging right for Texas. Many of these species are native to the urban area of Houston, and many others

will migrate into the area as they make their annual trip south in search of food and warmer climate. Urban growth has greatly reduced the size of the habitats in the migratory paths. Instead of finding lush green pastures, tall trees, and watering holes, birds are bewildered by a man-made concrete jungle. Birds that do not adapt to these changes in their environment will migrate to a more supportive one, or the population of their species will become reduced. Some species, like the grackle and the pigeon, have adapted to urban changes well. They have learned to eat most organic matter. Large flocks of these birds are often seen feasting on leftover human food in or near trash receptacles and along roadsides. These birds are seen everywhere in the Houston area, and for this reason, miniature habitats are not needed to attract them to backyards. The mockingbird, the Texas State Bird, is very common throughout the state and can be observed readily as one navigates within the city of Houston. The purpose of building miniature habitats is to attract the less abundant birds to the backyards so that the physically challenged student may enjoy observing some of the birds that are seen less frequently in and around the city, such as cardinals and ruby-throated hummingbirds.

Wherever backyard habitats are needed, parental involvement will be required in planning and constructing them. All habitats that are added to backyards will require little or no changes to the existing landscape. Miniature habitats consist mainly of birdfeeders, a supply of fresh water, a few plants, and, when feasible, a birdhouse or two, which will serve to protect docile birds from more aggressive ones.

There are many kinds of commercial bird feeders that may be purchased. The range of prices for feeders varies. These feeders are available at the local garden stores that sell garden and feed supplies, such as Home Depot, Garden Ridge Pottery, and Backyard Gardeners. For the amateur builder, bird feeders can be built for a nominal cost, a minimum amount of time, and a little energy. Students who have created products that are beneficial to either man or animal in some way have often shown great pride. Parents, mentors, and volunteers could be asked to build or purchase materials that are needed to make the birdfeeders.

Different birds are attracted to different kinds of food and feed at different times of the day. Students will select feeders and food sources depending on the types of birds they want to attract to their backyards. They will then decide where to place the feeders and what type of food to put in them. The placement of the feeders is crucial, because different species of birds feed at different levels. Doves are ground feeders, whereas woodpeckers feed high in trees. Some birds are timid and reluctant to venture out into open territory to feed, and others are aggressive. Mockingbirds will attack other species of birds, squirrels, and small animals. Grackles are another aggressive species and are often seen in battle with the mockingbirds. Blue jays are aggressive towards cardinals and other small birds. When placing the feeders, consider the safety of the birds, the ease of reaching the food, the height of feeders, and the opportunity for the viewer to observe the feeders. Simplicity will be the key to building these miniature habitats, since many of

the students' medical expenses are quite exuberant, leaving little money for extra activities.

### **Birdwatching for the Novice**

Birdwatching is a pastime that is accessible to everyone. The curious young mind, the gangly teenager, and the gray-haired grandfather can all enjoy birdwatching. In addition, birdwatching is capable of crossing cultural and language barriers. Speakers of all languages are capable of mimicking the serene song of a bird heard from a distance. Depending upon the preference and purpose of the individual birdwatcher, the dollar cost of birdwatching can be an affordable activity. For the average person, a pair of eyes is all that is required to observe some of the phenomenal attributes of birds. For example, basic flight patterns, habitats, and birdcalls can be identified by use of the five senses. However, binoculars, scopes, and cameras show details about these beautiful creatures that the unaided eye cannot detect, for example, the red iris of the red-eyed vireo and the white ring around the neck of the green-headed wood duck. The joy of birdwatching is heightened whenever birds are observed in their natural habitats with close-up views that are only possible through use of ocular instruments. In addition, a few basic items are essential for making birdwatching effective and enjoyable. These items are a pair of binoculars, a notebook, pen, and a bird field bird guide. A bird field guide is useful for identifying species of birds as well as determining the types of birds that are present in a given environment.

Novice birders should familiarize themselves with the ocular instruments used in observing birds in nature. Each instrument comes with a basic operating manual. Birders should learn the basic parts of the ocular scopes and the function of each part. Next, the birder should practice focusing on some stationary object. Practice of this kind should continue until the birder has mastered the use of the instrument.

For the physically challenged birder, adjustments should be made to accommodate the challenges. For example, a spotting (spy) scope will be used as the primary ocular instrument for students with limited use of their hands or those who have unsteady hands.

I will manage and operate the scope as needed. Once the scope is focused, the students will look through the scope and describe the objects he/she observes. He or she will be permitted to use a tape recorder as an audible field notebook to compensate for the limited hand usage. Some students will be required to transcribe the recording into a written copy later, depending upon the degree of limitation of the use of their hand(s). For some students, writing is an accomplishable task; it just takes time. Birdwatching is fluid—birds move. The focus, in this instance, is on seeing the beauty of these feathered creatures in a close-up arena, through use of ocular scopes.

Students will do the activities in Lesson Two to further develop their birdwatching experiences. For students who are fragile, hospitalized, or confined to their beds, the

birdwatching will be done through windows. I will place the spotting scope near the window that offers the best view for observing wildlife in nature. Wildlife other than birds may also be included for observation by these students. The objective is to give them an opportunity to be successful in observing living, moving creatures, since birds move swiftly and often do not stay stationary very long. Birdfeeders will be added to the landscape to attract birds when possible and necessary.

Confined students who can manage binoculars will be taught how to use that powerful tool. Each of these students will be provided a pair of binoculars along with a bird field guidebook, to keep in their homes during the duration of this unit. They can continue to observe wildlife throughout the day. After a few successes, the students will be on their way to becoming confident beginner birders (“BBs”).

After Lesson Two has been completed, students will be ready for a rewarding field trip. Not all of my students will be able to go on a birdwatching field trip, but, for those who are, a field trip will be planned. I have included a section on fieldtrips in this unit. The field trip(s) selected will depend on the handicapping conditions of my students. Parent permission forms must be secured from both parents and school district/school. In some cases, medical approvals from doctors are required. I will ask parents to accommodate their children and will solicit volunteers to help with various aspects of the trip. There are community outreach programs that are accessible to the physically challenged students. I will ask them for assistance in defraying some of the cost of the trip. I have sponsored field trips in the past for physically challenged students, which gives me the inspiration to plan one for my current students. One of my favorite places is the heron rookery in the Smith Oaks bird sanctuary near High Island, Texas. It is like walking into a bird paradise. The trails there are not paved for wheelchairs. However, they can be navigated by birders in wheelchairs with some assistance. The reward of seeing *beauty in abundance* will outweigh any challenges in getting to the site.

### ***Backyard Birds of Houston***

In addition to basic items recommended for birdwatching, a little knowledge goes a long way in identifying birds in your ecosystem, because in every ecosystem, there are common species that are easily recognized by the general public. For example, the owl is known by its hoots and the blue jay and red cardinal by their color. Many recognize the mockingbird, our state bird, by its song, which is made up of repeating patterns of threes, and most can point out the abundant pigeons with their small heads and broad bodies of beautiful colors. This unit focuses on the most common birds seen in and around the Houston-Gulf Coast area. Amateur birdwatchers can build confidence by beginning with sightings of these common birds. Students will learn as they work through this unit how to identify common birds of their neighborhoods mainly by physical characteristics, flight patterns, and habitats. Birdcalls will also be used to help determine which bird is being scoped.

Some of the more common birds in Houston neighborhoods are, like owls and hawks, raptors. The popular blue jays, cardinals, and mockingbirds are also integral parts of the Houston landscape. Further, there are pigeons, sparrows, and pesky black grackles on almost every corner. A variety of woodpeckers, warblers, blackbirds, and crows continues to make Houston their home—at least for now. Knowledge of basic facts about Houston-Gulf Coast birds will be helpful in the process of recognizing birds in this region. The basic information about the birds in the following section is mainly taken from personal observations and Klutz Press’s *Backyard Birds*.

### **The Barn Owl (14-20 inches)**

Barn owls are the most numerous owls in the Houston area. They are night animals that feast on mice, moles, other small mammals, and small birds. The barn owl has a large white heart-shaped face. It can turn its head three fourths of the way around and almost upside down. The barn owl has excellent vision in poor light and extremely good hearing. It inhabits open woodlands, grasses, marshes, and farms. Barn owls nest in tree cavities, inside vacant buildings and barns, but can also nest in underground burrows. The barn owl’s call is not the usual “hoot” but a long rasping screech. A good science project for students is to verify the diet of an owl by dissecting the pellets it regurgitates. Owl pellets may be commercially purchased (*Backyard Birds*).

### **Pigeon (13 inches)**

Pigeons, with their small heads and plump bodies, were brought to America from Europe by early settlers. Here in America, they nested on ledges of buildings, which became a survival strategy. In Europe, they nested on rocky cliffs and were part of the food web for raptors such as hawks and falcons. With few raptors in cities, the pigeon population flourished. Pigeons are rock doves but are often called “rats with feathers” because of their successful species-adaptation to the city environment. They will eat almost anything organic. Pigeons flock together (*Backyard Birds*).

### **Red-Winged Blackbird (7-9 ½ inches)**

The red-winged blackbird’s feathers are glossy and jet-black, with bright-red shoulder patches crested by yellow. It is one of the easiest birds to identify for the beginner birdwatcher. These birds live in pastures, marshes, irrigated fields, along roadsides, and in cities. They make their nests out of grasses and other vegetation, building them low in reeds or bushes over or near water. The red-winged blackbird eats mainly seeds and insects (*Backyard Birds*).

### **Northern Mockingbird (9-11 inches)**

The mockingbird is an amazing bird. It is either loved or despised. There is no in between. This bird is compared to the meadowlark in *Backyard Birds*, where the author states that “if meadowlarks are the classical musicians of the fields, then mockingbirds



are the pop stars of the suburb.” The guide further states that the mockingbird “can compose its own songs, imitate other birdsongs, imitate barking dogs, sirens, and a beeper on a dump truck”—you name it. Mockingbirds sing all the time and sometimes all night, especially during the summer. They are extremely territorial and can be seen chasing birds, squirrels, and other small mammals. In spite of the fact that the mockingbird is the Texas state bird, many people don’t like them because of their aggressive behavior. Mockingbirds live in cities, suburbs, woods, alongside roads, and on farmlands. They appear tolerant of the people and construction that often displace their habitats. Their nests are built in trees and shrubs out of twigs, leaves, moss, and roots. Mockingbirds are seen darting from tree to tree, perched on fences and in trees and bushes. The mockingbird has white wing and tail patches that are very noticeable in flight and a long slender bill. It sings both in flight and while perched. It eats insects, fruits, and wild birdseeds (*Backyard Birds*).

### **Blue Jay (11-12 inches)**

The blue jay has a crest and a black necklace. Its overall appearance is blue. Blue jays are known as party animals. They are loud and aggressive and do not hesitate to chase more docile birds away from feeding trays. They will raid the nests of smaller birds, stealing their eggs and chicks. They will dive-bomb cats and steal dog food even while the dog is near. But, around their nests, hidden deep in the foliage, they are quiet and reclusive. Blue jays are known to bury acorns and retrieve them later for eating. This behavior helps replenish the forest with new saplings. Jays also love to hide other edible items, such as insects, seeds, nuts, fruits, and even baby birds. Blue jays are usually found in woods containing pines and oaks. Thus, they are common in Northwest and Northeast Houston. The blue jay is the only blue-winged jay with white on its wing. Its call is a loud “jay,” which it repeats 10 to 20 times per minute (*Backyard Birds*).

### **American Robin (9-11 inches)**

The American robin is commonly called the “robin redbreast,” but its breast is really a shade of orange to orange-brown. This bird, with its stop-and-start gait, hops across lawns and backyards in search of that first worm of the spring. There is a song that is associated with spring, and part of it goes as follows: “when the *red red robin comes bob bob bobbing along*.” In addition to eating worms, robins eat insects and berries, especially in winter. Some of them have been known to get drunk, fly into windows, and pass out after eating too many of these berries, as reported in *Backyard Birds*. Robins live everywhere there are grassy areas, for example, cities, fields, gardens, and farms (*Backyard Birds*).

### **Northern Cardinal (7 ½ - 9 inches)**

The northern cardinal, known simply as the redbird, is one of the most conspicuous of the urban birds of Houston. Its red color and crests are identifiable field marks. Cardinals

eat berries, fruit, insects, and seeds. Their love of birdfeeders has led to an increase in the species' population and range. Cardinals are found in cities, parks, near woods, and thickets. Their nests are built in dense shrubbery or among tangled vines and are made out of twigs, vines, grasses, and weed stalks softened with hair and fine grass stalks. Cardinals mate for life, and the father feeds the young while the mother prepares for the next brood. They have close relationships and may be heard completing each other's songs. They have several calls that are easy identifiable; for example, one of their mnemonic sounds, according to my interpretation, is "Theal! Theal! Chump! Chump! Chump! Chump!"

### **The Woodpecker (6- 9 inches)**

The authors of *Golden Field Guides* state that woodpeckers have "strong bills, sharply pointed for chipping and digging into tree trunks or branches for wood-boring insects." (194). Their tails are stiff and used as props. There are many species of woodpeckers. The most common ones in Texas are those indicated on the range maps: northern flicker, the pileated woodpecker, the red-bellied woodpecker, the red-cockaded woodpecker, the yellow-bellied sapsucker, the hairy woodpecker, and the common downy woodpecker. Most species "drum" on resonant limbs, poles, and drain pipes as indicated by *Golden Field Guides*. Woodpeckers build their nests in cavities of tree trunks or branches. Their long tongues are used to retrieve insects and grubs from tree trunks. Some of the common species calls are: "Pik! Pik!," "Flick!," or a "Flicker!" series repeated two to seven times per minute. "Keer!," "Peek!," and a raspy "Kluck!" are also calls of the woodpeckers. A birder will become more familiar with the various calls of these birds as he/she spends more time observing them. Woodpeckers are said to have hard heads because their brains are insulated for protection against injury while pecking. Woodpeckers also eat seeds – often from feeders – and berries. They are found in parks, forests, woods, and in cities among pines and oaks. Dead trees or branches and telephone poles are also suitable homes for the woodpecker (Robbins 194).

### **House Sparrow (L: 5-6 inches)**

The house sparrow is one of the most abundant birds in North America. It is found in all 48 states according to *Backyard Birds*. The house sparrow is a small, gray, chirpy bird that will eat anything organic. It can be found begging boldly for food in city parks. The house sparrow has a gray crown, whitish cheeks, and a black throat. The house sparrow lives in cities, in suburbs, and on farmlands. Its nest is built of large balls of grasses, weeds, and trash that are forced into any small cavity available (*Backyard Birds*).

### **Texas Migratory Birds**

Scientists and birdwatchers in Texas have recorded 333 species out of the 338 species of Nearctic-Neotropical migrants in the North Americas. This number represents 98.5 percent of all species of birds that breed in temperate latitudes farther south (Central and

South American). Fifty-four percent of the 621 species of birds documented in Texas are Nearctic-Neotropical migratory birds. These migratory birds and the state of Texas form a mutually beneficial relationship (Shackelford i).

What is migration, and why do birds migrate? Shackelford defines migration as the cyclic or periodic travel of an animal as it returns eventually to its original place of departure (2). Migration is usually annual and is closely linked with seasonal changes. Many animals migrate, but migration is generally associated with birds because of their highly efficient means of traveling over long distances in relatively short periods of time. This distance may be a few miles or thousands of miles. For example, birds inhabiting mountainous areas often move just a few miles from upper zones where they breed to foothills or plains when the weather is severe. In contrast, the ruby-throated hummingbird nests from the southern United States up into Canada and winters as far south as Panama according to Shackelford (2). These little birds store up enough fat under their skin tissues to fly 26 hours non-stop at 25 miles per hour over the Gulf of Mexico, a distance of over 600 miles. The American golden-plover, on the other hand, flies nonstop over the Atlantic Ocean – about 2400 miles – to its winter nesting haven in Brazil. Shackelford eagerly points out that the migratory champion is the Arctic Tern. The Tern breeds in regions of Asia, Europe, and North America but winters in the extreme southern Pacific and Atlantic Oceans, some 11,000 miles away (Shackelford 2-3).

Migrating birds fly at different speeds, which are determined mostly by “species type” and the “terrain traveled.” They fly faster over water than land and faster in spring than in the fall. Those flying over land may stop for food and rest, but trips over water are made without stops. The common loon is one of the fastest flyers at 70 miles per hour. The American golden-plover travels at 60 miles per hour, whereas the woodcock averages just a little over 10 miles an hour (Shackelford 4).

Different species of birds travel at different heights. Not all birds migrate, but those that do, migrate in groups, often forming the characteristic “V” pattern of the geese, with the point in direction of flight. Strength and protection are found in numbers, even for birds. Shackelford further shows that most migrants fly at low altitudes—under 7400 feet. Small birds fly between 800 and 1600 feet above ground level during the day and about 200 feet above it at night (Shackelford 4).

Students will find the discussion of migratory birds challenging as they grapple with such questions as: What factors affect migration? How does weather affect migration? Why do birds migrate at night? What is the origin of migration? Has natural selection played a part in migration? What are migratory flyways? Do most migrants return to their breeding places after winter? Why or why not? What are some of the treaties and laws used to protect migratory birds? Most of these questions are found in the book on *Migration and Migratory Birds of Texas*. Students should prepare answers to these and similar questions for class discussion, using the bibliography at the end of this unit for

references suggestions. Discuss the answers in class using visuals when feasible. Have students map and explain one of the migratory flyways. All work from this section should be placed in the student's portfolio.

### **Raptors: Birds of Prey**

From the California condor to the local red-tailed hawk, these mystic birds of prey strike awe into the heart of birders of all ages. Students love to watch them soaring high in the sky. A study of these birds piques students' interest. Therefore, a brief introduction of raptors is included in this unit. Students will use the CD-ROM, *Birds*, which is listed in the bibliography to learn about the nature of these birds. They will summarize their findings in a PowerPoint presentation using the guided lesson from the CD-ROM. A hard copy of the presentation should be kept in the portfolio.

Raptors are carnivorous birds of prey that feed primarily on living things like mice and small mammals. Most raptors—like hawks, falcons, and eagles—are diurnal (daytime active). The red-tailed hawk is easily seen soaring relatively low over trees in Houston and in nearby neighboring cities in search of food. Raptors are magnificent creatures that are often at the top of the food chain in many ecosystems. Their health and well-being can serve as indicators for environmental risk factors that are threatening to the wildlife, plants, and water in the ecosystem. Raptors have three major characteristics that set them apart from other birds: strong grasping feet for seizing prey from the air, a hook-tipped beak for killing their prey, and the sharpest eyesight of any bird for spotting its prey from the air. After raptors have been introduced to the class, have students research some basic facts about the following owls: barn owl, great horned owl, eastern screech owl, and the snowy owl. Have students print pictures of each of the owls from the Internet and share their work with the class or with the teacher in the case of a homebound or hospitalized student. Significant and interesting facts about each of the owls should be the focus of their work. All work is to be kept in the student's portfolio.

### **Restricted Species**

Hunting is a wildlife management tool used to help control wild populations so that they do not outgrow their food supply. Hunting is heavily regulated, and much modern conservation theory and practice were developed by hunters. Hunting, like passive birdwatching, requires careful observation to identify allowed and forbidden harvesting so that animals do not outgrow their food supply. Restricted species fall into specific categories: endangered, threatened, protected and unprotected. All hunters have the responsibility and legal right to know their birds before pulling the trigger. Only 50 percent of the species of doves and pigeons that dwell in Texas are legal to hunt. However, the red-billed pigeon, the Inca dove, the ground dove, and the band-tailed pigeon cannot be hunted at anytime. They are protected. The mourning dove, the white-winged dove, and the white-tipped dove are considered legal game birds and may be

hunted during open seasons, whereas the rock dove (domestic pigeon) is an unprotected game bird and may be hunted anytime.

Endangered species result from man’s entrance and alteration of habitats, although some species were always rare. Certain endangered species have historically lived in parts of Texas, and some are rare species on the verge of extinction as defined by the Texas Parks and Wildlife Department. In Texas, certain species and habitats are protected. Efforts are made to find new ways to increase both the species numbers and the habitats. Birds on the endangered list include the whooping crane, the golden-cheeked warbler, and the black-capped viero.

Threatened species are more numerous than endangered species but are on the verge of endangerment; hawks, bald eagles, and egrets fall into this category.

Protected birds are not to be hunted. Many raptors that were once considered harmful predators are now protected. These birds serve a useful purpose in keeping down rodent and other populations, thus preventing environmental risks such as widespread diseases caused by an overabundance of pests. Amongst this protected group of raptors are eagles, falcons, hawks, and owls.

Another group of protected birds that serve multiple useful purposes are shorebirds. Because they often migrate with unprotected birds, they are often mistaken for them. For example, the unprotected rails and snipes often look like other protected species of birds. Pelican, herons, ibises, egrets, gulls, and smaller shorebirds are included in this group of protected birds. Hunters should be sure of a bird’s identity before shooting it (Hall).

**Look-a-likes**

Look-a-likes are protected species that look like hunted species. Both these groups fly together or inhabit the same habitats. Look-a-likes sometimes fall victim to mistaken identity. The *Hunters Education Manual* reported that in 1989, a hunter shot a whooping crane, mistaking it for a snow goose. Other examples of look-a-likes are shown in the chart below (Hall). Distinguishing look-a-likes can help beginning observers, and passive bird-watchers should certainly make use of these species to develop watching skills.

**Table 1: Look-a-likes**

<b>Protected Birds</b>	<b>Unprotected Birds</b>
American Kestrels (Sparrow Hawks)	Doves
Sparrows and Songbirds	English Sparrows
Double-Crested Cormorants	Geese and Ducks
Whooping Cranes	Snow Geese

When in doubt, whether to hunt or not to hunt, hunters should check the state and federal regulatory laws governing protected and endangered birds. The fine for shooting a

protected bird ranges from \$10 to \$200 per bird. All birds, except those listed below, are protected under state law (Hall).

- Rock doves (domestic pigeons)
- Starlings
- English sparrows
- Grackles
- Ravens
- Red-winged blackbirds
- Cowbirds
- Crows

### **Field Trips for the Physically Challenged Birder**

Fields trips provide opportunities for novice birders to practice what they have learned about observing birds in nature. Birders should prepare for these eventful activities by bringing along basic items such as hats, water, rain jackets, insect repellent, and lunches if needed. In addition, binoculars, field guides, notebooks, and a birding trail map of the area are useful when on a field trip. Birders should always dress appropriately for the season and wear comfortable, sturdy shoes. Any required medication should be included as should a first aid kit. There exist many locations that are potentially successful venues for a field trip.

The Brazos Bend State Park is one of the Texas Parks & Wildlife facilities that offers opportunities for physically challenged birders to observe birds in natural habitats. It is located about 30 miles south of Houston off of Highway 288 South. The facility houses an indoor nature center and has a ½-mile, paved, interpreter-accompanied, outdoor trail that is wheelchair accessible. The nature center operates from 9am to 5pm, Monday through Saturday. There are also programs available for the blind. The cost is \$3 per person, ages 13 and up. This is a good possibility for our field trip.

Smith Oaks Bird Sanctuary in High Island, Texas, is another facility that offers a limited opportunity for physically challenged birders. The trails, with their shallow slopes, are navigable by wheelchair birders. The heron rookery, located in a clay bottom pond on the north side of Smith Oaks, provides a nesting area for some of the most spectacular shorebirds of the Central Gulf Coast. It is a *must* visit for birdwatchers. Great herons, spoonbills, and egrets are numerous and easily identified. In addition, spring migration in Smith Oaks offers a remarkable wildlife spectacle as vireos, warblers, tanagers, orioles, and buntings literally drop from the sky to roost among the trees as they complete their non-stop journey across the Gulf of Mexico. With or without technology, birders will experience a breathtaking wildlife ecosystem.

The Bolivar Peninsula is part of the Bolivar Loop Birding Trail and is near Smith Oaks. The next stop on this interesting loop will bring one to the Bolivar Peninsula after leaving Smith Oaks. Here, on the Gulf, with resounding waves breaking against the shore, an array of shorebirds may be observed and identified. There are no paved trails for wheelchairs, but a birder could watch the birds from a car or a place nearby. There is plenty to see, hear, and scope. This would be a good jumping-off point. A short ride on the ferry across the Galveston Bay would bring the tour back onto Interstate 45 and into Houston in about an hour and a half.

A local field trip may include a part of the Buffalo Bayou Loop. This birding loop consists of six locations—all located downtown Houston or within a short distance from downtown (*The Great Texas Coastal Birding Trail*). I list and describe four of them below:

- Sam Houston Park
  - Season: Migration, winter
  - Purpose: To offer several birding sites to visitors who may have traveled to Houston on business.
- Hermann Park/Houston Zoo
  - Season: All seasons (particularly winter)
  - Purpose: To tour a tropical birdhouse with more than 200 exotic birds, a breeding program for endangered birds, and the Cockrell Butterfly Center.
- Russ Pittman Park (Nature Discovery Center)
  - Season: Migration, winter
  - Purpose: To observe migrants land birds during migration including a variety of wintering hummingbirds.
- Houston Arboretum and Memorial Park
  - Season: All seasons
  - Purpose: To observe a diverse population of woodland birds that are attracted to the pine/oak woodlands that are fenced in by urban sprawl.

## LESSON PLANS

### Lesson One—Houston Urban Sprawl: A Research Project

#### *Overview*

Houston was once known as a big country city with open spaces, appealing buildings, bayous, mosquitoes, and plenty of wildlife. Over time, the landscape of Houston has changed. Spaces have been filled with high rises and towering buildings. Beautiful trees that were once prevalent throughout the city have been bulldozed to make way for urban expansion. As the landscape of this bustling city changes, so does the wildlife population. Therefore, this research paper will attempt to address the effect Houston growth has had on its wildlife.

### ***Objectives***

- To research a topic
- To report the results
- To recognize the importance of preserving wildlife

### ***Terms***

Wildlife	Urban sprawl
Landscape	Preservation
Conservation	

### ***Materials***

Computer	Online service
Paper	Pen
Contact list of local officials	APA reference guide
Contact list of wildlife preservation organizations	

### ***Procedure***

Students will research the following topic: The Effect Houston Sprawl Has on Wildlife. Prior to beginning the project, have students complete Activities One and Two. Discuss these activities with the students. Have students design a portfolio in which to keep all of their completed work for this curriculum unit. The activities follow:

- Activity One: List as many things as you know about wildlife in the city.
- Activity Two: List at least five things you would like to know about wildlife in the city.
- Activity Three: Write a 250-word or longer research paper on the effects Houston urban sprawl has on wildlife population. Use at least three different references following the APA format.
- Activity Four: What new things did you learn about wildlife upon completing your research? What do you think Houston's landscape will look like in the next decade?
- Activity Five: Contact a wildlife organization. Ask for brochures, leaflets, and information on wildlife preservation. Inquire about membership. Evaluate if you would now or in the future like to support or join this organization.
- Activity Six: Write a letter to one or more of Houston's local officials explaining your research findings and urging him or her to support a position on preserving wildlife through an active wildlife management initiative.

## **Lesson Two—Birdwatching for the Novice**

### ***Overview***

There is a song in the air from a bird in a nest,  
From a limb on a tree, looking out at me.  
Binoculars are searching for me to see  
Where oh where can that little birdie be?



This little rhyme could very well be the song of a novice birder. Bird watching requires skill, practice, and patience. This exercise will focus on sighting birds. Once a bird has been sighted, the spy scope will be used to aid in identifying it.

This lesson is comprised of two activities. The first activity aims at teaching one how to use ocular scopes by using five artificial or paper cut-out birds. These birds will be placed at various levels and locations in the student's yard or some other suitable location. These artificial birds maybe made or purchased. These birds are stationary and give one time to sight and scope them without the fear of the birds flying away. To give the beginning birders the opportunity to look for details, answers to questions in forms of codes may be written somewhere on the bird. The birder will find the code written on the bird and use it to answer a set of related questions prepared by the teacher. For example, the teacher may write on the red cardinal the name of the Cardinal (code) from a Catholic diocese. Once the student has the cardinal in sight, he or she will focus the scope or binocular to read the name of the Cardinal. Then the student will complete the chart. Questions are answered by using the correlated code for each bird. Design questions and codes for each of the five birds. Activity Two gives the amateur birder an opportunity to scope live, moving birds in their natural habitats. Speed is of the essence in observing live birds because they move suddenly, leaving only a small window of time for gathering details. For this reason, the spy scope is the better ocular for the physically challenged birder who may have difficulty in managing binoculars.

### ***Activity One: Sights and Scopes***

#### *Objectives*

To learn how to sight and scope stationary birds.

#### *Terms*

- Binoculars
- Spy scope
- Bird field guide

#### *Materials*

- Binoculars
- Spy scope
- Bird field guide
- Field notebook
- Pen
- Paper
- Artificial birds/cut-outs of birds

*Procedure*

The student will locate the five artificial birds that have been placed in different locations in the yard (habitat). The process of locating these birds is called sighting. Each student will develop his or her own methods of sighting birds.

Some factors that may be considered are: movement, landing or lighting, habitats, (bushes, trees, watered-filled ditches, etc.), bird songs, and nests. As each bird is sighted, use both of the ocular scopes to gather data to help identify the bird. Binoculars are used for closer distances and are easily moved from one location to another. The spy scope reaches greater distances and offers greater clarity in terms of seeing detail. Copy the code on the bird. From the code, the student will answer a question associated with that code. Complete the chart on this bird. Repeat this procedure until all birds are identified.

**NAME THAT BIRD**

Associated Question	Name of Bird	Bird Code
Bird #1		
Bird #2		
Bird #3		
Bird #4		
Bird #5		

***Activity 2: Using Ocular Scopes***

*Objective*

To learn how to observe live birds in their natural habitat.

*Terms*

- Habitat
- Field markings
- Songbirds
- Raptors

### *Materials*

- Bird field guide
- Field notebook
- Tape recorder (as needed)
- Binoculars
- Spy scope

### *Procedure*

Observe, in an urban natural habitat, three different bird species using a pair of binoculars or a spy scope. Identify the birds and justify the name of them using notes from your field notebook or a tape recorder. Documentations may include color, field markings, bill, wingspan, flight pattern, habitat, solo or flock, call, and any unusual behavior. Visit one of the birdwatching web sights for affirmation. Upon completion of the exercise, create a PowerPoint presentation, painting, or musical piece incorporating bird songs. Display your product.

## **Lesson Three—Know Your Birds: A Cumulative Review**

### ***Overview***

Owls are birds of prey that are symbols of wisdom, magic, mystery, good luck, and even doom. *I Heard the Owl Call My Name* by Margaret Craven is a book that brings to mind the fear that is sometimes associated with the unfamiliar. The low ascending throttling and wheezy cry of the death owl, better known as the barn owl or the church owl, strikes fear in many people. People react to this sound in different ways. Men have been seen pointing pocketknives in the direction of the sound in an effort to quiet the owl and break the spell of death. Some men turn the left pocket of their jeans inside out to avoid whatever doom awaits them.

Quite the contrary, the graspy-throttling sound of the barn owl is really associated with birth. The owl lays five eggs, which hatch into little snowy owls. So the call of the barn owl means life not death. At this point in the curriculum unit, students have already learned this fact along with many other facts about owls. Several owl activities are included in this review. In addition, a vocabulary activity will serve as an assessment, covering basic terms and concepts of the unit.

### ***Objectives***

To recall basic concept through use of puzzles

To analyze the diet of owls

### ***Materials***

Owls: *Scramble Squares* puzzle set

An owl pellets identification key

A puzzle generating program

A dissecting kit (plastic)

Owl pellets (preferably commercial types)

A computer

Gloves

Small plastic trays

Hand lens/microscope  
Small water spray bottle  
Pen

Paper towels  
Water  
Paper

### ***Activity 1: An Owl Prowl***

#### *Procedure*

Using the package of *Owls: Scramble Squares*, the student should unscramble the nine square pieces. Place the results in your portfolio, forming one larger square. Discuss strategies used to accomplish this task. Identify the four types of owls in this owl prowling by perfectly matching the pictures on the square edges characteristics for bird.

### ***Activity 2: What's for Dinner?***

#### *Procedure (for students)*

Receive one of the owl pellet kits from your teacher. It will have all supplies necessary to perform this activity. Spread paper towels on the work surface (table). Place the tray on paper towels. Open one of the pellets and place it in the tray. Working very carefully, spray the pellet slightly in order to soften it. Begin gingerly to pull it apart with dissecting tools. Watch for tiny bones, teeth, hair, and other skeletal parts. A hand lens and/or the microscope must be used to see some of the tiny parts. Use the owl key to identify what this owl had for dinner. For example, the owl may have eaten mice, a mole, or some other small creature. Place your conclusions for this activity in your portfolio. Discard used gloves, paper, towels, and pellets.

### ***Activity 3: Bird Talk***

#### *Procedure*

Define each of the word from the vocabulary list. Create a crossword puzzle using at least 60% of the words. Use the computer and a program that generates puzzles. Make a key to use in checking the puzzle. Submit a printed copy and a key to the teacher and place a copy and key in your portfolio.

#### *Vocabulary List*

Migration	Habitats	Limiting factors
Raptors	Nocturnal	Diurnal
Legal game birds	Protected birds	Unprotected birds
Migratory patterns	Markings	Rookery
John Audubon	Binoculars	Spy scopes
Field guides	Refuges	Orientation
Navigation	Passerines	Wetlands
Ibis	Herons	Barn owl
Aves	Raven	70 miles per hour

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This is a helpful one page fold-out guide of familiar birds. This is a simple field reference to backyard birds.

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This is a birding trail town map developed to help birders find that great avian resources along the Texas coast. It offers information about the trail locations and how to reach them, including obscure birding spots that are difficult to reach.

## **Supplemental Resources**

### ***Teacher Resources***

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