

Audubon
EAGLE Watch
Training Manual

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Audubon
CENTER FOR BIRDS OF PREY

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PREFACE

How to Use This Manual: This manual has been organized into multiple sections. It is essential that EagleWatch volunteers familiarize themselves with Sections 1-5 as well as Appendices B-E. Appendix A Regulations for the Protection of Bald Eagles and Section 6 Bald Eagle Biology should be considered highly recommended reading.

Additional information on eagles and instructions on how to use the EagleWatch Data Portal are available in the EagleWatch Resource website <http://eaglewatchflorida.org>



Section One: EagleWatch Program Overview and Goals

EagleWatch is a Volunteer Citizen Science Program sponsored by Audubon Florida. The bald eagle is our nation's symbol and one of the largest and most majestic birds in North America. Bald eagles are native only to our continent. They suffered a dramatic decline in the 1950's due to the widespread use of the insecticide, DDT. This prompted federal protection and recovery plans, which have resulted in a nationwide increase in the population. Since DDT was banned in 1972, Florida's eagle population has increased more than 300%. From less than 100 active nests in the mid 1970's, Florida now has over 1,500 nesting pairs. Florida has one of the largest populations of bald eagles in the United States, behind Minnesota and Alaska. In 2007, bald eagles were removed from the Endangered Species list, having been declared officially "recovered". Today, bald eagles are still protected by the Florida Fish and Wildlife Conservation Commission (FWC) and the US Fish and Wildlife Service (USFWS) under state (F.A.C. 68A-16.002) and federal laws (Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act).

EagleWatch Program Goals

- 1) Collect data on eagle nesting activity throughout Florida.
- 2) Work with stakeholders to improve eagle management in Florida.

Stakeholders include:

- a. Local, state, and federal government
 - b. Private landowners and public land managers
 - c. Utilities, such as cellular service providers and power companies
 - d. The public
- 3) Educate volunteers and the public about eagle biology and conservation needs in Florida.
 - 4) Prevent disturbances to active eagle nests.

As an EagleWatch volunteer, you are tasked with monitoring the activity of bald eagle pairs throughout the nesting season (Oct 1st-May 15th). Your information can help eagles in the following ways:

- Collect data that will be used by Audubon scientists to better understand the needs of Florida's eagles.
- Identify threats and aid in formulating an appropriate management plan for nests that may be threatened by new or encroaching development.
- Provide information to assist law enforcement in the event of an Eagle Act violation.
- Enable the rescue of eaglets that may have fallen from their nests.
- Confirm or enhance the Florida Fish and Wildlife Conservation Commission's annual nesting activity and productivity data.
- Discover and document previously unrecorded nests.



Section Two: Volunteer Job Description

1. **Duties:** As an EagleWatch volunteer, you'll assume responsibility for monitoring a specific nest(s) for the duration of the nesting season (Oct-May). You'll be assigned a nest(s) that is convenient for you to access. At a minimum, you will be expected to visit the nest at least twice each month for 20 minutes per visit and submit appropriate monthly reports.
2. It's expected that you'll conduct yourself in a responsible, professional manner.
3. **Length of program:** Monitoring begins in mid-October, when the eagle pair has returned to their territory. With successful fledging (usually in April-May), the monitoring is technically at an end. However, fledglings continue to return to the nest for up to 6-10 weeks post-fledge and many volunteers continue to observe the nest because it's a very special time to observe the family interactions, mentoring, and the juveniles.
4. **Training:** You will attend the Audubon Florida EagleWatch training program. EagleWatch training is scheduled at select locations in Florida during the months of September-October. To find a location near you, go to <http://fl.audubon.org/audubon-eaglewatch> or contact the EagleWatch Coordinator for Audubon Florida at eaglewatch@audubon.org.
5. At any time, if you have questions or concerns, you can reach out to the designated local EagleWatch Coordinator or the Audubon Florida EagleWatch Coordinator at eaglewatch@audubon.org
6. **Contacts/who to call:** EagleWatch Coordinator at eaglewatch@audubon.org or 407-644-0190 Ext. 118/ Audubon Center for Birds of Prey, 1101 Audubon Way, Maitland, FL 32751
7. **Stewardship:** In addition to monitoring the nest(s) and reporting the necessary data to Audubon, the role of stewarding must be emphasized. Stewardship, in the context of conservation, is the acceptance of responsibility to shepherd and safeguard. In this case, the eagles, their young, and their habitat. Each year, EagleWatch volunteers have played a central role in identifying real and serious threats to the safety and well-being of their assigned eagle "family." Timely contact with your EagleWatch Coordinator has resulted in appropriate intervention, typically in consort with the Florida Fish and Wildlife Conservation Commission.

As an EagleWatch Volunteer you serve as a first line of defense for the eagles. While you are observing your nest, look around for human activities that could affect the eagles and their nest.

- ➔ Excessive numbers of onlookers or photographers watching the nest.
 - ➔ People approaching the nest in violation of the 330 foot guidelines.
 - ➔ Construction markers close to the nest.
 - ➔ Construction or tree clearing in the vicinity of the nest.
 - ➔ If appropriate, take the opportunity to educate people if you see them coming too close or making noise to catch a picture of the bird in flight (they will usually have a camera....).
 - ➔ Nests in cell towers where adequate signage has not been placed on the tower.
8. Please do not attempt to address potential nest threats or disturbances without guidance, and do not intervene directly in any dispute. Contact the Audubon EagleWatch coordinator if you have concerns about anything you see occurring near your nest.

9. **No Trespassing:** It is critical that you obey posted NO TRESPASSING signs on towers and private land. Do not enter any land without permission of the land owner on private land or land manager on public lands. If the land owner does not give you permission, you will have to view the nest from the public right of way. If it is not visible from there, please contact your local coordinator. Not all nests are going to be accessible.
10. **Cell towers:** Cell towers are private property. It is essential that you never enter into the fenced area at the base of any tower unless permission has been granted by the cell tower company. Volunteers assigned to eagle nests on cell towers should collect information about the tower including site number and telephone numbers to call in case of emergency. This information is posted on the access gate to the facility. In case of fallen or injured eaglets at the base of any communication or power transmission tower permission should be obtained from the company. (See Appendix E “What to do if you find an injured raptor”)
11. **Private Property:** Do not enter private property without permission. Do not go through gates or over fences near the nest site without permission from the land owner. Don't be afraid to talk to people that are living or working close to eagle nests. The eagles' neighbors know what is happening while you are not there. People who live and work in the area see them daily.
12. **Nest etiquette:** Please review this important summary Appendix D.

Section Three: EagleWatch Monitoring Protocols

1. **Purpose of monitoring:** To collect data that will be used to better understand the needs of Florida's bald eagle population and the threats they face.
2. **Nest assignment and identification:** Locate and visit the assigned nest(s). If you are unsure about the location, do be careful and you may wish to take a partner on the first visit if the nest appears to be in a secluded area. If you do not observe any eagles on your first visit(s) to your assigned nest, please continue to investigate the area throughout December. Keep in mind that not all eagles return to their territories at the same time, and late arrivals can still be productive.
 - a. If your nest is in a neighborhood or on private property, be considerate of the landowners. Introduce yourself if appropriate -- these individuals, if they are aware of the nests, can supply a wealth of information about historical nesting activity of the birds on their property and could be an asset to the Audubon EagleWatch program. The most successful observations have generally been those nests with whom the volunteers have established a collaborative relationship with the property owners.
 - b. It is common for several EagleWatch volunteers to be assigned to a nest. This results in a richer, denser reporting of the nest activities. Your coordinator will share any relevant information about the nest and its activities with all volunteers assigned to a specific nest.
3. **Observation timetable:** In general, the best observations are made from 7 a.m. - 11:00 a.m. or after 3:00-5:00 p.m. due to the eagles' typical pattern of activity.
4. **Observation methods:** Bring a compass or cell phone and note directions of flight patterns; birds can become quite predictable once you're familiar with their activities. Eagles typically have a favorite tree close to the nest upon which they perch and maintain vigilant guard over their nestlings. Use binoculars to scan the area to see if birds are present. FWC Guidelines advise that no activity take place within **330 feet of the nest during nesting season**. It may be necessary to observe even further away to avoid disturbing the birds. In some cases, particularly urban nests, it is possible that your observation site is closer than 330 feet. But do

NOT do anything to upset the birds if the nest appears active (fresh branches added, lots of feces underneath, both adults in area). If the birds flee and vocalize, they are disturbed and you must make your observations from a more distant point.

5. **Key Observations:**

- a. Once eggs have been laid, you can expect to find one of the parents on the nest at all times. Record and report when they start incubating. This is characterized by one adult sitting in the middle of the nest. Incubation lasts for about 35 days; both parents share in the incubating of the eggs.
- b. Try to determine when the eggs hatch and report this date. Egg(s) have hatched if adults are seen bringing food to the nest, tearing it up and feeding it to the young eagles. It can take up to two weeks before you might actually see the eaglets. Once eggs have hatched, for the next several weeks, one eagle will be at the nest at all times.
- c. It is very important to report when the eaglets fledge (leave the nest). Fledging is preceded by branching for 7-10 days.
- d. Check your nest after a bad storm. If an eaglet has fallen from the nest, they may need to be rescued and taken for treatment. Call your local EagleWatch Coordinator immediately. Program our phone numbers into your cell phone now so that you have them! You should also call The Audubon Center for Birds of Prey in Maitland Florida (see What to Do If You Find a Sick or Injured Raptor) for more information.

6. **Possible violations of the Bald Eagle Management Act** [Appendix A]: The regulations regarding potentially detrimental activities around an eagle nest are extensive and complex. EagleWatch volunteers are not expected to “enforce” or otherwise engage in discussions with potential violators. However, it is important that all EagleWatch volunteers become familiar with the protections afforded by state and federal laws in order to bring possible violations to the attention of the appropriate authorities.

7. **Emergencies:** In the event of an emergency nest situation (i.e., violations of the federal or state laws protecting the eagles and their nest sites, or if the eaglets are in danger or injured), please document the violation immediately call your local EagleWatch coordinators and the Audubon Florida EagleWatch Coordinator, Reinier Munguia. They, in turn, will contact Florida Fish and Wildlife Conservation Commission and the USFWS.

Audubon Center for Birds of Prey 407-644-0190
Reinier Munguia 863-797-7374; Eaglewatch@audubon.org
Wildlife Alert Emergency Number to report Wildlife Violations 1-888-404-3922

Section Four: EagleWatch Data Reporting

Volunteers are asked to visit the nest at least twice every month for a minimum of twenty minutes per visit from October 1 through May 15 as well as complete and submit your two site visit reports each month.

The preferred method for EagleWatch data entry is the new web-based system at www.auduboncitizenscience.org. Once your nest is assigned, you will receive an email invitation to join the EagleWatch website, with instructions on how to register and login. The user manual will also be distributed at the time of the invitation. Similar in scope and content to the hard copy site visit form, the on-line form has been designed for ease and consistency in compilation of data for two different observation dates per month.

For volunteers who have limited access to the internet, or may otherwise have difficulty submitting data online,

there is an alternative method of data submission. This is a PDF form that can be completed on your computer or manually, saved with a unique file name, which includes the FWC nest number and date (i.e., “PO167 2-1-2016”) and then emailed to eaglewatch@audubon.org. The form accommodates two site visits per month. While EagleWatch will continue to accept data in this way, volunteers are strongly encouraged to enter data using the online system described above.

Whichever method you use, the data form is the same. Carefully review the form so you’ll be able to fill the required fields on the form. The Nest Site Visit Form can be found in [APPENDIX B]

Reporting Essentials:

1. Include the nest number on every report, and make sure it is correct when entering data online. If you do not know your nest number, contact your local coordinator or email eaglewatch@audubon.org.
2. Date and time your observations are made.
3. Condition of nest.
4. Type and condition of nesting substrate (artificial structures are recorded as MMS on the online form).
5. Number of eagles and/or eaglets observed.
6. Describe any eagle activity, i.e., perching, flying, eating, sitting in nest, bringing nesting material, vocalizing, etc.
7. Additional room is available for more lengthy descriptions of your site visit. (Usually later in the season when the eaglets can be observed and are entertaining to watch, observers have more details to record). This is a good place to include an estimation of hatch date, as well as any important details related to potential nest disturbance.
8. If you note distress on the part of the nesting eagles at any time, try to identify the cause and report it immediately to the Audubon EagleWatch coordinators. Again, complete details are important.
9. The most important piece of data to collect during the nesting season is the number of young that have fledged. A fledged eaglet is defined as “capable of coordinated, sustained flight”. Observations of eaglets flying, as well as spotting them in trees in the vicinity of the nest are excellent indications of successful fledging.
10. Zero is an important number! A blank field on a data sheet cannot be assumed to be a zero for the purpose of data analysis and research. If the number of eagles or eaglets observed is zero, be sure to record this number.

Section Five: Human Activity and Nest Disturbances

Understanding Disturbances

Individual bald eagles exhibit considerable variation in response to human activity, depending in part upon the type, frequency and duration of activity; extent of modification of the environment; time in the bird’s reproductive cycle; and various other factors not well understood. Therefore, it cannot be predicted with absolute certainty the effects a given disturbance might have on a particular pair of bald eagles. Certain human activities are, however, known to disturb bald eagles more than others.

Eagles are most vulnerable to disturbance early in the nesting period, i.e. during courtship, nest building, egg

laying, incubation, and brooding (roughly the first 12 weeks of the nesting cycle). Disturbance during this critical period may lead to nest abandonment. During the nest building period, for example, eagles may inadequately construct or repair their nest, or may abandon the nest, both of which can lead to failed nesting attempts. During the incubation and hatching period, human activities may startle adults or cause them to flush from the nest. Startling can damage eggs or injure young when the adults abruptly leave the nest.

Prolonged absences of adults from their nests can jeopardize eggs or young. Depending on weather conditions, eggs may overheat or cool and fail to hatch. Young nestlings rely on their parents to provide warmth or shade, and may die from hypothermia or heat stress if adults are forced away from the nest for an extended period of time. Eggs and juveniles are subject to greater predation risk while they are unattended. If human activities disrupt the adults' foraging and feeding schedule, the young may not develop healthy plumage, which can affect their ability to survive.

Human activity near a nest later in the nesting cycle may cause premature fledging, thereby lessening the chance of survival. Older nestlings may be startled by loud or intrusive human activities and prematurely jump from the nest before they are able to fly or care for themselves.

Human activities that cause any of these responses and lead to injury, a decrease in productivity, or nest abandonment could be considered disturbance under the Eagle Act and thus a violation of the Act.

EagleWatch volunteers should avoid any action that may disturb the nesting eagles. If the birds stop doing what they were doing before they noticed your presence or show any signs of distress, you must back off and keep your distance to reduce stress.

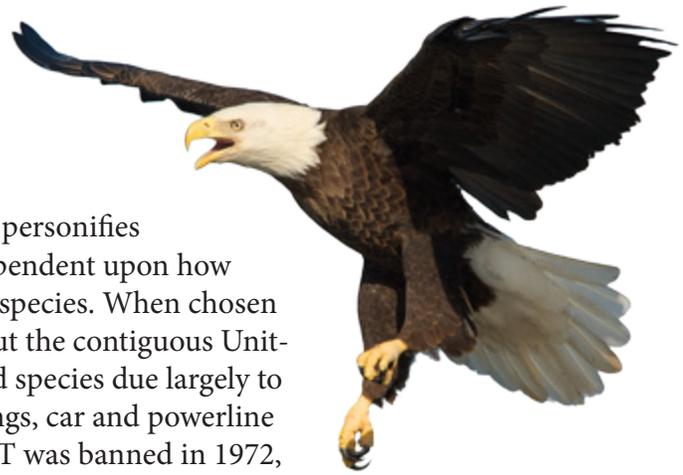
****NO ACTIVITY IS PERMITTED WITHIN 330 feet of a nest during the nesting season.****

Phase	Activity	Sensitivity to Human Activity	Comments
I	Courtship and Nest Building	Most sensitive period; likely to respond negatively	Most critical time period. Disturbance is manifested by nest abandonment. Bald eagles in newly established territories are more prone to abandon nest sites.
II	Egg laying	Very sensitive period	Human activity of even limited duration may cause nest desertion and abandonment of territory for the nesting season.
III	Incubation and Hatching	Very sensitive period	Adults are less likely to abandon the nest near and after hatching. However, flushed adults leave eggs and young unattended; eggs are susceptible to cooling, loss of moisture, overheating, and predation; young are vulnerable to elements.
IV	Nestling period 4-8 weeks	Moderately sensitive period	Likelihood of nest abandonment and vulnerability of the nestlings to elements gradually decreases. However, nestlings may miss feedings, which may affect their survival, or may prematurely leave the nest due to disruption
V	Nestlings 8 weeks through fledging	Very sensitive period	Gaining flight capability, nestlings 8 weeks and older may flush from the nest prematurely due to disruption and die.

Excerpts from: http://www.fws.gov/midwest/eagle/conservation/baea_nhstry_snstvty.html

Section Six

Bald Eagle Biology



GENERAL OVERVIEW

The bald eagle is much more than just the symbol of America: it personifies strength, majesty and independence. Yet, its very existence is dependent upon how humans manage the environment that is shared with all wildlife species. When chosen as a national symbol in 1782, it was found abundantly throughout the contiguous United States. Historically, it has been listed as a federally endangered species due largely to human ignorance and persecution by pesticides, careless shootings, car and powerline collisions and loss of habitat for nesting and foraging. Since DDT was banned in 1972, Florida's eagle population has increased more than 300%. In 2007, bald eagles were removed from the Endangered Species list, having been declared officially "recovered". Today, bald eagles are still protected by the Florida Fish and Wildlife Conservation Commission (FWC) and the US Fish and Wildlife Service (USFWS) under state (F.A.C. 68A-16.002) and federal laws (Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act).

The bald eagle is native to our continent and is one of the largest birds in North America. The Latin name "Haliaeetus leucocephalus" means "white-headed sea eagle", referencing its genus classification. The word "bald" refers to an old English use of the word meaning "white" since the head is distinctly feathered. Birds commonly confused with bald eagles include Ospreys, Turkey Vultures, and Golden Eagles, the latter only occasionally sighted in northern Florida during the winter migratory months.

Like other birds of prey, bald eagles exhibit "reversed sexual size dimorphism", and females are larger than males. Female eagles in Florida weigh from 8-12 pounds and have a wingspread up to eight feet. Males are smaller, weighing 6-10 pounds, with a wingspread of six feet. Both sexes have the characteristic white head and tail, yellow beaks and eyes upon maturity, a gradual process of four to six years. Young eagles, called juveniles, are uniformly brown and larger in size than adults due to longer wing and tail feathers. Immature and subadult refer to plumage sequences after the first year and before adulthood.

Adaptations for survival include keen eyesight that can identify objects three to four times farther away than humans, operating much like a telescope for focusing; powerful feet and claws called "talons" to capture and kill prey; an elongated beak with a sharp tip adept at tearing food; and well-developed muscles in the legs and supporting the beak that aid in prey destruction. Eagles tear and swallow their food in large pieces, temporarily storing it in an area below the throat called the "crop" before actual digestion. The crop is a noticeable bulge when full that can store over two pounds of prey when food is plentiful.

Vocalizations: An eagle's call is quite distinctive, ranging from a short staccato note, a whining call, and a high pitched scream of descending notes. Vocalizations serve several purposes including greeting, solicitation, territorial defense, threat, and begging calls for food (juveniles).

Longevity: Eagles can live in the wild from 15-25 years and up to 38 years in captivity. Eagles follow a pattern typical of raptors, with lower juvenile survival followed by increasing survival into adulthood.

Diet: Eagles are opportunistic scavengers with a prey base that includes fish, squirrels, wading birds, ducks and road-killed animals called carrion. Fish is also pirated from Ospreys in spectacular aerial acrobatics.



THREATS and TERRITORIAL FIGHTS

Threats: The bald eagle has no natural predators. Their biggest enemy is humans. Causes of bald eagle mortality include collisions with cars and power lines, electrocution, gunshot wounds and poisoning. Lead is highly toxic and a preventable cause of death if bullets/shot and fishing weights were converted to non-lead material. http://www.biologicaldiversity.org/campaigns/get_the_lead_out/ Eagles may also succumb to avian pox, mosquito borne illnesses and food contamination. Loss of nesting and foraging habitat through urban development seriously jeopardizes nesting success for eagles in Florida. These birds are strongly territorial, particularly during nesting season, and are known to engage in battles over nesting habitats, causing injury and even death. In the last decade, Florida has seen an increase in eagle mortality and injury due to territorial fights.

Territorial Fights: Although eagles are highly social during the non-nesting season, intraspecies fighting with aggressive aerial territory battles can occur among eagles throughout the nesting season. Territorial defense behavior includes:

Threat Vocalization: One or both adults will emit a high pitched scream, often repeatedly, at the trespassing eagle.

Circling Display: The defenders will soar over the unwanted eagle until it leaves the area. Note: you may observe this display if an immature eagle in non-threatening plumage enters the nesting area.

Territorial Chase: This is one of the most common and potentially dangerous of all territorial displays. Territory defenders pursue the invader until he/she leaves the area or a fight ensues. This can be a fight to the death. The state of Florida has witnessed an upswing in eagle mortality/injury due to territorial disputes as habitat diminishes. Typically, talon wounds are inflicted on the legs, lower abdomen, chest and head areas, and in severe disputes, mortality occurs.

When mature (age 4-5), eagles return to the vicinity of their original nest sites to breed. That is why there are concentrations of active nests located around large lakes throughout Florida. An area's carrying capacity is reached when the habitat is saturated with eagles for the amount of food and nest sites that it can support. This causes a natural dispersal of birds into new areas for breeding, including historic ranges and non-traditional nest sites in urban areas.

GENERAL NESTING INFORMATION

The nesting season in Florida extends from October through May, with nests usually located in a live pine or cypress tree, most often within 1-1.8 miles of water. Nests are often reused year after year, with some pairs of eagles using an alternate nest within their defined territory. Man-made structures including cellular towers and power-line towers are being utilized in increasing numbers due to loss of suitable nesting habitat. It is not uncommon for nests to be blown from trees by storms, after which the eagles typically renest on the same sites, often in the same trees. Bald eagle nests are legally protected.

Nest size: Bald Eagles build the largest nest of any bird in North America. These nests are reused annually by the same pair of birds and increase in size accordingly to the length of time they have been occupied. The largest recorded nest was in Florida, measuring over eight feet across, nearly eighteen feet tall, and weighing almost two tons. A typical nest, however, is much smaller (similar to a queen-sized bed), ranging from four to five feet in diameter across and three to four feet tall. Eagles nesting on man-made structures tend to build smaller nests which are often confused with Osprey nests.



Typically Bald Eagles in Florida prefer to nest on Long-leaf Pine, but may also use Bald Cypress and Live Oaks.



Eagles nesting on man-made structures may not build large nests like those nesting on trees.



Eagle's nests on man-made structures are often confused with Osprey nests like the one above, as they tend to be shallow and small.

Osprey nests are often misidentified as eagle nests and are generally located on the tops of dead trees or man-made structures. Eagles prefer live trees with a canopy providing shade overhead, but have uncharacteristically utilized man-made structures in recent years.

Nest Site Fidelity and Alternate Nest Use: A pair of eagles will generally return to the same nest year after year, called nest site fidelity. In most, but not all cases, eagles will have more than one nest within their breeding territory, called an alternate nest. The usual number of alternate nests averages from 1-2. The most commonly accepted explanation for this occurrence is that the alternate nest serves as insurance in case the primary nest is destroyed early in the nesting season.



In the final stages of nest construction the adults bring grass or Spanish Moss to line the nest cup.

Nest construction: Once a suitable nest tree has been selected, with cypress and pine being favored in Florida, both birds will gather branches and sticks and begin constructing the nest or adding new materials if a nest already exists. The branches are woven together by the female, much like the weaving of a basket. New nest construction can take less than a week, but maintenance on the nest occurs throughout the entire nesting season. The nestcup, or small depression where the eggs are laid in the middle of the nest, is lined with soft vegetation, with Spanish moss and grass being the most common materials. The nestcup is generally less than a foot in diameter with a depression of about four inches. The newly hatched chick may spend the first two weeks in the nest cup completely out of sight for the observer.

Abandoned and Alternate Nests: Bald Eagles often use alternate nests in different years. Although all nests used by a given pair are situated in the same general vicinity, some nests go unused for several consecutive years and thereby may appear abandoned. Even a solitary nest can go unused for several years, often due to the death of one member of the resident pair, and then be reoccupied by either the original pair or one member of the original pair with a new mate.

Perch Trees: Bald Eagles spend nearly 90% of their daylight hours perching, making perch trees an important consideration in an eagle's selection of a breeding territory. There are often a number of favorite trees used habitually located within each pair's territory, often serving different functions. Some trees are used as "sentry" perches, providing lookout points. Eagles will simply loiter or rest on other perches, or utilize them to hunt or forage from. Trees with heavy foliage are most commonly used while eating, providing the eagle with cover to hide its prey from other birds.

Aerial displays to establish or renew a pair bond

Vocal Displays: One or both birds will call to the other while perched or flying. While perched, this is usually a loud scream, and the head is tilted back in a vertical position.

Chase Displays: The two eagles will pursue each other, sometimes in rapid dives or just erratic flights. Often one will fly upside down beneath the other and touch talons. Occasionally, they will grab talons and go into a roll, exchanging places in flight.

Cartwheel Display: The most spectacular of all courtship displays! The pair flies to great altitude, locks their talons together, and falls towards earth spinning and whirling in a series of cartwheels. The pair separates as they near land or water and often ascend back skyward, lock talons and repeat the display.

Please Note: Immature eagles will perform many of these flights, in nesting and non-nesting season. They may be playing, exercising or perfecting these flights for future use.

COPULATION

It is a common misconception that eagle copulation occurs in mid-air during the “cartwheel display”, but it actually occurs on a tree branch (sometimes following the courting flights). The act takes place after the birds have been perched together for awhile, although active nest-building can precede it. The female generally begins by assuming a “solicitation” posture, either perched on a branch or on the nest, holding her body in a horizontal position with her head forward and her wings slightly apart. She will then vocalize to and sometimes even prod the male, soliciting his services. In response, the male calls to the female (usually a high pitched whining cry), flaps his wings and moves his tail up and down. He then mounts the female’s back, with his talons curled inwards to avoid injury, and copulation occurs. Rapid vocalizations and wing flapping accompany this action.

Copulation takes place in as little as five to fifteen seconds and may occur several times a day. It is most commonly observed in the early morning hours or just before dusk. Copulation frequency increases from six days before to three days after the laying of the first egg. Most courtship flights and copulation activity in Florida occur throughout November and December. Rarely, if the first nesting attempt is unsuccessful, the birds may recycle, having a second clutch of eggs in January or February.

EGGS & INCUBATION

Egg laying begins in late November and can occur even into February if the first nesting attempts are unsuccessful. Bald eagle eggs are dull white in color, rough in texture, weigh one-quarter of a pound and resemble the shape of a rounded extra-large chicken egg. Clutch size (the number of eggs) is generally dependent upon availability of food and can vary from one to four, although two is the most common. Eggs are laid several days apart, with eaglets hatching on different days, resulting in siblings of various sizes. Eggs begin to hatch after a 33-35 day incubation period.

Incubation, the act of providing warmth to increase embryonic metabolism and tissue development, begins after the appearance of the first egg and is a shared duty by male and female bald eagles. A brood or incubation patch is developed on the lower breast and abdomen of both adults, an area of lost feathers and increased vascular circulation that facilitates heat transference to an egg. This patch is evident only during the nesting season.



The inverted flight is part of the pair bonding process, occasionally it is used to deliver food to the mate, and it can be the beginning of a cartwheel display.

Eggs are rotated almost every hour as the adult eagle shifts position or rearranges nesting material. This turning and distribution of heat is essential for proper embryonic development and prevents the membranes from adhering to the inside of the eggshell. Eagle eggs are rarely left unattended and may be covered by soft nesting material in an adult's brief absence.

The incubation posture of the adult eagle is extremely low in the middle of the nest and can make it difficult for ground observation. Since incubation is a shared effort, "shift" changes may be witnessed as one adult flies off and another onto the nest to resume egg care. The incoming adult will often walk around the rim of the nest, clench its talons firmly in a ball, and gently step into the nestcup. As the adult lowers itself to cover the eggs, it often sways side to side (occasionally using a nest branch as a pivot) and settles into the incubating posture. Rearranging of the nesting materials then always follows, with the smaller males tucking substrate closer to their bodies to retain heat and the females adjusting the nestcup to accommodate their larger size. Eagles will also assume a pseudoincubation posture several days prior to egg laying or for unknown reasons.

HATCHING

The cheeping of the eaglet inside the shell is a sign that the hatching process will occur soon and that breathing with the lungs has begun. Hearing this sound often stimulates the adults to bring food to the nest in preparation for a hungry nestling. The eaglet can breathe for a short time from the air chamber inside the eggshell, but must soon pip, or break a hole through the eggshell, to survive.

Pipping is aided by the eggtooth, a point on the top of the beak, which breaks the egg from the inside. Strong head and neck muscles assist the eaglet in this continuous effort as it rotates inside the shell in a circular motion. Finally, the exhausted eaglet struggles its way out of the shell, soon ready for its first meal. It can take from five hours or up to two days from the moment the egg is pipped until the eaglet makes its first appearance.

EAGLET TERMINOLOGY

There are three terms used in the description of young eaglets: hatchling, nestling, and fledgling. The hatchling, an eaglet in the first few critical days of life, is totally dependent upon its parents for food and warmth. Hatchlings have a large head, are weak and awkward, and spend most of their time lying and sleeping in the nest. Their first meal is usually offered after 24 hours and consists of small pieces of organ or muscle meat pulped to a soft mash in the adult's beak. A nasal discharge lubricates the food and supplies fluid to the hatchling. Food is placed in the tip of the upper mandible of the adult's beak, whose head is turned sideways to allow ease in feeding. The adult eagles now assume a brooding posture in the nest, and are slightly elevated upright, with wings extended to provide shade or warmth for the eaglets.

Nestlings are considered semi-altricial, that is, they are covered with down and can see but are confined to the nest. They are the fastest growing bird in North America, ranging from 100 grams to 4,000-5,000 grams within three months. Nestlings gradually become self-reliant in behaviors ranging from feeding to flying. Most of the early developmental growth occurs in body tissues; later gains in weight occur as the plumage grows. Growth is rapid in the first month, with females gaining weight faster than males (resulting in reversed sexual dimorphism), although males develop their feathers faster and often fledge first. As the nestlings grow and are able to thermoregulate (10-14 days), or maintain their body temperature, the adults vacate the nest and spend the day in a nearby perch or roost tree.

Finally, fledglings have taken their first flight, but are still dependent upon adults and utilize the nest for several months as they perfect their hunting and foraging skills. Fledging occurs between 12-16 weeks after hatching.

PLUMAGE SEQUENCE

The young eaglet experiences several different plumage phases before leaving the nest: primary down, secondary down, transitional and juvenile. As hatchlings, eaglets are in the primary or natal down phase and are fluffy grey in color with a whitish head and throat. By their third week, the secondary down appears and is a longer, thicker, dark-grey wool covering. During the transitional stage at age four to six weeks, the eaglet has its first dark brown-to-black “pin” feathers emerging on the back, shoulders, breast and wings. The juvenile eaglet is fully feathered by 10 weeks of age and exercises its wings by jumping up and down in the nest.



A
10 days



B
21 days



C
28 days



D
49 days



E
96 days



F
2 years



G
3 years



H
5 years

Images Courtesy of Arizona Game and Fish Department

EAGLET NESTLING BEHAVIORS

The behavior patterns of the developing nestlings change almost as rapidly as their plumage. During the first weeks of life because of eaglet size disparity, fratricide, or the act of killing one's sibling, can occur. This is seen when food is scarce, and also when the first hatchling is a male followed by a female. Fighting occurs between young siblings and can result in eventual mortality. Adult eagles do not interfere, but will continue to supply morsels of food to any interested nestling. The first month is critical in the survival of a weaker eaglet.

As feathers emerge, the nestlings begin wing-flapping and become preoccupied with preening activities, including stimulating the uropygial gland near the base of the tail for a fluid to weatherproof their new plumage. When nearly one month old, they grasp objects in their talons, peck at food, and regurgitate pellets of undigested casting material. At six to seven weeks old, eaglets stand upright, scream loudly for food, take “hop flights” hovering above the nest and play games. Lone eaglets occasionally exhibit play behavior, pouncing on items in the nest, or even tugging the adult's feathers. Multiple chick nests provide observers with entertainment as the eaglets steal food from each other, play tug-of-war, chase each other around the nest and engage in other youthful antics.

Feedings increase in frequency and amount as the eaglets require enormous energy to grow at an accelerated rate. Slumber often follows a meal, with the eaglets either dozing upright in the nest or laying down. Exercise is vital to developing the strong wing and leg muscles necessary for flight and capturing prey.

EAGLET DEFENSIVE BEHAVIOR

Eaglets will often stand side by side in the nest and observe the daily activities around their nest site. This is an important behavioral imprinting to the natal territory for future nesting purposes. If approached in the nest when less than one month old, eaglets can respond by making food begging vocalizations and postures. Reaction of older nestlings is various, ranging from throwing their heads back and vocalizing, spreading their wings, and hissing open-mouthed with talons extended, i.e. the fighting stance display; running across the nest or jumping out; or the stoop-shoulder, head-down display. Some have also been seen laying flat in the nest “playing dead”.

FLEDGING

A pre-fledge milestone is an activity called branching, when the eaglet takes short hops/flights to branches within the nest tree. The young eagles branch for 7-10 days before fledge, exercising their wings and legs, taking short flights to branches in the nest tree. At ten-to-twelve weeks of age, the eaglet is physically ready to fly. Most eaglets fledge around 12 weeks. The timing of actual fledging can be influenced by human activity or disturbance around the nest, causing a premature fledge. This can result in injury or even death of the eaglet. Premature fledglings that fall to the ground can be successfully raised there, although predators and humans can pose threats to survival. This developmental stage of newly flighted eaglets can be a most perilous time.

From twelve-sixteen weeks, the young eagles hone flight and landing skills, and experience hunting and foraging on their own for the first time. Juveniles have poor skills at this early stage, so they depend on their parents for food. Most eaglets will still return to the nest tree for food deliveries and rest, although they spend the day flying and hunting throughout the adults' home range. Adult eagles will continue to provide food to their young at this age, as they encourage them to become self-reliant. The young eagles scavenge roadkills on their own since hunting proficiency takes several months.

When the juvenile eagles are seventeen to twenty-three weeks old, they are self-sufficient and wander away from the nesting territory. Florida juveniles tend to migrate northward after the nesting cycle is completed, although some family groups remain together over the summer months and other young eagles join congregations of juvenile/subadult birds around large lakes or landfills.



In 2007, the USFWS removed the bald eagle from the list of federally endangered and threatened species. Although the bald eagle is no longer protected under the Endangered Species Act, it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The USFWS (2007b) has redefined some of the terminology included in the Bald and Golden Eagle Protection Act, which prohibits the unpermitted “take” of bald eagles, including their nests or eggs. The act defines “take” to mean to “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb” an eagle. The new definition of “disturb” is to “agitate or bother a bald or golden eagle to the degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior” (USFWS 2007 This management plan adopts the federal definition of “disturb” in 50 C.F.R. § 22.3 and Florida’s definition of “take” in Rule 68A-1.004, F.A.C.

National Bald Eagle Management Guidelines were published in the Federal Register in 2007. They include guidelines about distance buffers between activities and nests; avoidance of certain activities during the breeding season; and avoidance of disturbances at foraging areas and communal roost sites. In 2008, Florida Fish and Wildlife Commission (FWC) adopted the Bald Eagle Management Plan and Rule 68A. This plan supports the continued regulation of nesting habitat.

The regulations (both state and federal) regarding potentially detrimental activities around an eagle nest are extensive and complex.

EagleWatch volunteers are not expected to “enforce” or otherwise engage in discussions with potential violators. Rather, we ask that you reach out immediately to your local EagleWatch coordinator AND to the Audubon Florida EagleWatch Program Coordinator with the details of the threat. They will contact Florida Fish and Wildlife Conservation Commission (FWC) and the USFWS.

For the most current guide to avoid disturbance of bald eagles and the regulations at Florida Fish and Wildlife Conservation Commission: <http://legacy.myfwc.com/eagle/>

For the complete Bald Eagle Management Plan: http://myfwc.com/media/427567/Eagle_Plan_April_2008.pdf

THE LAW

A. FEDERAL STATUTES:

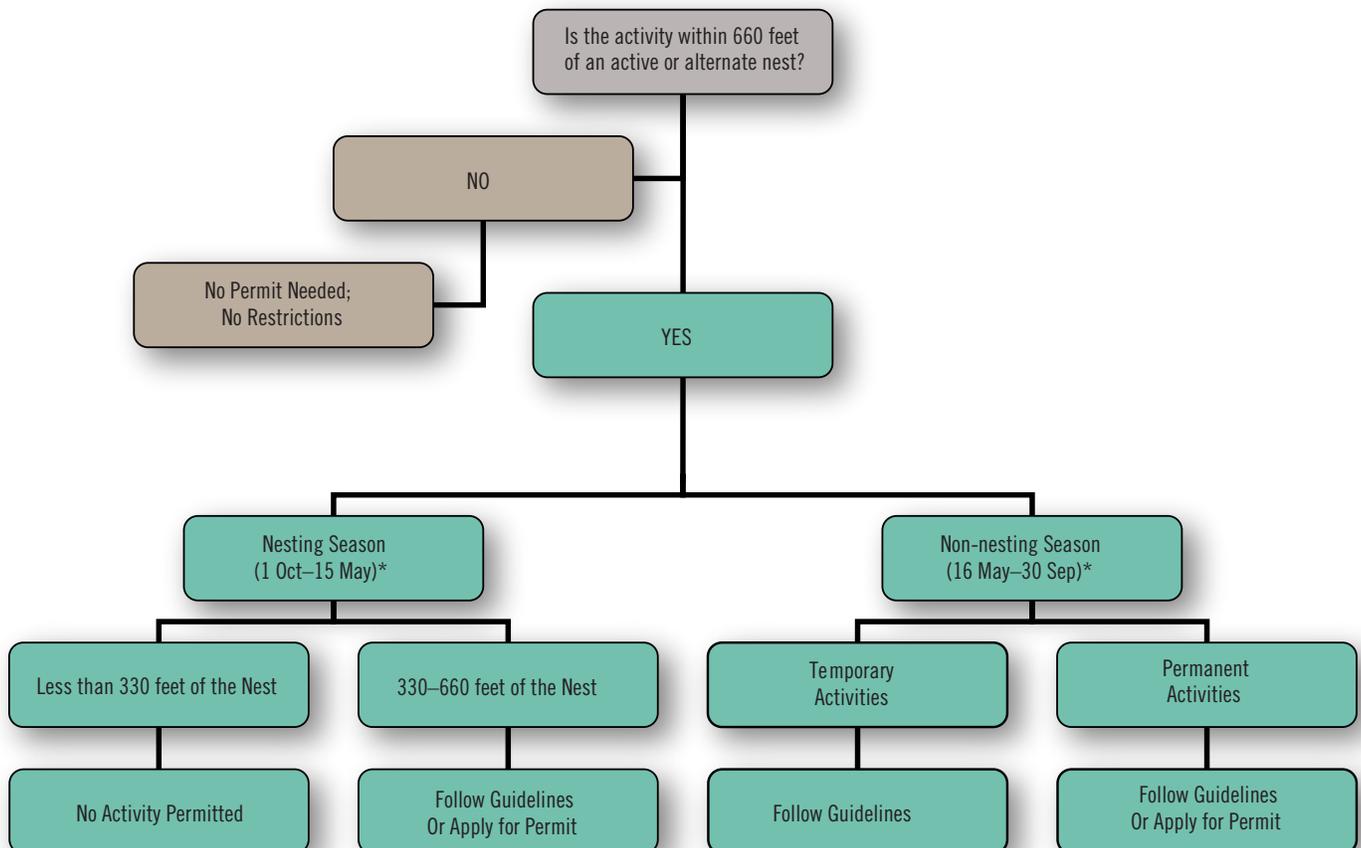
1. **The Eagle Protection Act (16 U.S.C. 668a-668c)**, and the regulations derived therefrom (50 CFR 22), state, in part, that no person “...shall take...any Bald Eagle...or any Golden Eagle, alive or dead, or any part, nest or egg thereof...” with “take” meaning “...to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb...” without a valid permit to do so. Whoever violates any part of the EPA may be fined up to \$250,000 or imprisoned from 1 to 2 years or both.
2. **The Migratory Bird Treaty Act (16 U.S.C. 703-712)**, makes it unlawful “...to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, or possess, ... offer for sale, sell, ..., any migratory bird, any part, nest or eggs of any such bird...” Violators may be fined up to \$250,000 for a felony and/or imprisoned up to 2 years.

B. STATE OF FLORIDA STATUTE:

F.A.C. 68A-16.002 Bald Eagle (*Haliaeetus leucocephalus*).

1. No person shall take, feed, disturb, possess, sell, purchase or barter, or attempt to engage in any such conduct, any bald eagle or parts thereof, or their nests or eggs.....
2. For purposes of this section, the term “disturb” is defined as, “To agitate or bother a bald eagle to the degree that causes, or is likely to cause (a) injury to an eagle, (b) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (c) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”
3. On public land, it is unlawful for any person to knowingly enter any area posted as closed for the protection of bald eagles, their nests, or their nest trees, except the staff or authorized agents of the managing public entity for that area, or as authorized pursuant to subsection 1.
4. The section of the Bald Eagle Management Plan entitled “Permitting Framework April 2008,” which includes the FWC Eagle Management Guidelines.

The following flowchart shows when a permit is recommended for activities near an eagle’s nest. Notice that activities within the 330 radius are not permitted during the breeding season or until all birds have fledged.



Appendix B

Nest Site Online Form

Below is a sample of the online reporting form. Familiarize yourself with the data requested on the form. For more information on how to access and use the EagleWatch Data Portal or to download hard copies of the observation form you can click on the link below.

<http://eaglewatchflorida.org/training>

Audubon FLORIDA

Citizen Science | Eagle Watch | Hello EagleWatch | Log Off

Account

Eagle Watch

- View Nests
- View/Enter Nest Site Visits

Create Nest Site Visit

Please enter information below.
(*Required field)

Nesting Season
2016-2017

FWC Nest #

Observer Name
Lake Region, EagleWatch

Date
[]

Time Observed From:
[]

To:
[]

Weather

Nest Condition

Tree Condition

Noise Level

Source
[]

Adults Observed
0

Adult Behavior(s)
Select Some Options

Eaglets Observed
0

Number of Young Fledged
0

Young Perished
0

Eaglet Behavior(s)
Select Some Options

Specific Observation:
[]

Submit Cancel

Appendix C

EagleWatch Cheat Sheet

Audubon Center for Birds of Prey 407-644-0190

Reinier Munguia Cell 863-797-7374; eaglewatch@audubon.org

Wildlife Alert Emergency Number to report Fish and Wildlife Violations 888-404-3922

Florida Fish and Wildlife Conservation Commission FWC contact number 352-732-1225

- ⇒ All nests are protected by federal and state laws.
- ⇒ No activities are permitted within 330 feet of a nest during the nesting season Oct. 1 - May 15 or whenever eagles are present at the nest site.
- ⇒ The FWC will not permit any activity within 100 feet of a nest at any time, except for nests built on artificial structures

Monitoring: The purpose of monitoring is to detect any abnormal behavior of the adult eagles or their chicks that may be elicited in response to human activities that potentially could result in disturbance, nest abandonment, or death of the eggs or eaglets.

- ⇒ In Florida, monitoring should begin no later than Oct 1 and continue through fledging (mid-May).
- ⇒ Generally, monitoring of nests should be done in accordance with Bald Eagle Management Plan (BEMP). This means staying at least 330 ft from the nest when monitoring.
- ⇒ Some pairs of eagles are more sensitive to human presence than others, and may require more caution and distance on the part of the nest monitor in order to prevent disturbance.
- ⇒ Watch the behavior of eagles carefully for signs of distress. If they seem alarmed by your presence (vocalization, flushing from nest) – back off! No photo or report is worth jeopardizing a nest.

Nest attendance:

- ⇒ During the 35 days of incubation AND the first 2-4 weeks post-hatch, there will almost always be a parent at the nest.
- ⇒ One parent broods during inclement/cool or rainy weather until chick is 4 weeks old.
- ⇒ At 5-6 weeks, nest attendance drops significantly but parents remain close by on branch.
- ⇒ **Nest attendance is abnormal** if at least one adult is not present prior to egg laying or both adults are absent for more than two 15 minute periods during incubation, early brooding or inclement weather prior to 4 weeks post hatch.
- ⇒ Adult behavior at the nest: eagle may assume alert posture over eggs; vocalizing/distress calls; flushing if there is a disturbance. Flushing behavior: humans on foot cause eagles to flush much more than humans in vehicles.

Developmental Timetable (Florida):

- ⇒ Nesting season: **Oct 1-May 15**
- ⇒ Eggs laid: usually mid-December; **33-35 day incubation** period (nestcup is low; hard to observe from ground but can see at “shift change”)

Eaglet development:

- ⇒ 6-7 weeks --- eaglets stand upright, squeak loudly for food, take hops.
- ⇒ 10 weeks—fully feathered and exercises wings in nest.
- ⇒ Branching ~ 2 weeks before fledging. Short flights to branches in the nest tree.
- ⇒ Early fledging (physically ready to fly at 10-12 weeks of age) -- circumstances for early fledging include disturbances; food competition with sibling and faster development of females versus males.
- ⇒ Fledging—in Florida, fledging typically occurs at 11 weeks of age; but can occur 8- 12-16 weeks after hatching.

- ⇒ At 12-16 weeks eagles learn to flight, landing skills and hunting/foraging on their own. Most eaglets still return to nest tree at night for roosting. Adult eagles will continue to provide food at this age. Hunting proficiency takes several months.
- ⇒ Fledgling will use nest for several months for feeding, while practicing their flight and hunting skills.
- ⇒ Late fledging stage: juveniles 17-23 weeks old. They are self-sufficient and wander away from the nesting territory. Some migrate northward although some family groups stay together over the summer and other juveniles join up around lakes/landfills.

Eaglet plumage:

- ⇒ Hatchling: primary or natal down—fluffy grey.
- ⇒ Three weeks old: secondary down—thicker, dark grey covering (can thermoregulate now),
- ⇒ Four-six weeks (transitional): first dark brown to black pin feathers emerge.
- ⇒ 10 weeks: juvenile eaglet fully feathered; tail and wing feathers longer in first year.
- ⇒ Plumage stages in eagles: <http://www.swbemc.org/plummage.html>

Q&A Section

How often do I have to visit my assigned nest?

On average every 15 days.

What if I can't continue to monitor the nest at any time during the season?

Since having continuity in the data is very important, you should contact the EagleWatch Program Coordinator to find somebody that can cover your nest in your absence.

What is the most important data collected?

While all the data in the observation form is important, the most important of all is the number of nestlings you observe and the number of fledglings that leave the nest. We encourage our volunteers to write comments on the Specific Observation section of the form to include observations such as: food items brought to the nest, the presence of eaglets from a previous generation, what kind of materials they bring to line up the nest cup, etc. This information gives us important clues about the bird's preferences based on location and time of year.

What is the most critical time for the nestlings?

The first 3-5 days are the most critical for the chicks. Then later on as they approach fledging time the risks are very high for a young eaglet. Many birds fall of their nest every year while exercising their wings. It's recommended to visit the nest more often during the late nesting stages to be able to document a successful fledge.

How do I know when my bird(s) are about to fledge?

Several things are indicative of a near fledge. First the eaglet may look a bit skinnier as feeding by the adult is reduced to encourage the eaglet to fly off the nest. The eaglet becomes more vocal as it begs for the adults to bring them food. The adults could be seen flying by the nest with food in their talons as an invitation for the eaglet to follow them.

What if I encounter an eagle nest disturbance, a fallen eaglet or injured eagle?

If you encounter a nest disturbance, you should contact the EagleWatch Program Coordinator as soon as possible to discuss the situation before taking action. Do not engage with the people involved in the disturbance, but gather as much information as possible from a safe distance. To assist a fallen, eaglet contact the EagleWatch Program Coordinator to get further instructions. With eagles requiring immediate medical assistance, contact the Center for Birds of Prey at 407-644-0190 for more information.

Bald eagles can be very sensitive to human behavior. Human presence can stress the birds and negatively affect their breeding success. The energy they use to avoid human disturbances is no longer available for other uses during the nesting season. Repeat disturbances can cause problems for the eagle including nest abandonment.

Some eagles are more tolerant of humans than others. For example, eagles in cell towers located in busy places have become more accustomed to humans. That being said, their towers can exceed heights of 200 feet, so they have built in more space between themselves and people. Where eagles are found in forests, they do not encounter humans often and our presence disturbs them more.

For the safest and least intrusive viewing experience, please follow these guidelines when observing or photographing nesting eagles:

1. Use binoculars or a spotting scope. Don't try to get "just a little bit closer."
2. Photographers should use a telephoto lens.
3. Do not stand directly under an eagle nest or in close view of the nest!
4. FWC guidelines advise you to stay at least 330 feet away from any nest (the length of a football field).
5. Use your car or a tree as a blind putting it between you and the eagles. They are less sensitive to those objects than a free-standing or moving human.
6. Try to be at the EagleWatch site with your binoculars between dawn and 11 a.m. The early-riser may be treated to the vocalizations of feeding bald eagles.
7. Respect the landowners. Always ask permission before entering private property. Don't trespass or intrude in any way. Heed all No Trespassing signs.
8. If an eagle stops what it is doing to watch you, you are disturbing the eagle—move on!
9. Don't EVER do anything to try and make the bird fly. Flushing an eagle can cause harm to the nestlings.
10. Be as quiet as possible.
11. If you see an eagle, consider yourself lucky. Don't do anything that might stress the bird. They will see you. Move slowly and carefully and keep your gestures restrained.
12. Do not ever feed the eagles.
13. If an eagle is on the ground, do not approach it. When it flies off, do not attempt to follow it.
14. Demonstrate eagle friendly actions by your own behavior. Be courteous to both other eagle observers and wildlife.
15. Keep the area free from litter. Pick up after yourself and take your trash with you.
16. Keep pets at home.

For your comfort:

1. Wear appropriate outdoor clothing, sturdy footgear and avoid brightly colored clothing
2. Bring sunglasses, sun block, bug spray and water.
3. Find a comfortable place to observe the eagles.

For your safety:

1. Keep an eye out for other birds and wildlife in the area.
2. If the nest is in a remote location, bring someone along.
3. Have a cell phone with you.
4. Be aware of your surroundings at all times.
5. It is important to remember to look down while you are moving, not just up, to avoid tripping, falling into a hole or stepping on a snake.

- Please note that all wild birds, including raptors, are protected under state and federal laws. It is illegal to harm, harass or possess any wild bird. You are allowed to rescue a wild bird but you must get it to a permitted facility as soon as possible. The quicker the bird is in qualified care the better its chances are for release.
- Raptors can be very dangerous, even sick, injured and/or young birds. They have very sharp talons and beaks! BE CAREFUL!
- Please note the location where the bird was found; this information will be necessary in order to return the bird to its home once it has recovered. Study the area where the bird was found to determine what may have cause its injuries. Take notes as to how close to a road, powerlines or structure was the bird found. This little pieces of information are essential for the quick assessment of the bird and to reduce future incidents.
- For baby raptors, please note the exact location it was found, mark the spot if possible. Look up into the trees to see if the nest and/or adults are there. Every attempt should be made to reunite families.
- Get a box that is slightly larger than the bird. Poke lots of air holes into the sides. Place the box over the bird. Carefully slide something flat under the box in order to contain the bird.
- If you do not have a box, throw a towel or blanket over the bird. BEWARE of their talons and beaks!
- Do not attempt to give the bird food or water. Transport it to a wildlife rehabilitator right away in a dark, warm (room temperature) container with breathing holes in it.
- Contact Audubon Center for Birds of Prey at 407-644-0190.
- Only certain facilities are licensed to treat eagles. In the case of an injured Bald Eagle, make every effort to contact your local EagleWatch coordinator or the Center for Birds of Prey prior to taking the bird anywhere.
- Local veterinarian offices or local (domestic) animal shelters may have these contacts as well.

<http://fl.audubon.org/how-help-sick-or-injured-raptor>

Appendix F References and More Information

Plumage Stages in Eagles

<http://www.swbemc.org/plumage.html>

<http://www.featheredphotography.com/blog/2013/01/27/a-guide-to-aging-bald-eagles/>

FWC

<http://myfwc.com/wildlifehabitats/managed/bald-eagle/>

Complete Bald Eagle Management Plan

http://myfwc.com/media/427567/Eagle_Plan_April_2008.pdf

Local rehabilitators used by FWC

<http://www.wildliferehabber.org/>

General Facts about Bald Eagles

<http://www.baldeagleinfo.com>

http://www.allaboutbirds.org/guide/Bald_Eagle/id

<http://animals.nationalgeographic.com/animals/birds/bald-eagle/>

Audubon Center for Birds of Prey

<http://fl.audubon.org/audubon-center-birds-prey>

<http://fl.audubon.org/audubon-eaglewatch>

U.S. Fish & Wildlife Service

<http://www.fws.gov/migratorybirds/BaldEagle.htm>

<http://www.fws.gov/midwest/eagle/recovery/biologue.html>

ACKNOWLEDGEMENTS

REFERENCE MATERIAL: “The Bald Eagle” by Mark Stalmaster, Universe Books, 381 Park Avenue South, New York, NY 10016. ISBN Number 0-87663-491-9.

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