



## **Eagle Watchers' Guide**

### **Blackwater Refuge Eagle Cam**



**Recap of 2004/2005 Nesting Season**

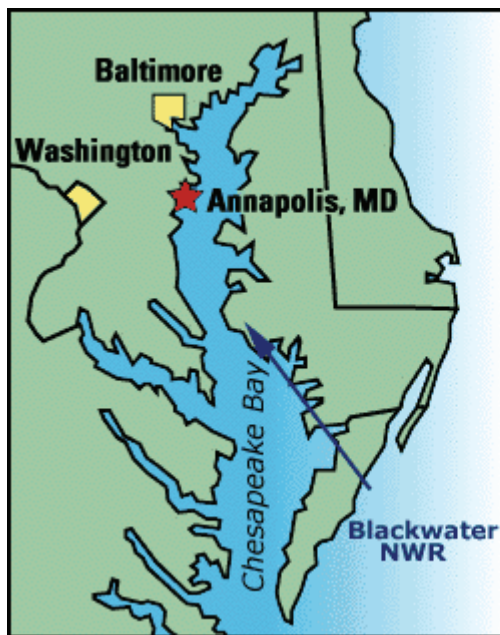
**Presented by the Friends of Blackwater NWR**  
<http://www.friendsofblackwater.org/>

## Introduction:

Blackwater National Wildlife Refuge is located in the Chesapeake Bay watershed on the Eastern Shore of Maryland. In November 2004, the Friends of Blackwater NWR went live on the Internet with our first Eagle Cam. The web cam was attached to a tree trunk near the top of an almost 80-foot loblolly pine tree located in a forest at the Refuge.

During its operation, the cam broadcasted images throughout the day, as well as during part of the evening, (using infrared, or night-vision, technology). The images were then uploaded to the Friends' website, where thousands of fans began tuning in to watch the bald eagles' adventure unfold.

The nest that was chosen for the Eagle Cam was an established nest, although at the time of our first airing, we knew nothing about the eagle couple's breeding history.



Blackwater Refuge is one of over 540 national wildlife refuges in America.

National wildlife refuges are federal lands that play a vital role in protecting habitat for the country's many important species.

**Fact:** Blackwater NWR is the largest wildlife refuge in Maryland and is an important stopover area for migratory waterfowl on the Atlantic Coast.

## Preparing the Nest:

Throughout November, December, and early January, the eagle pair worked on sprucing up their nest for the new breeding season. Together the male and female brought in new sticks to strengthen the structure, and also brought in grass-like material to form a soft cup in the center of the nest where the eggs would rest.



When the couple weren't performing nest maintenance, they often took time to bond with each other by touching beaks and sharing a meal at the nest. Among the food the male eagle brought to the female were fish, ducks, and rabbits.



**Fact:** In colonial times, “bald” was a synonym for white, which is how the bald eagle received its name.



When the eagles left the nest, they spent their time hunting, perching, and possibly sky dancing — a courting display where the eagles swoop at each other, narrowly missing a collision, until one bird turns on its back and grasps the extended talons of the partner bird. Then the pair falls towards the earth like a spinning cartwheel and releases their hold just above the surface of the water or ground.

With the eagles gone, other animals bravely came to check out the nest site. Visitors included gray squirrels, a turkey vulture, blue jays, and mourning doves.



But all the forest animals vanished when the true owners returned, because the eagle parents were about to get down to serious business.

**Fact:** Eagles mate for life, although they will seek a new mate if the old one dies, and they will “divorce” if they fail to produce young with a partner.

## Laying the Eggs:

Up until the evening of January 24, 2005, neither of the eagle parents had spent an entire night on the nest; instead they preferred to roost nearby. But on the evening of January 24, something changed — the female eagle spent her first night on the nest. Early on the morning of January 25, we saw the reason why, because when the mother stood up to shift her position, there it was — a shining white egg laying in the middle of the nest!



Bald eagles often lay one to three eggs in a clutch (normally two). On occasion, some eggs may not hatch — when this happens, the eggs are called "infertile," meaning they were not productive.

When the pesticide DDT was being used in the U.S. in large quantities back in the 1950s and 1960s, female eagles accumulated the pesticide in their bodies by eating fish. Since DDT is slow to breakdown and since eagles are high up on the food chain, the raptors' bodies collected large amounts of the chemical from all the fish they ate — a process known as biomagnification. The female eagles then began to pass the chemical onto their eggs. The end result were eggs that did not hatch, or eggs whose shells were so thin (DDT hinders calcium production) that when the female sat on the eggs, they broke.

DDT's impact on birds of prey was responsible for the decline of many species, including bald eagles, peregrine falcons, ospreys, pelicans, and some species of owls. DDT was banned in the U.S. in 1972, and raptor populations began to rise again with help from concerned citizens and government agencies.

DDT still lingers in the environment in areas where it was dumped in large quantities, such as off the California coast near the Channel Islands. In such areas, the pesticide continues to hurt peregrine falcon and bald eagle reproduction.

**Fact:** The deadly effects of the pesticide DDT were revealed by Rachel Carson in her 1962 book "Silent Spring." In 1980, she was posthumously awarded the Presidential Medal of Freedom for her efforts.

But back on the Eagle Cam nest in Maryland, the egg-laying was far from over. During the last few days of January, two more eggs appeared (again early in the morning), on January 28 and then January 31. The clutch was finally set at three eggs.



Incubating the eggs took around thirty-five days, and both eagle parents had a brood patch (a warm, featherless area on their stomachs), which they placed against the eggs to keep them warm. Although both parents helped incubate the eggs, the female did the majority of the incubating.



**Fact:** A bald eagle egg is off-white and about the size of a goose egg.



In addition to incubating, the eagles also needed to turn the eggs about once an hour to ensure that the eggs were evenly heated and that the embryos didn't stick to the insides of the shells. When turning the eggs, the eagles often balled up their talons to prevent their sharp claws from puncturing the eggs.



While the Eagle Cam parents were watching over their eggs, they also had to take care of themselves at the same time. The female eagle often preened herself while on the nest, by taking oil from a gland at the base of her tail, and rubbing it on her feathers. The oil kept the bird's plumage clean and waterproof. Without it, she would get chilled in rain and snow.

As for the father eagle, he spent much of his time keeping trespassers out of the nesting area and hunting for food, although soon he would be shopping for a larger family.



**Fact:** The female bald eagle is larger than the male. The depth of her bill and size of her talons are also larger.

## Welcoming the Chicks:

Finally after weeks and weeks of careful egg care, the time had arrived for the family to come into the world. On the afternoon of March 1, a small hole appeared in the first egg. The chick was trying to escape its shell-encased home.



During the lead-up to the chick hatching, the eagle parents undoubtedly heard the chick chirping and also felt the chick moving within the egg, so they surely weren't surprised to see the egg split in half. In the end, it took the chick about twenty-four hours to break completely free from its egg — a difficult and tiring process for the young bird. But once the chick had rested and dried off, the father eagle soon delivered a nice duck for the rapidly growing family.



**Fact:** An eaglet has a small egg tooth on its beak that it uses to break through the shell. The egg tooth remains for about a month before falling off.



On March 3 — about twenty-four hours after the birth of the first eaglet — the second egg started showing signs of a chick pecking its way out. As the mother eagle carefully passed food to the oldest eaglet, right beside them yet another chick was being born.



On the afternoon of Friday, March 4, two healthy-looking chicks were now resting in the soft cup of the nest, with no sign yet that the third egg was ready to hatch.

Throughout the weekend, the chicks grew stronger, even showing some early signs of sibling rivalry — a common occurrence in raptor nests.



**Fact:** Upon hatching, an eaglet has a pale beige-gray down — the first of two coats of down it will have before feathers appear. The second down coat is darker and woollier than the first.

As the sun went down each evening and the nest grew dark, the mother still tended to the needs of the little chicks. And during the day, she kept an even closer eye on the sky and called after birds flying too close to the nest. Sometimes she also called out to the male eagle to bring more food!



On the afternoon of Monday, March 7, three full days after the birth of the oldest chick, the third egg began to break in half, and the final chick made its entry into the world.



**Fact:** Older eaglets are larger since they're born first, and thus they have a definite advantage in obtaining food from the parents.



## Raising Eaglets:

The eagle family was complete — and it was a big family at that! Three seemingly healthy chicks required almost constant care. Besides needing to be fed, the chicks also needed to be kept warm, since they were too young to control their own body temperatures. Occasionally a small chick peeked out from under the mother's chest, as it was being kept warm by her body.



In addition to food and warmth, the eaglets also needed protection from predators. If the eaglets were left unattended at the nest, raccoons, crows, and nocturnal great horned owls could take the small eaglets.

As the chicks grew more mobile, the parents also had to prevent the inquisitive youngsters from falling out of the nest. On one evening, a determined eaglet kept inching its way to the edge, fascinated by something below them. Finally a parent had to intervene and herd it away from the side.



**Fact:** Occasionally an eagle parent will put dried grass on top of an egg or young chick to protect it from the elements or to hide it from predators.



By the end of March, the chicks were noticeably larger and beginning to develop the body structure of little raptors. The eagle parents did an excellent job as they both hunted for food to satisfy the hungry chicks and worked to ensure that all three eaglets got their share of the meals.



In many bald eagle nests, a third eaglet would have a hard time surviving. Sibling rivalry often means the smallest eaglet has trouble getting enough food because its bigger siblings command much of the meals. But in the Eagle Cam nest, all three eaglets were well fed and when skirmishes did occur, they were common sibling tussles, where sometimes the smallest chick was actually the instigator.



**Fact:** While eagle parents protect chicks from the cold, heat stress is often a bigger problem. On sunny days, parents sometimes spread their wings to produce shade for the chicks.

Around the beginning of April, the chicks were losing their second covering of gray-colored down and had started to develop small dark feathers on their bodies. Visible on the Eagle Cam were the tiny pin feather shafts, which gave birth to the new wing feathers.



Also visible on the eaglets were their big gangly yellow feet that would one day turn into powerful, piercing talons.

Although the eagle parents were doing a great job of feeding all the eaglets, it was clear that the oldest chicks were much more developed — a common occurrence among eaglets. Eagle biologists in the past used to believe that eaglets hatched weeks apart because of their varying sizes. Later they discovered that the chicks were actually only one to three days apart in age.



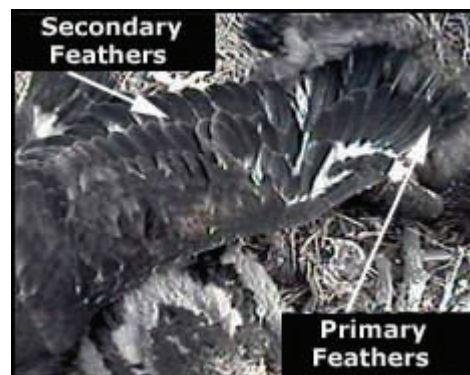
**Fact:** Feathers are made of keratin — the same protein that makes hair and fingernails. An adult eagle has around 7,000 feathers.

As the weeks passed and the eaglets got older, the nest became more crowded, and often the parents perched in a nearby branch to watch over the young. Although the Eagle Cam did not have audio, there was no doubt that the young birds frequently raised quite a racket when they became hungry, incessantly calling for a parent to return quickly with the next meal. All the begging might have been another reason for the adults staying off the nest during much of the day.



### **Growing Eagles:**

Around the beginning of April, the eaglets began exercising their growing wings, and even the smallest eaglet got into the game. But it was clearly the oldest eaglet that was developing its wings the fastest, as was evident whenever it stretched a wing out and showed off its beautiful primary and secondary flight feathers. Although the chicks were about a month away from their first flight, more and more of their time would now be spent beating their wings and eventually making short hops around the nest as they prepared themselves for that first takeoff.



**Fact:** Primary feathers can be manipulated somewhat like fingers on a human hand. The eagle can adjust them to reduce turbulence and increase stability while in flight.



In addition to feather development, something else that was visible was the chicks' crops. A crop is a storage space in a bird's upper chest where food is held until the bird is ready to digest it. A crop is a handy device for a parent because it means the chick can carry around extra food and doesn't have to be fed as often. Seeing a bulging crop on one of the eaglets was always a sure sign that it had just been fed.



As May approached and the chicks readied themselves for their first flight, the eaglets were so big that it was hard for all of them to fit into the camera view, but occasionally we did get a glimpse of the handsome brood, and it was clear they had progressed from fuzzy chicks to fierce-looking raptors in about six weeks. The family was growing up.



**Fact:** Eaglets waddle, shuffle, and squat in the nest until they gain the strength to walk around, which happens at about six or seven weeks of age.

During the spring nesting season of 2005, the U.S. Fish and Wildlife Service staff at Blackwater Refuge had been talking with Craig Koppie — an endangered species specialist with the Service — about relocating one of the Eagle Cam eaglets and donating it to the Vermont Bald Eagle Restoration Initiative project.

At that time, Vermont was the only state in the country that did not have a breeding pair of bald eagles, and the USFWS was working to reestablish breeding eagles in the state. In the previous year, Maryland (and other states with healthy eagle populations) had donated eaglets to the program. Since the Eagle Cam nest was overflowing with three eaglets, it was decided to remove one and send it with the other eaglets that Maryland was donating for the second year of the Vermont project.



On May 4, Craig Koppie climbed the Eagle Cam tree at Blackwater Refuge and removed the middle eaglet. Originally the plan had been to remove the youngest, but it was decided that the bird would be too small to put in with the other project eaglets, so the middle eaglet was taken. Craig wrapped the eaglet up well for its trip down to the ground, and banded the other two eaglets before leaving the tree. While Craig was in the tree, the parents stayed off the nest, but they returned as soon as he left.

**Fact:** The other states contributing eaglets to the Vermont Bald Eagle Restoration Initiative were Maine, Massachusetts, New York, and Virginia.

Once the second eaglet was on the ground, several photos were taken of her (we later learned it was a female) and they revealed a magnificent bird. She was then placed in a container and flown on a special plane to Vermont, where she lived in a hacking tower until she was ready to fledge — which she did on June 1, along with the other project birds. It is hoped she will one day return to Vermont to raise her own family.



June 1, 2005

Back in Maryland at the Eagle Cam nest, the two remaining eaglets could be seen on the cam along with the adults. In photos taken right after Craig Koppie left, the bands were visible on the eaglets' feet.



**Fact:** Hacking is a method of transplanting birds to another area in an effort to rehabilitate bird populations. Where the bird fledges determines where it will return to breed.



Banding — or ringing in Europe — has been going on for centuries. Today birds are banded in order to help biologists learn more about dispersal, migration, behavior, life span, and population growth. When Craig banded the eaglets, he used a rivet band, which is a common band for eagles. The bands do not heat up in the sun and won't harm the eaglets' feet.



While banding is important, what is equally important is that individual citizens help bird biologists by reporting when they find either a band or a bird that is wearing a band; reports can be submitted by calling 1-800-327 BAND — the toll-free number for the Bird Banding Laboratory in Laurel, Maryland, which collects federal bird band reports. This phone number is often found on the band itself.

### **First Flights:**

At the Eagle Cam nest, the chicks were rapidly maturing. On May 12, the two remaining eaglets shared a fish without help from the adults. Ripping off fish or duck pieces is not an easy chore, and young eaglets are beak-fed by a parent until they are skilled at digging in themselves. But in the cam shots, it was clear the eaglets were beginning to do just that.



**Fact:** The head of a fish is the easiest place to begin eating, which is why so many adult raptors bring headless — rather than tailless — fish to the nest.

During this period at the nest, the eaglets were out of view much of the time because they had taken to "branching" — or sitting in the branches of their home tree, which is a natural lead-up to fledging.

While our camera view at the Blackwater nest did not give us a wide-enough shot to see the moment when the oldest eaglet took its first flight, it did appear that on May 18, there was a sign that the elder eaglet was now a fledgling. During the morning hours, the oldest eaglet showed up at the edge of the nest with a tiny fish — much smaller than any meal the parents would bring. It then began to feed on it alone and when the youngest eaglet attempted to share, the oldest wouldn't allow it, and kept the fish for itself. A short time later, an eagle parent arrived with a much larger fish, and fed it to the youngest. It's possible the oldest eaglet found the little fish dead and retrieved it for an easy meal — a common feeding method most young eaglets use before they learn to pluck fish from the river.



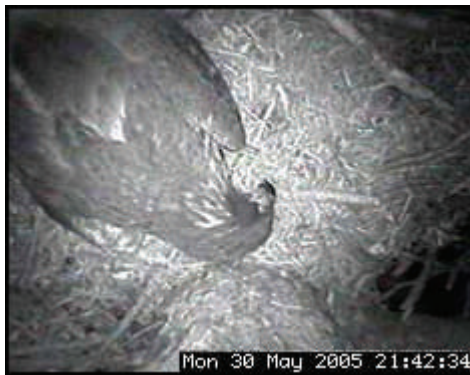
In the days that followed, the oldest eaglet was not seen much on the nest. It appeared that the fledgling was spending a good bit of time flying about and learning the layout of the Refuge, probably in the company of one of the parents. The eaglet was also imprinting the Refuge on its memory — for one day it would return here to raise its own family of eagles.



**Fact:** Landing is the hardest part of learning to fly. Graceful landings by eagles only come after much practice.

At the end of May, the youngest eaglet still sat in the branches and slept in the nest. But at the beginning of June, the youngster stopped sleeping at the nest, which meant it was roosting in the trees with the adults. Soon it was gone during most of the daylight hours, and it appeared that the last eaglet had finally fledged.

The fledged birds likely stayed around the nest area for six to eight weeks before striking out on their own.



The 2004-2005 Eagle Cam season was a wonderful success as cam watchers from around the world witnessed the birth and fledging of three healthy eaglets. Everyone participating agreed that it was a privilege to have witnessed the events, as few humans have been given such an intimate view of the bald eagle's family life. The memories of this season will remain, as will the knowledge we have gained.



Read on to learn more about eagles and Blackwater Refuge...



## More Eagle Facts:

Eagles usually nest in tall trees that are no more than two miles from water.

Where an osprey will build a nest at the top of a pole or tree in an exposed location, eagles prefer to nest near the crotch of a tree, more sheltered from the weather.

Eagles use a loud song or call to defend their territory. The raptor tosses its head skyward several times while emitting a ringing call to all who can hear. In addition to calling, an eagle will also protect its territory by flying around it or by perching conspicuously near the top of a nearby tree, its white head alerting all around that a bald eagle is defending the area.



When an eagle is standing on a tree limb and begins to fall asleep, its leg muscles contract and tendons in its feet automatically close its toes around the branch, locking the bird to the limb so it doesn't fall.

Chicks shoot their excrement over the side of the nest. And to increase nest sanitation, the adults bury old, rotting food under fresh nesting material brought to the nest throughout the season.

Adult eagles have a wing span of six to seven feet (close to eight feet on the females).

The bones of an eagle weigh, in total, less than half the weight of their feathers.

Eagles are not the strongest flyers, and spend much of their flight time soaring and gliding, rather than flapping.

Fledglings fly at about eight to fourteen weeks of age, depending on how quickly they've developed.

Grown immature eagles have longer primary, secondary, and tail feathers than adults, and look bigger than their parents.

Immature bald eagles develop the all-white head and tail at about five years of age. Until they mature, young eagles spend their time exploring, sometimes over large areas.

## More about Blackwater National Wildlife Refuge:

Blackwater National Wildlife Refuge is a GREAT place to watch bald eagles; and the reason for this is because Blackwater Refuge is located in the heart of the Chesapeake Bay watershed — an area that the local folks call "Chesapeake Country."

Chesapeake Country is located on the Eastern Shore of Maryland, where large populations of wildlife depend on the bounty of the Chesapeake Bay for their survival. The Chesapeake Bay is the largest estuary in America, and its shallow waters and numerous tributaries create wonderful fishing grounds for two of the most popular birds at Blackwater Refuge — the osprey and the American bald eagle.



From March through September, the ospreys (also called fish hawks) are plentiful around the Bay and at Blackwater, but in the winter, the fish-dependent ospreys have to migrate south since the water can freeze over and cut off their food supply. Bald eagles are not totally reliant on fish for their survival, so they can stay in the region because the woods, farms, and marshes that surround the Bay offer the eagles many small animals and waterfowl to eat.

Blackwater Refuge has one of the largest populations of breeding bald eagles on the East Coast, and during the winter months, the Refuge not only hosts a large permanent eagle population, but also hosts many migrant eagles that come from northern and southern states. This means that in the winter, Blackwater Refuge can have as many as 150 bald eagles flying about the Refuge.

Blackwater National Wildlife Refuge is approximately 27,000 acres in size and was originally founded in 1933 as a refuge for migratory waterfowl. The two Refuge rivers — the Little Blackwater River and the Blackwater River — are major stopover areas for waterfowl migrating down the Atlantic Coast; biologists actually call this popular "bird highway" the Atlantic Flyway. But in addition to protecting thousands of migrating geese and ducks, Blackwater also protects endangered and threatened species, such as the endangered Delmarva fox squirrel and the threatened American bald eagle.



Like all national wildlife refuges, Blackwater Refuge is run by the U.S. Fish and Wildlife Service (USFWS) — a federal agency of the Department of Interior. The USFWS currently oversees over 540 wildlife refuges in America, which exist on over 95 million acres of land — more land than the National Park Service. What's special about these refuges is that they are the only federal lands where wildlife is supposed to come first, and that means they play a crucial role in protecting the amazing variety of life that America is so fortunate to possess.



Wildlife refuges like Blackwater are one of the main reasons that bald eagles are still alive today. In the past, humans had reduced bald eagle populations to a small percentage of what they once were. Shooting, shoreline development and pesticide use — especially use of the now-banned pesticide DDT — contributed to a major reduction in bald eagle numbers throughout America. But today bald eagles are thriving because Americans were determined to save them.



The USFWS staff and the Friends of Blackwater are proud that Blackwater National Wildlife Refuge is contributing to the comeback of bald eagles by providing them with a healthy and safe home, and we're happy that we can share this magnificent raptor with our website visitors. We hope this guide and our Eagle Cam give you a special window into the world of the bald eagle — an amazing creature we feel privileged to observe.

### **Learn More:**

Visit our 2004-2005 Eagle Cam Web Log to relive the season as it happened:

[http://www.friendsofblackwater.org/eagle\\_cam\\_blog/](http://www.friendsofblackwater.org/eagle_cam_blog/)

And visit our 2004-2005 Eagle Cam Gallery to see more photos like the ones in this guide:

<http://www.friendsofblackwater.org/camcentral.html>

Published by the Friends of Blackwater National Wildlife Refuge — a nonprofit citizens support group for Blackwater NWR and the Chesapeake Marshlands NWR Complex. Learn more about supporting the Friends and our raptor cams:

<http://www.friendsofblackwater.org/support.html>



## Credits:

The Friends of Blackwater would like to gratefully acknowledge the efforts and support of those who have partnered with us and have contributed generously to the Eagle Cam project. Without their contributions of time, materials, expertise and funding, bringing you the Eagle Cam would not have been possible.

Choptank Electric Cooperative, AACuracte Tree Service, and WildCam.com have provided help and expertise to get the images on our website. We would like to especially thank Ron West who on short notice willingly climbs the tree to install and adjust the camera. We also thank the Refuge staff, who provided expertise and assistance with each step of the installation.

Thanks to photographer Bob Quinn for the use of his eagle photos.

And a final thank you to all our cam watchers, who inspired us with their enthusiasm and who enriched the project with their photos and observations.

Thank you!

