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Raptor Research Foundation Conference: Historic 4-Chick Bald Eagle Nest

By Yoke Bauer DiGiorgio

Director, Delaware Valley Eagle Alliance

In 2009 the Delaware Valley Eagle Alliance announced the successful fledging of four bald eagle chicks from a nest along the Delaware River in Northampton County, PA. The PA Game Commission was notified and provided with documentary film confirming the historic event.

The DiGiorgios have completed capturing fourteen weeks of footage and photographs documenting from the time that the 4 chicks were first observed (April, 2009) through several weeks after they fledged - first flight (July, 2009).

In September 2010, the DiGiorgios collaborated with Dr Bryan Watts, Center for Conservation Biology, College of William and Mary, co-authored and presented a Poster Paper at annual Raptor Research Foundation Conference in Fort Collins, CO to the biologists attending the conference.

The Raptor Research Foundation is a non-profit scientific society whose primary goal is the accumulation and

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Raptor Research Foundation Conference (continued):

dissemination of scientific information about raptors (hawks, eagles, falcons and owls). This information is used to inform the public (both scientific and lay) about the role of raptors in nature, and to promote the conservation of raptors whose populations are threatened by human activities. Membership includes academic researchers, government agency employees, and others interested in birds of prey. The Raptor Research Foundation achieves its goals primarily through publication of research reports in *The Journal of Raptor Research*, and through its annual meeting held in a different North American location each year at which research results are presented.

Response and interest by all those attending the annual conference was terrific.

Brood size in bald eagles reflects a broad range of evolutionary tradeoffs, generally varies between 1 and 3, with 2 being the most common. Prey abundance is believed to be a major determinant. Reports in the literature of 4-egg clutches are very rare, with some suggesting that they may have resulted from two females laying eggs in the same nest. In 1986 on the Chesapeake Bay, a 4-egg clutch was successful with no sign of an extra female. An account, however, was never published.

Bald Eagle broods hatch asynchronously and often form dominance hierarchies. Under normal circumstances, the degree of hatching asynchrony for unusually large clutches likely creates such a disadvantage for the last chick that it sets an upper bound on brood size.



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CHICK DEVELOPMENT

- For the **first two weeks** chicks are covered in white down and depend on the adults for warmth.
- **By 2-3 weeks**, chicks are covered in gray down and are more able to regulate their temperature. When the chicks are young typically the male does most of the hunting. Chicks are not yet able to tear the prey and are fed regularly by both adults.
- **By 3-4 weeks**, flight feathers are just appearing. Chicks may eat as much as 2 lbs per meal. Growth is rapid.
- **By 5-6 weeks**, chicks are developing coordination and are more active and playful. They may grab at adults to get food.
- **By 7 weeks**, chicks are proficient at moving around the nest. The adults typically spend less in the nest and may perch on branches in the nest tree or neighboring trees.
- **By 8 weeks**, chicks are nearly adult size. Coordination is improving and body posture is more erect. Chicks are able to tear prey and feed themselves.
- **By 9-10 weeks**, chicks exercise flight muscles and learn to control lift in preparation for their first flights. This includes taking to the support branches of their nest tree.
- **Fledging** typically occurs between **10-12 weeks**. Chicks remain dependent on the adults for food for several weeks after fledging.
- **Now called juvenile bald eagles, it will take them 4-5 years to reach full adulthood,**

The DiGiorgios estimated that there was a one and a half to two week age difference between the oldest chick and the youngest chick. Chick #1 was visibly larger and more developed than the younger three chicks, and chick #4 was visibly smaller and less developed than the older three. This remained the case up until they fledged.

There appeared to be an abundance of prey at the Northampton County, PA nest and this may have been the reason for the observed lack of formation of strong dominance hierarchies. John DiGiorgio recalls filming on a particular evening in May where, over a two and a half hour time span, the adults brought in a total of five fish and fed the chicks continuously with no sibling aggressive behavior observed. All four chicks fledged during the 4 days between June 19, 2009 and June 2, 2009.

Following the conference, the DiGiorgios are exploring working with the community to provide information and education on bald eagles and this historic event.

A documentary film and book are being developed.

Raptor Rehab for an Early-Fledging Eaglet

By Don Hamilton

**Natural Resource Specialist,
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Bald eagles grow up fast. From their emergence as 6 ounce hatchlings, they grow into 8 to 12 pound juveniles, with 6-and-a-half foot wingspans, when they're ready to leave the nest (fledge) about 12 weeks later.

Much has to go right for eaglets to make it to adulthood. Weather must be favorable for birds that hatch this early in the season (generally late March or early April in this area) to survive. Their parents will shelter them from harsh weather, but a late snowfall with snow accumulation in the nest can sometimes do them in. The adults have to catch enough food to provide for one, two, or three young with voracious appetites and rapidly growing bodies. Potential predators, such as tree-climbing raccoons, need to be kept at bay by watchful adults. And the nests themselves, sometimes as large as 10 feet across and weighing up to several hundred pounds, need to hold up to fierce winds and swaying trees, and sometimes tumble from a tree at the worst possible time.

Along with these challenges are the hazards of the fledgling eaglet's first awkward flight, or in some cases premature tumble, from the nest. Young pre-fledging eaglets spend a lot of time jumping and testing their wings, and building up their flight muscles, in the nest. But this sometimes leads to an early exit, and an uncontrolled flight to the ground, before a fledgling is ready for it. Injuries can result from the youngster striking tree limbs on its descent, and it may find itself on the ground and subject to whatever predators are afoot. Adult birds usually try to feed an eaglet that's on the ground, but survival often depends on it gaining enough strength to at least fly to the lower limb of a nearby tree for safety.

We had just such a situation here on the Delaware River last summer when two early-fledging eaglets ended up on the ground the 2nd week of June, a few weeks before they were ready to fly. The first bird was found on June 10th by a landowner near the nest tree, who contacted a National Park Service (NPS) ranger about it. Because the adult eagles hadn't yet found this fledgling, and the fact that there was a dog on the property that wouldn't leave this bird alone, a decision was made to capture this eaglet and take it to the Delaware Valley Raptor Center (DVRC), as its best chance for survival.

It's always best to leave such captures to those experienced with handling these birds. In this case, a couple of NPS employees knowledgeable about such tasks were able to catch this fledgling. Taking care not to injure the bird in the process (a fish landing net or blanket works well for the initial capture), one ranger made sure she gained control of the legs above the feet while cradling this rambunctious youngster, so that the eaglet's sharp and very strong talons didn't inflict damage on its well-meaning captors. The other ranger helped place the bird in a transport box with a lid and air holes, minimizing the chance that it could further injure itself. This young male, which we named "Speckles" because of his coloration, was then taken to the Delaware Valley Raptor



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Center in Milford, PA, for evaluation, where they were expecting him after a phone call to make arrangements. A second fledgling from this nest, a young female, was found in the same vicinity the following day, and was also captured and taken to the DVRC.

The staff at the Delaware Valley Raptor Center (Bill and Stephanie Streeter, and Jan Lucciola) is very knowledgeable about and experienced in dealing with birds of prey, and are extremely dedicated to their important work. The first order of business was to treat the eaglets for dehydration, a common problem with birds that have been on the ground and maybe haven't eaten for awhile. This is done by inserting a tube down the esophagus and into the stomach, and hydrating with a mixture of lactated ringer's solution and dextrose. Because a wild animal in captivity experiences significant stress which can compromise the immune system, these birds are given injections of B-complex and E vitamins to boost the immune system, and iron dextran to help prevent anemia. Next, an initial survey is done to determine any injuries or broken bones. Speckles was favoring his left leg, but no fracture was palpated, and the X-rays came back clear. His sister was not so lucky. She had sustained a fractured wing, likely during her first flight from the nest, and would require surgery and the insertion of a pin to ensure proper alignment and mending of the bones. A local veterinarian works with the DVRC to perform these complex operations.

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Raptor Rehab for an Early-Fledging Eaglet (continued):

Speckles adapted fine to his new, temporary home. He began eating well, continued to exercise his wings and develop flight muscles, and was soon placed in a larger flight enclosure, where Bill could fully assess his flight capabilities. Speckles shared this larger enclosure with Julia, a well-mannered golden eagle who serves as a program bird for the DVRC, due to an injury that left her unable to survive in the wild, and therefore could not be released. The two birds got along well. Perhaps Julia reminded Speckles of his own mother, and maybe, somehow, he sensed some encouragement from her, and some admiration of his improving flying ability. Speckles was getting stronger, and gaining altitude. He would be releasable, when he was ready to go.

Rounding out his third week at the Raptor Center, Speckles was flying well, and Bill knew he'd be ready to go soon. We were aware that there was a third eaglet yet to fledge from Speckles' nest, and knew that if we could release Speckles near the nest, and close to the time that the last of his siblings fledged, Speckles stood the best chance of being found and accepted by his parents, and being fed, and taught to catch food, by them. This would give him his best chance of survival in the wild. Knowing that the last eaglet would fledge soon, we monitored the nest from a viewpoint across the river several times a day, waiting for this last sibling to make his move.

As we entered the 4th of July Weekend, Bill knew that Speckles was raring to go, and was getting concerned about him injuring himself on the screen windows of the flight enclosure. A decision was made to release Speckles near the nest, and hope for the best.

On the morning of his release, Speckles' reluctant sibling was still hanging in there, alertly observing the world from his nest vantage point, and still apparently unwilling to leave his all-too-familiar surroundings and comfort zone. Bill met us at the Milanville Office, and we drove with Speckles to a field on the Delaware River, near the stand of trees that the nest was in. Scott Rando, a volunteer eagle observer and excellent wildlife photographer, met us there for the release. We couldn't see the nest from this vantage point, but were only a few hundred meters away from it, and hoped that Speckles would fly to a line of trees near the river. It was likely his parents spent a lot of time perched in the trees and fishing in this vicinity, and they would find each other there.

As Bill brought Speckles out of his cage, and made preparations for the release, Scott remarked about a flock of crows we could hear making a lot of noise in the nearby nest woodlot. Crows often mob a bird of prey they perceive as a threat to them and their young, trying to drive it from the area. We wondered what they could be so upset about, and got Speckles ready for his re-introduction into the wild. Katherine Szupillo, a seasonal Biological Technician with the NPS on the Upper Delaware River, was offered the chance to do the honors on freeing Speckles, and readily accepted. We all gave Speckles our best wishes, and Katherine, facing the river, tossed him up and sent him on his way. With a few sturdy flaps of his wings, Speckles was soon 30 feet off the ground, and turned towards the river. He flew strong for 150 meters, and landed gracefully in the branch of a tree

overlooking the water. It was a beautiful sight to see.

Shortly after that, one of the adult eagles appeared, flying from a location downriver and heading for the nest woodlot, likely to investigate what all the commotion was about with the crows in this area. Speckles no doubt saw this bird as it flew directly overhead, and the adult may have seen Speckles as well. We left feeling optimistic about their reunion.

On his way home, Scott stopped at the vantage point across the river to take another look at the nest, and to see if he could spot either of the adults or Speckles from that location. The last eaglet had fledged the nest! And the crows we had heard making all the noise as we were preparing to release Speckles may very well have been harassing his just-fledged sibling in that woodlot! Timing-wise, the release couldn't have been any better.

We don't know for sure how things turned out with Speckles and his parents and sibling. We did get a report of a lot of interaction between adults and young eagles downstream of this location a bit. Hopefully it was Speckles and his sibling learning from their parents how to catch fish from the Delaware River.

EAGLEFEST FEATURED ARTIST POSTER



With a donation of \$30 (plus shipping and handling), you will receive a limited edition 16 by 20 poster created by:

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Sustainability: What Is It and Is It Really Achievable?

By Jason A. Porter

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Like most people, you have probably heard about “living sustainably,” eating “sustainable foods” or “going green.” Much of the time, you hear this language associated with marketing of a product or service and is an attempt to appeal to a growing number of socially and environmentally conscience consumers. So what is sustainability and is it something we should be concerned about?

The word sustainable, as used in ecology, refers to diverse and productive ecosystems (e.g. old growth forests, untouched wetlands) or to management of natural populations that does not lead to their overuse or extinction (e.g. sustainable fisheries, sustainable forestry). It seems simple enough to apply this to humans and define sustainability as the maintenance of diversity and productivity within all of the earth’s human population. But is it so simple? What does diversity mean? Diversity can apply to ethnicities, cultures, forms of government, economic markets, even ideas. Which of these metrics of diversity will we use to test if we have “maintained diversity”? How about productivity? Are we talking about population size, economic growth, measures of living standard, technological advance or environmental health? I think you can begin to see why a definition for the word sustainability can be so elusive, let alone a solution for achieving sustainability.

The most commonly quoted definition of sustainability (typically in reference to sustainable development) comes from the United Nations Brundtland Commission (March 20, 1987), which determined “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” I think you would agree that this is rather vague, but it does help define a goal of sustainability; continue to grow and prosper, but in a way that allows for prosperity and growth in future generations. Achieving sustainability is a multi-disciplinary endeavor requiring the merger of ecology, economics, sociology and political science across national borders, political ideologies and cultures. Nothing simple about it!

As we work towards meeting the goals of sustainability, it makes sense to ask “why now?” I am sure many of you reading this article can remember a time when the word “sustainable” did not exist. When there was no consideration of “green economies” or eating “sustainable foods.” Essentially, sustainability has become more important because the human population and the level of consumption by this population is large enough that we are beginning to reach the “running out” point of many of our natural

resources. This includes resources like oil, potable water, grazing pasture, farmland and available land for disposal of household and toxic waste. Simply put, you worry more about the efficient use of resources when they are almost gone than when they seem plentiful and endless.

So how do we monitor our use of natural resources and determine if they are being used efficiently and equitably? This is “the” question in sustainability science, with many different metrics and methodologies being tested for efficacy. However, one metric, first introduced in an [academic publication](#) by William Reese in 1992, is the [ecological footprint](#). The ecological footprint is a measure of the impact an individual’s consumption of resources and production of waste has on the stores of these resources. Mathis Wackernagel, a former graduate student of William Rees, further developed the methodology for the ecological footprint while completing his [Ph.D. dissertation](#) and is currently the President of the [Global Footprint Network](#), an international think tank committed to improving ecological footprint methodology and achieving human population sustainability.

The ecological footprint was introduced to overcome the problem of not being able to accurately calculate the number of humans the earth can support. Because humans are not distributed homogenously across the earth, move frequently from region to region and use resources from one ecosystem to support growth in another, the earth’s carrying capacity for humans cannot be accurately determined. However, the ecological footprint approaches the problem in a different way. Instead of calculating the number of humans that can be supported by the earth, it calculates how much biproductive land (for development and harvesting of resources) is necessary to support a person’s lifestyle. This is a wholly more simple quantity to compute and allows one to produce a quantitative estimate of their impact on the earth. This estimate can then be compared to others and an equitable discussion about the use of resources can be had.

The ecological footprint is not without its flaws. Many different methods for calculating an ecological footprint exist, potentially leading to different conclusions. However, the Global Footprint Network published the first set of internationally recognized [ecological footprint standards](#) in 2009. Standardized methodologies for calculating the

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EAGLE FACTS

- Height: 30-31”, Wing Span: 6’-7’6”, Weight: to 14 lbs, Life Span: 25 – 30 years.
- Mated bald eagles are monogamous.
- Female bald eagles are larger than the males.
- Can fly 36 – 44 miles per hour.
- Can spot a fish up to 3 miles away.
- With eyes almost as big as a human’s, bald eagles also have color vision.
- Juvenile bald eagles resemble Golden Eagles, require 4 – 5 years to reach full adulthood, have a longer tail and wider wings than adults.
- Snatch fish with their talons.
- Have special pads on the soles of their feet, especially designed to firmly grip a slippery wriggling fish.
- Each foot has four toes, three pointing to the front and one to the rear, ending with razor sharp black talons up to two inches long.

Sustainability (continued):

ecological footprint will certainly lead to more reliable metrics and better conclusions based on these metrics. Although not all encompassing, metrics like the ecological footprint allow us to have important conversations about resource use based on collected data, not speculation and bias.

But like all other realms of life, there are no “quick fixes” and if a solution seems too good to be true, then it probably is. What is important is that we make ourselves aware of the issues surrounding natural resource use and depletion, gather appropriate data using instruments such as the ecological footprint, and have the rational and informed conversation about how we want to proceed. This is, in fact, why sustainability is so hard to define and achieve; it requires hard work, an open mind and a willingness to work together towards an equitable solution. Add the fact that it is the entire human population that has to be involved in this discussion and solution and the scale of sustainability become clear.

So, is sustainability achievable? It better be because, in one way or another, sustainability, in reference to the efficient and equitable use of natural resources, is necessary. A better question may be, how long before we decide to achieve sustainability?

For more information on sustainability or calculating your ecological or carbon footprints, refer to these resources:

Sustainability (Economic, Environmental and Social)

Worldwatch Institute - www.worldwatch.com

Center for Sustainable Economy - www.sustainable-economy.org

SustainAbility - www.sustainability.com/

Ecological and Carbon Footprints (Methodology and Application)

Global Footprint Network - www.footprintnetwork.org

Zero Footprint Foundation - www.zerofootprintfoundation.org

Ecological and Carbon Footprint Calculators

www.myfootprint.org

www.footprintnetwork.org/en/index.php/GFN/page/calculators

www.zerofootprint.net/carbon-software-products

The Delaware Valley Eagle Alliance

Our mission: to increase awareness, understanding and promote conservation of our wildlife and natural environment.

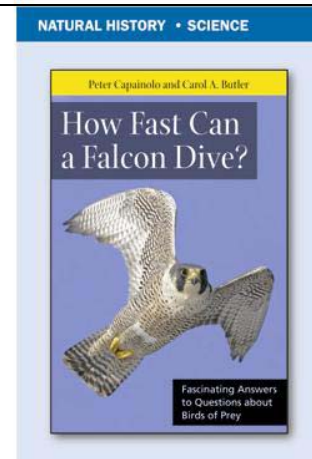
Educational Events, Programs and Publications

The *Delaware Valley Eagle Alliance* is a 501(c)(3) not-for-profit organization. All events and programs are funded by your generous donations. If you would like to make a donation, please send your “tax deductible” check, payable to the *Delaware Valley Eagle Alliance* to:

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FOR MORE INFORMATION Visit our website at: www.dveaglealliance.org E-mail us at: jyd630@aol.com

Yoke Bauer DiGiorgio, Editor-in-Chief



How Fast Can a Falcon Dive?

By Peter Capainolo and Carol A. Butler

BOOK EXCERPT.....

“How do environmental toxins endanger birds of prey?”

*The Bald Eagle *Haliaeetus leucocephalus* was removed from the federal government’s endangered species list in 2006, but a 2008 publication by Maine’s BioDiversity Research Institute reported concern about elevated accumulations of mercury in the blood and feathers of Bald Eagle young in the Delaware/Catskill region of New York State. Wind-borne mercury from coal-burning power plants in the Midwest falls into lakes and streams in the Catskill area and forms methylmercury, which is ingested by worms and other organisms that are then eaten by fish that are in turn consumed by eagles and fed to their nestlings.*

The Institute conducted a survey to identify biological mercury hotspots in the northeastern United States and southeastern Canada. A hotspot, compared to surrounding areas, has concentrations of mercury in fish, birds, and mammals that exceed human or wildlife health standards. The survey identified five biological mercury hotspots and nine areas of concern. In some areas, the mercury was due to emissions from local sources that became concentrated in animals. The research noted the need for a monitoring network and the development of mitigation strategies to rapidly improve conditions.

In a report published in 2007, the Institute also found that Maine’s Bald Eagle population was smaller. To study mercury concentrations in fish-eating Bald Eagle nestlings and adults in Maine, between 2001 and 2005, researchers collected and analyzed nestling blood, shed adult feathers, and abandoned eggs. The results varied among ten Maine watersheds, and sample sizes were relatively small, but the study did find that blood mercury levels in Maine eaglets and in shed adult feathers were at high levels similar to what is found in areas with pollution due to mining or dredging. Follow up studies found that eagles with higher blood mercury levels had fewer chicks that fledged. There were also fewer occupied nests in polluted areas, suggesting an impact on reproduction from the mercury exposure.”

ABOUT THE AUTHORS

Peter Capainolo is a Senior Scientific Assistant in the Department of Ornithology at the American Museum of Natural History in New York City and an adjunct faculty member in the Department of Biology, The City College of the City University of New York. He is also a Research Associate and member of the Board of Trustees of The Long Island Natural History Museum and has been appointed to serve on the New York State Falconry Advisory Board.

Carol A. Butler is the originator and co-author of the Rutgers University Press series of natural history question-and-answer books: *Do Butterflies Bite?* (2008); *Do Bats Drink Blood?* (2009); *Why Do Bees Buzz?* (2010); and *Do Hummingbirds Hum?* (2010). She is also the co-author of *Salt Marshes: Natural and Unnatural History* (2009), *The Divorce Mediation Answer Book* (1999) and several articles in print and online. She is a psychoanalyst and a mediator in private practice in New York City, an adjunct assistant professor at New York University in the Department of Applied Psychology, and a docent at the American Museum of Natural History.