4th UPDATE ~ May 26, 2021 SHENANDOAH VALLEY RAPTOR STUDY AREA

LANCE & JILL MORROW

Screeech



Thank you, Matthew Gingerich and your folks, for inviting us to come to band nestling screech owls. One female screech owl that Jill banded last year showed up in a nearby box on the same property this year. She produced 4 nestlings all got bands. We also banded another brood of owls in a nearby box in the front yard; photos of the red phase mother left, and her 4 young owlets, see below.





People enjoy holding and touching owls – until they get pooped on!



Contents of the screech owl box reveals what the nestlings are eating: lots of birds and a segment of crayfish appendage.



Ben Spory handling adult female Eastern Screech owl.

Publications

We are very excited that three papers we have authored/co-authored have been accepted for publication in peer-reviewed journals – all of which are due out "any day now".

Mark Causey has been a bird bander in Virginia since the late 1970's. He is a colleague of the late Roger Jones; both ran raptor banding stations and installed many dozens of Kestrel and Barn Owl boxes in northern and north central Virginia.



Mark taking a Coopers Hawk out of a mist net for banding at Cape Charles Virginia ~ September 1982.



The late Roger Jones holding a blurry merlin. He and Mark Causey are the giants upon whose shoulders we now stand.

We recently collaborated with Mark Causey to publish a portion of his extensive data on Barn Owls; a paper that has been accepted for publication in the Virginia Society of Ornithology journal *The Raven*. Below is the title and abstract:

Barn Owl Nest Box Productivity in Prince William and Fauquier Counties Virginia, 1986-2009 Mark Causey*, Damascus, MD 20872 Lance Morrow and Jill Morrow, Timberville VA 22853 *Corresponding author: mcausey53@gmail.com

In a study area in Northern Virginia nest boxes placed for Barn Owls (*Tyto alba*) in retired silos were monitored annually for occupancy and productivity from 1986-2009. The percentage of available boxes occupied by Barn Owls varied yearly, ranging from 23-85% with a mean occupancy rate of $56 \pm 0.13\%$. The success rate, defined as nests from which at least one Barn Owl fledged per occupied nest box, varied yearly from 57-95%, averaging $81 \pm 0.09\%$. During this study, a total of 1928 Barn Owls fledged from 571 occupied nest boxes; a mean of 3.3 ± 0.79 owls fledged per occupied box with a declining trend of 0.7% annually.

Next paper: we expect to appear online (any day now), and it will also be printed in the next issue of *The Raven*. This paper gives the exact locations of all known Barn Owl nest sites in the SVRSA with our specific recommendations for improving barn owl safety and reproduction, primarily through predator-proofing the bottoms of silos and opening sealed retired silos.

Registration and Management Recommendations for Barn Owl (*Tyto alba*) Roost and Nest Sites in Virginia's Northern Shenandoah Valley

Jill Morrow* Timberville, VA Lance Morrow Timberville VA

From 2009-2015 we located and monitored 25 Barn Owl (*Tyto alba*) roost sites and 34 Barn Owl nest sites in the Shenandoah Valley Raptor Study Area of Virginia. Of these sites, 53.5 were in farm silos, 3.5 were in barns, 1 in a bean hopper and 1 in a hay dryer. Barn Owls avoid silos occupied by breeding Domestic Cats (*Felis catus*) or Raccoons (*Procyon lotor*) but will roost and nest in silos containing a small number of Rock Pigeons (*Columba livia*). Registering exact locations of Barn Owl roost and nest sites is important for future monitoring of occupancy and habitat changes. We present a registry along with a management plan to protect Barn Owl sites from mammalian predators and to potentially increase Barn Owl productivity. Recommendations include: continue monitoring active Barn Owl sites, predator-proof 44 active silos, and open sealed retired silos located in suitable habitat.

Our third paper details 14 years of kestrel productivity our SVRSA boxes. It is "in press" at the journal *Maryland Birdlife* to be printed with several color photos! We will post the entire article on our Research Gate page once it comes out in print. Here is the title and abstract:

Reproductive Parameters of American Kestrels (*Falco sparverius*) using Nest Boxes in the Shenandoah Valley of Virginia 2008–2020 Jill Morrow1 and Lance Morrow Shenandoah Valley Raptor Study Area, Timberville, Virginia 22853 **Abstract:** Our research objective was to collect baseline reproductive data on American Kestrels (*Falco sparverius*) using nest boxes in the Shenandoah Valley Raptor Study Area (SVRSA) in Virginia. From 2008 through 2020, between 4 and 87 nest boxes were available each breeding season. During this 13-year period, 608 nest attempts were made, nest box occupancy by kestrels averaged 82%, and 75% of nest attempts were successful. Clutches were initiated from 7 March through 1 July, peaking around 6 April. Clutch size averaged 4.6 (n=608 nest attempts) and, of 2,791 eggs laid, 72% hatched with 94% of hatchlings surviving to banding age. A total of 1,900 kestrel nestlings were banded in SVRSA boxes, equaling 4.2 per successful box (alternately expressed as 3.1 per nest attempt). Reproductive parameters of kestrels in SVRSA are comparable with two other nest box programs in Virginia and 11 other programs in North America. We present evidence that kestrels in the study area are non-migratory and SVRSA nest boxes sustained high occupancy and success rates for over a decade.

Fortunately, we were able to use Mark Causey's and Roger Jones's data from kestrels nesting in their northern Virginia boxes to demonstrate that kestrel productivity in Virginia has not substantially changed since their data was collected in 1983. Everything circles back around when bird banders and observers share data!

Highland County Kestrels

Highland County Virginia is approximately 50 miles WSW of the SVRSA. For several years Patti Reum, Dr. John and Nancy Spahr, Dr. Charles "Zig" Ziegenfus, Alan Williams, and other visitor/volunteers have monitored 70-80 kestrel nest boxes. John Spahr, who recently became Jill's banding subpermittee, is now permitted to trap and band both wintering and nesting kestrels in Highland County! Concurrently, John is also monitoring/banding Screech Owls in his 50+ nest boxes that were installed strictly for Screech owl research.

Before John became a bander, banding Highland kestrels had been performed on an inconsistent basis by various banders who were only available for a day or two. With John banding all the breeding adult kestrels he can capture and all the nestlings in boxes, we will be able to learn more about this population of kestrels such as: whether they are migratory, their basic productivity in the more pristine environment of Highland County, and how much (if any) intermingling they have with other kestrel box programs (SVRSA, Page Valley, Clifton Institute in Warrenton, Zig's newly installed boxes in East Rockingham County, Hawk Mountain in Pennsylvania, and other states' programs). Time will tell.



John Spahr holding a male kestrel with Patti Reum looking on.

Currently in SVRSA

We have 73 of 80 available boxes occupied by kestrels at this time and expect a couple late occupancies so it is possible that we will have 75 occupancies this year (94% occupancy)! So far, we have banded 29 boxes containing 130 nestlings which works out to 4.5 nestlings per successful box. This is well above our long term average of 4.2 (SE 0.08) nestlings per

successful box (SE 0.08). However, later broods are typically not as large, so we expect this number to be about average by the end of this season.

Below is a figure with a large red arrow showing "YOU ARE HERE" in the scheme of kestrels laying clutches so you can get an idea of the glut of boxes with babies who are ready to band in the next month. The peak of clutch initiations from 608 kestrel nests in SVRSA is 6 April. From that date, it takes 9 days to complete a clutch of 5 eggs, 30 days of incubation and we try to band babies at 16 days of age. So, roughly 55 days from the day the 1st egg is laid to banding date. In other words, a peak of clutch initiations on 6 April translates into a peak of banding activity starting in mid-May and continues for about a month. After mid-June it quiets down quite a bit so we can relax, band a few stragglers, check to verify if early chicks fledged, and look for 2nd nest attempts.

The shaded blue box on the left side of the figure represents the proportion of young kestrels that we have banded to date. At this time, we have banded about 40% of the occupied boxes so we've got a bunch of work ahead of us coming up very soon.



In addition, we have captured 67 females and 11 males breeding in our boxes plus the paltry 12 kestrels we winter trapped.

Between our study area and the Highland County nest box program, we expect to band 500 nestling kestrels this year! Thus far, we have banded 130 in the SVRSA and John Spahr has banded 68 of the Highland County nestlings. Once again, we are about 40% of the way to our goal this year!

Failures

Last update we mentioned 2 of our aging kestrel boxes lost their lids in a windstorm. A few days ago, we found out that a 3rd lid came off a box with kestrel eggs. The parents likely abandoned the lidless box and eggs were eaten by a predator or removed by a starling. We reinstalled the lid and have recently observed kestrels hanging around so checked inside and found 2 kestrel eggs. So, this box has it's second occupancy in 2021.

Three other box failures this year were at the 3-egg stage. We capture breeding adults preferably well into the incubation stage, to avoid disturbing kestrels while in the egg-laying stage. However, 3 boxes each had 3 eggs abandoned in them and we had not been the cause of abandonment because we never caught an adult in them. Perhaps the kestrels found out they were in a Coopers Hawk territory after laying 3 eggs, so they just moved on rather than risk being fed to Cooper's nestlings. There could be a lot of other reasons kestrels abandon their eggs, like changes in prey levels, increased noise or competition for nest cavities, injury or death of one of the parents, etc.



This kestrel box appears to have been depredated, as there are 2 squashed eggs and one intact egg. However, in our experience, black rat snakes swallow the eggs whole, so we are a bit mystified by this scenario. Could it have been a squirrel? We removed the nest, added new bedding and returned after 20 days to find a new clutch of 5 kestrel eggs.

Nest failure is important to our research. Only a few boxes in the SVRSA have predator guards because we are attempting to understand the effects of predation on kestrel productivity.

To date, there have been 5 failures for 2021: 3 at the 3-egg stage, 1 box lost the lid, and other box with squashed eggs. Four of five of the failed boxes have been re-occupied by 23 May. This is really interesting stuff! The normal long-term failure rate in the SVRSA is about 25% of occupied boxes fail to have 1 chick survive to banding age. So, 2021 is a very successful year (so far and subject to change with one wild thunderstorm). Don't count your chicks before you band them!

Packed in

Several years ago, we began to have squirrels nesting in our kestrel boxes. At first, we thought it was a problem for kestrels having their boxes taken over by these "tree rats" so we installed another kestrel box near any squirrel occupied box. One such location is box # 122 which was installed in 2016 and occupied the first year by kestrels. The kestrels abandoned those eggs and we attributed it to the renovation of the nearby home with lots of noise and vehicles coming and going. The next year we found a dead male kestrel inside the box under a squirrel nest with a couple cute squirrels, so we installed a paired kestrel box 386 yards away which kestrels immediately moved into and raised 5 nestlings. Over the last 6 years (11 nest box years) this pair of kestrel boxes has produced 18 kestrels in the original box # 122 plus at least 7 in paired box # 446 (may be 12 in # 446 but we don't know because they are still too young to band this year). Again, this year a squirrel occupied the original box # 122 but they left after 7 weeks and a kestrel moved in and produced 3 nestlings. At this same time, the paired box was occupied by kestrels and the next nearest kestrel box 838 yards away was occupied by kestrels and the nearest barn owl silo (230 yards away) has an active nest too! So, within a ³/₄ mile area there are 3 active kestrel nests, 1 fox squirrel nest, and 1 active barn owl silo this year. Mice and voles must be getting pretty hammered... And that does not consider those eaten by redtail hawks, great horned owls, foxes and black rat snakes!



Headless vole found inside a kestrel box.

Blights

The SVRSA seems to be slowly dying. First is from "house blight". This is where people buy up a field used by kestrels, build a giant house and plant a mowed lawn instead of having a hayfield or pasture. (We cannot complain, as we've lost our right to do so after chopping down mature trees to build our house on a beautiful, wooded ridge.) Basically, we are seeing large new houses going up everywhere throughout the study area on large plots of land. Wealthy people generally don't want to see old locust snags so those are removed as well, along with all the wildlife that uses old snag trees.



This new house is being built on one of our formerly best kestrel box sites. The box used to be on the pole directly behind the PortaPotty. The box was used by kestrels for 6 of 8 years and producing 29 fledglings over its lifespan. Our protocol is that to be considered survivors, we set a high bar for fledglings, who must be recaptured after surviving at least 6 months post-fledging. Three of the 29 fledglings from this box have been recaptured, making it one the most successful boxes SVRSA has ever had in terms of producing survivors. This large house will likely be surrounded by 6 acres of manicured lawn which holds little prey for kestrels.

The other type of kestrel blight is agriculture, growing vast monocrops of corn and soy. The year we installed the box, pictured below, it was surrounded by abandoned fields abundant with grasses and wildlife. Every year since, they have sprayed it with herbicides and planted GMO crops (devoid of wildlife). In this recent photo, these fields have been recently killed and the GMO corn is starting to sprout.

Kestrels are a resilient little falcon. No matter how much this area is altered by agriculture, the box still produces young kestrels every year. Since 2015, this box has been occupied 7 times (every single year), been successful 6 times, and produced 23 baby kestrels. This works out to 3.8 per successful nest, slightly below the average for the study area. Under closer scrutiny, we have found none of the 23 kestrels fledged from this box has ever been recaptured. It has taken 7 years of high productivity in this box to realize it might just be a "sink". A biological sink (AKA ecological trap) draws in breeding birds who waste their time producing young who don't survive long enough to reach breeding age, hence do not increase (or even maintain) the population.



It has taken us over a decade to collect enough data to make these hypotheses. Good thing we enjoy it!

Recognition of our Research

Due to our advancing age, organizations have recently been recognizing our work with raptors. In the 2020 Center for Conservation Biology's Annual Report, we were dubbed "Conservation Champions" by the Director, Bryan Watts. Below are the 2 pages explaining our research.



LANCE WILLIAM MORROW JILL MORROW

Lance Morrow was born in the Washington, D.C. area and graduated from the University of Texas with a degree in biology and sociobiology. Jill Morrow was born near Denver, Colorado and graduated from Colorado State University with a focus in microbiology and medical technology, University of Colorado at Denver with a doctorate in biochemistry and conducted post doctoral work with tuberculosis. She later worked for the Red Cross and a company developing vaccines. Lance and Jill later worked as consultants evaluating construction plans and cost estimates for major companies.

CONSERVATION WORK

CONSERVATION CHAMPIONS

Lance developed a passion for raptors by the age of six and Jill enjoyed wildlife in her rural upbringing and began banding raptors around Denver. Both have worked on a wide range of bird research and conservation projects across North America over decades. These projects include banding thousands of gray-crowned rosy-finches and recapturing individuals across years, establishing a successful mountain bluebird box program and working with loggerhead shrikes. Over the past thirteen years they have worked intensively to develop a grassland raptor project focused on American kestrels and barn owls within the Shenandoah Valley. They manage pairs in 100- nest boxes and monitor reproductive rates and survival by trapping birds during both breeding and winter seasons. Beyond the fieldwork, Lance and Jill have worked to educate the farming community about grassland raptors.

ONGOING CCB WORK

CCB biologists have worked with grassland birds for decades, focusing on their ecology and management. Much of the current effort to manage grassland raptors is being mounted by champions like Lance and Jill. We admire and applaud these efforts.

A nestling barn owi just after banding. This species has declined dramatically throughout their eastern range. CCB biologists continue to be concerned about the decline of grassland birds and have worked for decades to better understand management options and to promote efforts by champions like Lance and Jill that appear to be working. *Photo by Bryan Watts*

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Sappy but true. We genuinely appreciate the recognition. Thanks Bryan.

Recognition of others Research



Zig in the photo above is holding a freshly trapped adult Red-shoulder Hawk.

Recently Zig was named a "Valley Treasure" by the Alliance for the Shenandoah Valley – congratulations. Here is an excerpt from the awarding website:

"In addition to his professional work teaching field ornithology at JMU, Dr. Charles Ziegenfus (Professor Zig) has spent decades researching, banding and tracking migrations and populations of dark-eyed juncos, bluebirds and white-crowned sparrows to name a few. In partnership with Clair Mellinger from EMU at Highland Retreat, he has monitored the migration of the Northern Saw-whet owl with for twenty years. Recently Professor Zig has setup several boxes for American kestrels in eastern Rockingham County and has engaged landowners up and down the Valley to host bird boxes and help with monitoring on their property." SOURCE: <u>Announcing our 2021 Valley Treasure - Dr. Charles Ziegenfus | Alliance for the Shenandoah Valley (shenandoahalliance.org)</u>

Oddball Prey Items

Over the years we have seen some interesting items inside kestrel boxes. We assume they were all captured by kestrels and brought in to feed the nestlings.



Young kestrels with 5-lined skink in nest box

Shenandoah Valley Raptor Study Area

Lance and Jill Morrow



Skink found in nest box

Shenandoah Valley Raptor Study Area

Lance and Jill Morrow



Two fence swifts found in kestrel nest box

Lance and Jill Morrow

Frog found in kestrel nest box

Shenandoah Valley Raptor Study Area

Lance and Jill Morrow

Hatchling Common Snapping Turtle found in kestrel nest box 3

Shenandoah Valley Raptor Study Area

Lance and Jill Morrow





Bat found in kestrel nest box 45 Shenandoah Valley Raptor Study Area

Lance and Jill Morrow

Garter snake found in kestrel nest box 92

Shenandoah Valley Raptor Study Area

Lance and Jill Morrow





Crayfish claw recently found in active kestrel box near a stream running down through a pasture.

Insects collected in the Shenandoah Valley Summer 2005

Lance and Jill Morrow



Mostly, we find bits of the "standard" menu items in kestrel boxes: voles, shrews and mice, grasshopper legs and wings, beetle wings and lots of unidentifiable (at least for us non-birders) small bird feathers. Since 2005 we have been collecting insects and noticed a dramatic decline in both insect numbers and diversity. Raising this young "chocolate" kestrel here at home, affords a wonderful opportunity to observe development of kestrel hunting skills. At 6 weeks of age, she presumably would have fledged out of her box about 2 weeks ago. In the wild she would be trying to feed herself while her parents supplement her diet. At this age Clover is still unable (or unwilling) to catch and kill a small mouse or nestling by herself. She is drawn to insects instead. With this global decline in insects, we find it amazing that young falcons (and other wild animals dependent on insects) are able to survive long enough to develop hunting skills that enable them to switch over to more abundant but more difficult prey like rodents and birds. Probably explains why most fledgling kestrels don't survive their first 2 weeks after fledging. Maybe the cicada hatch will enable more young kestrels to survive this year...

Thanks people!

Several people make our lives easier by mowing beneath the kestrel boxes and we really appreciate it! Grass that is four feet tall is difficult to walk through carrying a ladder. Wah – wah! But the benefit we most appreciate is that we can see and avoid stepping in groundhog holes!



The dirt in lower left corner is where the groundhog hole is located! Tough to see when covered by tall grasses... mowing saved our ankles here!

Feel free to share or have anyone who wants to be added to the list send us an email: <u>saltlick2003@gmail.com</u>

Lance & Jill Morrow

P.S. – Ben, we'll feature you banding barn owls in the next update... you are not being ignored.