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A STUDY OF AVIAN NEST PREDATION AT AUDUBON ACRES IN CHATTANOOGA, TENNESSEE

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ABSTRACT

Predation is believed to be the primary cause of nesting mortality among North American migratory land birds. High rates of nest predation can jeopardize avian reproductive biology by affecting life histories and habitat selection. Artificial nests are commonly used to study nest predation because they allow the researcher to investigate comparative treatments and their impact on predation. Relative nest predation was studied at Audubon Acres in Chattanooga, TN using artificial nests. The study investigated differences in habitat type, nest height, egg type, and predator type. Results of this study showed very high levels of nest predation across each of the study variables; urbanization and forest fragmentation were believed to be the most likely contributors to nest predation.

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INTRODUCTION

Predation is widely believed to be the primary cause of nesting mortality among many open-cup nesting birds (Martin and Li 1992). It is believed that some aspects of the breeding biology of migratory land birds can make them more susceptible to nest loss (Robbins 1980). Specifically, open-cup nests are more vulnerable to predators than other nest types, such as cavity nests (Wilcove 1985). Gates and Gysel (1978) and Hoover and Brittingham (1998) found that 50-98% of nest losses on open-cup nesting passerines in eastern North America were due to nest predation.

High rates of nest predation can jeopardize avian reproductive biology by directly affecting life histories, community structure, and habitat selection. For example, Martin (1995) found that greater than 50-60% of the variation in clutch size and annual fecundity was a direct result of nest predation and nest site selection. Habitat selection can also be affected by high rates of nest predation because nesting behaviors evolve to reduce predation risk. A study conducted by Weatherhead and Blouin-Demers (2004) showed how birds choose nesting locations that are both inaccessible due to cover and thermally inhospitable to snakes to avoid predation. Due to the importance of nest predation on avian conservation, studies that investigate factors contributing to nest predation can provide baseline data for future studies.

The appearance and mode of disturbance of the eggs can lend valuable information when trying to identify various types of predators. Avian predators can be inferred when the nest is found intact and any eggs have peck holes and no evidence of teeth marks (Yahner and Piergallini 1998; Yahner and Mahan 1999). Predation can be attributed to mammals if the nest is damaged and/or the egg has been crushed, broken into several pieces, or chewed, often leaving teeth marks as evidence (Jobin and Picman 1997; Yahner and Mahan 1999). Often when predation is attributed to snakes, eggs are missing entirely (Weatherhead and Blouin-Demers 2004).

Artificial nests are commonly used to investigate factors influencing avian reproductive success and nest predation. The validity of scientific studies using artificial nests can be justified not as an authentic simulation of natural nests, but rather as a tool for investigating comparative treatments and their effect on the intensity of predation (Zanette 2002). Artificial nests are useful for determining relative rates of predation among habitats to better understand the effects of fragmented landscapes, tract size, and edge effects (Wilcove 1985).

There are a number of differences between artificial and natural nests, including type of nest, predator preference for nest type, nest placement, egg characteristics such as size, color, and smell, and spatial and temporal distribution of nests (Wilson et al. 1998; Buler and Hamilton 2000). Bayne and Hobson (1997) suggest that the aforementioned differences may bias predator behavior. Human visitation and any olfactory cues left by the investigator may also have an affect on relative rates of predation (Wilson et al. 1998; Buler and Hamilton 2000).

Most studies that use artificial nests to determine rates of predation often do not include comparative data on predation of natural nests (Major and Kendal 1996). A number of studies have shown predation to be more intense at artificial nests (Yahner and Voytko

1989; Reitsma 1992). However, studies conducted by Storaas (1988) and Willebrand and Marcstrom (1998) have shown predation rates to be lower for artificial nests compared to natural nests. In some cases, it has been found that predation rates do not differ for either nest type (Gottfried and Thompson 1978; Andren et al. 1985). Predation rates can also vary among nest type due to predator preference. Some studies have shown artificial nests to be more susceptible to predation by avian predators, where the use of visual cues is more prominent (Angelstam 1986; MacIvor et al. 1990). The added visibility of artificial nests may in part be due to the lack of camouflage by an attending adult and/or feathers (Butler and Rotella 1998). Mammalian predators, however, rely primarily on olfactory cues to discover bird nests (Storaas 1988; Willebrand and Marcstrom 1998). They may fail to detect artificial nests due to the lack of avian scent, and/or they may avoid artificial nests altogether due to the presence of human scent (Storaas 1988). A study conducted by Part and Wretenberg (2002) suggests that predation rates may be unreliable when using artificial nests and eggs because different predators will be attracted to the nest.

Nest placement is another important variable affecting nest predation, and it is also easy for the researcher to control. Transects have been used for years in a variety of scientific field studies. However, with studies measuring nest predation, transects may be more of a hinderance than a help. The use of transects should be avoided due to the possibility of a "trap-line" effect which occurs when a single predator sequentially consumes many nests on a transect (Reitsma et al. 1990; Lewis and Montevecchi 1999). Moreover, transects are atypical of natural patterns and when used in artificial nest studies can create an unnatural nesting density in a given area (Ortega et al. 1998). Yahner and Mahan (1999) recommend that artificial nests be carefully placed at random locations to mitigate easy detection of nests by predators.

The effect of nest height on predation has been studied in great detail, with varied outcomes. Ortega et al. (1998) and Brand and George (2000) found that arboreal nests had a higher rate of predation than ground nests, perhaps due to ease of detection and access. In contrast, studies conducted by Best and Stauffer (1980) and Wilcove (1985) showed predation rates to be higher for ground nests rather than arboreal nests. In a study conducted by Vander Haegen and DeGraaf (1996), rates of predation were similar for both ground and arboreal nests. Because nest height has yielded varied rates of predation in past studies, this variable will be investigated at Audubon Acres to determine its impact, if any, on avian nest predation.

The size, shape, and color of eggs can affect artificial nesting studies, primarily due to predator biases. Researchers caution against the use of artificial nests baited with eggs that are different in size from the eggs found in natural nests (Wilson et al. 1998). Studies using artificial nests to simulate predation on passerine nests most often use quail eggs, *Coturnix sp.* (Bayne and Hobson 1999). Recent studies have found that the use of quail eggs can possibly exclude smaller predators because of their potential inability to penetrate the hard shell of quail eggs (Haskell 1995). Quail eggs have much thicker shells and are 30-100% wider than most passerine eggs (Bayne and Hobson 1999; DeGraaf and Maier 1996). To avoid potential bias associated with large quail eggs, many studies often incorporate eggs made out of modeling clay (Moller 1989; Bayne et al. 1997). Clay

eggs are small and soft enough to be easily marked by smaller predators, allowing for a more accurate assessment of predation risk from a variety of predators (Moller 1989). In a study conducted by Major et al. (1994) predation on clay eggs was almost identical to rates of predation on real nests. The best way to avoid potential bias around egg type is to incorporate both quail and clay eggs in the same nest (Bayne et al. 1997).

There are instances where human activity and scent have caused increases in predation levels, but at other times have not. Major (1990), among others, found that human scent increased predation rates on artificial nests by influencing the probability of nests being discovered by predators (Martin and Geupel 1993; Whelan et al. 1994). Loiselle and Hoppes (1983) suggest that the handling of nests and eggs may leave persistent odors that can attract nest predators. Studies conducted by Nol and Brooks (1982) and Small and Hunter (1989) recommend that precautions are taken to avoid leaving human scent at artificial nest sites by wearing rubber boots and gloves when handling and observing the nests, although there was no mention of any potential impact on predation due to the smell of the rubber. In some cases, however, contradicting data has been found that suggests little to no affect of human activity on predation rates (Gottfried and Thompson 1978; Hoi and Winkler 1994).

Even though the impact of human activity and scent on nest predation is somewhat unclear, it is still important to disturb as little as possible when conducting these studies. As long as the same methods are used throughout the entire study, any differences in predation should be equivalent (Moller 1987; Picman and Schriml 1994). Also if artificial nest studies take place in public parks, arboreta, and other similar places, human scent may already be associated with the property and thus have less of an effect on overall rates of predation (Schmidt and Whelan 1999).

The seasonal variation and timing of artificial nest studies can certainly have an affect on nest predation. High predation rate is more evident from May to early June, with less predation from late June to August (Gottfried and Thompson 1978; Filliater et al. 1994; Hoi and Winkler 1994). The time of day and length of exposure may also affect predation. Picman and Schriml (1994) and Weatherhead and Blouin-Demers (2004) suggest that avian predators are most active during the day, whereas mammalian and reptilian predators exhibit the highest level of activity during the evening and night. Artificial nests and eggs are typically exposed to predation for a time similar to the common incubation period of local passerine species, around 14 days (Ehrlich et al. 1988).

Habitat selection can also play a key role in the interactions between predators and prey. Therefore, habitat characteristics such as size, edge proximity, and type can have a tremendous affect on studies which focus on predation risk. Wilcove (1985) and Small and Hunter (1988) found that predation rates were higher in small woodlots compared to larger, contiguous forested tracts. Forest fragmentation can cause an increase in predation risk due to greater edge and the preference of predators to select edges for foraging (Noss 1983; Gates and Gysel 1978).

The overall difference in type of habitat may also affect predation rates on artificial nests. Studies conducted by Bowman and Harris (1980) and Yahner and Mahan (1996) found

that clear-cut plots suffered less predation than uncut plots for two reasons. First, in clear-cut plots, there is more brushy vegetation near ground level that can better conceal nests (Bowman and Harris 1980; Yahner and Mahan 1996). Second, uncut plots contain over story trees that can serve as perch sites for avian predators (Bowman and Harris 1980; Yahner and Mahan 1996). Lower rates of predation have also been observed for forest tracts near bodies of water as opposed to more inland habitats (Small and Hunter 1988); however, data provided by Vander Haegen and DeGraaf (1996) are contradicting because they found that proximity to water had no affect on predation rate. In studies investigating nest predation, multiple habitat types should be incorporated to determine their effect on nest predation.

To try to resolve some of the variability and contradicting data throughout the literature, we used artificial nests to examine the effects of four habitat types, two nest heights, and two egg types on predation rates at Audubon Acres, a wildlife sanctuary in Chattanooga, TN.

METHODS

STUDY SITE

This study took place at the Elise Chapin Wildlife Sanctuary, also known as Audubon Acres, in Chattanooga, TN (35.04° N, -085.20° W; Fig. 1). The property is approximately 53 ha in size, which we divided into four primary habitat types: mixed hardwood forests, forested riparian areas, managed open areas, and a loblolly pine (*Pinus taeda*) clear-cut area. The hardwood habitat consists primarily of American Beech (*Fagus grandifolia*), maple (*Acer spp.*), and oak (*Quercus spp.*) trees. For the riparian habitat along South Chickamauga Creek, the habitat is dominated by river birch (*Betula nigra*), oak, and sweetgum (*Liquidambar styraciflua*) trees, in addition to mountain laurel (*Kalmia latifolia*)

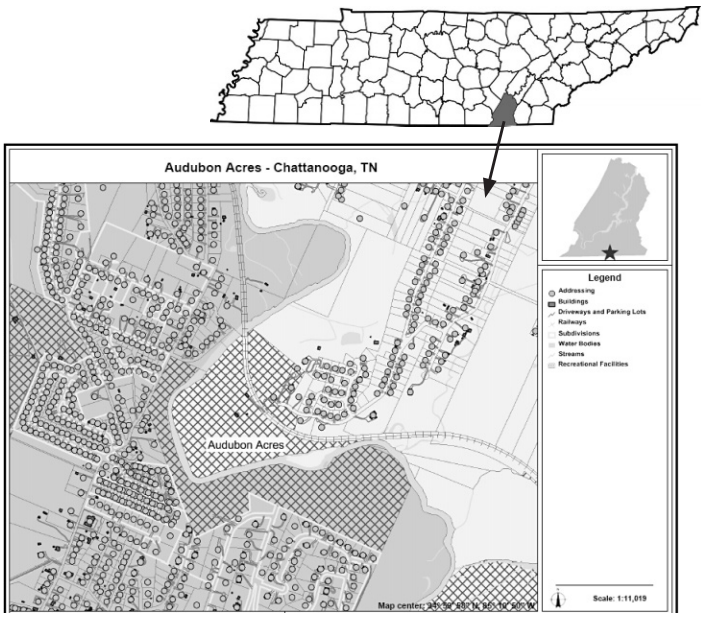

Figure 1. Location of Audubon Acres Sanctuary, Hamilton County, TN.

and river cane (*Arundinaria gigantean*). Open areas at Audubon Acres are managed lawns with pines, redbud (*Cercis canadensis*), and oak trees dominating the periphery. A southern pine beetle (*Dendroctonus frontalis*) infestation in 1999 resulted in approximately 4 ha of loblolly pine (*Pinus taeda*) being clear-cut. The area is currently experiencing secondary succession with primarily small pines and Chinese privet (*Ligustrum sinense*).

ARTIFICIAL NESTS

Nest predation was examined during a three week period in May and June, 2006 and 2007. Artificial nests, similar to those used by Wilcove (1985), were used to study nest predation. The artificial nests resembled small wicker baskets and were purchased commercially from Factory Direct Craft Supply (Franklin, OH). They were 10.16 cm in diameter and were used to simulate the nests of local open-cup songbird species. Filler material was added to each nest consisting of grasses, pine needles, leaves, and/or small twigs collected at the nest site. Two eggs were placed in each nest; one quail egg (*Coturnix sp.*) that was purchased commercially from B&D Game Farm (Harrah, OK), and one hand molded clay egg made of Crayola Model Magic® (Fig. 2). The average size of the quail egg was 24 mm X 31 mm, whereas the average size of the clay egg was 18 mm X 24 mm. Both egg types were used to avoid any potential bias in relation to egg size, and tooth/beak impressions left on the clay egg helped us determine predator type. The quail eggs were refrigerated until time for use to prevent fouling of the eggs. The artificial nests and clay eggs sat outside for a minimum of seven days prior to their field set up, as a means to reduce human scent.

Within each of the four primary habitat types ten locations were randomly chosen for nest placement. At each nest location two nests were placed; one at ground level and one on a tree branch, for a total of 80 nests used per season. Ground nests were placed next to a stump, fallen tree, or at the base of a tree. Arboreal nests were placed on a branch or in the fork of tree limbs 1 to 2 m above the ground (Fig. 3). Nests were placed a minimum of 50 m apart.

Figure 2. Artificial nest baited with one quail (l) and one clay egg (r).

Figure 3. Nest placement in a tree

Figure 4. Predated nest.

Nests were checked weekly and the number of predation events was tallied. A nest was considered predated if eggs were missing, broken or cracked (Fig. 4); or if imprints and/or other markings were found on the clay eggs; or if the nest was found knocked down, moved, or destroyed (Yahner and Piergallini 1998; Bayne and Hobson 1999).

STATISTICAL ANALYSIS

The intensity of predation was measured over three weeks during two seasons, habitat type (open, hardwood, clear-cut, riparian), nest height (ground vs. arboreal), and egg type (quail vs. clay). Predator type was also described for select predated nests impressions in the clay eggs, or the general condition of the nest and quail egg (e.g. nest relatively undisturbed and egg gone suggests a snake or avian predator; nest knocked down and egg shells on ground suggests mammalian predator, etc.). A chi-square goodness-of-fit test was used to test for differences between years, week, habitat type, nest height, and egg type (Howell 1995).

RESULTS

EFFECT OF SEASON

Our 2006 season ran from May 22nd – June 14th, and May 23rd – June 12th for 2007. Nest predation was high (>90%) during both seasons and only differed slightly (X^2 = 0.25, p = 0.999). Because of this, the data for both seasons were pooled for the remaining analyses. The summarized data for seasons across the study variables are listed in Table 1.

EFFECT OF WEEK

Throughout the study period, there were 320 possible predation events that could have occurred (40 nests per habitat x 4 habitats x 2 years). During week one, 272 (85%) of nests had been predated. By week two, 292 (91%) nests suffered predation. Finally, after three weeks, the rate of predation on avian nests had grown to 95% (306/320). No statistical difference was observed for nest predation among the three weeks (X^2 = 1.113, p = 0.573).

EFFECT OF HABITAT TYPE

Avian nest predation was high at Audubon Acres for each of the four habitat types studied. Overall, predation was highest in the open and hardwood habitats and lowest in the clear-cut and riparian habitats. Predation in the open habitat reached 100% by the end of the study period, with all 80 nests experiencing predation. The hardwood habitat experienced 78 predation events out of a possible 80 (98%). Finally, the clear-cut and riparian habitats had equal predation, with 93% of nests being predated. No statistical difference was observed among the different habitats (X^2 = 0.95, p = 0.981).

EFFECT OF NEST HEIGHT

There was no difference in predation between ground nests and arboreal nests (X^2 = 0.925, p = 0.742). Ground nests suffered 99% predation, whereas 93% of arboreal nests were predated.

EFFECT OF EGG TYPE

There was no difference in nest predation for quail eggs versus clay eggs throughout the study ($X^2 = 0.625$, $p = 0.999$). Quail eggs were predated 152 times out of a possible 160 (95%), whereas clay eggs were predated 154 times out of a possible 160 (96%).

PREDATOR IDENTIFICATION

Of the 44 predated clay eggs recovered throughout the study at nesting locations, 15 eggs showed evidence of avian predation, 25 eggs appeared to have been predated by mammals, and the predator type could not be determined for the remaining four eggs. For avian-predated eggs, 73% were from ground nests, with only 27% from arboreal nests. Predation attributed to mammalian predators was more evenly distributed; 44% of nest predation was observed at ground nests, while 56% was observed at arboreal nests. These data suggest that avian predators prefer ground nests, while mammalian predators show a slight preference for arboreal nests.

Table 1. Frequency of nest predation at Audubon Acres Sanctuary, TN 2006-2007. Each value is derived from a possible of 20 total predation events.

	Ground Nest Quail Egg	Ground Nest Clay Egg	Arboreal Nest Quail Egg	Arboreal Nest Clay Egg
Week One				
Open Habitat	19	19	18	19
Hardwood Habitat	20	19	17	16
Clear-Cut Habitat	18	17	13	13
Riparian Habitat	17	18	13	16
Week Two				
Open Habitat	20	20	20	20
Hardwood Habitat	20	19	17	18
Clear-Cut Habitat	19	20	13	18
Riparian Habitat	18	18	15	17
Week Three				
Open Habitat	20	20	20	20
Hardwood Habitat	20	20	19	19
Clear-Cut Habitat	20	20	16	18
Riparian Habitat	20	18	17	19

DISCUSSION

Because nest predation is believed to be the primary cause of declining populations of North American migratory land birds (Wilcove 1985), it is important to understand the contributing factors to avian nest predation. Studies investigating nest predation can lend valuable information towards better understanding avian reproductive success and conservation biology.

In studying the effect of habitat type on nest predation at Audubon Acres there was no significant impact, although subtle differences in predation for habitat were observed. Predation rates were high across each of the four habitat types studied. The degree to which nest predation relates to habitat and predator types can provide information useful in determining management plans that will impact breeding success of local migratory and resident birds.

Highest rates of predation were observed for both the open and hardwood habitats at Audubon Acres; this may be due in part to nest concealment. The open areas at Audubon Acres consist of sparsely located trees and managed lawn areas. Even though efforts were made to conceal nests, the habitat itself does not provide much camouflage for either ground or arboreal nests. The hardwood habitat did provide more camouflage; however, it consisted mostly of over story trees which can serve as perch sites for avian predators (Bowman and Harris 1980; Yahner and Mahan 1996). As a generalization, nest locations that have greater cover suffer lower rates of predation and vice versa (Huhta 1995). The lowest rates of predation were observed in the clear-cut and riparian habitats. In regards to predation in the clear-cut habitat, this finding is consistent with studies conducted by Bowman and Harris (1980) and Yahner and Mahan (1996); they found that clear-cut plots experienced less predation than un-cut plots due to the increase of low, successional vegetation and its part in nest concealment. In past studies, lower rates of predation have been observed for forest tracts near bodies of water as opposed to more inland habitats (Small and Hunter 1988; Saracco and Collazo 1999).

Because avian nest predation was high at Audubon Acres across all four habitat types, urbanization and forest fragmentation may be likely contributors to predation due to the land use at Audubon Acres. The property is located in subdivisions in a populated area. Wilcove (1985) found that predation rates were higher in suburban areas, compared with rural areas, due to greater densities of nest predators in suburban environments. Audubon Acres acts as a wildlife sanctuary, but it is used a great deal by the public. Numerous hiking trails are cut through the property, along with South Chickamauga Creek and a railroad track, resulting in a non-contiguous forest. Therefore, it is reasonable for predation to be high at Audubon Acres because the property is made up of edge habitats and predators tend to prefer forest edges, especially for foraging (Noss 1983; Gates and Gysel 1978). Thorington and Bowman (2003), on the other hand, suggest that predation rates are not impacted by edge proximity, but rather by housing density in suburban environments. Urbanization can lead to fragmentation of natural habitats (Thorington and Bowman 2003); therefore, when the two act together, avian nest predation can be a direct result (Thompson et al. 2002; Thorington and Bowman 2003).

The intensity of nest predation can also vary depending on nest height and predator preference for ground versus arboreal nests. A study conducted by Loiselle and Hoppes (1983) showed that the vertical layer of forest where nests are located can impact rates of predation. This study, however, showed no difference in predation between ground and arboreal nests; predation was high for both nest heights, suggesting no predator preference for height.

Artificial nest studies often use both quail and clay eggs to avoid potential bias around egg type (Bayne et al. 1997); the same approach was taken in this study, where nest predation was measured for both quail and clay eggs. The data for quail and clay egg predation were high and very similar throughout the study, showing no significant difference between egg types; there was no preference for egg type by local predators.

The findings of this study do not present a positive outlook for birds breeding in urban parks. High levels of nest predation showed no discrimination across the study area. Avian reproductive success can directly be impacted by high predation rates. Parental investment decreases in areas where there is high predation (Martin 1995); less time and effort are spent on reproduction. In areas where predation risk is high, parents should risk as few eggs and young as possible. Therefore, with decreased parental investment and subsequent smaller clutches and broods, avian reproductive success can decline in areas where there is high risk of predation, such as Audubon Acres.

The high nest predation at Audubon Acres, across each of the study variables, can provide insight into the design of nest predation studies. In accordance with the data presented in this study, predation can occur anywhere, across multiple habitat types and nest heights, as well as on various egg types; at Audubon Acres predation will occur no matter the study methodology. However, a number of recommendations can be made on ways to improve the study design for future nest predation studies.

In nest predation studies multiple field trials should be conducted per breeding season to account for multiple broods and varied reproductive success throughout the entire breeding season. Gottfried and Thompson (1978) found nesting success to be lower from May - early June, rather than from late June - August; this finding is interesting considering the high rates of predation observed at Audubon Acres from May - June in 2006 and 2007. As implemented in this study, the length of nest exposure should simulate incubation periods of local open-cup nesting birds; however, nests sites should be checked daily for evidence of predation. Daily nest checks would provide a more thorough estimate of when nest predation occurs. If nest predation occurs quickly, within one to two days after eggs are laid, or in this case placed in the artificial nest, local birds will have to adjust by better camouflaging and protecting their nest and/or having multiple broods per season to ensure reproductive success. The study design investigating the effect of ground and arboreal nests on avian nest predation should remain the same because it is important to account for both ground and tree nesting birds in nest predation studies. However, additional arboreal nests could be added to examine a greater range of nest heights and/or placements (e.g. close to the trunk vs. at the end of a branch). Finally, a better effort should be made to accurately identify predator species, rather than just classify predator type. Because nest predation was so high at Audubon Acres, additional studies may be warranted to determine migratory and resident bird density and diversity, as well as the overall environmental health of the wildlife sanctuary.

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LITERATURE CITED

Andren, H., P. Angelstam, E. Lindstrom, and P. Widen. 1985. Differences in predation pressure in relation to habitat fragmentation: An experiment. Oikos 45:273-277.

Angelstam, P. 1986. Predation on ground nesting birds' nests in relation to predator densities and habitat edge. Oikos 47:365-373.

Bayne, E. M. and K. A. Hobson. 1997. Temporal patterns of predation on artificial nests in the southern boreal forest. Journal of Wildlife Management 61:1227-1234.

Bayne, E. M. and K. A. Hobson. 1999. Do clay eggs attract predators to artificial nests? Journal of Field Ornithology 70:1-17.

Bayne, E. M., K. A. Hobson, and P. Fargey. 1997. Predation on artificial nests in relation to forest type: contrasting the use of clay and quail eggs. Ecography 20:233-239.

Best, L. B. and D. F. Stauffer. 1980. Factors affecting nesting success in riparian bird communities. Condor 82:149-158.

Bowman, G .B. and L. D. Harris. 1980. Effect of spatial heterogeneity by ground-nest depredation. Journal of Wildlife Management 44:806-813.

Brand, L. A. and T. L. George. 2000. Predation risks for nesting birds in fragmented coast redwood forest. Journal of Wildlife Management 64:42-51.

Buler, J. J. and R. B. Hamilton. 2000. Predation of natural and artificial nests in a southern pine forest. Auk 117:739-747.

Butler, M. A. and J. J. Rotella. 1998. Validity of using artificial nests to assess duck nest success. Journal of Wildlife Management 62:163-171.

DeGraaf, R. M. and T. J. Maier. 1996. Effect of egg size on predation by white-footed mice. Wilson Bulletin 108:535-539.

Erlich, R. R., D. S. Dobkin, and D. Wheye. 1988. The Birder's Handbook: A Field Guide to the Natural History of North American Birds. Simon and Schuster: Fireside, NY.

Fenske-Crawford, T. J. and G. J. Niemi. 1997. Predation of artificial ground nests at two types of edges in a forest-dominated landscape. Condor 99:14-24.

Filliater, T. S., R. Breitwisch, and P.M. Nealen. 1994. Predation on northern cardinal nests: does choice of nest site matter? Condor 96:761-768.

Gates, J. E. and L. W. Gysel. 1978. Avian nest dispersion and fledging success in field-forest ecotones. Ecology 59:871-883.

Gottfried, B. M. and C. F. Thompson. 1978. Experimental analysis of nest predation in an old-field habitat. Auk 95:304-312.

Haskell, D. G. 1995. Forest fragmentation and nest predation: are experiments with Japanese quail eggs misleading? Auk 112:767-769.

Hoi, H. and H. Winkler. 1994. Predation on nests: a case of apparent competition. Oecologia 98:436-440.

Hoover, J. and M. Brittingham. 1998. Nest-site selection and nesting success of Wood Thrushes. Wilson Bulletin 110: 375-383.

Howell, D. C. 1995. Fundamental Statistics for the Behavioral Sciences. 3rd edition. Wadsworth Publishing Company: Belmont, CA.

Huhta, E. 1995. Effects of spatial scale and vegetation cover on predation of artificial ground nests. Wildlife Biology. 1:73-80.

Jobin, B. and J. Picman. 1997. Factors affecting predation on artificial nests in marshes. Journal of Wildlife Management 61:792-800.

Lewis, K .P. and W. A Montevecchi. 1999. Predation on different sized quail eggs in an artificial nest study in western Newfoundland. Canadian Journal of Zoology 77:1170-1173.

Loiselle, B .A. and W. G. Hoppes. 1983. Nest predation in insular and mainland lowland rainforest in Panama. Condor 85:93-95.

MacIvor, L. H., S. M. Melvin, and C. R. Griffin. 1990. Effects of research activity on Piping Plover nest predation. Journal of Wildlife Management 54:443-447.

Major, R. E. 1990. The effect of human observers on the intensity of nest predation. Ibis 132:608-612.

Major, R. E. and C. E. Kendal. 1996. The contribution of artificial nest experiments to understanding avian reproductive success: a review of methods and conclusions. Ibis 138:298-307.

Major, R. E., G. H. Pyke, G. Christy, G. Gowing, and R.S. Hill. 1994. Can nest predation explain the timing of the breeding season and the pattern of nest dispersion of New Holland honeyeaters? Oikos 69:364-372.

Martin T. E. 1995. Avian life history evolution in relation to nest sites, nest predation, and food. Ecological Monographs 65:101-127.

Martin, T. E. and G. R. Geupel. 1993. Nest-monitoring plots: methods for locating nests and monitoring success. Journal of Field Ornithology 64:507-519.

Martin, T. E. and P. Li. 1992. Life history traits of open vs. cavity-nesting birds. Ecology 73:579-592.

Moller, A .P. 1987. Egg predation as a selective factor for nest design: an experiment. Oikos 50:91-94.

Moller, A .P. 1989. Nest site selection across field-woodland ecotones: the effect of nest predation. Oikos 56:240-246.

Nol, E. and R. Brooks. 1982. Effects of predator exclosures on nesting success of Killdeer. Journal of Field Ornithology 53:263-268.

Noss, R. F. 1983. A regional landscape approach to maintain diversity. BioScience 33:700-706.

Ortega, C. P., J. C. Ortega, C. A. Rapp, and S. A. Backensto. 1998. Validating the use of artificial nests in predation experiments. Journal of Wildlife Management 62:925-932.

Part, T. and J. Wretenberg. 2002. Do artificial nests reveal relative nest predation risk for real nests? Journal of Avian Biology. 33:39-46.

Picman, J. and L. M. Schriml. 1994. A camera study of temporal patterns of nest predation in different habitats. Wilson Bulletin 106: 456-465.

Reitsma, L. R. 1992. Is nest predation density dependent: A test using artificial nests. Canadian Journal of Zoology 70:2498-2500.

Reitsma, L. R., R. T Holmes, and T. W. Sherry. 1990. Effects of removal of red squirrels, *Tamiasciurus hudsonicus*, and eastern chipmunks, *Tamias striatus*, on nest predation in a northern hardwood forest: an artificial nest experiment. Oikos 57:375-380.

Robbins, C. S. 1980. Effect of forest fragmentation on breeding bird populations in the piedmont of the Mid-Atlantic region. Atlantic Naturalist 33:31-36.

Saracco, J. F. and J. A. Collazo. 1999. Predation on artificial nests along three edge types in a North Carolina bottomland hardwood forest. Wilson Bulletin 111: 541-549.

Schmidt, K. A. and C. J. Whelan. 1999. Nest predation on woodland songbirds: when is nest predation density dependent? Oikos 87:65-74.

Small, M. F. and M. L. Hunter. 1988. Forest fragmentation and avian nest predation in forested landscapes. Oecologia 76:62-64.

Small, M. F. and M. L. Hunter. 1989. Response of passerines to abrupt forest-river and forest-powerline edges in Maine. Wilson Bulletin 101:77-83.

Storaas, T. 1988. A comparison of losses in artificial and naturally occurring Capercaillie nests. Journal of Wildlife Management 52:123-126.

Thompson, F. R. III, T. M. Donovan, R. M. DeGraaf, J. Faaborg, and S. K. Robinson. (2002). A multi-scale perspective of the effects of forest fragmentation on birds in eastern forests. Studies in Avian Biology. 24: 8-19.

Thorington, K. K. and R. Bowman. 2003. Predation rate on artificial nests increases with human housing density in suburban habitats. Ecography 26:188-196.

Vander Haegen, W. M. and R. M. DeGraaf. 1996. Predation on artificial nests in forested riparian buffer strips. Journal of Wildlife Management 60:542-550.

Weatherhead, P. J. and G. Blouin-Demers. 2004. Understanding avian nest predation: why ornithologists should study snakes. Journal of Avian Biology. 35:185-190.

Whelan, C. J., M. L. Dilger, D. Robson, N. Hallyn, and S. Dilger. 1994. Effects of olfactory cues on artificial nest experiments. Auk 111:945-952.

Wilcove, D. S. 1985. Nest predation in forest tracts and the decline of migratory songbirds. Ecology 66:1211-1214.

Willebrand, T. and V. Marcstrom. 1998. On the danger of using dummy nests to study predation. Auk 105:378-379.

Wilson, G. R., M. C. Brittingham, and L. J. Goodrich. 1998. How well do artificial nests estimate success of real nests? Condor 100:357-364.

Yahner, R. H. and C. G. Mahan. 1996. Effects of egg type on depredation of artificial ground nests. Wilson Bulletin 108:129-136.

Yahner, R. H. and C .G.Mahan. 1999. Potential for predator learning of artificial arboreal nest locations. Wilson Bulletin 111:536-540.

Yahner, R .H. and N. H. Piergallini. 1998. Effects of microsite selection on predation of artificial ground nests. Wilson Bulletin 110:439-442.

Yahner, R. H. and R. A. Voytko. 1989. Effects of nest site selection on depredation of artificial nests. Journal of Wildlife Management 53:21-25.

Zanette, L. 2002. What do artificial nests tell us about nest predation? Biological Conservation 103:323-329.

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PEREGRINE FALCONS BREEDING IN NORTHEAST TENNESSEE

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The Peregrine Falcon (*Falco peregrinus*) is a historical nester in Tennessee. The most thorough inventory of nesting peregrines in the state was compiled by Albert F. Ganier, who noted 25 known eyries in his personal journals (Alsop 1979). However, the species suffered a steep population decline and was extirpated from the state by the late 1940s (Knight 1997). Restoration efforts began in the 1980s and peregrines resumed nesting in the state by 1997 (Knight and Hatcher 1997). Of two active peregrine nests found in Tennessee in 1997, one near Alum Cave Bluff in the Great Smoky Mountains National Park has remained active for most, if not all, years since, while the other nest near Chattanooga was active for about a decade (multiple Season reports in The Migrant). An adult and two immature peregrines at Greenbrier Pinnacle in the Great Smoky Mountains National Park on 22 June 2003 indicated nesting at this former hack site (Lewis 2003). Sightings have suggested breeding at a couple of other sites in East Tennessee, but lacked verification. The recovery of a nesting population in the state has been slow and all nesting data are important.

This note documents breeding by a pair of Peregrine Falcons in 2016 at Doe River Gorge, Carter County, Tennessee, as observed over five years of monitoring by the authors. The site is a deeply carved gorge containing several impressively large cliffs. The habitat within the gorge is primarily hardwood forest (mainly oak (*Quercus spp*), maple (*Acer spp*), and Yellow Poplar (*Liriodendron tulipifera*) with some pine (*Pinus spp*) and Eastern Hemlock (*Tsuga Canadensis*) interspersed. A narrow gauge railroad track that was constructed through the gorge in the 1880s, but inactive since the 1950s, provides an easy walking route into the gorge. The site has been part of a Christian camp and ministry for more than 25 years, but the gorge has remained relatively unspoiled. The upper slopes within the gorge are part of the Cherokee National Forest. Visitor access to the gorge via the railroad track typically is limited to dates before or after the summer camp season, which runs from mid May into autumn. The authors were generously granted special access to monitor the peregrines into the summer.

HISTORY OF PEREGRINE FALCONS IN DOE RIVER GORGE

Lee R. Herndon (1950:60) described the Duck Hawk, as the Peregrine Falcon was known at the time, as a rare summer resident of Carter County, stating that they were "probably nesting in the Doe River Gorge, pair observed there May 5, 1946 (LRH)." The initials indicate that Herndon was the observer on that date. If nesting that year, this would have

been slightly later than the last known nestings of peregrines in East Tennessee, which occurred in 1943 in the Great Smoky Mountains National Park (Stupka 1963) and in 1944 at what is now Fall Creek Falls State Park (Spofford 1944). As a lad of 14 Range accompanied Herndon into Doe River Gorge in the 1960s, and Herndon pointed out a particular cliff, saying that that was where the peregrines had nested. However, we can find no literature to confirm nesting there, so it is uncertain whether nesting was verified or just suspected.

Annual visits to Doe River Gorge to search for peregrines were made from 1990 to 1996 by Knight as part of a broader survey to locate nesting pairs in the state (Knight and Hatcher 1997). No falcons were seen during these visits to the gorge. However, a single peregrine was seen there on 5 May 2002 by Larry McDaniel (Lewis 2002).

On 24 April 2012 Range was hiking in Doe River Gorge when, much to his surprise, a Peregrine Falcon was sighted and landed on the very cliff Herndon had pointed out. He returned the following day with Knight and they observed a pair. The female briefly inspected a potential nest ledge, and one of the pair was seen carrying prey. Copulation by the pair was observed on 1 May by Knight, but no further evidence of nesting activities was forthcoming. A single peregrine on 27 June was the last sighting that year.

Range returned to the site on 13 March 2013, observing a pair around the same cliff. The pair was seen on three other visits through 4 June by the authors, but no evidence of breeding was observed. No peregrines were seen in 2014 on visits in March and April. Range returned on 10 March 2015, seeing a single falcon. Knight observed a pair on 24 March and witnessed copulation by the pair. On 24 April we saw the female enter a likely-looking nest ledge and remain for an extended period; however, no further evidence of breeding was detected. No peregrines were seen on 8 May and we did not return that year. In light of events in the following year, perhaps we gave up too soon.

A pair of peregrines was seen in the gorge on 20 February 2016 by Range, who witnessed an impressive example of territorial defense on 7 March as one falcon intensely harassed a Black Vulture (*Coragyps atratus*) that flew by the cliff. Copulation by the pair was observed on 25 March by Range and Glen Eller. The falcons were vocal this year, mainly early in the season, something we had not heard in the previous years. Both peregrines were present on 4 May, and we saw the male carrying food, but could not see where he landed. Only a single falcon was seen briefly on 27 May. Upon arrival at the site on 10 June we immediately spotted three heavily streaked juvenile peregrines perched in a large hemlock snag next to the favored cliff. At 09:30 the male delivered a Blue Jay (*Cyanocitta cristata*) to the young and all three eventually ate some of it. Another food delivery occurred at 10:45; the prey item appeared to be a European Starling (*Sturnus vulgaris*). The juveniles never left the snag in which they were perched during the 2.5 hours we observed them. We concluded that they had just fledged within the previous day or two. When we returned on 17 June all three juvenile peregrines were actively flying around the vicinity of the cliff and chasing one another. Based on their relative sizes, we judged the young to be two females and one male. Also on this date, the adult male arrived with prey and made a mid-air transfer to one of the juveniles.

The peregrines favored a single cliff, among several possible choices in the gorge, during

each of the four years of occupancy. This was the same cliff pointed out to Range by Herndon years earlier as the nest site of the falcons. The elevation along the railroad track at this site is approximately 2040 ft (620 m), and the eyrie is situated at least 100 ft (30 m) above that.

Interestingly, Common Ravens (*Corvus corax*) have nested on a cliff directly across the gorge from the peregrine eyrie for several years, including successfully fledging three young in late April this year.

ACKNOWLEDGMENTS

We greatly appreciate the cooperation and hospitality of Doe River Ministries, Inc. for granting us access to the gorge for the purpose of monitoring the Peregrine Falcons.

LITERATURE CITED

Alsop, F.J., III. 1979. Population Status and Management Considerations for Tennessee's Threatened and Endangered Bird Species. Page 132. Tennessee Wildlife Resources Agency, Project E-002-R-01, FIN.

Herndon, L. R. 1950. Birds of Carter County, Tennessee. The Migrant 21:57-68.

Knight, R. L. 1997. Peregrine Falcon. Pages 113-115 *in* Atlas of the breeding birds of Tennessee (C. P. Nicholson, Editor). University of Tennessee Press, Knoxville.

Knight, R. L. and R. M. Hatcher. 1997. Recovery efforts result in returned nesting of Peregrine Falcons in Tennessee. The Migrant 68:33-39.

Lewis, R. P. 2002. The spring season: Eastern mountain region. The Migrant 73:63.

Lewis, R. P. 2003. The spring season: Eastern mountain region. The Migrant 74:133-134.

Spofford, W. R. 1944. Notes on the Peregrine Falcon. The Migrant 15:66-67.

Stupka, A. 1963. Notes on the Birds of Great Smoky Mountains National Park. University of Tennessee Press, Knoxville.

2016 Tennessee Spring Bird Count

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Spring Counts this year in Tennessee involved 239 observers on 10 counts; these observers tallied 56,084 individuals of 221 species during 635 party hours in the field. The 166 species found on the Elizabethton count was a new high for that count and the highest species total for a Tennessee spring count since at least 1997. The weather was fairly mild for the most part, but several of the counts experienced light rain. Temperatures ranged from a chilly 33° F in Anderson County to a warm 85° F in Hamilton County. Notable sightings included Snowy Egret, Black-bellied and American Golden plovers, 18 species of shorebirds, Northern Saw-whet Owl, Western Kingbird, 35 species of warblers, Painted Bunting, and Rusty Blackbird. The counts in the table are arranged geographically from west to east.

COUNTY SUMMARIES

Anderson County – 0510-2100. Weather: mostly clear; wind 0-15 mph; 33-64° F. The 118 species found this year tied the high total for this count. Observers: Frank Bills, Sharon Bostick, Doug Bruce, Bates Estabrooks, Melinda Fawver, Carole Gobert, Ron Hoff, and Dollyann Myers.

Blount County – 0500-2040. Weather: clear to partly cloudy; wind 5-22 mph; 50-71° F. Mississippi Kite, Black-billed Cuckoo, Fish Crow, and Swainson's Warbler were of note. Observers: Jean J. Alexander (compiler), Warren Bielenberg, Doug Bruce, Fae Burkhart, Melinda Fawver, Marian D. Fitzgerald, Tom E. Fitzgerald, Sandy B. Graves, Kim J. Henry, Stephen P. Henry, Thomas D. Howe, Susan Hoyle, James R. Human, David M. Johnson, Karen J. Petrey, Logan Rosenberg, Doug Schneeberger, Paula Schneeberger, Jay Sturner, Mary Tankersley, Jimmy Tucker, June D. Welch, Ron Welch, and Randy Winstead.

Cumberland County - 0310-1850. Weather: overcast with light rain; wind SE 4 mph; 61-76° F. A Herring Gull and 30 species of warblers provided highlights. Observers: Pamela Barrett, Nan E. Beasley, Daniel L. Combs, John Cyrus, Douglas A. Downs, Annell S. Fields, Janie C. Finch, Ric Finch, Susan Hadenchuk, Edmond K. LeGrand (compiler), Joseph E. Mast, Steven J. Stedman, Lyndi Voelker, and Reuben J. Yoder.

Elizabethton - 0400-2150. Weather: cloudy to partly cloudy with scattered late afternoon thundershowers; wind was light and variable; 53-81° F. The count this year set a new record for species with 166 found. American Golden-Plover and Fish Crow were both new species for this count. The total for Worm-eating Warbler (39) was a new state high for a count. Other sightings of note included Hooded Merganser (hen with 2 young), Common

Merganser, Virginia Rail, Black-billed Cuckoo, N. Saw-whet Owl, Peregrine Falcon, Sedge Wren, and Cerulean Warbler. Observers: Fred Alsop, Jim Anderson, Joshua Argo, Rob Armistead, Betty Bailey, Gary Bailey, Emily Bays, Paul Bays, Jerry Bevins, Rob Biller, Rick Blanton, Linda Block, Kevin Brooks, Debi Campbell, J. G. Campbell, Ron Carrico, Angela Cross, Rack Cross, Gil Derouen, Diane Draper, Glen Eller, Harry Lee Farthing, Bambi Fincher, Dave Gardner, Bill Grigsby, Carl Hacker, Jean Henson, Neal Henson, Jackie Hinshaw, Don Holt, Everett Honaker, Mike Hubley, Susan Hubley, Karen Justice, David Kirschke, Rick Knight (compiler), Roy Knispel, Richard Lewis, Bill Little, Priscilla Little, Larry McDaniel, Joe McGuiness, Cathy McNeil, Tom McNeil, Eric Middlemas, Charles Moore, Kathy Noblet, Brookie Potter, Jean Potter, Sherri Quillen, Peter Range, Chris Soto, Bryan Stevens, Kim Stroud, Nancy Tate, Amanda Teeter, Mary Anna Wheat, John Whinery, and Clay Wilburn.

Hamilton County – 0500-1900. Weather: clear; wind W 20 mph; 45-85° F. Merlin and Pine Siskin were notable sightings. Observers: David Aborn, Rosemary Baker, Tim Baker, Harold Birch, Kevin Calhoon (compiler), John Denier, Lizzy Denier, John Dever, Daniel Jacobson, Gary Lanham, Pixie Lanham, Laura Marsh, Barbara McMahan, Mike McMahan, O J Morgan, Tommie Rogers, David Spicer, Jonathan Spicer, Judee Spicer, Scott Spicer, and Jimmy Wilkerson.

Knox County - 0130-0230, 0500-1905. Weather: sunny; wind N 0-15 mph; 48-79°F. Notable sightings included Hooded Merganser with 5 young, Virginia Rail, Sora, and 14 Fish Crows. Observers: Mark Armstrong, Robin Barrow-Nichols, Frank Bills, Eric Bodker, Sharon Bostick, David Buehler, David Caylor, Gail Clendenen, Steve Clendenen, Chuck Estes, Carole Gobert, Paul Hartigan, Tom Howe, Susan Hoyle, James Human, Tony King, Jerry Ledbetter, Bruce Marshall, Morton Massey, Denise Nauman, Charles P. Nicholson, Anthony Nyzio, John O'Barr, Talissa Ralph, Martha Rudolph, Michael Ryon, Kurt Sickafus, Jay Sturner, Colin Sumrall, Robert Terrell, Jimmy Tucker, Chris Welsh, and Shane Williams. Non participating compiler - K. Dean Edwards.

Loudon County – 0520-2130. Weather: clear; wind WSW 11 mph; 50-78° F. Olive-sided Flycatcher, Loggerhead Shrike, Philadelphia Vireo, Fish Crow, and Dickcissel were notable. Observers: Pat Ball, Bobbie Carlin, Gail Clendenan, Steve Clendenan, Barbara Colaw, Stan Colburn, Chuck Cruikshank, Kathleen Dooley, Mary Eleton, Ron Hoff, Harry Jackson, Trent Jett, Tony King (compiler), Toby Koosman Gary Lucas, Claire Manzo, Matt Mathews, Dollyann Myers, Denise Nauman, Joan Ormazu, Pat Patterson, Elton Pierson, Charlotte Jenkins Raymond, Mary Reif, Ginnie Santoli, Carolyn Snow, Phil Snow, Zee Zee Sullivan, Mike Sullivan, Dean Turley, David Verhulst, Lesley Whiston, and Ed Young.

Montgomery County – 0510-1953. Weather: mostly cloudy to fair, with some late afternoon sprinkles; wind NNE 10 mph, with gusts to 37 mph; 57-63°F. Yellow-bellied Flycatcher and Horned Lark were notable. Observers: Elaine Foust (compiler), Debbie Hamilton, Steve Hamilton, Gloria Milliken, Daniel Moss, Steve Routledge, Sue Shipkowski (F/Y), and Stanley York.

Nashville - 0400-1800. Weather: intermittent light rain; 65-80° F. Numerous highlights included Snowy Egret, Black-bellied Plover, American Avocet, Franklin's Gull, Scissor-tailed Flycatcher, Lark Sparrow and Lincoln's Sparrow. Observers: Chris Agee, Rachel Anderson, Kim Bailey, Kristy Baker, Sandy Bivens, Kevin Bowden, Susan Bradfield, Trae Bradfield, Joel Bruyere, David Buchanan, Jean Buchanan, Ed Byrne, Phillip Casteel, Richard Connors, Jerry Drewry, Margie Dunham, Bob English, Francis Fekel, Graham Gerdeman, Chris Guerin, Mark Hackney, John Kell, Amy Potter, Polly Rooker, Sheila Shay, Danny Shelton, Chris Sloan, Chad Smith, Michael Smith, Joshua Stevenson, Victor Stoll, Joe Stone, Chloe Walker, LinnAnn Welch, Melinda Welton, Terry Witt, and Mary Zimmerman. Scott Block and Jan Shaw: non-participating co-compilers.

Shelby County – 0700-1800. Weather: cloudy to partly cloudy; wind 10-20 mph with stronger gusts; 59-63° F. Highlights included American Avocet, Ruddy Turnstone, Western Kingbird, and Painted Bunting. Observers: Betty Blaylock, David Blaylock, Andrea Blevins, Thomas Blevins, Chad Brown, Judy Dorsey, Jim Ferguson, Sue Ferguson, Rob Harbin, Bob Ilardi, Margaret Jefferson, Kimberly John, Georges McNeil, Hal Mitchell, Gaynell Perry, Dick Preston (compiler), Virginia Reynolds, Victor Stoll, Ed Thomas, Jim Varner, Susan Varner, and Martha Waldron.

2016 SPRING COUNTS

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
Date	14-May	14-May	30-Apr	30-Apr	7-May	14-May	15-May	14-May	24-Apr	30-Apr	
Species											
Black-bellied Whistling-Duck	69	-	-	-	-	-	-	-	-	-	69
Canada Goose	74	134	140	109	306	186	175	118	188	653	2083
Mute Swan	-	-	-	1	-	-	-	-	-	-	1
Wood Duck	9	26	13	46	16	1	1	38	32	85	267
Gadwall	-	-	-	-	1	-	-	-	-	-	1
American Wigeon	-	-	-	-	-	-	-	-	-	2	2
Mallard	45	5	85	34	102	42	17	68	66	332	796
Blue-winged Teal	39	2	22	3	2	-	1	-	4	6	79
Northern Shoveler	-	-	9	-	-	-	-	-	-	-	9
Lesser Scaup	-	-	1	-	-	-	1	-	-	-	2
Bufflehead	-	-	-	2	-	-	-	-	-	5	7
Hooded Merganser	1	-	-	-	-	-	1	1	1	3	7
Common Merganser	-	-	-	-	-	-	-	-	-	2	2
Ruddy Duck	-	-	2	-	-	-	-	-	-	-	2
Northern Bobwhite	3	6	7	6	2	3	-	5	3	1	36
Ruffed Grouse	-	-	-	-	-	-	-	-	-	1	1
Wild Turkey	4	44	114	12	5	4	-	18	21	57	279
Common Loon	-	-	22	2	-	-	-	-	-	1	25
Pied-billed Grebe	-	-	2	1	1	1	-	-	3	5	13
Horned Grebe	-	-	1	-	-	-	-	-	-	1	2
Double-crested Cormorant	-	5	91	10	43	65	9	4	148	65	440
Great Blue Heron	16	20	35	12	89	71	16	38	87	107	491
Great Egret	4	4	5	-	2	1	2	-	-	-	18
Snowy Egret	-	-	2	-	-	-	-	-	-	-	2

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
Cattle Egret	-	-	1	-	-	4	-	-	-	-	5
Green Heron	2	4	6	10	10	-	2	9	8	16	67
Black-crowned Night-Heron	-	-	-	-	-	2	2	1	2	1	8
Yellow-crowned Night-Heron	3	-	1	-	-	-	-	-	-	14	18
Black Vulture	7	46	673	4	71	50	4	2	14	152	1023
Turkey Vulture	19	66	39	17	67	54	15	35	33	212	557
Osprey	-	3	5	1	26	-	8	17	23	15	98
Mississippi Kite	35	-	-	-	-	-	-	1	-	-	36
Bald Eagle	-	1	-	1	-	6	-	7	2	10	27
Northern Harrier	-	-	-	2	1	-	-	-	-	-	3
Sharp-shinned Hawk	-	-	4	-	-	-	-	1	2	2	9
Cooper's Hawk	1	3	4	3	3	2	1	3	4	7	31
Accipiter sp.	-	-	-	-	-	-	-	-	1	-	1
Red-shouldered Hawk	10	10	4	8	12	-	7	11	13	-	75
Broad-winged Hawk	2	-	2	8	4	-	1	6	5	16	44
Red-tailed Hawk	2	17	22	7	8	11	1	13	15	38	134
Buteo sp.	-	-	-	-	-	-	-	-	1	-	1
Virginia Rail	-	-	-	-	-	-	-	-	2	1	3
Sora	-	-	-	-	-	-	-	-	2	4	6
American Coot	-	-	13	-	-	-	3	-	3	3	22
Black-necked Stilt	79	-	-	-	-	-	-	-	-	-	79
American Avocet	4	-	30	-	-	-	-	-	-	-	34
Black-bellied Plover	-	-	1	-	-	-	-	-	-	-	1
American Golden-Plover	-	-	-	-	-	-	-	-	-	1	1
Semipalmated Plover	5	4	1	-	-	-	1	-	-	-	11
Killdeer	54	20	22	32	26	20	11	5	18	46	254
Spotted Sandpiper	17	-	34	9	15	1	8	3	9	83	179

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
Solitary Sandpiper	1	4	9	13	11	-	3	3	19	34	97
Greater Yellowlegs	2	-	-	-	1	-	-	-	1	2	6
Willet	-	-	330	-	-	-	-	-	-	-	330
Lesser Yellowlegs	58	4	1	-	3	-	-	-	1	2	69
Ruddy Turnstone	1	-	-	-	-	-	-	-	-	-	1
Stilt Sandpiper	17	-	-	-	-	-	-	-	-	-	17
Dunlin	1	-	-	-	-	-	-	-	-	-	1
Baird's Sandpiper	1	-	-	-	-	-	-	-	-	-	1
Least Sandpiper	1950	5	25	-	33	-	31	-	-	5	2049
White-rumped Sandpiper	44	-	-	-	-	-	-	-	-	-	44
Pectoral Sandpiper	300	-	4	-	-	-	1	-	-	2	307
Semipalmated Sandpiper	550	-	1	-	-	-	1	-	-	-	552
Western Sandpiper	1	-	-	-	-	-	-	-	-	-	1
Short-billed Dowitcher	3	-	-	-	-	-	-	-	-	-	3
Wilson's Snipe	-	-	-	3	-	-	-	-	9	-	12
American Woodcock	-	-	-	2	-	-	-	-	-	-	2
Wilson's Phalarope	4	-	-	-	-	-	-	-	-	-	4
Bonaparte's Gull	-	-	-	-	-	-	-	-	-	1	1
Franklin's Gull	-	-	1	-	-	-	-	-	-	-	1
Ring-billed Gull	-	-	-	-	-	-	-	-	-	7	7
Herring Gull	-	-	-	1	-	-	-	-	-	-	1
Least Tern	11	-	-	-	-	-	-	-	-	-	11
Caspian Tern	-	-	2	-	-	-	-	-	-	-	2
Forster's Tern	-	-	4	-	-	-	-	-		7	11
Rock Pigeon	18	19	48	-	164	19	23	80	41	166	578
Eurasian Collared-Dove	14	-	3	2	5	2	-	3	-	3	32
Mourning Dove	155	60	89	151	104	176	38	192	168	254	1387
Yellow-billed Cuckoo	6	6	5	4	2	7	7	46	1	9	93

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
Black-billed Cuckoo	-	-	-	-	-	-	-	1	-	1	2
Barn Owl	1	-	-	1	-	-	-	-	-	-	2
Eastern Screech-Owl	-	-	2	3	3	-	1	-	5	10	24
Great Horned Owl	1	-	3	-	-	-	1	1	2	6	14
Barred Owl	2	2	11	6	1	2	5	-	2	12	43
Northern Saw-whet Owl	-	-	-	-	-	-	-	-	-	3	3
Common Nighthawk	-	2	2	2	-	-	-	2	-	1	9
Chuck-will's-widow	-	1	2	15	12	2	4	10	4	10	60
Eastern Whip-poor-will	-	-	8	58	2	-	4	-	-	32	104
Chimney Swift	52	39	117	17	76	62	62	63	57	209	754
Ruby-throated Hummingbird	18	5	19	12	5	2	5	10	6	31	113
Belted Kingfisher	6	5	13	2	6	2	4	9	13	30	90
Red-headed Woodpecker	3	4	7	38	3	1	-	-	8	2	66
Red-bellied Woodpecker	38	25	54	67	17	48	31	63	89	97	529
Yellow-bellied Sapsucker	-	-	-	-	-	-	-	-	-	4	4
Downy Woodpecker	33	16	26	11	20	24	10	27	30	37	234
Hairy Woodpecker	1	4	3	10	2	6	5	2	7	10	50
Northern Flicker	1	3	7	15	3	5	3	11	16	33	97
Pileated Woodpecker	15	13	22	39	12	10	6	19	10	43	189
American Kestrel	1	2	6	10	6	1	-	-	4	19	49
Merlin	-	-	-	-	1	-	-	-	-	-	1
Peregrine Falcon	-	-	-	-	-	-	-	-	-	1	1
Olive-sided Flycatcher	-	-	-	-	-	1	-	-	-	-	1
Eastern Wood-Pewee	42	40	27	21	13	22	10	14	2	7	198
Yellow-bellied Flycatcher	-	1	-	-	-	-	-	-	-	-	1
Acadian Flycatcher	36	26	12	8	3	-	9	9	-	12	115
Willow Flycatcher	-	1	-	-	-	-	-	5	-	-	6
Least Flycatcher	-	-	2	-	-	-	-	-	-	6	8

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
Empidonax sp.	-	-	-	-	-	-	-	1	-	-	1
Eastern Phoebe	7	24	31	40	25	20	19	43	18	77	304
Great Crested Flycatcher	38	22	28	47	22	19	5	16	5	15	217
Western Kingbird	1	-	-	-	-	-	-	-	-	-	1
Eastern Kingbird	13	26	52	58	39	45	10	18	23	57	341
Scissor-tailed Flycatcher	-	-	2	-	-	-	-	-	-	-	2
Loggerhead Shrike	-	-	1	-	-	2	-	-	-	1	4
White-eyed Vireo	57	36	65	94	19	16	11	25	21	12	356
Bell's Vireo	-	2	-	-	-	-	-	-	-	-	2
Yellow-throated Vireo	9	9	17	29	2	1	5	4	8	9	93
Blue-headed Vireo	1	-	1	18	1	-	5	8	6	78	118
Warbling Vireo	9	2	15	-	-	-	-	-	1	20	47
Philadelphia Vireo	1	-	-	-	-	1	-	-	-	-	2
Red-eyed Vireo	30	21	79	267	62	22	45	128	47	257	958
Blue Jay	29	28	85	117	50	86	18	97	217	320	1047
American Crow	26	106	70	194	122	118	39	147	129	338	1289
Fish Crow	8	-	-	-	5	2	-	2	14	1	32
Common Raven	-	-	-	-	-	-	-	-	-	14	14
Horned Lark	-	4	-	4	-	-	-	-	-	2	10
Purple Martin	25	15	30	126	9	137	1	20	29	81	473
Tree Swallow	2	5	10	130	70	205	60	72	137	426	1117
No. Rough-winged Swallow	19	95	67	44	83	30	13	58	49	133	591
Bank Swallow	-	-	7	-	-		14	-	-	-	21
Cliff Swallow	-	136	240	-	340	141	355	83	236	807	2338
Barn Swallow	69	72	98	220	77	85	31	216	67	217	1152
Carolina Chickadee	26	65	86	73	48	30	41	96	98	173	736
Tufted Titmouse	70	59	113	128	42	104	43	112	116	166	953
Red-breasted Nuthatch	-	-	-	-	-	-	-	-	-	16	16

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
White-breasted Nuthatch	9	6	29	20	11	14	6	16	21	26	158
Brown-headed Nuthatch	-	-	-	3	9	11	2	8	5	-	38
Brown Creeper	-	-	-	-	-	-	-	-	-	4	4
House Wren	-	3	6	33	3	2	-	14	6	45	112
Winter Wren	-	-	-	-	-	-	-	-	-	4	4
Sedge Wren	-	-	-	-	-	-	-	-	-	1	1
Carolina Wren	61	40	60	76	70	117	55	129	131	129	868
Blue-gray Gnatcatcher	26	54	96	83	51	21	24	31	41	97	524
Golden-crowned Kinglet	-	-	-	-	1	-	-	-	-	5	6
Ruby-crowned Kinglet	-	-	5	7	3	-	-	1	8	4	28
Eastern Bluebird	32	77	76	74	71	132	42	76	51	157	788
Veery	-	1	11	2	1	-	-	-	-	13	28
Gray-cheeked Thrush	1	-	4	-	-	-	1	1	-	-	7
Swainson's Thrush	35	11	64	6	7	1	2	5	-	2	133
Hermit Thrush	-	-	-	-	-	-	-	1	-	-	1
Wood Thrush	9	10	34	64	10	17	23	17	24	138	346
American Robin	44	131	92	308	185	216	83	279	290	888	2516
Gray Catbird	3	9	15	18	7	2	8	45	8	55	170
Brown Thrasher	5	21	20	36	52	38	19	55	51	45	342
Northern Mockingbird	35	69	69	40	90	175	17	110	120	122	847
European Starling	86	312	338	380	279	239	141	242	344	986	3347
Cedar Waxwing	41	152	2	45	219	34	34	219	10	44	800
Ovenbird	-	1	7	75	9	-	8	13	1	244	358
Worm-eating Warbler	-	-	11	8	3	-	3	3	3	39	70
Louisiana Waterthrush	-	5	15	19	2	-	2	7	3	32	85
Northern Waterthrush	-	2	10	4	3	-	-	1	3	-	23
Golden-winged Warbler	-	-	-	-	1	-	-	-	-	2	3
Blue-winged Warbler	-	-	3	2	-	-	-	-	4	-	9

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
Black-and-white Warbler	1	1	17	60	7	-	3	6	7	90	192
Prothonotary Warbler	23	17	16	-	2	1	-	-	-	-	59
Swainson's Warbler	3	-	-	1	-	-	1	1	-	6	12
Tennessee Warbler	3	6	84	7	14	-	2	-	1	-	117
Nashville Warbler	1	1	4	1	1	-	-	-	1	1	10
Kentucky Warbler	15	9	31	39	3	4	3	-	2	5	111
Common Yellowthroat	10	48	50	93	11	15	7	59	29	27	349
Hooded Warbler	7	2	12	88	12	-	14	32	12	208	387
American Redstart	13	1	6	11	10	-	12	4	11	21	89
Cape May Warbler	-	-	6	2	6	-	-	-	7	4	25
Cerulean Warbler	6	-	5	5	1	-	4	-	1	2	24
Northern Parula	15	24	39	18	2	4	17	7	1	56	183
Magnolia Warbler	-	1	10	-	3	1	-	3	-	3	21
Bay-breasted Warbler	1	-	12	1	2	-	-	-	-	2	18
Blackburnian Warbler	-	-	11	4	1	-	-	-	2	7	25
Yellow Warbler	1	6	18	10	18	-	-	1	6	15	75
Chestnut-sided Warbler	2	1	16	6	6	-	6	4	1	36	78
Blackpoll Warbler	-	-	48	12	5	-	-	-	3	1	69
Black-throated Blue Warbler	-	-	-	1	-	-	-	-	1	85	87
Palm Warbler	1	-	77	7	7	-	1	-	15	8	116
Pine Warbler	-	5	4	31	4	2	1	14	14	10	85
Yellow-rumped Warbler	3	1	40	16	22	2	5	5	92	62	248
Yellow-throated Warbler	2	13	16	54	6	-	14	1	3	44	153
Prairie Warbler	-	18	43	89	30	-	3	16	2	5	206
Black-throated Green Warbler	-	1	22	30	9	-	5	9	9	81	166
Canada Warbler	-	-	2	-	-	-	2	-	-	44	48
Wilson's Warbler	-	-	1	1	-	-	-	-	-	-	2
Yellow-breasted Chat	-	20	17	65	15	17	11	49	4	8	206

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
Grasshopper Sparrow	-	-	10	5	-	3	4	1	-	4	27
Henslow's Sparrow	-	4	-	-	-	-	-	-	-	-	4
Chipping Sparrow	13	65	46	89	39	51	19	33	78	126	559
Field Sparrow	1	32	80	72	28	68	21	50	49	72	473
Lark Sparrow	-	-	2	-	-	-	-	-	-	-	2
Dark-eyed Junco	-	-	-	-	-	-	-	-	-	63	63
White-crowned Sparrow	-	-	5	3	-	-	-	-	3	11	22
White-throated Sparrow	-	2	32	11	-	1	-	-	41	13	100
Savannah Sparrow	9	1	12	12	1	-	2	15	14	1	67
Song Sparrow	-	-	30	85	35	54	39	91	90	276	700
Lincoln's Sparrow	-	-	1	-	-	-	-	-	-	-	1
Swamp Sparrow	-	1	13	4	-	-	-	-	8	5	31
Eastern Towhee	6	81	68	93	76	59	29	78	108	222	820
Summer Tanager	45	37	75	2	7	6	3	1	3	1	180
Scarlet Tanager	3	4	51	57	16	4	7	24	25	82	273
Northern Cardinal	69	172	208	165	188	243	84	236	312	299	1976
Rose-breasted Grosbeak	1	4	63	27	6	-	1	-	12	30	144
Blue Grosbeak	6	14	12	20	10	3	1	7	5	6	84
Indigo Bunting	92	122	108	143	75	58	23	158	28	126	933
Painted Bunting	1	-	-	-	-	-	-	-	-	-	1
Dickcissel	34	38	3	-	-	5	-	-	-	-	80
Bobolink	-	-	1	120	-	-	1	-	1	1	124
Red-winged Blackbird	94	149	123	229	105	102	17	156	121	480	1576
Eastern Meadowlark	17	16	39	140	32	71	9	26	28	142	520
Rusty Blackbird	-	-	-	-	-	-	-	-	-	2	2
Common Grackle	53	52	119	79	149	263	42	149	155	477	1538
Brown-headed Cowbird	49	59	104	83	43	58	22	41	95	91	645
Orchard Oriole	6	21	36	26	16	12	9	16	16	42	200

Counties	Shelby	Montgomery	Nashville	Cumberland	Hamilton	Loudon	Anderson	Blount	Knox	Elizabethton	Totals
Baltimore Oriole	7	-	16	2	6	1	6	1	1	38	78
House Finch	16	53	32	32	58	69	14	62	107	56	499
Pine Siskin	-	1	30	49	1	3	-	1	-	59	144
American Goldfinch	6	100	91	94	35	50	28	202	102	354	1062
House Sparrow	11	26	42	43	52	23	11	45	63	80	396
Total individuals	5364	3567	6401	6080	4598	4252	2239	4997	5239	13347	56084
Total species	128	118	161	137	131	98	118	116	131	166	221
Observers	22	7	37	14	20	15	8	24	33	59	239
Parties	8	5	13	7--9	-	10	4	14	25	13	92
Party hours	35	36.39	71.5	70.75	59	39	25.95	83.25	90.25	124	635.09
Hours by car	12	23.94	29.5	41.5	30	27.25	13.5	19.6	16	-	213.29
Hours by foot	23	12.45	42	29.25	29	11.75	12.45	61.53	71.75	-	293.18
Hours by canoe or other	-	-	-	-	-	-	-	2.12	2.5	-	4.62
Miles by car	95.5	285.5	364	431	367	175	110.9	287.2	167.7	-	2283.8
Miles by foot	18	8.3	31.5	22.25	18	9.35	7.75	38.9	43.9	-	197.95
Miles by canoe or other	-	-	-	-	-	-	-	2.5	4.6	-	7.1
Hours owling	0.75	-	4.5	4.75	6	0.6	1.5	1.58	3.5	9	32.18
Miles owling	-	-	25	52	15	3.4	10	1	11	-	117.4
Feeder observers	-	1	-	-	-	21	2	3	-	-	27
Feeder hours	-	2	-	-	-	24.25	2	4.5	12.4	-	45.15

THE 2016 DISTINGUISHED SERVICE AWARD PRESENTED TO GLEN CRISWELL

Mark Greene

William Glen Criswell has been a fixture in the Tennessee birding community since the late 1970's. From that time, it is nearly impossible to look at the season report for the West Tennessee Coastal Plain Region in *The Migrant* and not see the initials "WGC" numerous times. He has found numerous first, second and third state record birds as well as out of season rarities, early and late migrants, and numerous nests. A complete list of rarities that he has found is too long to list here but includes White-tailed Kite, Cinnamon Teal, Sabine's Gull, Arctic Tern, Snowy Plover, Curlew Sandpiper and Groove-billed Ani. He has written many articles in *The Migrant* over the years to document these rarities. He has found and documented nests for King Rail, Least Bittern, Chuck-will's-widow, Brown Creeper and many others.

Glen was born and raised in Dyer County and grew up hunting and fishing and spending time outdoors. He served in the U.S. Army from 1954 to 1957 and in the U.S. Navy from 1959 to 1976. He traveled to Des Moines, Iowa; Pendleton, California; Germany; the Mediterranean; and to the Caribbean three times. It was during his military days that he began watching birds and taking photographs of the natural world around him. He has lived in the Millsfield community in Dyer County since 1978, and it was around this time that he began contributing his sightings to *The Migrant* for inclusion in the Seasons report. He has lead several hikes and field trips for Tennessee Ornithological Society meetings in northwest Tennessee, has contributed slides to the Memphis chapter for use in educational programs, and provided nesting data and photos for Breeding Bird Surveys and the Tennessee Breeding Bird Atlas Project.

In 2010 he donated more than 160 bird books, many bird notes, and over a thousand slides of birds, bird nests, wild flowers, reptiles, amphibians, insects, and more to the Learning Resource Center at Dyersburg State Community College in Dyersburg, Tennessee. His bird records (along with those of Ken Leggett and Ken Webster) and many of his photographs were archived and can be viewed online at this link: http://intweb.dscc.edu/archives/lrc/

For these and many other reasons, the Tennessee Ornithological Society presented Glen Chriswell with the 2016 Distinguished Service Award (Figure 1).

Figure 1. Left to right: Mark Greene, Distinguished Service Award recipient Glen Chriswell and TOS President Steve Routledge gathered at the TOS Spring 2016 Meeting at Reelfoot Lake State Park.

MINUTES OF THE TOS 2016 SPRING BOARD OF DIRECTORS MEETING

7 May 2016
REELFOOT LAKE STATE PARK

The annual Spring meeting was held 6 May-8 May, 2016 at Reelfoot Lake State Park and was hosted by the Memphis Chapter of TOS. Field trips were offered to Walnut Log Road, Phillipy Pits and Black Bayou.

The Directors meeting was called to order by President Dr. Steve Routledge (NTOS) at 1:08 pm.

Secretary Cyndi Routledge (NTOS) confirmed there was a quorum; minutes of the Fall meeting were accepted as written.

REPORTS OF OFFICERS AND DIRECTORS-AT-LARGE

PRESIDENT: Steve Routledge (NTOS) – Deferred report to old and new business.

VICE-PRESIDENTS: East TN Vice-President Rack Cross reported that Dr. Fred Alsop received the TDEC Paul Hayden Memorial Award at the annual Environmental Conference.

TREASURER: Mac McWhirter (MTOS) – Treasurer Mac McWhirter reported that the Society remains in sound financial shape, ending the year 2015 with just over $307,000 in the investment fund after a flat year in the markets. This centennial year was an unusually active year for funding grants and other activities. Income for the year was $23,611, with $13,688 coming from dues and memberships and $10,000 for a pass-through gift to the International Crane Foundation program for "Keeping Whooping Cranes Safe". Expenditures included a total of $18,000 in conservation grants and donations and $17,346 for the publishing of eight (8) Migrants, finally catching our publications up-to-date thanks to the work of the new editor and past co-editors over the past three years. Total expenditures were $41,489. Memberships for 2015 totaled 689, with 672 regular memberships and 17 institutional subscriptions.

THE MIGRANT: Editor Bob Ford (MTOS) provided a report to the President; the June 2015 issue is nearing finalization and the September and December 2015 are in the editing phase. The editor requested submissions for 2016 issues of *The Migrant*. Observers are reminded to please submit their sightings to Regional Editors for the season report or consider them for "Roundtable Notes" for publication.

THE TENNESSEE WARBLER: Editor Theresa Graham (MTOS) reported that the next issue will be in August. Deadline for submissions is 30 June.

COMMITTEE REPORTS

TENNESSEE BIRD RECORDS COMMITTEE: Ruben Stoll (NTOS) has tentatively agreed be the Secretary, and Chris Sloan (NTOS) has offered to be his assistant. Terry Witt is moving to Florida, and a replacement may be needed. President Steve Routledge will take appropriate actions as needed.

CONSERVATION POLICY COMMITTEE: Dick Preston (MTOS) / Melinda Welton (NTOS) report that TOS supported the State of Tennessee's Land Unsuitable for Mining Petition (LUM). The closing of the public comment period was in February, and a final petition evaluation will be forthcoming, followed by a 30 day waiting period and ultimately a decision. The Committee thanks everyone who sent in comments. President Steve Routledge (NTOS) added TOS as a signatory to the following group letters: American Bird Conservancy "The Albatross and Petrel Conservation Act of 2016"; National Wildlife Federation letter to President Obama seeking greater protection of public lands and wildlife from energy development; a coalition of environmental groups led by Defenders of Wildlife in opposition to the Sportsman's Heritage and Recreation Enhancement bill; the Tennessee Valley Authority requesting an alternative to closing and filling of their fly ash retaining ponds; the Tennessee Department of Environment and Conservation opposing a permit allowing increase in pollutants into the Hatchie River (this permit was denied).

CONSERVATION AND RESEARCH FUNDING COMMITTEE: Dr. Michael Collins (MTOS) had no report. Mac McWhirter (MTOS/Highland Rim), Treasurer, noted however that the committee has been active and awarding conservation grants.

OLD BUSINESS

Windfall Committee Report — The Committee is essentially done with all its business. The TVA/TWRA Tennessee Birding Trail signs are all printed. Tennessee Department of Transportation has been contacted, and they are waiting for approval for placement. Funding still needs to become available to proceed.

Discover Birds Activity Books Report — Over 2,400 books are still available for distribution. To date the book has reached over 15,000 children in 10 states and 3 countries. Grants are being sought by Cyndi Routledge (NTOS) with the assistance of Marion Pratt (NTOS) to cover the cost of future printings. David Hanni, Bird Conservation Coordinator with TWRA, also offered to assist with the grant search.

The Tennessee Warbler logo: Thanks were extended to Mindy Fawver (KTOS) and Theresa Graham (MTOS) for work on the new updated *The Tennessee Warbler* logo.

NEW BUSINESS

Sandhill Crane hunting season update — The Sandhill Crane hunt will remain "experimental" for a fourth season due to procedural changes within U.S. Fish and Wildlife Service. The hunting season is expected to expand up to 45 days with a 3-day hiatus for the

Sandhill Crane Festival. The hunt will likely become "operational" in 2017/2018 season with other significant changes. A comment period for those changes will take place 15 October through 15 November 2016. Discussion of these changes will take place at the Fall 2016 TOS Board of Directors meeting and members will be asked to comment directly to TWRA during the allocated comment period.

Colonial Waterbird nest survey — David Hanni, Bird Conservation Coordinator with TWRA, provided a report that there is an ongoing discussion of continuing strong partnerships between TWRA and TOS, including a joint effort to survey colonial waterbird nest sights. Members were asked report rookeries to David Hanni and include species, number of birds and location.

"The Life History of Birds" — Jim Ferguson (MTOS) offered a 28 volume complete set of "The Life History of Birds In America" that he was willing to give to anyone who made a $50 donation to TOS. Melissa Turrentine made the donation and received the books.

Tennessee Bluebird Society — A link on the TOS website to the Tennessee Bluebird Society has been added and the Bluebird Society has added the TOS link to their site.

Poo-Poo Project — Teton Raptor Center initiated and designed a vent cap for port-a potty and vault outside toilets to prevent small owls and other cavity nesting birds from using vents as nesting cavities. Caps cost $29.95 and they have distributed over 5700 caps to over 34 states. There is currently no representation in Tennessee. The Teton Raptor Center contacted TOS to inquire if we wanted to become involved. Dick Preston will check with David Hanni and follow up at the Fall Meeting.

2016 Fall Meeting — The Fall meeting will be 30 September through 2 October at David Crockett State Park with the Buffalo River Chapter in Lawrenceburg. Complete details will be upcoming in *The Tennessee Warbler* and are already on the TOS website.

Spring TOS meeting — President Steve Routledge (NTOS) will inquire with Knoxville chapter.

Field Cards — Ron Hoff (KTOS) asked about updated cards. Cyndi Routledge (NTOS) will contact David Hanni at TWRA for details.

The meeting was adjourned at 2:07 pm.

Respectfully submitted,

Cyndi Routledge, Secretary

TENNESSEE ORNITHOLOGICAL SOCIETY

ANNUAL BUSINESS MEETING

The Annual Spring business meeting was held at Reelfoot Lake State Park in Tiptonville, Tennessee on 7 May 2016. President Steve Routledge called the meeting to order at 6:57 pm. Secretary Cyndi Routledge confirmed a quorum. Steve Routledge began the meeting with recognition and thanks to the Memphis TOS Chapter for hosting a great weekend event.

Steve Routledge provided the membership an overview of the Board of Directors meeting. Among various business items, President Steve Routledge also announced the following: the search for President Elect ongoing; Rack Cross and Bill Grigsby and the Kingsport birding group have begun a new age and ethnic diversity birding program.

The Distinguished Service Award was presented to Glen Criswell for his contributions to Tennessee ornithology. On behalf of the TOS membership, Steve Routledge congratulated Glen for his achievements.

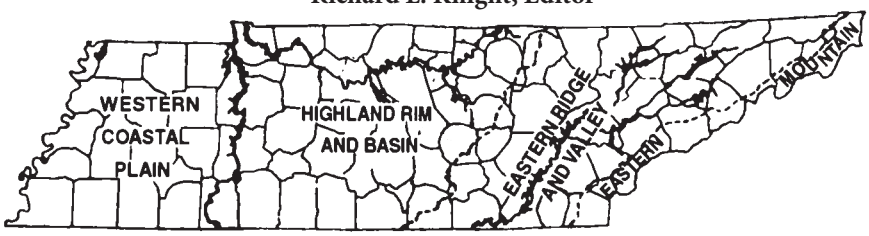
The meeting was adjourned at 7:30 pm for the evening's speaker, Matt Hill from the Missouri Department of Conservation.

Respectfully submitted,

Cyndi Routledge, Secretary

THE WINTER SEASON

Richard L. Knight, Editor



1 December 2015 - 29 February 2016

Temperatures this winter were mild, particularly in December which was in sharp contrast to the previous two winters. Although precipitation amounts were above average this season, there was little snow outside the eastern mountains. Waterfowl numbers were low likely because of mild conditions. Although White-winged Scoters were reported from all four regions, their numbers were well below those of the last two winters when many were forced south by the frozen Great Lakes (which remained open this winter). Few Surf Scoters were seen, while Black Scoter and Long-tailed Duck went unreported. Occurrences of the rarer loons and grebes were limited to West and Middle Tennessee. Most of the rarer gull sightings also occurred in West Tennessee.

A male Lesser Goldfinch in Lake County provided a first state record. Other rarity highlights included two Common Ground-Doves, a Black-chinned Hummingbird, two Ash-throated Flycatchers, a Townsend's Solitaire, a Snow Bunting, a trio of Smith's Longspurs and a Common Redpoll.

The mild conditions likely contributed to the number of notable lingering birds this winter, which included a Semipalmated Plover, a nighthawk species, a White-eyed Vireo, six Blue-gray Gnatcatchers, four Common Yellowthroats, a Chestnut-sided Warbler, a Yellow-throated Warbler and a Wilson's Warbler, two Lark Sparrows, four Summer Tanagers and two Baltimore Orioles. Also significant were the nearly two dozen reports statewide of Orange-crowned Warblers that totaled over 30 individuals, numbers that were well above average. Boreal irruptives were generally scarce overall, aside from a late surge of Pine Siskins.

Standard Abbreviations

ad - adult
CBC - Christmas Bird Count
Co - County
Cr - Creek
ers - earliest reported sighting
et al. - and others
fide - reported by
im - immature
L - Lake
lrs - latest reported sighting
max - maximum count
m.ob. - many observers
Mtn - Mountain
NWR - National Wildlife Refuge
R - River
SP - State Park
WMA - Wildlife Management Area

WESTERN COASTAL PLAIN REGION - - The winter season continued the trend of unseasonably higher temperatures. While November averaged nearly 5 degrees above normal, the December mean temperature was 10 degrees above historic norms. January proved the outlier, only 0.25 degree warmer than normal. February was 2.5 degrees above normal. Rainfall across the region for the period was slightly above historic totals. Each month this winter recorded an inch or more above average, bringing the total for the region well above the normal range of precipitation. January had the only snow event, with most of the region receiving little more than a dusting, while areas in the northwest had an inch or two.

The season produced a bonanza of unusual appearances. The list of rarities was highlighted by a state first Lesser Goldfinch in Lake County and a Townsend's Solitaire in Gibson County. Also notable were Snow Bunting and two records of Common Ground-Dove. It was a good winter for gulls, with a Black-legged Kittiwake, Little Gull at two sites, an Iceland Gull, Thayer's Gull at three sites, a Great Black-backed Gull, and a new state high count of Lesser Black-backed Gulls. Among irruptive species there were only two reports of Red-breasted Nuthatch; Purple Finches were found across the region, but their numbers were low in the aggregate. Pine Siskins made a late push, with many area feeders hosting good numbers in late January through February.

Goose - Eagle: **Cackling Goose**: 18 Jan (3) Herb Parsons L, Fayette Co (RH); 19 Jan (3) Navy L, Shelby Co (DDP); 20 Jan (2) Gibson Co L (MAG). **Mute Swan**: 20 Jan (1) Gibson Co L (MAG); 13 Feb (2) Lick Cr, Benton Co (RS, VS). **Tundra Swan**: 14 Dec (1) Tiger Tail Rd, Dyer Co (DDP). **White-winged Scoter**: 15 Jan (1) Paris Landing (MCT). **Common Goldeneye**: 16 Jan (1300) Paris Landing (RS, VS), max; 26 Jan (4) Coon Valley Rd, Tipton Co (DDP), rare in Co. **Common Merganser**: 13-18 Feb (30, including several males) Bennett's Cr and Britton Ford, Henry Co (RS, VS). **Red-throated Loon**: 19 Dec (1) Reelfoot CBC (MCT, Bob Foehring, Rick Shipkowski); 20 Dec - 16 Jan (1-2) Pace Point area (VS, RS). **Pacific Loon**: 20 Dec (7) Big Sandy CBC, ties the high count for the state; smaller numbers seen thru season in Pace Point area (RS, VS, MCT). **Red-necked Grebe**: 1 Dec (1) Reelfoot L (MAG). **Eared Grebe**: 23 / 25 Feb (1) Reelfoot L, Obion Co portion (MAG / RS, VS). **Western Grebe**: thru 27 Feb (1) Pace Point (RS et al.), continuing. **Great Egret**: found on CBCs at Memphis (2) and Reelfoot L (1). **Osprey**: 28 Dec (1) Shelby Farms (Ernie Restivo), lrs; 26 Feb (1) Pickwick Dam (RS), ers. **Red-tailed Hawk**: 25 Feb (1 Harlan's, 1 Krider's, and 1 *Calurus*) Bogota WMA, Dyer Co (RS, VS). **Rough-legged Hawk**: 26 Feb (1) Obion Co (MAG). **Golden Eagle**: 20 Dec (1) Reelfoot CBC; 12 Jan (3+ ad, 1 im) Big Sandy area (RS, MM), max; 25 Feb (1 ad) Bogota WMA, Dyer Co (RS, VS).

Crane - Merlin: **Sandhill Crane**: 1 Dec (91) Obion Co (MAG); 26 Dec (12) Haywood Co (Bob Ford); 26 Jan (165) near Trimble, Dyer Co (MAG). **Killdeer**: 12 Jan (853) South Fork, Forked Deer R Bottoms, Haywood Co (MAG), max. **Lesser Yellowlegs**: 20 Dec (1) Reelfoot CBC. **Wilson's Snipe**: 12 Jan (304) South Fork, Forked Deer R Bottoms, Haywood Co (MAG), max. **American Woodcock**: 23 Jan (6) Wolf River WMA (MGW, GP, MTOS). **Black-legged Kittiwake**: 1-21 Dec (1 im) Pickwick Dam (m.ob.), continuing from 30 Nov. **Little Gull**: 1 Dec / 23 Feb (1 im) Reelfoot L (MAG); 12 Dec (1 ad) Pickwick Dam

(MS, PDC, DSn). **Franklin's Gull**: 24 Dec (2) Lake Co (DDP), rare in winter. **ICELAND GULL**: 18 Feb (1 im) Paris Landing (MCT). **THAYER'S GULL**: 13 Dec (1 im) Pickwick Dam (MCT); 20 Dec (1) Big Sandy CBC (Bill Pulliam); 16 Jan (1 im) Eagle Cr (RS, VS). **Lesser Black-backed Gull**: 20 Dec (12) Big Sandy CBC, new high count for the state. **Great Black-backed Gull**: 20 Dec (1) Big Sandy CBC (WMP). **Forster's Tern**: 20 Dec (16) Big Sandy CBC, with smaller numbers seen thru mid Feb at Eagle Cr (TJW, RS, VS); 25 Feb (4) Reelfoot L (RS, VS). **Common Ground-Dove**: 19 Dec (1) near Tiptonville, Lake Co (MAG, RS, VS, m.ob.); 18 Feb (1) jct Hwy 104 and Hwy 412, Dyer Co (MAG). **Short-eared Owl**: 20 Dec (4) Reelfoot CBC; 23 Jan (1) Wolf River WMA (MGW, GP, MTOS); 5 Feb (1) Lake Co (Stanley York). **Nighthawk sp**: 20 Dec (1) Ensley, on Memphis CBC (RH), photo and video did not rule out Lesser Nighthawk. **Merlin**: 14 Dec (1) Moss Island WMA, Dyer Co (DDP); 18 Feb (1) Big Sandy Unit (MCT).

Flycatcher - Bunting: **Least Flycatcher**: 20 Dec (1) on Kentucky portion of Reelfoot CBC (Brainard Palmer-Ball et al.). **White-eyed Vireo**: 20 Dec (1) Chester Co (Ruth Carr, photo). **Blue-headed Vireo**: 19 Dec (7) Memphis CBC. **Fish Crow**: 5 Feb (1) Gibson Co (MCT, RS, VS). **Horned Lark**: 22 Jan (3000 +) Gibson Co, along a 15 mile section of Hwy 45W by-pass (MAG), during snowstorm, new high count in state. **Tree Swallow**: 24 Dec (15) Hatchie NWR, Haywood Co (fide Bob Ford); 25 Feb (several) Reelfoot L (RS, VS), ers. **Red-breasted Nuthatch**: 13 Jan (1) Gibson Co (MAG); 22 Jan (1) Munford (DDP); only reports. **House Wren**: found on CBCs at Memphis (1), Reelfoot (3), Big Sandy (1), and Jackson (1). **Marsh Wren**: 20 Dec (1) Reelfoot CBC; 23 Jan (1) Wolf River WMA (Allan Trently); 13 Feb (1) Ensley (DDP). **Blue-gray Gnatcatcher**: 20-21 Dec (1) Reelfoot CBC, on Kentucky portion (MAG). **TOWNSEND'S SOLITAIRE**: 4 / 6 Feb (1) near Gibson Co L (MAG). **Gray Catbird**: 19 Dec (1) Memphis CBC (Judy Dorsey, Steve Wagner). **Lapland Longspur**: 22 Jan (400 +) Gibson Co, along a 15 mile section of Hwy 45W by-pass (MAG). **SNOW BUNTING**: 22 Jan (1) Gibson Co (MAG), with larks and longspurs along Hwy 45W by-pass during snowstorm.

Warbler - Goldfinch: **Orange-crowned Warbler**: found on CBCs at Memphis (3), Reelfoot (10), Big Sandy (1), and Jackson (1); 6 Jan - 29 Feb (1, at feeder) Brunswick, Shelby Co (GP); 5 Feb (1) Gibson Co (MCT, RS, VS). **Common Yellowthroat**: 1 Dec (1) Fayette Co (RH); 20 Dec (1) Reelfoot CBC; 15 Feb (1) Tipton Co (DDP). **Palm Warbler**: 13 Feb (1) Henry Co (RS, VS). **American Tree Sparrow**: 22 Jan (1, at feeder) Munford (DDP). **Lark Sparrow**: 19 Jan (1) Gibson Co (MAG). **Le Conte's Sparrow**: 14 Feb (2) Shelby Farms (DDP). **Harris's Sparrow**: 18 Dec (1 ad) Fayette Co CBC (RH, DDP, Judy Dorsey, Van Harris); 21 Dec (1 im) south of Ridgely, Lake Co (MAG). **Western Meadowlark**: 30 Jan (1) Shelby Farms (MGW, Jim Waldron). **Yellow-headed Blackbird**: 26 Jan (1 im male) near Trimble, Dyer Co (MAG); 8 Feb (1) Ensley (VS). **Brewer's Blackbird**: 13 Feb (2) Henry Co (RS, VS). **Baltimore Oriole**: 30 Jan (1, at feeder) Memphis (Marianne Wilson, photo). **Pine Siskin**: 16 Jan (125) Eagle Cr (RS, VS); 25 Feb (194, at feeder) Munford (DDP); max. **LESSER GOLDFINCH**: 5-6 Jan (1 male) Airpark Campground, Lake Co (MAG, photo), first state record.

Locations: Big Sandy - unit of Tennessee NWR, Henry Co; Eagle Cr - Henry Co; Ensley

- Shelby Co; Munford - Tipton Co; Pace Point - Henry Co; Paris Landing - Henry Co; Pickwick Dam - Hardin Co; Reelfoot L - Lake and Obion Cos; Shelby Farms - Shelby Co; Wolf River WMA - Fayette Co.

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HIGHLAND RIM AND BASIN REGION - - Weather in December in Middle Tennessee was very warm; on average temperatures were 12.7 degrees above normal. Rainfall for the month was slightly above normal. January weather had temperatures that were slightly below normal and rainfall 1.5 inches below normal. Also in January, Nashville and areas to the north received at least 8 inches of snow on 22 January. Other areas around the region had less. February temperatures and rainfall were both slightly above normal, while snowfall amounts averaged about 2 inches.

The winter season in Middle Tennessee produced a variety of highlights, including Surf and White-winged Scoter, Red-throated and Pacific Loon, Black-chinned Hummingbird, Ash-throated Flycatcher, Smith's Longspur, Wilson's Warbler, American Tree Sparrow, Summer Tanager, and Common Redpoll.

Waterfowl: **Greater White-fronted Goose**: 12 Dec (450) Duck R Unit (RS); 17 Dec (11) Lawrence Co (DJS); 19 Feb (500) Cross Cr NWR (Robert Wheat); 19 Feb (7) Eagleville (Nancy Robb); 23 Feb (6) Lexus Pond, Putnam Co (SJS); 27 Feb (115) Montgomery Co (JH). **Snow Goose**: 1 Dec (201) Tennessee R, Perry Co (RS, AT); 9 Dec (1) Bedford Co (DSn); 12 Dec (29) Duck R Unit (RS); 17 Dec (3) Lawrence Co (DJS); 30 Dec (1) Montgomery Co (JH); 19 Jan (1) L Karen, Warren Co (SNM); 13 Feb (13) Eagleville (Karen Gill); 13 Feb (2) White Co (Doug Downs); 23 Feb (2) Lexus Pond, Putnam Co (SJS). **Ross's Goose**: 1 Dec (13) Tennessee R, Perry Co (RS, AT); 12 Dec (11) Duck R Unit (RS); 17 Dec (2) Lawrence Co (DJS); 31 Dec - 1 Jan (1) DeKalb Co (RS / VS, AT); 2-6 Jan (2) Eagleville (Kristy Baker, Stephen Zipperer, Nancy Robb, Josh Stevenson); 2-19 Jan (1-2) Montgomery Co (JH); 28 Jan (1) Savannah Bottoms (DJS); 2 Feb (15) Lick Cr embayment, Perry Co (RS); 7-9 Feb (1) Coleman Pond (Jim Arnett, MS, PDC); 12 Feb (2) Percy Priest L, Rutherford Co (RHC); 12 Feb (25) Duck R Unit (CW); 14 Feb (2) Coffee Co (BD); 19 Feb (2) Rock Island, Warren Co (RS); 19 Feb (2) DeKalb Co (RS); 25 Feb (1) Williamson Co (CA). **Cackling Goose**: 12 Dec / 12 Feb (65 / 75) Duck R Unit (RS / CW); 1-11 Feb (1) Shelby Bottoms (FF, PDC); 7-8 Feb (1) Coleman Pond (MS). **Mute Swan**: 19-20 Jan (1) Swan Pond, Dunbar Cave SP, Montgomery Co (JH, m.ob.); 28 Jan (2) Carbondale slough, Montgomery Co (Stanley York); 5 / 18 Feb (2) Cross Cr NWR (Robert Wheat); 7 Feb (2) Leatherwood Bay, Stewart Co (VS). **American Black Duck**: 18 Feb (126) Duck R Unit (Robert Wheat), max. **Blue-winged Teal**: 12-16 Feb (1) marsh on Walter S. Davis Blvd, Nashville (FF, m.ob.), ers; 19 Feb (1) DeKalb Co (RS). **Canvasback**: 16 Feb (35) Lick Cr embayment, Perry Co (RS), max. **Redhead**: 17 Feb (48) Rock Island, Warren Co (RS), max. **Surf Scoter**: 1-2 Dec (2-7) Old Hickory L, Davidson / Sumner Cos (MM, PDC, MS); 26 Dec (1) Tennessee R, on Perry Co CBC (fide RS). **White-winged Scoter**: 12 Feb (1) Duck R Unit (CW). **Common Merganser**:

25 Jan (1 female) Defeated Cr Rec Area, Cordell Hull L, Smith Co (CA); 7-18 Feb (1 female) Coleman Pond (MS, m.ob.). **Red-breasted Merganser**: 1 Dec (252) Tennessee R, Perry Co (RS, AT), max.

Loon - Eagle: **Red-throated Loon**: 1 Dec (1) Tennessee R, Perry Co (RS, AT), first Co record; 24 Dec into Mar (1) Percy Priest L, Davidson Co (RHC, m.ob.); 6 / 26 Feb (1 ad) Bruton Branch, Pickwick L, Hardin Co (RS). **Pacific Loon**: 24 Dec - 17 Jan (1) Percy Priest L, Davidson Co (RHC, Jan Shaw, m.ob.). **Red-necked Grebe**: 16 Feb (1) Woods Reservoir, Franklin Co (VS). **Eared Grebe**: 16 Feb (1) Woods Reservoir, Franklin Co (VS). **American White Pelican**: 1 Dec (30) Tennessee R, Perry Co (RS, AT); 2 Jan / 29 Feb (37 / 103) Dyson's Ditch Refuge, Cheatham Co (MS / FF); 6 Jan / 4 Feb (200 / 342) Fall Cr Rec Area, Percy Priest L, Rutherford Co (RHC); 17 Jan (50) Barkley WMA, Stewart Co (Barbara Wilbur). **Great Egret**: 28 Dec (8) Sumner Co (RDH, DMy); 1 Feb (1) Duck R Unit (RS); 1 Feb (1) Drake's Cr, Old Hickory L, Sumner Co (Allison Salas); 22 Feb (1) Shelby Park and Bottoms (PDC). **Osprey**: 8 Dec (1) Tims Ford L, Franklin Co (DSn). **Red-tailed Hawk**: 12 Dec (1, dark morph *calurus*) Robertson Co (TL, Jan Shaw), same site as one on 29 Dec 2014 (TL); 13 Feb (1, "Krider's") Duck R Unit (CW). **Golden Eagle**: 12 Dec / 13 Feb (1 im) Duck R Unit (RS / CW); 18 Dec - 28 Jan (1 ad) Savannah Bottoms (RS, DJS); 2 Jan (1) Harrison Ferry Mtn, Warren Co CBC (NPM, SNM) first Co record; 2 / 16 Feb (1) Perry Co (RS).

Rail - Falcon: **Virginia Rail**: 18 Dec (1) Savannah Bottoms (RS); 19 Dec (2) White Co CBC (Ed LeGrand). **Sandhill Crane**: 2 Dec (29) Fort Campbell (DMo); 19 Dec (30) Sumner Co (MS); 27 Dec (55) Williamson Co (Melinda Welton); 27 Dec (225, at roost) Coffee Co (SNM); 2 Jan (60) Rutherford Co (Kristy Baker); 6 Jan / 4 Feb (41 / 30) Percy Priest L, Rutherford Co (RHC); 8 Feb (625) White Co (Doug Downs); 16 Feb (350) DeKalb Co (Carol Williams); 18 Feb (200) Putnam Co (Carol Williams); 18 Feb (60) Wilson Co (Greg Tomerlin); 18 Feb (300) Dekalb Co (Judy Fuson). **Semipalmated Plover**: 11 Jan (1) Shutes Branch Rec Area, Old Hickory L, Wilson Co (Ann Shapiro, photo), one of few winter records in state. **Greater Yellowlegs**: 18 Feb (1) Liberty Park and Marina, Montgomery Co (JH), ers. **Least Sandpiper**: 10 Dec (2) Estil Springs, Franklin Co (DSn); 8-9 Jan (6-9) Wilson Co (Stephen Zipperer, CA). **American Woodcock**: 26 Feb (8) Fort Campbell (DMo), max. **Bonaparte's Gull**: 20 Feb (400) Percy Priest Dam, Davidson Co (PDC, MS), max. **Forster's Tern**: 12 Dec (5) Duck R Unit (RS). **Barn Owl**: 8 Dec (1) Williamson Co (RS); 11 / 16 Jan (1) Duck R Unit (Clayton Ferrell / RS). **Black-chinned Hummingbird**: 12 Dec (1 im female, banded) Montgomery Co (Cyndi Routledge). **Rufous Hummingbird**: 3-5 Feb (1) Williamson Co (VS). **Merlin**: 9 Dec (1) Bedford Co (DSn); 18 Dec (1) Savannah Bottoms (RS); 1 Jan (1) Lincoln Co (Evan Buck); 27 Feb (1) Smith Co (CA); thru season (1) Anderson Rd Rec Area, Davidson Co (m.ob.), regular wintering site. **Peregrine Falcon**: 16 Jan (1) Robertson Co (TL et al.).

Flycatcher - Longspur: **ASH-THROATED FLYCATCHER**: 2-16 Jan (1) Dunbar Cave SP annex property, Montgomery Co (Steve Hamilton, Debbie Hamilton, m.ob., photo). **Loggerhead Shrike**: 20 / 22 Feb (1 each) DeKalb Co, separate sites (John Foster / RS). **Blue-headed Vireo**: 18 Feb (1) Cross Cr NWR (Megan Hart). **Horned Lark**: 5 Dec (100) Robertson Co (TL). **Brown-headed Nuthatch**: 17 Dec (1) Lawrence Co, Buffalo R CBC (Bill Pulliam). **House Wren**: found on CBCs at Nashville (1), Hickory-Priest (1), Cookeville

(2), White Co (4), Duck R Unit (1), Buffalo R (1), and Savannah (1). **Sedge Wren**: 26 Dec (5) Perry Co CBC (RS). **Blue-gray Gnatcatcher**: 29 Dec (1) Old Hickory Dam, Davidson Co (FF); 2 Jan (1) Duck R Unit CBC (AT). **Gray Catbird**: 16 Jan (1) Bells Bend (Michael Doss); 24 Jan (1) Lincoln Co (RDH, DMy). **Lapland Longspur**: 2 / 6 Dec (2 / 1) Fort Campbell (DMo); 2 Dec (1) Old Hickory L, Davidson Co (VS); 5 / 12 Dec (100 / 200) Robertson Co (TL); 23 Dec (6) Perry Co (RS). **Smith's Longspur**: 2 Dec (3) Fort Campbell (DMo).

Warbler - Redpoll: **Orange-crowned Warbler**: 6 Dec (1) Harpeth R Greenway, Davidson Co (FF); 12 Dec (1) Duck R Unit (RS); 14 Dec / 29 Feb (1) Old Hickory Dam, Davidson Co (PDC); 23 Dec (1) Shelby Park and Bottoms (Scott Duncan); 4 Jan (1) tailwater campground, Pickwick Dam, Hardin Co (RS, VS); 29 Jan (1) Cedar Cr, Old Hickory L, Wilson Co (CA). **Palm Warbler**: 12 Dec (1) Duck R Unit (RS); 15 Dec (1) Bell's Bend (FF); 27 Dec (1) Rutherford Co (Greg Tomerlin); 7 / 16 Jan (6 / 5) Montgomery Co (Stanley York / JH); 2 Jan (2) Warren Co CBC (SNM, NPM); 14 Jan (5) Savannah Bottoms (DJS); 16 Jan (9) Cheatham Co (MS, FF); 6 Feb (1) Shelby Park and Bottoms (MS, PDC); 18 Feb (1) Cross Cr NWR (Megan Hart). **Wilson's Warbler**: 6 Dec (1 male) Harpeth R Greenway, Davidson Co (FF). **American Tree Sparrow**: 29 Dec (1) Sumner Co (RDH, DMy); 23-25 Jan (1) Bellevue, Davidson Co (FF); 9 Feb (1) Fort Campbell (DMo). **Vesper Sparrow**: 22 Dec (2) Fort Campbell (DMo); 1 Feb (1) Duck R Unit (RS). **Le Conte's Sparrow**: 5 Dec (1) Shelton Ferry WMA, Montgomery Co (JH); 14 Dec (1) Shipley Farm, Tennessee Tech, Putnam Co (SJS). **Summer Tanager**: 4-20 Dec (1) Mt. Juliet, Wilson Co (Pam Haas); 23 Jan (1) Tullahoma, Coffee Co (Chris Myers, photo); 23 Jan (1) Clarksville (Michelle Rogers, photo). **Rusty Blackbird**: 19 Dec (20) White Co (Doug Downs); 22 Feb (32) Fort Campbell (DMo), max. **Brewer's Blackbird**: 4 Feb (7 females) Warren Co (SNM). **Purple Finch**: 22 Jan (16, at feeder) Warren Co (SNM, NPM), max. **Common Redpoll**: 10-23 Jan (1, at feeder) Clarksville (Rick Shipkowski, DMo, m.ob.).

Locations: Bell's Bend - Davidson Co; Coleman Pond - Davidson Co; Cross Cr NWR - Stewart Co; Duck R Unit - Humphreys Co; Eagleville - Rutherford Co; Fort Campbell - Montgomery Co; Savannah Bottoms - Hardin Co; Shelby Park and Bottoms - Davidson Co.

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CUMBERLAND PLATEAU / RIDGE and VALLEY REGION - - This winter was generally mild, especially compared to the last two. Indeed, December was the warmest on record in the Tri-cities region, with temperatures more than 12 degrees above average. Temperatures in January and February varied only slightly from normal. For the season as a whole, precipitation varied from a couple inches above average in the Tri-cities to more than six inches above normal at Chattanooga. On 20 and 22 January the Tri-cities area experienced two snow events of 5-6 inches each; this snow cover lasted a week. Early February had three light, short-lived snowfalls.

Waterfowl numbers were generally low, but sightings of Tundra Swan, Surf Scoter, White-winged Scoter, and Common Merganser were notable. Numbers of Sandhill Cranes at

Hiwassee Refuge were low. A total of 2,480 on the CBC there was well below the recent norm of 8-10 thousand. The corn crop on the refuge was consumed by cranes earlier than usual this winter, but other possible causes for the low numbers include the mild winter and recent hunting pressure. A Killdeer nest with four eggs on 8 January was exceptionally early. A Black-legged Kittiwake and Great Black-backed Gull were noteworthy. Passerines were highlighted by an Ash-throated Flycatcher at Chattanooga and the state's first winter record of a Chestnut-sided Warbler in Knox County. Also notable for lingering were Blue-gray Gnatcatcher, Gray Catbird, Yellow-throated Warbler, Summer Tanager and Baltimore Oriole. An above average number of Orange-crowned Warblers was found this winter. The approach of spring was heralded by the arrival of a Purple Martin and several Tree Swallows in late February. Boreal irruptives were scarce this winter.

Waterfowl: **Greater White-fronted Goose**: 26-28 Dec / 3 Feb (3) Sevier Co (KW); 14-17 Feb (2-10) Hiwassee Refuge (Libby Wolf, CM); 21 Feb (2) John Sevier L, Hawkins Co (SHu); 21-28 Feb (2) near Boone L (PGR, m.ob.). **Snow Goose**: 5 Dec (1) Steele Cr Park, Sullivan Co (Larry McDaniel) ; 6 Dec / 3 Feb (7 / 1) Hiwassee Refuge (CM); 10 Dec (2) Hancock Co (RDH, DMy); 10 Dec (1 blue) Grundy Co (BD); 16-17 Jan (1) Lamar, Washington Co (JHM, m.ob.); 22 Feb (80) Marion Co (TLR). **Ross's Goose**: 6 Dec / 14-15 Feb (1 / 5) Hiwassee Refuge (CM / Libby Wolf, CM); 7 Dec (1) Chickamauga Dam (BD); 25 Jan / 11 Feb (1) Hamilton Co (BD); 31 Jan (1) Hitch Pond, Blount Co (RDH, DMy). **Tundra Swan**: 20 Feb - 1 Mar (1) John Sevier L, Hawkins Co (SHu). **Blue-winged Teal**: 25 Feb (1 male) Boone L (RLK), ers. **Redhead**: 2 Dec (44) Boone L (RLK); 10 Dec (37) Grundy Co (BD); 18 Feb (105) Eagle Bend Fish Hatchery, Anderson Co (RDH, DMy). **Greater Scaup**: 2 Dec (2) Boone L (RLK). **Surf Scoter**: 13-16 Jan (1) Chickamauga L (BD, m.ob.). **White-winged Scoter**: 31 Jan (3, 2 of which shot by hunters) Fort Loudoun L (RDH, DMy), (1) 7 / 26 Feb (Chris Welsh / MM); 22 Feb - 9 Mar (2) Warrior's Path SP, Sullivan Co (Gary Bailey, m.ob.); 24-25 Feb (1) Chickamauga L (BD). **Common Merganser**: 2 Dec thru Feb (1-3 males, 2-5 females) Beaver Cr, Sullivan Co (RLK, RRK, m.ob.); 10 Jan (1 female) Meigs Co (David Chaffin); 14 Feb (5) Holston R, Hawkins Co (SHu).

Loon - Gull: **Common Loon**: 1 Dec (52) Fort Patrick Henry L, Sullivan Co (GDE). **Horned Grebe**: 6 Feb (500 +) Cherokee L, Grainger and Jefferson Cos (KDE), max. **American White Pelican**: 9 Dec thru Feb (max 85 on 31 Jan) Hiwassee Refuge (CM, m.ob.). **Great Egret**: found on CBCs at Knoxville (3), Chattanooga (1), Hiwassee (15), and Nickajack (1); continuing trend of winter occurrences. **Black-crowned Night-Heron**: 14 Jan (1 ad, 1 im) Brainerd Levee, Hamilton Co (Rick Houlk), rare in SE TN. **Osprey**: 2 Jan (1) Knoxville CBC. **Golden Eagle**: 2-15 Jan (1 ad) Hiwassee Refuge (David Chaffin, Rick Houlk). **Virginia Rail**: thru season (1-2) Standifer Gap Marsh (fide Kevin Calhoon); 27 Feb (1) UT Plant Science Farm, Knox Co (MM et al.). **Sora**: 31 Dec (2) Standifer Gap Marsh (Daniel Estabrooks, Bates Estabrooks). **Sandhill Crane**: 21 Feb (2) Kingsport (RAP et al.); 28 Feb (1) Washington Co (JDA); east of usual migration corridor. **Whooping Crane**: 19 / 30 Jan (1) Hiwassee Refuge (CM). **Killdeer**: 8 Jan (female at active nest with 4 eggs) west Knoxville (Mark Campen). **Dunlin**: 2 Jan (11) Hiwassee CBC. **Least Sandpiper**: 2 Jan (22) Hiwassee CBC. **Black-legged Kittiwake**: 16 Jan (1 im) Ijams Nature Center, Knox Co

(KBr). **Lesser Black-backed Gull**: 19 / 21 Dec and 28 Jan (1 ad) Fort Loudoun L, Blount and Knox Cos (Marcia Davis, MM). **Great Black-backed Gull**: 15 Feb (1 im) Fort Loudoun L (Warren Bielenberg, photo).

Dove - Catbird: **Eurasian Collared-Dove**: 11 Jan (15) Limestone, Washington Co (RRK, JDA), large number for NE TN. **Rufous Hummingbird**: few reports this winter, with 1 banded in Knoxvlle and 1 recaptured in Clinton, Anderson Co (fide Mark Armstrong). **Merlin**: 19 Feb (1) Hiwassee Refuge (TLR); 24 Feb (1) Standifer Gap Marsh (Hugh Barger). **Peregrine Falcon**: 2 Dec (1) Johnson City (FJA); 10 Dec (1) Limestone (GDE, PGR, RAP); 16 Jan / 7 Feb (1) Limestone (RLK); 3 Feb (1) downtown Kingsport (FRC). **ASH-THROATED FLYCATCHER**: 7-15 Jan (1) Chattanooga (Phil Thatch, m.ob., photo). **Loggerhead Shrike**: 16 Jan (1) Washington Co (RLK et al.); 27 Feb (1) Jefferson Co (KDE). **Blue-headed Vireo**: 19 Feb (1) Marion Co (TLR). **Common Raven**: 18 Dec (1) Kingsport (FRC); 3 Jan (1) Phipps Bend, Hawkins Co (RAP); 4 Jan (1) Johnson City (RLK); 5 Jan (2) Mosheim, Greene Co (Nata Jackson); 31 Jan (2) Limestone (RLK); 3 Feb (2, carrying nest material) Bristol Motor Speedway, Sullivan Co (Michele Sparks), have nested here 2 of last 3 years. **Purple Martin**: 28 Feb (1) Washington Co (JDA), ers. **Tree Swallow**: 20 Feb (22+) Kingsport (RLK et al.); 20 Feb (6) Fort Loudoun L (Marcia Davis); 20 Feb (4) Hiwassee Refuge (David Spicer); ers. **Red-breasted Nuthatch**: 17 Jan (1) Hamilton Co (TLR), only report. **House Wren**: found on CBCs at Kingsport, Hiwassee, and Nickajack (1 each); 17 Jan (1) Washington Co (RLK). **Blue-gray Gnatcatcher**: 19 Dec (2) Standifer Gap Marsh and Chester Frost Park, Chattanooga CBC; 31 Dec (1) Standifer Gap Marsh (Daniel Estabrooks, Bates Estabrooks). **Gray Catbird**: 22 Dec (1) Crossville CBC; 2 Jan (1) Bradley Co (David Chaffin).

Warbler - Siskin: **Orange-crowned Warbler**: found on CBCs at Knoxville (2), Chattanooga (1), and Hiwassee (2); 5 Jan (1) Standifer Gap Marsh (Hugh Barger et al.); 9 Jan (1) Chattanooga (David Spicer); 16 Jan (1) Bowmantown, Washington Co (RLK et al.), first winter record in Co; 27 Jan (1) Knoxville (KDE); 29 Jan / 4 Feb (1) Kingsport (RLK / PGR), second winter record in Co. **Common Yellowthroat**: 6 Dec (1 female) Seven Islands SP, Knox Co (Jason Struner); 26 Dec (1) Kingsport CBC. **Chestnut-sided Warbler**: 18 Nov / 4 Dec (1 female) Forks of the River WMA, Knox Co (Jason Sturner), first winter record in state. **Palm Warbler**: found on CBCs at Knoxville (17), Norris (1) Chattanooga (8), and Hiwassee (6); 1 Jan (2) Limestone (RLK); 3 Jan (1) Paddle Cr, Sullivan Co (RLK). **Pine Warbler**: 27 Dec (1) Steele Cr Park, Sullivan Co (RLK, RRK), on Bristol CBC. **Yellow-throated Warbler**: 12 Dec into Jan (1) The Cove, Knox Co (Colin Sumrall, photo, m.ob.). **American Tree Sparrow**: 2 Jan (1) Tasso Rd, Bradley Co (David Chaffin), rare in SE TN. **Vesper Sparrow**: found on CBCs at Hiwassee (3) and Nickajack (2); 13-18 Jan (1) Johnson City (Larry McDaniel). **Lark Sparrow**: 16-25 Jan (1) Chattanooga (BD, m.ob.), few winter records in region. **Savannah Sparrow**: 24 Jan (34) Bowmantown, Washington Co (RLK), concentrated by snow cover, good winter number in NE TN. **Summer Tanager**: 5 Jan (1, at feeder) Hixson, Hamilton Co (Laura Wood, photo). **Baltimore Oriole**: 22 Jan into Apr (1 female) Sevierville, Sevier Co (Chris Myers, photo). **Purple Finch**: few, scattered reports. **Pine Siskin**: few, scattered reports; 6 Feb (160) Marion Co (TLR), max.

Locations: Boone L - Sullivan and Washington Cos; Chickamauga L - Hamilton Co; Fort Loudoun L - Blount Co (unless specified otherwise); Hiwassee Refuge - Meigs Co; Kingsport - Sullivan Co; Limestone - Washington Co; Standifer Gap Marsh - Hamilton Co.

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EASTERN MOUNTAIN REGION - - It was an unusually warm December. Average temperatures at lower elevations were nearly 13 degrees above normal. Precipitation was almost 2 inches above normal in December. January was cold with average temperatures about 3 degrees below normal. January had the most snow for the period, but with the total a little below normal. February temperatures were normal and precipitation was an inch above normal.

Waterfowl: **Snow Goose**: 15 Feb (1) Fishery Park, Unicoi Co (Bryan Stevens). **Blue-winged Teal**: 19 Dec (5) Watauga L (Joe McGuiness et al.), Elizabethton CBC. **Northern Pintail**: 10 Jan (4) South Holston L (Richard Lewis, FRC). **Redhead**: 1 Dec (35) South Holston L (Mike Sanders); 19 Jan - 19 Feb (max 20) South Holston R weir (RLK, m.ob.); 31 Jan (6) Fishery Park, Unicoi Co (Joe McGuiness). **Greater Scaup**: 19 Dec (2) Watauga L (GDE, RRK, PGR), on Elizabethton CBC; 11 Feb (1) South Holston L (RRK et al.); 13 Feb (1) South Holston R weir (SHu). **White-winged Scoter**: 19-21 Jan (1) Wilbur L, Carter Co (KBr, m.ob.). **Bufflehead**: 9 Jan (210) Wilbur L, Carter Co (RLK), max. **Common Goldeneye**: 2-8 Dec (1 male) South Holston R weir (RLK, m.ob.), only report. **Ruddy Duck**: 1 Dec (56) South Holston L (Mike Sanders), max.

Grebe - Falcon: **Horned Grebe**: 9 Jan (43) Watauga L, Johnson Co portion (RLK), max. **Eared Grebe**: 27 Dec into Mar (1) South Holston L (RLK, RRK, m.ob.). **Sandhill Crane**: 17-20 Feb (4) South Holston L (RLK, m.ob.). **Greater Yellowlegs**: 19 Dec (1) Parksville L, Polk Co (Rick Houlk). **Short-eared Owl**: 7-18 Jan (1) Cades Cove, GSMNP (KW, m.ob.). **Peregrine Falcon**: 20 Dec (1) Roan Mtn village (FJA, KBr et al.), Roan Mtn CBC; 28 Feb (1) Alum Cave Bluff, GSMNP (Evan Buck).

Shrike - Siskin: **Loggerhead Shrike**: 11 / 23 Feb (1) Holston Valley, Sullivan Co (RRK et al.). **Tree Swallow**: 21 Feb (1) South Holston L (FRC), ers. **Gray Catbird**: 20 Dec (1) near Roan Mtn village (FJA, KBr et al.), Roan Mtn CBC. **Palm Warbler**: 13 Dec (1) Cades Cove, GSMNP (Jason Sturner); 19 Dec (3) Elizabethton CBC (Tom McNeil). **Pine Warbler**: 19 Feb (1) South Holston L (RRK et al.), ers. **Fox Sparrow**: 2 Jan (11, all in one tree) Orchard Bog, Shady Valley, Johnson Co (Richard Lewis, FRC), on CBC, max. **Purple Finch**: scarce this winter. **Pine Siskin**: 3 Jan (90+) Roan Mtn (RLK).

Locations: GSMNP - Great Smoky Mtn National Park; Roan Mtn - Carter Co; South Holston L - Sullivan Co; South Holston R weir - Sullivan Co; Watauga L - Carter Co (unless specified otherwise).

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GDE - Glen D. Eller
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MAG - Mark A. Greene
JH - Joe Hall
RH - Rob Harbin
RDH - Ron D. Hoff
SHu - Susan Hubley
RLK - Richard L. Knight
RRK - Roy R. Knispel
TL - Tony Lance
MM - Morton Massey
JHM - Joe H. McGuiness
NPM - N.P. "Mac" McWhirter
SNM - Susan N. McWhirter
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PGR - Peter G. Range
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VS - Victor Stoll
MCT - Michael C. Todd
AT - Alan Troyer
MGW - Martha G. Waldron
CW - Chloe Walker
KW - Keith Watson

MTOS - Memphis Chapter

INSTRUCTIONS TO AUTHORS

The Migrant records observations and studies of birds in Tennessee and adjacent areas.

SUBMISSIONS: The manuscript should be submitted electronically to Bob Ford at editorthemigrant@gmail.com. Submission of hard copies is optional. If so desired the original and two copies of the manuscript should be sent to the: Editor: Bob Ford, 808 Hatchie, Brownsville, TN 38012 editorthemigrant@gmail.com. Manuscripts that have been published in other journals should not be submitted.

MATERIAL: The subject matter should relate to some phase of Tennessee ornithology. It should be original, factual, concise and scientifically accurate.

STYLE: Both articles and short notes are solicited; recent issues of *The Migrant* should be used as a guide in the preparation of manuscripts. Where more detail is needed, reference should be made to *Scientific Style and Format*, eighth edition, by the Council of Science Editors, councilscienceeditors.org.

COPY: Manuscripts should be double-spaced with adequate margins for editorial notations and emailed in Word.docx. Tables and figures should be prepared in a separate file with appropriate headings; see *Scientific Style and Format* for examples of appropriate form for tables. Photographs intended for reproduction should be at least 300 dpi or sharp with good contrast on glossy white paper. Weights, measurements, and distances should be in metric units. Dates should be in "continental" form (e.g., 16 March 1997). Use the 24-hour clock (e.g., 0500 or 1900).

NOMENCLATURE: The scientific name of a species should be given after the first use of the full common name in the text. The scientific name should be italicized and in parentheses. Names should follow the *A. O. U. Check-list of North American Birds* (seventh edition, 1998, or supplements).

TITLE: The title should be concise, specific and descriptive.

ABSTRACT: Manuscripts of five or more pages should include an abstract. The abstract should be less then 5% of the length of the manuscript. It should include a brief explanation of why the research was done, the major results, and why the results are important.

LITERATURE CITED: List all literature citations in a "Literature Cited" section at the end of the text. Text citations should include the author and year.

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