

**SUMMARY OF OBSERVATIONS OF CERULEAN WARBLERS IN THE
EFFIGY MOUNDS/YELLOW RIVER BIRD CONSERVATION AREA OF
NORTHEAST IOWA 2010-2013**

Submitted to:

- **Iowa Ornithologist Union**

Cooperating Agencies and Organizations

- **Iowa Department of Natural Resources, Yellow River State Forest**
- **U. S. Fish & Wildlife Service, Upper Mississippi River Refuge, McGregor District**
- **U.S. Army Corps of Engineers Natural Resources Section, St Paul District**
- **Effigy Mounds National Monument**
- **Quad Cities, Cedar Rapids, Des Moines, and Upper Iowa Audubon Chapters**

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Field work was conducted by:

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- Darwin Koenig, long-time Iowa Birder
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Mapping of the bird monitoring points and Cerulean Warbler locations

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This report was written by Jon Stravers.

OBJECTIVES

To provide data that helps to complete baseline information and helps to build a data base on breeding bird populations within Effigy Mounds/Yellow River State Forest Bird Conservation Area, with special emphasis on Cerulean Warblers and other neo-tropical migrant birds on the list of Species of Greatest Conservation Concern.

To correlate previous and current forest management practices with current bird survey information in attempt to develop a better understanding of the best possible forest management for species on the list of Greatest Conservation Concern such as Cerulean Warblers.

JUSTIFICATION

Cerulean Warblers inhabit large tracts of mature deciduous forests, often associated with steep valley slopes or floodplain forests (Hamel 2000). This species is considered one of rarest nesting warblers in Iowa (Kent & Dinsmore 1996; Jackson et al 1996), and their populations have declined in the last two decades throughout much of their North American range (Hamel 2000). Ceruleans are listed as the highest priority for land birds conservation in the U.S. on the national watch list based on Partners in Flight prioritization scores (Rosenburg et al 2000; U.S. Fish & Wildlife Service 2007 & 2008).

NOTE FOR 2013

This report for 2013 is part of an on-going study. This report is intended to be an update rather than a final report. Rich King and the staff at the McGregor District Fish & Wildlife Service are still doing additional analysis of Cerulean Warbler data, and the staff at Effigy Mounds is still in the process of mapping current Cerulean locations. In 2013 we did not conduct investigations within Bloody Run County Conservation Campground and the Bloody Run Wildlife Management Area as we did in previous years. We intend to collect additional data throughout the BCA in 2014, including along Bloody Run Creek. We also intend to continue our analysis of the Cerulean Warbler data collected and at some point produce a more thorough report.

PROJECT HISTORY

The Effigy Mounds/Yellow River Forest Bird Conservation Area in northeast Iowa (BCA) represents one of the largest blocks of protected land in the state of Iowa. It includes Effigy Mounds National Monument, Yellow River State Forest, portions of the Upper Mississippi River National Fish and Wildlife Refuge, the Bloody Run and Sny Magill Wildlife Management Areas, and Pikes Peak State Park. Together these various tracts provide some of the best large block forest habitat birds in the Upper Midwest Region.

We have been collecting information on Red-shouldered Hawks within this region since 1982, and we have been collecting information on other bird species of special interest in various parts of the BCA ever since the area was first designated as Bird Conservation Area by the Wildlife Diversity Section of the Iowa Department Natural Resources in 2003. Bird monitoring efforts increased in 2006 and 2007 when the Wildlife Division of Iowa Department of Natural Resources sponsored bird surveys in some locations within the Sny Magill and North Cedar and the Lansing Wildlife Management Units. This effort increased in 2009 when Yellow River State Forest began sponsoring bird surveys. The effort increased again in 2010 when Effigy Mounds National Monument, the U.S. Army Corps of Engineers Mississippi River Project Natural Resources Division, and the U.S. Fish and Wildlife Service all sponsored similar surveys in each of their respective portions of the BCA. These surveys have continued each year since then.

Our initial surveys documented a few pockets of Cerulean Warbler activity. However, it was only after the 2010 and 2011 results that we realized that Ceruleans were perhaps much more common within the BCA than previously expected. In 2010 we found Cerulean Warblers in 32 of 78 points surveyed. This included Effigy Mounds National Monument where we found Ceruleans in 19 of 46 survey points, Yellow River State Forest where we found Ceruleans in 7 of 14 survey points, and the Sny Magill complex along the Mississippi River where we found Ceruleans in 6 of 8 survey points (Stravers & Koenig 2010). It should be noted that this data reflects the number of points that Ceruleans were found; the actual number of Ceruleans observed is higher since many points had multiple Ceruleans.

In 2011 we found Ceruleans in 52 of 102 points surveyed. In Effigy Mounds National Monument we found Ceruleans in 24 of 49 survey points. In Yellow River State Forest we found Ceruleans in 17 of 27 survey points, and in sites along the Mississippi River we found Ceruleans at 11 of 26 points (Stravers 2011 reports to IDNR, USF&WS, USCOE, Effigy Mounds National Monument).

These on-going surveys helped to define some of the pockets of Cerulean activity; however all of the survey work prior to 2012 was conducted using point count surveys, with some inter-point observations when those inter-points were directly associated with the point counts. With additional support from the Iowa Ornithologists Union in 2012 and again in 2013 we used a variety of additional techniques such as transect searches and specific location searches to help define the specific number of Cerulean Warblers that made up the various pockets or clusters.

It may be of interest that 95% of the Red-shouldered Hawk nesting territories we have been monitoring in this region since 1982 are currently occupied by Cerulean Warblers as well.

METHODS

We conducted observations on Cerulean Warblers within the BCA of northeast Iowa on 41 mornings and also 10 evenings between May 10 and July 3 in 2013. We conducted ten minute point count surveys for birds at various locations within the BCA during the breeding season, including points within Yellow River State Forest, and the Upper Mississippi River Fish & Wildlife Refuge, and Effigy Mounds National Monument (National Park Service). We also conducted transect searches and specific location searches and 5 minute listening periods for Cerulean Warblers within each of these mentioned study areas and at locations within the Sny Magill/North Cedar Wildlife Unit, Pikes Peak State Park, and a few locations on private property within the BCA of northeast Iowa. Bird survey points were chosen so that a variety of forest habitats were represented. Selection of points was also influenced by the amount of time required to access each point.

At each of the bird point surveys we recorded all birds seen and heard within a ten minute time period using the standard point count procedures suggested by Bibby et al (1992). We divided the time period into 3 time frames: the first 3 minutes, the middle 2 minutes, and the last 5 minutes. Observations were conducted between thirty minutes before sunrise and 10:30 a.m. The order of the stations visited was varied by choosing a different starting point each visit. Observations were not conducted during inclement weather, including fog, steady drizzle, prolonged rain, and wind > 20 km/h – (12 mph).

In addition to recording the species seen or heard, other data collected for every observation, included the estimated distance to the individual bird and the type of observation (visual or auditory). Observers recorded birds at first detection and avoided double counting the same individual. Other data collected included cloud cover, wind speed, and start and end times.

Funding from a grant from the Iowa Ornithologist Union and from the various Audubon Chapters in the region allowed us to conduct additional observations on Cerulean Warbler populations within the BCA. We conducted transect searches and specific locations searches by boat, on foot, on ATV, and in 4-wheel drive automobile on trails and logging roads. We conducted these searches beginning from the original bird survey points where Cerulean Warblers had been recorded and then working our way up or down the valley in order to determine the extent of the Cerulean clusters. During these investigations we utilized a 5 minute listening period specifically for Cerulean Warblers (we did not record other species). We repeated those transect searches as often as possible and then monitored Cerulean activity in as many locations as possible.

We recorded a GPS reading from all locations where we heard Cerulean Warblers. From references in other Cerulean Warbler studies and from our previous observations we considered that most adult male Ceruleans attempt to defend a territory roughly the size of a hectare or slightly less. Consequently, on our 2nd visit after first discovering Ceruleans, we considered any Cerulean singing within 80 meters of the previous location to be the same Cerulean heard on the previous occasion.

Effigy Mounds - Yellow River Forest Bird Conservation Area



**Forest Connectivity:
Patch Cohesion Index -
4,000ha Radius**

Forest Habitat Connectivity

Measures of connectivity provide insight on the degree of isolation created by a patch's size, shape, and nearness to other habitat patches.

- * Larger tracts of habitat will generally exhibit higher connectivity.
- * Convoluted and irregularly shaped habitat (like that typical of the Driftless Area) will generally exhibit lower connectivity.
- * Similarly, small patches surrounded by non-habitat will have low connectivity.

Connectivity measures, like the Patch Cohesion Index, provide a quantified estimate of how readily wildlife will be able to make use of a given habitat patch, based on the biology of that species.

* Species adapted to interior forest habitat will be able to make use of areas with higher connectivity to other forest patches more easily than those isolated in a matrix of "hostile" habitat.

Legend

- Effigy Mounds BCA
- Specially Designated Lands

Public Lands

Manager

- County
- Iowa DNR
- NPS
- Townships
- County Boundary
- Major Lakes & Rivers

Landscape Context

3 Tiers

- Low Interior Forest Potential
- Moderate Interior Potential
- High Interior Potential

Forest Cover

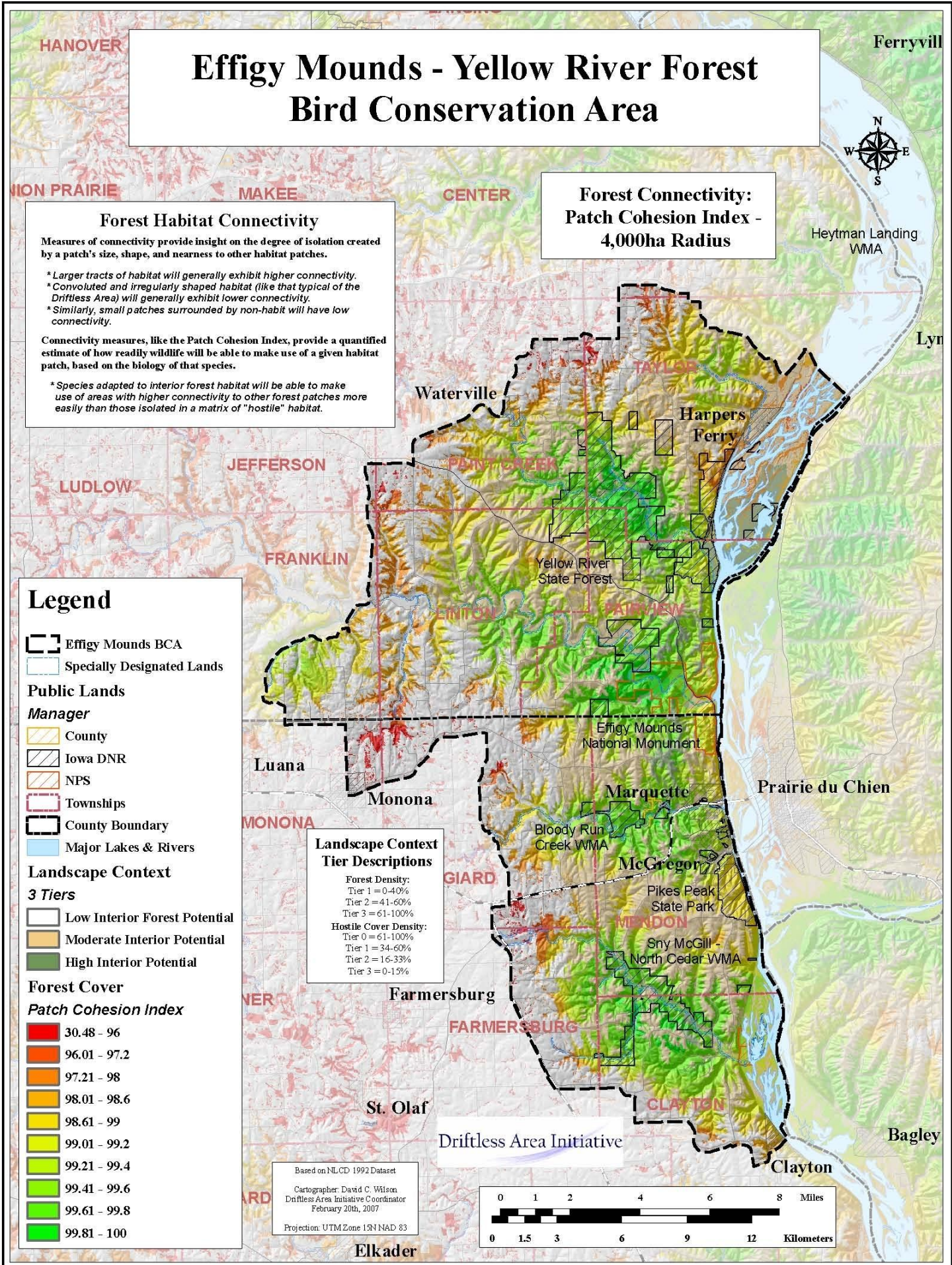
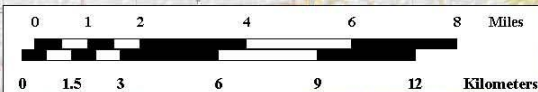
Patch Cohesion Index

- 30.48 - 96
- 96.01 - 97.2
- 97.21 - 98
- 98.01 - 98.6
- 98.61 - 99
- 99.01 - 99.2
- 99.21 - 99.4
- 99.41 - 99.6
- 99.61 - 99.8
- 99.81 - 100

Landscape Context Tier Descriptions

- Forest Density:**
 Tier 1 = 0-40%
 Tier 2 = 41-60%
 Tier 3 = 61-100%
- Hostile Cover Density:**
 Tier 0 = 61-100%
 Tier 1 = 34-60%
 Tier 2 = 16-33%
 Tier 3 = 0-15%

Based on NLCD 1992 Dataset
 Cartographer: David C. Wilson
 Driftless Area Initiative Coordinator
 February 20th, 2007
 Projection: UTM Zone 15N NAD 83



GPS locations - Bird Survey Points – Yellow River State Forest - 2013

(all GPS locations are 15T)

Paint Rock Unit

YRSF BP 1 - 647420 4781323 - deep interior forested valley, diversity of tree species and forest age.

YRSF BP 2 - 647519 4780818 - north of Paint Creek Road – deep interior forested valley.

YRSF BP 3 - 647651 4780397 - most easterly valley along the lower part of Paint Rock Road..

Paint Creek Unit

YRSF BP 4 - 645856 4779134 - along Donahue Road – mature flood plain forest and forested valley slope.

YRSF BP 5 - 644796 4779911 - along Donahue Road at the confluence of Browns Valley and Paint Creek.

YRSF BP7 - 644080 4781793 - bottomland forest along Paint Creek west of Donohue Road bridge.

YRSF BP8 - 645114 4781538 - Heffern Hill area – forested slope on north and east slope of Paint Creek.

YRSF BP 8C - 644371 4782097 - forested slope along Donahue Road – east of BP 8

YRSF BP 9 – 643337 4782512 – Little Paint Campground – big trees, open campground - south end

YRSF BP 13 - 643267 4779374 - Fire Tower Road – forested valley near the upper end of Browns Hollow.

YRSF BP 14 - 642312 4781221 – forested slope adjacent to Yellow River State Forest Office.

YRSF BP 17 – 642574 4780993 – forested slope along Fire Tower Road near the Saw Mill.

YRSF BP 18 – 641309 4781488 – floodplain and slope forest at White Pine Co. Road near the Paint Creek bridge.

YRSF BP 19 – 642951 4781021 – ridge top forest at Cedar Overlook.

YRSF 13-20 – 641875 4781874 – ridge top forest just west of Paint Creek overlook

YRSF 13-21 – 642224 4781926 – near a recent upland timber harvest between Saw Mill Overlook and Paint Creek Overlook

YRSF 13-22 – 642423 4781753 – ridge top forest near Saw Mill overlook

YRSF BP 13-23 – 641553 4781189 – forested slope along lower portion of Forester’s Trail.

YRSF BP 13-24 – 641511 4781002 – forested slope along Forester’s Trail

Luster Heights Unit

LUSTER HEIGHTS BP 13-1 – 647551 4777238 – along the ridge top near southern and eastern boundary

LUSTER HEIGHTS BP3C - 646796 4777703 – forest slope along the lower part of Luster Heights road.

LUSTER HEIGHTS BP 5 - 647258 4779200 - floodplain forest along Paint Creek near highway 364 bridge.

LUSTER HEIGHTS BP6 - 647988 4777187 – Forested slope and bottomland forest Paint Creek and Mississippi River confluence.

Johaningmeir Unit (Cerulean Warbler surveys only)

JOHANINGMEIR BP1 - 643829 4774469 – forested slope along Yellow River.

JOHANINGMEIR BP2 - 643956 4774158 – forested slope along Yellow River.

GPS Points for Cerulean Warblers surveys in Pool 10 – 2013 - All points are in NAD 83 – and 15T

Sny Magill Complex

- #1 649808 4758668 – Upper (north end) of the Sny Magill/Johnson Slough complex – close to forested valley slope.
- #2 649607 4758076 - Upper Sny Magill Red-shouldered Hawk territory – close to forested valley slope.
- #2B 649767 4758342 – new point on alluvial fan near point #2
- #3 649555 4756210 – Parklands type forest within the mounds at Effigy Mounds Sny Magill Unit.
- #4 649428 4756445 – RSH nest west of Sny Magill Mounds – close to forested valley slope.
- #5 694210 4755302 – south side of Sny Magill access road - RSH nest – close to forested valley slope.
- #6 649601 4755057 – Oak Bird Point – stand of medium aged swamp white oaks – central part of Sny Magill complex.
- #7 650235 4753448 – Clayton RSH nest – lower (south) end of the Sny Magill complex – close to forested valley slope.
- #8 650451 4756492 – island bird point – east end of the Sny Magill complex – typical island forest habitat.

Catfish Slough Complex

- #1 651290 4755865 - island bird point on the north and west end of the Catfish Slough Complex
- #2 651824 4754929 - on the north end of the Catfish Slough Complex close to forested valley slope
- #3 651921 4754600 - on the north end of the Catfish Slough Complex close to forested valley slope
- #4 652101 4754386 – in the middle of the Catfish Slough Complex close to forested valley slope
- #5 652458 4754076 – new point in the middle and eastern edge of the Catfish Slough Complex
- #6 651855 4753682 – forest tract in the southern portion of the Catfish Slough Complex
- #7 651855 4753234 - middle of the forest tract within the Catfish Slough Complex
- #8 651884 4752703 – most southerly point of the study area

Wyalusing Complex –

- #1 651482 4759362 – Glen Lake area – on the west side of the channel – and south of boat ramp
- #2 651829 4759651 – just south of the Wyalusing boat ramp and close to the valley slope
- #2B 651860 4759440 – new point on alluvial fan just south of bird point #2
- #3 651588 4760921 – west end of the swamp oak stand
- #4 651679 4761338 – south end of the swamp oak stand
- #5 652050 4761289 – east end of the swamp oak stand
- #5B 652149 4760906 – new point – alluvial fan east of bird point #5
- #6 652130 4762130 – east of the railroad tracks – north of Wyalusing bluff
- #7 653568 4762123 – east and north end of Wyalusing complex
- #8 650878 4761219 – outer part of the Wyalusing complex – one big old wolf tree cottonwood

RESULTS

During our observations within the BCA in 2013 we conducted a total of 498 listening periods (including ten minute point count surveys and five minute listening periods for Cerulean Warblers): we heard Ceruleans at 336 of these points. This included Yellow River State Forest where we found Ceruleans at 174 of the 250 listening points (we considered this to be 92 active territories).

In the Sny Magill & North Cedar Wildlife Management Areas we found Ceruleans at 72 of the 112 listening points (we considered this to be 28 active territories).

Along the Mississippi River, we found Ceruleans at 52 of the 81 listening point (we considered this to be 44 active territories - this does not include the active territories along the Mississippi River within Effigy Mounds National Monument and the active territories within Yellow River State Forest along Paint Creek and the Mississippi River).

In Effigy Mounds National Monument, we found Ceruleans at 23 of the 31 listening points (we considered this to be 19 active territories, which included two on private property within 300 meters of EFMO boundary).

In Pikes Peak State Park we found Ceruleans at 14 of the 24 listening points (we considered this to be 8 active territories).

It may be of interest that 12 of 13 active Red-shouldered Hawk territories we monitored in 2013 also had Cerulean Warblers present. Also, during our Cerulean Warbler investigations in 2013 we located two new Red-shouldered Hawk territories within active Cerulean Warbler locations.

SUMMARY OF ACTIVE CERULEAN WARBLER TERRITORIES LOCATED WITHIN THE EFFIGY MOUNDS/YELLOW RIVER FOREST BIRD CONSERVATION AREA IN 2013

<u>LOCATION</u>	<u># CERULEAN TERRITORIES</u>	<u>NEW IN 2013</u>	<u>PREVIOUSLY DOCUMENTED</u>
Upper Miss Refuge	44	24	20
Yellow River State Forest	92	30	62
Effigy Mounds NM	19	4	15
Pikes Peak State Park	8	3	5
Sny Magill/North Cedar WMA	28	14	14
TOTAL	191	75	116

RESULTS CERULEAN WARBLER SURVEYS IN YELLOW RIVER FOREST 2013

During our observations in 2013, we located 92 active Cerulean Warbler territories within Yellow River State Forest (Table 1). We recorded a total of 174 observations of singing Cerulean Warblers; at 31 of the points Ceruleans were heard on a single occasion; at 61 points Ceruleans were heard on two or more occasions

Of the 92 territories identified, 57 were in the Paint Creek Unit, 17 in the Luster Heights Unit, ten in the Paint Rock Unit, five in Little Paint Campground, and three in the Johanningmeir Unit. Perhaps it is significant that 55 of the active territories were within 300 meters of Paint Creek.

We had previous records of Cerulean activity in 62 of the territories, while 30 of the territories were newly found in 2013. Of the 92 territories identified, we have a record of Cerulean activity in eleven of these sites every year for the past five breeding seasons (2009-2013).

Of the 92 Cerulean territories, 28 were first recorded during surveys at the various bird survey points, 44 were recorded at inter-point locations in between the various bird points, and 20 of the Ceruleans were discovered during random or transect searches.

New pockets of Cerulean Warblers were found near Cedar Overlook and along Larkin Road in the Paint Creek Unit. We also found additional Ceruleans adjacent to previously known pockets along the Mississippi River in the Luster Heights Unit. Even though we located various pockets of Cerulean activity, we nevertheless did not find Ceruleans in many in many sections of Yellow River State Forest (see “No Find” Tables).

From these observations it appears that many of the 92 active territories in Yellow River State Forest were centered in the lower portion of fairly deep canyons where there was a stream, or an intermittent stream, or soil conditions were wet during May and June. Many of the territories also included topographic diversity in that they were near a bluff or steep incline and they also included vertical stratification with large mature trees with a distinct open topography in the upper branches.

Similar to our findings in previous years, we found that Cerulean Warbler territories were often “clustered” together with several active territories clumped together. We typically found Ceruleans at inter-point locations adjacent to monitoring points where we had already observed other Ceruleans. The maps of the Cerulean territories within Yellow River State Forest show a distinct clustering. This conspecific attraction is similar to findings in Cerulean Warblers studies in Southern Indiana (Kirk & Islam 2007; K. Islam personal communication).

Our findings in 2013 were similar to what we found in 2012 when Ceruleans Warblers were observed in Yellow River State Forest at 17 of the 21 points monitored, on 38 of 56 visits. In certain sections along Paint Creek we found a similar density of Ceruleans in 2013 as we did in 2012. We found Ceruleans in some locations within Brown’s Hollow in 2013; however, we found fewer Ceruleans in Browns Hollow in 2013 than we did in 2012. In other locations such as Old Junction Road we found Ceruleans in 2012 but not in 2013.

DISCUSSION

This report summarizes the results of 2013, but also refers to summaries in the previous four years of monitoring in Yellow River State Forest and other locations within the BCA of Northeast Iowa. The results in terms of Cerulean Warbler activity are well beyond what we imagined at the beginning of these observations as we found more Cerulean Warblers than originally expected. When we started this work in 2009 we found a few Cerulean territories in Yellow River State Forest and other locations throughout the BCA. As this work continued we found that many of these Cerulean territories were occupied each of the last five breeding seasons (2009-2013), and the number of known Cerulean territories within BCA has swelled to 191.

As a result of these findings the BCA in northeast Iowa was recently designated as “globally significant” by the National Audubon Society and by Birdlife International as part of the Important Bird Area program. Cerulean Warblers were found in a variety of woodland habitats, but they were most prominent in forest habitats that were near a steep slope and suitable groups of mature trees, and especially in areas that included wetland or at least slightly wetter valley forests. Perhaps it is significant that even though there has been consistent timber management in some sections of Yellow River State Forest, there has nevertheless been no regular timber management in slopes that exceed a 30 degree slope (Bob Honeywell, YRSF forester, pers com).

In many situations it appears that Ceruleans prefer some kind of vertical stratification with the structure and branch spacing found in the upper portions of many of mature oaks and black walnuts. There appears to be a tendency for Ceruleans to occupy sites with an uneven age management.

Although Ceruleans are considered an interior forest species, we found Ceruleans near the edge of recent timber harvests within Yellow River State Forest, and at edge habitats near Yellow River State Forest Headquarters and near the Sawmill. More work is needed to identify these pockets of Cerulean Warblers and to understand how Ceruleans use the various habitats throughout the breeding and post-breeding season.

During 2013 we also documented additional Cerulean territories along the Mississippi River mainly in the Sny Magill Complex and portions of Effigy Mounds National Monument and within the Wyalusing shelf, as well as the Sny Magill and North Cedar Wildlife Management Areas, and within Pikes Peak State Park. However, the highest density we found in any of these areas was along Paint Creek in Yellow River State Forest (J. Stravers reports to Effigy Mounds National Monument and USCOE, and Iowa Ornithologists Union).

As stated in the results sections, it appears that in many cases Cerulean Warbler territories were clustered together. We typically found Ceruleans at inter-point locations adjacent to monitoring points where we had already observed other Ceruleans. In many cases when we conducted additional searches of areas adjacent to known Cerulean Warbler territories, we often found other Ceruleans further up and/or further down the various valleys. This conspecific attraction is similar to findings in other Cerulean Warblers in Southern Indiana (Kirk & Islam 2007; K. Islam personal communication).

While we were able to identify specific areas of high concentration of Ceruleans, we also found significant portions of Yellow River State Forest where Ceruleans were not found (“No Find” Tables). Consequently, we feel there is additional opportunity to do a more sophisticated analysis of the Cerulean data collected between 2009 and 2013 which may help in understanding some of habitat requirements. There are also opportunities to investigate some of the population dynamics and perhaps try to determine nesting success in this population of Cerulean Warblers.

RECOMMENDATIONS

We feel this project helps to build a better understanding of bird populations and especially Cerulean Warbler populations within the Bird Conservation Area of Northeast Iowa, especially in Yellow River State Forest. This work has the potential to help in understanding how various timber management practices may, or may not, affect specific certain bird species, especially Cerulean Warblers.

As stated earlier in the Discussion section, Cerulean Warblers were found in a variety of woodland habitats and also found near the edge of a relatively recent timber harvest within Yellow River State Forest. Results of this study show that the BCA of northeast Iowa may contain some of the most important Cerulean Warbler habitat anywhere in the Upper Midwest. More work is needed to identify these pockets of Cerulean Warblers and to understand how Ceruleans use the various habitats throughout the breeding and post-breeding season.

Also, as stated in the Discussion section, there may be opportunities to do a more sophisticated analysis of the Cerulean data that has been collected in hopes of better understanding the habitat requirements for this species.

This work has additional merit with an outreach and landowner education potential in efforts such as Bird Friendly Forestry Workshops and various capacities in public education. This project also has shown the potential to gain additional support and perhaps future funding from other agencies and other conservation organizations. The presence of Cerulean Warblers may also assist with potential acquisitions of private lands that border Yellow River State Forest.

We would like to see these investigations continued in whatever fashion is feasible. Ongoing Cerulean surveys may help to better understand a variety issues that are related to forest management and Cerulean Warbler populations. We plan to make a list of areas that we consider potential “test cases” in helping to define what is highest potential and what might unsuitable Cerulean habitat.

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