

ANNUAL REPORT | 2023



RICHARDSON WILDLIFE FOUNDATION



Black Cherry logs, salvaged following a spring tornado



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Richardson Wildlife Foundation (RWF), located in Lee County in north-central Illinois, is a not-for-profit corporation dedicated to the long-term restoration of habitats and the judicious use of our natural resources. The Foundation was established in 1989 by Edward J. Richardson with an initial land donation of 250 acres and three primary goals of *Habitat Restoration*, *Conservation Education*, and *Research*. This area is recognized as part of the Grand Prairie Division of Illinois and was part of the historic, 30,000-acre Inlet Swamp and adjacent bluff lands. The Richardson family has funded the Foundation as it has expanded to 1,976 acres through land donations from the Richardsons and the purchase of adjacent farms.



Removing fallen timber to reopen access trails

For several years we have considered adding a “News & Notes” type of section to this report. In most years there is at least one event or situation that has an outsized impact on our work, for better or worse. Often, that situation is weather related, such as severe drought or abnormally wet seasons, the impacts of which naturally affect all or most categories of the habitat and projects that we describe in this report. This will be a space to address such things to avoid repetition in subsequent sections. It will also be a space to note any significant staffing changes, milestones, or achievements of the Foundation that might not naturally fall into the categories discussed in our other sections.

This year seems like the time to finally implement this section due to an unforeseen event this spring that altered the planned trajectory of much of our year. Just before sunset on March 31st, a day after we finished the last of our spring burns, a storm rolled in that spun off 2 tornadoes in our immediate vicinity and spawned a total of 22 different tornadoes in the greater Chicago region. This was reported as the third-largest tornado outbreak on record in the U.S. Just to our south, an F1 tornado with estimated winds of 95 mph tracked from Sublette through West Brooklyn, causing significant building damage in and around West Brooklyn. This cell did not directly pass through the Foundation property, but it was close enough to bring down some trees on our south end. A stronger F2 tornado with estimated winds of 115 mph impacted the Foundation on our west end and tracked northeast, leveling portions of several woodland parcels and continuing to do damage to neighboring buildings. Thankfully, no significant injuries were reported for our area and luckily the Foundation did not suffer any significant damage to buildings.

The storm left many hundreds of trees laid over, most of which had been uprooted. The areas that the storm hit hardest were woodlands on the Bernardin Tract near the Widgeon Wetlands where the damage was primarily to 30+-year-old white pines, the South Jeanblanc Tract where mature Black Cherry Trees were uprooted and laid over in suspended tangles, the Original Tract on both sides of Main Lake where the majority of timber that came down were Red Pines, and the areas on the Erbes Tract north and south of Lily Pond where damage was felt by several species of tree. It took us a week to remove trees and branches from roads, lanes, and trails to fully regain access, and the work to address the damage in the woodlands is ongoing.

We lost several mature Black Oak trees, but aside from those the ecological impact of the storm in the long run may be a positive one. As with any situation, we will use it as an opportunity to shape the future of the impacted areas into the best native habitat possible. To make the time needed to begin working through the impacted areas, we had to cancel a few projects planned for this year and we shifted timber work that had been planned for this year to a later date. Over the summer, our crew cut, dragged, and burned downed pines on the Original and Erbes Tract to make way for the next round of habitat work. We were able to find a local timber harvester who could use much of the Black Cherry that had fallen in the Jeanblanc woods, thus saving us months of heavy equipment work. Over the coming months we will continue this part of the process and implement the next management steps, which will be discussed further in the “Woodlands” section of this report.





Collecting Prairie Sedge

SEED COLLECTION

Achieving diverse restorations on a large scale in our habitat development projects is significantly more efficient and cost-effective using seed than by other methods. For that reason, collection of prairie, wetland, and woodland forb and grass seed is critical to our ability to restore and improve the habitat offered on site. To maximize the diversity of our plantings for the benefit of wildlife and habitat functionality, we try to collect as many desirable native species as possible.

Forb seed collection requires considerable time due to variation in seed maturation dates, the labor-intensive method of hand-harvesting, and the number of species and amounts we target. Many species are difficult to collect in quantity due to the spotty distribution of plants or because seed production from individual plants is low. Collecting and cleaning forb seed by hand, although time-consuming, is considerably less expensive than purchasing an equivalent amount of seed from a commercial source.

By hand collection, we gathered 887 pounds of seed of **273 species** of native prairie, wetland, and woodland plants this year. **The diversity of species is the highest we have ever collected.** It is gratifying to look back on the progress we've made over the many years that we've worked to expand species diversity on this site. As we have continued to introduce additional native species, we've been able to draw seed from those plants to drastically increase our annual harvest and, by extension, improve the quality of the habitat we're able to restore for wildlife. A few of the species we were especially excited to collect were Michigan Lily, Dwarf Blazing Star, and Pointed Tick Trefoil. We have been particularly focused on woodland habitat development lately, and we have continued to expand our collection of woodland wildflower seed accordingly. This is in part due to willing landowners and agencies from whom we have gratefully obtained permission to collect and/or transplant desirable native woodland species on several nearby, off-site, wooded locations, as well as from the excellent oak savanna on the Richardson property in LaFox.

Using a modified combine, we harvested 95 pounds of Side-oats Grama and 234 pounds of Little Bluestem seed from collection patches we planted four years ago. We harvested 735 pounds of tallgrass seed—a mix of Big Bluestem and Indiangrass—from one of our restorations on the Bernardin Tract. To supplement our collection, we participated in a seed swap with the Northern Illinois Native Seed Network hosted by DeKalb County Forest Preserve District, and we will seek to trade seed of some of our hand-collected forb species with native plant nurseries and other restoration agencies in exchange for species that are native to this area but are currently rare or absent from this site.



Prairie seed mix for a restoration on the Bauer Tract



Processing fruit and drupes of shrub species into usable seed



Short Green Milkweed

PRAIRIES

Illinois is known as “the prairie state” and RWF lies within the Grand Prairie natural division of Illinois. Prior to European settlement, and the subsequent conversion of the landscape to agriculture, tallgrass prairie was the primary habitat type in our region. Any wetland, woodland, or savanna habitat would have been surrounded by and dwarfed in scale by the seas of prairie grasses, sedges, and forbs that composed the backbone of the local ecosystem. Just as there are many kinds of woodland ranging from boreal coniferous forest to bottomland hardwood, oak savanna, or thickets, and wetlands ranging from bogs to marshes to swamps to ponds, there are many varieties of prairies as well. Types of prairies are primarily determined by soil structure, hydrology, and topography and bleed together into a matrix in which delineation might be less than straightforward and even vary over time depending on climate patterns. RWF grasslands, be they remnant or restored, are primarily black soil prairie and sand prairie. Both types might range from the dryer side to the wetter and might transition across an area from one to the other or into the marshy sedge meadows associated more with our wetland habitat.

Prairie habitat represents a higher proportion of the Foundation property than any other habitat type, most of it having been restored on former row crop ground. We conduct prescribed, controlled burns, generally on a three-year rotation for established prairies and more frequently for new plantings and those with invading, undesirable woody species. This rotational approach leaves some areas unburned, protecting fire-sensitive species, providing cover for wildlife, and allowing for the greatest potential for species diversity. Our spring burn season this year started on March 7th and ran through the 31st. It was helpful that we had gotten a jump on things with a successful fall burn season last year, decreasing the acres left to target this spring. Between fall of 2022 and spring of 2023, we burned 51 units totaling about 340 acres and got a small head start on the spring 2024 burn plan when we completed an additional 5 units totaling about 24 acres in December. All units were burned safely using a 4- or 5-person crew equipped with water tankers, drip torches, Nomex clothing, and two-way radios. As a safety precaution for burning, and to allow for access to the property, about 48 miles of firebreaks and trails were maintained via mowing during the growing season.

This year we planted three new prairie restorations on the Original (8.5 ac), Bauer (0.3 ac), and Bernardin (0.25 ac) land tracts and interseeded about 8.3 acres of existing prairie restorations on the Bernardin, Jeanblanc, Martin, and Burkardt land tracts to improve diversity in those plantings. The restoration on the Original Tract is mostly mesic soil, which we have farmed with row crops for the last several years to prepare for planting prairie. About a third of the planting was seasonally too wet to farm. That portion was repeatedly treated with herbicide to eliminate Reed Canarygrass and other weeds prior



Establishing a backfire in less than ideal conditions



Leadplant

PRAIRIES (cont'd)

to planting prairie. We planted a diverse seed mix of 138 species of flowering plants, grasses, and sedges at 26.7 pounds to the acre for this planting. The restoration on the Bauer Tract was conducted on one end of a row crop field and required no additional preparation prior to seeding 59 species at 23.5 pounds of seed to the acre. The restoration on the Bernardin Tract was done over an area that had previously been planted to prairie but had since become dominated by invasive Reed Canarygrass. We treated the area multiple times over the prior three growing seasons with Glyphosate to eliminate the Reed Canarygrass before seeding 71 species at 69 pounds of seed to the acre. We interseeded 86 species at 18.7 pounds per acre into existing prairie restorations on the Bernardin, Jeanblanc, Martin, and Burkardt land tracts. All of our prairie restorations and interseeding this year were conducted by frost seeding over light snow cover in January. For specific locations of this year's new plantings and interseeding efforts, see our habitat map (Appendix 1) in the back of this report.



Pasture Rose



White Blue-Eyed Grass



A spring ephemeral wetland

WETLANDS

Wetlands are among the most biologically productive and diverse habitat types found in nature. They provide immense value to human well-being through their natural functions of water purification, flood control, and groundwater replenishment even before factoring in the direct and intrinsic values of wetland flora and fauna. They are also among the most imperiled habitat types. Approximately half the world's natural wetlands had been drained by the mid-1990s. On our site, any efforts to accomplish successful restoration of native habitat and provide for the needs of local populations of wildlife need to be informed by the wetland history of the property. RWF exists at the southern edge of the historic Inlet Swamp, drained over one hundred years ago, and many of our soils are "hydric," or wetland formed. Soil types, coupled with hydrology and sunlight, are what determine which native species can thrive. Recreating the 30,000-acre wetland complex that once existed here is neither feasible nor culturally possible at this point, so our approach has been to restore what are known as prairie pothole wetlands dotting our landscape and providing similar ecological functions on a smaller scale.

We record monthly water level readings at each wetland to assess fluctuations occurring throughout the year as well as across multiple years. We have been in a dry weather pattern since the beginning of 2020 and as a result many of our wetlands began this year below their full capacity. From spring through fall this year, we actually saw an average amount of rainfall in the aggregate—however timing is everything as they say. The spring and early summer (typically times we can count on regular rainfall) were exceptionally dry and changed the complexion of the rest of the summer in our wetlands. From May 16th to June 24th we only recorded 0.4" of rain. The months of July, September, and October provided well-above-average precipitation, but that was not enough to bank very much water in our wetlands or restore receding groundwater levels. As a result of the spring and early-season drought, wetlands dried down fast, with 18 going fully dry before late-season rains replenished them to varying degrees. Most wetlands will overwinter again below their capacity. We hope to see winter precipitation and early spring rains bring water levels up to full prior to next summer, especially at those wetlands where we have released hatchling and head-started Blanding's Turtles. When water levels diminish, juvenile turtles and other vulnerable species are left more exposed to foraging Raccoons and other predators.

We regularly make repairs in the summer months to our wetlands as part of an ongoing maintenance program. Visual searches are made for Muskrat tunneling damage and repairs are made as needed. After making numerous repairs in recent years and on the heels of several dry years, there was little Muskrat damage in need of attention.

We began our year with a plan to evaluate and survey an area around the Woody Wetland on the Original Tract for its potential to be restored to shallow wetland habitat. Due to time demands of dealing with the fallout from the tornado this spring, we opted to put that project on hold. We did, however, survey the existing vegetation and made note of how and where rainwater pooled in the current topography. The plant community has a problem with Reed Canarygrass but we observed more quality sedges and flowering plants than anticipated among the weeds. We began a grass-specific herbicide treatment program in accessible portions of the area that we plan to continue. We will monitor the area to determine which course of action (herbicide treatment vs. earthwork) might lead to the better outcome.



Green-Fringed Orchid

WETLANDS (cont'd)

Over the winter we continued the restoration process of three wetlands that we constructed and one that we rehabbed in the summer of 2022. We seeded in and around the basins and berms with diverse mixes of native wetland plants, grasses, sedges, shrubs, and forbs. The two new additions to the chain of pools on the Bauer Tract that we call the Snake Wetlands (2.2 ac) were seeded with 125 pounds of seed of 135 different species. The new seasonal pool (2 ac) on the Wysneinski South tract, west of Mink Wetland, was seeded with 81 pounds of seed of 188 species. Following rehab of the dike of Mink Pond (1 ac), we seeded the dike and emergent area of the wetland with 44 pounds of seeds of 94 native species.



A drying wetland in late summer



Dutchman's Breeches

WOODLANDS

Woodland habitat at RWF can be boiled down to 3 categories of timber stands: mixed timber which predate the inception of the Foundation (“Existing Timber” on our map), hardwoods planted by RWF (majority Black and Bur Oak), and oaks planted among Red and White Pines by RWF. For each type of timber stand, our intent is to develop healthy oak savanna and woodland communities with a diverse, native understory. This is by its nature a slow process, but the Foundation has now been working on our woodland habitat for over 30 years. Our wooded habitat has come a long way over that time, showcasing the results of those many years of growth, bare-root and potted tree and shrub planting, selective cutting, invasive species control, protection of priority seedlings, and seeding of native understory plants. There remains plenty of work to do, but it is rewarding to see the returns on the investment of effort and resources when we evaluate our woods.

Most of our existing mixed timber stands are the result of natural succession following the abandonment of agricultural crop fields or pastures many decades ago. Some were planted with various pines 50+ years ago. Our management strategies for these woodlands are based upon individual assessments of the quality and species composition of each stand. Many contain a majority of non-native or low-wildlife-value tree species. Our goal for most of the existing woodlands is to increase the proportion of oaks and other beneficial native deciduous trees to shift these areas into healthy, self-sustaining woodlands and savannas. Implementing this goal includes the removal of non-native and detrimental species; protecting existing, desirable saplings from deer damage; and improving understory communities of shrubs, small trees, woodland wildflowers, savanna forbs, sedges, and grasses.

As our timber matures, more of our oak plantings are reaching a size at which they become tolerant of fire. Beyond tolerance, fire is an essential aspect of savanna and oak woodland ecology. This spring we burned two units planted to oaks, one of them for its first time, and another unit of existing timber that contained just a few oaks. Oak survival appears to have been 100% and the benefits to the understory plant community are apparent. There was an observable uptick in both flowering plants in the understory and acorn production from the oaks themselves. For more information on the effects of prescribed fire on oak growth and survival in these very units, read researcher Allison Earl’s writeup of her master’s thesis project later in this report.

We usually concentrate the bulk of the mechanical aspect of our forestry management in the winter, when frozen ground can support heavy equipment without damaging roots or significantly disturbing the soil. This year was an exception in two ways. Mild winter temperatures prevented freezing of the ground surface. To avoid damage to oak roots and desirable plants, we did very little winter work with heavy equipment, instead focusing on smaller-scale work we could do with chainsaws and herbicide. Then the tornado



Swamp Dogwood



Planting bottomland hardwood trees for riparian restoration

WOODLANDS (cont'd)

this spring forced us to do timber work through the summer months. We spent weeks in the summer cutting and removing timber that had been uprooted or broken off on the Original and Erbes Tracts, and we allowed a local timber harvester to use his much-larger equipment to salvage most of the Black Cherry logs that came down in the Jeanblanc South woods. We will continue to clear debris through the upcoming winter in the affected woods on the Original, Erbes, and Bernardin Tracts where pine monocultures had originally been planted on sand dune soils, with the hope of completing that task and interseeding appropriate sand-loving native seed mixes suitable for savanna, full-sun, and open woodland before spring. We will attempt to burn the remaining root balls and slash from fallen trees in the Jeanblanc woods. The denser cherry wood, most of which remained alive even through the summer following the storm, may prove too wet to effectively burn this winter. We will assess and develop a plan focused on restoring oak savanna habitat over the long term, which may include a growing season of herbicide treatments and earthwork before introducing seed or plant material.

Last fall we planted potted trees to complete the second half of 18.4 acres on the Wysneinski South Tract (northeast of Harrier Wetland/south of Terrace Wetland) that we enrolled in the USDA's Conservation Reserve Native Hardwoods Program. **During the severe drought conditions in the late spring and early summer of this year, we repeatedly watered all 885 potted and 1,950 bare-root trees and shrubs in the entire 18.4 acre planting.** In February we interseeded the second half of the planting with 104 native prairie, woodland, and savanna plant species at a rate of about 22 pounds of seed to the acre. We also supplemented the shrub component of this planting in April using 1,100 bare-root seedlings of Red Osier Dogwood (300), American Plum (200), Black Chokeberry (200), Silky Dogwood (100), White Oak (100), Smooth Sumac (100), and Fragrant Sumac (100). In addition to the above planting we interseeded 131 native prairie, woodland, and savanna plant species at a rate of about 6.7 pounds of seed per acre into three tree plantings that we had recently thinned on the Wysneinski Central Tract.

This year we continued a project of improving a bottomland hardwood riparian area along both sides of the Brooklyn Creek on the south end of the property. After two years of successive prescribed burns and removal of invasive and undesirable trees, shrubs, and grasses, this fall we added potted trees and shrubs in and around the existing timber. In November we planted 203 oak and hickory trees and 70 shrubs. Species included White Oak (60), Bur Oak (40), Swamp White Oak (38), Pin Oak (32), Shagbark Hickory (20), Northern Red Oak (13), Nannyberry (25), Hazelnut (35), and Downy Serviceberry (10). Each tree was equipped with an Earthmat to reduce desiccation and competition, as well as a wire basket with rebar stakes to protect from browsing and rubbing by deer. This upcoming winter we will seed the area with a diverse mix of native woodland and savanna plant species, and next spring we hope to supplement the tree and shrub species using bare-root stock. The purchases of potted trees and shrubs, Earthmats, and basket materials for this project were facilitated by the Illinois Department of Natural Resources on a contract for habitat project implementation, made available due to our participation in the Illinois Recreational Access Program.



Cleanup following tornado to prepare for oak savanna restoration



Garlic Mustard

INVASIVE SPECIES MANAGEMENT

Suppression of invasive species continues to be a major portion of our habitat work and is an ongoing challenge on this site, as it is on the broader landscape. Even as we continue to make great progress in reducing invasive plants, we find that it requires an immense amount of effort to hold ground against reinvasion, and that vigilance is required against invasions by additional exotic species, which become more frequent each year. As an example, we've been watching the highly invasive Cut-Leaved Teasel spreading west in ditches along roadsides and getting closer to RWF over time. This year we noticed a small colony of plants right on our doorstep, on a neighboring property twenty feet from our border. With permission, we cut, bagged, and disposed of the seed heads and treated the remaining visible rosettes. Hopefully an ounce of prevention will be worth a pound of cure in this case.

Recently we have encountered increasing invasions of Oriental Bittersweet, a plant somewhat similar to but far more aggressive than the native American Bittersweet. This vine is occasionally used in landscaping but frequently escapes to natural areas with the help of birds that eat its berries. This year we found and eliminated Oriental Bittersweet plants on the Bernardin, Jeanblanc, Wysneinski Central, Erbes, Dale, and Original Tracts.

Reed Canarygrass poses a greater threat to the vegetative integrity of our wetlands than any other current factor. Many of our wetlands and waterways require periodic management actions to circumvent Reed Canarygrass dominance. We continued the ongoing program of treating this invasive species at several wetlands as well as areas on more upland locations and mowed to prevent seeding in other areas. We continue to make and evaluate treatments using Clethodim, an herbicide that targets grasses but does not harm broadleaf plants or sedges. While this herbicide may not be as effective per treatment at harming perennial grasses as Glyphosate is, the selectivity of Clethodim allows us to use it in areas in which the collateral damage to native species would be too severe to justify a broad-spectrum treatment. Following treatments with Clethodim, the unharmed sedges and broadleaf plants can continue to thrive and compete with the weakened invasive grass. We hope to find that more frequent use of this tool and refinements to our approach with it can help us prevent Reed Canary from taking over otherwise healthy plant communities and forming monocultures.

Another wetland plant capable of dominating wet habitat is Phragmites, or Giant Reed. We treated small-scale invasions of Phragmites on the Wysneinski North and South, Montavon, Original, Dale, and Bauer Tracts this year. Phragmites is a very difficult plant to eliminate, but on our site we have had little trouble in controlling it to prevent complete takeover using periodic treatments with aquatic-safe forms of Glyphosate during its flowering stage.

Garlic Mustard is an invasive, herbaceous, biennial plant that can dominate at ground level in woodlands, edging out native woodland wildflowers and the fauna which depend on them. Our control efforts this year included applications of 3% solutions of Glyphosate, hand-pulling of plants before they seeded, and controlled burning. We targeted Garlic Mustard in woodlots on the Erbes, Jeanblanc, Original, Wysneinski Central, and Mellot Tracts. To avoid damage to valuable native spring wildflowers on the Bauer Tract, we hand-pulled Garlic Mustard in the timber west of Meridian Road. Garlic mustard seed's persistence in the soil seed bank, new invasions brought in on the hooves, feet, and fur of animals, the scale of our invaded woodlands, and the short window of the effective treatment season conspire to make complete eradication an unachievable goal. Our strategy is to reduce existing invasions of Garlic Mustard to limit its spread.



A cut stump treatment of invasive White Mulberry

INVASIVE SPECIES MANAGEMENT (cont'd)

Invasions of prairie plantings, other grasslands, and tree plantings by Canada, Bull, and Musk Thistles and White and Yellow Sweetclover are a periodic problem. Canada Thistle is an aggressive perennial invasive which tends to thrive in disturbed habitat or the early stages of habitat restoration. In many cases we target invasions in our prairies on foot with backpack sprayers to prevent damage to non-target plants or mow Canada Thistles during the growing season prior to the flowering stage to prevent seed development. We have found our best results in recent years have come from controlling seed production of Canada Thistles, chemically treating the most severe invasions in the spring, mitigating sources of disturbance, and interseeding native species to outcompete the thistle over time. Bull and Musk Thistles and White and Yellow Sweetclover are all biennial species (live two years, produce seed in year two, then die). For this reason, it is possible to limit seed production through repeated mowing, allowing time and competition to diminish the population. This has been a focus of our strategy for years and has been effective in decreasing the density of the invasives and curtailing spread. We do, however, find that we mow many of the same acres every year, and while density of Sweetclover seems to be decreasing, its footprint remains largely the same. We are experimenting with an herbicide treatment recommended by a close colleague using low rates of Clopyralid 3 herbicide in spring to kill Sweetclovers in the rosette stage prior to flowering. Our trial area is 2 acres in size. Prior to herbicide treatment, we conducted a plant transect survey, noting the density and diversity of native species and the invasive Sweetclover. Following treatment we noted evidence of damage to plants, native or invasive, and the severity thereof. Damage was mostly observed as curling or browning of leaves. We will continue with the trial next year to evaluate the method's collateral damage to natives and effectiveness against Sweetclover.

Bush Honeysuckle, Autumn Olive, and Common Buckthorn are invasive shrubs that can dominate in both woodland and open canopy habitat. By outcompeting seedlings of native species, which local herbivores often favor, they can entirely alter the character of a habitat over time. Over recent years we have made excellent progress clearing our woodlands and prairies of the adult, seed-producing individuals of these species, even as they have increased in prevalence on less-managed properties in our area. During the growing season and into the fall, we treated adult plants and seedlings of invasive shrubs with Glyphosate or Triclopyr 4 using backpack sprayers. Treatments varied from foliar spraying while the plants were actively growing to cut stump or basal bark treatments later in the fall. Keeping up with ongoing regrowth of seedlings and new invasions in these many acres is time-consuming and will be required indefinitely as we work through the invasive seed banks, but it is critical to maintaining the progress we've made and will help prevent further spread of invasives.

Although it is a native species, Sandbar Willow is an aggressive invader of moist, sunny habitat, particularly capable of diminishing the diversity and quality of wet prairie and sedge meadow. Periodic mowing of the suckering stems of this clonally growing plant can stop or reverse its outward spread. Targeted herbicide treatments can be effective but often cause damage to the surrounding native species. We took advantage of the dry summer conditions this year to mow large areas of willows earlier in the summer than would normally be possible, allowing grasses and sedges to regrow before fall on the Wysneinski Central, Wysneinski North, Bauer, Montavon, and Original Tracts, and on the Bauer Tract we used Triclopyr 4 herbicide to treat a dense, inaccessible stand.

We continue to become more effective and efficient at combatting invasive species as we refine our techniques. We monitor the scientific literature and maintain dialogue with colleagues to learn new methods and treatment options. We research and maintain vigilance against invasions of known problem species that have not yet become established at RWF. We have made outstanding progress controlling or suppressing many of these invasive species, and our habitat on site is much the better for it.



Sunflowers

FOOD PLOTS / AGRICULTURE PLANTINGS

We maintain wildlife food plots of corn, winter wheat, sunflowers, soybeans, oats, Imperial Whitetail Clover, other perennial forages, and Brassica to complement our native habitat in meeting the food requirements of wildlife. We planted one new Imperial Whitetail Clover and Chicory patch (~1.16 ac) in the spring and fall-planted four patches with a mix of Brassicas, perennial clover, alfalfa, Sainfoin, and Chicory. We planted Liberty herbicide-tolerant corn and soybeans to help combat Glyphosate-resistant Water Hemp weeds.

Final acreage figures for all wildlife food plots included twenty-two fields of corn totaling 55.25 acres, twenty-five fields of soybeans totaling 58.41 acres, one field of sunflowers totaling 2.8 acres, twenty-nine fields of Imperial Whitetail Clover totaling 14.68 acres, and thirty-three fields of mixed perennial forages totaling ~4 acres. Acreages are measured using GPS and mapping software and reported to the Farm Service Agency for crop certification.

We applied 100 pounds per acre each of DAP and potash to all row crop, perennial forage, and clover fields. We applied 32% Nitrogen on the corn and sunflower fields in the growing season. For weed control on corn acres we used Verdict preemergence, and a single treatment of Glyphosate, Atrazine, AMS, and Sotrion postemergence. For weed control in soybeans we made a preemergence treatment of Verdict, and two postemergence treatments with Liberty, Clethodim, AMS, and Glyphosate. We regularly mowed our perennial food plots for weed control and sprayed Clethodim for control of grasses. Weed control was good on corn acres, better than average on sunflowers, and adequate on soybeans in fields where plants were able to canopy. Where deer browse prevented beans from developing canopy, Water Hemp and Pigweed continued to germinate and grow following treatment. This year's severe drought in May and June severely hurt soybean production. Plants on dryer soils were unable to push through intense deer-browsing pressure and by the time regular rainfall had returned, we had reached the point in the growing season that soybean plants had to put their energy into flowering and seeding rather than shoot growth. Because of this, many fields failed to canopy, weed pressure was severe through the rest of summer, and yield on those fields was poor. As with any program at RWF, we continue to research potential methods to determine if there is a more effective way to manage row crops for production and wildlife use.

Harvesting soybeans
stunted by drought and
deer browse





MAIN LAKE

One of our primary management goals for Main Lake is to promote healthy populations of game fish for recreational fishing opportunities. To minimize encumbrances to fishing, we selectively treat the pond with several products to reduce algae and aquatic plant growth. We have been very satisfied with the improved control of filamentous algae over the last three years since we replaced several of our summer treatments of Cutrine Ultra with Copper Sulfate crystals and increased our applications of Aquashade, a blue dye used to reduce the available light in the photo-spectrum used by algae and aquatic plants. This was the second successive summer with minimal problematic, late-summer planktonic algae blooms. The table below contains the pond management products we most often use, their purpose, timing of applications, and total annual amounts used.

Product	Type	Target	Treatments	Timing	Amount
Aquashade	Dye	Algae & Plants	4	April-Aug.	21 gal
Aquathol K	Herbicide	Aquatic plants	1	May	10 gal
Reward	Herbicide	Aquatic plants	0	June–Sept	0 gal
Copper Sulfate	Algaecide	Algae	5	April–Sept.	300 lb.
Cutrine Ultra	Algaecide	Algae	4	May–Aug.	25 gal
Clearigate	Algaecide	Algae	2	May, Aug.	3.5 gal
Phycomycin	Algaecide	Plankton Algae	0	July–Sept	0 lb.
Aquaprep	Enzymes	Organic Muck	3	April–Sept.	7.5 gal

We performed annual maintenance on the aeration system to help balance the diffusers and keep them operating efficiently. We retrieved all diffusers from the lake bottom, cleaned them in a muriatic acid bath, reassembled them to the plastic tubing, and repositioned them on the lake bottom. We changed filters and graphite vanes on the compressors and adjusted control valves to balance the system. We shut the system down for winter in November following turnover of the water column and will restart it in early spring—or earlier if snowpack over ice becomes too severe during the winter.

In the absence of dense plant and algae cover, smaller fish can be left exposed to predation at an early life stage, thus reducing the number of prey species (Bluegill in this case) reaching a size that provides productive forage for the upper-size classes of Largemouth Bass. Over the last few years we have added several types of cover objects to address this need. Though it has only been 2 years since our first additions of cover objects, the results are apparent. The average size and girth of bass has already notably increased, and the numbers of forage-size Bluegill has increased drastically.

We were able this year to achieve our management goals for aesthetics and the health of the fishery while maintaining a reduced number of algae treatments and total chemical use. Bluegill spawned multiple times this year and the Largemouth Bass spawn was productive. Fish and other aquatic populations would still benefit from natural cover provided by emergent vegetation becoming established along a greater percentage of the lakeshore if we can find a way to bring that about. With that goal in mind, we will continue to try to spare the south shoreline from herbicide treatments next year.



Inspecting metal cone nesting structure

WOOD DUCK NEST SURVEY

We maintained a total of 82 nest box structures for Wood Ducks on or near wetlands and waterways across the property. Maintenance of duck boxes includes repairing structural damage, cleaning out any remains in the boxes, and putting in fresh wood shavings for nesting material. We have three types of nesting boxes available for Wood Ducks: Ducks Unlimited plastic boxes, cedar wood boxes, and galvanized round metal cone boxes.

Fifty-seven percent of available boxes produced a successful nest. The table below indicates Wood Duck usage and nesting success rates at each type of nest box as well as the total for this year and our historical averages. We observed a total of 712 eggs laid this year, of which 291 had hatched (41%). **That hatching rate was the highest we’ve recorded in nine years**, and the total number of eggs, while not historically high, was almost 9% higher than last year. There were fewer “dump nests” this year (19) but the total number of eggs laid in “dump nests” (240) was similar to a year ago, still well below the historical average (354). “Dump nest” refers to nests in which female Wood Ducks (frequently more than one) will lay eggs but not incubate or care for them. This occurs both in artificial nest boxes and natural nesting cavities. The behavior is a form of nest parasitism in which females attempt to sneak their eggs into an active nest to have another female raise the resulting chicks with her own brood.

Type of Nest Box	# of Boxes	Usage by Wood Ducks		Success Rate of Nests	
		#	%	#	%
Metal Cone	5	5	100%	3	60%
Ducks Unlimited	18	15	83%	11	73%
Cedar Vertical	59	49	83%	34	69%
Total	82	69	84%	48	70%
Historical Average	N/A	N/A	84%	N/A	60%

During this year’s nest box inspections, we found several boxes that were usable but in need of replacement or repairs. One box was damaged between the winter repairs and the nest survey and was unusable for nesting. We will carry out the necessary maintenance or replacement of these boxes prior to the upcoming nesting season.



Inspecting nest boxes for use

EASTERN BLUEBIRD NEST SURVEY

On June 30th we inspected the 49 Eastern Bluebird nest boxes on site for use during the nesting season. Eastern Bluebird nests were observed in 15% of the boxes, 5% lower than last year. As in recent years, we observed multiple cases (3) in which House Wrens constructed nests over active Bluebird nests. House Wrens ultimately nested in 30 of the 51 available nest boxes. We estimated that about 9 Eastern Bluebird chicks fledged from our boxes this year, which is far fewer than we typically observe. Our approximation of the number of fledglings remains a rough estimate based on egg fragments observed and other subjective factors. We are likely to continue to see significant fluctuation in Bluebird recruitment dependent upon local or regional habitat, weather patterns, competition for nesting sites (with species such as House Wrens), fluctuations in habitat structure, or other factors. As the oak trees and savannas restored on the property mature, we expect conditions to become more favorable for Eastern Bluebirds.

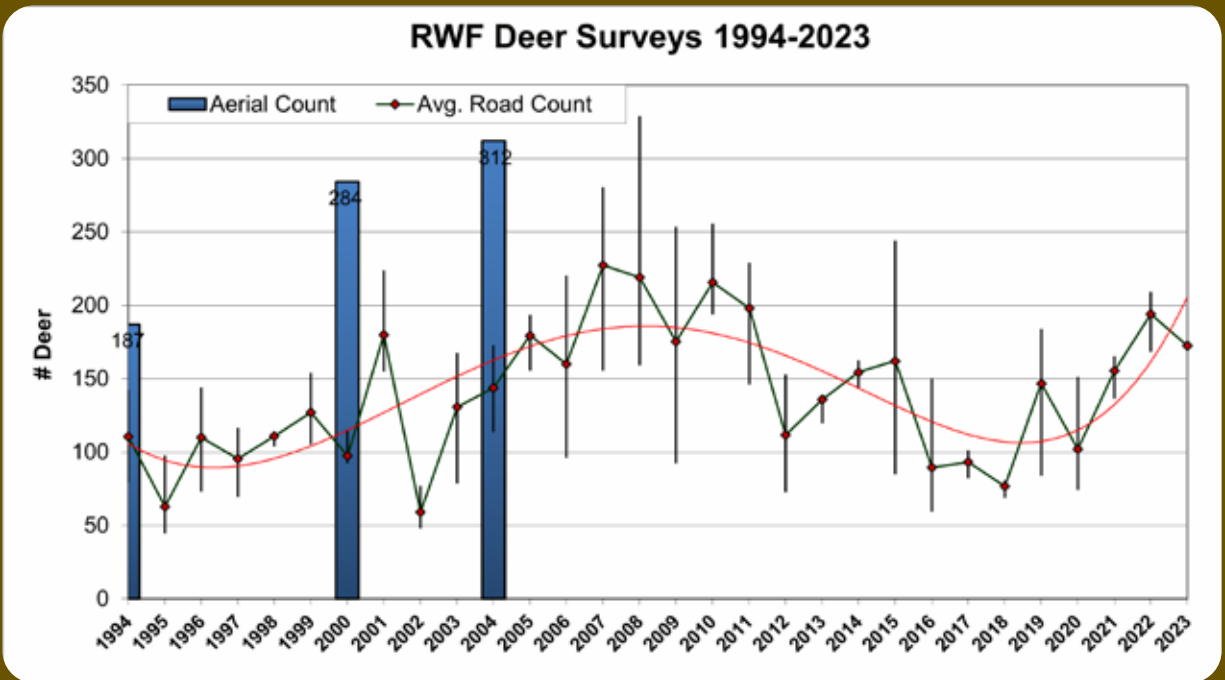
Other species that used Eastern Bluebird nest boxes this year included House Wren (49%), Tree Swallow (9%), mice (6%), European Starling (6%), ant nests (6%), and Carolina Chickadee (2%). Nest boxes were found to be empty on 13% of inspections. In addition to replacing and repairing aging boxes, we continue to adjust nest box placement to try to favor Bluebirds, especially over their chief competitors, House Wrens. Even so, intense competition for nesting sites may be an unavoidable effect of our woodlands reaching a shrubby stage of succession preferred by House Wrens.



Eastern Bluebird eggs



House Wren eggs



Young Whitetail buck chasing a doe

WHITETAIL DEER SURVEYS

Following a protocol we established years ago, we conducted three ground censuses for Whitetail Deer early in the evenings of January 30th, February 17th, and February 24th of 2023. They were conducted from a vehicle traveling a predetermined route along gravel roads on site. Two observers recorded deer seen from the vehicle. The census route and schedule of dates are consistent from year to year. The total numbers of deer seen for each census were 185, 179, and 153, respectively, for an average of 172 deer sighted per survey. One of the reasons we monitor ongoing trends in deer numbers is that when deer populations become excessively high, the herd, individual deer, and the quality of local habitat will suffer. **This year's survey average was the second highest of the last 12 years and 23% above our 30-year average.** Strong fawn production over the prior three years resulting from favorable spring weather conditions and following a temporary reduction in our harvest strategy several years ago account for the increase. It is worth noting that these road survey numbers are a “noisy” dataset as they are simple observations of deer made over three days in the winter from a limited vantage point. There are a number of variables that can skew results one way or the other despite our efforts for consistency. They are only one index of the size of the deer herd and are one of many metrics taken into consideration for devising our deer management strategy.

We use trail cameras to survey wildlife use of the property, and they are especially effective when deployed to monitor deer. A total of 20 cameras were strategically placed across the property to gather information on the movement patterns, reproductive parameters, concentrations, and general presence of deer and other wildlife. Information collected with these cameras can be used to estimate deer recruitment rates, buck-to-doe ratios, numbers of mature bucks, and movements and patterns of deer and other wildlife with more nocturnal or secretive behavior. Among the observations gleaned from trail camera surveys in 2023 were Bobcat and Badger sightings and that deer and turkey recruitment rates continued to be robust.

On February 24th we surveyed all corn and soybean food plots planted in 2022 to determine utilization by deer and other wildlife. It is important to note that these numbers refer to the food crop that was available over the winter of 2022–2023 and do not reference the crop we planted in 2023. Our surveys reflected that an abnormally cool early growing season and summer drought conditions in 2022 did reduce yields on well-drained fields, but crop production was adequate on darker soils. Browsing pressure on soybeans by deer during the growing season (another indicator of population size) continued to increase in scope and severity. On dryer fields this prevented rows from canopying, leaving an open niche for weeds to exploit. All corn fields produced ears this year (which has not always been the case). Taken as a whole, in food plots property-wide, 67% of corn stalks still had cobs attached (a 16% decrease over the previous survey) and 16% of kernels remained on those cobs. Between the increase in corn that we left standing and very mild winter conditions, deer and other grain-eating wildlife did not experience any lean time last winter. In addition to corn, we left about 15% of our soybeans standing for wildlife use. Improved shatter-resistance of modern soybean varieties has made this crop an even more valuable food source in recent winters. We've found that they continue to hold beans in pods deep into winter and even into spring, above any typical depth of snow cover and readily available for wildlife browse. In recent corn surveys, we've made it a point to record information on soybeans as well. Unlike what we found with corn, this year's survey showed the near-total utilization by wildlife of the beans that we left standing in most fields but two fields had significant beans remaining in pods. There was no need and no evidence this year of deer foraging on “hunger foods” such as Red Cedar, Arbor Vitae, or Yew shrubs in landscaping during the late-winter months.



A fawn captured for our ear-tagging research project

WHITETAIL DEER SURVEYS (cont'd)

We monitor many aspects of the local deer population through cooperative efforts with hunters, who fill out a log sheet upon completion of each deer hunt on site. They record numerous factors and observations on deer and other wildlife, which are entered into a database by Foundation staff for analysis. This dataset helps us identify trends in population demographics that influence subsequent population numbers and give us invaluable information that strongly informs our deer management strategy. Our hunters also provide us access to sample material from harvested animals, which we collect and deliver to the Illinois Department of Natural Resources to be tested for Chronic Wasting Disease. RWF has provided the Department with the majority of samples taken from Lee County over the years. Unfortunately, since 2020, we have had several samples test positive for CWD, including 2 adult bucks this year. In response to the presence of CWD on site we have increased our efforts to harvest and test adult deer for this fatal disease. Moving forward, the presence and observed prevalence rates in our area will heavily influence our decisions as we develop our management goals for Whitetail Deer.

Foundation employees captured seven Whitetail Deer fawns on the property incidental to other work (4 males, 3 females). We equipped the fawns with individual ear tags containing I.D. numbers, the acronym "RWF," and our office phone number. To date, we have tagged 102 deer (52 male, 49 female, and one unknown). Of these, 23 have yielded valuable post-capture information regarding local population demographics, mortality factors, and movement patterns. We have recovered 11 females on site: 9 harvested by hunters and 2 killed by vehicle collision. We have recovered 5 males on site: 2 killed by vehicle collision (both < 1 year old), 1 evidently predated in its first month, and 2 harvested (both at 4.5 yrs. old). In addition 3 males (one 1.5 yrs. and two 2.5 yrs. old) and 4 females (1.5, 2.5, 3.5, and 8.5 yrs. old) have been phoned in after being harvested off site by hunters. These deer were from < 1 mile to 25 miles from the Foundation when harvested. The data collected from this tagging program provides useful information that we use when developing our deer management strategies.



A doe and fawn pass by a buck leaving his scent on a vine



Smooth Green Snake

HERPETOLOGICAL SURVEY

Foundation staff survey reptiles and amphibians using cover boards, aquatic hoop traps, and visual and audio searches. Amphibians observed on site this year included Tiger Salamander, Western Chorus Frog, Blanchard's Cricket Frog, Grey Tree Frog, Northern Leopard Frog, Green Frog, American Bullfrog, and American Toad. Reptiles observed this year included Six-Lined Racerunner, Smooth Green Snake, Fox Snake, Eastern Garter Snake, Plains Garter Snake, Eastern Hognose Snake, Brown Snake, Painted Turtle, Common Snapping Turtle, Blanding's Turtle, Spiny Softshell Turtle, and Ornate Box Turtle. No Spring Peepers were recorded this year.

Whenever feasible, turtles that we capture are assigned and marked with a code so that they can be identified if they are caught in the future. This provides us with valuable information on growth rates and population demography. With four female Blanding's Turtles "on air" (equipped with radio transmitters) to begin the field season and finding ourselves buried in tornado-related clean-up this spring, we did not put our usual effort into trapping wetlands for Blanding's and other aquatic turtles. The only new turtles we marked this year were hatchling Blanding's Turtles from protected nests that we directly released into wetlands. Read more about our efforts to study and boost the local Blanding's Turtle population in the "Research and Study Projects" section of this report.

All species of amphibians at RWF breed in wetland habitat but each has its own specific requirements of hydrology, plant cover, etc., and different species mate at different times of year to maximize the chances that their eggs and larvae have the conditions they need for success. Most, but not all, of our local amphibians thrive in ephemeral wetlands, which tend to dry down in the summer and recharge with fall-winter-spring precipitation. Periodic drying of breeding pools reduces populations of many upper-level aquatic predators of amphibian eggs and larvae such as fish and leeches. Drying also spurs plant growth on exposed mudflats in the late summer and fall, which expands the base of the food chain for larval amphibians. On the other hand, if wetland water levels drop quickly and early in the summer, amphibian larvae may not have time to complete their metamorphoses to an adult stage before being stranded by receding waters. Different species have different maturation rates. Chorus Frogs and American Toads, for example, mature quickly and can leave ponds as small frogs in their adult stage in early summer. Tiger Salamanders require a much longer duration and may not mature until September or later.

Successive dry years caused many of our wetlands to enter the amphibian breeding season below their full capacity, and an extremely dry period through most of May and June brought water levels down more quickly than usual. Eighteen of our wetlands dried completely, but the rest maintained a pool. Depending on location and size of the watershed, wetland habitat varied more from wetland to wetland in the early and mid-summer months than usual. Several of the wetlands in the east and central low grounds on the Foundation held water deep into summer and produced incredible numbers of Northern Leopard Frogs, with dozens of emergent juvenile frogs seen hopping away from each footstep a person might take within 100 yards of the pond. American Toads, a relatively common species of low conservation concern, had a second consecutive year of lower reproductive output than usual. We'll keep an eye on this as the reasons for that drop-off aren't clear. We saw juvenile Tiger Salamanders in the fall, though not in great numbers; that species is typically the last to metamorphose of our local amphibians. American Bullfrogs and Green Frogs require more permanence to their wetlands, with larvae overwintering in the pond and emerging the following summer. Wet years favor these species and we have been in a dry spell. There were enough ponds that maintained healthy water levels through the year that there is no reason for concern over either species. Diversity of habitat leads to diversity of wildlife and no two years ever offer identical conditions. As multi-year cycles of weather and habitat conditions play out it is always interesting to monitor changes to the amphibian community.

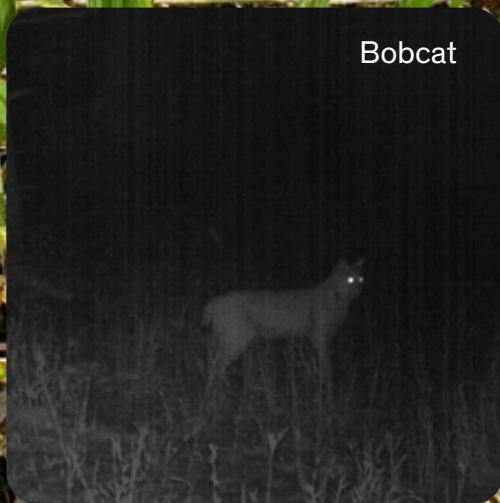
Juvenile Sandhill Crane



American Badger



Bobcat



WILDLIFE OBSERVATIONS

The Foundation maintains records of wildlife observations and reproductive parameters of various species. The following are notes on selected observations.

In late January, a large male River Otter was unfortunately hit by a vehicle on Shaw Road where the waterway from Martin Wetland flows north. Over the years we have seen scat, tracks, and sign that we attributed to River Otters, but this was the first certain confirmation. We saw more scat and tracks of otters in February at Kingfisher Wetland that seemed to indicate several individuals of varying size classes. **We also had our first images of a Bobcat on one of our trail cameras in January.** This was our second observation of a Bobcat (the first going back to 2010) and the first photos we've had to document the species here. As our oak woodlands mature, RWF habitat will become more suitable for Bobcats. Their preferred prey species are certainly already abundant here.

An extremely mild winter, a dry mid-late spring, and average-to-wet late-summer and fall conditions benefitted a lot of species this year. Our spring waterfowl migration on site was stronger than last year's but still perhaps weaker than normal. The fall migration of waterfowl was above average, and with the lack of a winter freeze by year's end it continued later than normal. This was an average-to-above breeding year for Ring-Necked Pheasants. Wild Turkeys had a second consecutive bonanza breeding year, benefiting from decreased egg predation due to our Raccoon-removal efforts for Blanding's Turtle recovery. Bobwhite Quail were heard calling in the spring and summer and coveys of the birds were seen twice on both the north and south ends of the property. Sandhill Cranes continue to nest on site. Multiple breeding pairs and nests were observed, and several chicks were seen with parents this year. At least 3 juveniles fledged and were seen flying with parents well into the fall. American Beavers and Eastern Cottontails remained significantly more abundant than usual. Removing beaver dams from wetland control structures and culverts was an ongoing and mucky chore this year.

Members of the Illinois Audubon Society surveyed RWF during the IAS's Spring and Christmas Bird Counts (CBC) and Global Big Days. They recorded 95 species in 2023, including a Snow Goose on their CBC for the first time. In 2023, 13 new sightings were added to the eBird list for RWF bringing it up to 137 total species currently.

The return in the fall of a particular pair of Whooping Cranes has become an event that we look forward to each year, and in mid-October they were back. This pair has spent a month or more here before continuing further south for winter for the last several years. This year and last, a second pair joined the first for a week or so before continuing on. There are only a few hundred Whooping Cranes in the world, though that is considerable progress from their low point of only about 20 individuals in the 1940s. The collaborative effort of private organizations like the International Crane Foundation and governmental agencies to bring this species back from the brink has been one of the great testaments to what can be achieved by coordinated conservation biology.

Sightings of Endangered or Threatened species included Whooping Crane, Osprey, Northern Harrier, Starhead Topminnow, Blanding's Turtle, and Ornate Box Turtle. Other species of interest included Pileated Woodpecker, Red-Headed Woodpecker, Broad-Winged Hawk, Rough-Legged Hawk, Merlin, Pied-Billed Grebe, Common Loon, Trumpeter Swan, White-Fronted Geese, Whip-Poor-Will, Yellow-Breasted Chat, Black-Throated Green Warbler, Bald Eagle, Eastern Screech Owl, Blanchard's Cricket Frog, Tiger Salamander, Six-Lined Racerunner, Smooth Green Snake, Plains Garter Snake, River Otter, American Badger, and Bobcat. Also see Morgan Brown and Dr. Chris Dietrich's description in the "Research and Study Projects" section of this report on several species of leafhoppers and planthoppers that they identified for the first time on this site (or, in one case, in the state).



Releasing recently emerged hatchlings directly to a wetland

RARE TURTLES RECOVERY PROJECT

Blanding's and Ornate Box Turtles are Endangered and Threatened, respectively, in Illinois and have drastically declined in number in the state and in many places across their native ranges. They are among the most imperiled full-time resident species on our site; both are primarily prairie species. Blanding's Turtles are a species evolved to exist in a prairie pothole wetland ecosystem. Ornate Box Turtles are a terrestrial species and do not have the same wetland requirements as Blanding's Turtles.

The loss of historical prairie habitat—and especially of large, unbroken blocks of prairie—has been a leading factor in the decline of both species. At RWF we have restored many acres of prairie and wetlands, which has certainly benefitted the small remaining populations of these two turtle species. Even so, our population surveys over the years have not shown an age structure that would indicate a growing or even stable population. The most limiting factor for turtles in this region today other than habitat loss is nest and hatchling predation by mesopredators, primarily Raccoons. Raccoons are a species that benefits from and exists in larger numbers on today's agricultural landscape than they did in days before plowing and successional forest regeneration. The quality or quantity of nesting sites for Blanding's and Ornate Box Turtles at RWF may have diminished over the years as trees planted on sandy ground have matured, making conditions more appealing to Raccoons and other mesopredators. Relatively open sandy soils are preferred nesting sites for female turtles of both species.

For several years we have taken actions meant to foster a recovery of these populations on our site. In the initial phases we were able to identify some nesting areas for both species, allowing us to conduct informed habitat management practices. Later, through much trial and error, we learned to follow female Blanding's Turtles during their nesting forays to protect their nest and eggs from predation with wire baskets. We would then release resultant hatchlings directly to shallow, vegetated wetland habitat following their emergence, saving them from the risks of "running the gauntlet" to find suitable habitat on their own. For several years we were able to work with partner agencies to incubate eggs and give the hatchlings a year or more in a head-starting program, further increasing their odds of survival. An introduced fungal pathogen has put head-starting programs on hold for the last two years. We are hopeful that with increased biosecurity and testing protocol, those programs will resume and that we will find a partner agency willing to include RWF hatchlings.

We continue to refine our approach to Blanding's Turtle conservation measures into a fairly repeatable annual process. Our efforts begin in early spring, by locating any turtles that overwintered with radiotelemetry transmitters affixed to their shells. Knowing where these turtles are successfully overwintering gives us valuable information, applicable to habitat management practices and the next step in our process: trapping for additional females. Starting in April or May, prior to the turtle nesting season, we usually deploy and monitor aquatic hoop traps and conduct visual searches in and around wetlands, with the primary goal of finding gravid (pregnant with eggs) adult female turtles. Capture rates can be frustratingly low. With few adult Blanding's Turtles and many acres of wetland habitat, the needle in the haystack analogy applies. When we capture adult females, we palpate (feel for eggs) to determine if they are gravid, take size measurements and health observations, and affix a radio transmitter to their carapace, allowing us to monitor them by triangulating the signal from their transmitter picked up by a telemetry receiver. The turtles are then released at the site of their capture. This year, with four females "on-air" to start the year and much unanticipated work required due to the spring tornado we opted not to trap for additional females.



A recaptured head-started Blanding's Turtle

RARE TURTLES RECOVERY PROJECT (cont'd)

Typical nesting season is late May into late June. Beginning in mid-May we regularly locate the female turtles in evenings to determine if they remain in a wetland or are moving over land, potentially on a nesting foray. Sometimes overland movements are “false alarms” as it is common for Blanding’s Turtles to move from one pond to another. Regardless, we have learned to keep a close watch on a gravid turtle. We check her status approximately every 3 hours around the clock until she either nests or returns to a wetland. If we are able to follow a female through her nesting process, we either protect the nest with a welded wire basket or collect the eggs, carefully store them in sealed containers with some of the sand substrate from the nest and deliver them to our partners for incubation.

Like certain other turtles, Blanding’s Turtles exhibit Temperature-Dependent Sex Determination (TSD) rather than a genetic, chromosomal determination of sex. In this species cooler incubation temperatures lead eggs to develop into male hatchlings while warmer temperatures result in female hatchlings. This interesting aspect of their development affords us a level of control over the sex of the eggs when we incubate. Because Blanding’s Turtles exhibit delayed sexual maturity (>14 years for Females, ~12 years for males) and because reproductive females are so desperately needed to foster a recovery, we generally opt to incubate each clutch at temperatures to generate a 2:1 ratio of female-to-male hatchlings.

Even with the additional protection afforded to hatchlings by nest caging and direct release or head-starting, they remain at significant risk of predation by mesopredators such as Raccoons, Opossums, Mink, and Coyotes for several years. Additionally, we cannot expect to capture all female Blanding’s or Ornate Box Turtles every year nor protect all nests from predators. To address this threat to our imperiled turtle populations, we were granted a special permit from the Illinois Department of Natural Resources to trap mesopredators outside of the typical furbearer trapping season. Our goal has been to trap before and during the turtle nesting season, primarily targeting Raccoons. From May 2nd to July 9th we deployed as many as 95 dog-proof style reach-in traps to help avoid non-target species. Traps were expertly placed and baited along Raccoon trails and checked 7 days a week. Over 3,288 total trap nights (1 trap night = 1 trap set for 1 night minus any false triggers), we removed 168 raccoons and 22 Opossums. The local Raccoon population is impressive and apparently quite resilient. Despite our trapping over 700 over the last three years, following our trapping session this year we still observed adult and juvenile Raccoons occasionally in person and frequently in our trail camera surveys.

We were able this year to track 4 gravid female Blanding’s Turtles and protected 3 nests. The fourth gave us the slip — apparently emerging and nesting quickly and at an unusual hour. We used wire mesh baskets to keep predators out and eventual hatchlings in. Starting in late August we checked the nests daily, hoping to see emerged hatchlings. All 3 nests had successful hatchlings. From two of the nests hatchlings emerged in late September (9 and 12 hatchlings). One female had nested in a corn field while the corn was only knee high. We basketed the nest, marked the area, and conducted farming operations around it. Unfortunately as the corn grew taller, it apparently shaded the nest too much and in the resulting cool conditions most of the eggs failed and the hatchlings did not emerge on their own. We excavated the nest in mid-October and were able to save 3 hatchlings. The rest had died in various stages of development before hatching. We released all 24 hatchlings from the 3 nests directly to the relative protection of a wetland. We currently have transmitters on the same 4 adult females we followed this year, and we hope to capture more in our spring trapping season.



Wire baskets protect nests from predators. When the hatchlings emerged we moved them directly to shallow wetland habitat.

RARE TURTLES RECOVERY PROJECT (cont'd)

Year	Adult Females with Transmitters	Nests Protected	Hatchlings Direct Released	Head-Started Juveniles Released
2018	4	2	22	—
2019	3	3	—	—
2020	1	1	—	37
2021	2	—	—	—
2022	3	3	33	23
2023	4	3	24	

Interventive nest protection is more difficult for Ornate Box Turtles than for Blanding's Turtles for a variety of reasons. Box Turtles rarely lay more than 2 eggs while Blanding's commonly lay more than 10. It is difficult to definitively conclude whether a Box Turtle is gravid or not because of the challenges of palpating them due to their small size and ability to close their plastron on probing fingers. Box Turtles are entirely terrestrial so there is no cue to look for as an indication that they are soon to nest as there is when Blanding's Turtles leave their wetland. We are currently only aware of 2 female Ornate Box Turtles on site and a male that has not been seen in several years. Currently, our best conservation approaches for this species are to create quality habitat and reduce nest predators in areas known to harbor Box Turtles.

The road to recovery for either of these turtle species will be long and difficult. The hard-earned successes and lessons we've learned to this point have been due primarily to collaboration and partnerships, as will be any future success. Discussions, planning sessions, cooperation, and mutual support from colleagues have been critical to scaling up our efforts efficiently. Across northern Illinois these turtles face many of the same threats and require the same types of interventions to remain part of the animal community on our local landscape. We are very fortunate and very grateful to have found the partnerships we have formed over the last few years, and we look forward to continuing to work together on this important effort.



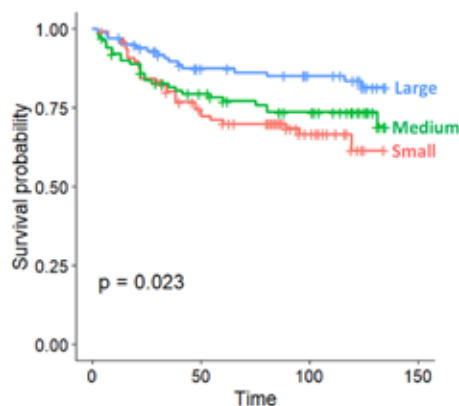


Hatchling Blanding's Turtles

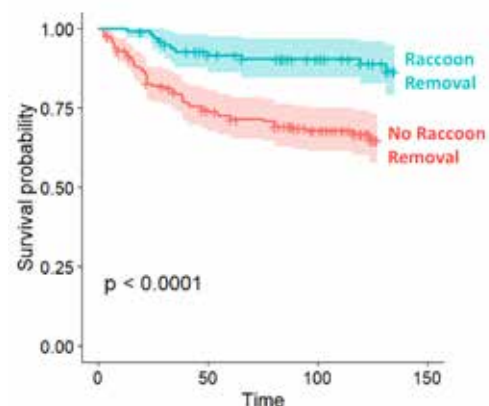
WHAT MATTERS FOR THE SURVIVAL OF HEAD-STARTED BLANDING'S TURTLES?

Northern Illinois University researchers Callie Klatt Golba and Rich King, along with collaborators Elizabeth Bach (Nachusa Grasslands), Gary Glowacki (Lake County Forest Preserve District), Bill Graser (Forest Preserve District of Kane County), Kathryn McCabe (Lake County Forest Preserve District), Daniel Thompson (Forest Preserve District of DuPage County), and Brian Towey (Richardson Wildlife Foundation), presented results of a multi-year study of the effects of size at release and Raccoon removal on survival of head-started Blanding's Turtles at the 2023 Joint Meeting of Ichthyologists and Herpetologists. An abstract and figures from their presentation are provided here.

Head-starting is a popular conservation intervention used for many turtle species that involves collecting eggs from the wild, hatching and rearing the turtles in captivity, and releasing them back into the wild once they have reached a specified age or size. The goal is to protect vulnerable life stages (eggs, hatchlings), increase juvenile recruitment, and re-establish self-sustaining populations. Analyses of survival, spatial ecology, and growth of head-started Blanding's Turtles demonstrate the potential utility of head-starting for increasing recruitment. However, replicated studies using consistent head-starting and monitoring methods are lacking, so the generality of single-population studies is uncertain. **To determine best practices for head-starting as a management tool, we conducted a replicated study of head-start survival at 7 sites in Northern Illinois from 2020 to 2023.** A total of 304 turtles (up to 35 turtles per site per year) were released and tracked using radiotelemetry for 1–3 active seasons post-release and for 1–3 overwintering periods. Head-starts varied in size and age at release and sites varied in size, predator management, and Blanding's Turtle population status. Initial analysis using Cox regression shows that active-season survival was highly variable among sites, ranging from about 40%–90%. Overwinter survival, estimated directly from the number of transmitter-equipped turtles that survived, averaged 94% across sites and years. These results will be combined with Population Viability Analysis and estimates of economic costs to develop recommendations of best practices for Blanding's Turtle head-starting. This will include site-by-site management considerations, release size or age, follow-up monitoring, and adaptive management guidelines.



Survival is significantly greater for head-started Blanding's Turtles that are larger at release. Small head-starts ranged from 34 to 70 g, medium head-starts from 71 to 106 g, and large head-starts from 107 to 336 g. Time is measured in days post-release; downward steps in survival lines represent mortality events; vertical lines represent censored data due to transmitter failure or removal.



Survival is significantly greater for head-started Blanding's Turtles at sites and in years with raccoon removal than without raccoon removal. Time is measured in days post-release; downward steps in survival lines represent mortality events; vertical lines represent censored data due to transmitter failure or removal.



Camera trap images
of Raccoons

EFFICACY OF PREDATOR CONTROL AND PREVALENCE OF ZONOTIC PATHOGENS IN NORTHERN ILLINOIS RACCOONS

Two graduate students at Southern Illinois University, Ashley McDonald, a doctoral student in Dr. Augustin Jiminez's Parasitology laboratory, and Jennifer Schultze, a master's student in Dr. Clay Nielsen's Wildlife Ecology laboratory, are studying various aspects of Raccoon Ecology at RWF in conjunction with our in-house efforts to reduce predation on Blanding's Turtle nests and juveniles. The following paragraphs are their summary of their ongoing projects.

Raccoons (*Procyon lotor*) are mesopredators that are highly adaptable to new environments, allowing them to flourish in both urban and rural landscapes. Raccoons are chronic nuisance animals that forage on anthropogenic food sources. Their growing abundance in developed landscapes has generated an interest in understanding how raccoons affect humans and the environment. Due to their opportunistic nature and adaptability, raccoons can negatively impact several avian and reptilian species, including the endangered Blanding's Turtle (*Emydoidea blandingii*) found on Richardson Wildlife Foundation lands. For raccoons, predator removal has commonly been investigated as a management strategy to increase survival of vulnerable populations, and the results suggest predator removal to be an effective approach, significantly reducing predation and increasing nest survival of Diamondback Terrapins (*Malaclemys terrapin*), American Oystercatchers (*Haematopus palliatus*), and Blanding's Turtles. While past studies have explored predator removal as a management method, not many have determined the efficacy and long-term feasibility of predator removal in an overabundant population.

Overabundance of raccoons has also led to heightened concern regarding disease transfer between raccoons, other wildlife, and humans. Zoonoses are attributed to approximately 60% of known human infectious diseases worldwide and 75% of emerging infectious diseases. Raccoons are known to carry many zoonotic pathogens such as *Babesia* spp., *Ehrlichia* spp., *Anaplasma* spp., *Rickettsia* spp., *Borrelia* spp., *Trypanosoma cruzi*, and *Baylisascaris procyonis*, but efforts to quantify the prevalence and distribution of zoonotic pathogens in raccoons along a rural-urban gradient are scarce. Monitoring the prevalence and distribution of zoonotic pathogens in host species is important for the development of strategies to reduce occurrence of human infection and the prevention of future pandemics caused by emerging zoonotic diseases.

Our study has two primary objectives: (1) to determine the intensity of trapping effort needed to reduce an overabundant raccoon population and estimate abundance and density of raccoons before and after removal, and (2) to assess the prevalence and distribution of zoonotic pathogens in raccoons.

To reach objective 1, we are conducting research at 6 northern Illinois study sites representing a rural-urban gradient during 2022–2024; Richardson Wildlife Foundation is one of those sites. Each February–August, 109 camera traps are placed at all 6 sites; 23 of which are at Richardson Wildlife Foundation. We have already collected considerable pilot data from our 2022 and 2023 field seasons, compiling over 100,000 wildlife images; 32,456 of those were obtained at Richardson Wildlife Foundation. Changes in raccoon detection rates as visualized through camera data will indicate the efficacy of raccoon removal efforts throughout the spring. We will quantitatively analyze these changes using occupancy modeling and relative abundance indexing methods.



Camera trap images showing (top to bottom) a Coyote, male and female Ring-Necked Pheasants, and a Raccoon

EFFICACY OF PREDATOR CONTROL AND PREVALENCE OF ZONOTIC PATHOGENS IN NORTHERN ILLINOIS RACCOONS (cont'd)

Raccoon capture and removal efforts are conducted during April–May by site collaborators or United States Department of Agriculture - Wildlife Services personnel. Trappers use wire cages and dog-proof foothold traps for capture. During our 2022 and 2023 field seasons, 551 raccoons were removed from our study sites including 361 from Richardson Wildlife Foundation. Trapping data will help determine the intensity of trapping effort needed to reduce raccoon populations and to estimate the pre-removal density of raccoons.

To reach objective 2, and to take advantage of raccoons removed by trappers, raccoon carcasses are collected from project collaborators and necropsied according to standard procedures. We collect 20 raccoons from each site per year ($n = 300$ total raccoons). Raccoon carcasses are necropsied, and tissue samples collected from the liver, diaphragm, spleen, and heart. Intestinal tracts are also collected for examination for intestinal parasites. The pathogens of interest in this study include *Borrelia burgdorferi*, *Babesia microti*, *Anaplasma phagocytophilum*, *Ehrlichia chaffeensis*, *Rickettsia rickettsii*, *Trypanosoma cruzi*, and *Baylisascaris procyonis*. Thus far, we have completed 88 intestinal tract examinations and have detected the presence of raccoon roundworm in 23 individuals (26%). We have also detected intestinal parasites in 86 individuals (98%) including hookworms, tapeworms, trematodes, and acanthocephalans. To quantify pathogen prevalence, we are extracting DNA from tissue samples using a commercial kit per the manufacturer's instructions (DNeasy Blood & Tissue Kit, Qiagen, Valencia, California). Resulting DNA will be quantified via qPCR using primers and probes described in previous studies. Prevalence of each pathogen will be determined as the proportion of infected individuals from each site and prevalence will be compared among sites to assess differences across the rural-urban gradient. Based on previous studies, we predict that overall pathogen prevalence will be high in raccoons, warranting public health concern.

This study will help determine the intensity of trapping effort needed to reduce an overabundant predator population and to estimate abundance and density of raccoons. It will assist in evaluating the long-term feasibility of conducting predator control methods in management. Monitoring (via camera traps) spatial distribution of raccoons before, during, and after removal programs will provide insight into the duration of removal impacts. The use of camera traps alongside predator removal is a non-invasive and cost-efficient method for monitoring the efficacy of predator removal. Our findings will also advise public health officials of the presence of zoonotic pathogens in these study areas, contributing to precise diagnoses and improved patient care in local communities. Results will also allow an assessment of public health risk that raccoons pose to humans and will help inform wildlife management decisions to integrate the health and wellbeing of wildlife and humans.



Allison igniting the backfire on a controlled burn of oak savanna habitat

EFFECTS OF PRESCRIBED FIRE ON OAK GROWTH AND SURVIVAL

Allison Earle, as a student in Dr. Scott Meiners's Plant Ecology laboratory at Eastern Illinois University, conducted the field research for her master's thesis at RWF. She successfully defended her thesis and graduated with her Master of Biological Sciences degree in May. (Congratulations, Allison!) A manuscript based on this work has been submitted to the journal Restoration Ecology. The following paragraphs are Allison's summary of her research.

Temperate savannas are among the most at-risk biomes because of their high rate of conversion to other land uses and low rate of protection. Oak savannas, a temperate savanna type characterized by a canopy of oaks (*Quercus* spp.), are estimated to occupy less than 1% of their historical range. Savannas have a grass-dominated, continuous herbaceous layer and a tree canopy covering between 25-50% of the land. In the absence of periodic burning, fire-sensitive shrubs and trees can become established, eventually resulting in a closed-canopy forest.

Because oak savanna restoration is a slow process, there is relatively little literature available to inform the practice. One restoration approach is to plant trees into a grassland. However, young oaks are more susceptible to fire than older trees. To protect the young trees, mechanical control (e.g., mowing) in place of prescribed fire may be needed for the first several years after planting. While mowing mimics some effects of prescribed fire, it is not a perfect substitution. Therefore, returning fire to the restoration is important for maintaining the desired community structure and composition.

I looked at oak growth and survival after the addition of prescribed fire. With this project, I was able to address the following research questions:

- 1) Is there a threshold of tree diameter above which risk of top kill from prescribed fire is low?
- 2) Does prescribed fire generate physiological changes in leaves?
- 3) Does prescribed fire alter oak growth?

To answer these questions, I tracked the responses of 379 planted oaks in two management units at Richardson Wildlife Foundation. Firebreaks divided the units, and a portion of both units were burned in March 2022. Within each area, I assessed the responses of *Quercus macrocarpa* (Bur Oak), *Q. alba* (White Oak), and *Q. velutina* (Black Oak). Trees were selected to represent a range of sizes and understory cover to capture a gradient of fire severity and potentially, tree responses.

Prior to the burn, I placed pyrometers near the base of the oak trees to measure the surface temperature during the fire. The pyrometers were copper tags painted with 11 lacquers, which liquify at different temperatures. I also marked the location of the tree, identified it to species, and measured its diameter at breast height (dbh). After the burn, I measured the scorch height and the percent of the area scorched on each trunk. This, in combination with the pyrometer data, gave me a measure of the intensity of the burn for each tree. To determine how fire severity affects the trees, I measured extension growth from the year prior to the fire and the year following the fire (four stems). I also measured the chlorophyll content and leaf mass per unit area (LMA) of two leaves from each tree. Chlorophyll content is related to the photosynthetic efficiency of the leaf and LMA is related to plant growth and resource acquisition strategies.



Pyrometer
before (left) and
after fire (right).



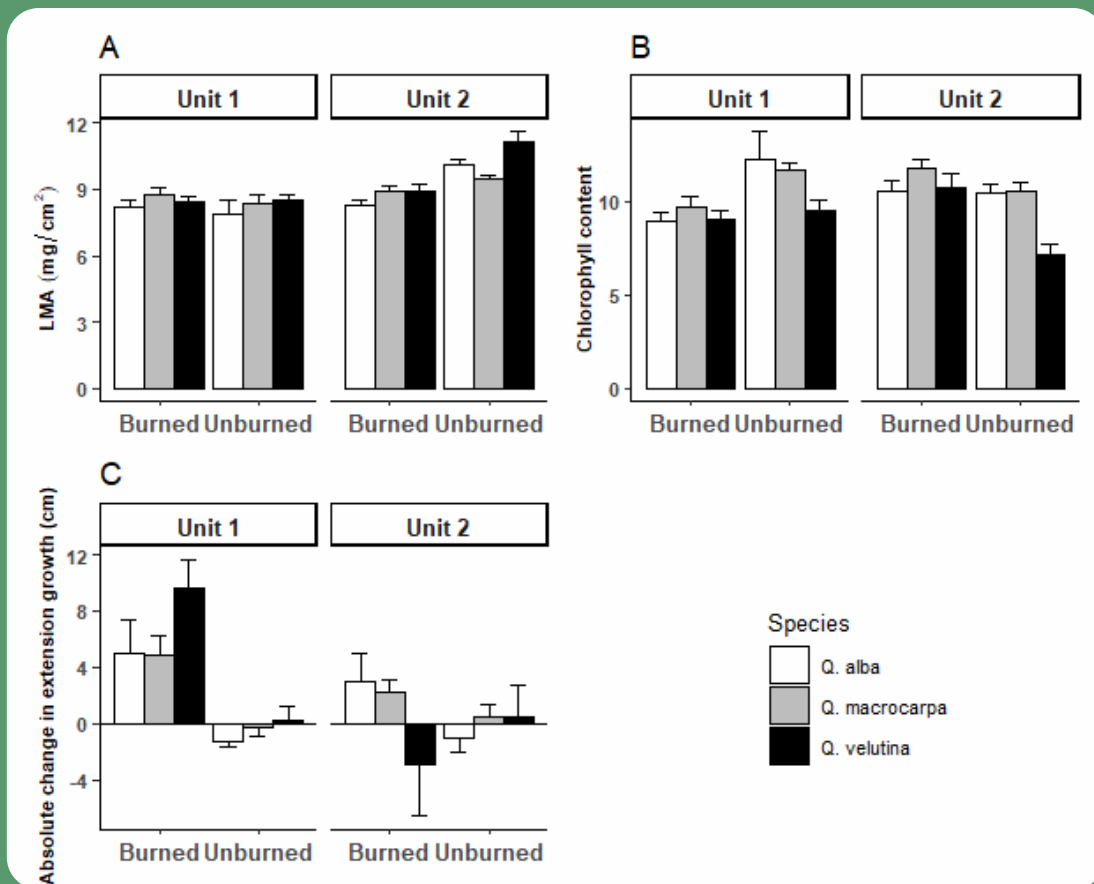


Figure 1. Influence of burn treatment, unit, and oak species on leaf mass per unit area (A), chlorophyll content (B), and absolute change in extension growth (2021 to 2022, C). Excludes top killed individuals. Negative bars in Figure C indicate less growth on average in 2022 compared to 2021.

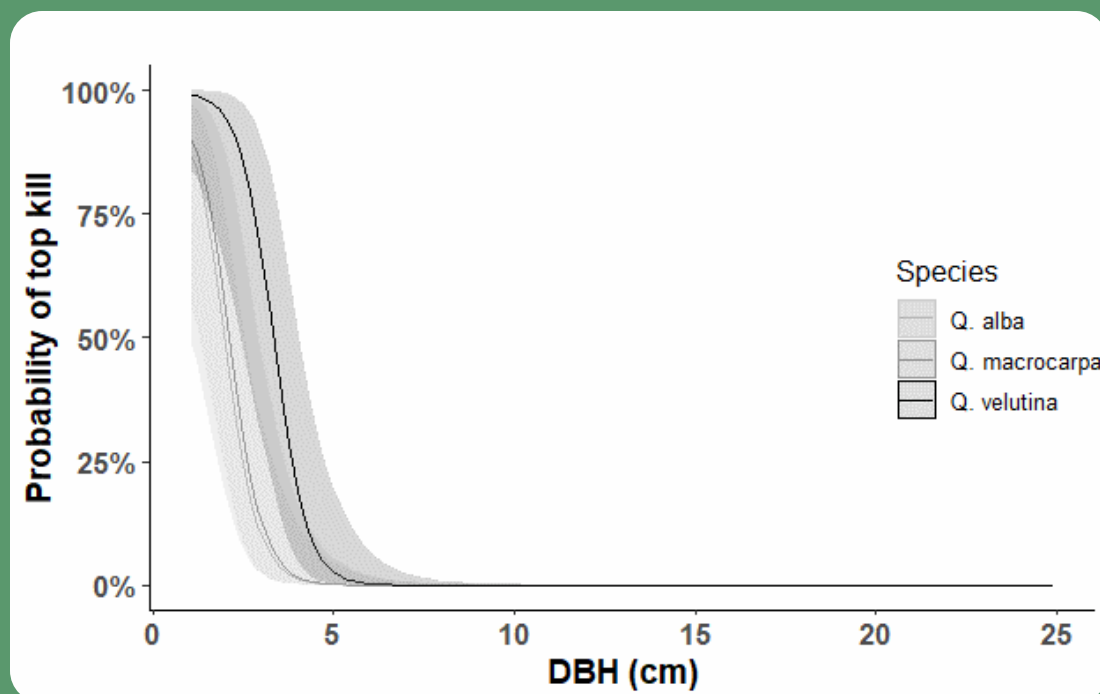


Figure 2. Probability of being top killed by fire as a function of initial tree size for the three *Quercus* species.

EFFECTS OF PRESCRIBED FIRE ON OAK GROWTH AND SURVIVAL (cont'd)

The temperature of the burns averaged about 330°C (626°F) and were very uniform, so fire intensity was not considered as a variable in analyses. Physiological differences were generally small and inconsistent across units (Figure 1A & 1B). There was a slight decrease in LMA in the burned area of Unit 2 compared to the unburned area, which may indicate higher nutrient availability after the burn. However, because I did not measure chlorophyll content or LMA prior to the burn, it is possible the differences I detected between burned and unburned areas may have been a result of within site variation, rather than fire effects. The trees in both burned units grew more than those in the unburned units, regardless of species or dbh (Figure 1C). This may be because the fire released nutrients or decreased competition from the herbaceous understory. In addition, there was no outright mortality, although 19 trees were top killed (the aboveground portion of the tree was killed, but it resprouted from the roots). Probability of top kill was largely dependent on dbh, with trees greater than 5 cm dbh having near zero probability (Figure 2). Black Oaks were slightly more likely to be top killed than either White Oaks or Bur Oaks. Trees where char height was higher were also more likely to be top killed, suggesting fire intensity played a role in vulnerability.

This study does have limitations. For example, my results may not be applicable to burns with higher intensity, which may cause more tree damage. Furthermore, as multiple, frequent fires are generally needed to reduce survival of undesirable trees, but may also reduce survival of the desired trees, caution should be used in determining fire frequency in young, planted savannas. Despite this, the information gathered from this research has clear management implications. Because there was no mortality in our study and only the smallest trees were top killed, it may be feasible to use dormant season prescribed fire as a tool to increase the growth of planted trees, especially once they exceed 4 cm DBH. Increased growth in burned areas suggests that fire will improve oak growth in the short term, speeding the development of a more mature savanna canopy. Most importantly, the introduction of fire into developing savanna restorations will reduce the cover of aggressive shrubs which are often responsible for the degradation of remnant savannas. Fires should also allow the expansion of the diverse and heterogeneous forb understory characteristic of savannas, often the initial motivation behind savanna restoration.





Morgan vacuuming vegetation using a modified leaf blower

PRAIRIE INSECT SAMPLING

Morgan Brown, a master's student at University of Illinois, is working with Illinois Natural History Survey State Entomologist Dr. Chris Dietrich to survey prairie insects at sites throughout the state. Their work will allow comparisons with surveys done in prior years to track changes in species presence and prevalence over time. The remnant prairie at RWF is one of several field sites they are using. The following paragraphs are Morgan's summary of her research to date.



The planthopper species *Bakerella minuta*, previously not recorded from Illinois.

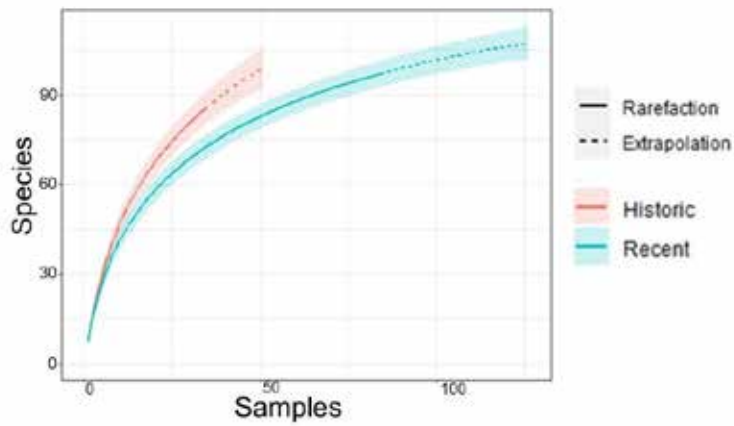
them again to gain insight into the current community composition. Richardson Wildlife Foundation acts as one of our sites, having originally been sampled in 1997. We began recent sampling at RWF during the summer of 2022 and returned during the summer of 2023 to continue our efforts. Over the course of each summer, we visited RWF three times to collect insects by sweep-netting and vacuuming prairie vegetation within the large remnant prairie in the northern portion of RWF and the sand prairie east of the entrance.

At the time of last year's report, we had collected and identified 42 unique species of Auchenorrhyncha during the summer of 2022. **After further examination of specimens collected in 2022 in addition to the specimens collected during the summer of 2023, we have currently collected and identified 103 unique species from RWF. During historic sampling, a total of 86 unique species were collected and identified, indicating that over time the species richness of Auchenorrhyncha has increased at RWF.** Some notable new leafhopper findings from 2023 include the bluestem-feeding *Prairiana kansana* and the willow-feeding *Macropsis viridis*. Further inspection of specimens collected in 2022 also revealed *Bakerella minuta*, a planthopper previously not known to occur in Illinois. *B. minuta* is presumed to feed on sedges and also occurs in Florida and Georgia.

Using our current data, we created species accumulation curves to determine the completeness of historic and recent sampling. This curve displays the number of total species collected per the number of samples collected for recent sampling (2022–2023) and historic sampling (1997). The dashed portion of the curve represents the estimated number of species collected if more sampling was done using the same methods. As a species accumulation curve nears asymptote, or flattens out, it can be assumed that the samples collected are representative of the actual community present at the collection site. Our

Insect decline has become a pressing issue, with most publications agreeing that insect abundance is declining at a rate of 1–2% annually. Insects fill a wide variety of niches, making them a vital component of their ecosystems. We are interested in investigating insect decline by studying changes over time in a less-studied group of insects, the suborder Auchenorrhyncha which comprises leafhoppers, treehoppers, planthoppers, spittlebugs, and cicadas. Auchenorrhynchans are abundant in prairie ecosystems and serve as a good indicator of habitat quality. To better understand how Auchenorrhyncha communities have changed over time, we are returning to multiple areas of remnant tallgrass prairie throughout Illinois that were originally sampled in the 1990s and sampling

Richardson Wildlife Foundation



Species accumulation curves showing the number of species collected per number of samples collected for all historic and all recent samples. The solid lines represent actual samples collected and the dotted lines represent a prediction of how the curve will continue if more samples are collected using the same method.



NMDS plot showing the degree of similarity between samples. Each red cross represents a species collected. The distance between sample names represents the similarity between samples, with a short distance representing high similarity and a large distance representing low similarity.



Leafhopper, *Neohecalus magnificus*

PRAIRIE INSECT SAMPLING (cont'd)

curves show that neither the recent nor historic samples are near asymptote, suggesting that more sampling is needed to gain a better insight into the Auchenorrhyncha communities at RWF. This also suggests that historic samples are not entirely representative of the past community at RWF.

We have also made a non-metric multidimensional scaling (NMDS) plot using the current data to visualize the change in community composition over time. The distance between community markers represents the similarity in species composition between the communities, with a short distance representing high similarity and a large distance representing low similarity. The plot shows a dissimilarity between the historic and recent samples suggesting that the community composition has changed over time in both the remnant prairie and sand prairie. The plot also shows that the communities in the remnant and sand prairies have become more similar over time.

The changes in species composition shown by the NMDS plot are majorly accounted for by a decreased abundance and presence of species in the leafhopper tribe Deltocephalini, including a loss of more conservative species such as the *Pancium* specialist *Polyamia apicata*. On the other hand, there has been a noticeable increase in the abundance and presence of the leafhopper subfamily Typhlocybinae, comprised of minute species such as the potato leafhopper *Empoasca fabae* which is a highly dispersive generalist feeder. These changes in community composition may be explained by management practices, namely prescribed burning which impacts less dispersive conservative species much more than more dispersive generalist species that can evade disturbances more successfully. To conclude our sampling of the current Auchenorrhyncha community at RWF, we plan to revisit for a third time during the summer of 2024.

Leafhopper, *Destria fumida*





Giving a presentation on wetland restoration and management

EDUCATION

Whenever possible, the Wildlife Foundation hosts educational and community groups of all ages and backgrounds, fosters interest with the public in our mission and methods, and supports local education and research efforts however we can. As in any given year we oriented guests, students, and researchers to RWF, presented our museum specimens to interested groups, and provided some history and context to the Foundation: our mission and methods, successes and challenges, and how we fit into the regional conservation picture. We provided temporary housing to researchers working on site or in our area. Through our participation in the Illinois Recreational Access Program (IRAP), we provided state-administered spring access to turkey hunters to help young people and first-time turkey hunters learn safe, responsible hunting techniques and gain experience with and appreciation for wildlife and the natural world. Boy Scouts from the Sandwich, IL, troop visited the Foundation in June for an annual overnight camping trip and fishing on Main Lake.

In February, an RWF staff member presented on the topic of Wetland Creation and Management at a conference for the Illinois Association of Conservation Districts. The presentation addressed topics such as when a wetland restoration may be a positive addition to a natural landscape, the Inlet Swamp and drainage history of the Green River Lowlands, wildlife considerations, wetland sighting issues, water law, conducting stadia surveys, design techniques, water control devices, step-by-step implementation methods, tools, recordkeeping, and ongoing maintenance and troubleshooting. One other staff member attended the conference, and both took part in other breakaway sessions to learn more on subjects beneficial to RWF.

Additional continuing education for staff personnel was provided via participation in Pesticide Applicator Training Clinics and meetings with Illinois Department of Natural Resources Wildlife Biologists on the status and management of Chronic Wasting Disease in Whitetail Deer.

MUSEUM COLLECTIONS AND STUDY SPECIMENS

The Foundation maintains museum collections of plants, insects, fish, herps, and mammals for educational and research purposes. Our herbarium consists of 979 plant specimens representing 78 families, 261 genera, and 455 species matted on acid-free paper. Our seed collection includes 82 native prairie and wetland species displayed in glass vials. The insect collection exhibits thousands of pinned and labeled specimens in glass-topped drawers. Our fish collection is comprised of 185 specimens of 13 genera and 21 species preserved in jars of alcohol. The herp collection includes 35 specimens representing 15 genera and 17 species in the form of preserved turtle shells and specimens preserved in jars with alcohol. The mammal collection represents 30 species in the forms of hides stretched on wire frames and skulls displayed in a glass-topped case.

The majority of specimens in our museum cases were collected on site by RWF personnel, researchers from the Illinois Natural History Survey, or educational institutions. Databases are maintained on each of these collections, and informational brochures illustrating species lists for the Foundation property are available for educational and research purposes.



Sarah and Rich collecting several species of sedge seed

INTERNSHIP / SEASONAL EMPLOYEE PROGRAM

Most years we offer one or more internships during the summer and/or fall months. This year we were fortunate to be able to offer two college-level summer internships to Rich Griffin, a recent graduate of Penn State University, and Sarah Waggoner, a recent graduate of Ferris State University.

The pair joined our team from mid-May through mid-August. Their responsibilities included invasive species control, collecting native plant seed, Wood Duck and Bluebird nest inspections, equipment and shop maintenance, removal of dead trees, and wildlife surveys. That's all hard work and they endured every type of weather a Midwestern summer has to offer. Sarah is moving on to work as a programs assistant at Zapata Ranch in Colorado, and Rich is currently seeking job opportunities in the field with organizations such as the Maine Audubon Society. We wish them both good luck! We're grateful for their hard work, wish them both a bright and successful future, and hope they enjoyed their experience at RWF.

VOLUNTEERS

The Foundation has benefitted over the years from the help of volunteers who donate their time in large or small amounts to assist with our conservation projects. At times, volunteers have come to us as individuals who introduce themselves simply to offer their help. Other times they have come in group form as entire scouting troops, classes, or student groups. This year we were fortunate to have help from Foundation family and friends, as well as a few new faces. Former intern Elyse Leannais, now with McHenry County Conservation District, joined our crew to collect prairie seed in June. Phil Nagorny joined in turtle nest-protection on several late nights in June. Tess Wilson edited and proofread copy such as this report and saved us more than a handful of trips to town. The summer crew from TNC's Nachusa Grasslands joined our crew for a day collecting wetland seed at RWF and hosted our seed team for a similar collection outing at Nachusa. We greatly appreciate the work that each put forth on the projects in which they were involved. We continue to seek and encourage other potential volunteers of various skill, knowledge, and experience levels, as there is no shortage of valuable habitat work to be done throughout the year.



The Nachusa summer crew visits RWF to collect wetland seed



Cleaning the combine's bin to access and replace worn augers

EQUIPMENT, PROPERTY, AND BUILDING IMPROVEMENTS

Equipment maintenance and repairs account for a significant percentage of total employee hours each year. The following list details repairs or improvements made to implements, tractors, and trucks this year:

S770 Bobcat

- Replaced hydraulic remotes

Woods Batwing 180 Mower

- Replaced hydraulic hose
- Replaced blades
- Replaced wing skid shoes

John Deere 4020

- Replaced water manifold gaskets

John Deere 4040

- Replaced water manifold gaskets

John Deere 8650

- Repaired fuel leak
- Replaced hydraulic filters
- Replaced air filters
- Replaced temp gauge
- Replaced belts
- Flushed all fluids
- Replaced compressor kit
- Replaced evaporator

John Deere 1435

- Replaced blades

John Deere 4840

- Replaced parking brake / linkage

John Deere 9500 Combine

- Installed grain tank inserts
- Re-flight grain tank augers
- Replaced bearings & flanges of grain tank augers

110 Gallon Sprayer

- Replaced nozzles & bodies

300 Gallon Sprayer

- Rebuilt ace pump
- Replaced nozzles & bodies

IH 715 Combine

- Replaced shaft and pulley at feeder house
- Straightened & repaired ladder

John Deere 335 Disk

- Repaired left wing cylinder

J.D. 722 Soil Finisher

- Replaced worn sweeps
- Replaced hydraulic hoses

Gravity Wagon

- Replaced tie rod
- Replaced tire

John Deere Gators

- Flat tire repairs
- Re-mounted starter
- Replaced sprayer switch

Pickup Trucks

- Replaced tires, '16 Ford
- Replaced rear speed sensor '11 Chevrolet
- Replaced battery, '07 GMC
- Rebuilt rear axle differential, '07 GMC

In addition to the specific list above, we changed filters, fluids, and grease for all tractors and trucks; sharpened mower blades; made numerous repairs to small equipment including the chainsaws, backpack sprayers, snow blower, leaf blower, and tree augers; and patched or otherwise repaired tires of implements, tractors, and trucks as needed. We also retired our old 7' mower and replaced it with a new Woods BB84.50.



Rehabbing the Erbes research cabin

EQUIPMENT, PROPERTY, AND BUILDING IMPROVEMENTS

This year at the office building we made repairs to the boiler system and replaced a failed well pump, a faulty electric breaker box, and 2 storm doors. At our shop building we power washed, primed, and painted the building, made repairs to the overhead heater, and replaced a breaker and outdoor security light. At the Montavon farm we replaced the bathtub, several electrical receptacles, and re-secured the main power cable into the house with new connectors. At the dairy barn on the Wysneinski farm we power washed, primed, and painted the roof and made repairs to the south door which was pulled off its track by the spring tornado. At the Erbes research cabin we undertook a significant project to pull in and secure the west wall. Over the years the wall and floor joists had come off the stone foundation due to weight distribution issues. We removed the floorboards from the west wall, supported the floor joists, and installed threaded rods with nuts on both ends through a part of the outside wall that we reinforced to pull the wall in as far as possible and to keep it in place. We replaced the section of floor that we had to remove and replaced the paneling that had been on the west wall with drywall then painted.

The Lodge building itself was not damaged by the tornado thankfully, but several large pines against the building and in the yard blew down. We removed those trees and a few others that were dying, cut out the Yew bushes growing underneath, re-graded the surrounding lawn areas, and planted lawn grass in late summer. We made repairs to sinking paving stones on the north slope of the parking area by removing all pavers from the area, adding and compacting gravel, installing new edging, re-laying pavers and applying locking sand. We power washed the building, cleaned windows, replaced ballast in fluorescent lighting, made plumbing repairs including repairs to sinks and toilets, replaced two beds and frames, applied a crabgrass preventer, and rolled the lawn.

At the Sanctuary we power washed the entire building, stone walkways, and decks; cleaned gutters; re-caulked windows; and replaced a contactor switch in the geothermal HVAC system.

Other repair and maintenance jobs included winterizing buildings, pressure washing algae from barn roofs and walls, cleaning gutters, and splitting firewood.

As in any year we spent significant time removing trees that were dying of diseases such as Tip Blight or infections of Emerald Ash Borer or Pinewood Nematode (not to mention the vast numbers of trees brought down by the tornado, which we describe in detail elsewhere). We pruned trees near buildings and along lanes and trails to maintain accessibility on the property. We maintained fruit trees with annual pruning and by following a recommended pest control program from Stark Brothers Nursery. We controlled insect pests, blight, and Cedar Apple Rust with one application of a dormant-oil spray and periodic applications of Home Orchard Spray and Ferbam. Pest control measures were generally effective and fruit production was fair. Several of our trees have become less productive with age and from being shaded out by growing pines.

Property maintenance included the jobs listed above as well as overseeing pest control contractors at the Lodge and Sanctuary; mowing and maintaining lawns; maintaining landscaping; grading, spreading gravel, and patching potholes on lanes; clearing snow; repairing and maintaining cable gates and posts; posting property boundary signs; clearing overhanging limbs from trails and firebreaks; repairing broken field tile lines and blowouts; and removing Beaver dams where necessary for proper drainage.



LaFox Pond and treatment gear

PRAIRIE AND SAVANNA MANAGEMENT

On April 11th and 12th we conducted successful controlled burns on approximately 52 acres of prairie, savanna, and creek banks. With a crew of 5 people, 2 drip torches, 2 John Deere Gators, and a John Deere tractor—each machine with 50-gallon pumper units—we established a blackened safety zone around the perimeter of each unit prior to head firing. A total of seven units were safely and successfully burned.



Prescribed burn in the LaFox prairie

POND MANAGEMENT

We controlled aquatic vegetation and algal blooms using various chemical applications over the course of the growing season. Following last year's challenges in controlling Sago and Horned Pondweed at the LaFox Pond, we tried a different product for our spring herbicide application and a mid-season phosphorus blocker. Results were much improved this year. For control of rooted aquatic vegetation, we applied Aquathol K once in May and Reward in 3 different applications from June to August. We made 11 treatments with Cutrine Ultra and 2 treatments of Copper Sulfate to control algae from April through October. We treated twice with the enzymatic product Aquaprep in June and August to reduce organic muck and available nutrients. We applied EutroSORB, a new product which binds to phosphorus in the water table, limiting that nutrient's availability to plants and algae. We made EutroSORB treatments on two occasions in May and July. In all, we used a total of 5 gallons of Aquathol K, 4.25 gallons of Reward, 8.1 gallons of Cutrine Ultra, 50 lbs. of Copper Sulfate, 5 gallons of Aquaprep, and 2.5 gallons of EutroSORB. The continued use of Aquashade—an EPA-approved pond dye which limits the amount of light available in the water column—has helped us reduce the severity of blooms and therefore the amount of herbicide and algaecide needed to manage the pond. We applied a total of 14.5 gallons of Aquashade dye in 4 treatments across the growing season.

We performed regular maintenance on the aeration system to help balance the diffusers and keep them operating efficiently. In August, we replaced a PVC elbow near the compressor that was no longer airtight and buried the pipe. We then retrieved all diffusers from the pond bottom, cleaned them in a muriatic acid bath, reassembled them to the plastic tubing, lowered them to the pond bottom, and balanced the pressure to diffusers from the pump.

Plums and Custard Mushroom



ADMINISTRATION

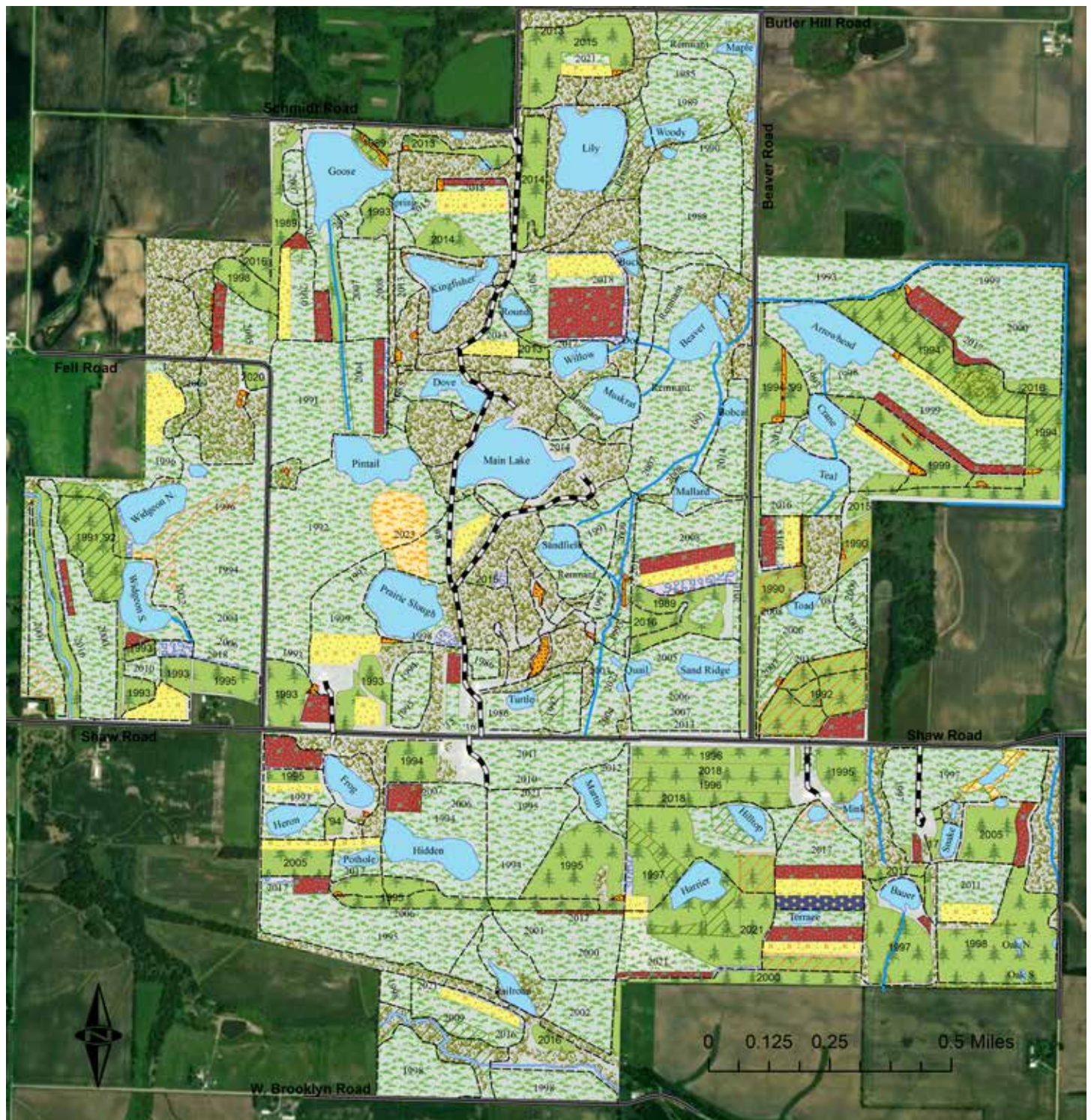
The following is a brief list of administrative support services involved with the daily operation of the Wildlife Foundation:

- Habitat planning, layout, mapping, and evaluation of annual land management practices
- Budgeting, payroll, task code, and programmatic accounting
- Preparation of an annual report of Wildlife Foundation accomplishments
- Maintenance of a website representing the Wildlife Foundation
- Representing RWF at meetings and conferences for the advancement of the Foundation
- Coordination of investigations, surveys, and research projects
- Literature review and research of management practices and conservation issues
- Completion of required state and federal reports for continued operation
- Applying for miscellaneous permits and licenses needed for continued operation
- Complying with reporting requirements for federal crop programs
- Ordering and purchasing supplies needed for operation and project implementation
- Conducting staff meetings and training sessions
- Devising work plans, project lists, and scheduling
- Conducting annual employee evaluations and reviews
- Technical support services
- Seeking and interviewing potential employees or internship applicants
- Maintaining professional and business contacts
- Legal searches and review of operations
- Program evaluation and review
- Correspondence and miscellaneous office duties

PHOTO CREDITS

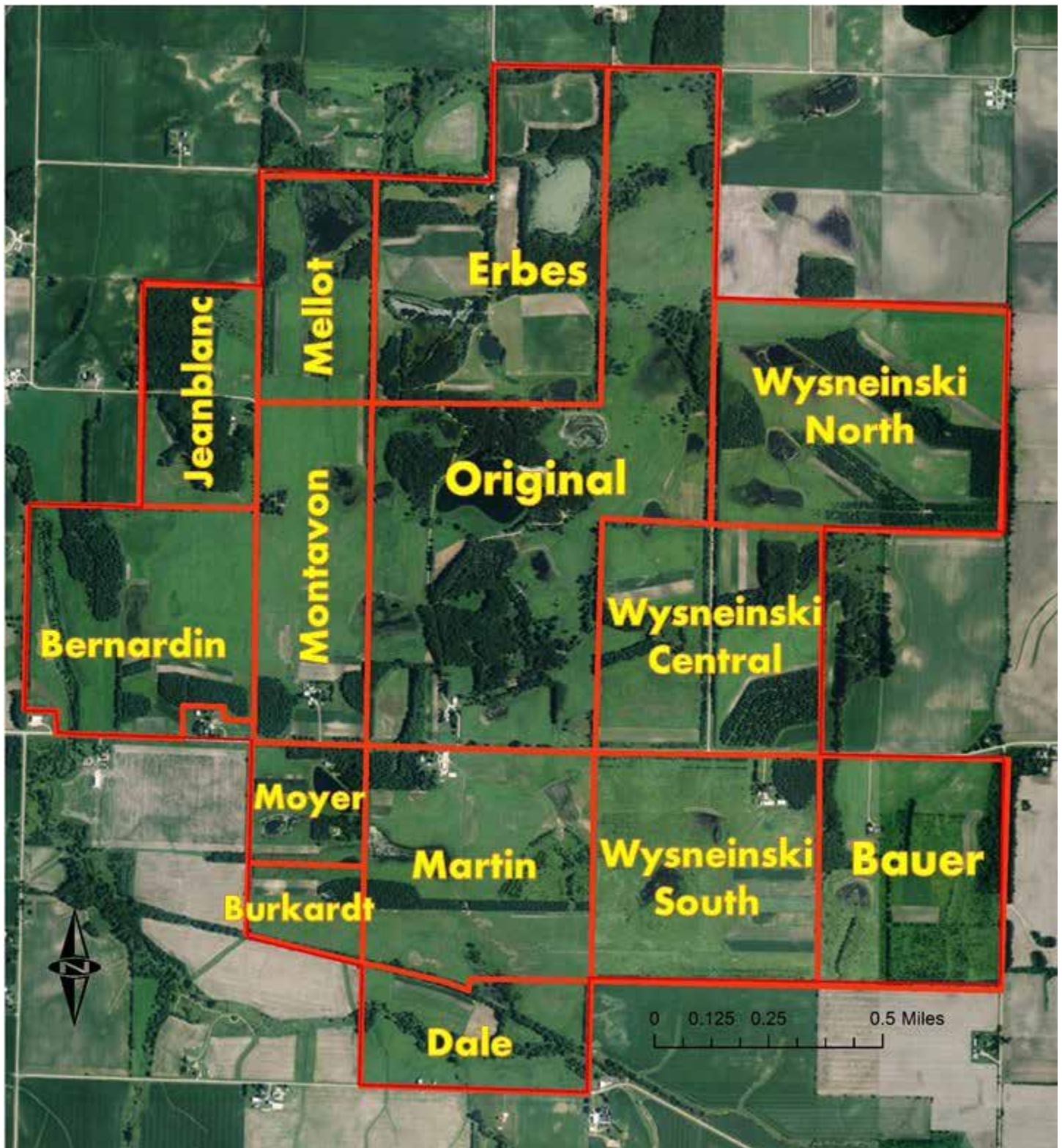
The following individuals contributed photographs for this year's annual report: Brian Towey, Amanda Contreras, Justin Pitzer, Allison Earle, Morgan Brown, Chris Dietrich, Ashley McDonald, and Jennifer Schultze.

MAP OF HABITAT MANAGEMENT PRACTICES



Legend

	Gravel Lane		Water		Interseed, 2023		Corn		Clover Foodplots
	Trails		Prairies, 2023		Habitat Preparation		Soybeans		Existing Timber
	Roads		Prairies		Mixed Foodplots		Sunflowers		Tree Plantings



2023 ACREAGE FIGURES

RICHARDSON WILDLIFE FOUNDATION

Prairie Restoration	Acres	% of Total
1985	21.2	
1986	13.3	
1987	8.2	
1988	19.3	
1989	6.9	
1990	15.5	
1991	38.8	
1992	39	
1993	45.9	
1994	38.5	
1995	52.2	
1996	25.2	
1997	24.6	
1998	33.1	
1999	36.73	
2000	51.2	
2001	25.2	
2002	10.9	
2003	3.6	
2004	15.3	
2005	17.1	
2006	26.5	
2007	27.93	
2008	20.2	
2009	12.6	
2010	18.52	
2011	23.65	
2012	16.1	
2013	30.5	
2014	19.2	
2015	9.2	
2016	12.13	
2017	19.08	
2018	2.05	
2019	0.25	
2021	13.85	
2022	6.3	
2023	9.05	
TOTAL ACRES-	808.8	40.9%
Remnant Prairie -	40.4	2.0%
Tree Plantings		
1989	13.8	
1990	7.4	
1991	16.7	
1992	23.8	
1993	16.2	
1994	51	
1995	39.7	
1996	15.1	
1997	46.4	
1998	23.7	
1999	23.8	
2000	2.2	
2001	1.7	
2002 - (625*)		
2003 - (300*)		
2004 - (452*)		
2005	15.2	
2013	9.2	
2014	11	
2015- (28*)	14.2	
2016- (37*)	8.9	
2017- (108*)	8.65	
2018- (81*)	12	
2019- (242*)		
2020- (241*)	1	
2021- (400)	9.2	
2022- (485)	9.23	
2023- (273*)	2.75	
TOTAL ACRES-	382.8	19.4%

* Potted trees planted within existing woodland plantings.

Wetlands	Acres	% Of Total
Beaver	5.5	
Main Lake	14.2	
Woody	2.4	
Dove	3.2	
Muskrat	5.1	
Sandfield	3.8	
Goose	13	
Teal	6.5	
Mallard	2.6	
Pintail	7.1	
Wigeon North	5.2	
Wigeon South	5.4	
Prairie	8.2	
Hidden	7.6	
Pothole	1.3	
Hilltop	2.7	
Bauer	2.5	
Martin	3.5	
Railroad	2.2	
Terrace	0.75	
Harrier	5.2	
Turtle	1.5	
Crane	2.8	
Arrowhead	6.8	
Bobcat	1.5	
Lily	13.4	
Willow East	2.3	
Willow West	1.8	
Round	1.6	
Kingfisher	8	
Spring	1.3	
Mink	1.1	
Snake	2.7	
Sand Ridge	2.1	
Toad	2	
Buck	1.65	
Doe	0.5	
Maple	2	
Oak	0.59	
Quail	1.5	
Mink West	1.2	
Dugouts (6)	1	
TOTAL ACRES-	165.3	8.4%
Cool Season Grasses		
TOTAL ACRES-	9.0	0.5%
Food Plots	Acres	% Of Total
Corn	55.24	
Soybeans	58.41	
Oats	0.0	
Sunflowers	2.80	
Winter Wheat	0.0	
Clover / Chicory	14.68	
Brassica	6.5	
TOTAL ACRES-	141.20	7.1%
Drainages		
Bauer	1.2	
Bernardin	1.1	
Dale	1.3	
Sandfield	0.5	
Wysneinski	1.6	
TOTAL ACRES -	5.7	0.3%
Trail \ Firebreaks -		
Total Length - 47.87 miles	70.3	3.6%
Road \ Ditch Easements	45.9	2.3%
Total Length - 6.6 miles		
Building and Home Sites -	18.9	1.0%
Pre-existing Timber	291.2	14.7%
TOTAL ACREAGE -	1,976	

HUNTER HARVEST

The following table represents hunting activity for the past calendar year. One hunter trip is defined as a hunter going afield for one specific hunting activity. For example, a hunter may have hunted deer in the morning and hunted pheasants in the afternoon, or hunted deer in the morning and again in the afternoon. Both of these examples would count as two hunter trips for the same day.

SPECIES	HUNTER TRIPS	HARVEST
Dove	5	39
Waterfowl	6	8*
Pheasant	6	6
Deer (Archery)	199	35**
Deer (Firearm)	9	3**
Coyote	****	1
Turkey (Spring)	46	14***
Turkey (Fall Archery)	****	2***

* The waterfowl harvest included 2 Canada Geese, 3 Green-Winged Teal, and 3 Mallards.

** The deer harvest included 29 does and 6 bucks with the following breakdown: 21 adult females, 8 juvenile females, 6 adult males, and 0 juvenile males.

*** The turkey harvest included 8 Toms and 6 Jakes harvested in the spring season and 1 Jake and 1 Tom harvested in the fall archery season.

**** Hunter trips were incidental to deer or turkey hunting.



A mature whitetail buck in velvet

TRAPPING HARVEST

SPECIES	HARVEST
Raccoon	168
Muskrat	0
Opossum	22
Eastern Cottontail	0
Mink	0
Fox Squirrel	0
Striped Skunk	0
Beaver	0
Badger	0
Coyote	0



Oak savanna restoration at year 18 and a mature Whitetail buck



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