

Richardson
Wildlife
Foundation

ANNUAL REPORT

2022



Hooded Merganser chick

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.



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Swamp Rose Mallow

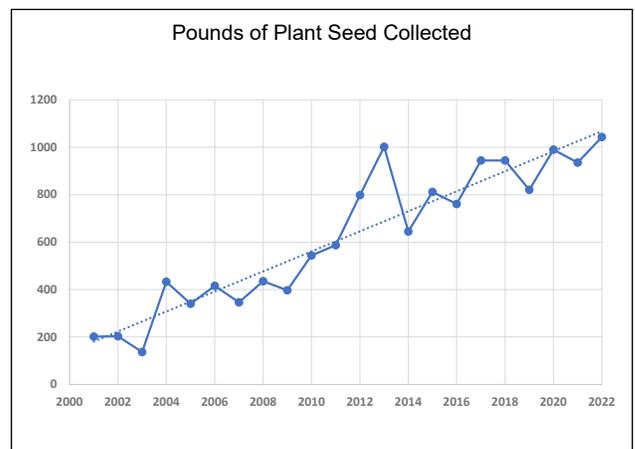
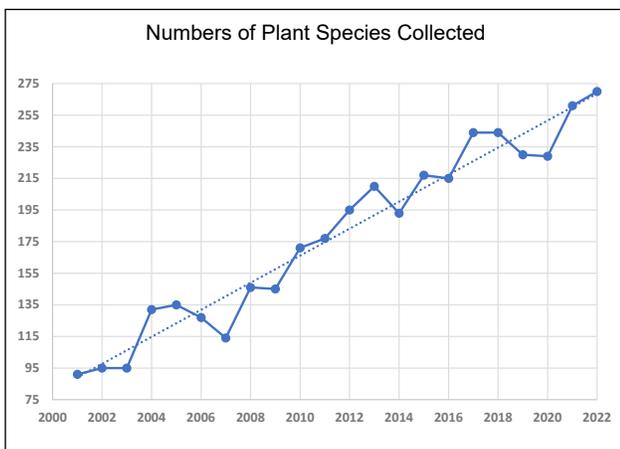
SEED COLLECTION

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 1,043 pounds of seed of 270 species of native prairie, wetland, and woodland plants this year. Both of those numbers are historical bests for us. 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 are able to restore for wildlife. **The charts below illustrate more than 20 years of RWF staff steadily building up our species count for a more complete set of tools in our restoration toolbox.** A few of the species we were particularly excited to collect were Poke Milkweed, Bladdernut, Whip Nutrush, Heart-Leaved Golden Alexander, and Shooting Star. 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 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. Additionally, we’ve gratefully accepted permission to collect certain species at The Nature Conservancy’s Nachusa Grasslands site.

Using a modified combine, we harvested 144 pounds of Side-oats Grama and 133 pounds of tallgrass seed from collection patches we planted just three years ago. To supplement our collection, we were excited to participate 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.





Head firing to complete a prescribed prairie burn

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 range from bogs to marshes to swamps to ponds, there are many types 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 was unusually short, as winter weather dragged deeper into spring than usual. Thankfully, we had gotten a jump on things with a successful fall burn season last year, decreasing the acres we needed to target this spring. Between fall of 2021 and spring of 2022, we burned 44 units totaling about 321 acres and got an excellent head start on the spring 2023 burn plan when we completed an additional 9 units totaling about 100 acres in December. All units were burned safely using a 4- or 5-person crew equipped with water sprayers, drip torches, Nomex clothing, and two-way radios. As a safety precaution for burning, and to allow for access to the property, 47.9 miles of firebreaks and trails were maintained via mowing during the growing season.

This year we planted a mesic-to-moist prairie restoration on the Bernardin tract (2.8 ac) and a diverse sedge meadow on the Original tract (3.5 ac). We also interseeded sandy areas of existing prairie on the Erbes and Jeanblanc tracts with a supplemental seed mix designed to boost the prevalence of less common plants that thrive in that niche. Both new plantings were made in areas that had been previously planted to low diversity prairie some years ago but had since been dominated by invasive weeds and grasses. Before replanting, we treated with glyphosate



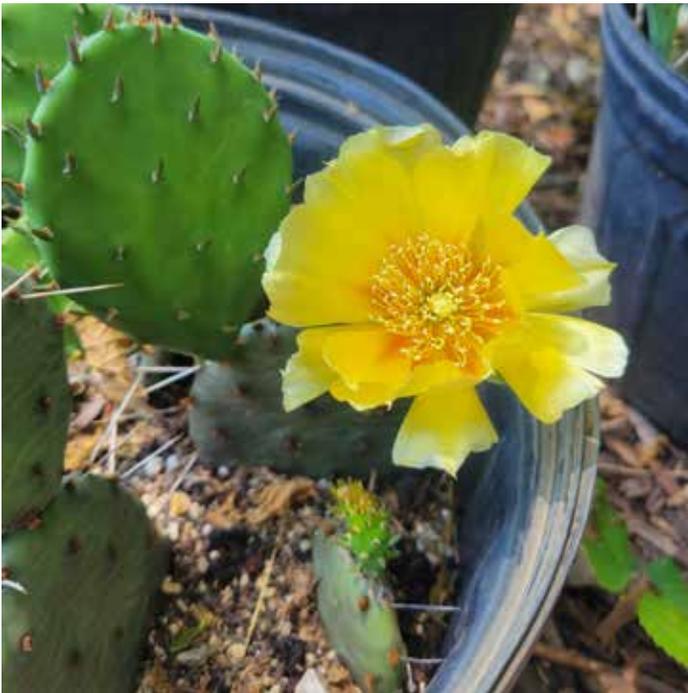


Royal Catchfly, Compass Plant, Cream Gentian, and Black-Eyed Susan in Tallgrass Prairie

multiple times for at least 2 growing seasons and both were prepped with the soil finisher to allow for better seed-to-soil contact. For both plantings we used a diverse seed mix of flowering plants, grasses, and sedges. For the restoration on the Bernardin tract our seed mix included 109 species at 34 pounds of seed to the acre. For the Original tract sedge meadow planting we used 136 species at 54.5 pounds to the acre. Our interseeding efforts on the Erbes and Jeanblanc tracts were conducted over approximately 2.5 disparate acres of existing prairie using 49 dry mesic prairie species at 14.8 pounds per acre. All our prairie restorations and interseeding this year were conducted as frost seedings 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.

In preparation for restorations planned for future years, we have been eliminating non-native cool-season grasses and invasive weeds on several areas through multiple means. We are preparing small areas on the Bernardin and Bauer tracts by repeated herbicide application and a larger area on the Montavon tract by farming row crops in areas that had previously been cool-season grasses and weeds. We will seed all of these areas with native prairie and sedge meadow plant species in winter of 2023.

We had an opportunity this year to acquire some cactus pads of Eastern Prickly Pear. This native plant is a quality representative of sandy or rocky soil prairies and savannas in our area. We grew just over a dozen plants from pads taken from parent plants from a local sand prairie. All of the pads rooted in our propagation pots and several even flowered in their first year. They were transplanted into a prepared bed on the Montavon tract to grow and supply pads for future propagation and transplant efforts.



Propagated Eastern Prickly Pear



Queen of the Prairie



False Indigo blooming at Snake 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. Replacing 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 water level readings at each wetland monthly to assess fluctuations occurring throughout the year as well as across multiple years. We have been in a multiyear dry weather pattern and as a result many of our wetlands began this year below their full capacity. Thanks to some late spring rains and a fairly normal amount of summer precipitation, fewer of our wetlands went fully dry this year than had in the prior two years. **By October, only 8 of the named wetlands that we routinely survey had zero standing water, compared with 20 dry wetlands a year prior.** That said, many of the wetlands that never fully dried in 2022 remained well below capacity at year's end. We hope to see winter precipitation and early spring rains bring these 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 are left more exposed to foraging Raccoons and other predators.

During the late summer months, we constructed two small wetlands along the waterways and outflow of the Snake Wetland on the Bauer tract, rehabbed the dike of Mink Pond, and created a temporary wetland/retention pool above Mink Wetland. We began the process of creating the new wetlands with a stadia survey and analysis of the site, which we used to plan the general shape of the basin and placement of the dike. We then used a backhoe to search out and destroy the underlying drainage tiles. All were destroyed or removed to prevent future water loss from the wetland. Using our largest tractor pulling an earth scraper, we excavated soil from what will be the basins of the wetlands and used that soil to construct the dikes, which will retain the water. We graded and shaped the dikes with our bulldozer and installed 6" non-perforated field tile at the intended high-water lines for drainage. As these wetlands are in the middle of prairie habitat and will be subject to prescribed fire, we used steel ends with ratguards on each tile where they were exposed. The new eastern wetland drains freely into a waterway leading to the northern pool downhill. The northern wetland's control tile will drain back into the pre-existing tile on the outside of the dike, sending any overflow underground and underneath Shaw Road. If water supply temporarily exceeds control capacity, each wetland has an emergency spillway built into one end of the dike which will accommodate that temporary overflow.

We took on the Mink Pond rehab to add a gentler slope to the dike, which had eroded quickly in recent years due to water action and Muskrat burrowing. We needed a source of soil for this project, so we planned and implemented a small wetland and retention pool just uphill from Mink to the west. This area had become a monoculture of Reed Canarygrass so for the prior two growing seasons we had been treating with Glyphosate and tillage to kill the invasive grass. We brought the water level of Mink Pond down by laying over the tilt-tube control structure prior to beginning the earthwork. Once water levels were low enough, we worked in



Reshaping the dike at Mink Pond

WETLANDS (cont'd)

tandem with our bulldozer and our largest tractor pulling an earth scraper. We scraped topsoil from this new basin and moved it to the eroded dike of Mink Pond where the soil was pushed into place, compacted, and smoothed with the dozer. We also built up a low dike on our existing access trail that will hold back a temporary pool in the new western basin in times of heavy precipitation. Following completion of the 3 new wetland dikes and the reshaped Mink dike, we seeded each with Winter Wheat and Timothy Grass to prevent erosion. In December after some vegetation had established and the ground had frozen on the rehabbed dike of Mink Wetland, we placed a dump truck load of 6-10" limestone under and around the exterior tilt-tube to prevent further erosion from the outflow. The basins, shorelines, dikes, and surrounding areas of all new and rehabbed wetlands will be planted with seed mixes of native wetland plants, prairie grasses, and forbs before spring of 2023.

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 a couple of dry years, there was little Muskrat damage in need of attention. We did, however, cut down and rebuild the Hickenbottom risers at Arrowhead and Pintail wetlands. These are the guard units that allow filtered water flow through the control structures. Low winter water levels on those two wetlands had allowed shifting ice to damage and dissociate the risers from their tile/pipes. We hope that by decreasing the height of the risers, drilling more 1" holes in the "blind-T" portions, adding weight with cinder blocks, and firmly staking these units with metal fenceposts, there will be fewer future instances of this kind of ice damage. Over the winter we seeded diverse mixes of native wetland plants, grasses, sedges, shrubs, and forbs into and around Quail Wetland—which we constructed in 2021 on the Original and Wysneinski Central tracts—and in the low ground and waterway to the west of Quail. These areas combined for just under 5 acres, which we seeded with 287 pounds of seed of over 135 species. In its first year after construction, Quail Wetland continuously held water and developed an exceptional plant community for its age.



Pickerelweed thriving in year one at the new Quail Wetland



Establishing a backfire in an oak savanna's first prescribed burn

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 undesired 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. We burned several of those this spring, one of them for its first time. Oak survival was likely 100% and the benefits to the understory plant community were apparent. 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 also conducted a second consecutive prescribed burn on the creek bottom woods along Brooklyn Creek on the south end of the site. Fire is an essential aspect of savanna and oak woodland ecology. This burn, coupled with previous and subsequent management actions reducing undesirable and invasive



White Trout Lily and Mayapple



Wood Anemone



Cockspur Hawthorn

WOODLANDS (cont'd)

plants, is part of a multi-year plan to reshape the canopy and understory along the creek to a more healthy and natural representation of a bottomland oak savanna. We plan to continue to reduce unwanted woody and herbaceous vegetation; plant native oaks, bottomland hardwoods, and shrubs next fall; then interseed quality forbs and grasses in the winter of 2024. There are currently few or no oaks growing in this area, but following the introduction of trees and shrubs, this unit will be removed from our burn plans for at least 15 years—or as long as it takes for the oaks to grow to a size that would tolerate fire.

We 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. Last winter we were able to conduct pine-thinning operations on 22 acres in three tree plantings on the Wysneinski Central tract. Thinning these pines releases the adjacent oak trees and allows additional light and nutrients to the understory level, preventing “shade deserts”—as dense pine stands are sometimes called—from forming. The reduction in competition from mature pines fosters growth of forbs, grasses, shrubs, and oak regeneration, providing cover and food resources to ground-dwelling wildlife. Pines that remain will retain their lower limbs, rather than losing them as the closed canopy grows ever higher. Following our timber work, we seeded these areas with over 178 native woodland and savanna plant species at a rate of about 21 pounds of seed to the acre. We seeded these areas yet again in July, using species that we collected in the early growing season. Research suggests that the seed of many of the spring ephemeral wildflowers are recalcitrant, meaning that they do not tolerate being dried out completely. We hope to achieve better establishment of such species by incorporating a summertime seeding.

Last year we planted potted trees on the first half of 18.4 acres on the Wysneinski South Tract that we enrolled in the USDA's Conservation Reserve Native Hardwoods Program. This year, we interseeded that area with 107 native prairie, woodland, and savanna plant species at a rate of about 16.1 pounds of seed to the acre. We also supplemented the shrub component of this planting in April using 850 bare root seedlings of Hazelnut (250), Black Chokeberry (150), Red Osier Dogwood (150), Silky Dogwood (150), American Plum (100), and Fragrant Sumac (50). **In the fall we planted potted trees on the second half of this project northeast of Harrier Wetland and South of Terrace Wetland. In November we planted 420 oak trees and 65 shrubs. Species included Bur Oak (140), Black Oak (110), Swamp White Oak (80), Northern Red Oak (40), Pin Oak (30), Chinkapin Oak (20) Nannyberry (25), Hazelnuts (25), and Downy Serviceberry (15).** Each tree was equipped with an Earthmat to reduce desiccation and competition, as well as wire baskets with rebar stakes to protect from browse and rubbing by deer. This winter we will put down seed of native woodland and savanna plant species, and next spring we hope to supplement the tree and shrub species using bare-root stock as we did on the first half of the planting.



Wild Geranium



Hinge cutting a Silver Maple

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.

Recently we have encountered increasing invasions of **Oriental Bittersweet**, a somewhat similar but far more aggressive plant to 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, 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 evaluate treatments that we made last year 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 a small amount of controlled burning. We strategically targeted known patches of 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. Treatment of the original colonization sites depletes the seed bank, but it is a long, slow battle since plants produce copious amounts of seed, and research suggests that at least five years of complete suppression are required to significantly deplete the seed bank. Seed is also dispersed long distances on the hooves, feet, and fur of animals. Despite our efforts to kill plants before seed production occurs, complete coverage and surveillance of the property is not possible, and we are subject to constant invasions from off-site seed sources. The only attainable goal for Garlic Mustard on this site is to control and limit the population rather than aim for complete eradication.

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



1m² frame used in transect survey of Sweetclover vs. native species

INVASIVE SPECIES MANAGEMENT (cont'd)

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. This year, we began a trial of 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 made note of evidence of damage to plants, native or invasive and 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 they are 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 any moist 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. Moist spring conditions often prevent fire from penetrating into willow thickets in low ground.

Another year of dry autumn conditions allowed us to successfully target willow invasions using fall prescribed burns in a large unit on the north end of the Original tract.

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.



Soybean food plot heavily browsed by wildlife

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 3 new combination Imperial Whitetail Clover and chicory patches (~2.2 ac), in the spring, and began rehab of several other patches in late summer using herbicide, tillage, and planting a fall crop of Brassica as a placeholder and for wildlife value. We planted Liberty herbicide-tolerant corn and soybeans and treated with that—once on corn, twice on soybeans—to help combat Glyphosate-resistant Water Hemp weeds.

Final acreage figures for all wildlife food plots included twenty-one fields of corn totaling 55.5 acres, twenty-five fields of soybeans totaling 57.83 acres, one field of sunflowers totaling 3 acres, twenty-eight fields of Imperial Whitetail Clover totaling 14.75 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 50 pounds per acre each of DAP and potash to all row crop, perennial forage, and clover fields (we decided to use half of our typical rate of dry fertilizer due to a 400% price increase.). We applied 32% Nitrogen on the corn and sunflower fields in the growing season. We used Verdict, Glyphosate, Atrazine, and Sotrion for weed control on all corn acreage and Verdict, and Liberty on soybeans. We regularly mowed Imperial Whitetail Clover and Chicory for weed control and sprayed Clethodim for control of grasses. In the fall we spread 3 tons of lime on all rowcrop, clover, and foodplot acres south of Shaw road and on the Erbes tract. Weed control on corn acres was good, poor on sunflowers, and good on soybeans where plants were able to canopy. Where deer browse prevented beans from developing canopy, Water Hemp continued to germinate and grow following treatment. 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.



Spreading ag lime



Releasing Triploid Grass Carp

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 summer there were also fewer problematic, late-summer planktonic algae blooms than in any year for over a decade.** In an attempt to further improve our control of aquatic vegetation and decrease our reliance on herbicides, we released 25 Triploid Grass Carp into Main Lake in April. This number is well below recommended stocking rates designed to eliminate herbicide use but we hope that the addition will help slow regrowth of unwanted vegetation. This is not a native species of fish but they are sterile, having been specially spawned in hatcheries to have an extra chromosome set. The table below contains the pond management products we used this year, their purpose, timing of applications, and total annual amounts used.

Product	Type	Target	Treatments	Timing	Amount
Aquashade	Dye	Algae & Plants	5	April-Aug.	32.5 gal
Aquathol K	Herbicide	Aquatic plants	1	May	10 gal
Reward	Herbicide	Aquatic plants	1	June–Sept.	5 gal
Copper Sulfate	Algaecide	Algae	3	April, June	500 lb.
Citrine Ultra	Algaecide	Algae	3	May–Sept.	22.5 gal
Clearigate	Algaecide	Algae	1	May	2.25 gal
Phycomycin	Algaecide	Plankton Algae	0	July–Sept.	0 lb.
Aquaprep	Enzymes	Organic Muck	3	April–Aug.	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 turn-over 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. To address this lack we sunk several densely branched spruce tops in water from 3–5 feet deep and placed several cut pine trees protruding from the shoreline. To provide shelter during the winter months we also constructed a number of cover objects made from field tile, PVC pipe, and PEX tubing and sunk them in the three deepest spots in the lake using cinder blocks. **Though we only recently made our first additions of cover objects for fish in the lake in 2021, 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. Both Bluegill and Largemouth Bass spawns were 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.



Wood Duck nest box built and donated by Sandwich Boy Scout Troop 45

WOOD DUCK NEST SURVEY

We maintained a total of 83 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. One box had been damaged between the winter repairs and the nest survey and was unusable for nesting. We have three types of nesting boxes available for Wood Ducks: Ducks Unlimited plastic boxes, cedar wood boxes, and galvanized round metal cone boxes.

Forty-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 654 eggs laid this year, of which 235 had hatched (36%). That hatching rate was 11% higher than what we saw last year but the total number of eggs was lower (-33%). There were a higher number of “dump nests” this year (24) but the total number of eggs laid in “dump nests” (241) was significantly lower than a year ago and well below the historical average (362). “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	4	80%	4	100%
Ducks Unlimited	23	20	87%	13	65%
Cedar Vertical	55	42	76%	22	52%
Total	83	66	80%	39	60%
Historical Average	N/A	N/A	84%	N/A	59%

During this year’s nest box inspections, we found several boxes that were usable but in need of replacement or repairs. We will carry out the necessary maintenance on these boxes prior to the upcoming nesting season. **Boy Scout Troop 45 from Sandwich, IL, generously built and donated 4 wooden nest boxes to the Foundation this year.** These will be used to replace boxes that are beyond repair or deployed in new locations before next nesting season. We and the woodies thank you, Scouts!



Inspecting nest boxes for use

EASTERN BLUEBIRD NEST SURVEY

We inspected the 51 Eastern Bluebird nest boxes on site for use during the nesting season on June 30th. Eastern Bluebird nests were observed in 20% of the boxes, the same rate as last year. **As in recent years, we observed multiple cases (2) in which House Wrens constructed nests over existing Bluebird nests. House Wrens ultimately nested in 30 of the 51 available nest boxes.** We estimated that about 13 Eastern Bluebird chicks fledged from our boxes this year, which is 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.

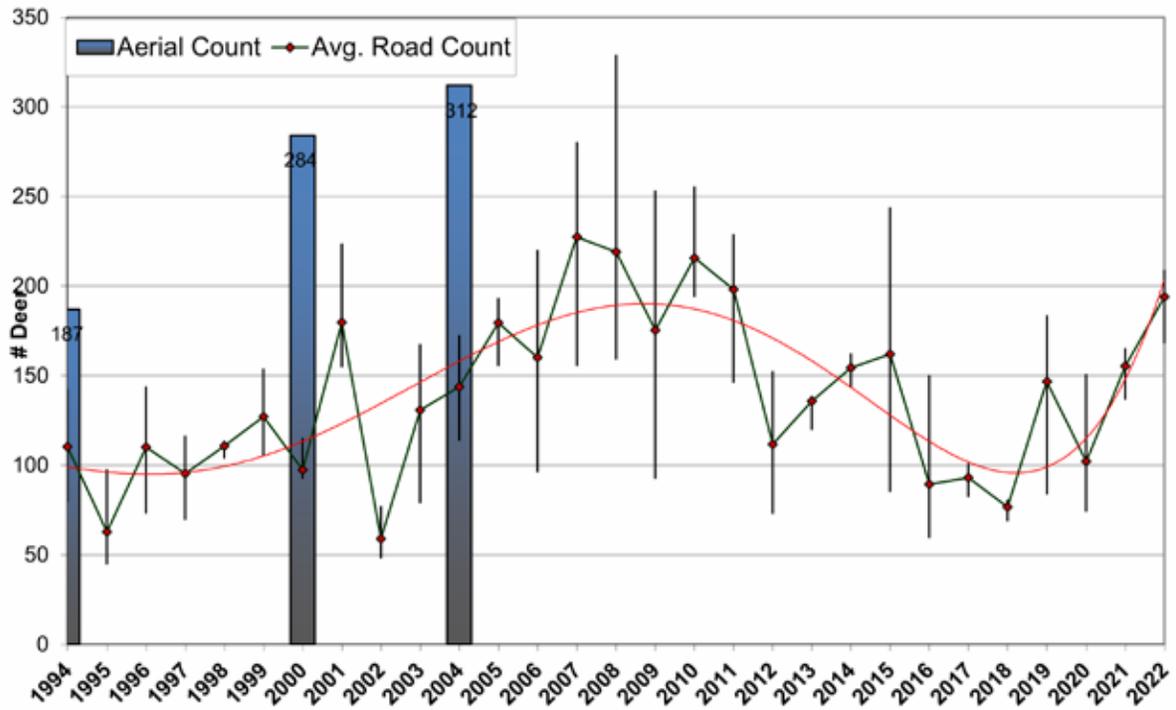
We are likely to continue to see significant fluctuation in Bluebird recruitment dependent upon local or regional habitat, weather patterns, competition for nesting sites (with species such as House Wrens), fluctuations in habitat structure, or other factors. As the oak trees and savannas restored on the property mature, we expect conditions to become more and more favorable for Eastern Bluebirds.

Other species that used Eastern Bluebird nest boxes this year included House Wren (59%), Tree Swallow (14%), mice (12%), House Sparrow (2%), European Starling (2%), and ant nests (2%). Nest boxes were found to be empty on 4% 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 chick, eggs in nest box

RWF Deer Surveys 1994-2022



Young adult bucks sparring

WHITETAIL DEER SURVEYS

Following a protocol we established years ago, we conducted three ground censuses for Whitetail Deer early in the evenings of January 26th, February 19th, and February 23rd of 2022. 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 168, 209, and 205 respectively, for an average of 194 deer sighted per survey. One of the reasons we monitor ongoing trends in deer numbers is because 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 highest in ten years and 47% above our 29-year average.** Strong fawn production over the prior two years resulting from favorable spring weather conditions and following a temporary reduction in our harvest strategy 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 17 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 2022 was that deer and turkey recruitment rates continued to be very robust.

On February 25th we surveyed all corn and soybean food plots planted in 2021 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 2020–2021 and do not reference the crop we planted in 2022. Our surveys reflected that summer drought conditions in 2021 did reduce yields on well-drained fields, but crop production was good on darker soils. Browsing pressure by deer during the growing season (another indicator of population size) was more severe and widespread on soybeans than in recent years. 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). After recent crop surveys had shown an increasing usage rate of corn by deer and other species, we adjusted our harvest downward and left a larger portion of corn standing through the winter months. Taken as a whole, in food plots property-wide, 80% of corn stalks still had cobs attached (a 25% increase over the previous survey) and 24% of kernels remained on those cobs. Between the increase in corn that we left standing and relatively 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. 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.



Two mature Whitetail Bucks

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 three of our samples, taken from mature does in 2020 (2) and 2021 (1), tested positive for CWD. These were the first positive tests to be recorded from our site and the first from Lee County. Following the news of the positive tests we have increased our efforts to harvest and test adult deer for the presence of 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 two Whitetail Deer fawns on the property incidental to other work, both males. 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 95 deer (48 male, 46 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 10 females on site: 8 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 3 females (1.5 yrs., 2.5 yrs., and 3.5 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 Whitetail doe encountering a Wild Turkey



Spiny Softshell Turtle

HERPETOLOGICAL SURVEY

Foundation staff surveyed 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, Eastern Hognose Snake, Brown Snake, Painted Turtle, Common Snapping Turtle, Blanding's Turtle, Spiny Softshell Turtle, and Ornate Box Turtle. No Spring Peepers or Plains Garter Snakes were recorded this year.

As we have for several years now, we put specific effort in May and June into surveying our wetlands for Blanding's Turtles with the goals of furthering our understanding of their use of the site, identifying nesting areas, and protecting nests from egg-predators. Read more about our efforts to study and assist Blanding's and Ornate Box Turtles in the "Research and Study Projects" section of this report. While trapping for Blanding's Turtles, we also caught 6 Common Snapping Turtles and 66 Painted Turtles from ten different wetlands. Whenever feasible, new turtle captures 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.

We have written in past years and in other parts of this report about the effects of wetland hydrology on species composition and how that, in turn, impacts wetland-breeding amphibians. 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 reach and complete their metamorphoses to an adult stage. Different species have different maturation rates. Chorus Frogs, 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. We had a generally normal amount of precipitation this year that came on the back of two dry years that caused many wetlands to enter the amphibian breeding season below their full capacity. Even so wetland pools across the property had a longer duration this year due to regular summer rainfall. Most species of amphibians on site seemed to have productive breeding years. Notably, we saw more juvenile Northern Leopard Frogs and Tiger Salamanders (the last to mature of our local amphibians) than we had in recent years. American Toads and Bullfrogs, two species of low and very low conservation concern respectively, seemed to experience an observable decrease in reproductive output. For American Toads, we surmise that this was due to late onset of spring weather and possibly relatedly colder water temps at their normal chorus and egg laying time. For Bullfrogs the cause is almost certainly a compounding effect of successive dry years, as that species requires more permanent water bodies with their larvae overwintering in ponds prior to metamorphosis the following summer. Diversity of habitat leads to diversity of wildlife and no two years ever offer identical conditions. It is interesting and informative to watch different groups of species thrive from year to year as multi-year cycles of weather and habitat conditions play out.



Eastern Hognose Snake



Sandhill Crane nest

WILDLIFE OBSERVATIONS

The Foundation maintains annual records of on-site wildlife observations and reproductive parameters of several species. The following are notes on selected observations.

This year opened with a mild winter, but one that held on deeper into spring than normal. The late spring may have shortened or delayed some species breeding windows and it may have impacted reproductive success in some early breeders. The year also began with public warnings about an epidemic of Avian Influenza, which caused significant mortality in many species of birds, especially migratory species. Our spring waterfowl migration on site was weaker than normal, though this may have had more to do with lower water levels in spring than wider population declines. The fall migration of waterfowl was below average as well, with the exception of Canada Geese. Our impression of the spring songbird migration was that it was fairly strong and diverse. This seemed to be an average-to-below breeding year for Ring-Necked Pheasants but Wild Turkeys had a bonanza breeding year, likely benefitting from our Raccoon removal efforts for Blanding's Turtle recovery. **We've never recorded as many turkeys as we did this year.** Bobwhite Quail were heard calling in the summer and coveys of the birds were seen a small number of times on the Jeanblanc and Erbes Tracts. We are glad to see that this species continues to hold on, but it seems the local quail population is always spare enough that it is just one catastrophe from extirpation. Sandhill Cranes continue to nest on site. Multiple breeding pairs and nests were observed, and several new chicks were seen with parents this year though no chicks were observed to survive more than a week or so. Predation by Coyotes or raptors is our leading theory (assumption) as to their fate. Three mammal species — American Beavers, White-Footed Mice, and Eastern Cottontails — were significantly more abundant than usual. Keeping up with beaver dams on our wetland control structures and in culverts was a time-consuming and mucky chore most of the year.

The return in the fall of a particular pair of Whooping Cranes has become an event that we look forward to and treasure. For several years, this pair has spent a month or more here before continuing further south for winter. Having one of North America's rarest birds find refuge and comfort on our site is very gratifying. 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 efforts 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. Seeing and hearing this species use habitat that we have worked to restore is inspiring. For a day or two shortly before continuing south, a second pair of Whooping Cranes joined the other. **Watching 4 massive, elegant, white Whoopers feeding and loafing with a group of Sandhill Cranes at Beaver Wetland almost felt like seeing back in time.** Here's hoping it's a vision of the future too.

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 Aphrodite Fritillary, Red-Shouldered Hawk, Rough-Legged Hawk, Merlin, Pied-Billed Grebe, Trumpeter Swan, Woodcock, Whip-Poor-Will, Red Start, Scarlet Tanager, Hooded Merganser, Bald Eagle, Eastern Screech Owl, Blanchard's Cricket Frog, Tiger Salamander, Spiny Softshell Turtle, Six-Lined Racerunner, Smooth Green Snake, and American Beaver.



Releasing head-started Blanding's Turtles

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 the numbers of juveniles 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 initial phases we were able to identify some nesting areas, allowing us to conduct informed habitat management practices. Later, we were able to follow two female Blanding's Turtles during their nesting forays, protect their nest and eggs from predation with wire baskets, and release 22 resultant hatchlings directly to shallow, vegetated wetland habitat following their emergence. Our recovery program took another, even more significant leap forward in 2019 when we were able to collect 39 eggs and send them to an incubation facility and from there on to a head-starting program for Blanding's Turtles. We were able to do this through a cooperative partnership with The Nature Conservancy, researchers from Northern Illinois University and the University of Illinois, the Forest Preserve districts of DuPage and Lake Counties, the Illinois Department of Natural Resources, and others. In 2020 we made our first release of head-started turtles, which we had collected as freshly deposited eggs the year prior. A subset of those hatchlings were followed via radio telemetry for the rest of that summer. Their survival rates were much lower than anticipated, owing almost entirely to predation by Raccoons.

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 radio telemetry 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 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 released at the site of their capture.

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 overland, potentially on a nesting foray. Sometimes overland movements are



Newly captured adult female Blanding's Turtle

RARE TURTLES RECOVERY PROJECT (cont'd)

“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 collect the eggs, carefully store them in sealed containers with some of the sand substrate from the nest, and deliver them to our partners at the Forest Preserve District of DuPage County. There, Ecologist Dan Thompson has been kind enough to incubate our eggs along with those from his project of the same goal.

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 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 following methods Dan has used in his own program.

After hatching and an acclimation period, the hatchlings are individually marked, and we move them to a head-start facility in Lake County where the RWF hatchlings remain active over winter in controlled, aquatic, enclosures with heat lamps and a highly nutritious turtle diet. Under these conditions they can grow far more rapidly than is possible in the wild as well as continuing their growth over winter, a time at which they would otherwise be dormant and not growing at all. Once the hatchlings achieve a target size and weight, we bring them back to the Foundation to release them into wetlands. At this size they are less vulnerable to predation from fish, birds, small mammals, and bullfrogs and therefore more likely to survive to reproductive age.

Even with the additional growth afforded to hatchlings head-started for a year, 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 4th we deployed as many as 63 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 3,182 total trap nights (1 trap night = 1 trap set for 1 night), we removed 193 raccoons, 9 Opossums, and 1 Striped Skunk. The local Raccoon population is impressive and apparently quite resilient. Despite our trapping almost 500 over the last two summers, following our trapping session this year we still observed adult and juvenile Raccoons occasionally in person and frequently in our trail camera surveys.

Radio telemetry study of our prior release of head-started Blanding’s Turtles in 2020 showed a higher mortality level than we had hoped for due mainly to predation. We and our collaborators decided to give that year’s hatchlings an extra year in the Lake County head-start facility with the hope that they would attain a greater size prior to release and that that would afford them greater protection from predation. In early June we released 23 head-started Blanding’s, about half of which had been hatched in 2020 and half in 2021. These turtles did average larger in size than the 2020 release and most were released with radio transmitters to be studied for survival, growth rate, and habitat use patterns. Survival rates were markedly improved over the 2020 release. See Rich King’s report on his encouraging findings in the following section.



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

RARE TURTLES RECOVERY PROJECT (cont'd)

Due to concerns about an invasive fungal pathogen found in some of the Illinois head-starting facilities this spring, it was decided to put on hold any head starting of turtles born this year. The hope is that with better understanding and biosecurity measures we can return to this valuable method in 2023 or soon thereafter. Until that time our focus is on nest protection, in situ, rather than egg collection and incubation in a lab. We were able this year to capture and track 3 gravid female Blanding's Turtles and protect all 3 nests. We used wire mesh baskets to both keep predators out and eventual hatchlings in. Starting in late August we checked the nests daily, hoping to see emerged hatchlings. All three nests had successful hatchlings that emerged in early September. We collected the resultant 33 hatchlings as soon as they emerged and moved them directly to the relative protection of a wetland, saving them the dangerous overland search for suitable habitat. It is fair to assume that survival rates will be lower with direct release than they might have been with head starting prior, but we hope that our continued mesopredator control efforts will increase the odds that a good number of these juveniles can reach maturity. We currently have transmitters on 4 females following the capture of a female in August that may or may not have reached sexual maturity yet. We will attempt to capture more in our spring trapping season, and we hope starting the year with more turtles and new techniques will allow us to collect or protect even more eggs next year.

To address the difficulty and unpredictability of patrolling for multiple turtles at multiple wetlands at all hours of day and night, some of our partners have adapted their system to encourage females to lay eggs in enclosures. When nesting season approaches, researchers will periodically palpate females to determine size and calcification of the eggs inside. Once eggs start to harden, females are brought to fenced enclosures providing water, nesting substrate (sand), and protection from predators. They are then checked daily to determine if they have deposited eggs. If they have, the enclosure is searched, eggs are collected, and the incubation/head-start process begins. If females do not lay after a certain time, they can be induced to oviposit with an injection of one or more hormones that will spur nesting behavior. Our recent experience has shown us the value of this approach and we hope to emulate the technique when headstarting becomes an option again.

At this time fewer direct interventions are possible for Ornate Box Turtles than we have implemented for Blanding's Turtles. Nest protection is more difficult 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.



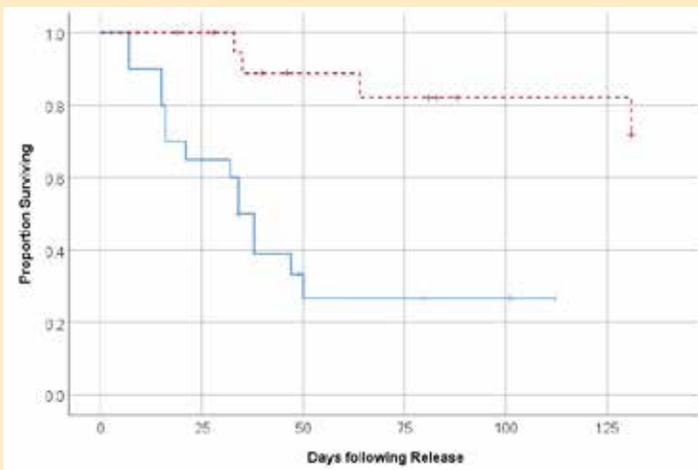
Grant Koch releasing a transmitter-equipped head-started Blanding's Turtle

ASSESSING SURVIVAL RATES OF HEAD-STARTED BLANDING'S TURTLES

Dr. Rich King of Northern Illinois University has been providing leadership, expertise, and coordination to recovery efforts for the Endangered Blanding's Turtles in northern Illinois. This year Dr. King and research assistant Grant Koch, a Wildlife Biology major at the University of Wisconsin–Stevens Point, assessed survival rates of the head-started Blanding's Turtles released this spring. The following is Dr. King's summary of their findings.

Head-started Blanding's Turtles were released at Richardson Wildlife Foundation for the second time in 2022. These releases are part of a larger project study of survival, movements, and growth of head starts at multiple sites spearheaded by Dr. Rich King at Northern Illinois University and including collaborators at RWF, Nachusa Grasslands, and forest preserve districts in Lake, DuPage, and Kane County. Previously, head starts had been released at RWF in 2020 but low survival led to the decision to delay additional releases, allowing young turtles to attain a larger size. Two size classes, 1st-year head starts and 2nd-year head starts, were released in early June. Grant Koch, a Wildlife Biology major at the University of Wisconsin–Stevens Point, spent the next three months using radiotelemetry to track 20 of these turtles and a similar number at Nachusa Grasslands. Rich continued tracking these turtles through mid-October when cooler weather caused turtles to retreat into the muck for winter.

Survival of head starts at RWF was significantly better in 2022 (about 72%) than in 2020 (about 27%) over the 4-month tracking period. Analyses are not yet complete but it is likely that the larger size of some head starts in 2022 and raccoon removal efforts at RWF both contributed to higher turtle survival. Seven of the survivors at RWF are equipped with transmitters that should continue to function until summer 2023. Tracking of these turtles will resume in spring, providing data on over-winter survival. This project and related work demonstrate that nest-caging, head-starting, and predator control can benefit the Blanding's Turtle, an endangered species in Illinois.



Survival functions of head-started Blanding's Turtles released in 2020 (solid blue line) and 2022 (dashed red line). Downward steps represent documented mortality events; vertical marks represent points at which turtles were removed from the study either because of anticipated battery failure or because no signal could be detected. Survival was significantly higher in 2022 than in 2020.



A young female Raccoon in a hollow den tree

ASSESSING THE 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 pre-removal abundance and density of raccoons, 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 nine 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 field season, compiling over 50,000 wildlife images; 14,769 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 or index methods.



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

ASSESSING THE EFFICACY OF PREDATOR CONTROL AND PREVALENCE OF ZOO NOTIC 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 field season, 304 raccoons were removed from our study sites including 193 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 abundance 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 divergens*, *Babesia microti*, *Anaplasma phagocytophilum*, *Anaplasma platys*, *Ehrlichia chaffeensis*, *Ehrlichia ewingii*, *Rickettsia rickettsia*, *Trypanosoma cruzi*, and *Baylisascaris procyonis*. Thus far, we have completed 55 intestinal tract examinations and have detected the presence of raccoon roundworm in 15. We have also detected intestinal parasites in 53 out of the 55 examined thus far including hook worms, tapeworms, trematodes, and acanthocephalans. To quantify pathogen prevalence, DNA will be extracted 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 pre-removal 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.

On the previous page are photos taken via camera traps in 2022. All cameras were placed 1 meter off the ground, positioned along game trails, water sources, and habitat edges.



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

EFFECTS OF PRESCRIBED FIRE ON OAK GROWTH AND SURVIVAL

Allison Earle, a graduate student in Dr. Scott Meiners's Plant Ecology laboratory at Eastern Illinois University, has been conducting research for her Master's thesis at RWF. Working within our plans to conduct prescribed burns in several of our restored oak savannas in the spring of 2022, Allison is evaluating some effects of fire on the oaks and other woody species. This topic is one that has been only lightly explored in restored habitat and may have significant implications for natural land management, including for us here at RWF. 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 and 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) What role does stem size play in oak growth and survival?
- 2) Do different oak species respond differently to prescribed fire?

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 ensure 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). With this information, I can model plant responses along a gradient of fire intensity, tree size, and across species.



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





Taking measurements to compare growth rates before and after burns

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. The trees in both burned units grew more than those in the unburned units, regardless of species or dbh (Figure 1). 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).

The information gathered from this research has clear management implications. Because there was no mortality and trees grew more in the burned units, land managers may be able to burn management units with young oaks with less concern for the fire effects. If managers wish to avoid top kill, waiting until most of the trees are greater than 5 cm dbh should greatly reduce the risk.

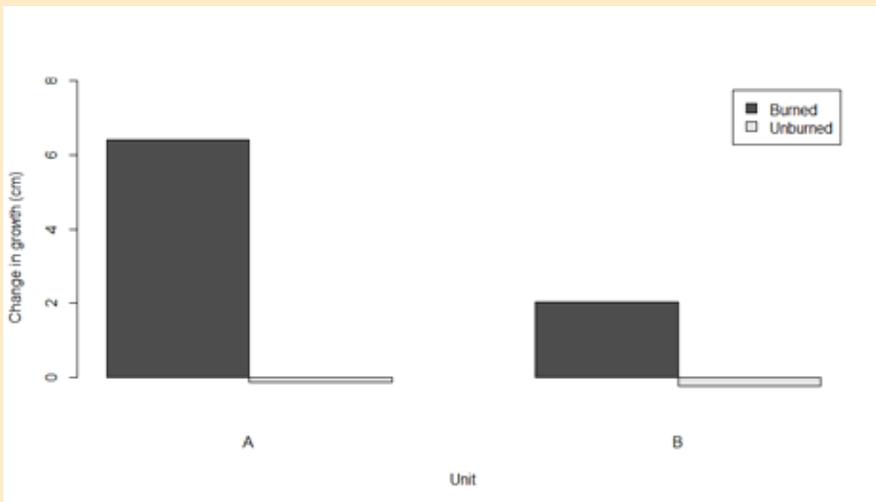


Figure 1. Change in oak extension growth (cm) between 2021 and 2022. Black bars are the units burned in 2022 and grey bars are the unburned units. Data from all three oak species are pooled.

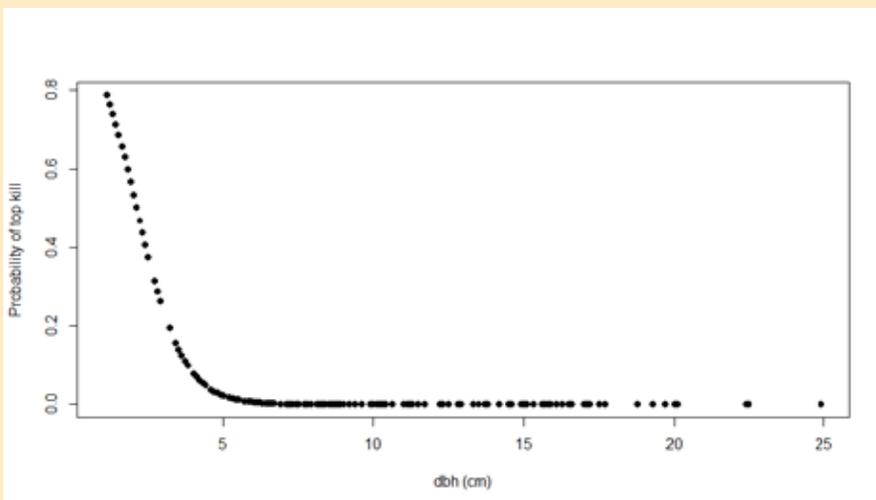


Figure 2. Probability of top kill as a function of diameter at breast height (dbh).

Leafhopper, *Destria fumida*



Leafhopper, *Neohecalus magnificus*

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.

Insect decline has become a hot but controversial topic recently, with some deeming it the “insect apocalypse” and predicting the extinction of more than half of insect species in upcoming decades. While numerous studies have been carried out investigating the phenomenon, many only look at broad measures of species diversity and fail to look at changes in individual species. Most studies have also focused on the more charismatic insects such as butterflies, beetles, and bees. To contribute to the conversation and begin to fill this gap in knowledge, we are investigating changes in the less-studied prairie leafhoppers and related Hemipteran insects. To do so, we are surveying multiple remnant prairies throughout Illinois that were previously surveyed 25 years ago and comparing our current findings with the past findings to see if the community structure has significantly changed since.

Richardson Wildlife Foundation is one of our sites which was originally sampled for prairie leafhoppers in 1997. We returned to the Foundation over three different visits during the summer months of 2022 to begin our current sampling efforts by taking net sweeps and vacuums of vegetation, focusing on the areas of large remnant prairie located in the north portion of the Foundation and the sand prairie located east of the main entrance. After collecting these samples, we sorted out the insects we are interested in and identified them in the lab. So far, we have collected and identified 42 unique species of leafhoppers and related Hemiptera from the Foundation. When comparing the current species composition to that found in the previous survey, we have collected about a third of the leafhopper species that were collected in 1997. However, we have also found 20 species that were not previously documented at RWF. These include *Flexamia prairiana*, a tallgrass prairie endemic that specializes on big bluestem and little bluestem grasses; *Destria fumida* and *Neohecalus magnificus*, which specialize on cordgrass; and *Cosmotettix luteocephalus*, which feeds on sedges. We also found a European grass-feeding species, *Errastunus ocellaris*, that has, so far, only been documented at one other site in Illinois. We are going to continue our efforts over the next two summers to ensure we get a full picture of the current community structure.



USDA-NRCS Wetland Soils Class

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 youth turkey hunters to help young people and first-time turkey hunters learn safe and 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 overnight camping trip and fishing on Main Lake. This troop has used the site for such activities several times over the years and this year they constructed several Wood Duck nesting boxes to help our efforts in that department.

In September we hosted a hydric soils class for USDA and NRCS. Thirty participants came from around the state to learn to identify the many characteristics indicative of wetland soil processes from instructors from around the country. They took samples using hand probes and truck-mounted hydraulic probes capable of going deeper. We were also able to provide a clean-cut trench, dug with our backhoe to illustrate the gradient of soil types, indicating the seasonal water table, as one looked deeper down the pit wall.

Continuing education for staff personnel was also 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. We also began a program this year in which each staff member selected one or more study topics of interest to them that could benefit the Foundation and we researched those throughout the year. Topics included cataloging and photographing the mushroom species present at RWF; the benefits, methods, requirements, and cost of cover crops; an in-depth dive into timber stand improvement techniques and their implications for various wildlife species and plant communities; identification of amphibian egg masses; creek oxbow restoration; plant propagation techniques; and best practices for seed storage and use of recalcitrant seed.

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.



Justin instructs Elyse on operation of the 4020 tractor

INTERNSHIP / SEASONAL EMPLOYEE

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 a full-time, college-level internship and a part-time high school position. Though the number of applicants was well below what we might normally receive, we lucked out. We were able to bring back Kaleb Kleckner, a student at Mendota High School, for his second summer in a part-time role, and we hired Elyse Leannais, a graduate of Illinois State University with several years of quality ecological work experience. Between the two, we went into the summer with more experienced hands than we could expect.

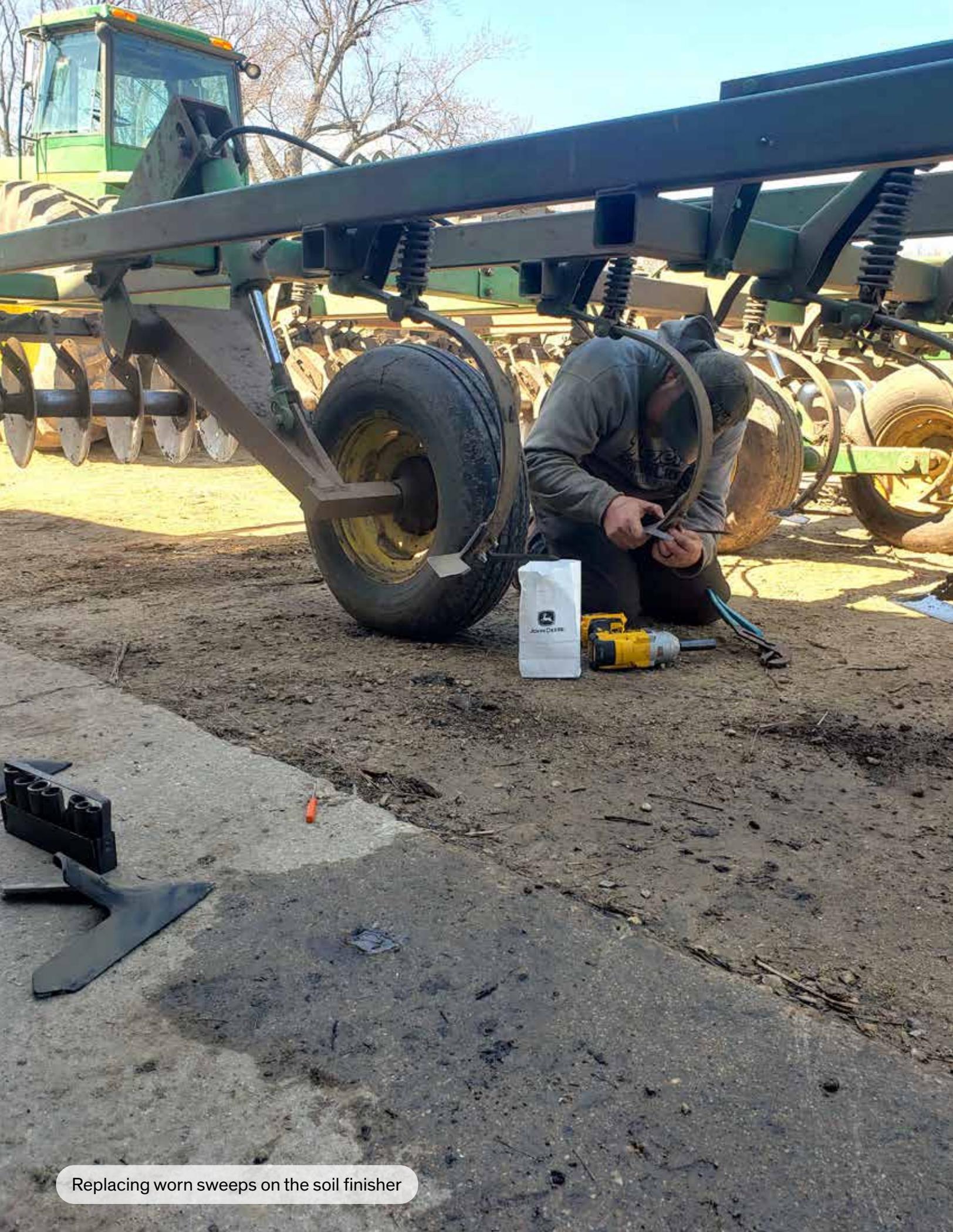
The pair joined our team in early summer, with Kaleb ending his term when the fall semester began and Elyse working through September. Their responsibilities included invasive species control, collecting native plant seed, Wood Duck and Bluebird nest inspections, equipment and shop maintenance, removal of dead trees, and wildlife surveys. In addition, they each found productive roles in our Blanding's Turtle trapping project and our mesopredator removal program. It became apparent quickly that Elyse was far more qualified than required for her role, and while we hope she learned a lot in her time with us, she brought her experience and knowledge to RWF—we learned from her as well. She began a full-time role as Crew Manager at Cook County Friends of the Forest Preserves immediately after her time at RWF. They are lucky to have her. Our year would not have been as successful without Elyse and Kaleb's effort. We're grateful for their hard work, wish them both a bright and successful future, and hope they enjoyed their experience at RWF.



Seasonal Interns Elyse Leannais and Kaleb Kleckner

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 Ben Kusiak, now with TNC, joined our crew to collect prairie seed in June. Dan Kokes helped with seed collection in September. Phil Nagorny joined in project turtle nest-watch in September. Tess Wilson edited and proofread copy such as this report and saved us more than a handful of trips to town. 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.



Replacing worn sweeps on the soil finisher

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

- Repl. hydraulic hose
- Repl. drive belt idler

Skid Steer Grapple Bucket

- Repl. hydraulic hoses
- Repl. hydraulic fittings

Woods Batwing 180 Mower

- Replaced hydraulic hose

Woods 7' Mower

- Welding Repairs

John Deere 4020

- Rebuilt engine
- Repaired antifreeze hose

John Deere 4040

- Repr. broken front axle
- Repaired cab steps
- Replaced front tire

John Deere 8650

- Replaced batteries
- Repl. fuel pump plunger

John Deere 1435

- Replaced blades

IH 715 Combine

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

John Deere 7200 Planter

- Repr. row unit drive shaft clutch

J.D. 722 Soil Finisher

- Replaced worn sweeps
- Repaired broken tongue

Gravity Wagon

- Replaced 4 tires

Touring Hay Rack

- Replaced tires

John Deere Gators

- Flat tire repair

Pickup Trucks

- Repl. tires, '07 GMC
- Repl. 1/4 panel '07 GMC
- Hail repairs, '07 GMC
- Repl. battery, '07 Chev.
- Installed wiring harness for snowplow, '16 Ford

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 aged 2007 Chevrolet and replaced it with a 2016 Ford F-250, replaced our old 500-gallon gasoline tank with a new double-walled unit, and purchased a new grapple bucket for the skid steer.



Re-shingling the office building

EQUIPMENT, PROPERTY, AND BUILDING IMPROVEMENTS

This year at the office building we re-shingled the roof, replaced a security light, and replaced the internet line-of-sight dish and Wi-Fi router, and on the gate by our entrance replaced hail-damaged vinyl boards and posts. At our shop building we replaced the gutters, replaced and rewired the main electrical fuse box, and made repairs to the overhead door. At the Montavon farm we made repairs to barn doors, made electrical repairs and improvements to barns, repaired faulty roof flashing, and added gutter downspouts for better water displacement. At the machine shed on the Wysneinski farm we replaced hail-damaged skylight panels, painted the roof, and rebuilt portions of the lower rat-wall with tongue-in-groove boards. We replaced the security light on the dairy barn. At the brick house on the Wysneinski farm we repaired wind damaged shingles and replaced a bathroom vanity. At the Bauer house we replaced hail-damaged siding and a storm window.

At the Lodge we power washed the building, painted the north and east façade, installed a new light in the main bath, cleaned gutters, cleaned windows, repaired the water softener, replaced ballast in fluorescent lighting, made plumbing repairs including repairs to sinks and toilets, applied a crabgrass preventer, and rolled the lawn.

At the Sanctuary we power washed the entire building, stone walkways, and decks; applied touch-up stain to decks; cleaned gutters; thoroughly re-caulked windows and expansion joints on flagstones; repaired ice and erosion damage to the dock; wrapped plumbing in the crawlspace with insulation; made electrical repairs to main bedroom overhead lighting; ordered a replacement refrigerator; and reupholstered the window seats in the main bedroom.

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 brought down by storms or were dying of diseases such as Tip Blight or infections of Emerald Ash Borer or Pinewood Nematode. 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, but apple production was fair at best this year with several of our trees becoming less productive with age and some being shaded by ever larger pines.

Property maintenance included many of the jobs listed above as well as overseeing pest control contractors at the Lodge and Sanctuary; mowing and rolling 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.



Prescribed burn in the LaFox prairie

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 John Deere Gators, and a John Deere tractor—each machine with 50-gallon pumper units—and 2 drip torches, 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. On two days at the end of October our crew returned to treat invasive Bush Honeysuckle and Autumn Olive invading the savanna using foliar treatments of Triclopyr 4, a broadleaf-specific herbicide.

POND MANAGEMENT

We controlled aquatic vegetation and algal blooms using various chemical applications over the course of the growing season. For unknown reasons control of Horned and Sago Pondweeds was particularly challenging at the LaFox Pond this year, requiring more treatments than usual, especially near the shorelines. For control of rooted aquatic vegetation, we applied Nautique once in May and Reward in 7 different applications from May to September. We made 14 treatments with Cutrine Ultra and Aquaprep to control algae from April through September. In all, we used a total of 5 gallons of Nautique, 15 gallons of Reward, 10.6 gallons of Cutrine Ultra, and 8.2 gallons of Aquaprep. 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 12.5 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 dug up and replaced a short section of PVC pipe and connections near the compressors where leaks had formed. 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.





Nest and eggs of Brown Thrasher

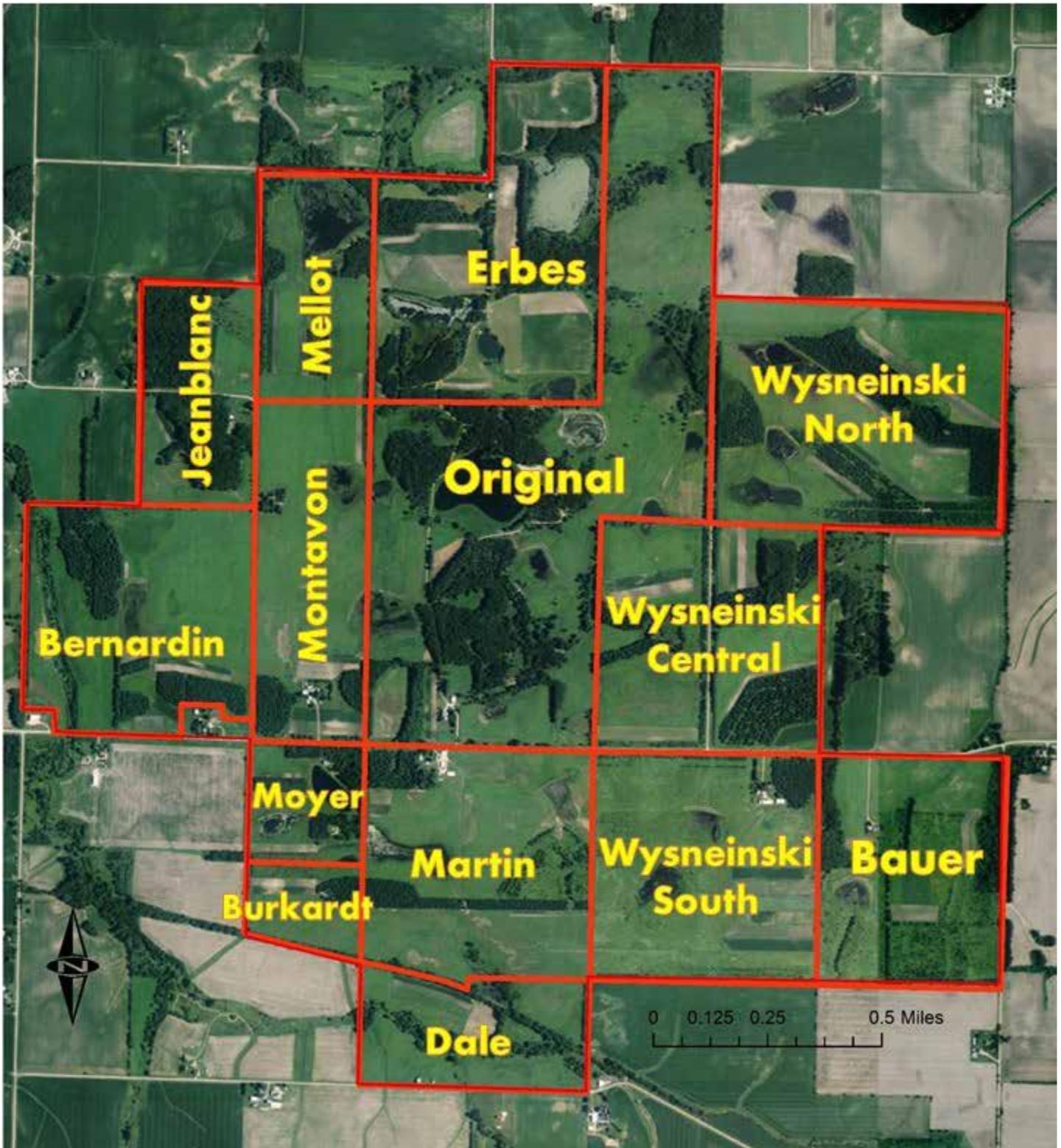
ADMINISTRATION

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 regarding management practices & 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, Elyse Leannais, Allison Earle, Morgan Brown, Ashley McDonald, Jennifer Schultze, and Dee Hudson.



2022 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	
TOTAL ACRES-	799.8	40.5%
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	
TOTAL ACRES-	380.1	19.2%
<i>* Potted trees planted within existing woodland plantings.</i>		
Pre-existing Timber	291.2	14.7%

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	4.1	
Round	1.6	
Kingfisher	8	
Spring	1.3	
Mink	1.1	
Snake	1.9	
Sand ridge	2.1	
Toad	2	
Buck	1.65	
Doe	0.5	
Maple	2	
Oak	0.59	
Quail	1.5	
Snake east	0.8	
Mink west	1.2	
Dugouts (6)	1	
TOTAL ACRES-	165.3	8.4%
Cool Season Grasses		
TOTAL ACRES-	17.2	0.9%
Food Plots	Acres	% Of Total
Corn	55.51	
Soybeans	61.48	
Oats	0.0	
Sunflowers	2.96	
Winter Wheat	0.0	
Clover / Chicory	14.75	
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%
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.

<u>SPECIES</u>	<u>HUNTER TRIPS</u>	<u>HARVEST</u>
Dove	8	38
Waterfowl	5	7*
Pheasant	6	2
Deer (Archery)	199	33**
Deer (Firearm)	16	4**
Coyote	****	0
Turkey (Spring)	18	6***
Turkey (Fall Archery)	****	1***

* The waterfowl harvest included 1 Canada Goose and 1 Blue-Winged Teal.

** The deer harvest included 24 does and 13 bucks with the following breakdown: 20 adult females, 4 juvenile females, 8 adult males, and 5 juvenile males.

*** The turkey harvest included 4 Toms and 2 Jakes harvested in the spring season and 1 hen harvested in the fall archery season.

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

TRAPPING HARVEST

<u>SPECIES</u>	<u>HARVEST</u>
Raccoon	201
Muskrat	2
Opossum	9
Eastern Cottontail	0
Mink	0
Fox Squirrel	0
Striped Skunk	1
Beaver	4
Badger	0
Coyote	0





Ornate Box Turtle



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