



# ANNUAL REPORT 2020

Richardson Wildlife Foundation







Monarch caterpillar, *Danaus plexippus*, feeding on Swamp Milkweed, *Asclepias incarnata*

## RICHARDSON WILDLIFE FOUNDATION

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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## OFFICERS

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## STAFF

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## FRONT COVER PHOTOS

Clockwise: Yellow-Crowned Night Heron, *Nyctanassa violacea*; Barred Owl, *Strix varia*; Rose-Breasted Grosbeak, *Pheucticus ludovicianus*, sub-adult male; 2 Whooping Cranes, *Grus americana*, with a Sandhill Crane, *Antigone canadensis*





Collecting seed of Tussock Sedge, *Carex stricta*



## 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. Hand collecting and cleaning forb seed, although time-consuming, is considerably less expensive than purchasing an equivalent amount of seed from a commercial source. An additional benefit to collecting seed on site is that using seed of our local ecotype helps to maintain the genetic integrity in our plantings and increases the conservation value of our restorations.

By hand collection, we gathered 990 pounds of seed of 229 species of native prairie, wetland, and woodland plants this year. We have been particularly focused on woodland habitat development lately, and our collection of woodland wildflower seed continues to increase in amount and diversity. This is in part due to willing landowners from whom we have gratefully obtained permission to collect and/or transplant desirable native woodland species from several nearby, off-site, wooded locations, as well as from the excellent oak savanna on the Richardson property in LaFox. Additionally, we were granted permission to collect certain prairie and wetland species that we do not have on our site at The Nature Conservancy's Nachusa Grasslands site.

Using a modified combine, we harvested 69 pounds of Side-oats Grama and 161 pounds of Little Bluestem grass seed from collection patches we planted just two years ago. To supplement our collection, we will trade seed of some of our hand-collected forb species to 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.



Bagging native grass seed





White Wild Indigo, *Baptisia alba*, above; Goat's Rue, *Tephrosia virginiana*, below



## 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 prairie as well. Types of prairie 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 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. We had a successful 2020 burn season during which we burned 47 units totaling about 316 acres from March 4th through April 6th and got a nice head start on the spring 2021 burn plan in December when we completed 5 units totaling about 99 acres. All units were burned safely and socially distanced 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, 47.3 miles of firebreaks and trails were maintained via mowing during the growing season.

This year we used much of our prairie forb seed collection for the improvement of road-adjacent habitat, most of which had been planted to cool season grasses in the past. We interseeded more than 130 species into areas along Shaw, Beaver, and Fell Roads in January, using leaf blowers from the bed of a truck during favorable wind conditions and hand dispersal when winds were not helpful. We also targeted improvements to species diversity in specific areas of dry and sandy prairie restorations by hand seeding appropriate species that were lacking in those places. For specific locations of this year’s interseeding efforts, see the orange cross hatching in 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 many areas through multiple means. We are preparing significant areas on the Wysneinski South and Montavon tracts by farming row crops in areas that had previously been cool season grasses and weeds. We continued herbicide treatments to eliminate Reed Canarygrass in over 20 patchy acres split between the Original, Montavon, Wysneinski South, and Bernardin tracts. We treated with the herbicide Glyphosate twice or more during the growing season when the areas were dry enough to access with sprayer equipment. Some of these areas will be seeded with native prairie and sedge meadow plant species in 2021 while others will require another year of treatment for best results.





Pickerelweed, *Pontedaria cordata*, at Sand Ridge 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 on a monthly basis to assess fluctuations occurring throughout the year as well as across multiple years. This year bucked a recent trend. There are certainly other, more notable aspects that 2020 will be remembered for but it was also the first near-average year for precipitation in the last five. After four very wet years, we had a relatively dry summer this year. In reality it was far more average than dry, but we received nearly 12 fewer inches of rain from April to September than we had in the same period in 2019. June and August account for much of that difference, with August being the driest month of the year at less than an inch of total rainfall. By October, 17 of the 41 named wetlands that we routinely survey had no standing water.

There are pros and there are cons to having a dry spell but the impact is largely dependent on trends with the weather in the recent past. We weren't particularly happy to see Mink Pond reduced to little more than a large puddle for instance, having introduced fish there over the last several years. However dry downs helped achieve management goals in other instances. We prefer to manage most of our wetlands as fish-free for the benefit of species that thrive without fish as top predators. Muskrat populations have boomed in the recent wet years. It has become difficult to keep up with the damage they do to our dikes, not to mention the toll they take on the emergent wetland vegetation which is both food and cover for so many native wetland residents. Both fish and Muskrat populations took a hit this year at wetlands that dried down.

This year's return to a more normal rainfall total will serve to reset the playing field to a degree for wetland residents. We had been trying for several years to artificially lower water levels at certain ponds in order to achieve our management goals, to little effect until this year. During the summer months in the preceding year we had lowered tilt tubes or lifted control boards which hold water back in an attempt to drain Arrowhead, Crane, Teal, Sandfield, Spring, Pintail, Bobcat, Beaver, and Muskrat Wetlands, all of which had been invaded by Green Sunfish and some of which had also been invaded by Black Bullhead Catfish or Common Carp. Only two of those ponds were drawn down enough to achieve the fish control we wanted at that time. This year though, without any attempts to draw water levels down, five of the above wetlands dried completely and several others may have dried enough to take a serious toll on the unwanted fish populations.





Grading the dike during construction of the new Oak Pond wetlands



## WETLANDS (cont'd)

As mentioned above in reference to Mink Pond, we do manage several of our more permanent wetlands with fish as part of the goal. We've introduced native fish species that are of conservation concern as well as some more common species as part of the community we try to promote. We continued our native fish-stocking program at Mink and Goose ponds with introductions of more common native gamefish species. We transplanted adult Bluegill and Largemouth Bass from Main Lake to both ponds in the spring. We intend to continue this effort at Goose pond next spring and with additional species as opportunity allows.

We made repairs to our wetland dikes in summer months as part of an ongoing maintenance program. Visual searches were made for Muskrat damage, and repairs were made where needed. As has become typical over the last several years of wet weather, we found a lot, including one wetland dike that had been tunneled all the way through and leaked until repairs could be made in the dry part of summer. With backhoe, skid steer, and bulldozer, we made the needed dike repairs at Bauer, Muskrat, and Arrowhead. We also replaced the Hickenbottom risers at Bauer and Prairie Wetlands and constructed a weed guard for the interior tilt tube at Dove pond.

With a fairly lengthy period during which conditions were dry enough to access wetland basins, we were able to get quite a bit accomplished. We conducted extensive rehab and reshaping projects at Prairie and Widgeon North Wetlands. Both wetlands are ephemeral in nature and were constructed over 25 years ago. Large portions of the shallows of both were dominated by near-monocultures of Reed Canarygrass, which had gathered silt and lost depth over the years. Our efforts this year are meant to supply more wetland habitat that meets the depth and vegetation requirements of the Endangered Blanding's Turtle and to eliminate the Reed Canarygrass monocultures in favor of native wetland vegetation. To do this we started by spraying a glyphosate-based herbicide to the Reed Canarygrass monocultures. We then removed eight or more inches of soil from approximately 3.5 acres of wetland basin on the southern half of both wetlands, trying to remove all of the rhizomes of the Reed Canarygrass where possible. When conducting excavation work the scope and feasibility of a project revolves more around where and how far away the spoils will be moved than how much soil needs to be excavated. In both projects we were able to make good use of the soil we removed from the basins and were able to bury most of the soil containing Reed Canarygrass rhizomes. At Prairie Wetland we raised a trail that had repeatedly flooded in recent years and flared the soil into the existing slope, burying other unwanted vegetation and improving our spring access for controlled burns and management. At Widgeon North, we added the spoils to thicken the dike of Widgeon South, gaining a stronger water barrier and a gentler slope. Both projects relied on one operator using our largest tractor, the 8650, pulling our earth-scraper to move the soil while another used our bulldozer to smooth, compact, and level the soil. Several weeks following the earthwork conditions allowed us to treat the areas again with herbicide where green shoots of Reed Canarygrass had regrown. We will seed these basins as heavily as we can over the winter months with native submergent, emergent, and moist soil wetland plant species and we will conduct follow-up herbicide treatments where required when conditions allow.

In addition to the rehabs described above, we constructed two small wetlands on the Bauer tract that we are calling the Oak Ponds. These were constructed within an oak tree planting in a waterway with a failing field tile line that comes off a neighboring farm property. The southern pool is smaller but deeper and will spill into the northern pools downhill. After conducting a stadia survey and analysis of each site, we used a bulldozer and backhoe to search out and destroy any underlying drainage tile, excavated basins, and constructed dikes with water control structures and emergency spillways for occasions when water supply exceeds control





Coring to locate and remove field tile



## WETLANDS (cont'd)

capacity. We used a Hickenbottom Riser, Blind T connection, and non-perforated plastic field tile to redirect outflow from the northern pool back into the existing field tile which runs north beyond the new wetlands. Following completion, we seeded the dikes with Winter Wheat, Oats, and Timothy grass to prevent erosion. The basins, shorelines, dikes, and surrounding areas will be planted with native wetland plants, prairie grasses, shrubs, and forbs before spring 2021. We were pleased to see that even in a relatively dry fall such as this, both wetlands maintained a pool going into winter. Surrounded by oaks as they are, it won't be very many years before these wetlands are some of our only woodland wetlands, which may make them a colonization site or stronghold for species such as the Spring Peeper tree frog, which require those conditions.

Over the winter we seeded diverse mixes of native wetland plants, prairie grasses, shrubs, and forbs (123 total pounds of 131 plant species collected on site) into and around Maple, Doe, and Buck wetlands which we constructed in 2019 on the Original and Erbes tracts.



Azure Bluet, *Enallagma aspersum*





Young oak woodland restoration



## WOODLANDS

Woodland habitat at RWF can be boiled down to 3 categories of timber stands: mixed timber which pre-date the inception of the Foundation (“Existing Timber” on our map), hardwoods planted by RWF (majority Black and Bur Oak), and oaks planted with 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.

This spring we conducted the first prescribed burn on a band of oak, dogwood, plum, and hazelnut trees and shrubs that the Foundation had planted as bare root saplings along both sides of the Brooklyn Creek north of Shaw Road 20 years prior. We conducted the burn in conjunction with prescribed fire treatments to the adjacent prairie habitat. Fire is an essential aspect of savanna and oak woodland ecology and the oak trees had finally attained enough size to withstand the burn without significant damage. The burn was a success: no damage was noted to oak trees. A small percentage of the dogwoods and hazelnuts were top-killed (as anticipated) but had re-grown with renewed vigor to half or more of their previous height by summer’s end. Most of the shrubs and essentially all of the plums were growing densely enough to inhibit fuel load, preventing a hot or fast fire, and exhibited no observed positive or negative effect from the burn. Invasive Garlic Mustard and Bush Honeysuckle were set back where the fire was hot enough. This unit will be added to future burn plans on a 3- to 6-year rotation.

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. The extended winter conditions we experienced in the early months of 2019 provided us a long enough working period that we did something we rarely have been able to do: we caught up with the acres of pine thinning and oak release that we had prepared. There is much more of the same kind of work needed but the process starts with killing unwanted trees with a process called girdling and requires roughly a year for those trees to die and dry. We spent much of the winter this year and part of the summer identifying pines that would be thinned to allow light to adjacent oak trees and understory, girdling them with chainsaws, and treating the cut with Glyphosate. We addressed areas of need in woodlands on the Martin, Wysneinski North, Wysneinski Central, Erbes, Bernardin, and Mellot tracts. It would take more than one long winter of mechanical removal for us to catch up with all the areas we now have prepared. As we complete prescribed thinning on a section of woodland, we will interseed a diverse mix of woodland and savanna plant species which will help foster a healthy understory in





Cinnamon Fern, *Osmundastrum cinnamomeum*



## WOODLANDS (cont'd)

areas that had been barren due to the dense, year-round shade cast by the pine canopy. The increased light availability will foster the continued development of these young, diverse savannas by allowing the oaks to grow more quickly and healthily, improve native forb growth and oak regeneration, and provide better nesting/bedding cover and browsing within the timber for wildlife.

We removed invasive Black Locusts from a section of the woodland on the Jeanblanc South tract. These trees had been girdled and treated with herbicide in prior years to kill them standing and were dry enough to cut and burn. Following the removal of the locusts, we interseeded the woods with a healthy mix of native grasses and forbs and will supplement with additional species this winter. This spring we planted 238 bare root saplings in the area (Bur Oak, Red Oak, Northern Pin Oak, Shagbark Hickory, Hazelnut, Eastern Wahoo, Serviceberry, Aromatic Sumac, Black Chokeberry, Ninebark, Nannyberry, Redbud, Chickasaw Plum, Red Osier Dogwood, Gray Dogwood, and Arrowwood). At the same time, we planted over 1,800 of the same species to finish a similar woodland rehab on the Jeanblanc North tract that we had otherwise completed in 2019. In November we laid the foundation of the new structure of the south woods by planting potted trees and shrubs into the area from which we had removed locusts while expanding the woodland on the east by about an acre.

In addition to the more substantial projects described above we strategically planted 600 bare root shrubs of six species and 100 Northern Pin Oaks in moist soil areas around Toad, Goose, and Widgeon Wetlands, and planted potted RPM trees and shrubs in strategically located areas across the property. Trees were generally placed where recent management actions or storm damage had increased light availability or where particular species were deemed beneficial as future seed sources for the surrounding woodland. We equipped potted trees with Earthmats to reduce desiccation and competition, as well as wire baskets with rebar stakes to protect them from browse and rubbing by deer. Potted trees were planted in areas and numbers indicated in the table on page 19.



Cicada, *Megatibicen* or *Neotibicen* spp



Red-spotted Purple Butterfly, *Limenitis arthemis astyanax*, on dogwood





Wild Plum, *Prunus americanus*



## WOODLANDS (cont'd)

## POTTED TREE AND SHRUB ALLOCATIONS:

|                  | Original | Martin | Mellot | Bauer | Jeanblanc | Erbes | Montavon | Total |
|------------------|----------|--------|--------|-------|-----------|-------|----------|-------|
| Black Oak        | 2        | 5      | 9      | —     | 15        | 8     | 4        | 43    |
| Bur Oak          | 6        | 3      | 10     | 2     | 13        | 6     | 1        | 41    |
| Pin Oak          | —        | —      | —      | 5     | —         | 12    | —        | 17    |
| White Oak        | 1        | —      | 4      | 2     | 5         | 5     | 2        | 19    |
| Red Oak          | 1        | —      | —      | 2     | 6         | 6     | 2        | 17    |
| Hybrid Oak       | 6        | —      | 7      | 2     | 3         | 6     | 2        | 26    |
| Shagbark Hickory | 4        | —      | 8      | —     | 6         | 2     | 1        | 21    |
| Hazelnut         | 3        | 2      | 16     | 4     | 10        | 9     | —        | 44    |
| Nannyberry       | —        | —      | 2      | —     | —         | 11    | —        | 13    |

Dutchman's Breeches, *Dicentra cucullaria*False Indigo, *Amorpha fruticosa*





Treating regrowth of invasive shrubs



## 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 regional, state, and worldwide 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 re-invasion.

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 vigilant care to prevent Reed Canarygrass takeover. We continued the ongoing program of treating this invasive species at several wetlands as well as several areas on more upland locations and mowed to prevent seeding in other areas. Several areas on the Bernardin and Original tracts were treated twice with Glyphosate during the growing season, and another area on the Original tract was tilled and temporarily converted to a food plot in a multi-year treatment strategy designed to restore native species in areas dominated by Reed Canarygrass.

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 efforts are focused on minimizing its spread and eliminating it from known areas over time. 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. As we work to control Garlic Mustard in woodlands, we also treat invasive Bush Honeysuckle shrubs as we encounter them. We strategically targeted known patches of Garlic Mustard in woodlots on the Erbes, Jeanblanc, Original, Wyszynski 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 seems to be depleting 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 known to be 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, invasive perennial which tends to thrive in disturbed habitat or the early stages of habitat restoration. In many cases we target invasions in our prairies on foot with backpack sprayers to prevent damage to non-target plants or mow Canada Thistles during the growing season prior to the flowering stage to prevent seed development. We have found our best results in recent years have come from controlling seed production of Canada Thistles and chemically treating the most severe invasions in the spring while 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 can be possible to prevent seed production through repeated mowing, allowing time and competition to diminish the population. This has been a focus of our strategy for several years and has been working well.

Bush Honeysuckle, Autumn Olive, and Common Buckthorn are all 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. During the growing season and into the fall, we treated adult plants and seedlings of





Removing invasive Black Locust, *Robinia pseudoacacia*



## INVASIVE SPECIES MANAGEMENT (cont'd)

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 annually for a number of years and periodically thereafter as we work through the invasive seed banks. The treatments require significant time and material, 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 many suckering stems of this clonally growing plant can stop or reverse its outward spread. Targeted herbicide treatments can be effective but often are not feasible without causing damage to the surrounding native species. Willow growth was not as robust this year in the drier summer conditions. We mowed small patches of willows on the Wysneinski North, Montavon, and Bernardin tracts.

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 and other professionals to learn methods and treatment options that could help us in our efforts at RWF. 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. There is no viable alternative to dedicating resources to invasive species control if we are to maintain quality habitat for a wide variety of native wildlife species.

## DISEASE AND PEST CONTROL MANAGEMENT

*Sphaeropsis*, or Tip Blight, is a fungal infection that affects many of the older Red Pines on this site. A number of trees needed to be removed this year, though fewer than in other recent years. In an attempt to control the spread of this blight in Red Pines, we treat trees of high aesthetic value with a foliar spray of the fungicide Topsin in May and June. We cut, removed, and burned Jack, Red, and Scotch Pines killed by Tip Blight, weather extremes, or Pinewood Nematode.

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. Following a year in which most of our Apple trees produced an overabundance of very small fruit, most trees produced few or no apples this year. The two pear trees produced a reasonable crop but fruit was fairly small. Pest control measures were generally effective where applicable.

The Emerald Ash Borer, which has spread across this part of the state in recent years, reached RWF (to our knowledge) in 2015. While we do still have some live, mature Green Ash trees that are apparently unaffected as yet, many have died and most others will follow. Ash did not comprise a large portion of our woodland tree community but nonetheless it is a shame to watch a native species fade away due to an introduced insect pest. On a landscape level, there is essentially nothing we can do but watch the process and remove affected trees that threaten buildings.





Sunflower foodplot



## FOOD PLOTS / AGRICULTURE PLANTINGS

We maintain wildlife food plots of corn, winter wheat, sunflowers, soybeans, oats, Imperial Whitetail Clover, and Brassica to complement our native habitat in meeting the food requirements of wildlife. We planted 3 new Imperial Whitetail Clover patches (~1.5 ac). Following several years of declining performance from most of our Brassica food plots, this fall we planted perennial forage crops along with our brassica seeding. Growing the Brassica in the same locations for multiple years has steadily reduced performance in most plots due to disease and/or invertebrate pest damage. We will evaluate growth and wildlife appeal of these plots next growing season to determine if this mix can be used in an effective rotation with the Brassica to break the pest cycle. We planted Liberty herbicide-tolerant corn and soybeans and treated with that to help combat Glyphosate-resistant Water Hemp weeds in soybeans. We added about 5 acres of new row crops this year south of Pintail Wetland in a degraded portion of restored prairie. Our intent is to use the tillage and herbicide regime of row cropping for 2 or more seasons to eliminate invasive weeds and grasses before restoring the area to high-quality prairie habitat.

Final acreage figures for all wildlife food plots included eighteen fields of corn totaling 46.6 acres, twenty-nine fields of soybeans totaling 86.6 acres, two fields of sunflowers totaling 5.6 acres, twenty-five fields of Imperial Whitetail Clover totaling 15.8 acres, three fields of winter wheat totaling 2.2 acres, and thirty-three fields of Brassica (+ perennial forages) totaling ~4 acres. Acreages are measured using GPS and mapping software and reported to the Farm Service Agency for crop certification.

Before planting, we spread 3 tons of lime per acre on all Brassica plots by hand, using shovels from our dump wagon. We applied 100 pounds per acre each of DAP and potash to all row crop and clover fields. We applied 32% Nitrogen on the corn and sunflower fields in the growing season. We used Verdict, Glyphosate, and Sotrion for weed control on all corn acreage and Verdict, Liberty, and Secure on soybeans. We regularly mowed Imperial Whitetail Clover and Chicory for weed control and sprayed Clethodim for control of grasses. Weed control on corn acres was good, adequate on sunflowers, and good on soybeans where plants were able to canopy. Where deer browse prevented beans from developing canopy, herbicide-resistant Water Hemp was a problem. Next year we intend to add a second application of preemergent herbicide to further combat Water Hemp. Little to no stunting of soybeans was observed following herbicide 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.



Planting soybeans





Treating unwanted Horned Pondweed, *Zannichellia palustris*



## MAIN LAKE

Our management goals for Main Lake include promoting healthy populations of game fish for recreational fishing opportunities. In order to minimize encumbrances to fishing, we selectively treat the pond with a number of products to reduce algae and aquatic plant growth. To suppress growth of both plants and algae by reducing the available light in their required photo-spectrum, we applied a total of 35 gallons of Aquashade blue pond dye in periodic treatments from April to August. For control of rooted aquatic vegetation, we treated the lake with 2.5 gallons of Aquathol K in one treatment, 5 gallons of Aquastrike in three treatments, and 11.25 gallons of Reward in four treatments. To control algae, we spread copper sulfate crystals across the bottom of the lake in two treatments totaling 800 pounds in April and October, and we made 9 treatments of Cutrine and/or Clearigate between April and October. We used a total of 55 gallons of Cutrine Ultra, 10 gallons of Clearigate, and 11 gallons of Aquaprep. Planktonic algae was a factor but has been less of a challenge for the last 2 years than most. It was present most of the late summer but was very manageable. Pithophora algae—which has thicker cell walls than other forms of filamentous algae and requires greater doses of copper products to penetrate and effectively control it—had become more challenging in recent years but this year we varied our timing and quantity of treatments with copper sulfate crystal and found good success.

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.

Though the lake required frequent algae treatments, management goals were achieved or exceeded for aesthetics and the health of the fishery. Both Bluegill and Largemouth Bass spawns were productive, and fall observations suggested that there may have been a second Bluegill spawn as there were many fry of a smaller size class.

The fishery would benefit from cover provided by emergent vegetation becoming established along a greater percentage of the lakeshore or introduction of other physical cover structures. We will continue to try to spare the south shoreline from herbicide treatments next year and explore options and efficacy of introduced cover objects to promote fish growth.



Performing maintenance on aerator diffusers





Inspecting nest boxes to estimate numbers of fledglings



## WOOD DUCK NEST SURVEY

We maintained a total of 85 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. Four boxes were damaged between the February repairs and the nest survey and were unusable for nesting. Two additional boxes were flooded during the nesting season. We have three types of nesting boxes available for Wood Ducks: Ducks Unlimited plastic boxes, cedar wood boxes, and galvanized round metal cone boxes.

Wood Ducks nested in 20 of the Ducks Unlimited boxes (100%). Twelve of these nests produced chicks (60%). The cedar boxes showed 84% Wood Duck use (46 of 55) of which 47% produced chicks. There were two successful nests this year from the 5 metal cone boxes (40%). Overall use of boxes by Wood Ducks (84%) was less than last year (91%) but nesting success rates were higher. Forty-one percent of available boxes produced a successful nest (2% higher than last year). The numbers of estimated eggs hatched was 1.2% higher than last year at 248 (245 last year) while the total number of eggs recorded was 11% lower at 1,018 (1,148 last year). The proportion of eggs that hatched was 24% (21% last year). There were ten fewer “dump nests” this year (17) but the total number of eggs laid in “dump nests” only decreased by 2% from a year ago. “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.

After conducting 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. We will also install one or more boxes on the newly constructed Oak Wetland on the Bauer tract.



Juvenile Eastern Bluebird, *Sialia sialis*





## EASTERN BLUEBIRD NEST SURVEY

We inspected the fifty-one Eastern Bluebird nest boxes on site for use during the nesting season on July 14th. Three nest boxes were unusable for birds during breeding time due to damage. Eastern Bluebird nests were observed in 27% of the remaining boxes, lower by 1% compared to last year. We found that House Wrens constructed 3 nests over an existing Bluebird nest compared to 7 last year. We estimated that there were about 21 fledglings from our boxes this year, the highest total in three years. It is likely that the warmer, less stormy spring we experienced this year favored Bluebirds' ability to incubate eggs relative to the last several years. 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 in 2020 included House Wren (51%), Tree Swallow (8%), ant nests (6%), mice (6%), and Great-Crested Flycatcher (2%). Nest boxes were found to be empty on 7 inspections (14%). 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, Wrens. Even so, intense competition for nesting sites may be an unavoidable effect of our woodlands reaching a stage of maturity preferred by Wrens.







A doe and her nearly grown fawns feeding in October



## WHITETAIL DEER SURVEYS

Following a protocol we established years ago, we conducted three ground censuses for Whitetail Deer early in the evenings of January 28th, February 13th, and February 19th of 2020. 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 kept similar from year to year. The total numbers of deer seen for each census were 74, 81, and 151, respectively, for an average of 102 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 surveys were lower than the previous year and below our 26-year average. Observations suggest that the driver for that decrease was a below-average reproductive output in the spring of 2019. In recent years we had observed that the deer herd had been reduced to below a maximum carrying capacity and that the risk of habitat damage due to excessive deer browse was low. We therefore decreased our hunting pressure and harvest goals to allow for greater recruitment into the population. 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 2020 was that recruitment numbers were significantly higher than the previous year.

On February 24th we surveyed all corn and soybean food plots planted in 2019 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 2019–2020 and do not reference the crop we planted in 2020. The growing season of 2019 was historically bad for farming in our area due to extended wet conditions in spring resulting in a late planting season coupled with early frosts which damaged crops and halted maturation of soybeans. As soybean harvest was impossible in the fall, we opted to harvest a higher percentage of corn than we typically would. Probably owing in part to the availability of large amounts of soybeans throughout the winter months, there was an abundance of corn remaining at the time of our survey. All cornfields were found to have produced ears (which has not always been the case) and a record 54% of uncombined corn remained available. Taken as a whole, in food plots property-wide, 90% of corn stalks still had cobs attached (a 6% increase over the previous survey), and on those, ~60% of kernels remained on the cobs. The large amount of soybeans available for wildlife use, taken with the relatively modest numbers of deer observed in our surveys in winter of 2019–2020, make it unsurprising that the results of this survey show record amounts of available grain left in our food plots. It has been several years since we last observed evidence of deer foraging in the winter on “hunger foods” such as Red Cedar, Arbor Vitae, or Yew shrubs in landscaping during the late winter months.





Trail camera photo of an adult buck, ear tagged as a fawn



## 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. 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 which 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, one of our samples, taken from a mature doe in November, tested positive for CWD. This is the first positive test to be recorded from our site and the first from Lee County to date. Following the news of this positive test we increased our efforts to harvest and test adult deer for the duration of the 2020 hunting season. No subsequent tests from other harvested deer have shown infection yet but the presence of this fatal disease will weigh heavily on our decisions as we develop our management goals for Whitetail Deer moving forward.

Foundation employees captured two Whitetail Deer fawns on the property incidental to other work, both females. We equipped the fawns with individual ear tags containing I.D. numbers, the acronym "RWF," and our office phone number. To date, we have tagged 90 deer (43 male, 46 female, and one unknown). Of these, 20 have yielded valuable post-capture information regarding local population demographics, mortality factors, and movement patterns. We have recovered eight females on site: six harvested by hunters, and two killed by vehicle collision. We have recovered five males on site: two killed by vehicle collision (both < 1 year old), one evidently predated in its first month, and two harvested (both at 4.5 yrs. old). Three males (one 1.5 yrs. and two 2.5 yrs. old) and two females (1.5 yrs. and 4.5 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. This year's total of 2 fawns was lower than average. It was observed that while we encountered fawns at an above-average rate, they matured very quickly this spring and became too quick to capture by hand.







Common Snapping Turtle, *Chelydra serpentina*



## 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 Fox Snake, Eastern Garter Snake, Eastern Hognose Snake, Brown Snake, Painted Turtle, Common Snapping Turtle, Blanding's Turtle, and Ornate Box Turtle. No Spring Peepers, Six-Lined Racerunners, Plains Garter Snakes, Green Snakes, or Spiny Softshell Turtles were recorded this year.

As we have for several years now, we put specific effort in April and May 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 2 Common Snapping Turtles and 94 Painted Turtles from eight different wetlands. 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. To date, we have marked and released about 299 adult turtles of four species.

In the Wetlands section above we made note of the fact that many species of pond-breeding amphibians benefit from periodic drying of breeding pools. Drying 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 most larval amphibians. In the consistently wet weather of recent years, the majority of our ephemeral wetlands maintained a pool. In some cases we sought to draw water levels down in order to facilitate the drying event but in most of those cases conditions remained too wet to completely dry the wetlands. This year however, dry summer conditions led a good number of our wetlands to dry naturally, without our intervention. It will be interesting to see if we see a related spike in amphibian reproduction next year.





Two Whooping Cranes, *Grus americana*, with a Sandhill Crane, *Antigone canadensis*



## WILDLIFE OBSERVATIONS

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

Ideal June weather for young chicks led to a very successful reproductive year for Wild Turkey and Ring-Necked Pheasant. Bobwhite Quail also seem to have had similar success. Adults were seen and heard frequently for a sixth year in a row and across the property which is a positive sign. Juvenile Bobwhites were seen and recorded on multiple occasions and a covey of approximately 40 birds was reported in the fall from our south end. Sandhill Cranes continue to breed on site. Several juveniles were seen this year but an accurate estimation of how many was not possible. At least one of those was seen to have survived to flying age and was observed with its parents well into the fall. One adult Sandhill Crane was found dead on site in mid-March, without an obvious cause of death. Migratory waterfowl—ducks and geese—used the site in lower-than-average numbers during the spring migration but the fall migration was minimal for a third consecutive year on our site. Two species of songbirds, the Baltimore Oriole and the Rose-Breasted Grosbeak, were more commonly seen on site in the breeding season than has been typical. Bald Eagles were noted more frequently as well, especially during the early summer months. Sightings were so common that we suspected that they may have been nesting on site or very nearby, but no nest was found. Observations suggest that Raccoon populations remain high, but Coyote observations seem to have fallen slightly from their peak 2 years ago.

The most exciting avian visitors to the Foundation were a pair of Whooping Cranes that spent about 3 weeks in the fall using wetlands and food plots at RWF. We had recorded Whooping Cranes on site a few times over the years, mostly seen in flight, but this pair made greater use of our habitat and for longer than we had previously seen. For our conservation efforts to benefit North America's tallest bird, and one of its rarest, is an honor. 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 was an inspiration. We hope this pair of cranes will return, with friends, in the near future.

Sightings of Endangered or Threatened species included Whooping Crane, Osprey, Northern Harrier, American Bittern, Yellow-Crowned Night Heron, Black-Billed Cuckoo, Starhead Topminnow, Blanding's Turtle, and Ornate Box Turtle. Other species of interest included Scarlet Tanager, Rose-Breasted Grosbeak, Pied-Billed Grebe, Trumpeter Swan, Woodcock, Hooded Merganser, Bald Eagle, Eastern Screech Owl, Blanchard's Cricket Frog, Tiger Salamander, Eastern Hognose Snake, Gray Squirrel (a common species but unusual for our site), and American Badger.

## OTHER SURVEYS AND DATABASE RECORDS

Several projects are of an ongoing nature and require field investigations, monitoring, and updating of records annually. Some of these include Wild Turkey brood surveys, fish surveys, habitat type database records, wetland management regimes, native plant seed collection lists, seed cleaning techniques, native plant seed harvest chronologies, prairie burn schedules, and prairie and wetland restoration management notes, techniques, and reports.





Headstarted & released Blanding's Turtle, *Emydoidea blandingii*



## 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. Two years ago, we leapfrogged that accomplishment when, after several years of attempts, 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. Last year, our recovery program took another, even more significant leap forward when we were able to collect 39 Blanding's Turtle eggs and send them to an incubation facility and from there on to a headstarting 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. This year we made our first release of headstarted turtles, which we had collected as freshly deposited eggs last year.

We have refined our approach to Blanding's Turtle conservation measures over recent years into a fairly repeatable annual process. Our efforts begin in early spring, by locating any turtles that overwintered with radio telemetry transmitters applied 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 are often frustratingly low. With few adult Blanding's Turtles and many acres of wetland habitat, the needle in the haystack analogy is apt. When we capture adult females, we palpate (feel for eggs) to determine if they appear to be gravid, take size measurements and health observations, and affix a radio transmitter to the back of 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





Collecting eggs for incubation and head start program



## RARE TURTLES RECOVERY PROJECT (cont'd)

“false alarms” as it is common for Blanding’s Turtles to move from one pond to another. Regardless, if a female is moving overland we have learned to keep a close watch. 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 sexual outcome of incubation. 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 have chosen to ask Dan to incubate each clutch at temperatures to generate a 2:1 ratio of female to male hatchlings following methods he has used in his own program.

After hatching, the hatchlings are given time to acclimate to life outside the egg, they are individually marked, and we move them to a facility in Lake County, where Gary Glowacki operates that county’s Blanding’s Turtle recovery effort. Under Gary’s care, 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. Another potential advantage is that head starts may achieve reproductive maturity at an earlier age than their wild counterparts.

Even with the additional growth afforded to hatchlings headstarted 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 applied for 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 nesting season, primarily targeting Raccoons and, to a lesser extent, Coyotes. While we were granted and made use of the permit last year, complications of pandemic shutdowns prevented approval this year until after turtle nesting and release of our head starts. With the delay in approval and the first cohort of transmittered hatchlings already released, we opted to use this year to gather baseline data on predation risks to headstarted hatchlings (results discussed below). Next year we will seek to start to our trapping efforts earlier and hope to provide greater protection to these turtle populations.

This spring we were excited to release our first 37 headstarted hatchlings at 3 wetlands on site that met the following criteria: known to be used by Blanding’s Turtles in recent years, abundant emergent vegetation, mucky bottom substrate, and had not dried down in >3 years. Dr. Rich King of Northern Illinois University, a partner on this project, secured funding from the Illinois Department of Natural Resources to follow a subset of headstarts using very small radio transmitters on our site as well as at release locations of several other partner agencies. Goals of his project are to evaluate survival and growth rates, habitat use, and behavioral





Releasing a headstarted Blanding's Turtle



## RARE TURTLES RECOVERY PROJECT (cont'd)

characteristics of hatchlings, among other aims. Twenty of the headstarts we released this year were equipped with mini transmitters and tracked through the expected lives of the necessarily small transmitter batteries. By the end of the summer, we had lost at least 70% of the transmitted turtles to predation. These were confirmed as predated, found as carcasses, with obvious injuries and signs of predation by Raccoons. We lost signal from the transmitters of three others. This could have been due to mechanical failure, but it is at least as likely that the signal loss was due to predation events. Transmitters were removed from the surviving turtles before their batteries expired.

This summer was dryer than recent years' and 2 of the wetlands we used as release sites began to dry down in June. We found that as wetlands dried, hatchlings were less likely to follow the water down, and more likely to either remain in the vegetation at the previously flooded areas they occupied or to strike out over land. The mass predation tracked with the dropping wetland levels. Turtles that left drying wetlands tended to survive longer once away from the wetland than those that stayed in muck or vegetation nearby. The level of predation this group of hatchlings experienced was startling to us, even though a certain level of mortality was expected. Although it was severely disappointing and certainly a blow to our efforts and the Blanding's population, we learned the magnitude of the threats posed by Raccoons on our site and the danger of exposure during dry times. We will certainly use this information to inform future actions, specifically release sites and predator control efforts.

In better news, on the night of June 18th this year we were able to follow a gravid female Blanding's Turtle to her nest and collect her eggs. This was the first clutch of eggs we have protected from this turtle. This is significant because the more genetic diversity we can retain in our small population the better. We had tracked this turtle in 2015 but she was not gravid that year and we removed her transmitter for use on a different gravid female. This year, she laid 15 good-sized eggs, which were incubated as described above, all hatched, and are currently in the Lake County head-start program. We will do all we can to set these head starts up for success when we release them. As for the mother turtle, we left her transmitter affixed, recorded her location in late fall, and hope that we will be able to follow her to another nest next year.

We have not yet made the same strides in our efforts with Ornate Box Turtles as we have recently with 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 aware of only 2 female Ornate Box Turtles on site and a male that has not been seen in several years. We removed the radio transmitters we had on the females this year as their batteries were due to expire before next field season. 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 learned this year were 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 in order 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.





Taylor Steinfeldt releases a headstarted Blanding's Turtle



## HABITAT USE AND PREDATION OF HEADSTARTED BLANDING'S TURTLES

*Taylor Steinfeldt, former RWF intern and 2020 part-time seasonal crewmember, completed his research requirements for his MSc. from Trinity College in Dublin, Ireland, this summer at RWF. Coordinating with his advisers in Ireland and Dr. Rick King of Northern Illinois University, Taylor combined his educational goals with our Blanding's Turtle recovery efforts and Dr. King's ongoing research and evaluation thereof. The following paragraphs are Taylor's summary of his research.*

The Blanding's Turtle (*Emydoidea blandingii*) is a semi-aquatic freshwater turtle, listed as a threatened species in Illinois and throughout much of its range. Population decline has resulted from a combination of habitat loss, low recruitment rate, and predation. Without intervention, nesting success of the species is very low, with between 5% and 25% egg survival rate on average. Collection of eggs from the wild and laboratory incubation prevents predation from raccoons (*Procyon lotor*) and other predators while in a vulnerable state. Headstarting is a management strategy meant to increase survival rates of young by raising them in captivity to a size class less vulnerable to predation. The purpose of this study was to monitor a cohort of headstarts sourced from and returned to Richardson Wildlife Foundation. Their body condition, movement patterns, and behavior, following their release, was of the utmost concern, with the aim of identifying correlations between the turtles' growth and various habitat metrics (e.g., site temperature, habitat type, and aquatic vegetation density).

The headstarts were fitted with small radio transmitters to facilitate their discovery after their release. Body condition and movement patterns were evaluated once per week, per individual. At each encounter, several data were collected, including life status, geographic coordinates, location, date & time, carapace (top shell) length and width, plastron (bottom shell) length, total shell height, body mass, body temperature, water depth, water surface & substrate temperatures, air temperature, emergent vegetation (e.g., cattails) density, submerged vegetation (e.g., Canadian waterweed) density, surface vegetation (e.g., duckweed) density, the three most dominant plant species in the vicinity (by biomass per square meter), the substrate type & depth, and the behavior of the individual at the time of encounter (e.g., swimming versus stationary). Each metric correlated to a specific aspect of the headstarts' overall performance and behavior. Shell measurements, body mass, and body temperature were used to calculate growth rate and to track body condition, which were then tested against the habitat characteristics (e.g., habitat type—in the water versus on land) to identify any statistically significant correlations. Further delineations also occurred between release site and sex of the individual.

Through statistical and geospatial analyses, over 220 data entries were evaluated, leading to several statistically viable results, a couple of which are presented here. Additionally, all data was evaluated—a process called a distribution normalization skew test—to ensure the sample size was large enough to accurately form conclusions, a significant issue when researching small populations. One of the most notable findings was the correlation of growth rate to habitat type (Figure 1), using a Student's T-Test to compare the average growth rate on land against the average growth rate in the water. It was found that the two values were, indeed, significantly different from one another, with the growth rate on land averaging -0.088 grams per day and +0.079 grams per day in the water. This result was supported by previous studies and the general hypothesis that fewer resources are available on land than in the water, resulting in a reduced growth rate.

Another key finding of the study was the relationship of aquatic vegetation to turtle presence. Previous research stressed the importance of emergent vegetation (e.g., cattails and river bulrush). However, through a Fisher's F-Test, the variance (i.e., the spread of data points) was evaluated, indicating that the metric of submerged vegetation ( $\sigma^2 = 0.0212$ ) was statistically more



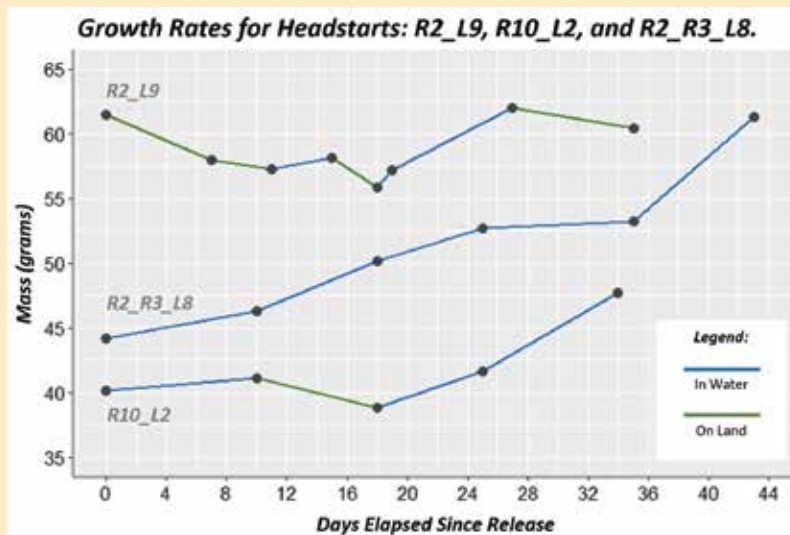


Headstarted & released Blanding's Turtle, *Emydoidea blandingii*

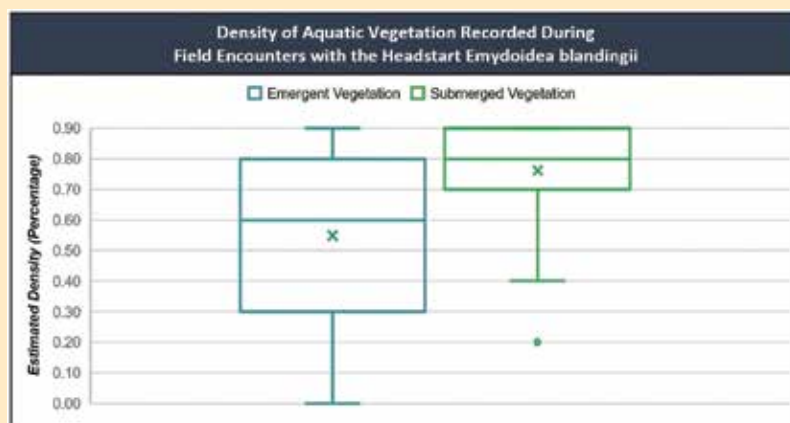


## HABITAT USE AND PREDATION OF HEADSTARTED BLANDING'S TURTLES (cont'd)

restrictive (i.e., smaller) than that of emergent vegetation ( $\sigma^2 = 0.0867$ ). This showed that while emergent vegetation may be important to the species, so too is submerged vegetation, potentially more so. The plot below (Figure 2) shows this variance of the two vegetation types, depicting a higher restriction on the variance of submerged vegetation. In other terms, the headstarts appeared to favor only high densities of submerged vegetation but were less impacted by the density of emergent vegetation in comparison. This was a novel finding of the study, not mentioned previously by other researchers on the species. Future research should focus on identifying more of these ecological relationships that the headstarts have with their environment, such as predation and nutrition. By further researching the species, and through scientifically driven management interventions, it is hoped that some Illinois Blanding's Turtle populations can eventually increase enough to justify removal of its Endangered status.



**Figure 1:** Growth rates of headstarts (R2\_L9, R10\_L2, and R2\_R3\_L8) with separations of line color by habitat type (i.e., land versus water). Trends indicate a positive growth rate while in the water (blue) and a negative or neutral growth rate while on land (green).



**Figure 2:** Boxplot representing the spread of data for the densities of emergent vegetation and submerged vegetation, recorded during field encounters with the headstart *Emydoidea blandingii*.





Declan Considine with a nice Main Lake Bluegill



## EDUCATION

Whenever possible, the 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. If 2020 had been an ordinary year we would have 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. Unfortunately, we know that 2020 was no ordinary year. Pandemic-related safety measures limited possibilities for educational groups to travel or congregate so like other important parts of regular life, educational trips to the Foundation were put on hold for safer times. Even so, through our participation in the Illinois Recreational Access Program (IRAP), we were able to provide state-administered spring and summer access for hiking, bird watching, and photography, as well as youth turkey hunting to help young people learn safe and responsible hunting techniques and gain experience with and appreciation for wildlife and the natural world. One lesson taken in by many people this year was the value of natural places and their ability to help ground and restore our perspectives in times of stress or anxiety. We hope that lesson remains long after our current stressor passes and that folks will continue to value and support efforts that benefit nature.

Since laying the groundwork for a regional turtle conservation effort with colleagues in 2017, we have continued to contribute to an action plan to bring the Endangered Blanding's and Threatened Ornate Box Turtles back from the edge of extinction in this part of the state. While we were unable to hold an in-person "turtle summit" meeting this year, we continued to push this objective forward through digital and virtual means with our friends at the Nature Conservancy, Northern Illinois University, Illinois Department of Natural Resources, and County Forest Preserve Districts of Lake, DuPage, and Kane counties. Publicists with TNC facilitated virtual meetings with our team that allowed them to get the story of the Blanding's Turtle, and efforts to restore their numbers, out into broader conversation. Television and other news outlets in the Chicago region sent reporters and photographers to film releases of headstarted Blanding's Turtles at Nachusa Grasslands. When the stories aired thousands of people who may never have otherwise heard of Blanding's Turtles learned about their plight and the consequences of habitat loss and alteration.

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.

## 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 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.





Brandon Jahn learning ignition protocol on controlled prairie burn



## INTERNSHIP / SEASONAL EMPLOYEE PROGRAM

Most years we offer one or more internships during the summer and/or fall months. This year we were fortunate to have two such positions to offer and were happy to bring back Brandon Jahn, who had just completed his Conservation Biology B.S. at Illinois State University, and Taylor Steinfeldt, who was pursuing his MSc. from Trinity College in Dublin, Ireland. Both had spent last summer working and learning in internships with the Foundation.

Brandon, having graduated in December, was available in the spring, just when we needed an extra team member to fill out our burn crew. In addition to helping conduct prescribed burns, Brandon kept our spring turtle trapping, invasive species control efforts, and native seed collection projects from missing a beat before our new full-time Ecologist, Amanda Contreras, was able to join the team.

Taylor came back to RWF in early summer, splitting his days working half-time doing habitat work for the Foundation and half on his Master's thesis research on our Blanding's Turtle recovery project (see Taylor's summary of his research in the Research and Study Projects section of this report). Taylor and Brandon's responsibilities included invasive species control, collecting native plant seed, Wood Duck and Eastern Bluebird nest box inspections, herpetological surveys and conservation measures, equipment and shop maintenance, removal of downed trees, and wildlife surveys.

Both young men worked hard to move us toward our goals and brought new eyes and perspectives to our projects. We wish them both a bright future and hope that they enjoyed their time at RWF. We were very pleased for Brandon when he left his summer employment with us to begin a full-time position and equally pleased for Taylor upon his successful completion of his research and achievement of his Master of Science degree.

## 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. Although social distancing and pandemic-related caution limited our possibilities for volunteers, we were still fortunate to have help from some Foundation friends and family. Melissa Pitzer helped fill out our crew for a day of spring prairie burns. Tess Wilson edited and proofread copy such as this report and saved us more than a few supply runs into town. Our new Ecologist, Amanda Contreras, donated some of her time in early spring before her employment with us began, and our seasonal crewmember Brandon Jahn did the same this summer following his term. 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 blades on 722 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

## **John Deere 4020**

- Flat tire repairs

## **John Deere 4040**

- Replaced starter
- Repairs to AC
- Replaced rear tire rim

## **John Deere 4840**

- Repairs to AC
- Flat tire repairs

## **John Deere 450H Bulldozer**

- Replaced alternator

## **John Deere 1435**

- Rebuilt starter
- Replaced blades

## **John Deere 7720 Combine**

- Repaired sieves
- Replaced tie rod bolts
- Repl. pre-cleaner fan belt

## **John Deere 722 Soil Finisher**

- Replaced all blades

## **John Deere 7200 6-row planter**

- Replaced tongue

## **Cultimulcher**

- Repaired hitch and tongue

## **John Deere Gators**

- Replaced tires on 4x6

## **Yard Machine Snowblower**

- Replaced cutting edge

## **Gravity Wagons**

- Replaced bearings
- Replaced 3 tires

## **Clipper Cleaner**

- Weld repairs

## **Pickup Trucks**

- Repl. tires on '07 Chev.
- Repl. CV boot, '07 Chev.
- Repr. brakes, '11 Chev
- Repl. Muffler '07 GMC

In addition to the specific list above, we changed filters, fluids, and grease for all tractors and trucks; sharpened mower blades; made numerous repairs to small equipment including the chainsaws, backpack sprayers, snow blower, and leaf blower; and patched or otherwise repaired tires of implements, tractors, and trucks as needed. We also retired two aging pickup trucks and replaced them with a 2007 GMC 2500 pickup and a 2016 John Deere 4x2TX Gator, and replaced a gas pole saw, battery charger, and 2-way radios for our burn crew.





Painting the office building



# EQUIPMENT, PROPERTY, AND BUILDING IMPROVEMENTS

This year we pressure washed and painted our office building, two barns north and south of our shop building, the roof of the large equipment shed south of our shop, our entry sign, and the Erbes barn.

We did a significant rehab of the Martin house, in which we frequently house seasonal employees. We pulled up old carpet and installed laminate wood-style flooring; replaced the bathroom tub, shower surround, and vanity; replaced the kitchen sink, electric outlets, ceiling fans, gas valve, and stairway carpet; repaired damaged areas of ceiling plaster; and painted walls throughout the house.

At the lodge we replaced the gas diffuser and cast iron grate in the fireplace, made minor repairs to plumbing (sink valves, toilets) and electric (thermostats, fluorescent lights) units, made repairs to the lake aeration system, and replaced the water softener.

At the Sanctuary we replaced 4 skylights; replaced all carpet; removed and re-caulked windows; cleaned gutters; washed windows; pressure washed the building, decks, and stone walkways; completely stained both decks top and bottom; oversaw repairs to the alarm system; replaced a sump pump in the well pit; replaced a pressure switch in the waterfall plumbing; and made repairs to the dock.

We made minor plumbing repairs to a sink at the Montavon house and shower plumbing at the brick house. We installed a vent fan in the back of our shop building for clearing dust from the hammer mill during seed processing and cleaning. 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 dead or dying from disease or brought down by storms and pruning trees near buildings and along lanes and trails to maintain accessibility on the property. We used a stump grinder this fall in areas on the Original, Erbes, Wysneinski North, and Wysneinski Central tracts in places we had removed trees for oak release and management. Grinding the stumps allowed us to make areas within woodlands passable trails for future firebreaks and for access points to conduct management of invasive species.

We improved two waterways this year. On the Bernardin tract, interrupted or damaged field tile had caused “blowouts” in the soil under one of our trails as well as adjacent food plot and prairie. We ran a new line of tile—approximately 260’—vented it into a waterway flowing to Widgeon Wetland, recontoured the immediate area to improve overland flow during periods of heavy rain, and replanted appropriate vegetation in the disturbed areas. On the Original tract we excavated about a foot of silt from a ditch which carries the overflow from Doe to Beaver Wetlands. Prior to this maintenance, the tilt tube control structure of Doe Wetland would be underwater most of the spring due to backed up outflow.

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; and removing Beaver dams where necessary for proper drainage. This year required an especially large number of repairs to field tile and filling of the subsequent holes the washout leaves in the ground. The increase is probably owing to the wet weather over the last several years coupled with the age of the tile, most of which has been in place for over 50 years.



Controlled prairie and savanna burn





## PRAIRIE AND SAVANNA MANAGEMENT

On April 1st and 2nd 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. In late summer our crew returned to cut and treat invasive Bush Honeysuckle and Autumn Olive invading the unburned half of the savanna using chainsaws, loppers, hand saws, and herbicide.

## POND MANAGEMENT

We controlled aquatic vegetation and algal blooms using various chemical applications over the course of the growing season. For control of rooted aquatic vegetation, we applied Nautique once in May and Reward in 5 different applications from May to September. We made 12 treatments with Cutrine Ultra and/or Clearigate and Aquaprep to control algae from April through September. In all, we used a total of 2.5 gallons of Nautique, 6 gallons of Reward, 8.63 gallons of Cutrine Ultra, 1.73 gallons of Clearigate, and 6 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 15 gallons of Aquashade dye in 5 treatments across the growing season.

We performed regular maintenance on the aeration system to help balance the diffusers and keep them operating efficiently. In September, we 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.





Black and Gold Bumblebee, *Bombus auricomus*, on Yellow Coneflower, *Ratibida pinnata*



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

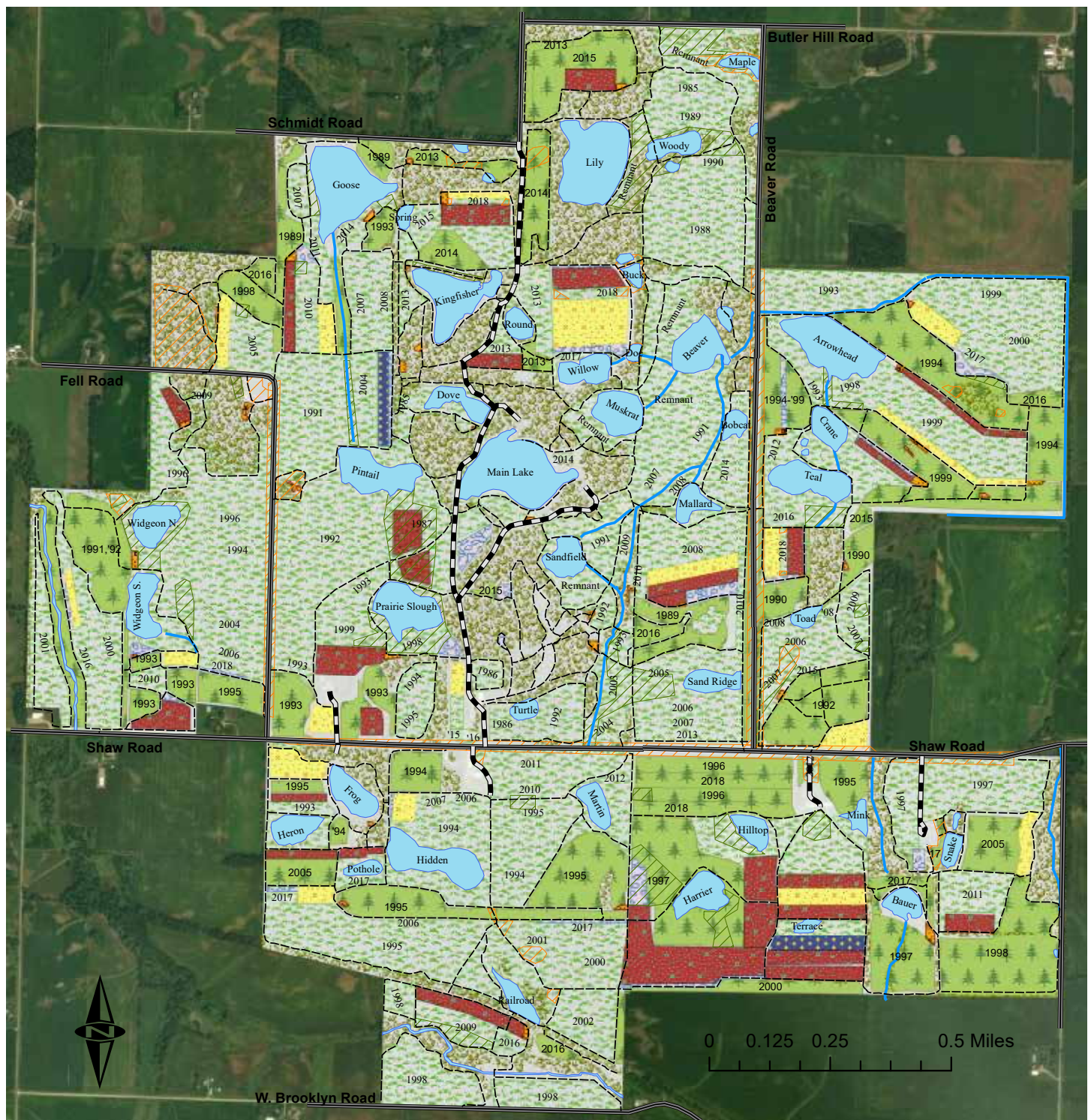
- Habitat planning, layout, mapping, and evaluation of annual land management practices
- Budgeting, payroll, task code, and programmatic accounting
- Preparation of an annual report of Wildlife Foundation accomplishments
- Maintenance of a website representing the Wildlife Foundation
- Representing 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 interview of 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 is a list of people who contributed photographs for this year's annual report: Brian Towey and Taylor Steinfeldt. We thank them for the use of their photos.



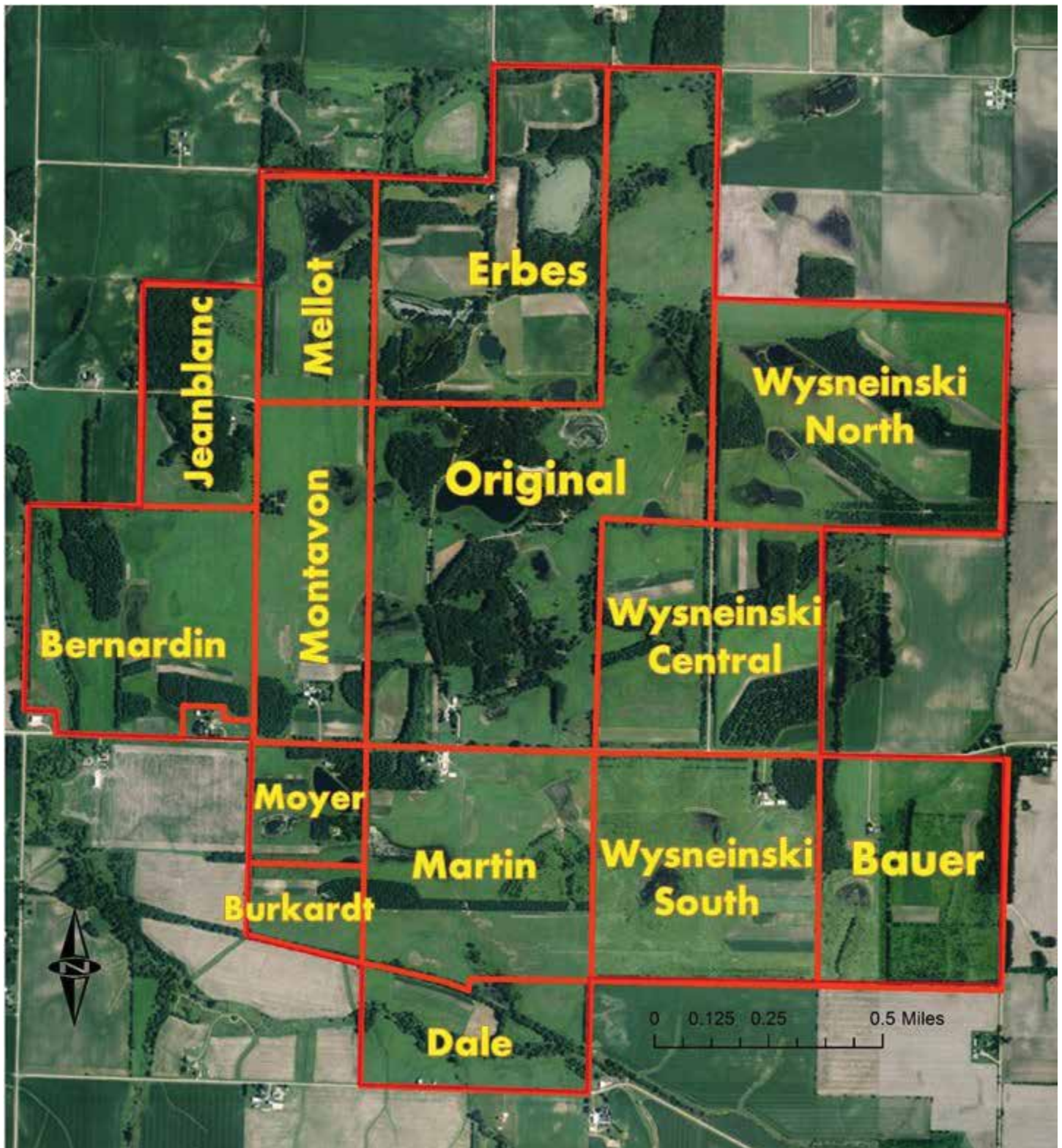
# MAP OF HABITAT MANAGEMENT PRACTICES



## Legend

|             |                 |                     |          |                  |
|-------------|-----------------|---------------------|----------|------------------|
| Roads       | Water           | Prairies            | Corn     | Sunflowers       |
| Gravel Lane | Existing Timber | Interseed, 2020     | Soybeans | Clover Foodplots |
| Trails      | Tree Plantings  | Habitat Preparation | Oats     | Mixed Foodplots  |







# 2020 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  | 41.3         |              |
| 1995  | 52.2         |              |
| 1996  | 28.1         |              |
| 1997  | 25.4         |              |
| 1998  | 33.1         |              |
| 1999  | 38.2         |              |
| 2000  | 51.2         |              |
| 2001  | 25.2         |              |
| 2002  | 10.9         |              |
| 2003  | 7.1          |              |
| 2004  | 15.3         |              |
| 2005  | 17.1         |              |
| 2006  | 26.5         |              |
| 2007  | 28.68        |              |
| 2008  | 20.2         |              |
| 2009  | 12.6         |              |
| 2010  | 18.52        |              |
| 2011  | 23.85        |              |
| 2012  | 16.1         |              |
| 2013  | 30.5         |              |
| 2014  | 19.2         |              |
| 2015  | 9.2          |              |
| 2016  | 12.13        |              |
| 2017  | 20.28        |              |
| 2018  | 2.05         |              |
| 2019  | 0.25         |              |
| <b>TOTAL ACRES-</b>   | <b>793.3</b> | <b>40.1%</b> |
| <b>Remnant Prairie -</b>  | <b>40.4</b>  | <b>2.0%</b>  |
| <b>Tree Plantings</b>   |              |              |
| 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            |              |
| <b>TOTAL ACRES-</b>   | <b>360.7</b> | <b>18.3%</b> |
| <i>* Potted trees planted within existing woodland plantings.</i> |              |              |
| <b>Pre-existing Timber</b>  | <b>291.2</b> | <b>14.7%</b> |

| 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                     | 2.4          |             |
| Wigeon South                     | 5.4          |             |
| Prairie                          | 8.2          |             |
| Hidden                           | 7.6          |             |
| Pothole                          | 1.3          |             |
| Hilltop                          | 2.7          |             |
| Bauer                            | 2.5          |             |
| Martin                           | 3.5          |             |
| Railroad                         | 2.2          |             |
| Terrace                          | 0.75         |             |
| Harrier                          | 5.2          |             |
| Turtle                           | 1.5          |             |
| Crane                            | 2.8          |             |
| Arrowhead                        | 6.8          |             |
| Bobcat                           | 1.5          |             |
| Lily                             | 13.4         |             |
| Willow East                      | 2.3          |             |
| Willow West                      | 1.8          |             |
| Round                            | 1.6          |             |
| Kingfisher                       | 8            |             |
| Spring                           | 1.3          |             |
| Mink                             | 1.1          |             |
| Snake                            | 1.9          |             |
| Sand Ridge                       | 2.1          |             |
| Toad                             | 2            |             |
| Buck                             | 1.65         |             |
| Doe                              | 0.5          |             |
| Maple                            | 2            |             |
| Dugouts (4)                      | 0.75         |             |
| Oak                              | 0.59         |             |
| <b>TOTAL ACRES-</b>              | <b>161.5</b> | <b>8.2%</b> |
| <b>Cool Season Grasses</b>       |              |             |
| <b>TOTAL ACRES-</b>              | <b>23.8</b>  | <b>1.2%</b> |
| Foodplots                        | Acres        | % Of Total  |
| Corn                             | 46.6         |             |
| Soybeans                         | 86.6         |             |
| Oats                             | 0.0          |             |
| Sunflowers                       | 5.6          |             |
| Winter Wheat                     | 2.2          |             |
| Clover / Chicory                 | 15.8         |             |
| Brassica                         | 6.5          |             |
| <b>TOTAL ACRES-</b>              | <b>163.3</b> | <b>8.3%</b> |
| <b>Drainages</b>                 |              |             |
| Bauer                            | 1.2          |             |
| Bernardin                        | 1.1          |             |
| Dale                             | 1.3          |             |
| Sandfield                        | 0.5          |             |
| Wysneinski                       | 1.6          |             |
| <b>TOTAL ACRES -</b>             | <b>5.7</b>   | <b>0.3%</b> |
| <b>Trail \ Firebreaks -</b>      |              |             |
| Total Length - 47.87 miles       | <b>70.3</b>  | <b>3.6%</b> |
| <b>Road \ Ditch Easements</b>    | <b>45.9</b>  | <b>2.3%</b> |
| Total Length - 6.6 miles         |              |             |
| <b>Building and Home Sites -</b> | <b>18.9</b>  | <b>1.0%</b> |
| <b>TOTAL ACREAGE -</b>           | <b>1,976</b> |             |





Wild Turkey, *Meleagris gallopavo*, hen with poults

## 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                  | 9                   | 100            |
| Waterfowl             | 3                   | 1*             |
| Pheasant              | 8                   | 7              |
| Deer (Archery)        | 264                 | 28**           |
| Deer (Firearm)        | 8                   | 3**            |
| Coyote                | ****                | 2              |
| Turkey (Spring)       | 25                  | 4***           |
| Turkey (Fall Archery) | ****                | 1***           |

\* The waterfowl harvest included 1 Canada Goose.

\*\* The deer harvest included 27 does and 4 bucks with the following breakdown: 24 adult females, 3 juvenile females, 4 adult males, and no juvenile males.

\*\*\* The turkey harvest included 3 Toms and 1 Jake harvested in the spring season and 1 bearded hen harvested in the fall season.

\*\*\*\* Hunter trips were incidental to archery deer hunting.

## TRAPPING HARVEST

| <u>SPECIES</u> | <u>HARVEST</u> |
|----------------|----------------|
| Raccoon        | 40             |
| Muskrat        | 18             |
| Opossum        | 0              |
| Mink           | 0              |
| Fox Squirrel   | 0              |
| Striped Skunk  | 0              |
| Beaver         | 0              |
| Badger         | 0              |
| Coyote         | 0              |









Yellow-crowned Night Heron, *Nyctanassa violacea*, hunting tadpoles from turtle basking trap





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