Richardson Wildlife Foundation

ANNUAL REPORT 2018

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 been the sole source of funding as the Foundation has expanded to 1,976 acres through land donations from the Richardsons and the purchase of adjacent farms.

TABLE OF CONTENTS

APPENDIX

OFFICERS

Edward J. Richardson….....President
J. Brian Towey.....Vice President
Cody Considine… ..... Secretary/Treasurer

STAFF

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FRONT COVER PHOTOS

Background:
Brown Snake, *Storeria dekayii*

From left to right:

- Trumpeter Swans, *Cygnus buccinator*
- Professional, turtle-searching, boykin spaniel with Ornate Box Turtle
- Electro-sampling for fish of conservation interest
- Hatchling Blandings Turtles, *Emydoidea blandingii*

Jack-in-the-pulpit, *Arisaema triphyllum*

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 944 pounds of seed of 244 species of native prairie, wetland, and woodland plants this year. This represents the highest number of species we have collected to date. As we continue to focus on woodland habitat development, 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, offsite, 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 site at the Nature Conservancy's Nachusa Grasslands site. Using a modified combine, we harvested 264 lbs of Little Bluestem and 18 lbs of Sideoats-Grama. Harvest of both of these species was more limited than we would prefer due to a shortage of areas that were not dominated by tallgrass and unusually poor seed production in areas which had not been burned in the spring. Many of the areas that were once rich with Little Bluestem are shifting to a more tallgrass dominant prairie as a result of several wet growing seasons in a row. 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.

Combining native grasses

Controlled, prescribed prairie burn west of Railroad wetland

PRAIRIES

Prairie habitat represents a higher proportion of the Foundation property than any other habitat type, most of it having been restored on former agricultural ground. We conduct prescribed and controlled burns, generally on a 3-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 additional early nesting cover for wildlife, and allowing for the greatest potential for species diversity. We had a successful 2018 burn season during which we burned 65 units totaling about 470 acres from March 12th through April 2nd. All units were burned safely using a 4 or 5-person crew equipped with water sprayers, drip torches, Nomex clothing, and two-way radios. As a safety precaution for burning, and to allow for access to the property, 47.3 miles of firebreaks and trails were maintained via mowing during the growing season.

This year, we allocated the bulk of our available prairie seed to several savanna restorations described in the Woodlands section of this report. We did however, seed several small, diverse prairie restorations and interseeded a grass and wildflower mix of prairie species into an existing cool season grass planting (table below). Site preparation differed between plantings, depending upon previous land conditions. A 1.6-acre restoration on the Bernardin tract required no additional preparations, as it had been actively farmed with row crops in the previous year and was therefore a blank slate for winter seeding. Two small collection patches on the Bauer and Montavon tracts were prepared for planting by treating with Glyphosate and/or 2,4-D multiple times during the growing season. We conducted all prairie restorations and interseeding by frost seeding over snow cover in January. A majority of the grasses were planted using the Truax prairie seed drill. Forbs and some grasses were spread by hand or by using a leaf blower from the bed of a pickup truck. For specific locations of 2018 prairie restorations and interseeding, see the habitat map in the back of this report (Appendix 1).

Land Tract	Acreage	Grass spp*	Grass Seed/Acre	Forb Seed/Acre
Bernardin	1.6 ac	LB, SG	6 lb/ac	107 spp; 46 lb/ac
Bauer	0.2 ac	N/A	N/A	49 spp; 26 lb/ac
Montavon	0.25 ac	N/A	N/A	87 spp; 22 lb/ac

** Abbreviations for grasses: LB = Little Bluestem, SG = Side-oats Grama, I = Indiangrass, BB = Big Bluestem. Grasses listed are dominant species planted in greater amounts. In most cases other grasses and sedges were planted in lesser amounts and are accounted in forb totals.*

Ear-leaved False Foxglove, *Tomanthera auriculata*, an Illinois Threatened Species

PRAIRIES (cont'd)

In addition to the plantings described above, in February we interseeded a number of elevated sandy areas in tallgrass dominated prairies on the Wysneinski North, Wysneinski Central, Erbes, and Mellot tracts using a mechanically harvested prairie seed mix from The Nature Conservancy's nearby Nachusa Grasslands site. This mix contained a number of late-season flowering plants including several that are either difficult to collect in quantity or were not previously represented on our site. Our continued thanks to the crew at Nachusa for the assistance!

In addition to new plantings from seed, we planted over 1,200 plugs of native plants in areas that should meet their specific sun, soil, and moisture requirements in accessible locations in recent plantings and established prairies, open woodlands, and wetlands. Some of these were sown and grown in-house by RWF staff but most were received in trade. We concentrated plugs in new prairie restorations and tree plantings. We plan and hope to be able to draw on these plants for seed to further diversify future plantings.

In preparation for restorations planned for 2019 or beyond, we have been eliminating cool season grasses and invasive weeds by farming row crops in several areas on the Wysneinski South tract and mowing areas dominated by Reed Canarygrass as a precursor to implementing an herbicide program during the next growing season.

Goose pond at dusk

WETLANDS

Wetlands are among the most biologically productive and diverse habitat types found in nature. They provide immense value to human wellbeing through their natural functions of water purification, flood control, and groundwater replenishment even before factoring in the direct value 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 is neither feasible nor culturally possible so our approach has been to restore what are known as prairie pothole wetlands dotting our landscape and providing similar function on a smaller scale.

We record water level readings at each wetland on a monthly basis to assess fluctuations occurring in our wetlands throughout the year as well as across multiple years. This was another in a series of wet years and despite our efforts to bring water levels down and potentially drain several wetlands in late summer, only four of our most ephemeral wetlands ever dried completely. Heading into winter, several early snow events followed by melting rains have brought most ponds back to full.

The current streak of wet years has led to a proliferation of both fish and Muskrats. We would prefer to manage most of our wetlands as fish-free for the benefit of species that thrive without fish as top predators. Muskrats in such high numbers can do significant damage to dikes and shorelines. In many cases, natural fluctuations of hydro-period can be counted on to keep these species in check, but the duration of this high water period justified an effort to artificially lower water levels at certain ponds in order to achieve our management goals. We lowered tilt tubes or lifted control boards which hold water back in an attempt to drain Arrowhead, Crane, Teal, Spring, Pintail, Bobcat, 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. We were successful in drying Spring and Arrowhead Ponds. The rest were reduced but not drained enough to eliminate fish. The upshot was a mixed result on our immediate goal but a notably positive effect on wetland flora, which responded vigorously even in the wetlands that never fully dried.

We do manage several of our more permanent wetlands with fish species of conservation concern as a part of the community we try to promote. See the "Green River Basin Fish Recovery Plan" write-up in the Research and Study Projects section of this report to learn about fish introductions we made at Goose Pond this year. We decided this year to begin a native fish — stocking program at Mink pond, which we constructed and restored in 2016. Mink Pond appears to have a watershed that may be relied upon to keep a year-round pool and a depth that should prevent freezing too deeply and therefore support fish if oxygen levels in the water remain high enough. To begin the process, we purchased and stocked

Installing a PVC water control structure

WETLANDS (cont'd)

Mink pond with 125 Fathead Minnows, 250 Redear Sunfish, and 100 4-6" Channel Catfish. We also transplanted about 20 adult Bluegill from Main Lake. In the spring, if fish can be observed to have survived the year and possibly reproduced, we will transplant more Bluegill (pre-spawn) and Largemouth Bass (post-spawn) to Mink Pond.

We mowed wetland dikes in June as part of an ongoing maintenance program. Visual searches were made for Muskrat damage, and repairs were made where needed. As expected we found more Muskrat damage than we typically would. We made the needed dike repairs at Hidden, Muskrat, Arrowhead, Pintail, Kingfisher, and Bobcat Wetlands. We also made more extensive repairs to wetlands while we had the control structures opened and water levels reduced. At Bobcat we reburied and weighted down the PVC overflow tube, which had been undermined by Muskrat tunneling and had begun to float, losing its functionality. At Widgeon South we dug out a vented tile to restore proper flow to the pond and proper drainage to the upland. At Muskrat we redesigned, built, and installed an adjustable "arm" that holds the interior tilt tube at its set level. At Pintail, following a stadia survey, we lowered the emergency spillway on the west end of the dike to prevent the flooding we've seen there in some recent springs when water flow exceeds what the control structure can accommodate.

During August and September, we constructed two wetlands on the Wysneinski Central tract that we are calling Sand Ridge and Toad Ponds. Sand Ridge was constructed in a swale between prairie-stabilized sand dunes just west of Beaver Road. Toad was constructed in a Reed Canarygrass–dominated, flat, level portion of a waterway that flows from the corner of Shaw and Beaver Roads through a woodland and eventually into Teal Pond. After conducting a stadia survey and analysis of each site, we dug a trench around each wetland to search out and remove drainage tile then repacked clay into the trench to form a core for water retention. We built, shaped, and packed the dikes with the bulldozer, 8650 tractor, and earth scraper. Prior to final shaping of the dike, Toad Pond was outfitted with an 8" tilt-tube control structure with 2 anti-seep, latex diaphragms. Because the outflow from Sand Ridge Wetland is not foreseen to be excessive under normal conditions and because the lay of the land allows any excess water to be shed to the west through a saddle between sand ridges, we determined that no control structure is needed at this point. Following completion, we seeded the dikes with 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 2019.

About 15 years ago we rehabilitated a stream that flows north through the property from Martin wetland down to Beaver Pond, crossing under Shaw Road east of our office building. At that time the banks were steep and the stream was eroding and cutting deeper every year. One of the tools used then to mitigate this problem was a series of "log dams" installed to step the water level down gradually, holding

Repairing undermined log dams

WETLANDS (cont'd)

Wood Ducks, *Aix sponsa*, seen through branches

it back in a pool and riffle system that would be more favorable to stream-dwelling flora and fauna as well as preventing further erosion. For the most part, these structures have held up well but the two furthest south and closest to Shaw Road were undermined by water flow and had failed. This year we addressed that issue by cutting the eroded banks with backhoe and bulldozer to a much more gradual slope and using that soil to fill and repair the log dams. This winter and spring, water will continue to flow (now over, rather than under, the log dams) carrying any excessive silt to deposit it at the next dam. Next summer when the area is dry enough to return with equipment again we will add rock and gravel above and below the dams to finish out the pool and riffle development, then seed the area with moist soil plant species.

Over the winter we seeded diverse mixes of native wetland plants, prairie grasses, shrubs, and forbs into the seven medium-to-small wetlands we constructed in 2017 on the Erbes, Original, Bauer, and Wysneinski North tracts. The four small, unnamed "dugout" ponds received 41 pounds of 120 plant species. The woodland pool created during repair of the Beaver Pond dike received 13 pounds of 84 species tolerant of the semi-shade conditions there. At the tiered Snake ponds on the Bauer tract we used 159 pounds of 118 plant species. In addition to seeding these wetlands, during the spring we planted plugs of high value wetland plant species at the dugout and Snake ponds that we received in trade from native plant nurseries.

Cattails can be highly aggressive displacers of more beneficial wetland plants. There are native, nonnative, and hybrid species of cattails generally growing together on wetlands at RWF. Efforts to control the expansion of aggressive stands of cattails as well as the invasive Common Reed Phragmites in our wetlands and maintain the gains we have made in recent years continued. We treated Phragmites at Arrowhead, Crane, Teal, and Pintail in August using Touchdown, a Glyphosate product registered for use in and near water.

To facilitate connectivity of our trail system around the northwest of Lily Pond and to connect two firebreaks, we installed and covered a 14" x 20' culvert on the Erbes tract. Prior to installation, a vehicle coming from the south would have to leave the property in order to access the area north of Lily Pond. This addition will improve both access and safety in the event of prescribed or wild fires. The exposed soil will be seeded in the spring with Timothy.

Mature Black Oak, *Quercus velutina*

WOODLANDS

In the habitat category of "woodlands," we refer to three types of timber stands: mixed timber stands which pre-date the inception of the Foundation, 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 one in which results are becoming more evident and rewarding each year as trees mature and interseeded, native, herbaceous plants become established.

Most of our existing mixed timber stands are the result of natural succession following the abandonment of agricultural crop fields or pastures 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.

Most years 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. This year we thinned dense pine plantings on the Wysneinski North, Bernardin, and Montavon tracts for oak release and to prepare for supplementation of more desirable tree and shrub species where required. Once each thinning was completed, we interseeded a diverse mix of woodland and savanna species. This seeding will help foster a healthy understory in areas that had been barren due to the dense, year-round shade cast by the pine canopy. The project continued with the planting of bare root trees and shrubs in the spring and potted tree and shrub species in the fall (both described below). Additional thinning as needed on a smaller scale in future years will foster the continued development of these young, diverse savannas by allowing the oaks to grow more quickly and healthily, allowing for greater light penetration for forb growth and oak regeneration, providing better cover and browsing within the timber for wildlife. In addition to the projects just described, we strategically released individual oaks from competition with pines where needed in tree plantings on the Wysneinski Central and Erbes tracts. The majority of these pines were girdled by chainsaw and treated with a 50% Glyphosate solution. A few were selectively dropped and left in place to provide immediate ground-level cover for wildlife.

Planting a potted Bur Oak, *Quercus macrocarpa*

WOODLANDS (cont'd)

In April, we used bare root trees and shrubs to supplement existing tree plantings and woodlands on the Wysneinski North, Bernardin, Montavon, and Bauer tracts. Species included Black Oak (200), Bur Oak (200), White Oak (100), Pecan (100), Red Osier Dogwood (200), Silky Dogwood (100), Hazelnut (300), American Plum (200), Smooth Arrowwood (250), and Smooth Sumac (200). Because we were planting into existing timber habitat, these plantings were done by hand and shovel, rather than using the pull-behind tree planter we would use on open ground. Although the process is rigorous, at this stage in the game supplemental planting is the most effective way to add diversity to our woodlands and value to wildlife.

In late October, we planted potted RPM™ trees and equipped them 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 numbers indicated in the table below, and locations of new plantings are indicated on the habitat map in Appendix 1 of this report. Two plantings totaling 12 acres on the Wysneinski South tract were new habitat, as they were converted from row crops this year. Both plantings were frost seeded in January with diverse, native seed mixes of grasses, sedges, and forbs collected on site and a native seed mix obtained in 2017 from the Nachusa Grasslands. The plantings were mowed periodically during the growing season to aid in establishment prior to planting trees in the fall. The south planting on the Wysneinski South tract was planted with 162 pounds of 131 species of hand-collected forb seed and a forb-rich allotment of Little Bluestem and Indian Grass. The north planting on the Wysneinski South tract was planted with 152 pounds of 130 species of hand-collected forb seed and a forb-rich allotment of Little Bluestem and Indian Grass. The plantings on the Wysneinski North, Bernardin, Martin, and Original tracts were supplementation plantings into thinned pine plantings and a small area where Reed Canarygrass was treated with glyphosate on one edge of an existing woodland. We interseeded all pine plantings that had been thinned as well as about 30 acres of existing woodlots on the Original, Erbes, Wysneinski South, Wysneinski North, and Bernardin tracts following multi-year programs of cutting and treating invasive shrubs. All told, we used 269 pounds of 167 species of hand-collected forb seed as well as a native seed mix from Nachusa Grasslands. We concentrated seeding in openings and near woodland edges where enough sunlight was available to sustain the majority of species used. Woodland plants that can thrive in shadier conditions were included, but comprised a minority of the seed mix, as those species are still difficult to obtain in quantity on-site at this time. All areas interseeded are symbolized by orange cross-hatching on the habitat map in Appendix 1 of this report.

White Oak, *Quercus alba*, basketed to protect from deer browse

WOODLANDS (cont'd)

POTTED TREE AND SHRUB ALLOCATIONS:

Wysneinski South	Wysneinski North	Bernardin	Martin	Original	
Acres	12	N/A	N/A	N/A	N/A
Bur Oak	90	6	2	-	2
Black Oak	76	4	-	-	-
White Oak	16	3	1	-	-
Chinquapin Oak	20	-	-	-	-
Shagbark Hickory	20	5	-	-	-
Paw Paw	-	9	3	-	3
Aromatic Sumac	6	6	-	3	-
Witch-hazel	6	7	2	-	-
Nannyberry	10	5	-	-	5
Black Chokeberry	10	3	-	-	2
Serviceberry	-	2	-	-	3

Virginia Bluebells, *Mertensia virginica*

Treating 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, Original, Wysneinski Central, and Martin tracts were mowed as a first step 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 and some hand-pulling of plants. As we target Garlic Mustard in woodlands, we also spray many invasive Bush Honeysuckle shrubs as we encounter them. We strategically targeted known patches of Garlic Mustard in woodlots on the Erbes, Jeanblanc, Original, Wysneinski Central, and Mellot tracts. We hand-pulled 2nd year Garlic Mustard plants on the Bauer tract in the timber west of Merridian Road to avoid damage to valuable native wildflowers in the spring. 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 perennial invasive and is the hardest to control. We target invasions in our prairies on foot with backpack sprayers as much as possible to prevent damage to non-target plants. In cool-season grasslands, we spray Milestone or Transline herbicides in the spring or mow Canada Thistles during the growing season prior to the flowering stage to prevent seed development. We then spray in late summer and early fall as plants are actively moving resources to the roots. Bull and Musk Thistles and White and Yellow Sweetclover are biennial (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.

Cutting and treating Bush Honeysuckle, *Lonicera maackii*

INVASIVE SPECIES MANAGEMENT (cont'd)

Recent research has shown that in addition to displacing and outcompeting native plants that have value to wildlife, the invasive shrubs Bush Honeysuckle and Common Buckthorn introduce novel chemicals into the environment that can have deleterious effects on the survival of native vertebrates, from amphibians to birds and mammals. Over recent years we have made excellent progress clearing our woodlands of the adult, seed-producing individuals of these species as well as those of another invasive shrub, Autumn Olive. This year, during the growing season and into the fall, we treated adult plants and seedlings of invasive shrubs with Glyphosate or Triclopyr 4 using backpack sprayers. Treatments varied from foliar spraying while the plants were actively growing to cut stump or basal bark treatments later in the fall. Keeping up with ongoing re-growth 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 spread of invasives to new areas.

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've 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.

Snow on a Jack Pine, *Pinus banksiana*

DISEASE AND PEST CONTROL MANAGEMENT

Sphaeropsis, or Tip Blight, remains a problem affecting many 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 treated 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. Pear trees were productive this year though most of the apple trees followed last year's over-productivity with a minimal fruit set. Pest control measures were 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 Green Ash trees that are apparently unaffected as yet, many have died and most others will follow. Ash does 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.

Last year we made an attempt to introduce a disease to help us control an invasive pest. Multiflora Rose is a well-known invasive species that has plagued the Midwest for many decades. Over the years we've had excellent success reducing the numbers of this thorny shrub on site, but it continues to maintain a presence and cost us time and effort to keep it under control. To battle multiflora on another front we moved cuttings of Multiflora Rose displaying symptoms of Rose Rosette Disease from a nearby, off-site population and put the cuttings in contact with healthy Multiflora plants here. The disease is caused by a virus but is carried by mites in the family *Eryophidae* which are microscopic, host-specific feeders on Multiflora Rose. While Multiflora is highly susceptible to this disease, our native roses have been shown to be resistant. If our attempt was successful, some of the mites on the cuttings transferred onto the rose leaves and infected the plants with the virus. Following up this year on our introduction sites, we did not see the tell-tale symptom of the disease: reddish-colored witches broom growth at the ends of the growing rose branches. If symptoms are not seen next year we may make another attempt at introduction. If successful, we would hope that this bio-control method could save us some time in the future that we would otherwise have spent chasing Multiflora with backpack sprayers and herbicide.

Rows of Soybeans and Corn - warm season foodplots

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. This year we planted 3 new Imperial Whitetail Clover patches (~1.5 ac). In order to implement a new weed management system recommended to help combat Glyphosate-resistant Water Hemp, we separated corn and soybean acreage into distinct fields.

Final acreage figures for all wildlife food plots included twenty-one fields of corn totaling 70.55 acres, twenty-five fields of soybeans totaling 63.7 acres, one 3.0-acre field of sunflowers, nineteen fields of Imperial Whitetail Clover totaling 13.12 acres, and thirty-five fields of winter wheat totaling ~9.2 acres. Acreages are measured using GPS and mapping software and reported to the Farm Service Agency for crop certification.

We applied 100 pounds per acre each of DAP and potash to all row crop 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, Glyphosate, Triad, Plexus, and Prefix on Soybeans. We used Me-Too-Lachlor and Beyond on Sunflowers for weed control. We regularly mowed Imperial Whitetail Clover for weed control and sprayed Clethodim for control of grasses.

Over the last several years agricultural fields across Northern Illinois (our site included) have been invaded by a Glyphosate-resistant Water Hemp plant which is extremely difficult to control. To adapt, many commercial farms have begun to use Dicamba, which is effective against Water Hemp but has a volatile chemistry that will often drift to non-target areas. Our relatively small agricultural fields and their proximity to the habitat we work so hard to restore makes currently available forms of Dicamba a poor fit for our site. This year's changes to the herbicide program on corn and soybean fields was designed to combat Water Hemp and other Glyphosate-resistant weeds without Dicamba. The resulting control of Water Hemp and other weeds in corn fields was excellent. In most soybean fields control was far superior to the previous several years but there were some fields in which control was still very poor. As with any program at RWF, we continue to research potential methods to determine if there is a more effective way to manage row crops for production and wildlife use.

Perrenial Clover and Chickory - cool season foodplot

Main Lake from the Lodge cove

MAIN LAKE

Main Lake is the only pond on site which we currently manage for game fish. 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 plant and algae by reducing available light of their required photo-spectrum, we applied a total of 35 gallons of Aquashade blue pond dye in periodic treatments from February to August. For control of rooted aquatic vegetation, we treated the lake with 7.5 gallons of Aquathol K in one treatment, 3.5 gallons of Aquastrike in two treatments, and 1.9 gallons of Reward in two treatments. To control algae, we spread copper sulfate crystals across the bottom of the lake in four treatments totaling 450 pounds in April, May, and August; made 16 treatments of Cutrine and/or Clearigate between May and October; and made one treatment of Phycomycin in June. We used a total of 180 pounds of Cutrine Plus, 41.75 gallons of Cutrine Ultra, 19.3 gallons of Clearigate, and 50 pounds of Phycomycin. Planktonic algae was less of a challenge than most years. It was present most of the late summer but was very manageable. Filamentous algae was more persistent this year, especially in the latter half of the growing season when the more difficult to treat *Pithophera* algae emerged and maintained a presence into the fall of the year.

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 October following turn-over of the water column and will restart it in early spring — or earlier in the event that snow pack over ice becomes too severe during the winter.

In the spring we stocked 250 Redear Sunfish at approximately 1.5” size. This species can attain sizes slightly larger than Bluegill, rarely overpopulates, and generally does not compete for food with the species currently in the Lake (Bluegill, Largemouth Bass, and Channel Catfish) as Redear Sunfish are specialists at consuming snails. We also constructed 2 nesting structures for Channel Catfish, which are obligate cavity nesters. Over the years, we have rarely seen successful breeding of Channel Catfish in Main Lake, which is not unusual in ponds. One technique employed to enable catfish to reproduce is to place artificial tunnels on the lake bottom at depths of about 3 feet. We did so this year with materials we had on hand: 8” corrugated field tile and quick-set concrete. We blocked one end of the field tile entirely with concrete and poured a few inches in the open end as well to weigh them down. We placed two of these structures in the proper depth along the southern edge of the lake. As materials become available we will likely add a few more of these structures and monitor the pond for juvenile Channel Catfish moving forward.

Drake Buffleheads, *Bucephala albeola*

MAIN LAKE (cont'd)

The lack of emergent vegetation in Main Lake slows the productivity of the fishery to some degree by limiting available food and cover for fish and their prey species. At the same time we actively treat unwanted vegetation through most of the pond, leading to a reduction in beneficial and unobtrusive vegetation as well. In an attempt to ameliorate this effect, we seeded stationary, emergent wetland plant species along the shallow south shoreline of the lake using 12 pounds of 25 species. We also transplanted Pond Lily and Watershield — both native, aquatic, rooted plants—from Lily and Kingfisher Ponds respectively. We buried tubers of the Pond Lilies and the fibrous root clumps of Watershield along the south shoreline in about 2 feet of water. Unfortunately these were immediately discovered by Muskrats. In the year ahead, we will evaluate how successful our seeding and transplants may have been while making every attempt to minimize non-target herbicide effects in that area. A successful establishment of emergent vegetation in this part of the lake could improve fisheries while decreasing the vigor of weedier plants and algae.

For a fourth consecutive year, we frequently had to open the control valve to release excess water, even during the summer, fall, and early winter, which had been historically unusual for this pond. 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 a good food base of this year's fry remained for larger fish.

Transplanting White Water Lily

Mated Pair of Wood Ducks, *Aix sponsa*, at their nest box

WOOD DUCK NEST SURVEY

We maintained a total of 79 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. Two boxes were damaged by Raccoons between the February repairs and the nest survey and were unusable for nesting. We have three types of nesting boxes available for Wood Ducks: Ducks Unlimited plastic boxes, cedar wood boxes, and galvanized round metal cone boxes.

Wood Ducks nested in all 22 of the Ducks Unlimited boxes (100%). Thirteen of these nests produced chicks (59%). The cedar boxes showed 84% Wood Duck use (43 of 51) of which 61% produced chicks. There was one successful nest this year out of four metal cone boxes. Overall use of boxes by Wood Ducks (87%) was somewhat lower than last year (94%) but nesting success rates were higher. Fifty-eight percent of available boxes produced a successful nest (12% higher than last year). The numbers of eggs hatched was almost unchanged from last year at 271 (274 last year) while the total number of eggs recorded was 30% lower at 802 (1150 last year). The proportion of eggs that hatched was 34% (24% last year). There were two fewer "dump nests" this year, marking a second consecutive year showing a decrease in that category. In addition to that welcome decrease, the total number of eggs laid in "dump nests" was down significantly 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.

In early winter we installed 3 new nest boxes on the recently constructed Toad and Snake Ponds to be ready for nesting season next year. 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 as well.

Surveying bluebird nest boxes

EASTERN BLUEBIRD NEST SURVEY

We inspected the fifty-one Eastern Bluebird nest boxes on-site for use during the nesting season on July 20th. Five nest boxes were unusable for birds during breeding time due to damage. Eastern Bluebird nests were observed in 19% of the remaining boxes, higher by 1% compared to last year but still well below the rates observed in other recent prior surveys. House Wrens were recorded in even greater numbers than the recent years' increases and seem to have displaced nesting bluebirds from their nests. We found that wrens constructed one nest over an existing Bluebird nest. We estimated that there were about 13 fledglings from our boxes this year, which would be the lowest such figure since 2005. Following last year's very high bluebird success, this number constitutes a significant step back. Our estimation of 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 food supplies, or other factors. As the oak trees and savannas restored on the property mature, conditions will become more and more favorable for Eastern Bluebirds.

Other species that used Eastern Bluebird nest boxes in 2018 included House Wren (52%), Tree Swallow (2%), Carolina Wren (2%), mice (2%), and ants (1%). Nest boxes were found to be empty on 10 inspections (22%). Despite relocating many existing nest boxes and installing new boxes on the Erbes Tract recently, wrens continue to use nest boxes at high rates to the exclusion of bluebirds. In addition to replacing and repairing aging boxes we continue to adjust nest box placement to try to favor Bluebirds. Even so, intense competition for nesting sites may be an unavoidable effect of our woodlands reaching a stage of maturity preferred by wrens.

Mature male Whitetail Deer, *Odocoileus virginianus*

WHITETAIL DEER SURVEYS

Following a protocol we established years ago, we conducted three ground censuses for Whitetail Deer early in the evenings of January 29th, February 12th, and February 22nd of 2018. 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 69, 81, and 80 respectively, for an average of 76.7 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 significantly lower than the previous average. Most recent indications suggest that the deer herd has been reduced to below a maximum carrying capacity and that the risk of habitat damage due to excessive deer browse is low. Based on this information it would be recommendable to encourage the population to increase by reducing harvest of does while continuing to monitor for population changes and habitat affects. 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 twelve cameras were strategically placed across the property to gather information on the movement patterns, concentrations, and general presence of deer and other wildlife. Information collected with these cameras is 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.

On February 26th we surveyed all corn food plots planted in 2017 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 2017–2018 and is not referencing the crop we planted in 2018. Our surveys reflected that in spite of overly wet growing conditions again in 2017, corn and bean production were both quite good, partially due to a continuing reduction in early season browsing by deer. All corn fields produced ears this year (which has not always been the case). Taken as a whole, in food plots property-wide, 97% of corn stalks still had cobs attached (a 13% increase over the previous survey), and on those, ~45.7% of kernels remained on the cobs. This was a second consecutive record amount of corn remaining at the time of our survey and was far more than adequate corn standing available to wildlife into the spring. In addition to corn, we left about 15% of our soybeans standing as a winter wildlife food source. Improved shatter-resistance of modern soybean varieties has made this crop an even more valuable food source in winter in recent years. We've found that they continue to hold beans in pods deep into winter and even into spring, above any normal depth of snow cover and readily available for wildlife browse. In recent corn surveys,

Adult doe and twin fawns

WHITETAIL DEER SURVEYS (cont'd)

we've made it a point to record information on soybeans as well. This year's survey showed that there were standing beans left in all fields for wildlife use in late February in addition to the record corn remaining. It has now 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.

We monitor many aspects of our 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. Thankfully, no positive cases have been found in our samples or in Lee County to date.

Foundation employees captured three Whitetail Deer fawns on the property incidental to other work: one female and two males. We equipped the fawns with individual ear tags containing I.D. numbers, the acronym "RWF," and our office phone number. To date, we have tagged 83 deer (40 male, 42 female, and one unknown). Of these, 19 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 six 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). Two males (1.5 yrs. and 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.

Does & fawns browsing alongside Wild Turkeys

Eastern Hognose Snake, *Heterodon platirhinos*

HERPETOLOGICAL SURVEY

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

We were fortunate this spring to be able to have John Rucker and his increasingly famous "turtle dogs" work on our site to search for Threatened Ornate Box Turtles as a part of an assessment of the status of local populations of this species in our area being organized by Dr. Rich King of Northern Illinois University. John's dogs, which are Boykin Spaniels, are specially bred and trained to locate turtles of any species and bring them to the attention of their handler. John and his dogs have participated in turtle research across the country and their detection rates can often put more traditional survey methods to shame. At RWF they found 2 of our marked female Ornate Box Turtles in the area we had found them in the past and no other turtles in areas they searched that we thought was also suitable habitat. Watching the dogs work was impressive. Not finding greater numbers or unmarked turtles, though, lends additional weight to the idea that this species exists at a very low level here. Admittedly we had hoped the dogs would be able to show us we were simply overlooking a healthy population. It will be on us as land managers to understand and find ways to mitigate for this species' lack of reproductive success if we hope to keep the population from blinking out.

As we have for several years now, we put specific effort in April into trapping 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. Additionally we kept radio transmitters on 3 females which we had trapped and studied last year. Our trapping efforts yielded an additional female which we had marked in a past year. We applied a transmitter and followed this turtle's nesting season as well. We found the first two juvenile Blanding's turtles in the 4-to-5-year-old, sub-adult age class that we have recorded since beginning study of this rare species on site. Unfortunately, one of the two was found dead. No cause of death could be determined. Even so (and especially after finding the live juvenile in the same area) it is encouraging to see some evidence of successful, natural recruitment to the population. While trapping for Blanding's Turtles, we also caught 21 Painted Turtles from four different ponds. All 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 273 adult turtles of four species. 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.

Common Loon, *Gavia immer*

WILDLIFE OBSERVATIONS

The Foundation maintains annual records of on-site wildlife observations as well as reproductive parameters of several species. The following are notes on selected observations. Ring-Necked Pheasant recruitment rates appeared to be notably high yet again this year. Wild Turkey recruitment looked similar or slightly greater than last year's lower than average rate, probably due to another rainy spring during their hatchling phase and predation by high raccoon and coyote population. It has been several (wet) years since we've seen particularly strong brood numbers of turkeys in the spring and summer months. Bobwhite Quail were seen and heard frequently for a fourth year in a row. Quail were observed and recorded from one end of the property to the other which is a positive sign. This species has seemed on the brink of a true population climb at various points in the last decade or so; here's hoping that this time the Bobwhites can gain some real traction. Sandhill Cranes continue to breed on site, though fewer juveniles were seen this year than the prior two years. Migratory waterfowl — ducks and geese — used the site in great numbers during the spring migration but the fall migration was over before it started due to an early cold spell. Observations suggest that Coyote and Raccoon populations have continued to increase recently which will inevitably take a toll on their prey species. Additional sightings of Endangered or Threatened species include Starhead Topminnow, Osprey, Northern Harrier, Blanding's Turtle, and Ornate Box Turtle. Other species of interest include Common Loon, Virginia Rail, Pied-Billed Grebe, Greater White-Fronted Goose, Trumpeter Swan, Woodcock, Eurasian Collared Dove, Bald Eagle, Blanchard's Cricket Frog, Tiger Salamander, Six-Lined Racerunner, Eastern Hognose Snake, Smooth Green Snake, and Least Weasel.

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, 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.

Wild Turkeys, *Melagris gallopavo*

SURVEYING AND LISTENING FOR ILLINOIS RAILS WITH AUTONOMOUS RECORDING UNITS

Daniel Goldberg, a Ph.D. student in the Capparella laboratory at Illinois State University, contacted RWF this spring seeking permission to conduct research on marsh birds in the wetlands on site. RWF is one of a number of survey locations in his project. The following paragraphs are Daniels's summary of his study at the Foundation this past summer.

As wetlands have been degraded and destroyed across the United States, populations of wetland-dependent birds called rails have plummeted. Rails hide in dense vegetation and call mostly at night so accurate population estimates and detailed descriptions of habitat use and behavior of many species are poorly known. The North American Marsh Bird Monitoring Program (NAMBMP) was created by the U.S. Fish and Wildlife Service so that biologists could use a standardized set of protocols to survey and study rails. These call-playback survey protocols allow biologists to count rails based on their vocalizations at sunrise or sunset. However, species that are active at night remain difficult to completely inventory at dawn or dusk. To learn more about rail behavior, including why and when they call at night, one promising avenue is to use Autonomous Recording Units, or ARUs, to record sounds in their environment for long periods in the field, to record rail calls made at night and during other time periods not covered by the NAMBMP protocol. ARUs have already been used successfully in rail studies elsewhere in the United States and can weather marshy environments and noninvasively monitor populations. For this project, in the summer of 2018 I set out to deploy an ARU at the Richardson Wildlife Foundation to determine if rail calls could be detected at a restored wetland habitat where a variety of species of rails have been seen and heard calling over the past few years.

On three visits to RWF between May and June of 2018, I followed the NAMBMP protocol to conduct call-playback surveys at dawn and dusk, in which a portable game caller was used to project calls of five different Illinois-native rail species, after which any species that called were noted. Of the four wetlands surveyed — Prairie Slough, Kingfisher, Arrowhead, and Mallard — Arrowhead Pond showed the most promise, as it was occupied by at least two calling Soras on the evening of May 11, and a calling Virginia Rail was present on June 12. Thus, on June 12, I deployed a single ARU at Arrowhead Pond and left it in the field to record all of its background sounds continuously for 20 days. By June 30, it had finished recording, the unit was retrieved, and its sound logs were downloaded and analyzed to search for rail vocalizations.

RESEARCH AND STUDY PROJECTS

Despite the apparent presence of Soras and Virginia Rails at Arrowhead Pond prior to the start of the ARU deployment, no calls of either species were detected by the unit over the course of its three weeks of monitoring. However, the calls that were picked up by the ARU provided a unique snapshot into the bird species that were present at Arrowhead Pond and in the adjacent agricultural fields and meadows. One of the most commonly detected species was the Sandhill Crane, whose long calls involving multiple bugling and chorusing individuals were quite often heard both nearby and at a distance. This result makes sense given that I noticed Sandhill Cranes calling far away even on the morning that the ARU was retrieved from Arrowhead Pond. Other birds whose calls were detected included Wood Ducks (which also was no surprise, given that at least two pairs were seen at Kingfisher alone), Ring-necked Pheasants (which were also seen strutting around RWF on prior visits), Great Blue Herons, and those noisy and ubiquitous marsh-dwellers, Red-winged Blackbirds. In short, while Soras and Virginia Rails did not make themselves heard, other vocal resident birds were quite well-represented in the sounds picked up by the ARU deployed at Arrowhead.

Although resident rails were not detected by an Autonomous Recording Unit as originally intended, this project still gave me a unique opportunity to work at a wonderful restored wetland site in the heart of Illinois. As a graduate student continuing in my studies of rail vocal behavior, it is gratifying to see such a well-maintained microcosm of the original prairie and marsh habitats that are cared for by such a passionate staff, who have created an excellent home for local birds.

Sandhill Crane, *Grus canadensis*

Smooth Greensnake, *Opheodrys vernalis*

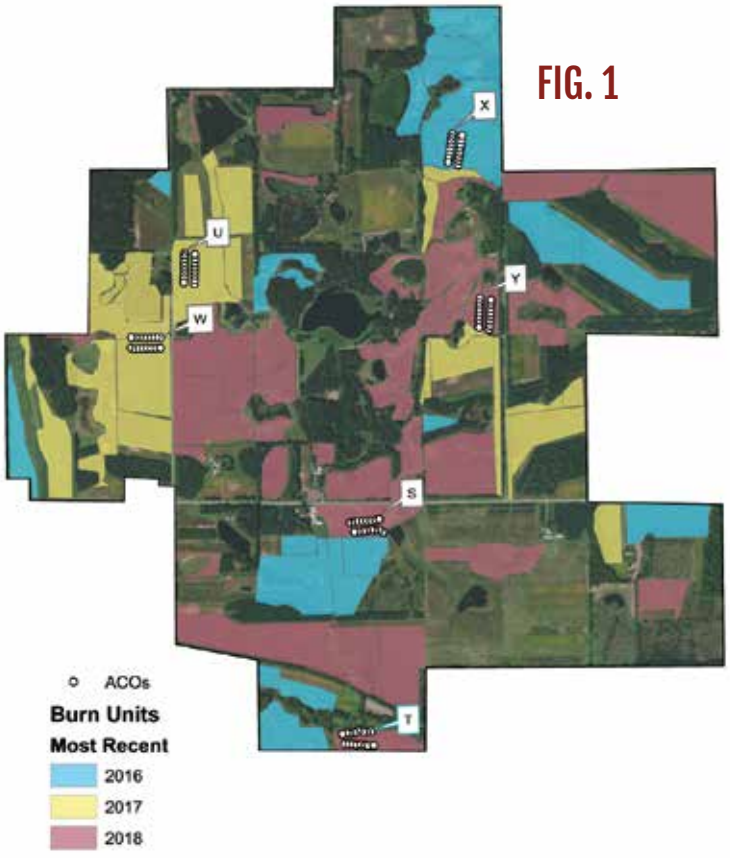
INFLUENCE OF FIRE HISTORY ON SMOOTH GREENSNAKE DETECTION

Jay Vecchiet, a graduate student in Dr. Richard King's herpetology laboratory at Northern Illinois University, has been conducting herpetological surveys and research at RWF and other local, protected, natural areas for the last two field seasons. During their summer research periods RWF has tried to help facilitate these studies by providing lodging for Jay and his field technicians. The crew has already reported significant finds of rare species that had not been documented from some of these sites in many years. The following paragraphs are Jay's summary of his study at the Foundation to this point.

This experiment is part of a larger, two-year project involving many protected properties throughout the Green River Conservation Opportunity Area (GRCOA). In the first year of the project (2017) Richardson Wildlife Foundation was not actively surveyed as I was confident in the accuracy of their complete species list for amphibians and reptiles. From surveys conducted at other sites during 2017, I noticed a possible pattern with the number of Smooth Greensnakes (*Opheodrys vernalis*) being captured corresponding to how recently the site of capture had been burned. In 2018 I included Richardson Wildlife Foundation as a survey site since they annually prescribe fire to their prairies and have current records of Smooth Greensnakes on the property. I hypothesized that Smooth Greensnake detection decreases as years since burn increases.

Artificial cover objects (ACOs) (24" x 30" x 5/8" plywood boards) were placed at six locations across the si Three locations (S, T, Y) were burned in the spring of 2018, two locations (U, W) were burned in the spring of 2017, and one location (X) was burned in the spring of 2016 (Figure 1). Sixteen ACOs were placed 20m apart in two rows that were 50m apart (8 per row) at each location. ACOs were checked weekly or biweekly from May through October.

FIG. 1



INFLUENCE OF FIRE HISTORY ON SMOOTH GREENSNAKE DETECTION (cont'd)

Only 4 of the 6 ACO arrays produced any Smooth Greensnakes and there was an overall low sample size with just 7 captures for the survey period (**Table 1**). However, from this data we can gather that site history likely plays more of a role in detection than burn history alone. Location X is adjacent to remnant prairie and is some of the oldest property owned. Thus it is likely that Smooth Greensnakes were able to persist in that location whereas other locations may have had to go through some recolonization events. Additionally, some locations were heavily mowed during the survey period, which may also affect detection.

Our surveys also resulted in the detection of other grassland snake species (**Table 2**) and Smooth Greensnake nests under ACOs. Smooth Greensnake nests were only observed in two locations (X and Y); clutch sizes ranged from 6 to 10 eggs and had an overall hatch success rate of 39% (**Table 3**). Incubation time of the nests is unknown due to irregularity of array checks. During the incubation period, a temperature data logger was placed under one ACO in location X where a nest was present (results forthcoming).

Juvenile Smooth Greensnake emerging from its egg

Table 1. Smooth Greensnake captures and ACO array characteristics

ACO Array	S	T	Y	U	W	X
Year Burned	2018	2018	2018	2017	2017	2016
Years Old	8	20	4	27	22	80
# males	0	0	0	1	1	2
# females	0	0	1	0	0	2

Table 2. Total captures per species per ACO array

ACO Array	S	T	U	W	X	Y
H. platirhinos	0	0	0	1	0	0
O. vernalis	0	0	1	1	4	1
P. vulpinus	2	0	10	0	1	3
S. dekayi	10	2	3	19	17	7
T. radix	7	0	1	0	3	7
T. sirtalis	21	2	17	47	79	138

Table 3. Smooth Greensnake nest success

ACO Array	X			Y	Avg.
Clutch Size	6	6	6	10	7
% Hatch Success	0	83	100	0	39

Newly emerged hatchling Blanding's Turtle and wire nest protection basket

RADIO TELEMETRY OF RARE TURTLES

Blanding's and Ornate Box Turtles are Endangered and Threatened in Illinois respectively 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 don't 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 been actively restoring prairie and wetlands, which has certainly benefitted the small remaining populations of these two turtle species. 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 the plow. The quality of historic 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 and closed the canopy or briars and shrubs have increased underneath, both factors potentially making conditions more appealing to Raccoons and other mesopredators. Relatively open sandy soils are preferred nesting sites for female turtles to use for egg deposition. In recent years we have had some success identifying some of the nesting areas being used by these species so that we might be able to manage accordingly. An additional goal has been to protect nests from predation but before this year we had not been able to do so. This year we continued our collaboration with Dr. Carrie Milne-Zelman of Aurora University and Dr. Rich King of Northern Illinois University to that end.

We began the spring ahead of the game, having left radio transmitters on three of the female Blanding's that we tracked last year. In May, we ran aquatic hoop traps and conducted visual searches. We were able to trap an additional female to which we affixed a transmitter. Prior to nesting season we used telemetry to relocate and recapture females to determine if they were gravid (pregnant with eggs). We palpated each turtle and found that 3 of the four were indeed gravid. This was a good ratio as it is common for Female Blanding's turtles to nest every other year or so on average.

As described in the Herpetological Survey section of this report, we were privileged to have John Rucker and his turtle-finding Boykin Spaniels visit the site and find 2 female Ornate Box Turtles. We did apply transmitters to these turtles before releasing them at the site of their capture but neither was gravid this year.

Typical nesting season for both species is late May or June. Beginning in mid-May we regularly located the female turtles, triangulating their radio signal to determine where they were and if they remained in a wetland. It is common for Blanding's Turtles to move from one pond to another and several of these turtles did so prior to their nesting foray. In Early June they began leaving their wetlands in search of nesting sites. This process often takes days, and is particularly challenging to researchers trying to be present for the actual nesting event because eggs are most often laid at night (but not always). Having

Hatchling Blanding's Turtles pre-release

RADIO TELEMETRY OF RARE TURTLES (cont'd)

learned the hard way in our previous efforts that these turtles cannot be relied upon to nest at a "typical" time, we located each turtle, approximately every 3 hours around the clock while they were on nesting forays until they laid.

The first turtle to nest did so quickly and between our inspections. This was an all-too familiar case of a turtle nesting when least expected. We were unable to backtrack to find the nest but we did learn the approximate nesting area, an open sandy patch of prairie. Perhaps because of our presence and a rain shower that evening, on repeated inspections of that area we never found a raided nest. Hopefully the eggs hatched without our assistance and some of the hatchlings survived to find a wetland in which to overwinter. The second and third female Blanding's to nest, however, spent days out of the water, moving very little for 24 hours then moving 200 yards in a night. One stopped for the day at a different wetland only to emerge and keep moving south that night. Eventually both remaining turtles did nest and we were able to finally accomplish the goal of putting predator exclusion baskets over them. One turtle nested in a sparse, sandy part of a prairie restoration. The other turtle nested in a soybean field which, following several heavy rain events shortly after egg deposition, flooded, and there was standing water over the nest for over 24 hours. We hand dug canals to try to ditch water away from the nest but opted not to disturb it by digging the eggs out. During the 2 months of incubation and hatching prior to typical late August or September hatchling emergence, we waited and wondered if our efforts would finally be rewarded. They were. First on August 29th then on September 1st, there were hatchling Blanding's waiting for the staffer who was checking nests. The nest in the flooded soybean field produced 12 hatchlings and 2 eggs that had not survived. The nest in the sandy prairie produced 10 hatchlings from 10 eggs. We released all 22 of the hatchlings within 24 hours of emergence in well-vegetated shallows in 5 different wetlands which we have recorded Blanding's turtles using in the past.

The effort to help facilitate a recovery of these two species has proven to be quite the challenge, to say the least. This year's success and the level of effort it required suggests that implementing a head-starting program, in which hatchlings are incubated in a lab and released after attaining a certain size, may be both feasible and more practical. Our collaborative discussions and planning sessions with colleagues took us to a model of how this could be done at the Lake County Forest Preserve District. There, as well as in DuPage County, researchers and staff have been incubating eggs, raising hatchlings, and releasing juvenile turtles into wild populations that faced the same threats of extinction as our populations here. There is broad interest among our working group to pursue this idea and try to implement a similar program for Lee and Ogle counties. We will continue to study and plan for efforts next field season to try to bring more recruitment to the small populations of Blanding's and Ornate Box Turtles at RWF. We will continue to restore and manage high-quality prairie and wetland habitat these species require. We greatly appreciate the loan of equipment and send our thanks to Dr. Milne-Zelman and Dr. King. We're also grateful to our staff who gave extra time on short or no rest during the nesting season. It was grueling, but it was worth it.

Grass Pickerel, *Esox americanus vermiculatus*

GREEN RIVER BASIN FISH RECOVERY PLAN

Ten years ago the Foundation began a project with Fisheries Biologists from the Illinois Department of Natural Resources to introduce fish species of conservation concern to a small number of our more permanent wetlands. Certain of these species immediately established in large numbers. This year, we sought to further this project by stocking additional species to Goose Pond, the largest wetland that we have dedicated to this purpose.

In April we purchased and stocked 250 4-6" Channel Catfish, 250 Redear Sunfish, and 125 Fathead Minnows from a commercial fish hatchery. In late summer Foundation staff joined IDNR Fisheries Biologists Karen Rivera and Rick O'Neil to collect fish for translocation to Goose Pond. Using a backpack electrofishing unit and D-frame dip nets, we sampled an unnamed waterway west of the Foundation where surveys had revealed the presence of fish species of interest. We captured and translocated approximately 40 Johnny Darters, 35 Grass Pickerel, 20 Smallmouth Bass, 20 Banded Darters, 12 Bluegill, 10 Blackstripe Topminnows, 10 Tadpole Madtoms, 5 Channel Catfish, and 2 Northern Pike. It is unlikely that certain of these species (Smallmouth Bass and Northern Pike specifically) will be able to establish breeding populations as the requisite spawning conditions will probably not be met in our wetlands but we decided to translocate a few to find out. We will survey in future years to attempt to quantify what species have established and proceed from there. We hope to introduce several other species that we were unable to find on this sampling trip in the future and to add numbers of species that we caught few of this year.

One of the conservation goals of the Foundation (and any natural land conservation effort) is for our various habitats to serve as a population source, a refuge where wildlife can maintain a healthy presence and potentially spread to other suitable habitat. With this fisheries project, beyond the goals of restoring a native community to our site and protecting uncommon native species from extreme population declines, is the possibility that at some point in the future, populations that we establish now could be used in similar managed introductions elsewhere. In the meantime we will continue to monitor the fish community at Goose Pond and hope that some of these introductions result in thriving populations. We're grateful to Karen and Rick for their interest, expertise, and efforts on this project.

Boyscouts Camping at Main Lake

EDUCATION

Whenever possible, the Wildlife Foundation hosts educational and community groups of all ages and backgrounds, fosters interest with the public in our mission and methods, and supports local education and research efforts however we can.

As in any year, this year we oriented visiting guests, students, and researchers to RWF, presented our museum specimens to several 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. Through our participation in the Illinois Recreational Access Program (IRAP), we provided state administered spring and summer access to nature lovers 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.

In May we hosted an annual meeting and trial of the North American Teckel Club in which numerous dogs and their handlers from around the continent competed in tracking, confirmation, and other events. Local hero Brawney Richardson represented us well, taking first in the 1,000-meter blood tracking component of the competition.

In September RWF hosted a field session for a "Hydric Soils for Wetland Delineation" course, taught and attended by employees of the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). The history of our site as a part of a much larger former wetland complex is written in the soils here. We hosted this course when it was last offered some years ago. We're glad to see it being offered again and equally happy to provide access.

During the field season we provided temporary living quarters for various researchers, including summer-long quarters for university students studying reptiles and amphibians in the Green River Basin area (of which we are a part).

After laying the groundwork for an organized, regional, turtle conservation effort with colleagues in 2017, we made tangible strides toward a 2–3 county plan to bring the Endangered Blanding's and Threatened Ornate Box Turtles back from the edge of extinction in this part of the state. We held a second formal "turtle summit" meeting in May, hosted by our friends at the Nature Conservancy's Nachusa Grasslands, during which an excellent turnout of professionals representing various agencies (state, federal, university, NGO, etc.) came together to share their knowledge, resources, and interest in a cooperative effort to implement a recovery strategy for these species. RWF is fully behind this objective and we look forward to working with this group to accomplish this important and challenging goal.

Continuing education for staff personnel was also provided via participation in Pesticide Applicator Training Clinics, meeting with Illinois Department of Natural Resources Wildlife Biologists on the status and management of Chronic Wasting Disease in Whitetail Deer, and meetings with researchers from the Illinois Natural History Survey.

Amanda planting a potted Bur Oak

SEASONAL EMPLOYEE PROGRAM

This year the Wildlife Foundation was lucky to have the opportunity to re-hire last year's intern Amanda Contreras, who had filled 2 consecutive internship terms having recently graduated with a degree in Biology from Aurora University. Upon her departure last year, we let it be known that we would welcome her back for a similar role if she were so inclined. She accepted and we instituted a seasonal position of Ecological Technician with her in mind. Amanda's prior experience allowed her to work more independently and for us to give her greater autonomy and responsibility than a less-experienced person could be expected to handle. Her responsibilities included assisting with prairie, wetland, and woodland plantings; collecting native plant seed; Wood Duck and Eastern Bluebird nest box inspections; herpetological surveys and conservation measures; invasive species control; equipment and shop maintenance; removal of downed trees; landscape and ornamental planting maintenance; and wildlife surveys.

VOLUNTEERS

The Foundation has benefitted over the years from the help of volunteers who donate their time in large or small amounts to assist with our conservation projects. At times, volunteers have come to us as individuals who introduce themselves simply to offer their help. Other times, they have come in group form as entire scouting troops, classes, or student groups. This year we received help from several volunteers: Randy Rutledge, Amanda Contreras, Terry Moyer, and Cody Considine. Randy assisted with a field trial of the North American Teckel Club which we hosted in May, Amanda assisted with woodland forb planting and inter-seeding during the winter months, Terry assisted with 2 controlled burns in the spring, and Cody helped with some earth work associated with installing a culvert. 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, or experience levels, as there is no shortage of valuable habitat work to be done throughout the year.


Black Bear
Ursus americanus
River Otter
Lutra canadensis
Marten
Martes americana
Deer Mouse
Peromyscus maniculatus
Prairie Vole
Microtus ochrogaster
Meadow Vole
Microtus pennsylvanicus
White Footed Mouse
Peromyscus leucopus
Short Tailed Shrew
Blarina brevicauda
Least Shrew
Cryptotis parva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MUSEUM COLLECTIONS AND STUDY SPECIMENS

The Foundation maintains museum collections of plants, insects, fish, herps, and mammals for educational and research purposes. Our herbarium collection consists of 979 plant specimens representing 78 families, 261 genera, and 455 species matted on acid-free paper. Our seed collection includes seed of 82 native prairie and wetland species displayed in glass vials. The insect collection exhibits several thousand 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 the 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.

Augering corn from Combine to gravity wagons

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:

John Deere 7720 Combine
- Repl. cleaning fan blades
- Repl. cleaning fan belt

Gravity Wagon
- Replaced 2 tires

S770 Bobcat
- Replaced turbo & EGR
- Repaired fouled air intake
- Repl. door handle sensor

Woods 7' Mower
- Replaced blades
- Replaced slip clutch disks
- Replaced tail wheel

John Deere 3010D Backhoe
- Replaced 2 windows

John Deere 450H Bulldozer
- Repaired ignition switch

John Deere 4020
- Rebuilt starter
- Repl. Hydraulic line
- Repaired leaking fuel tank

John Deere 4040
- Replaced batteries
- Replaced radiator

John Deere 4840
- Rebuilt #1 hydraulic port

John Deere 8650
- Replaced cabin fan

John Deere 1435
- Replaced blades
- Rotated tires

John Deere Soil Finisher
- Replaced worn sweeps
- Repaired drag

John Deere 335 Disk
- Repl. rear blades, bearings

John Deere Gator
- Repl. drive belt
- Replaced plugs
- Replaced passenger seat

Mercury 9.9 HP Boat Motor
- Replaced carburetor

30' Boom Sprayer
- Repl. nozzles, diaphragms

Chevrolet Pickups
- Replaced tires ('11)
- Repl. stabilizer bar ('11)
- Repl. engine mounts ('07)
- Repl. plugs & wires ('07)
- Repl. oil cool lines ('07)
- Rep wheel bearings ('00)
- Repl. Right window ('00)

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.

Rebuilding porch and stairs at the lodge

EQUIPMENT, PROPERTY, AND BUILDING IMPROVEMENTS

This year we painted our largest barn on the Wysneinski South tract and the roof of another small barn on the Martin tract. We pressure washed and painted 7 L.P. and Fuel tanks associated with buildings around the property. We replaced and re-painted the hinges on our main entry gate. We replaced an aging single-walled diesel tank and pump behind our shop building with a smaller, double-walled unit. We performed needed ditch and culvert maintenance along Beaver Road to facilitate better water flow during the heavy spring melt.

At the lodge we made some needed repairs to sunken pavers on the parking area and used locking sand and a concrete vibrator to ensure a tight fit; we pressure washed the decks and siding; bee-proofed the chimney in spots that have been repeatedly colonized by bees; replaced the main entry door handle and lock set; built and replaced an outdoor bench; cleaned gutters; and made electrical, sink, and toilet repairs. We also completely rebuilt the rotted north stairs and deck from the frame up using rot-resistant composite material and replaced a rotted window and cedar clapboard siding on the northwest façade. At the Sanctuary we made extensive repairs to the heating/cooling system; replaced the well pump and 2 pressure tanks; replaced worn spots in carpeting; removed and re-caulked windows; cleaned gutters; washed windows; pressure washed the building, decks, and stone walkways; and made repairs to the dock.

At the Erbes cabin we replaced the motor and shaft on the well pump. At the Bauer house we replaced 2 rotted and leaking upstairs exterior doors and painted the cellar door. At our office building we replaced a rotted storm door.

Other repair and maintenance jobs included making electrical repairs to overhead light ballasts at our office building, winterizing buildings, 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.

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; repairing field tile; and removing Beaver dams for proper drainage.

PRAIRIE AND SAVANNA MANAGEMENT

Maintaining the fire line in the savanna

On March 15th, 21st, and 22nd we conducted successful controlled burns on approximately 46 acres of prairie, savanna, and creek banks in the bottomlands. With our crew of 5 people, 2 John Deere Gators 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. This year our crew spent two days in the early spring, prior to burning, removing tree baskets from young oaks which had outgrown the need for protection from deer browse. As many of these baskets were plastic and flammable, removing them allowed us to burn the savanna unit more safely. After burns were completed in the spring, a crew of 5 returned to cut and treat invasive shrubs in the savanna using chainsaws, loppers, hand saws, and 50% Glyphosate. In the late fall, following the dormancy of many native species, two crewmembers used backpack sprayers to apply a foliar treatment of Glyphosate to invasive shrubs along the fence lines and to regrowth of invasive shrubs among the mature oaks.

POND MANAGEMENT

LaFox Pond

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 in 2 applications in May and Reward in 4 different applications: once each in May, July, September, and October. We made eleven treatments with Cutrine Ultra and/or Clearigate to control algae from May to October. In all, we used a total of 5 gallons of Nautique, 2.75 gallons of Reward, 7.4 gallons of Cutrine Ultra, and 2.6 gallons of Clearigate. The continued use of Aquashade, a pond dye which helps limit the amount of light available in the water column, has helped us reduce the amount of herbicides and algaecides needed to manage the pond. We applied a total of 12.5 gallons of Aquashade dye in 4 treatments spread across the growing season.

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

Honey Bee, *Apis mellifera*, hive exposed following storm damage to tree

ADMINISTRATIVE SERVICES

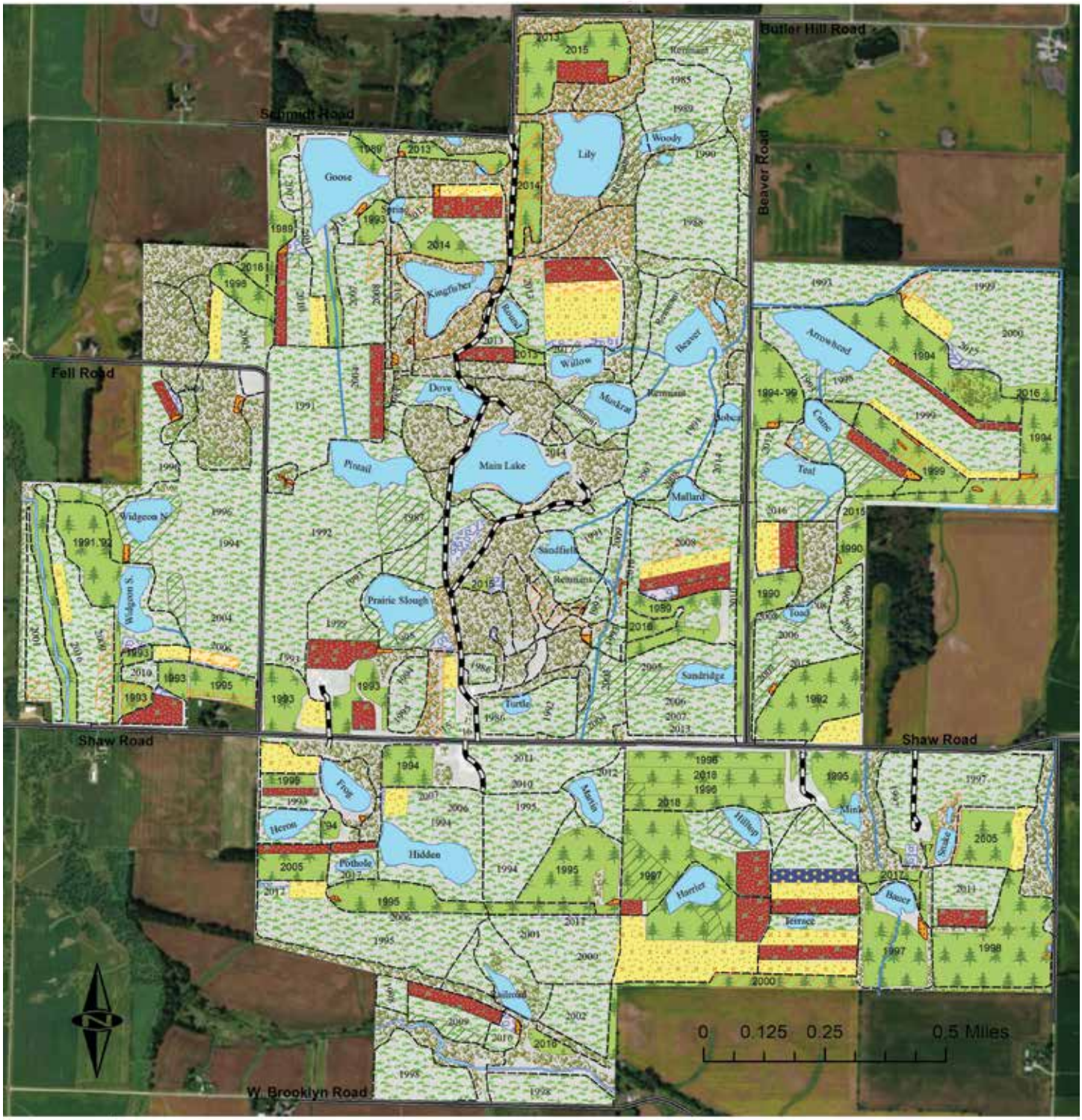
The following is a brief list of administrative support services involved with the daily operation of the Wildlife Foundation.

- 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 & research regarding management practices and conservation issues
- Completion of required state and federal reports for continued operation
- Applying for miscellaneous permits and licenses needed for continued operation
- Complying with reporting requirements for federal crop programs
- Ordering and purchasing supplies needed for operation and project implementation
- Conducting staff meetings and training sessions
- Devising work plans, project lists, and scheduling
- Conducting annual employee evaluations and reviews
- Technical support services
- Seeking and interview of potential employees or internship positions
- 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, Jay Vecchiet, Mark Shaw, and Tristan Schramer. We thank them for the use of their photos.

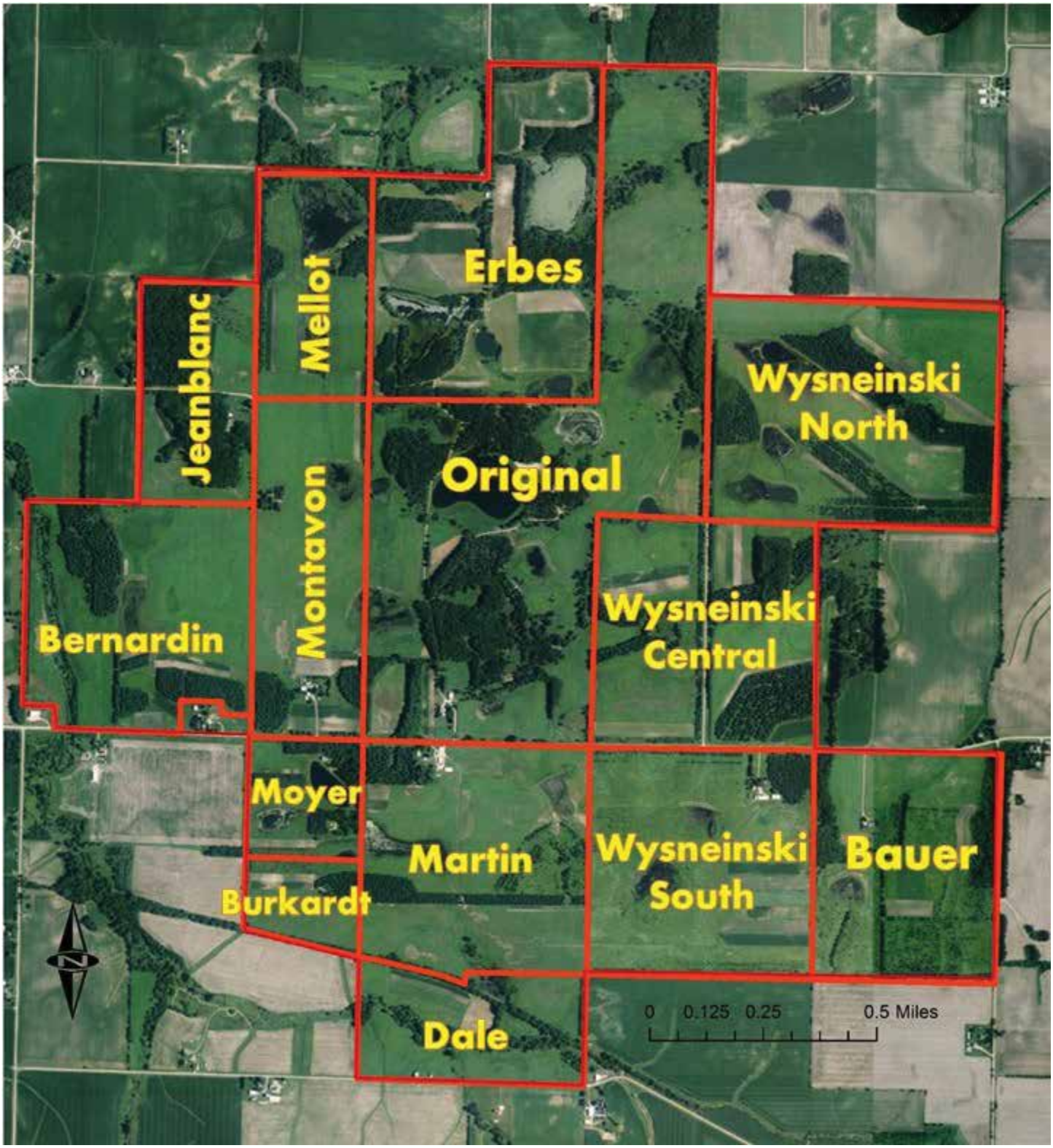
MAP OF HABITAT MANAGEMENT PRACTICES



Legend

- Gravel Lane
- Trails
- Water
- Existing Timber
- Tree Plantings
- Prairies
- Prairies, 2018
- Interseed, 2018
- Habitat Preparation
- Corn
- Soybeans
- Oats
- Sunflowers
- Clover Foodplots
- Mixed Foodplots

LAND TRACT MAP



2018 ACREAGE FIGURES

RICHARDSON WILDLIFE FOUNDATION

Prairie Restoration	Acres	% of Total
1985	21.2	
1986	13.3	
1987	12.3	
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	
TOTAL ACRES-	**797.1**	**40.3%**
Remnant Prairie -	**40.4**	**2.0%**
Tree Plantings		
1989	13.8	
1990	7.4	
1991	16.7	
1992	23.8	
1993	16.2	
1994	51	
1995	39.7	
1996	15.1	
1997	46.4	
1998	23.7	
1999	23.8	
2000	2.2	
2001	1.7	
2002 - (625*)		
2003 - (300*)		
2004 - (452*)		
2005	15.2	
2013	9.2	
2014	11	
2015- (28*)	14.2	
2016- (37*)	8.9	
2017- (108*)	8.65	
2018- (81*)	12	
TOTAL ACRES-	**360.7**	**18.3%**
** Potted oaks planted within existing plantings.*		
Pre-existing Timber	**291.2**	**14.7%**

Wetlands	Acres	% Of Total
Beaver	5.5	
Main Lake	14.2	
Woody	2.4	
Dove	3.2	
Muskrat	5.1	
Sandfield	3.8	
Goose	13	
Teal	6.5	
Mallard	2.6	
Pintail	7.1	
Wigeon North	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	
Dugouts (4)	0.75	
TOTAL ACRES-	**154.0**	**7.8%**
Cool Season Grasses	**32.6**	**1.6%**

Foodplots	Acres	% Of Total
Corn	70.55	
Soybeans	63.7	
Oats	0	
Sunflowers	3	
Winter Wheat	9.2	
Deer Clover	13.1	
Brassica	0.5	
TOTAL ACRES-	**160.1**	**8.1%**
Drainages		
Bauer	1.2	
Bernardin	1.1	
Dale	1.3	
Sandfield	0.5	
Wysneinski	1.6	
TOTAL ACRES -	**5.7**	**0.3%**
Trail \ Firebreaks -		
Total Length - 47.3 miles	**69.5**	**3.5%**
Road \ Ditch Easements	**45.9**	**2.3%**
Total Length - 6.6 miles		
Building and Home Sites -	**18.9**	**1.0%**
TOTAL ACREAGE -	**1976**	

WILDLIFE HARVEST REPORT

HUNTER HARVEST

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

SPECIES	HUNTER TRIPS	HARVEST
Dove	7	68
Waterfowl	16	16*
Deer (Archery)	161	12
Deer (Firearm)	9	2**
Turkey (Spring)	15	3***
Turkey (Fall Archery)	****	0

* *The waterfowl harvest included 1 Mallard, 4 Wood Ducks, 7 Blue Wing Teal, and 4 Canada Geese.*

** *The deer harvest included 9 does and 5 bucks with the following breakdown: 8 adult females, 1 juvenile female, 3 adult males, and 2 juvenile males.*

*** *The turkey harvest included 3 adult males.*

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

TRAPPING HARVEST

SPECIES	HARVEST
Raccoon	49
Muskrat	21
Opossum	17
Mink	1
Striped Skunk	0
Badger	0
Coyote	0

NOTES

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