Edgar Pérez
LUREC Data Final Report
Summer 2013

Before I present the cumulative data collected during my practicum at LUREC, I would first like to mention that my summer experience in the field, during this internship, has satisfied my desire for knowledge about the different projects, habitats, and organisms on campus. I hope that the data delivered in this report, will help LUREC directors to get a glimpse of what is happening on campus as restoration proceeds. With no further ado, I would like to discuss the different assignments I was working on at LUREC, the findings, and some recommendations.

LUREC Trees Project

On December 27, 2007 a woodland restoration and wetland assessment report was completed on the LUREC campus by Mackie consultants LLC, and Christopher B. Burke Engineering Ltd. One main purpose of the survey was to identify and tag all the trees at LUREC (a plant with a DBH of 4 inches or higher was considered a tree), in an effort to provide a description of the woodland forest tree composition. In addition, the surveyors were also required to take the geographical position of the trees, so that the data could be entered into the Loyola University GIS database. However, the coordinates, or the geographical position of one thousand five hundred and twenty-two trees (1,522) of the four thousand one-hundred and fifty-six (4,156) trees documented on campus were not taken, and therefore, were not represented on the LUREC trees map. So, one of my jobs this summer was to find those trees that had no coordinates, document their geographic position, and share the data with Loyola's GIS specialist, David Treering.

There was a problem with the collection of this data. To seek a tree in the 98 hectare property would have been almost impossible given that there were four thousand one-hundred and fifty-six (4,156) trees documented on campus. To reduce the conflict of this dilemma, I examined the LUREC trees map with existing coordinated trees, in order to locate trees that were nearby the uncoordinated trees, which then made it possible to narrow down the search area for a tree. Maps of the nearby trees were printed, substantially reducing my search time in the field for trees that were not geographically positioned. However, this was not the only issue at hand. Early on during the summer, my supervisor (Fr. Stephen Mitten) and the restoration director at LUREC (Dr. Roberta Lammers) realized that some trees were not correctly identified. Therefore, my supervisor added that I should also correctly identify the trees that I will be looking for. To prepare myself for the field work, I first conducted an online research of the trees that were found on campus, so as to become familiar with them; which in, facilitated the easier identification. In addition to having a good grasp of the trees on campus, I also carried with me a Trees and Shrubs Peterson Field Guide, in order to correctly identify a tree in case a new undocumented tree would come to light, and also to avoid confusion. Those I was uncertain of (i.e. Norway maple and Sugar maple) were identified by my supervisor.

The findings that resulted during, and at the end of this project, were somewhat of a surprise to me, given that the documentation of the trees was conducted by a professional organization. Several flaws were encountered during my tree searches for trees that were not geographically positioned. A summary of the flaws encountered include: **1)** many trees were misidentified (52). **2)** fourteen (14) trees were double tagged (some of them almost seem intentional). **3)** Tags lacked letters, so it was difficult to differentiate between numbers, and categories A and B; however, this confusion was reduced, as I decided to conduct searches in a systematic order. **4)** Three (3) trees were out of bounds, and not in our property. **5)** A few trees were classified as deadwood when the trees were actually fruiting, and living. **6)** Inaccurate geographic coordinates were given for trees 27, 28, and 29. **7)** Many large trees were not tagged. **8)** Trees that were classified as MISSING were actually tagged, but they were either double tagged, or the data was missing. **9)** MISSING TAGS did not mean that a tree had a tag missing, but it meant that a tag was totally missing from the pile due to manufacturing defects, or loss during the tagging process. **10)** Out of curiosity, I discovered that a double tagged geographically positioned tree had two separate distant points on the map, representing two trees, when it was actually one tree (big mistake). This calls for a reevaluation of all trees at LUREC. **11)** Some trees that were double tagged were identified as two distinct tree species. For example, tree 1735 also had tag number 1918. However, tree 1735 was identified as a Jack Pine, while tree 1918 was identified as a scotch pine. **12)** Many existing trees over DBH of 4 inches or higher were also not tagged originally which skews the present data at hand, and does not provide a true representation of all the trees found at LUREC. The accumulation of all these flaws made the job a bit complicated and very confusing at times. Nevertheless, the cleaning up of this inaccurate data is in process, and I do hope that the entire data for the LUREC trees project is corrected, and clarified.

I will now elaborate with more detail about each flaw. Trees 1320, 1321, and 1322 were not in our property. Therefore, I believe Mackie consultants LLC and Christopher B. Burke Engineering Limited did not provide the coordinates for those trees because of their out of bounds position. However, I did provide the coordinates for those trees so that LUREC has a record of where they are located. Furthermore while scouring through the forest; I came across many huge, emergent trees that did not have a tag. I assumed that they were initially tagged, but the growth of the tree probably forced the tag to fall off. Therefore, I also thoroughly conducted a tag search in the vicinity of the tree. When I did not find a tag, I then concluded that the tree was not identified and tagged. Some huge emergent trees that I found untagged included: yellow-bud hickories, red oaks, scotch pines, black cherries, and American elms.

It is also essential to note that the LUREC trees were tagged in three separate sets. Set one consisted of only numbers, set two consisted of numbers and the letter A, and set three consisted of numbers and the letter B. Since the trees were tagged in three sets, I also partitioned my maps in three sets, in the same order mentioned above. However, I discovered that the tags only had numbers, but not letters. This implied that the trees were categorized, as a means to differentiate between numbers. It would have been helpful if Mackie consultants LLC and Christopher B. Burke Engineering Limited had mentioned this in their document. This could have ended up in great confusion in the field if I had not decided to separate my searches by sets as well. For example, people without a map could easily confuse a tree with the number labeled 2, and not know that the tree is actually 2A, because of the absence of letters on the tags. Also, during my tree searches, I discovered that trees 27, 28, and 29 (only numbers) were out of place, and isolated from its neighboring trees. I came to the realization that since trees 27, 28, and 29, were surrounded by trees that were labeled A, then 27, 28, and 29 were actually 27A, 28A, and 29A respectively. Meaning that the coordinates given for 27, 28, and 29, were absolutely incorrect, and the trees needed to be geographically positioned. To confirm this, I conducted a search for 27, 28 and 29, and discovered that I was right. This problem would have gone unnoticed if keen attention was not paid to the pattern in which the trees were tagged.

I accidentally discovered a flaw that seemed rather awkward, and very interesting. Trees 257 and 261 on the LUREC trees map were shown as geographically positioned trees with two distinct points (which is expected). However, I accidentally came across one of these trees in the forest, and discovered that trees 257 and 261, which are shown as separate points, are actually one and the same tree. Now, at the moment, I did not understand how one tree was labeled as two separate points on the map; but what I did know, was that the tree was double tagged, with both numbers, and yet it was shown in two different geographic locations (substantially far apart). Personally, I cannot say if the mistake was deliberate, but from my own examination, from trial and error, I realized that the GPS device is prone to deliver two distinct readings for the same position. However, the differential readings may be very near each other not far apart, as was observed with these points. The degree of the error observed in this incidence, acknowledges for a critical investigation, and deeper observation of the trees, as the act almost looks as if it was done on purpose. In addition, this was merely one incidence of this mistake that I came across, but then again, I was only focused on uncoordinated trees. I have no idea if the same issue may arise after closer inspection of the other existing geographically positioned trees.

Now, I would like to present critical data collected and analyzed for the LUREC trees project at the end of my internship. Once again, one thousand five-hundred and twenty-two (1,522) trees had no coordinates at the beginning of the project. At the end of the summer, I had observed seven-hundred and forty-two trees (742). Taking the difference, seven-hundred and eighty trees (780) are yet to be observed and confirmed present on campus, and their coordinates taken. Out of the 742 trees observed, 10 trees were not found on campus; therefore, I positively located 732 trees total (including trees whose stump was observed). Trees that were classified as NOT FOUND, were trees that were searched for over an hour, and not located, meaning that there was no evidence of the presence of a tree; not even their stump was observed. Trees that were not found include: trees with tag number 181, 442, 464, 491, 837, 38A, 41A, 403A, 947A, and 1346A. I recommend that these trees be removed from the LUREC trees file. Furthermore, out of the 732 trees located on campus, fourteen (14) trees were double tagged, meaning that two tags, with dissimilar numbers were found on the same tree. Trees that were double tagged include: trees with tag number 1419, 1668, 1735, 1740, 1920, 1968, 49A, 125A, 238A, 242A, 835A, 1059A, 1167A, 1462A. Therefore, one tag number for double tagged trees should be removed from the LUREC tress file.

The document provided by Mackie consultants LLC and Christopher B. Burke Engineering Limited contained 9 blank spaces with the statement MISSING TAG. As mentioned earlier, missing tag did not mean that a tree in the area did not have a tag, it meant that the tag was totally missing due to manufacturing defects, or loss during the tagging process. I recommend that these spaces be removed from the LUREC trees file, as there will be no data available for those tags. In addition, in the document, there were 6 spaces that were reported as MISSING. However, MISSING does not have the same denotation as MISSING TAG. From my personal observation, 3 of those tag numbers that were classified as MISSING were found on trees that were double tagged, and 1 was found on a tree that was not. Therefore, missing can be interpreted as a double tagged tree, or a tree that was tagged, but the data was not recorded and needs to be filled in. The 3 trees that were classified as MISSING and were double tagged, include: trees with tag number 125A, 835A, and 1059A. The one tree that was classified as MISSING, but only had its data missing was tree 1269A. The two remaining spaces with the classification of MISSING were not seeked. Therefore, this should be followed up upon.

After analysis, the most intriguing and critical information gathered from this project, was that fifty-one (52) trees were terribly misidentified. For example, tree 948A was identified as a silver maple, when the tree was actually a black cherry. Another fine example of inaccurate identification is that of tree 1103A, which was identified as a red oak, when the tree was actually a box elder. Since the data gathered suggests that 52 out of 732 trees were misidentified; then 7.10% or 7% of the data was inaccurate, which is a large percentage of erroneous data. Note that this percentage of flawed statistics was only gathered from trees that were not geographically positioned. In addition, I randomly checked tree identification of trees with coordinates, and found five misidentified trees. Therefore, I recommend that LUREC check all the existing tree identification for accuracy. I estimate that at least 5% to 10% of the trees will be misidentified. In addition, after a closer examination of the document provided by Mackie consultants LLC and Christopher B. Burke Engineering Limited, I discovered that trees were identified during the winter. Therefore, identifications were done by bark, and tree form/shape observations. As a result, this immensely increased the probability for errors. I recommend that this project is only conducted during the summer when the trees are fruiting and leaves are visible, to reduce identification errors. Moreover, in the document, seven (7) trees were classified as deadwood, when the trees were actually vibrantly fruiting, and looking very healthy in the summer. This data should be updated, and their status should be changed. Plus, this was another error that arose due to the winter tagging timing. Additionally, since there were several flaws during the survey, we cannot fully depend on the information given.

Lastly, many trees are now dead, since the tagging in 2008. Therefore, I will provide a table describing the percentages of dead trees of each species; based on the number of trees I observed (732) (see table1). The results indicate that a large number of American elms have died since the trees were tagged. I cannot directly specify why the elms are dying, but I can extrapolate that more American elms will likely die in preceding years.

<u>Nest Monitoring</u>

During my nest monitoring data collection, I followed the rules set forth by the American Birding Association: **CODE OF BIRDING ETHICS** and I also put into practice the protocols provided by Nestwatch, an online data entry web-sight. As a subscribed member of Nestwatch, I downloaded the data collection sheets from the Nestwatch website, and took those sheets into the field, where all data was recorded at the nest site (See Photo 1 in appendix). Data collected at the nest site included: **1)** date and time, **2)** host species eggs, and host species live young or dead young, **3)** status and activity codes for the nest, adult and the young, including management activity if any, at, near or around the nest site, and **4)** whether or not brown-headed cowbird had parasitized the nests. If nests were parasitized, cowbird eggs, live young or dead young were also recorded. Nests were monitored every two to five days, however, when fledging time was near; nests were preferably monitored on a daily basis. All data collection was entered into Nestwatch to keep record of species nest success. Additional information such as first egg date, hatch date, fledge date, clutch size, unhatched eggs, and number of fledglings were also entered into the database. The beauty of Nestwatch is that the data collected and submitted is then accessible to scientists around the world, who may want to study nest success of different species in different regions. In addition, the data can be used to estimate total populations of bird species within any given year.

Nest monitoring is a tedious process, as it requires extra hours of observation, deviating from normal working hours. Therefore, I only monitored 12 nests during my summer internship. Twelve nesting attempts were documented for 9 species, at 11 different sites on campus. These nine species included: house wren, red-winged blackbird, eastern bluebird (See Photos 2 and 3), blue jay, brown thrasher, tree swallow, American robin, gray catbird, and black-capped chickadee. From the 12 nesting attempts monitored, 43 eggs were observed, but only 35 young survived to the fledge state, summing a total of 35 fledglings. The remaining 8 eggs were either attacked by predators, or did not hatch at all. Furthermore, the nesting success summary for these species (see table2) indicates that all species experienced 100% nesting success, except for the red-winged blackbird, which experienced 0% nesting success. Since most species experienced 100% nesting successes, this shows that LUREC possesses suitable habitat for favorable breeding grounds. The results from this small sample of interspecific and intraspecific nesting successes, demonstrates the need for a long-term nesting success research project as restoration continues. Moreover, during the monitoring process, the two red-winged blackbird nests that experienced 0% nesting success were located in the upland grassland prairie under current management. Therefore, I am not sure if the constant management of the area was a factor in their failure. I believe the nests were attacked by unknown predators, which lead to their total demise.

Since nest monitoring required extra time and energy, I did not document several other opportunistic nest sightings that I came across. A summary of the opportunistic nest sightings include: 2 cedar waxwings, 1 wood thrush, 5 gray catbirds, 1 baltimore oriole, 1 northern cardinal, 3 mourning doves, 1 house finch, 4 american robins, 1 field sparrow, and 1 blue-gray gnatcatcher. Although monitoring all nests in an attempt to trace a pattern of nesting success is needed for documentation as restoration proceeds, the task cannot be conducted by one individual. Rather, a team of individuals are needed to collect such data. Plus, it is essential that breeding birds on campus are kept under close watch, as new species may discover suitable breeding sites on LUREC grounds. For example, this summer, my supervisor and I documented the presence of 4 additional breeding birds on campus. These bird species were not documented holding breeding territories at LUREC during the summer 2012 census. The bird species include: scarlet tanager, blue-gray gnatcatcher, common grackle, and wood thrush. Therefore, in totality, 44 species have been documented breeding at LUREC; an increase of 9% at the end of summer 2013. In addition two bird species that were not documented in 2012, the Virginia rail and the Black-billed cuckoo were also seen in the back fen this summer and could possibly be nesting there. Continued monitoring of avian species on campus is essential, as LUREC is planning to implement its migratory bird/butterfly landscape project in the spring of 2014. Therefore, I am positive and confident, that the introduction of native plant species will not only increase plant biodiversity, but also insect and avian biodiversity. Be on the look out!

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GPS Mapping of the Thirteen-lined Ground Squirrel (*Ictidomyss tridecemlineatus*)

In the summer of 2012 there was a small density population of Thirteen-lined ground squirrels (*Ictidomyss tridecemlineatus*) (See photo 4 in appendix) residing on the southern mowed yard in front of the Center and towards the end of that summer, a few individuals moved across the entrance road from the south yard over to the north side area in the vicinity of the student farm where they established a few home burrows (Mitten personal observation). Starting June 14th and finishing July 20^{th} 2013, my supervisor and I began documenting the expansion of the Thirteen-lined ground squirrel across the front portion of the Loyola University Retreat and Ecology Campus (LUREC) by GPS mapping the locations of their burrow entrances noting clusters of holes over time and recording their runways from hole to hole (See photo 5 in appendix) . Our primary objective was to record by GPS mapping their home burrows (See Map 1) to obtain baseline data to aid in evaluating future changes in their population and document their expansion over time. We mapped 237 holes as of July 20, and estimated the number of ground squirrels at that time around 68 individuals. Thirteen-lined ground squirrels are asocial and territorial and have on average 3.5 burrows per individual territory (Long, C.A. 1974. Environmental Status of the Lake Michigan Region. Volume 15. Mammals of the Lake Michigan Drainage Basin. Argonne National Laboratory, Argonne, IL).

Study Area and Methods

We GIS mapped the thirteen-lined ground squirrel during June 14-July 20. Our study area was confined to the large mowed yards in front of the Campus building, but included the Student farm on the north side of the entrance way. The area comprises roughly 8.83 hectare including the prairie. Excluding the prairie section, since there was no ground squirrel burrows in the prairie that we could find, the area consisted of 6.61 hectares.

The study area (the boundary directly in front of the campus center) was divided into 75 by 75 feet plots. Flags were used as posts to represent the edges of the plots, but were also useful in facilitating our discretion to trace the boundaries between the plots. Lastly, a GPS (Global Positioning System) device was used to preserve accurate geographical locations of the ground squirrel burrows. All data was recorded on paper sheets for later data transfer to excel files. In addition, plots were constructed three grids at a time, moving from north to south. The grids were named or labeled with alphabetical letters, for example, grid a, grid b, etc. After the plots were set up, we would pair up, and move slowly from left to right or vice-a-versa, as a means to locate all possible ground squirrel holes. During the search time, holes were marked with flags to facilitate the easement of finding after the grid was swept. So, after a grid was thoroughly searched for holes, we went back and took the geographical location of the holes with the GPS device. Additional data recorded at each hole, included the plot in which it was found in, and the elevation. We also began mapping with the help of a few students from the Field Museum of Natural History the trails leading to individual burrows to determine territories but given time constraints we had to abandon the effort.

Results

Two-hundred and thirty-seven (237) ground squirrel holes were found during the study (see Map1). Eighty-eight (88) of which were located in the farm area. Since July $20^{th,}$ the date in which the data was collected, personal observations reveals that the colonization of new areas on campus is increasing swiftly, resulting in rapid expansion of territories across campus grounds. Many holes were opportunistically sighted in the student farm plots as the summer proceeded. The ground squirrel burrows are also now around the tennis court and in the back yard in front of the dining room (12 burrows) of the retreat house. Therefore, their expansion can somewhat be considered as a farm infestation, and I am positive that the student farmers might eventually construct a method to eradicate them from the plots. Briefly speaking, the ground squirrels will eventually be considered pests to the crops that are harvested at LUREC.

ADDITIONA ASSIGNMENTS CONDUCTED:

Moth/butterfly collection and identification

The moth/butterfly collection for the summer was somewhat not as exciting as I thought since the specimens were difficult to collect, and most of my time was invested in other projects. However, some of the more notable butterflies and moths collected during the summer include: the White-lined sphinx moth, the Yellow underwing moth, the Red-spotted Purple butterfly, the Cabbage butterfly, the Blue azure butterfly, the Polyphemus moth, and the Luna moth. There are now more than 100 species of Lepidoptera recorded at LUREC.

Piezometer Transect Cutting

Transect cutting was the most difficult job of all, and it was impossible to complete due to work load and time restrictions. Generally one to two days a week was reserved for helping Erin, the restoration intern cut and herbicide buckthorn along the transects lines leading to the piezometers. However, most trails leading to the piezometers have now been cleared, and should facilitate easier access to the majority of piezometers. The trails needed yet to be cleared are those that lead to piezometer 15 and 12.

Piezometer and Outflow readings

Piezometer and outflow readings were recorded once every two weeks. The restoration intern (Erin) and I conducted the readings on all occasions. All data collected that required conversion was converted, and entered into the LUREC's Management Committee file (K drive).

Finalization of the Migratory Bird/butterfly Landscape Project and Spot-Mapping

I was assigned to complete the designing of a bird/butterfly landscape project that was initiated by the ornithology class this summer. The project is to be implemented at LUREC in an effort to improve the ecosystem, and in turn, increase biodiversity. The landscape project was particularly focused in establishing a linear forest in the vicinity of the ponds, and in the back of the LUREC main building. The main idea behind this project is to introduce native plant species to the linear forest, in order to provide a permanent resource-rich environment for birds and other organisms during the year. In that way, migratory and resident avian species will have adequate resources, and possibly remain on campus. The assumption is that biodiversity will increase with the introduction of native shrubs and trees.

In addition, I was also assigned to work on finishing a spot-mapping project using data that was gathered by the ornithology class here at LUREC (See Maps 3-5). However, the spot-mapping project was only conducted in the back of the LUREC property (fen), using piezometers 13, 14 and 15 as the transect lines. When conducting avian breeding censuses in small areas, the spot-mapping method is usually employed as a means to determine which species are breeding in the area, and then later used to estimate the populations of the different species in the locale. By using spot-mapping skills, scientists are able to establish territories for breeding individuals, and determine their preferred nesting sites. In accordance with baseline research conducted in the summer of 2012 here at LUREC, the data that was gathered by the ornithology class revealed that the birds that were breeding in the back of the property last year, also held similar territories this year. Therefore, the data suggests that birds may be very loyal to their breeding grounds, and return to utilize it for consecutive breeding sessions. In short, they are very site-specific. As a result, the restoration project presently in effect, will somewhat affect avian breeding grounds, if their nesting sites are removed.

Bird Counts

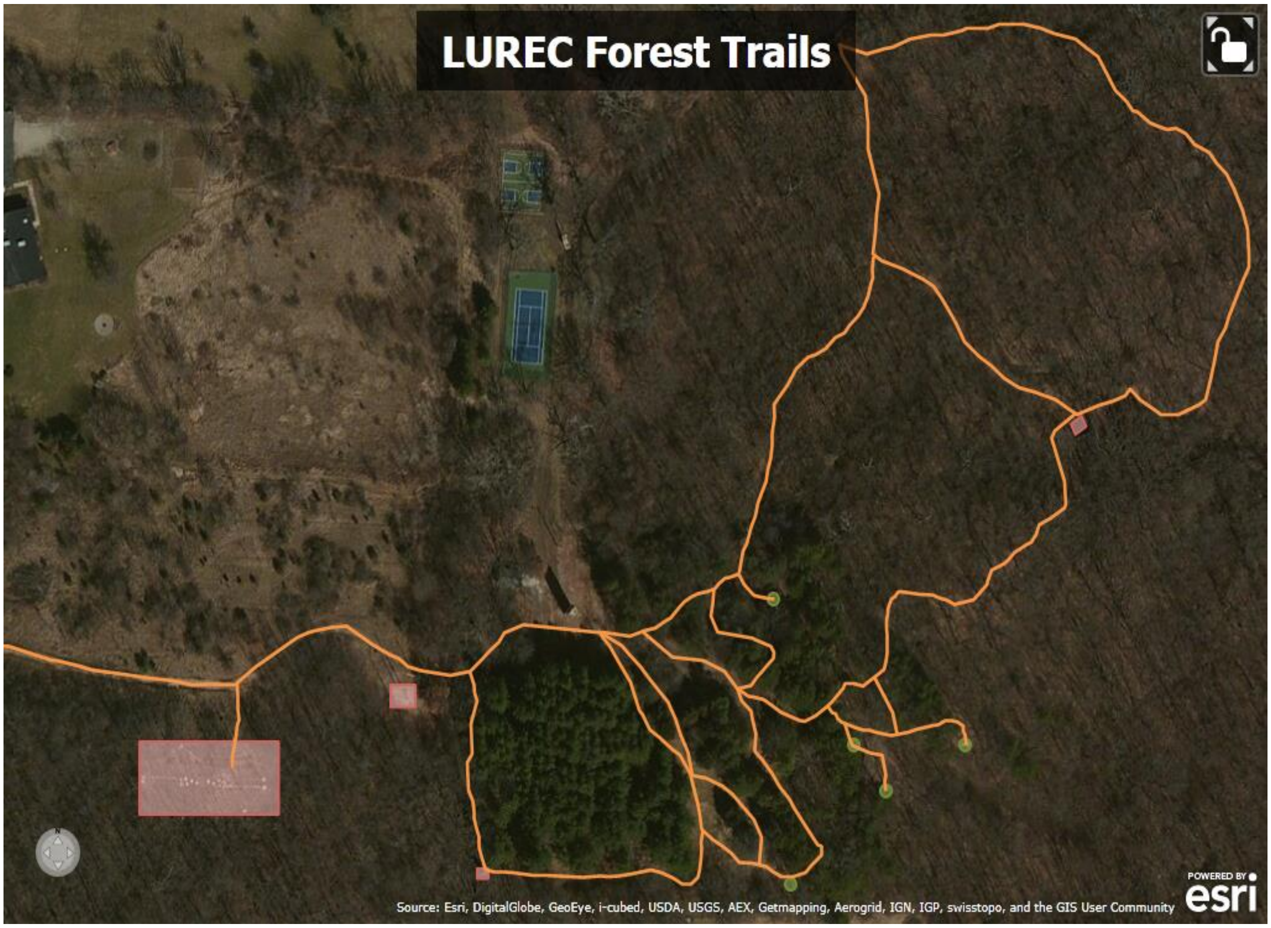
Conducting bird counts was not one of my job duties here at LUREC. However, as a lover of birds, I took this internship as an opportunity to improve my birding skills. Inquisitively, I conducted bird counts twice a month, to determine which bird species were present on campus at any given month during the summer/breeding season. During my bird counts, additional information such as weather, location, traveling distance, and time (start and end) were recorded. All data was entered into the citizen-scientists database eBird, and LUREC's naturalist log. Therefore, LUREC has a record of bird species seen or heard during the summer. In addition, the data is now available to researchers around to the world, who are interested in studying the differences in bird distributions at a global scale.

LUREC Trails GPS

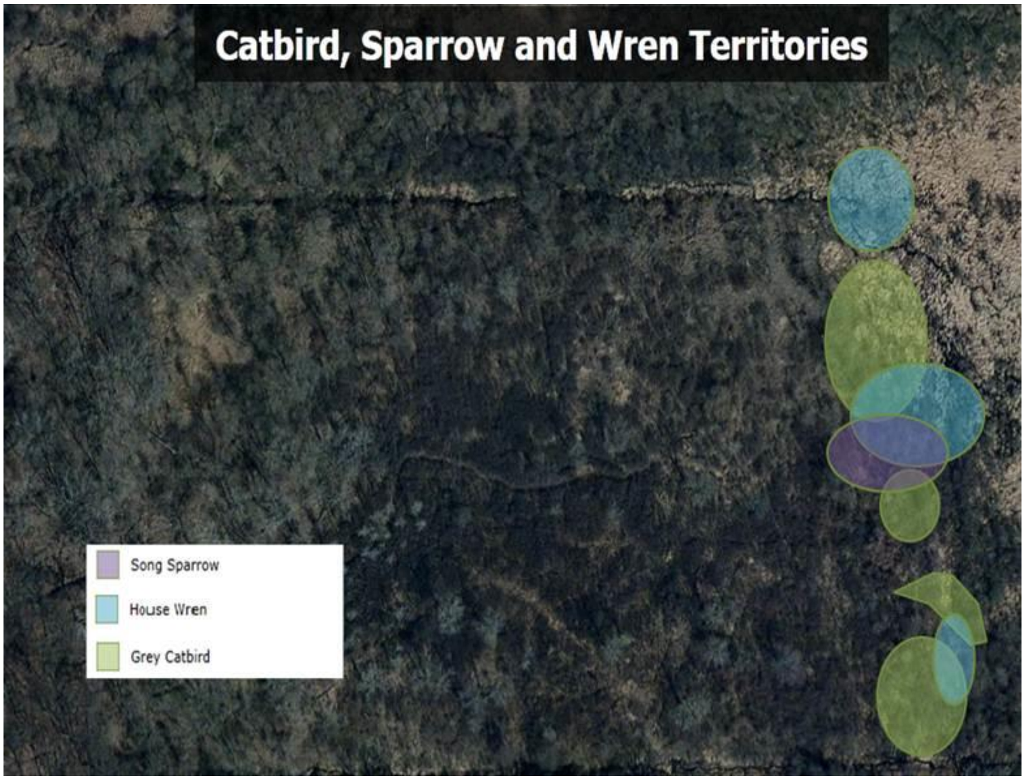
LUREC trails were GPS'ed and entered into Loyola's GIS software during this internship. The data was at the request of Loyola's GIS specialist David Treering. Accurate and precise representations of LUREC trails are now available to David through ArcGIS online (see Map2).

Appendix:

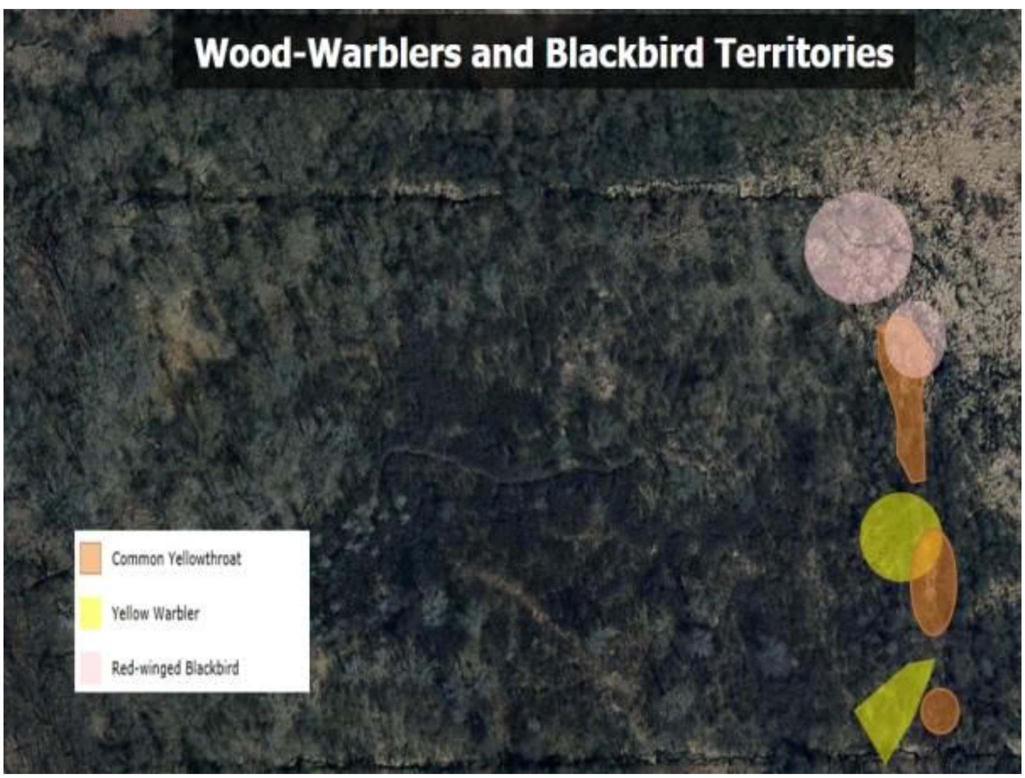
Map1


LUREC Forest Trails
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
POWERED BY
esri

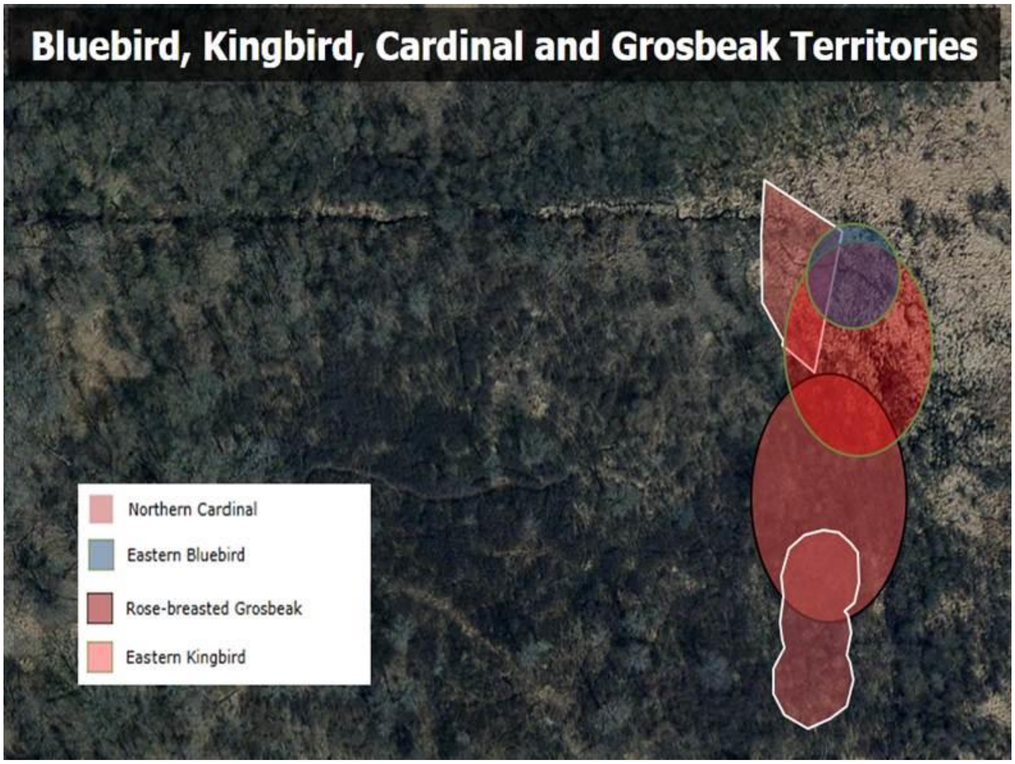
Map 2


Catbird, Sparrow and Wren Territories
Song Sparrow
House Wren
Grey Catbird

Map 3


Wood-Warblers and Blackbird Territories
Common Yellowthroat
Yellow Warbler
Red-winged Blackbird

Map 4



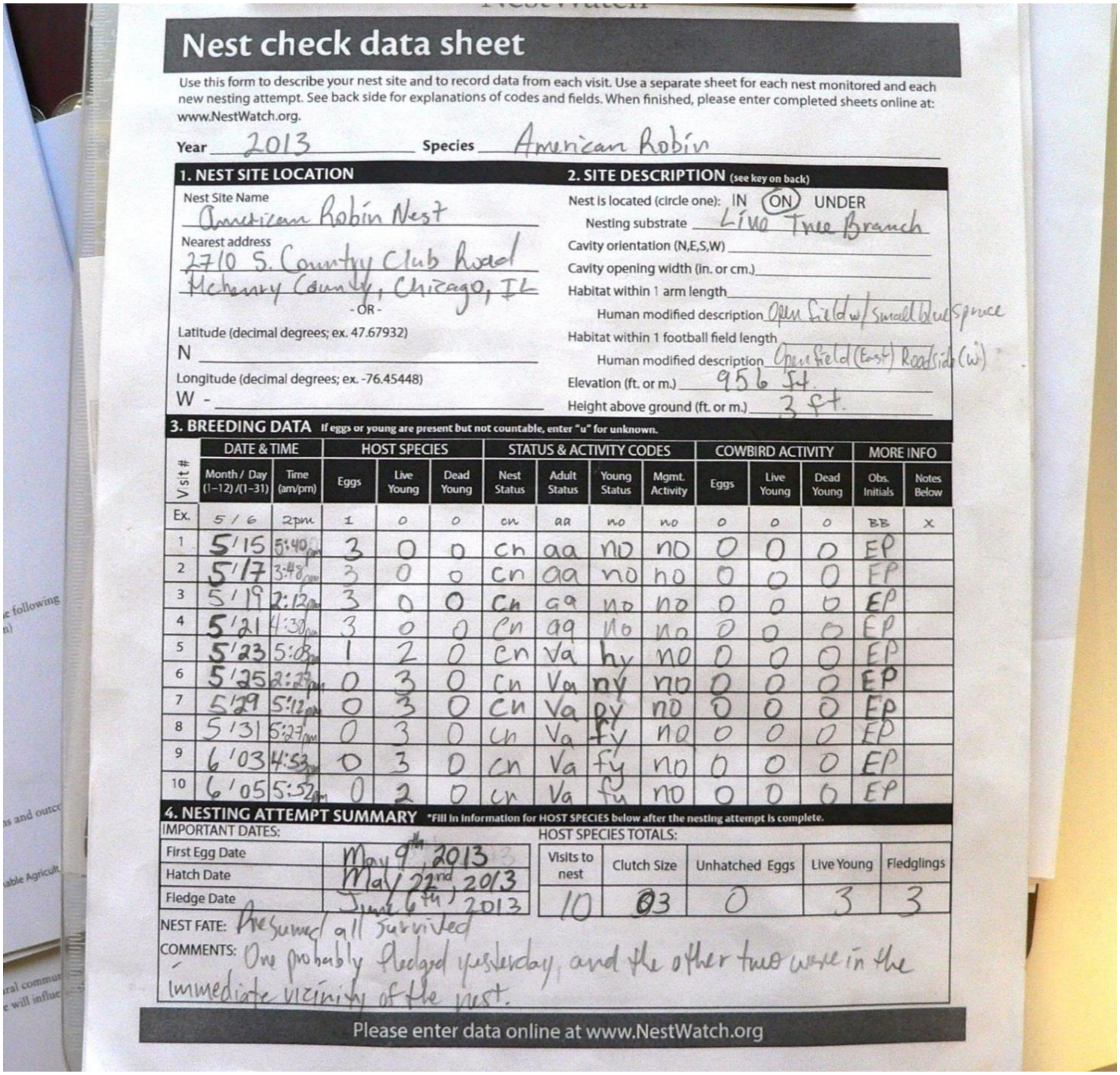
Map 5

Common Name	Number Observed	Number Dead	Percentage (%)
Black Cherry	300	24	8
American Elm	61	17	27.87
Bur Oak	20	2	10
Yellow-bud Hickory	59	1	1.69
White Ash	5	1	20
Black Walnut	5	1	20
Cottonwood	3	1	33.3
Jack Pine	10	1	10
Silver Maple	7	1	14
Apple	2	1	50
White Oak	86	6	5.8

Table 1: PERCENTAGE OF TREES FOUND DEAD BY SPECIES

Species Summary							
Nest Sites	All Sites						
Year	2013						
Species	**Total # of nest attempts**	**First egg date**	**Total # of eggs**	**Total # of nestlings**	**Total # of fledglings**	**Nest attempts with at least one fledgling**	**Nesting success rate**
Blue Jay	1	5/12/2013	4	4	4	1	100.00%
Tree Swallow	1	6/12/2013	4	3	3	1	100.00%
Black-capped Chickadee	1	6/3/2013	5	5	5	1	100.00%
House Wren	2	5/19/2013	9	9	9	2	100.00%
Eastern Bluebird	2	5/25/2013	7	6	6	2	100.00%
American Robin	1	5/9/2013	3	3	3	1	100.00%
Gray Catbird	1	5/28/2013	4	4	4	1	100.00%
Brown Thrasher	1	6/3/2013	1	1	1	1	100.00%
Red-winged Blackbird	2	6/18/2013	6	0	0	0	0.00%

Table 2: SPECIES SUMMARY FOR NESTS MONITORED AT LUREC



Nest check data sheet

Use this form to describe your nest site and to record data from each visit. Use a separate sheet for each nest monitored and each new nesting attempt. See back side for explanations of codes and fields. When finished, please enter completed sheets online at: www.NestWatch.org.

Year 2013 Species American Robin

1. NEST SITE LOCATION

Nest Site Name: American Robin Nest

Nearest address: 2710 S. Country Club Road, Mchenry County, Chicago, IL

- OR -

Latitude (decimal degrees; ex. 47.67932) N

Longitude (decimal degrees; ex. -76.45448) W -

2. SITE DESCRIPTION (see key on back)

Nest is located (circle one): IN (ON) UNDER

Nesting substrate: Live Tree Branch

Cavity orientation (N,E,S,W)

Cavity opening width (in. or cm.)

Habitat within 1 arm length

Human modified description: Open field w/ small blue spruce

Habitat within 1 football field length

Human modified description: Open field (East) Roadside (W)

Elevation (ft. or m.): 956 ft.

Height above ground (ft. or m.): 3 ft.

3. BREEDING DATA If eggs or young are present but not countable, enter "u" for unknown.

Visit #	DATE & TIME: Month / Day (1–12)/(1–31)	Time (am/pm)	HOST SPECIES: Eggs	Live Young	Dead Young	STATUS & ACTIVITY CODES: Nest Status	Adult Status	Young Status	Mgmt. Activity	COWBIRD ACTIVITY: Eggs	Live Young	Dead Young	MORE INFO: Obs. Initials	Notes Below
Ex.	5/6	2pm	1	0	0	cn	aa	no	no	0	0	0	BB	x
1	5/15	5:40pm	3	0	0	cn	aa	no	no	0	0	0	EP	
2	5/17	3:48pm	3	0	0	cn	aa	no	no	0	0	0	EP	
3	5/19	2:12pm	3	0	0	cn	aa	no	no	0	0	0	EP	
4	5/21	4:30pm	3	0	0	cn	aa	no	no	0	0	0	EP	
5	5/23	5:08pm	1	2	0	cn	va	hy	no	0	0	0	EP	
6	5/25	2:27pm	0	3	0	cn	va	ny	no	0	0	0	EP	
7	5/29	5:12pm	0	3	0	cn	va	py	no	0	0	0	EP	
8	5/31	5:27pm	0	3	0	cn	va	fy	no	0	0	0	EP	
9	6/03	4:53pm	0	3	0	cn	va	fy	no	0	0	0	EP	
10	6/05	5:52pm	0	2	0	cn	va	fy	no	0	0	0	EP	

4. NESTING ATTEMPT SUMMARY *Fill in information for HOST SPECIES below after the nesting attempt is complete.

IMPORTANT DATES:

First Egg Date	May 9th, 2013
Hatch Date	May 22nd, 2013
Fledge Date	June 6th, 2013

HOST SPECIES TOTALS:

Visits to nest	Clutch Size	Unhatched Eggs	Live Young	Fledglings
10	3	0	3	3

NEST FATE: Presumed all survived

COMMENTS: One probably fledged yesterday, and the other two were in the immediate vicinity of the nest.

Please enter data online at www.NestWatch.org

Photo 1

Photos 2 and 3

Photo 4

Photo 5

******* I was unable to retrieve additional GIS maps of the trees that were GPS'ed and the bird nest locations on campus from ArcGIS explorer online in time for this report,**