Panel endorses plans for key site

Developer aims to add businesses, apartments in downtown Oswego

By Linda Girardi
The Beacon-News

The Oswego Planning and Zoning Commission unanimously recommended approval of plans for a three-story mixed-use building on the site of the demolished old Village Hall in downtown Oswego.

The old Village Hall was demolished in 2015. The village vacated its offices in the building in 2008 when it moved into the new Village Hall at 100 Parkers Mill.

Yorkville-based Imperial Investments has plans to build an 18,000-square-foot building with a restaurant on the street level, offices on the second floor and apartments on the upper level of the old Village Hall site.

"This project meets our goals of bringing new restaurants and new investment to downtown Oswego," Village Administrator Dan Di Santo said.

Trustees in June approved an ordinance authorizing the approval of a purchase and sale agreement with Imperial Investments for 113 S. Main St., which is located next to the Dairy Hut.

Di Santo

Oswego Planning and Zoning Commission members at their January meeting voted to approve a preliminary planned unit development for the site.

The village is currently negotiating terms of a redevelopment agreement with the developer. The site falls within the parameters of a tax increment financing district approved for the downtown, Di Santo said.

The redevelopment agreement spells out the obligations for each party, he said.

Exhibit X

SCOTT STANTIS

Foxconn reconsidering $10B Wisconsin venture

Much-hyped manufacturing site may feature R&D

By Ally Marotti and Lauren Zumbach
Chicago Tribune

Foxconn Technology Group is reconsidering plans for its first U.S. plant, which promised a $10 billion investment and up to 13,000 jobs in southeastern Wisconsin, raising questions about the future of a project seen as vital to the region's economic development.

At least one resident questioned whether the plant will end up being good for taxpayers, while some local economic development officials said the facility could still provide a boost for the region.

Now, it "feels like things are just in flux," said Kevin Considine, president and CEO of nonprofit economic development organization Lake County Partners, in Lincolnshire, Ill.

The Taiwanese electronics giant, which supplies Apple, said Wednesday that it is considering adding research and development work to a facility that it originally said would focus on manufacturing.

"As we have previously noted, the global market environment that existed when the project was first announced has changed," the company said in a statement. "As our plans are driven by those of our customers, this has necessitated the adjustment of plans for all projects, including Wisconsin."

The statement said Foxconn is still committed to the creation of 13,000 jobs and its long-term investment in Wisconsin, but a

Turn to **Foxconn, Page 6**

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...ge of A+E section

$2.50 city and suburbs, $3.00 elsewhere
171st year No. 31 © Chicago Tribune

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ELDERTREE enveco LLC

Interstate Commerce Commission
Case No. 06-0706
Testimony of:

John J. Sabuco, President of ELDERTREE enveco LLC

Personal Address: 13832 Crescenzo Drive, A, Manhattan Illinois

Profession: Environmental Consultant, Ecologist, Theoretical Ecologist, Soil Scientist, Botanist, Mathematical Ecologist, Myco-ecologist

Education: Please see attached Credentials in **Appendix 1**

Expert Testimony: I have been vetted for and provided testimony as an expert witness on 48 occasions. These have been in numerous court systems including the Federal Court of the Northern District of Illinois. On at least one occasion my testimony was singled out for its clarity and excellence (Trident properties vs. Amoco Oil). In that case my client was awarded the largest ever settlement to a private property holder for damages caused by an oil company.

In a 2004 case similar to the case in question, a private property owner, Melvin Ohlendorf sought our help to prevent to taking of a portion of his property for a road right of way to expansion for the addition of a turn lane. This would have removed 10 of the largest trees on his property. The Illinois Department of Transportation sought to compensate him on the timber value of the trees. I argued that the trees were not general timber but provided an aesthetic monetary value to his property as a landscape feature. As such they should be valued for their replacement value and their impact on the value of the home – or they should move the roadway expansion. Replacement of a tree that requires 222-365years of uninterrupted growth would require considerable compensation. The Department ceded the logic and relinquished without argument, moving the roadway rather than pay the exorbitant value of the trees.

Familiarity with the Project Area:
I have been a biologist in this part of Illinois for over 30 years, with a special emphasis in plant ecology. I have explored the Fox River valley between Ottawa and Wedron on repeated occasions both professionally and personally with a special intensity while writing my book, ***"The Best of the Hardiest."***

Familiarity with the Power Line Route:

To familiarize myself with the power line route and alternate routes, I was flown in a small airplane repeatedly over the selected routes. I have provided aerial photographs for the route, that I have personally taken, with this testimony. I also walked the route along the Fox River and Smith Alternate Route 2B. I have reviewed numerous aerial photographs of the site provided by others, as well as USGS 7.5 minute topography maps, National Wetland Inventory Maps, and aerial photographs in my company's private collection. In all, I have totaled just over 42 hours of direct field time in the subject area for this project. I have spent over 140 hours of evaluation time on this testimony.

Based on My Education, Training and Experience as Well as My Familiarity with the Area, My Opinion Regarding the Proposed Power Line Route along the Fox River Is as Follows:

The route is ill-chosen for the following reasons:

- **Inadequate Evaluation of Threatened, Endangered and Candidate Species.** There has been no evaluation of those species listed only by the State of Illinois as threatened or endangered. NRC which provided the only biological assessment for the project site of which I am aware, only discussed state threatened and endangered status if the species was first federally listed or a federal candidate species (though many of these were missed). In fact, NRC spent time on just 6 species verified in the county but, conveniently, not in the project area. **Table 1** in **Appendix 2** contains a complete list species verified to exist not only in La Salle County but also in the lower Fox River basin – the subject area – by numerous, competent biologists and reported ***with voucher specimens*** to both the Illinois Natural History Survey (INHS) where they are listed on the INHS web site, and to the Nature Serve Database which is a national clearing house database referred to by various governmental bodies including US Fish and Wildlife.

  The list contains 23 species of molluscs, fish, reptiles, birds, mammals and plants. Of these, 11 are state-listed endangered, 5 are state-listed threatened, and 6 are on the state watch list for species of special concern. There is one species that is a federally protected species, and one federal candidate species. Except for the bald eagle, ***none*** of these were addressed by NRC.

  In Illinois, the state owns all animals whether existing in a preserve or not. The state maintains special privilege with concern to listed plants. Ameren has an obligation to evaluate the status of these species, to avoid a taking of the species: "It is unlawful for any person to (1) to possess, take, transport, sell, offer for sale, give or otherwise dispose of any animal or the product thereof of any animal species which occurs on the Illinois List; (520 ILCS 10/3)." A person is defined as, ". . . any individual, firm, corporation, partnership, trust, association, private entity, government agency, or their agents, and representatives." A taking is, "in reference to animals and animal products, to harm, hunt, shoot, pursue, lure, wound, kill, destroy, ***harass***, gig, spear, ensnare, trap, capture, collect, or to attempt to engage in such conduct. "Take" means, in reference to plants and plant products, to collect, pick, cut, dig up, kill, destroy, bury, crush, or ***harm in any manner***."

- **Inaccurate Evaluation of Bald Eagle Use of the Subject Area.** NRC, citing no local authorities whatsoever, and apparently making no field attempt to evaluate potential roosting trees or nest sites, astoundingly, concluded that, " . . . [the] transmission line will have **No Effect on the Bald Eagle . . .**" (emphasis is NRC's).

  Any attempt to find eagle nests ***must*** be conducted by low level fly-over in the spring before leaves appear on trees and it must be conducted by competent individuals. NRC did not conduct such a search nor do they employ an expert of this type according to their web site. To determine where eagles use trees along the river as a nighttime roost one must spend many hours observing every group of potential trees at the appropriate times. Since eagles may not use the same trees every night in which to roost, this may take many years of careful observation by competent individuals.

  Once individual, Lonnie Reppine, has made the observations of roosting trees and has provided testimony to the fact that such roosting trees exist near the damn in Dayton – in the center of the proposed route. He has seen many bald eagles roosting in the aforementioned trees (more than 15 at a single time) and at least one golden eagle juvenile.

  It should be noted that any disturbance within one quarter mile, or farther if in their line of site, – construction activities being specifically cited in the National Bald Eagle Management Guidelines – will cause abandonment of a roost by bald eagles. To cause such abandonment is a violation of the Bald and Golden Eagle Protection Act.

  In their Biological Assessment report dated January 4, 2007, NRC surmises, "The clearing [of trees] for this project at the Fox River Crossing would not significantly diminish the availability of such [roosting] potential perch sites." (Please note the date precludes the possibility of timely and appropriate habitat evaluation.) This statement betrays incredible ignorance of the habits of eagles, partly for the reason mentioned above. In addition, nighttime roosting sites and forage perches must be near wintertime feeding areas such as the free moving water below a damn spillway.

  Also ignored in the NRC report, is the specificity and fidelity of bald eagles to particular roosting trees and/or nesting trees. One need only visit the Starved Rock Lock and Damn on the Illinois river just a few miles to the west of the confluence of the Fox and the Illinois Rivers to see that nearly all of the eagles roost in a single tree at the east end of Leopold Island (**See Eagle Photos in Appendix 3**) in the river and just a few others on Plum Island. Therefore, to say that, "trees of this type are abundant in the area . . ." represents an uneducated opinion of little merit. Eagles will simply abandon an area without returning if the trees they have chosen are disturbed or eliminated. Further, NRC assumes that it is OK to disturb eagle habitat if other available habitat is nearby. However, this is directly contradictory to the law as I noted earlier. It makes no difference if humans think suitable habitat exists. It is, in essence, a decision for the eagles to make.

- **The Severe Limitations of Erodible Soils and Their Impact on Threatened, Endangered and Candidate Species.** I reviewed the Soil Conservation Service classification of the soils in the path of the power line. All are classified as highly erodible **(Table 3, Appendix 2)** with 11 of 15 soil types demonstrating a T factor (erosion in tons per year) at the highest level (5) and the remainder at 4 tons per year. The **Erosion Photos** in **Appendix 4** show that even small excavations are hard pressed to be stabilized and great efforts to do so fail routinely. It is hard to imagine that a large construction, such as the towers in question, could possible be properly maintained to provide zero erosion. In any event, Ameren has failed to adequately address this concern.

  Of the species listed in **Table 1**, the following are threatened or endangered largely because of siltation and poor water quality as measured by a Secchi disk (strictly a water clarity issue due to suspended natural solids). This is habitat loss due to degradation of that habitat by man.

Table 2 Erosion Effects on TEC Species

Species Name	Common Name	How erosion causes its demise
Alasmodonta viridis	Slippershell Mussel	Siltation causes drowning due to lack of oxygen in the water being siphoned.
Eliptio dilatata	Spike	Siltation causes drowning due to lack of oxygen in the water being siphoned.
Moxostoma carinatum	River Redhorse	Cause inefficient bottom foraging (lack of differentiation) and inefficient oxygenation
Moxostoma valenciennesi	Greater Red Horse	Cause inefficient bottom foraging (lack of differentiation) and inefficient oxygenation
Podilymbus podiceps	Pied-Billed Grebe	This diving bird requires clear water for diving for fish, and an uninterrupted fish supply in the correct range of size.
Bartramia longicauda	Upland Sandpiper	Requires clear water to forage for insects
Lontra canadensis	River Otter	Loss of molluscs is a disruption to a major food source.

Of course, this list consists only those species already imperilled. A great many other species could be affected by erosion and subsequent siltation. Albert and Sabuco (2000) demonstrated that species diversity increased property values for residential property. Therefore, the effect of the loss of species diversity on the value of property should be considered when making an appropriate offer to the homeowners for the right to create and use an easement through their properties.

- **Severe Habitat Fragmentation Due to Bifurcation of Wooded Areas along the Power Line Corridor.** The area in which the power lines are proposed is largely wooded with some interruption by residential homes and, to a far lesser extent, commercial enterprises. It is a fair characterization to call this a largely green corridor which allows for the movement of animals and the colonization of plants by seed propagules, along the banks of the Fox River and to and from higher ground perpendicular to the river.

Even animals such as birds and fish have been shown to greatly benefit from green corridors even though they are not restricted in their movement by those corridors (Ricklefs and Miller 1999, Meffe and Carroll 1997 in Appendix 5). Bifurcation – the splitting roughly in half – of such a corridor creates both a physical barrier and a behavioral barrier that stops the required movement of species from one location to another. Such fragmentation restricts breeding, the exchange of genetic material and reduces the area in which species may colonize and prosper (Meffe and Carroll 1997 in Appendix 5).

Some animals – especially cold blooded animals and mammals are dependent on migration from lower to higher ground and back to ameliorate the effects of wetter or drier weather on their existence. The power line corridor will abruptly stop such movements, in more sensitive species, leading to greatly reduced populations of such creatures. For instance a salamander cannot cross open ground under any circumstances to address a rising river or other conditions either too wet or dry for it to sustain proper homeostasis. It must have continuous cover for shade and moisture. Some creatures simply will not cross such a barrier even though it could physically do so. The soft shell turtle – endangered in Illinois – is just such a creature. Its survival instinct does not allow it to cross such open ground where there is no route for escape.

It has been shown that another cause of species loss by fragmentation is dues to the increased edge to patch size ratio. Habitat edges are detrimental to the species which reside within the habitat. Even a simple corn field shows the added stress at the edge of field with stunted plants and lower yields. Complex and seminal work in a variety of habitat types show the effects are alarming. In fact, and quite pertinent to this case, Rich *et al* (1994) found the power line corridors as narrow as 8 meters wide caused significant negative effects on forested patches by attracting opportunistic species (cowbirds, skunks raccoons, opossums, etc.) to areas which had been havens for more conservative species.

To quantify the impact of the bifurcation I used the Coefficient of Fragmentation (Sabuco, in press, see **Appendix 5**) which is based on the premise that the least amount of edge to enclosed core area would result in a piece of land in the shape of a disk. Therefore, for any given area, one can index its edge to core area by comparing it to a disk of the same area then creating a ratio of the actual perimeter or edge to the perimeter of the disk of the same area. The complete method is explained in **Appendix 5**. The result is a number between 0 and 1 expressed as a ratio.

I used aerial photographs combined with ground verification to distinguish discrete forested areas. I then measured these using digital computation on the aerial photographs. I then computed the edges of the area as they stand now and determined the Coefficient of Fragmentation. I then placed the power line corridor on the same parcels as it would stand according to Ameren's drawings and recalculated the Coefficient of Fragmentation based on the new edge lengths and changed core areas. I then compared the results.

Based on 15 distinct areas, I found the average CoF for the area as it exists right now is 0.702. After bifurcation the CoF is a disastrous 0.365 (Table 2, Appendix 2). As edge effect is a hallmark of Fragmentation, and the edge effect is more than doubled based on this analysis. Janzen (1983, 1986 in Appendix 5) found that as edge effect increases in a linear manner, the loss of species increased exponentially for the enclosed habitat. Therefore, the net effect of a 50% decrease in the CoF (as we have in this case) represents a horrifying potential of 75 to 80% species loss in the affected area. It should also be noted that all of the compromised species in **Table 2** are compromised to at least some degree by habitat loss.

There are more areas that could be evaluated, but those chosen were easier to calculate because of their size and the result is more favorable to Ameren. Should I perform an analysis which includes many of the smaller patches, the result would undoubted show an even greater decline in the sustainability of the core environment. Clearly the placement of the power lines in this corridor has an unseemly deleterious effect on the wildlife in an important set of riverine habitats.

- **Inadequate Proposed Compensation to Homeowners along Corridor.** Ameren has proposed compensation to the homeowners along the corridor that covers among other transgressions, the loss of the aesthetic value/landscape value/ of the large trees. The compensation is based on gross timber values, the lowest possible compensatory value for a tree. Because the area is largely residential, this form of compensation is inappropriate. The large trees represent an appealing attribute of each home and contribute to the value of the homes in a way that is meaningful to the homeowner. One can also reasonably attribute a value to a tree based on its replacement value should one grow a tree of similar size and species. To that end, I have assessed 20 trees greater than 10 inches in diameter at breast height which is the required lower limit for compensation of a tree. I compared these values to values taken on similar land and found less – 2.3% variation in growth per diameter of trunk. I then evaluated the trees according to the methods used in Ohlendorf vs. The Illinois Department of Transportation (**Appendix 6**). Using the two methods outlined therein: Cost to grow a tree to similar basal area using nursery pricing, and the volumetric comparison of trees to be replaced, with trees grown in nurseries. Inputs to the calculation are:

    - Average age per tree over 10 inches in diameter: 178 years
    - Nursery average wholesale cost for 2, 2.5 and 3" diameter trees: $460
    - Average number of trees per acre in the minimum size and above: 12
    - Acres of trees to be removed: 22 **(See Tree Photos in Appendix 7)**
    - Total trees for which compensation is to be granted: 264

The calculation yielded a value per tree of $95,191. The total justifiable compensation for the loss of 264 trees is $25,119,951. This cost is reflects the nearly two centuries average it takes to grow a tree to the size and condition of those in the corridor and the centuries worth of risk and attrition a hypothetical grower would assume.

- **Failure to adequately assess a less problematic alternative route.** As part of the process of assessing routes which accomplish the same task. Ameren is obligated to select the routes which cause the least amount of environmental, and socio-economic disturbance. I have reviewed an number of alternative routes. It appears that Smith Alternate Route No. 2B is the preferred route based on the low impact to natural areas, the least additional property owners affected, the type of property owners affected (primarily farms) and the fact that it joins another power line right of way for a great part of the distance. Only very small less than one-quarter mile slope with trees is affect by the route and these trees are generally smaller and consist of several non-native trees. The remainder of the route is through farmland. See Route Photos in **Appendix 8**. The construction of the towers on this route would seem to be considerable easier given the flat ground, and lack of clearing required.

In summary, the choice of the route along the Fox River intrudes into one of the few greenway corridors in the area. It further fragments a landscape already distressed, and jeopardizes a number of protected species, most notably the American Bald Eagle. Further, the preparation work by NRC to address biological impacts is lacking in scientific rigor and betrays a lack of understanding of the most basic of ecological concepts. Engineering analysis appears to have been entirely lacking in the choice of a route given the extreme erodibility of the soils and the slopes involved compared to alternative routes. Ameren has failed to address compensation for venerable old growth timer in a manner consistent with the current use of the land. An adequate alternative route exists that would eliminate or ameliorate nearly every concern I have listed here. I would like to see Ameren consider this route.

Respectfully submitted this
15th day of December, 2009

President, ELDERTREE enveco LLC

References Not Elsewhere Included in an Appendix

Albert, S and Sabuco, J. 2000. The effect of venerable trees on home real estate offers. Journal of Real Estate Research. 22:2, 34-41.

Rich, A.C., Dobson, D. S., Niles, L. J. 1994. Defining Forest Fragmentation by Corridor width: THe influence of narrow forest-dividing corridors on forest nesting birds of New jersey, Conservation Biology, 1:66-77. [5]

Appendix 1

Credentials

John J. Sabuco

President

The John Joseph Companies LLC

ELDERTREE enveco LLC

815.478.4800

Since 1979, **John** Sabuco has been at the forefront of ecological, agricultural and mathematical fields having published 5 college text books, 64 peer-reviewed journal articles, and having created 18 statistical/mathematical methods and procedures. His 1984 book, ***The Best of The Hardiest,*** now in its third edition, was given a glowing review by Joan Lee Faust of the **New York Times.** Selected as an **International Scientist of the Year in 2006** and listed as one of **The 2000 Most Influential Scientists of the 20th Century** by Cambridge University Biographical Institute, John was recently profiled in the book ***Living Legends*** by the same institution for his mathematical models describing ecological community assembly and invasion rules for all plants and animals, including humans. In addition, he created the most highly-considered model for forest transition to date helping to predict the new constitution of human-impacted forests – which is to say *all* forests.

John has helped to create many of the regulations used in his field and brought modern mathematics to the aid of farmers and growers worldwide – 14 foreign countries, in fact. John speaks 5 languages fluently and is linguistically competent in 3 others.

Educated at: Western Illinois University, BS Biology and top of his class.
Illinois State University, Ph.D. Ecology program (needs dissertation to complete)

For a complete resume:
http://www.thejjco.com/Staff/John_Sabuco_Resume.pdf

For company information:
http://www.thejjco.com/

ELDERTREE enveco LLC

The John Joseph Companies LLC

John J. Sabuco

jsabuco@eldertree.com

13832 Crescenzo, A, Manhattan , Illinois 60442
708-337-3307

Education

- Ph.D. program in Ecology at Illinois State University (require only dissertation)
- M.S. in Biology program at Western Illinois University, GPA 4.0 (4.0 scale): (Transferred before completion to Illinois State University's Ph.D. program)
- B.A.S. (BOG) Western Illinois University
- Phi Theta Kappa Honor Society (Academic)
- Phi Sigma Honor Society (Biology Academic)

Experience

1979- Present **Principal of The John Joseph Companies, LLC** an environmental consulting and a farmland management firm and successor to Eldertree Inc. an environmental consulting firm and **The White Oak Group, Inc.** an environmental contracting firm. Purchased **Hargrove & Hough, LLC** and integrated this firm into The John Joseph Companies, LLC along with **ELDERTREE enveco LLC**. Duties include:

- Research and Consulting completed in 22 foreign countries and 38 states.
- Industrial Hygiene/ Air quality Issues
- Microbiological Evaluation and Remediation
- Environmental Site Assessments
- Storage tank removal and remediation
- Rangeland Restoration
- Mine Spoil Reclamation
- Wetland Assessments & Mitigation
- Hazardous Materials Management
- Regulatory compliance research and reporting
- Remediation program management
- Endangered Species Studies

Publications

- College Textbooks: 5 Including: *The Best of The Hardiest* and *Where the Tall Grass Grows*
- Journal Articles: 64
- Manuscripts in review: 10
- Manuscripts in progress: 8

Statistical Methods & Measurement Systems Created: 18

Invited Presentations (Presented Papers): 32 (7)

National Media Exposure

- Chicago Sun Times — Twice including a front page article and a feature article.
- New York Times — Book Review by Joan Lee Faust, " Monumental. . . a serious tome . . . facscinating"
- WLS Channel 7 News — Interview with Alan Kreshesky

Professional Affiliations

- Mycological Society of America
- ASTM International:
- Environmental and Global Warming Drafting Committees.
- American Association for the Advancement of Science
- American Institute of Biological Science
- Ecological Society of America:
- Theoretical & Statistical Ecology and Vegetation Sections
- Prairie State College Foundation: Twice past President
- National Association of Environmental Professionals
- Illinois Association of ENvironmental Professionals
- American Industrial Hygiene Association

Some Significant Projects:

- **Chicago Public Schools**
  Created and ran the entire environmental program supervising 18 other consulting firms and 38 environmental contractors covering 600 schools. The only program in the history of the City of Chicago to have 96% Minority and Women Owned Business Enterprise participation. Saved 46 million dollars in the first year, alone. The only person that could close a school on his own counsel other than the COO.
- **O'Hare International Airport**
  Consultant for the Federal Aeronautics and Aviation Administration regarding the expansion of the airport. Performed or reviewed all biological assessments and wetland studies.
- **US Lead, Gary, Indiana**
  Implemented a wetland restoration plan and endangered and threatened species plan for the one of the largest combination restoration and remediation projects in United States history.
- **Detroit Public Schools**
  Created and executed the environmental program in joint venture with GSG Environmental.
- **Chicago Community Development Corporation**
  Performed all lead assessments, asbestos and radon studies for all of the properties in this largest privately held, non-profit, publically-funded low-income housing program in the City of Chicago.
- **Trident Properties vs. Amoco Oil**
  Consultant for Trident Properties in the largest single settlement made by an oil company under the RCRA Citizens Suit provision ($6.41 million) in the Northern Illinois District of the Federal Court. The White Oak Group, Inc. and **John J. Sabuco** were singled out in the Judge's commentary for the excellence and clarity of the work product.
- **ASTM International**
  Drafting Committee for ***Standard and Practice for Identifying and Complying with Continuing Obligations on Real Property Impacted by Contaminants of Concern.***
- **Ohlendorf vs. Illinois Department of Transportation**
  Using the value that mature trees add to a residential property, and an extrapolated cost to grow large trees, Sabuco placed a replacement value on trees the Department was to remove that they were unwilling to pay and they instead moved a proposed roadway.

References for these and other projects listed in our brochure are available. A full Curriculum Vitae is also available.

Appendix 2

Tables Not Located Within The Text

TABLE 1
Threatened, Endangered and Candidate species in The Lower Fox River Basin in La Salle County

Class & Count	State Status	Federal Status	Scientific Name	Common Name
Molluscs				
1	T		Alasmodonta viridis	Slippershell Mussel
2	T		Eliptio dilatata	Spike
Fish				
3	T		Moxostoma carinatum	River Redhorse
4	E		Moxostoma valenciennesi	Greater Red Horse
Reptiles				
5	E		Emydoidea blandingii	Blanding's Turtle
Birds				
6	E		Podilymbus podiceps	Pied-billed Grebe
7	W		Buteo lineatus	Red-shouldered Hawk
8	PS	PS	Haliaeetus leucocephalus	Bald Eagle
9	E		Bartramia longicauda	Upland Sandpiper
10	E	C	Lanius ludovicianus	Loggerhead Shrike
11	W		Certhia americana	Brown Creeper
12	T		Dendroica caerulea	Cerulean warbler
13	E		Circus cyaneus	Northern Harrier
Mammals				
14	W		Lontra canadensis	North American River Otter
Plants				
15	E		Pinus resinosa	Red Pine
16	W		Thuja occidentalis	Northern White Cedar
17	E		Phegopteris connectilis	Northern Beachfern
18	W		Cornus canadensis	Dwarf Dogwood
19	W		Eurybia furcata	Forked Aster
20	E		Filipendula rubra	Queen-of-the-Prairie
21	T		Solidago sciaphila	Shadowy Goldenrod
22	E		Symphoricarpos albus var. albus	Snowberry
23	E		Veronica americana	American Speedwell

TABLE 3
Major On-Site Soils for The Lower Fox River Basin in La Salle County

Soil Name	Map Symbol	Erosion Factor (in tons per year)	Wind Erodibility Group (see descriptions below*)
Camden silt loam	134	5	6
Proctor silt loam	148	5	6
Brenton silt loam	149	5	6
Elburn silt loam	198	5	6
Plano silt loam	199	5	6
St. Charles silt loam	243	5	6
Fox loam	327	4	5
Peotone silty clay loam	330	5	4
Marseilles silt loam	549	4	6
Loran silt loam	527	4	6
Ozaukee silt loam	530	4	6
Millington silt loam	3082	5	4L
Du Page silt loam	3321	5	4L
Ross loam	8073A	5	6
Titus silty clay loam	8404	5	4

* 4. - Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible, but crops can be grown if measures to control soil blowing are used.

4L. - Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible, but crops can be grown if intensive measures to control soil blowing are used.

5. - Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible, but crops can be grown if measures to control soil blowing are used.

6. - Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible, and crops can be easily grown.

Table 4

Coefficient of Fragmentation Calculation on Fox River Forested Habitats by Power Line Corridor

Index of Edge Effect of Natural Areas as They Are Now Configured

Scalar Values		Area (sq ft)	P	P if Disk (P_D)	Index (P_D/P)
1041	422	439302	2926	2348.96	0.803
2502	814	2036628	6632	5057.67	0.763
803	805	646415	3216	2849.38	0.886
983	155	152365	2276	1383.37	0.608
475	1108	526300	3166	2571.06	0.812
6066	1044	6332904	14220	8918.59	0.627
1116	188	209808	2608	1623.33	0.622
2636	201	529836	5674	2579.68	0.455
2624	694	1821056	6636	4782.52	0.721
4890	3658	17887620	17096	14988.95	0.877
1877	228	427956	4210	2318.43	0.551
				AVERAGE	0.702

Index of Edge Effect After the Installaion of the Power Lines.

Area after Frag	P after Frag	P if Disk (P_D)	Index (P_D/P)
335202	5008	2051.86	0.410
1786428	11636	4736.83	0.407
566115	4822	2666.53	0.553
54065	4242	824.05	0.194
478800	4116	2452.29	0.596
5726304	26352	8480.71	0.322
98208	4840	1110.63	0.229
266236	10946	1828.64	0.167
1558656	11884	4424.56	0.372
17398620	26876	14782.65	0.550
240256	7964	1737.13	0.218
		AVERAGE	0.365

Appendix 3

Eagle Photographs

Figure 1
Tree affinity on Leopold Island on the Illinois River, 2006

Figure 2
Eagle over the Fox River Valley during my site visit on Nov. 18, 2009

Figure 3
Tree affinity on Leopold Island on the Illinois River, 2008

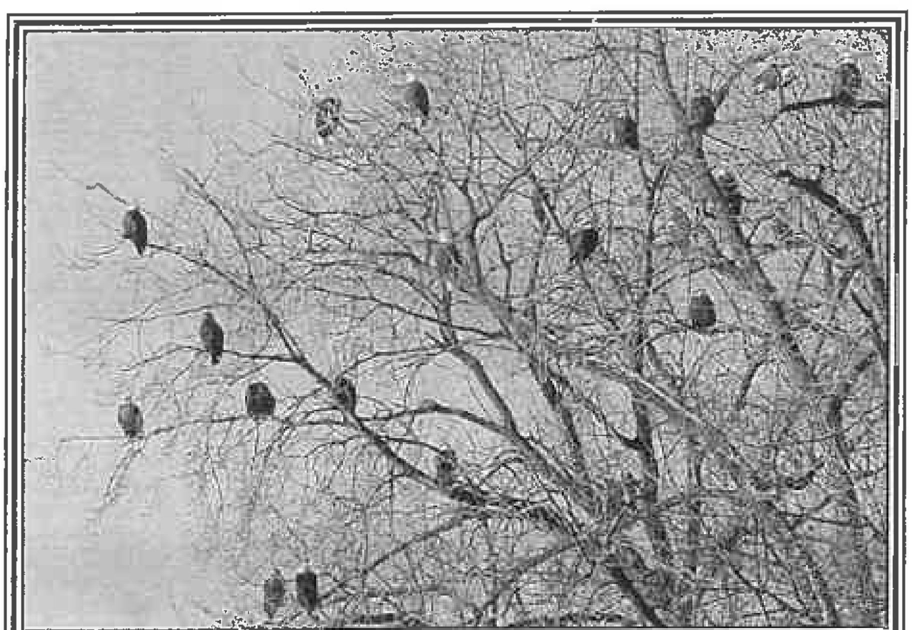

Figure 4
Tree affinity on Leopold Island, 2007, courtesy of The Magnificent Frigate Bird, Inc.

Appendix 4

Erosion Photographs

Figure 1

Example of erosion alongside railroad bed

Figure 2

Poor soil quality and erosion alongside railroad bed

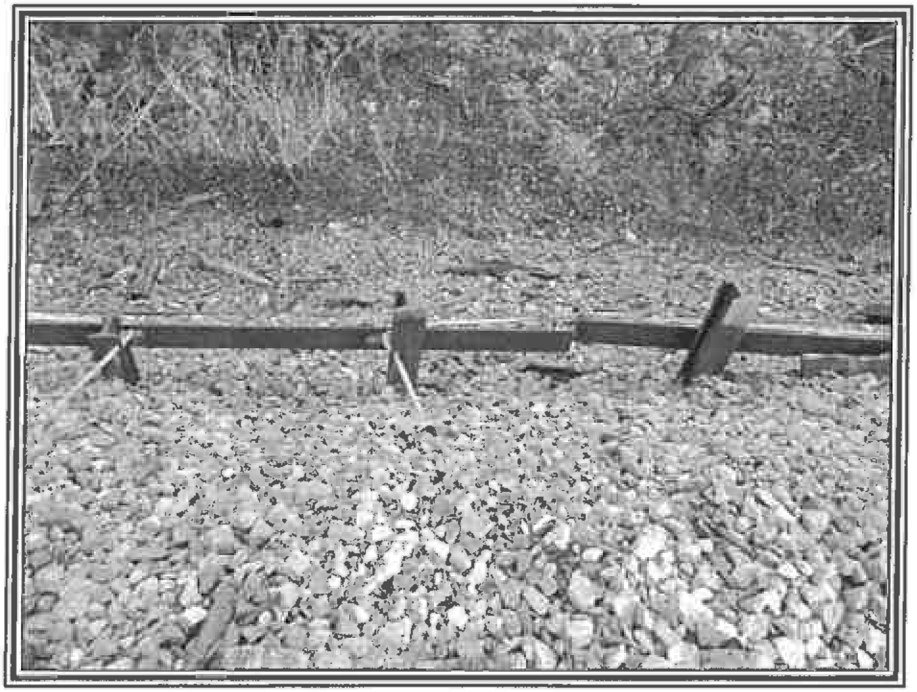

Figure 3
Ineffective retention wall alongside railroad bed

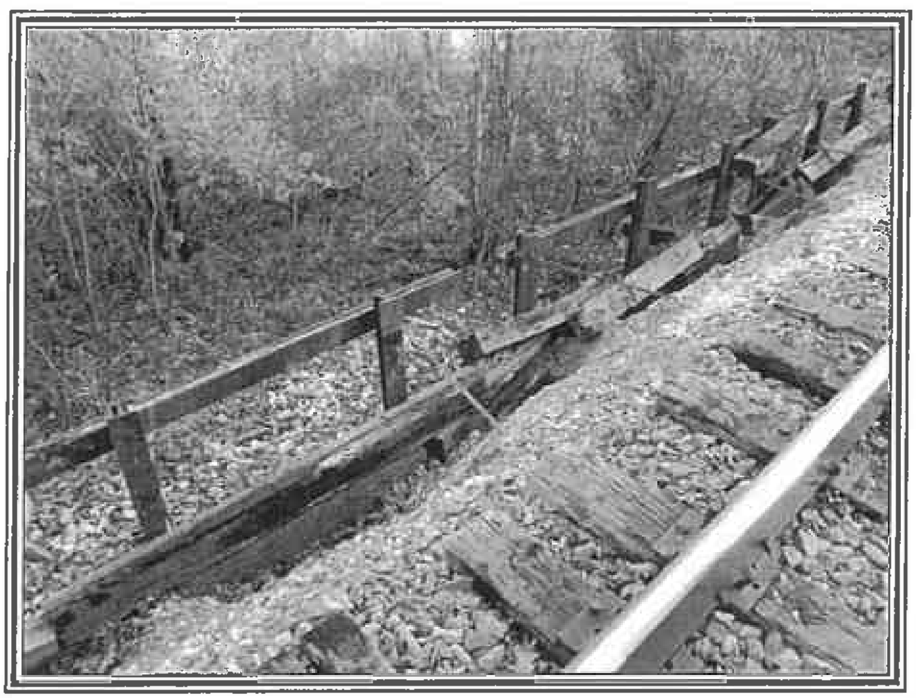

Figure 4
Ineffective retention wall alongside railroad bed

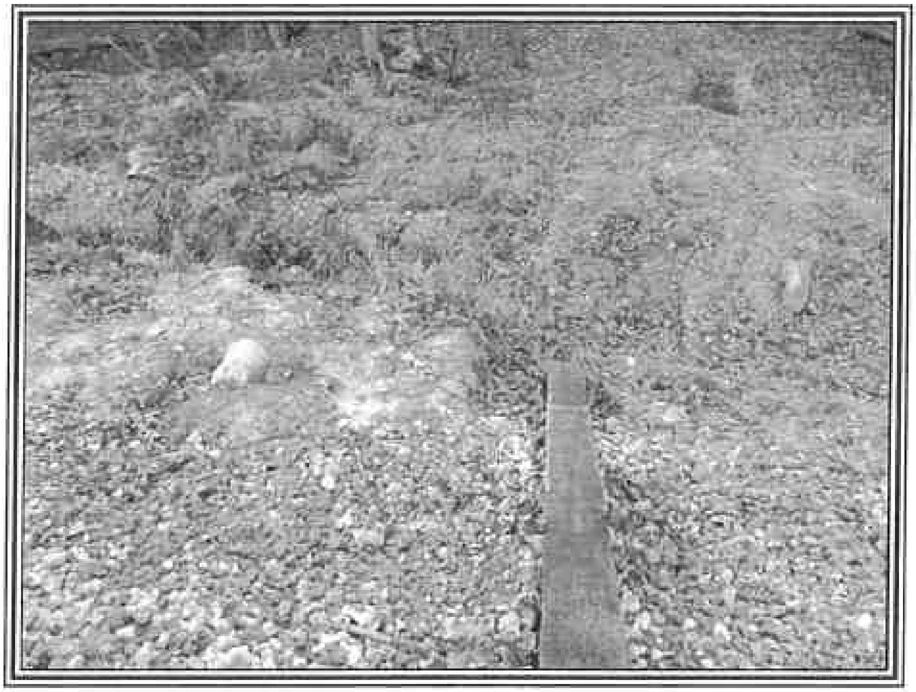

Figure 5

Example of erosion alongside railroad bed

Figure 6

Ineffective retention wall alongside railroad bed

Figure 7
Example of poor soil quality and erosion alongside railroad bed

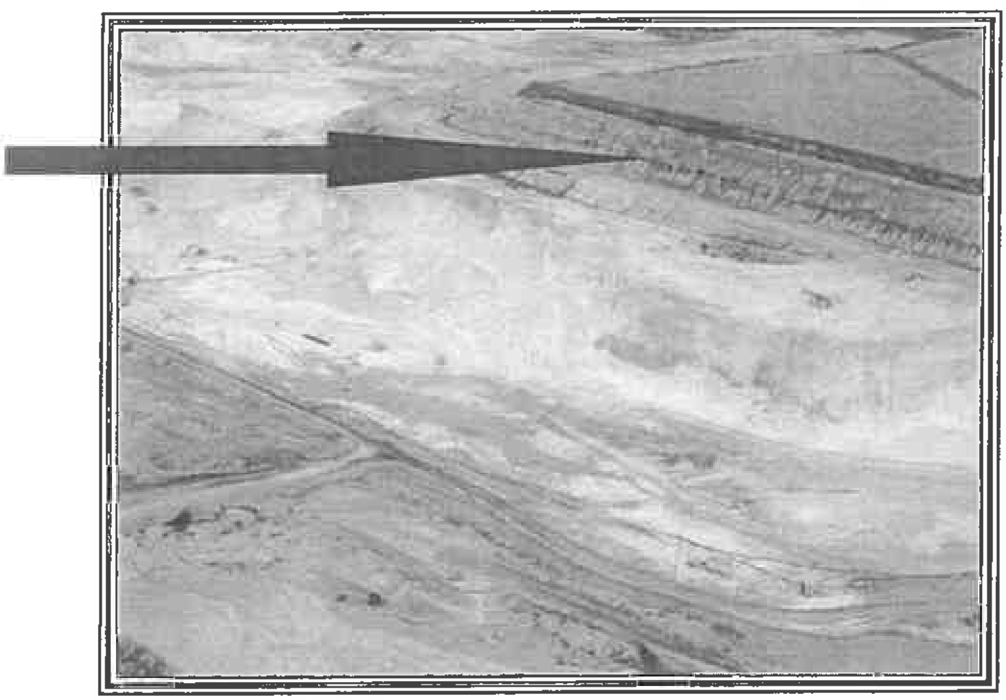

Figure 8
Example of general soil erosion around grave pit

Appendix 5

Coefficient of Fragmentation

Measuring Edge Effects, Habitat Fragmentation, Contagion
and
The Raw Probability of Patch Colonization

John J. Sabuco

From the first papers on island biogeography by MacArthur (1963, 1967), the physical measures of patch size and distance between patches, habitat or oceanic islands, or mainland and island, have been identified as critical to the study of colonization/invasion, species diversity, and the continued viability of populations (Wilcox 1980, 1985). In subsequent years, habitat fragmentation has been found to cause barriers to species movement or migration (Meffe and Carroll 1997), crowding effects (Leck 1979, Noss 1981, Lovejoy *et al*. 1986), local and regional extirpations, (Wheelright 1983, Lawrence 1990, Shaffer 1991, Carlson and Aulen 1992, Powell and Bjork 1995, Ferreira and Laurance 1997, Fisher and Stocklin 1997). Reduction in core area causes a variety of detrimental edge effects (Janzen 1983, 1986, Ranney *et al*. 1981, Murcia 1995, Harris 1984, Franklin and Forman 1987, Chen and Franklin 1990, Chen *et al*. 1992, Paton 1994). Therefore, tracking human encroachment on habitat and fragmentation over time is critical to understanding the functioning of ecosystems (Saunders, Hobbs and Margules 1991). In addition, it is important to be certain that restoration plans are not designed to emulate fragmented habitats. Future acquisitions or additions to preserves must also be analyzed with an appropriate quantifiable method for the evaluation of the aforementioned effects.

Krummel (*et al* 1987) developed an index of fragmentation which uses a fractal dimension in its calculation. This fractal dimension was estimated by calculating the slope of the regression of log Perimeter on log Area for a series of patches ranked according to size. Krummel (*et al* 1987) then scales the value of the slope to a value of 1 to 2 to emulate the fractal dimension of a disc where 1 equals a perfectly circular perimeter and values nearing 2 indicate a very convoluted perimeter. Milne (1991) correctly points out that perhaps, the biology that determines the usefulness of the application of Krummel's index has not been fully established though in some cases it is undeniably useful. Milne's (1991) conclusion is based on the response of fractal perimeters to landscape constraints.

Krummel's index returns a value indicating less convolution for some scales of the perimeter as the actual perimeter of a patch approaches artificial landscape constraints because the index does not account for the simultaneous change in the area of the patch. This has the effect of claiming that core area increases for that patch when in fact the core area remains constant or decreases. Krummel's index also demonstrates that the fractal dimension for natural forests does not increase linearly with patch size, but rather, it peaks at different scales of analysis (Mladenoff 1997). The response of macro-organism diversity however, is exponential with relation to patch size (Wilcox 1985, Lovejoy et al. 1986), patch dispersion (Nekola and White 1999) and edge degradation (Murcia 1995, Franklin and Forman 1987, Chen and Franklin 1990, Chen *et al.* 1992, Maurer and Heywood 1993, Kattan, Alvarez-Lopez and Giraldo 1994 and Nekola and White 1999). An index of fragmentation or patch dispersion should react in precisely the same manner regardless of scale, and the thoughtful scientist should be certain that the scale chosen for analysis is appropriate to the question (Lord and Norton 1990).

I have developed an index of core area that avoids this pitfall being applicable to all scales of analysis. The index can be used to make predictions with regard to resident species in a preserve, to address future land acquisition, or to compare similar preserves (or potential preserves).

Following Krummel's (*et al* 1987) premise, the smallest perimeter possible for any given enclosed area is a perfect circle (Milne 1991). Therefore, the perimeter of a subject site can be compared to the perimeter of a disc having the same area as the subject site (Milne 1991, Krummel *et al* 1987). In this way, we may judge the degree of convolution of a site's perimeter or its proportional core area. I propose the following ratio as an index of core area based on this logic.

$$K = \frac{\text{the } perimeter \text{ of the subject area if that area were disc-shaped}}{\text{actual } perimeter \text{ of the subject area}} =$$

$$K = P_D/P =$$

$$K = \frac{\pi\, 2\, [\sqrt{(A/\pi)}]}{P}$$

Where: A = the area of the sample

P = the perimeter of the sample

P_D = Perimeter of area of same size as sample if shaped as a disk

If our sample site were a disc, we could divide its area by *pi* to obtain the radius squared. Two times the square root of the radius squared is the diameter. *Pi* times the diameter is equal to the circumference of a circle that represents the idealized, smallest, perimeter of the sample site. Therefore, the clause $\pi 2 \sqrt{(A/\pi)}$ represents the perimeter of the sample area if that area were disc shaped. When divided by the sample area perimeter, it creates a ratio representing departure from the idealized, smallest perimeter. The range of the index is a ratio between 0-1. When *K* is equal to 1, the area is enclosed by a circular perimeter. As *K* becomes smaller the sample area is enclosed by a perimeter further removed from a circle gaining greater complexity (convolution) and reducing core area (Milne 1991, Schneider 1994). *K* in fact, is a direct estimate of the fractal dimension of a site's perimeter / area relationship. It has the same range as the fractal dimension where 1 equals the lowest level of convolution – a disc – and 2 equals the greatest level of convolution possible within a plane. It can be interpreted in exactly the same manner as a fractal dimension and can be converted to the estimated fractal dimension *d* with the equation:

$$d = (1-K) + 1.$$

When the core area of a site is degraded to the point where patches of the original community are now separated by a matrix which is unsuitable for most or all of the species in the community we say that the habitat has been fragmented. *K* can be used with sample sites composed of several disjunct parcels (Figure 1) however it was intended that this particular index would be unaffected by the distance between parcels. *K* values are determined only by the area enclosed within a subject site perimeter or within the perimeters of several patches. The distance between patches might vary considerably, yet have the same core area within their collective perimeters.

There are several qualities which are important in evaluating fragmentation. The rate of a species' (or its propagule's) movement in one general direction among patches (or in a continuous habitat) is called percolation (Murcia 1995). The resistance to that movement caused by spatial characteristics in the landscape is called permeability (Murcia 1995).

A species' ability to move from its place of origin to a receptor or target site decreases negative exponentially with distance (Roughgarden, Gaines and Pacala 1987, Brothers and Spingarn 1992) and is known as its diffusion rate or its dispersion ability.

Contagion refers to genetic communication between patches (not to be confused with the statistical term) . It is measured using the relationship of patches or islands to each other in terms of size and distance. A series of measurement techniques is required to quantify these characteristics. For the purposes of modeling, it is important to use practical and related measures that can be applied to a wide variety or organisms on many scales.

There are two indices in the literature that attempt to measure the dispersion among patches. One is called the Proximity Index and was developed by Gustafson and Parker (1992). The Proximity Index uses a nearest neighbor method of calculating the contagion of patches in a user-defined area. The index is the sum of the area of each patch after being divided by its nearest neighbor distance. While the inclusion of patch area is sound, the idea that a measure of distance is adequate to the task of calculating dispersion of patches is contrary to the prevalent thought on this subject which is that a species' ability to disperse over any given distance (Okubo and Levin 1989), and patch/island similarity (Nekola and White 1999) both have a negative exponential relationship to increasing distance between patches or islands. Had Gustafson and Parker (1992) used a mean square measurement between islands they would have been closer to a viable index (Milne 1991).

The second index of dispersion in the literature -- the Isolation Index -- was created by Nekola (1999). Nekola (1999) uses an exponential relationship between patches to down-weight the genetic effect of a patch on other subject patches based on its increasing distance from those patches. This approach is based on sound ecological principles (Okubo and Levin 1989, Nekola and White 1999), however the method leaves the rate of exponential decay to the user's discretion. He makes no argument for any particular rate of decay, propounding instead the idea that every biological function or species dispersion characteristic has a particular decay rate associated with it, and it is up to the user to make that determination.

I believe that one can begin with the notion that dispersion among patches or islands is the starting point for the evaluation of all other calculations regarding biotic factors affecting the movement or migration of species or their propagules in a fragmented landscape. Nekola (1999) demonstrates that change along environmental gradients as patches become more distant from each other, leads to the differential competitive sorting among species. This sorting is affected by the environmental amplitude – or niche breadth – of the species, and the dispersal ability of species. All of these important factors are ultimately defined by the distance between patches, and calculations regarding the distance between patches necessitate accounting for the size of the patches.

To calculate the raw probability that a patch or island is invaded by a species from another site – based strictly on habitat size and isolation – we need only divide the area of the target patch in question *(A_t)* by the area of a disc which has a radius *(R_i)* equal to the greatest possible distance between perimeter points from the invading patch (or population if there is a difference in size) to the target patch (Figure 3). The equation is:

$$P_1 \text{ (patch t is invaded from patch i)} = A_t / \pi R_i^2$$

The relationship of target size and distance from the source is treated exponentially with this formula (Figure 4). By extension, the probability that a particular target site is invaded from any set of sources is constituted of the previous equation summed across all patches that harbor potential invaders.

$$P_2 \text{ (patch t is invaded from among all patches)} = \sum_{i=1}^{n} (A_t / \pi R_i^2)$$

Clearly, we can evaluate the contagion among all patches by yet another extension of the equation where the probability that a target patch is invaded is summed across all potential target patches.

$$D = \sum_{\substack{i=1 \\ t=1}}^{n} (A_t / \pi R_i^2)$$

The value ***D***, measures the likelihood that gene flow will occur among all patches. This index reacts exponentially to average inter-patch distance and to patch size. Contagion and its subordinate probabilities are strictly a function of a mathematical system and as such they assume that the recolonization effort is ongoing, that colonists can travel the required distance, that the geographical direction that colonists may travel is random, the matrix is benign, and that at least one propagule can survive at each target site. It can be modified by life history traits of species in the patches, climate traits or any other factor the user requires to define a more exact value.

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Appendix 6

Ohlendorf vs. IDOT

A Tree Valuation

Performed using Volumetric and Maturation Comparison Methods

For Trees Located on a Property Commonly Known As:

The Southeast Corner of Klemme and Exchange Roads

Eldertree Stoneoak & Brookings, Inc. • 10269 West Lincoln Highway • Frankfort, Illinois 60423

Table of Contents

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A TREE VALUATION

GENERAL INFORMATION

Eldertree S&B Client (User):	Melvin Ohlendorf
Client Contact:	Melvin Ohlendorf
Client's Address:	3041 East Offner Road Beecher, Illinois 60423
Client's Customer:	Illinois Department of Transportation
Subject Site Name or Description:	Vacant forested land
Subject Site Address:	Southeast Corner of Klemme & Exchange Roads
Date:	January 12, 2004
Date of Inspection:	November 3, 2004
Field Inspector(s)	Consuelo Cazares John Sabuco Paul Vicari William Sluis
File Number:	E04-179L

Executive Summary

Purpose and Scope of Work

It is our purpose to determine the present-day dollar value of 3 white oaks (*Quercus alba*) and 7 bur oaks (*Q. macrocarpa*) on the subject property. The trees to be valued lay between the east edge of Klemme Road and a line determined by the Illinois Department of Transportation (IDOT) that is roughly 20-30 feet east of the roadway. Eldertree used a line 10 feet east of a line of stakes placed by IDOT to determine the position of this eastern boundary. The trees included all trees with a diameter at breast height (DBH – 4 feet above base of tree) of 10 inches or greater per state rule.

Overview of Methods

We used two methods to arrive at a fair price for the trees that are to be removed. There is a third method that I will describe that is outside of the expertise of this company. The first method used is to approximate the biomass (the approximated total volume of above-ground biological material) of the trees to be removed in a scientifically-accepted manner, convert the difference to a value factor or multiplier and then compare that biomass to the biomass of commercially available trees. This then allows for the same factor to be used to calculate the price of the trees to be removed based on biomass.

Our second approach uses age as mediator to determine the comparability of the trees to be removed and commercially available nursery stock. Nurseries know precisely how long it takes to bring a tree of a given species to a salable product from initial propagation. Therefore, we determined the age of the trees to be removed and used this to determine a multiplier that could be used to arrive at a dollar value based on the price and age of comparable nursery stock.

The third approach that is commonly used is a real estate valuation method. In this method, the value of the land is determined with and without the trees removed. The highest and best use of the land must be determined first. For instance the property in question probably has a highest and best use as estate housing. A qualified appraiser would determine the value of each lot as wooded with ancient trees or as lots without the large trees. The difference in lot price is the value of the trees. We are not qualified to use this method, however, we have often had the opportunity to associate this method with our own results during the 26 years this company has been in business and have found ***concurrence in all cases.***

Results

We have determined the value of all ten trees as follows.

Method	Value
Volumetric comparison	$1,671,250
Maturation comparison	**$175,000**
Average	**$923,125**

Methods

All measures, though originally taken in metric values, have been converted to English system values so that the reader might follow this report more easily.

METHOD 1 – VOLUMETRIC COMPARISON

Determination of Height

ESB used a Clino Master Clinometer to determine the height of trees. Using a baseline of 100 feet, the base of a tree was sighted and the percentage noted. Then the top of the tree was sighted and the percentage noted. These percentages are then added together and multiplied by the baseline to determine the height of the tree.

Determination of Basal Area

Basal area is the area of a cross section of the truck of a tree at a specified distance above ground. It is an accepted measure of biomass in forest ecology (Mueller-Dombois and Ellenberg, 1974, Grieg-Smith, 1983, Curtis 1959)

We obtained the circumference of the tree trunks at breast height less the thickness of the bark and divided the value by pi to obtain the diameter and again by 2 to arrive at the radius. This number was squared and multiplied by pi to arrive at the basal area.

Determination of the Coefficient of volume

Basal area is accepted as a measure of mass used by ecologists for individual trees when determining the biomass of trees in a forest because as branches divide and divide again there is no increase in mass as indicated by girth of the branches. In other words, if the branches of a tree could be compressed into a single branch or rather an extended trunk, the trunk would form a consistent cylinder of wood with a cross section area that is roughly equal to the basal area as measured above.

Basal area and height are highly correlated in nursery-grown tree stock, and these are the common indicators of nursery stock value. Prices for stock are heavily based on basal area as represented by DBH or height (as well as rarity, difficulty in propagation, and nursery time to salable stock). Basal area and height are ***not*** correlated in trees of advanced age (such as the subject trees) due to a variety of environmental conditions that can affect height, and girth of the trunk separately (Caswell and Cohen 1993, Curtis 1959, Mueller-Dombois and Ellenberg 1974). The correlation coefficient for the trees on site is found in Figure 1 and there is no correlation between height and basal area for the ten trees on site $r = 0.0182$). Therefore, we must use the product of the two measures to attain a common measure of volume or aboveground biomass for all trees. The product of height and basal area is the most common method of determining the biomass of individual trees (Grieg-Smith 1983). This measure is the coefficient of volume *V*.

ESB also determined the coefficient of volume for 3-inch diameter, oak nursery stock based on data collected by Sabuco (1996) from over 300 specimens.

Determination of Value

The coefficient of volume for the ten trees to be demised (V_D) was divided by the average coefficient of volume for the 3-inch oak nursery stock(V_N). ESB then took the sum of these values (ΣV_D) .

ESB averaged the wholesale prices for 3-inch oak nursery stock from 12 sources in the Chicago Area, and then multiplied that value by 0.95 to account for the possible bias that higher priced nurseries may have been selected accidentally. This number was rounded to $350.

The value for the trees **(C)** was then determined by dividing the sum of values (ΣV_D) after division by the value of nursery stock (V_N) and then multiplied by the modified average wholesale value of the nursery stock (**$**). The equation is:

$$C = \$(\Sigma V_D / V_N)$$

METHOD 2 – MATURATION COMPARISON

Overview

Trees in temperate climates form (nearly) annular growth rings within the xylem wood that hardens and preserves a record of the growth within the trunk. If it were possible to do so, one could simply count the rings that a tree produces from the outer edge to the center of the trunk to determine the age of the specimen. Cutting down a tree to determine its age is, perhaps, a bit harsh for the information that is retrieved. Therefore, foresters have developed a coring tool that retrieves a piece of wood from the trunk that is a few millimeters thick and 8 to 18 inches in length in which the rings can be counted. These coring tools are rarely long enough to retrieve a core sample from the center of the tree, so scientific methods must be used to estimate the age of the tree based on a 8, 10, 12 or 18-inch core sample. Generally, there are five areas in which errors can occur in making this determination, assuming the rings are counted correctly within the sample.

Error Type	Name of Error	Under/Over Estimate
The diameter must be calculated from point above the root flare which means that the growth rings that are below that point are not captured. Calculation error is usually 20 years or less	Juvenile Capture Failure	UNDER
Trees do not produce growth rings in every year. Calculation error in trees in temperate climates is 1 year missing per 50- 70 years of growth.	Missing Rings	UNDER
Core is not a true radius of trunk. Calculation error depends on degrees of incorrect angle but no usually more than 5 years per inch of core. Easily corrected.	Skewed Core	UNDER
The core sample from the outer rings of older trees usually represents the slower growth of the tree, so rings are more compressed in the sample. Calculation error may increase the age of the tree by as much as 5 to 15%.	Incomplete Sample	OVER

Error Type	Name of Error	Under/Over Estimate
Estimate of negative exponential growth function from mature trees to correct for Incomplete Sample error does not fully correct for the functional rate of declination. May account for 1 to 5 % overestimate.	Sample Bias	OVER

Incomplete sample error accounts for a greater absolute error than all other error types combined. Therefore, this is type of error is rigorously corrected. The skewed core error is easily corrected using trigonometry. Missing rings error is impossible to correct. Juvenile capture error is impossible to correct because growth of forest trees are not easily predictable in their early years. A sapling may sprout and grow to 3 or 4 feet in height and not grow significantly again for many years until there is break in the canopy, and it reaches for the gap (Sutherland 1990). Conversely, a sapling may experience no impediment at all and it will display uninterrupted growth for its entire life time. There is no way to know.

Normally, after correcting for the types of error that we can correct for (Skewed Core and Incomplete Sample), ecologists assume there is some balance among the remaining types of error (Juvenile Capture Error, Missing Rings and Sample Bias) or at least that the estimated age derived from the process is close enough to the real age to use for the model in question. Correlative field studies have borne out this assumption (Harper 1977). A discussion of these error types is always requisite, however, when working with core samples from trees.

Collecting Core Samples & Counting Annular Rings

ESB used a Suunto 12-inch core sample with a Teflon® coated bit to extract the cores from the ten trees to be demised. Samples were placed in plastic zipper bags with absorbent paper to control moisture. ESB labeled the bags with indelible marker to indicate tree species and position. The holes remaining in the trees from coring were filled with biologically inert, self-hardening, flexible filler. ESB also measured the circumference of the trunk of each tree at breast height and calculated the radii as described under the section titled **Determination of Basal Area**.

ESB lightly sanded the core samples with extra fine abrasive cloth and then immersed the cores in water to accentuate the differences between rings. Under 30 power magnification, the average arc of the rings was determined by overlaying a cross-hair grid and aligning the greatest extent of the arc with the centerline of the core sample. Only one sample had to be corrected for angle. Using a microscope, the average width of the rings from the entire length of the core was calculated and then divided into the radius of the trunk to correct for the Skewed Core error.

ESB counted the rings in the core sample and extrapolated the total number of rings per radius of the tree based on the rings per increment of measure to arrive at the number of years that the tree has grown after reaching breast height (uncorrected age after breast height – UAABH). This number is an over-estimate in most cases because of the incomplete sample error noted above.

Correction for Incomplete Sample Error

Trees slow in their growth as they get older (senesce). This slowing manifests as a negative exponential decline in growth rate.

Using Statistica 7.0 by Statsoft, ESB fit a negative exponential function to the data which was sorted in descending order. The fit of the function to the data appears to be accurate (Figure 2) however the first data point seems to be greater that the function anticipates. This could indicate that the best function fit is a Zipf-Mandelbrot distribution. To determine this, the Y-axis is converted to a logarithmic scale. The result shows that the physical variance from the distribution is similar to the variance of all other data from the fitted function and that fit is acceptable. The equation of the fitted negative exponential function is:

$$y = 661.2685^{(-0.0513x)}$$

of the form:

$$y = a^{(-bx)}$$

Where y = age, x = an individual tree, a = the intercept on the y axis after extension from a right-handed Riemann sum, and –b is the rate of declination.

The UAABH is multiplied by the rate of declination (0.0513) and that product was then subtracted from the UAABH to arrive at the estimate age of the tree less the age at breast height. We have made the assumption that all other forms of error cancel each other, and therefore call this number the estimate age.

Determination of Value

Sabuco (1996) determined the age of nursery stock in oak trees of several species from samples of more than 300 individuals per species, grown on their own roots. The nursery stock was 2, 2.5, and 3 inches in diameter and located in nurseries in northeast Illinois and northwest Indiana. The age was determined from propagator's records. The average age for a 3-inch bur oak was 5 years 2 months and for a white oak was 5 years 8 months. By dividing the estimated age of a tree (A_E) by the average age of bur/white oak stock of 5.5 years (A_S), we arrived at a multiplier that we used to multiply the wholesale price ($) of the 3-inch stock to arrive at a value based on the age of the trees to be demised.

$$C = \$(A_E / A_S)$$

Discussion

The methods used in this report assume that the value of a nursery-grown tree continues to increase in value as the tree gains in size and age. It may be argued, that the early years of nursing the tree are more expensive that the later years, the later years of growth taking place in passive environment (very little labor is expended per tree once it is in a large stock block). I would argue that one must add to the cost per tree attrition (due to disease, storms, accidents) spraying cost for herbicides and pesticides, unsalable stock due to misshapen growth, and other costs that reduce the salable stock as the tree grows larger. Therefore, the realistic cost of a hypothetical tree grown to advanced age while likely less per inch of diameter than a very young tree, is still in keeping with the cost of 3-inch nursery plant, which in nursery terms is at the large end of the salable stock size.

The disparity in valuation by the two methods is usual for humid temperate climates. In harsh climates where the growth is less vigorous, the valuation techniques derive much more similar numbers, and often the value by age produces a higher value that the volumetric method in areas such as desserts or hurricane riddled regions. Because of this, it is often argued that the lower value should apply due so as not to penalize the state for the excellent growing conditions or vice versa. I would argue that the best approach is the average value as this would generate consistent amelioration of numbers for vastly different conditions across a vastly different nation.

Important to this discussion is to answer the value question in reverse. How is possible that the valuation techniques used here could be wrong? Other minor adjustments for values in the equations, the resulting value based on actual commercial stock, and scientifically proven measures of volume and age will still result in a very high value for trees of this type. In short, it is not a matter to be taken lightly that the trees in question have stood for 222-365 years. They are very valuable by all reasonable measures.

Finally, the roadway widening in question could easily be changed to accommodate the trees. The entire west side of the roadway is an open pasture. Widening the road on that side of the roadway would harm nothing of value. The state should use the same standard that has been used in many other cases of this type. Avoid disturbance first, minimize damage second, then only if these methods do not suffice mitigate that loss of the natural habitat.

Sincerely,

John J. Sabuco, LLA
Ecologist
President
Eldertree, Stoneoak & Brookings, Inc.

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Tables & Figures

Table 1

Summary of Data

Species	Height (ft)	Height (m)	Basal Area (sqft)	Basal Area (sqm)	Coefficient of Volume	Adjusted age (yrs)	V_D/V_N Vol. Factor of 3" nursery stock	A_E/A_S Age Factor against 3" stock
Bur Oak 1	63	19.2	3.10	0.288	5.52	222	331	40
Bur Oak 2	65	19.8	3.43	0.319	6.31	236	378	43
Bur Oak 3	69	21.0	2.48	0.230	4.84	327	290	59
Bur Oak 4	74	22.6	4.15	0.386	8.70	293	521	53
Bur Oak 5	67	20.4	3.57	0.332	6.77	276	406	50
Bur Oak 6	60	18.3	2.31	0.214	3.92	249	235	45
White Oak 7	68	20.7	9.74	0.905	18.75	231	1124	42
White Oak 8	48	14.6	4.50	0.418	6.11	264	366	48
Bur Oak 9	56	17.1	5.71	0.530	9.05	289	543	53
White Oak 10	59	18.0	5.80	0.539	9.68	365	581	66
						Total	**4776**	**500**
3" Nurse Stock	12	3.7	0.05	0.005	0.02	5.5		

Note: Value assumes a replacement cost of $350 per 3-inch nursery stock oak tree

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Summary of Data

Species	Height (ft)	Height (m)	Basal Area (sqft)	Basal Area (sqm)	Coefficient of Volume	Adjusted age (yrs)	V_D/V_N Vol. Factor of 3" nursery stock	A_E/A_S Age Factor against 3" stock
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Note: Value assumes a replacement cost of $350 per 3-inch nursery stock oak tree

Table 1 Detail

Height

Species	in feet	line (%)	(%)	BSL*0.01	HSL*.01	Height (ft)	(m)
Bur Oak 1	100	3	60	0.03	0.6	63	19.2
Bur Oak 2	100	5	60	0.05	0.6	65	19.8
Bur Oak 3	100	3	66	0.03	0.66	69	21.0
Bur Oak 4	100	2	72	0.02	0.72	74	22.6
Bur Oak 5	100	3	64	0.03	0.64	67	20.4
Bur Oak 6	100	2	58	0.02	0.58	60	18.3
White Oak 7	100	4	64	0.04	0.64	68	20.7
White Oak 8	100	4	44	0.04	0.44	48	14.6
Bur Oak 9	100	5	51	0.05	0.51	56	17.1
White Oak 10	100	1	58	0.01	0.58	59	18.0
3" Nurse Stock						12	3.7

Basal Area

Species	Circum (m)	Diameter (ft)	(sqft)	(sqm)	of Volume	nursery stock
Bur Oak 1	1.9	1.99	3.10	0.288	5.5221	331.05
Bur Oak 2	2	2.09	3.43	0.319	6.3129	378.46
Bur Oak 3	1.7	1.78	2.48	0.230	4.8418	290.27
Bur Oak 4	2.2	2.30	4.15	0.386	8.6963	521.35
Bur Oak 5	2.04	2.13	3.57	0.332	6.7700	405.87
Bur Oak 6	1.64	1.71	2.31	0.214	3.9183	234.90
White Oak 7	3.37	3.52	9.74	0.905	18.7510	1124.13
White Oak 8	2.29	2.39	4.50	0.418	6.1118	366.41
Bur Oak 9	2.58	2.70	5.71	0.530	9.0507	542.60
White Oak 10	2.6	2.72	5.80	0.539	9.6840	580.56
3" Nurse stock		0.25	0.05	0.005	0.0167	
					Total	**4775.60**
					Value	**$1,671,250.00**

Age

Species	Rings/ inch	Diameter (ft)	Radius (in)	Age/breast height (yrs)	Negative adjustment	Adjusted age @ Breast Height (yrs)	Age Factor against 3" stock
Bur Oak 1	19.61	1.99	11.91	234	-11.68	222	40
Bur Oak 2	19.86	2.09	12.54	249	-12.45	236	43
Bur Oak 3	32.25	1.78	10.66	344	-17.19	327	59
Bur Oak 4	22.37	2.30	13.79	309	-15.43	293	53
Bur Oak 5	22.71	2.13	12.79	290	-14.52	276	50
Bur Oak 6	25.46	1.71	10.28	262	-13.09	249	45
White Oak 7	11.53	3.52	21.13	243	-12.17	231	42
White Oak 8	19.37	2.39	14.36	278	-13.90	264	48
Bur Oak 9	18.82	2.70	16.17	304	-15.22	289	53
White Oak 10	23.56	2.72	16.30	384	-19.20	365	66
						Total	**500.3845**
					Value	**$175,000.00**	

	Raw Age	ID	Height	BA	Adj Age
Sorted	384	White Oak 10	59	5.80	365
Final Data	344	Bur Oak 3	69	2.48	327
	309	Bur Oak 4	74	4.15	293
	304	Bur Oak 9	56	5.71	289
	265	Bur Oak 5	67	3.57	276
	264	White Oak 8	48	4.50	264
	251	Bur Oak 6	60	2.31	249
	249	Bur Oak 2	65	3.43	236
	243	White Oak 7	68	9.74	231
	234	Bur Oak 1	63	3.10	222

Table 1 Detail

Height

Species	in feet	line (%)	(%)	BSL*0.01	HSL*.01	Height (ft)	(m)
Bur Oak 1	100	3	60	0.03	0.6	63	19.2
Bur Oak 2	100	5	60	0.05	0.6	65	19.8
Bur Oak 3	100	3	66	0.03	0.66	69	21.0
Bur Oak 4	100	2	72	0.02	0.72	74	22.6
Bur Oak 5	100	3	64	0.03	0.64	67	20.4
Bur Oak 6	100	2	58	0.02	0.58	60	18.3
White Oak 7	100	4	64	0.04	0.64	68	20.7
White Oak 8	100	4	44	0.04	0.44	48	14.6
Bur Oak 9	100	5	51	0.05	0.51	56	17.1
White Oak 10	100	1	58	0.01	0.58	59	18.0
3" Nurse Stock						12	3.7

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White Oak 8	2.29	2.39	4.50	0.418	6.1118	366.41
Bur Oak 9	2.58	2.70	5.71	0.530	9.0507	542.60
White Oak 10	2.6	2.72	5.80	0.539	9.6840	580.56
3" Nurse stock		0.25	0.05	0.005	0.0167	
					Total	4775.60
					Value	$1,671,250.00

Age

Species	Rings/ inch	Diameter (ft)	Radius (in)	Age/breast height (yrs)	Negative adjustment	Adjusted age @ Breast Height (yrs)	Age Factor against 3" stock
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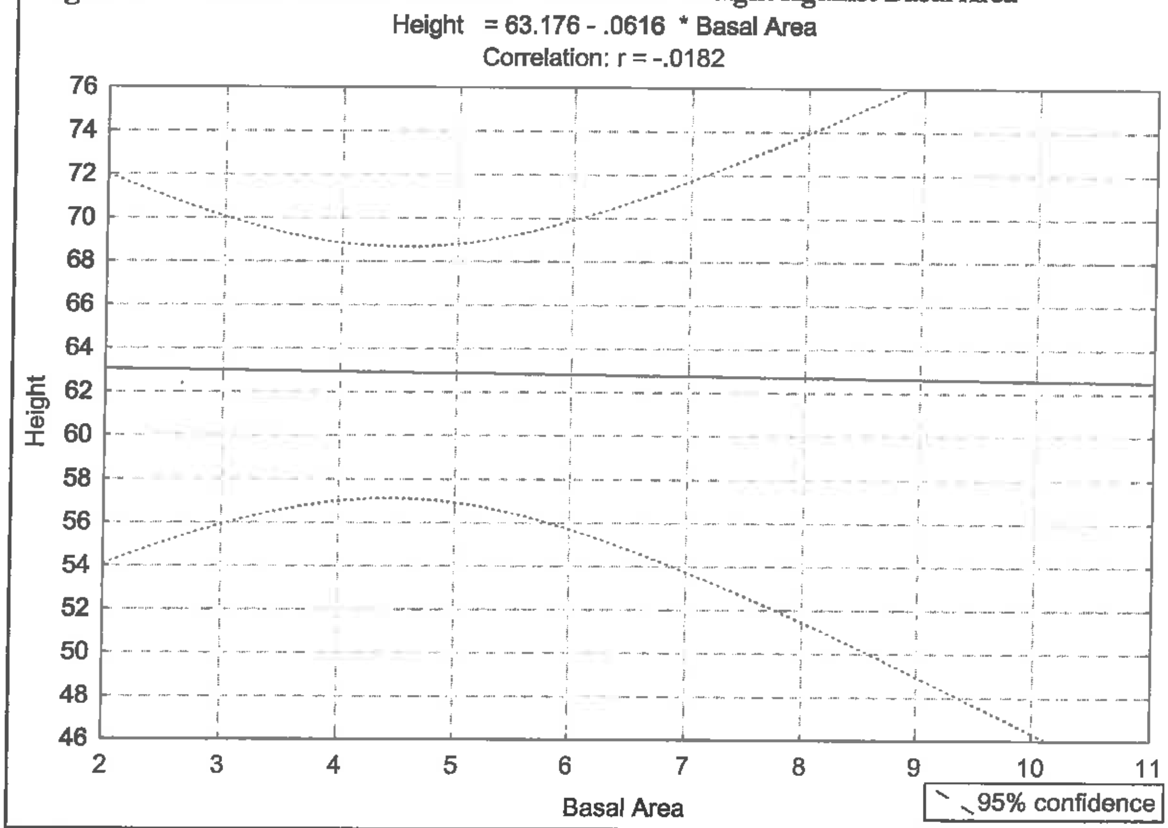
	243	White Oak 7	68	9.74	231
	234	Bur Oak 1	63	3.10	222

Figure 1 **Pearson Product Moment Correlation: Height Against Basal Area**



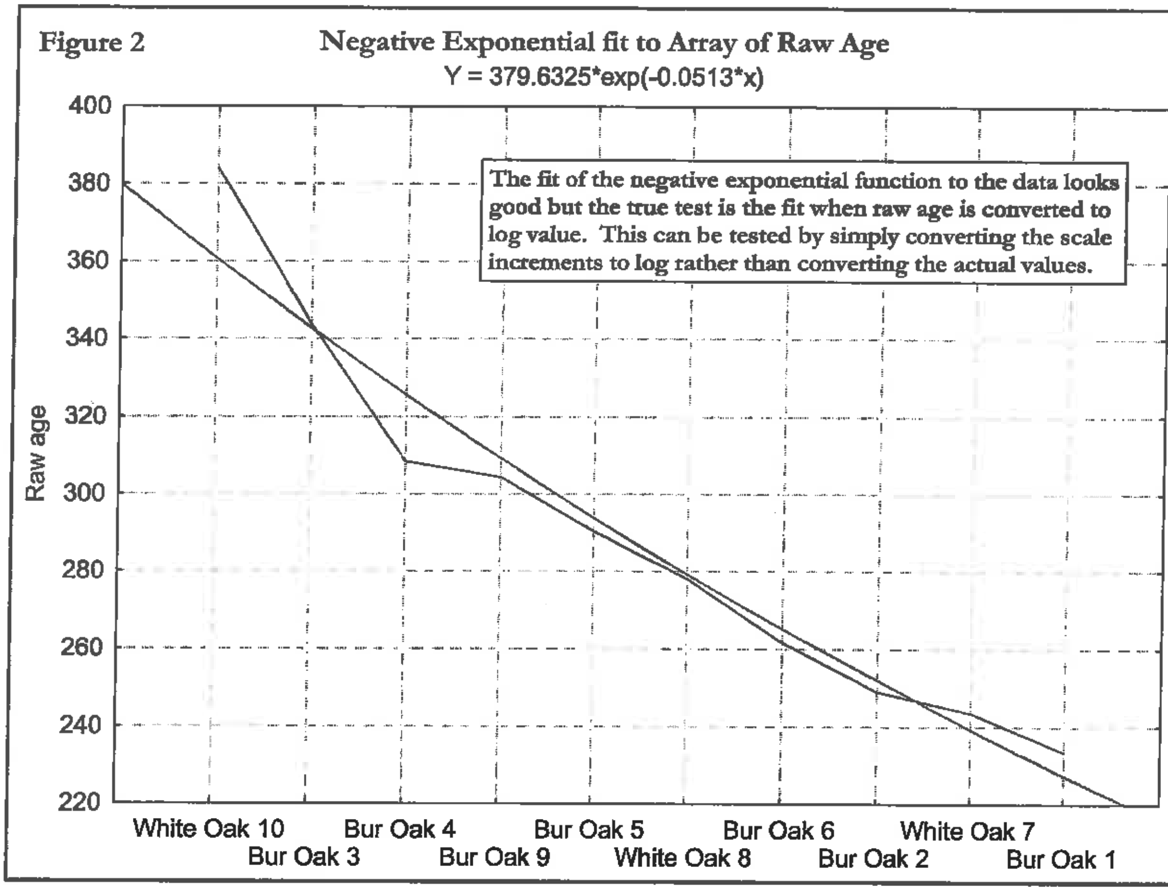
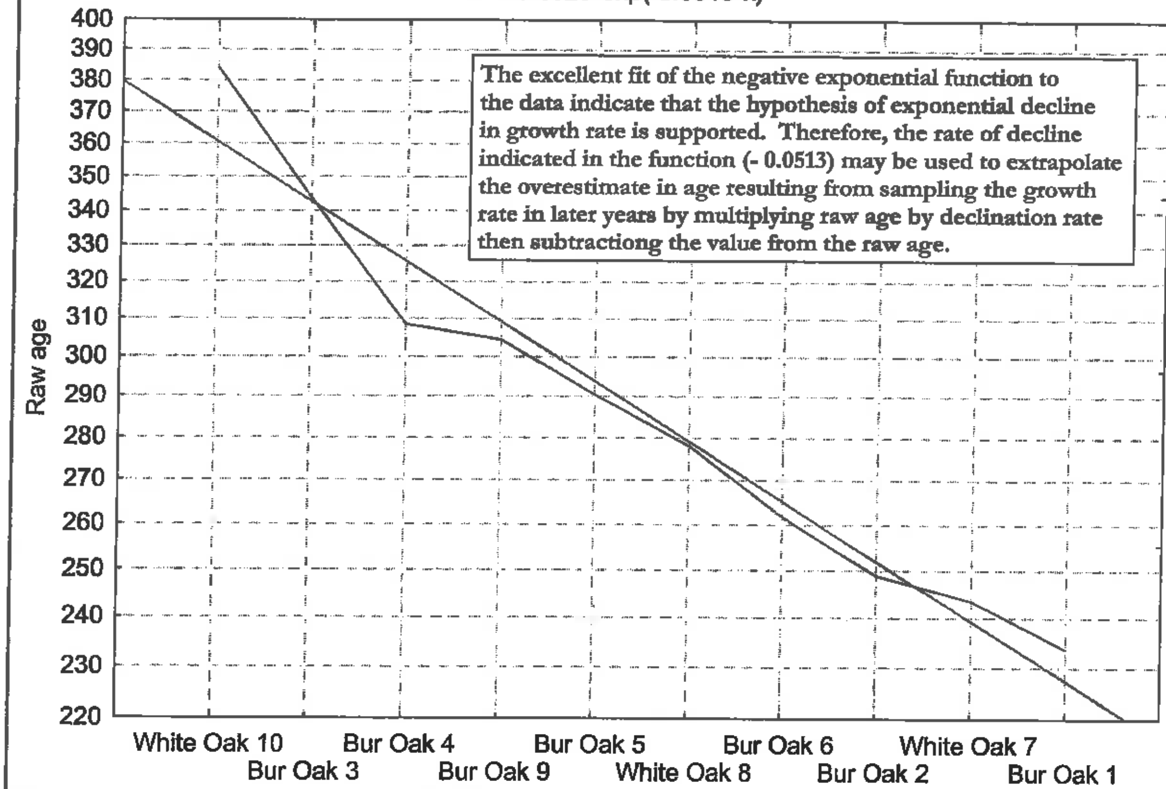


Figure 2
Negative Exponential fit to Array of Raw Age
Y = 379.6325*exp(-0.0513*x)
The fit of the negative exponential function to the data looks good but the true test is the fit when raw age is converted to log value. This can be tested by simply converting the scale increments to log rather than converting the actual values.
Raw age
400
380
360
340
320
300
280
260
240
220
White Oak 10
Bur Oak 3
Bur Oak 4
Bur Oak 9
Bur Oak 5
White Oak 8
Bur Oak 6
Bur Oak 2
White Oak 7
Bur Oak 1

Figure 3 Negative Exponential fit to Array of Raw Age -- Log Scale

Y = 379.6325*exp(-0.0513*x)



Appendix 7

Tree Photographs

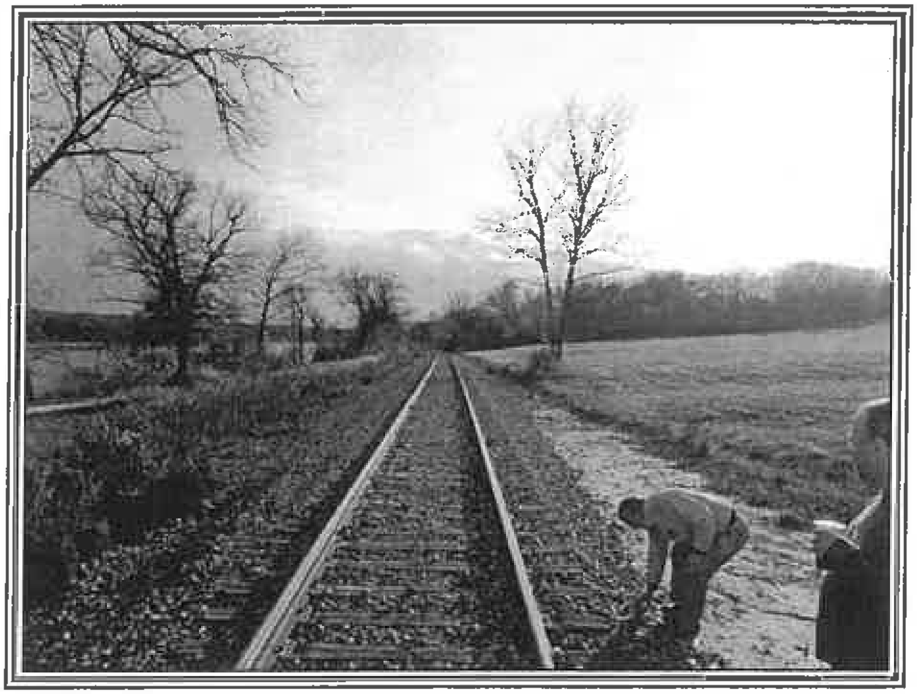


Figure 1

Example of tree stand (in distance)

Figure 2

Proximity of the Fox River to the subject site with roosting trees

Figure 3

Roosting trees along the Fox River

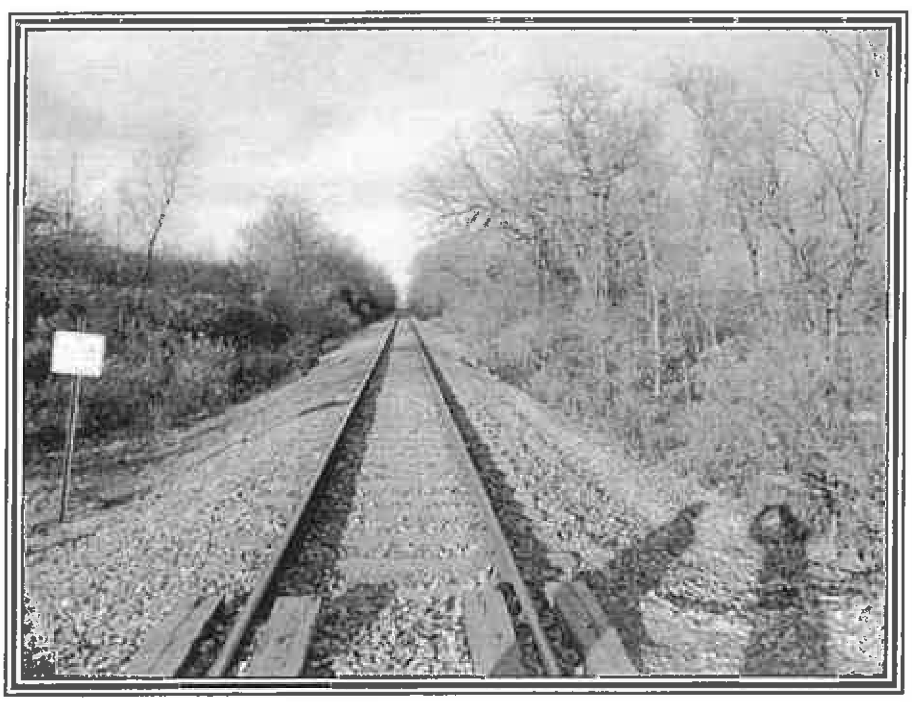


Figure 4

Large trees in path of lines to rigth

Figure 5
Example of large tree located on the subject site

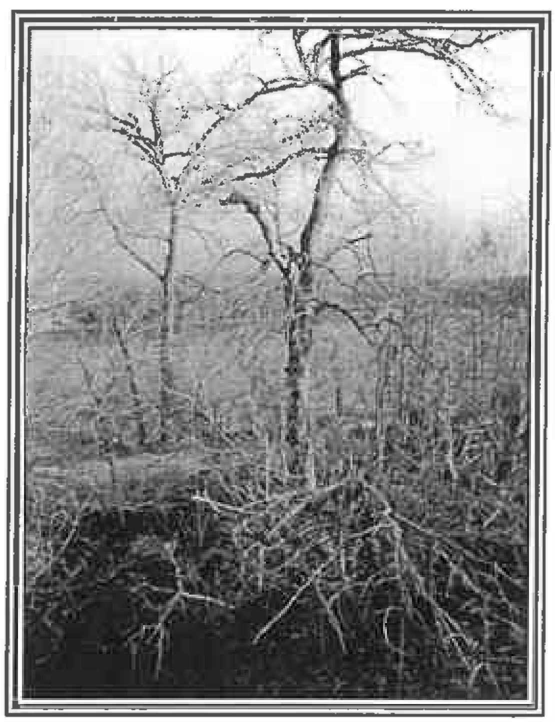


Figure 6
Roosting trees located on the subject area

Figure 7
Example of the large trees located on the subject area

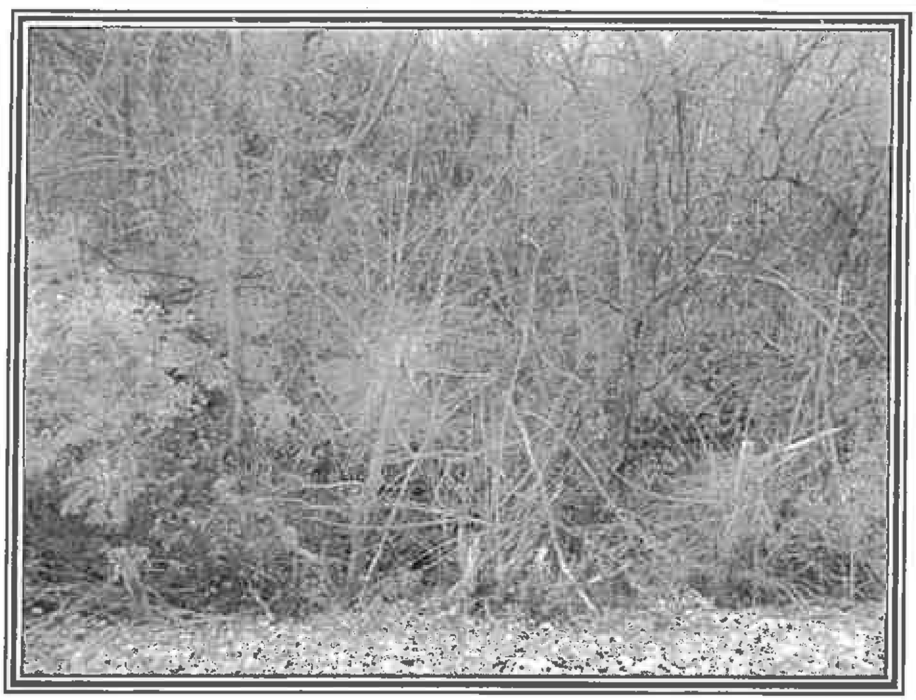


Figure 8
Example of the tree diversity located on the subject area

Figure 9
Example of the tree diversity and large trees located on the subject area

Figure 10
Example of average tree diversity for large trees located in the subject area

Figure 11
Example of the tree diversity and large trees located on the subject site

Appendix 8

Proposed and Alternate Routes Photographs

Figure 1

North end of proposed route

Figure 2

Example of forested area and gravel pit along proposed route

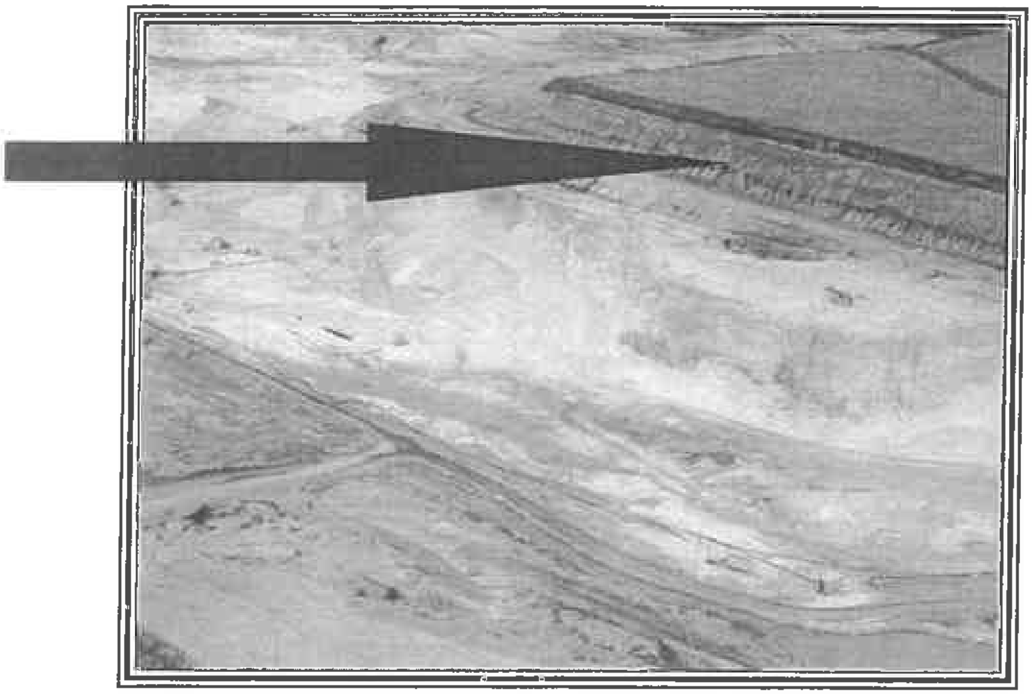


Figure 3

Example of erosion alongside gravel pit

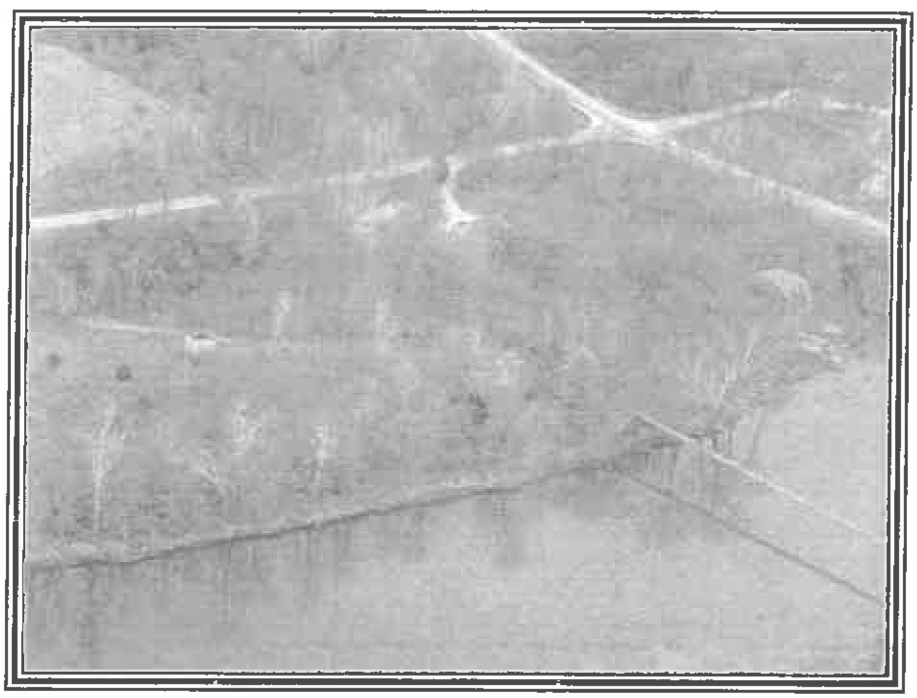


Figure 4

Example of forested land and large trees along proposed route

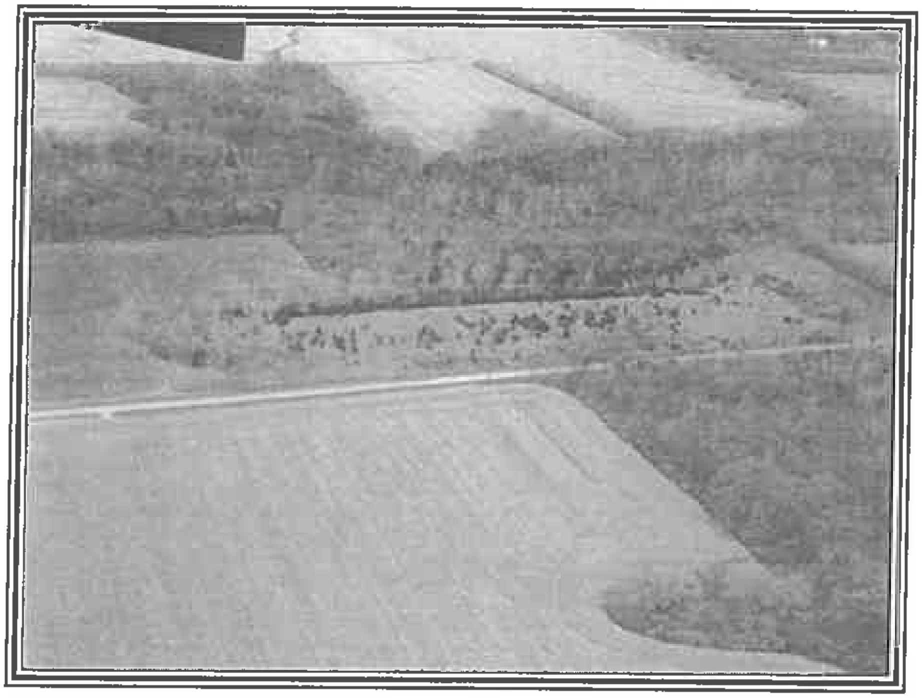


Figure 5
Example of forested land and large trees along proposed route

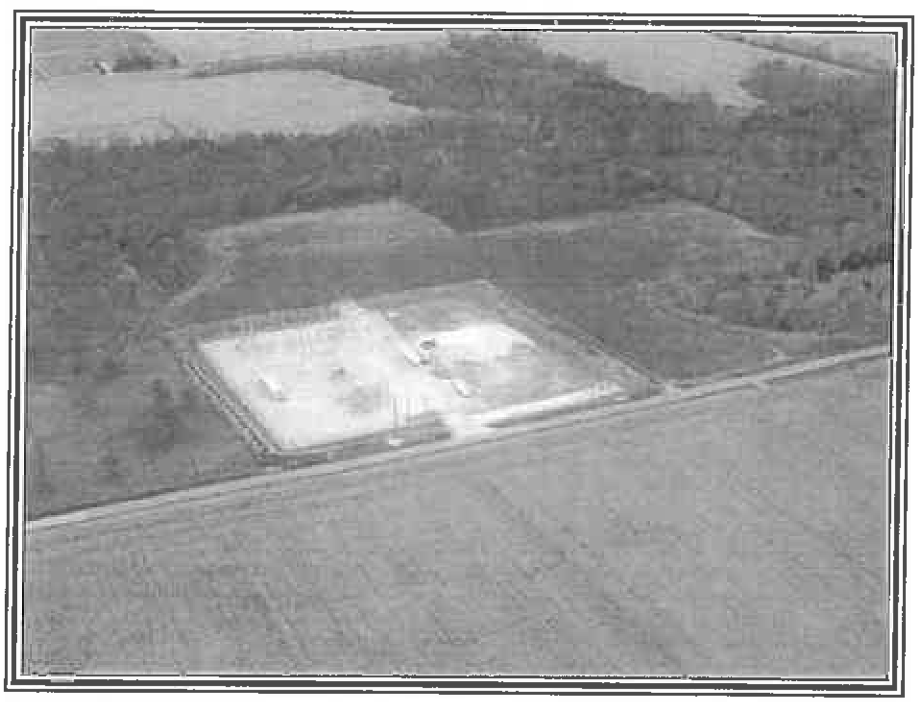


Figure 6
ComEd substation termination of proposed route

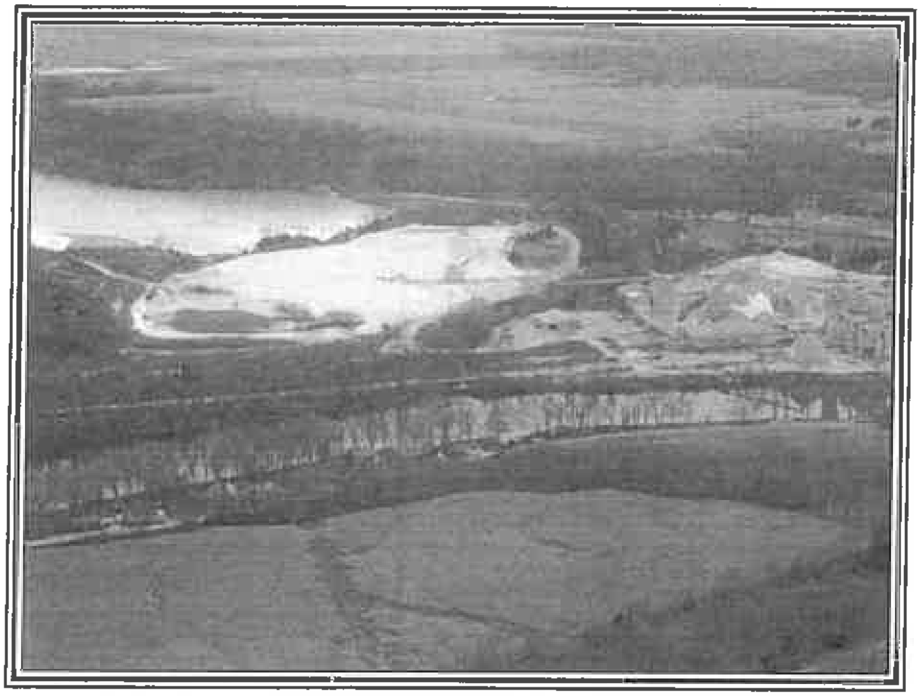


Figure 7
Gravel pit and examples of roosting trees on the river along proposed route

Figure 8
Example of forested land and large trees along proposed route

Figure 9

Example of forested land, gravel pits and large trees along proposed route

Figure 10

Gravel pit and erosion along proposed route

Figure 11
Gravel pit and erosion along proposed route; roosting trees in foreground

Figure 12
Example of forested land and large trees along proposed route

Figure 13
Example of forested land and large trees along proposed route

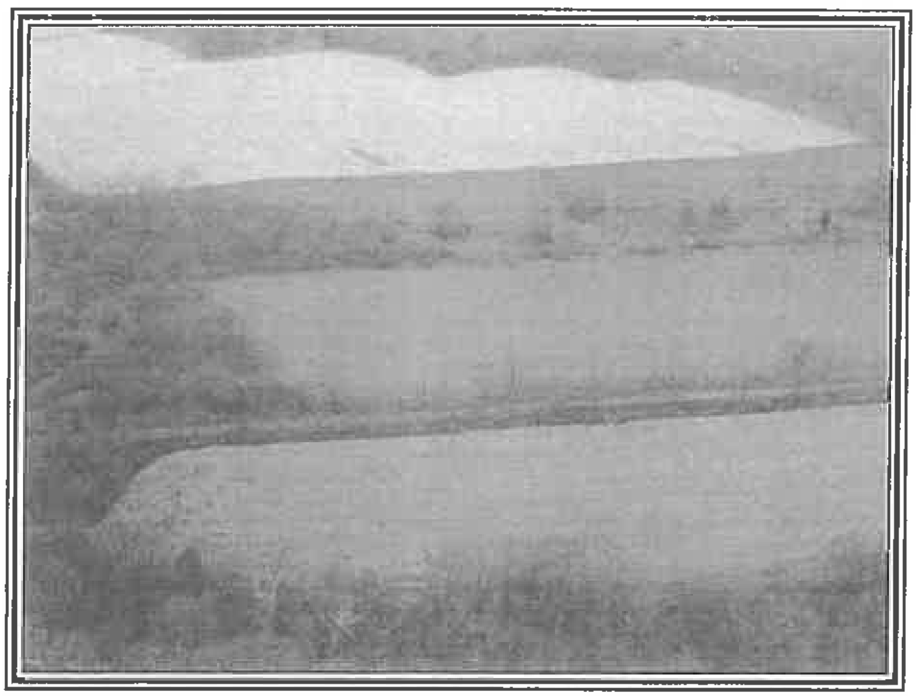


Figure 14
Example of forested land and large trees along proposed route

Figure 15
Example of forested land and large trees along proposed route

Figure 16
Example of forested land and large trees along proposed route near Sky Dive Chicago

Figure 17
Example of forested land and large trees along proposed route and proximity of single family homes

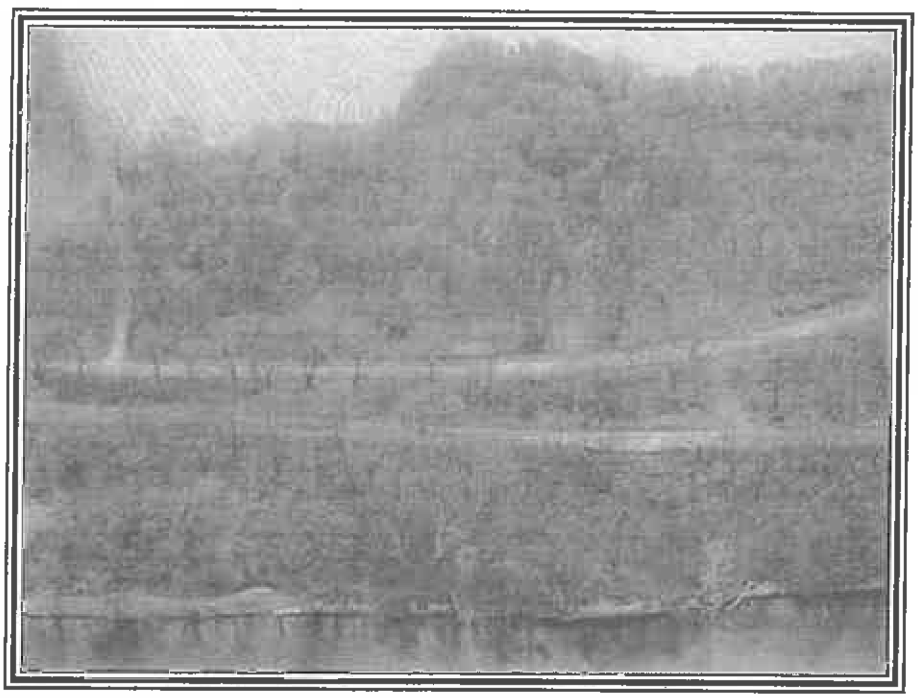


Figure 18
Example of forested land and large trees along proposed route

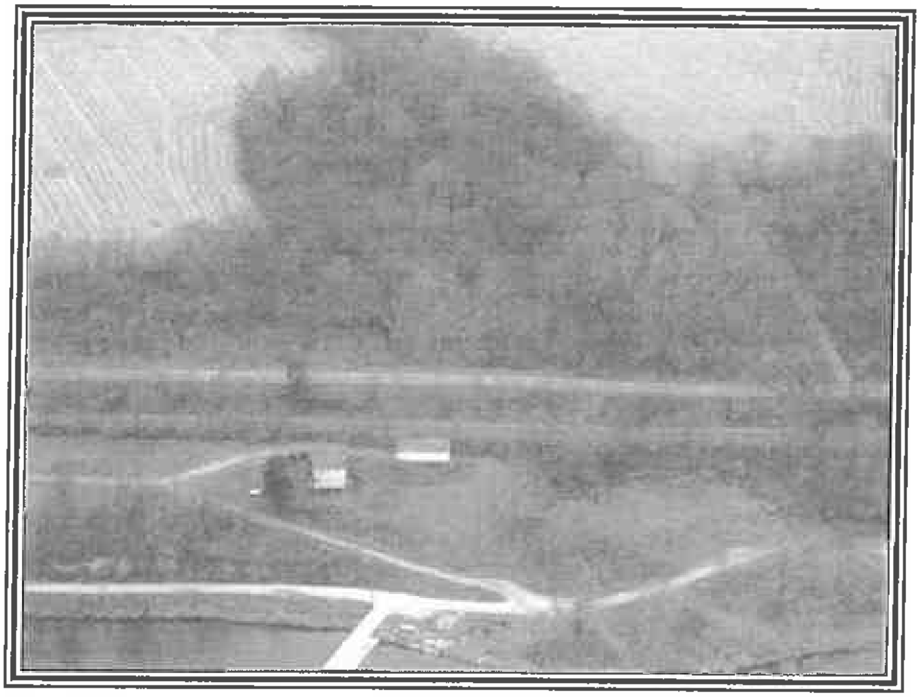


Figure 19
Example of forested land and large trees along proposed route

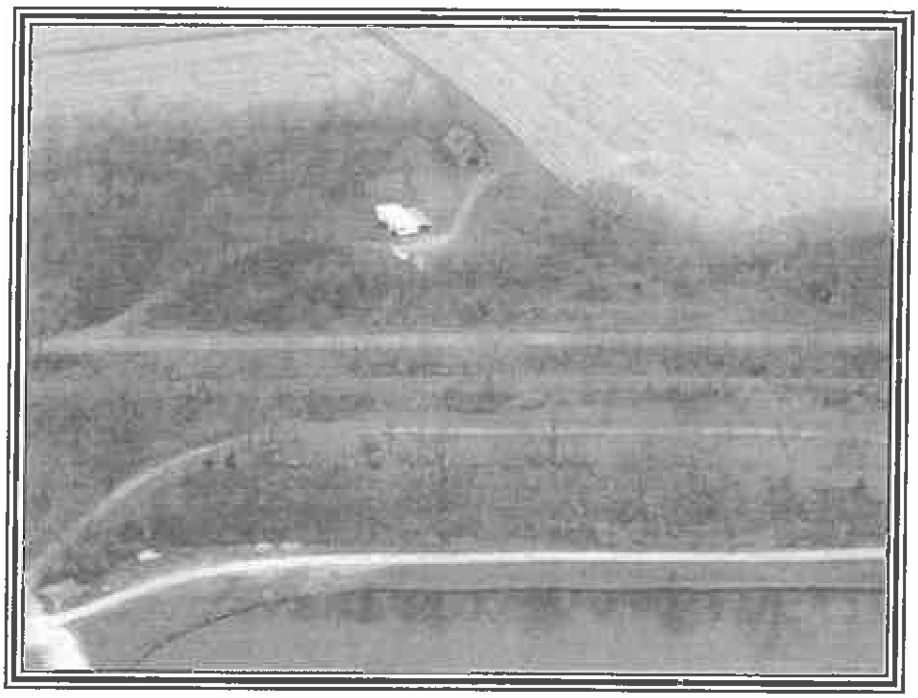


Figure 20
Example of forested land and large trees along proposed route

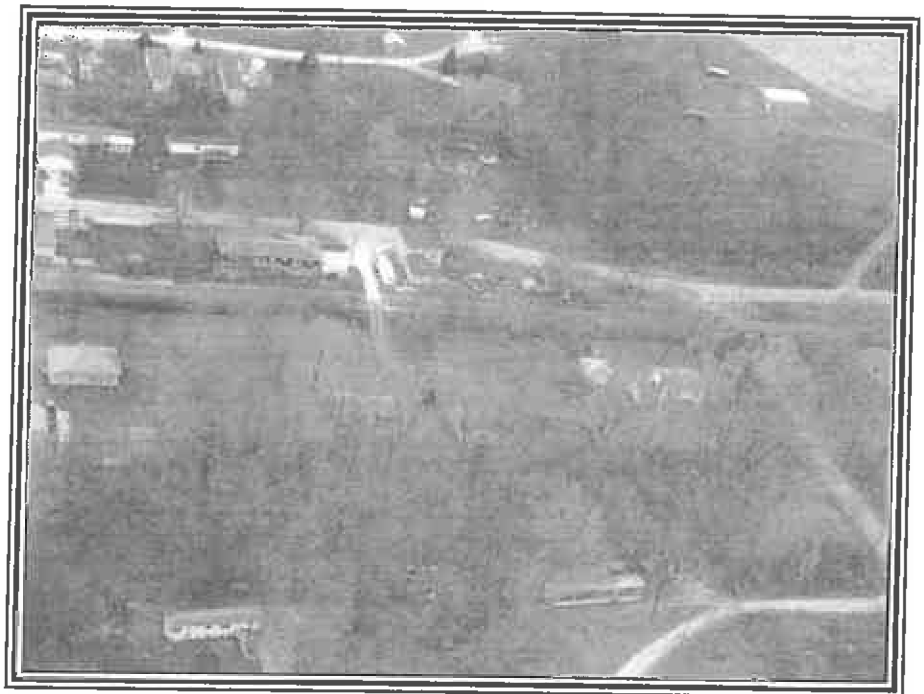


Figure 21

Proximity of residences to proposed route

Figure 22

Example of forested land and large trees and proximity of residences along proposed route

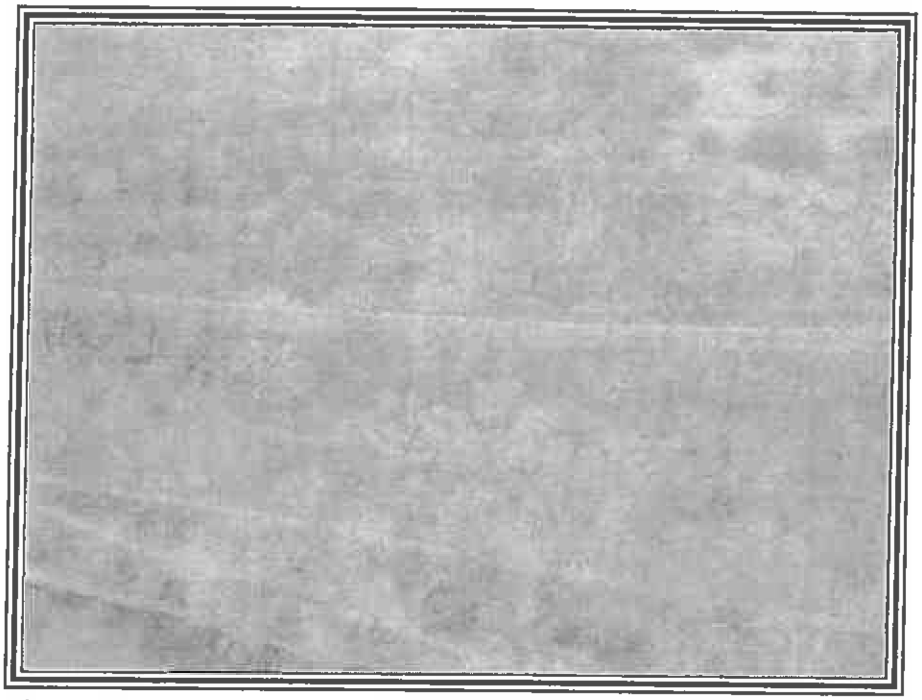


Figure 23
Example of forested land and large trees along proposed route

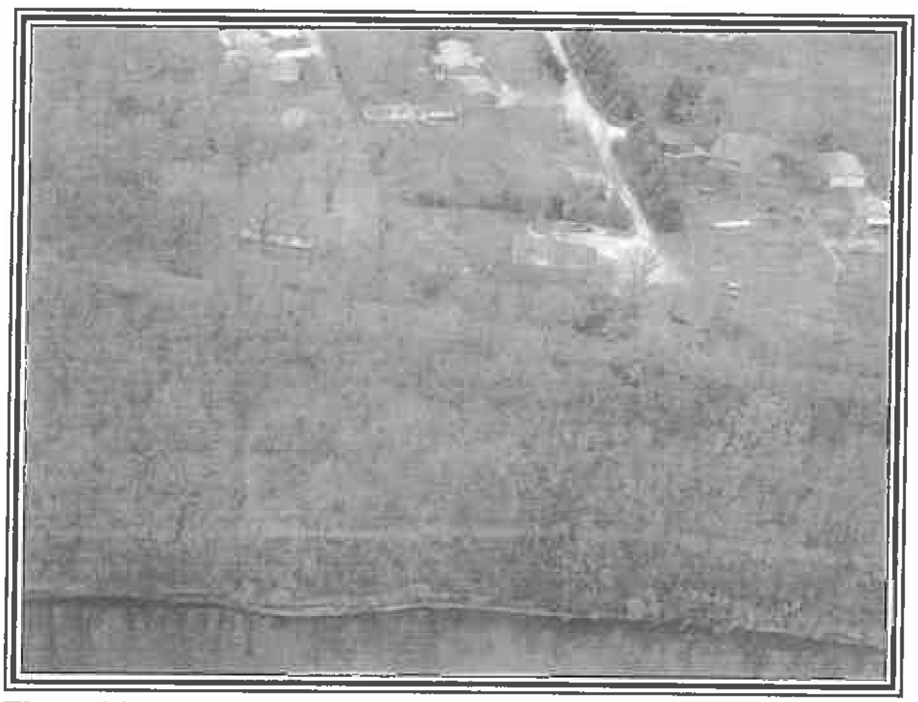


Figure 24
Example of forested land and large trees and proximity of residences along proposed route

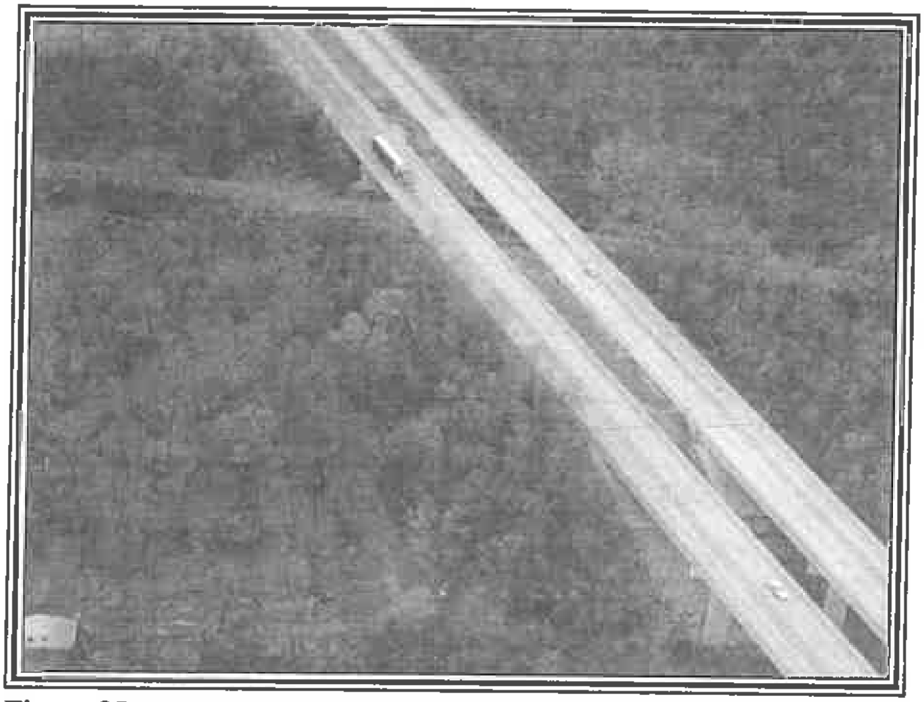


Figure 25
Example of forested land and large trees along proposed route

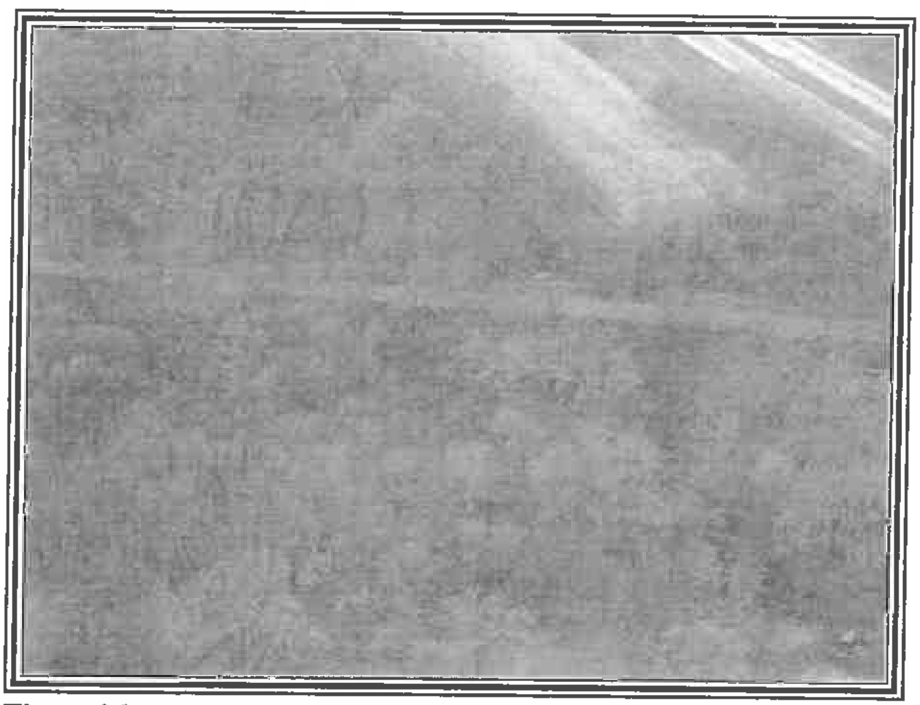


Figure 26
Example of forested land and large trees along proposed route

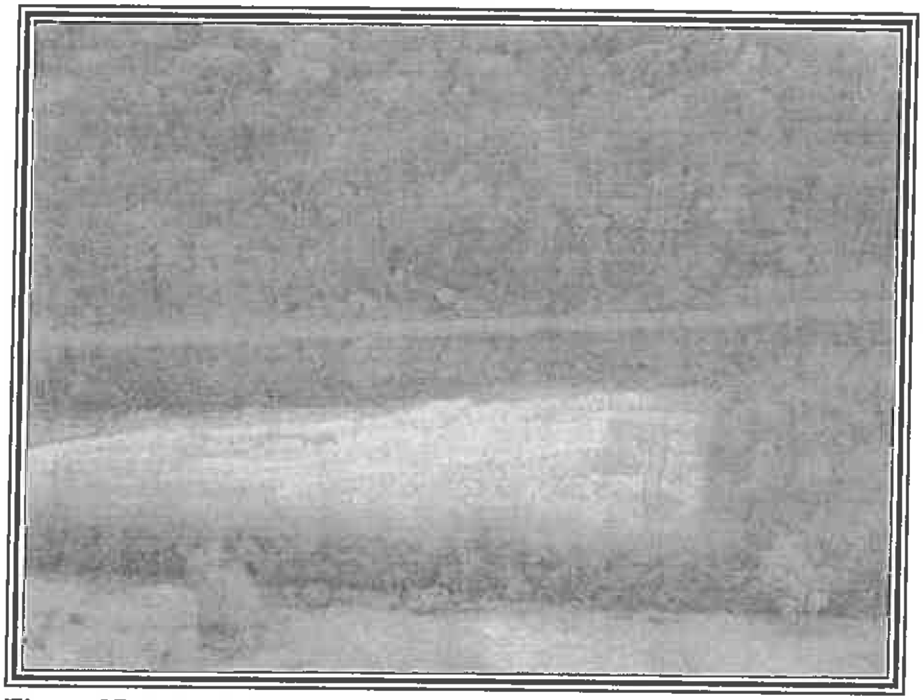


Figure 27
Example of forested land and large trees and wetland along proposed route on the west side of the Fox River

Figure 28
Example of forested land and large trees along proposed route on the west side of the Fox River

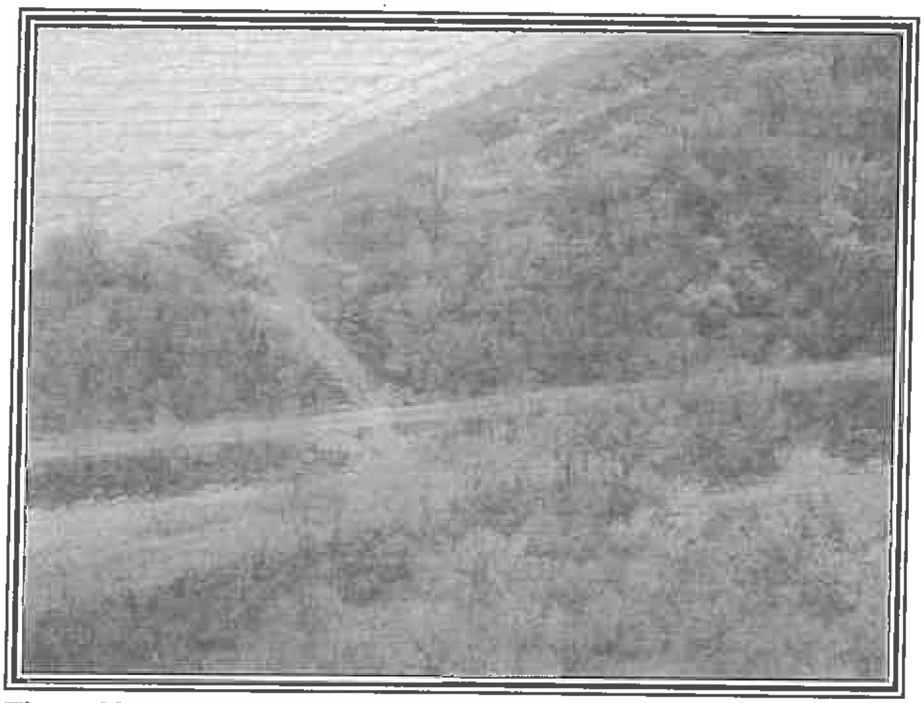


Figure 29
Example of forested land and large trees along proposed route

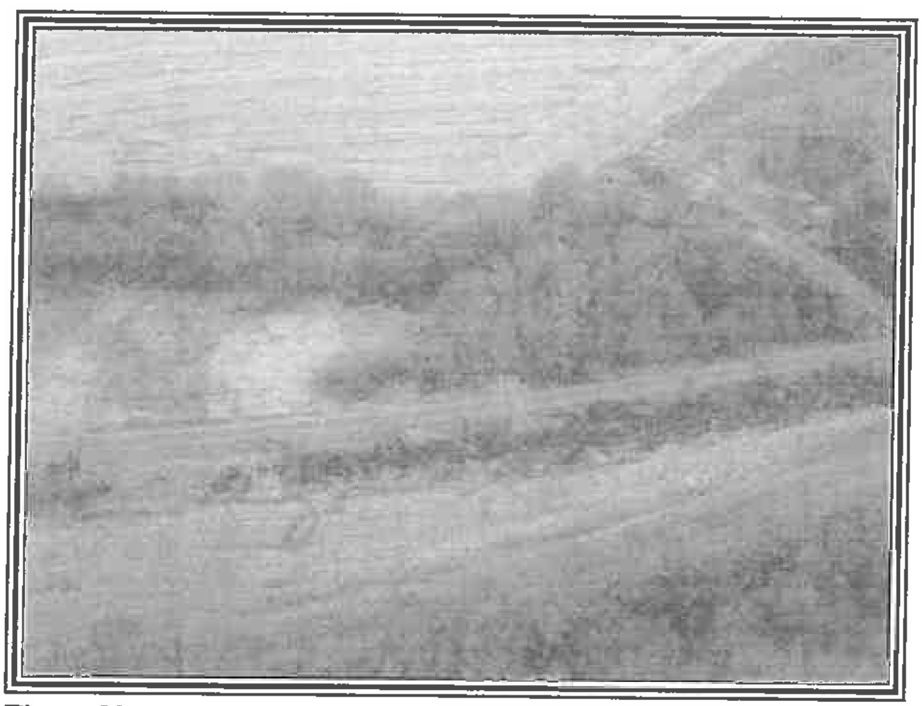


Figure 30
Example of forested land and large trees and wetland along proposed route

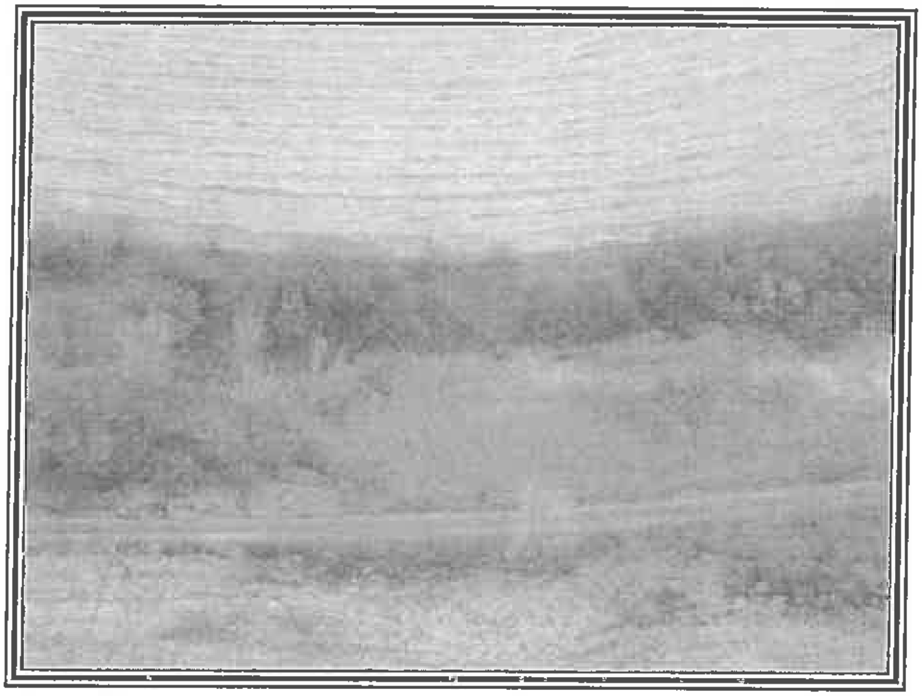


Figure 31
Example of forested land and large trees along proposed route

Figure 32
Example of forested land and large trees along proposed route

Figure 33
Example of forested land and large trees along proposed route

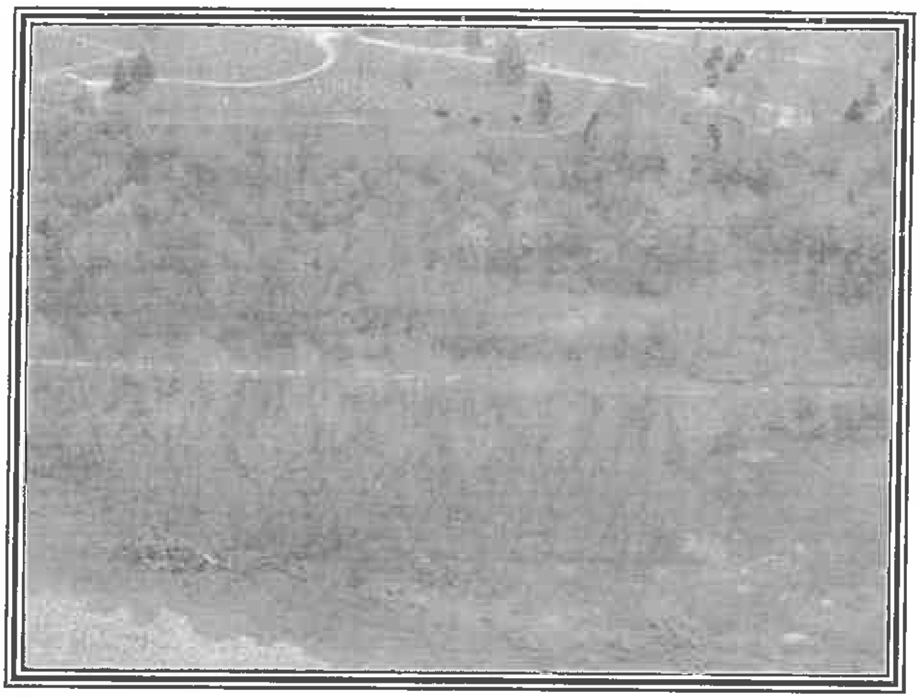


Figure 34
Example of forested land and large trees along proposed route

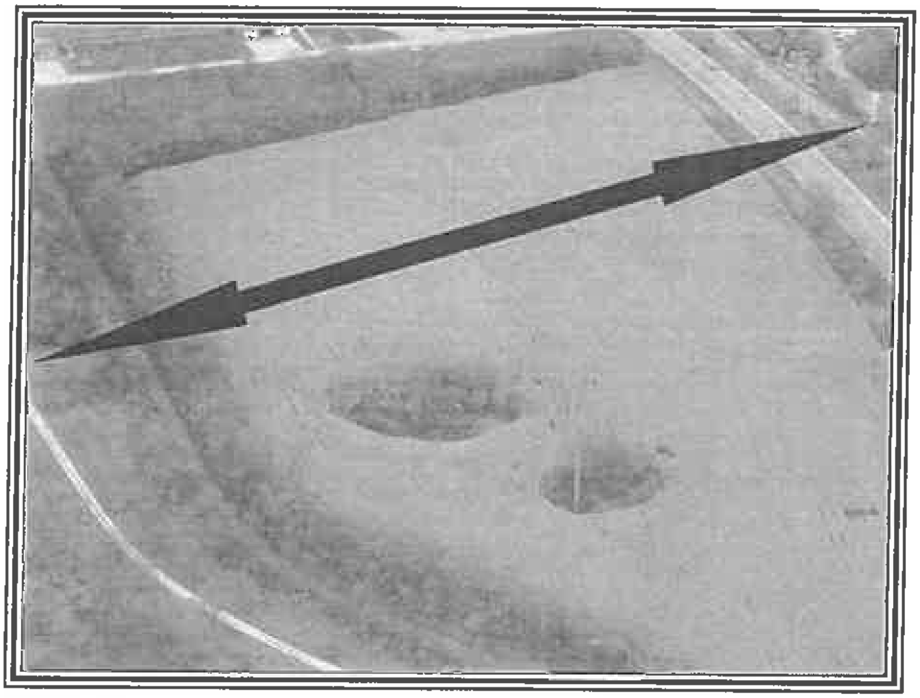


Figure 35
Farmland in proposed alternate route, Smith Alternate Route #2B

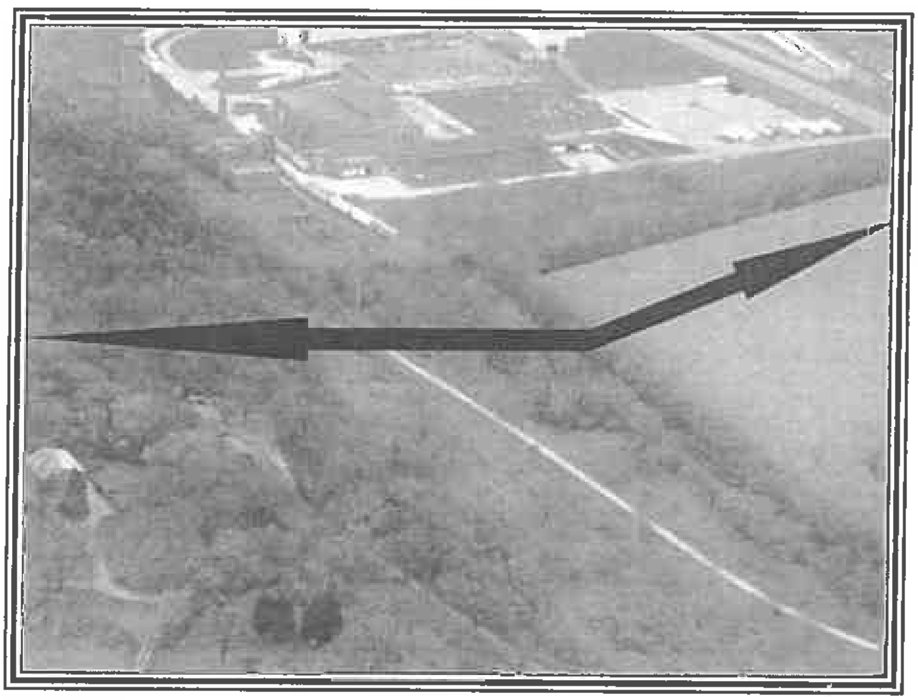


Figure 36
Proposed Alternate Route, Smith Alternate Route #2B

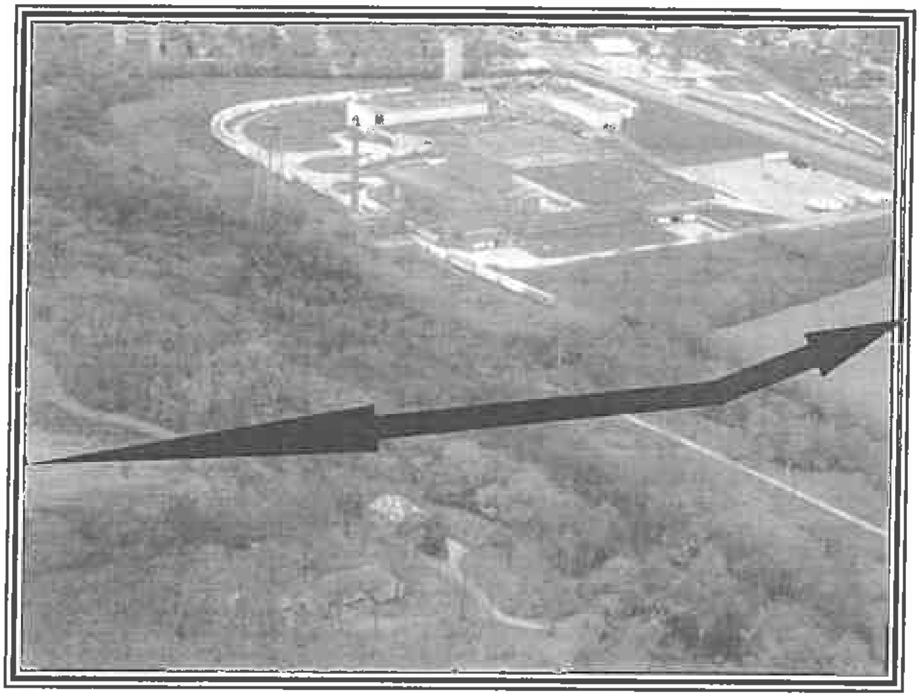


Figure 37
Proposed Alternate Route, Smith Alternate Route #2B

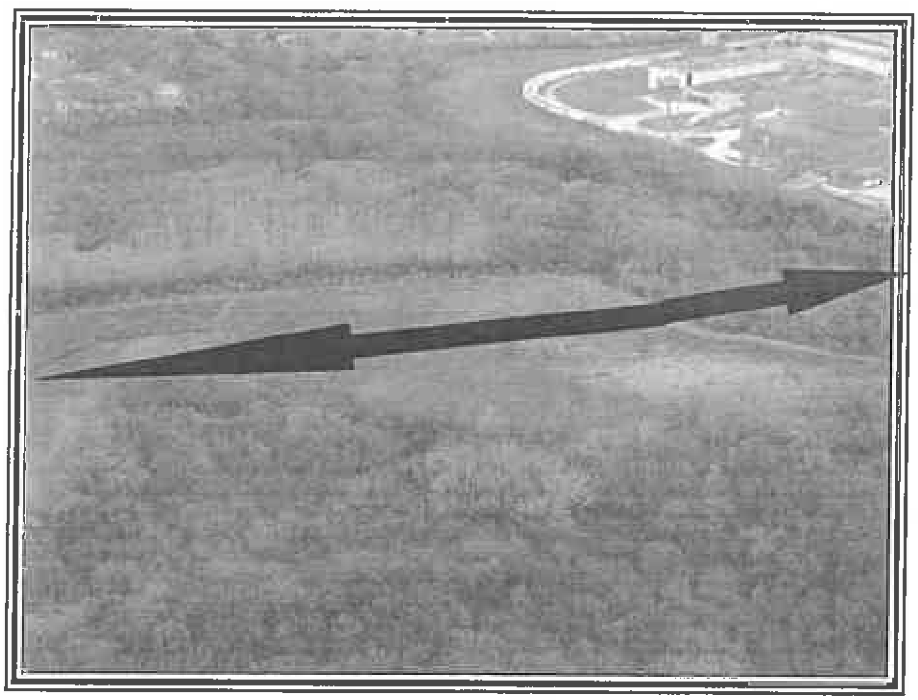


Figure 38
Proposed Alternate Route, Smith Alternate Route #2B

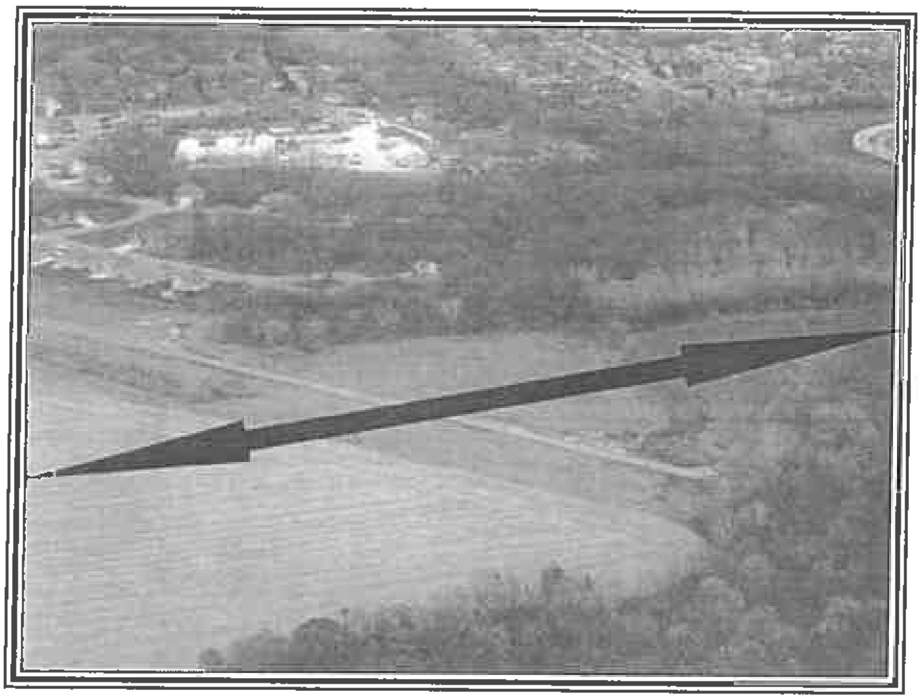


Figure 39

Proposed Alternate Route, Smith Alternate Route #2B

STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

Illinois Power Company d/b/a AmerenIP and Ameren Illinois Transmission Company Petition for a Certificate of Public Convenience and Necessity, pursuant to Section 8-406 of the Illinois Public Utilities Act, to construct, operate and maintain new 138,000 volt electric lines in LaSalle County, Illinois.	)))))))))	06-0706

NOTICE OF FILING

TO: See attached service list

Please take notice that on December 15, 2009, Fred M. Morelli, Jr., caused to be filed on behalf of Fox River Alliance, in the above captioned preceding, with Elizabeth A. Rolando, Chief Clerk of the Illinois Commerce Commission, via electronic mail, the Testimony of John Sabuco, a copy of which is attached hereto.

Respectfully submitted,

____

Fred M. Morelli, Jr.

Certificate of Service

I, Fred M. Morelli, Jr., hereby certify that a copy of the foregoing Exhibits and Testimony was served on all parties on the Service List in Docket No. 06-0706, by electronic mail and regular U.S. Mail where indicated by an asterisk (*), duly addressed with postage fully paid, on December 15, 2009.

Respectfully submitted,

____

Fred M. Morelli, Jr.

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