



Riverwoods Preservation Council

RPC DEER POSITION PAPER

July 5, 2011

“Deer have been called by scientists a ‘keystone’ species that impacts all layers of the biotic system. By browsing nuts and saplings (oaks are a favorite food) they change the tree composition and structure of the woods and prevent replacement of oaks that should dominate...By browsing the understory, they prevent the nesting of some birds and mammals and remove the food sources for birds, mammals, and other organisms...What suffers is the diversity of the area which is reduced over time to only a few species. At that point even the deer will no longer be able to sustain themselves within the system.”

S. Masi
Wildlife Botanist
Consultant to Lincolnshire
Presentation to Lincolnshire Village Officials
January 2000

Among the many impacts of deer on the ecosystem, we are facing the death of BOTH the deer and the woodlands...



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“Overabundant deer are one of the primary threats to preservation and restoration of native ecosystems in the Chicago Region.” (Chicago Wilderness)



There is no doubt that too many deer would be harmful to the cherished woodland, wetland, and savanna environments of Riverwoods. The Riverwoods Preservation Council (RPC) has concluded that certain areas of the Village have become overpopulated with deer and are being ravaged. It is critical for Riverwoods’ leaders and officials to determine immediate steps to address the ecological imbalance and damage caused by deer overpopulation in the Village.

“The Village has been feeling the severe impact of a growing deer population. This is not unique to Riverwoods or even the Midwest. The deer population has been exploding all over the country. The impact on Riverwoods may be greater than other places, however. Large areas of trillium appear to have been destroyed. The understory plants are being eaten. This is changing the nature of the Village as it is now possible to see through the woods and privacy no longer exists in areas where just a short time ago it was expected. More than that, however, it appears as if most or all of the new Oak, Maple, Hickory and other seedlings are being eaten. This will effect the woods for many years to come and may signify the end of forested areas in the Village as the mature trees die.”

Riverwoods Mayor Roy Stanger
1993

There is evidence that the problems caused by deer overpopulation have continued since Mayor Stanger’s comments in 1993. No sustained action has been undertaken to address this severe impact on the Village ecology and property values. In order to move forward effectively, the five most-often believed myths about the present situation must be dispelled:

- Myth 1. Deer should be favored over all other elements of our ecosystems (the *Bambi Syndrome*).
- Myth 2. Calculations of deer density based on aerial surveys applied across the entire Riverwoods village footprint represent an ecologically sustainable level for all Riverwoods ecosystems.
- Myth 3. Woodland ecosystem issues can be addressed simply by opening the tree canopy and planting native understory.
- Myth 4. Riverwoods doesn’t have to manage deer because our neighbors do so.
- Myth 5. Effective deer management does not have to include culling.



Riverwoods Preservation Council

Response to Myth 1 (Deer should be favored over all other elements of our ecosystems (the *Bambi Syndrome*)):

- Diversity is essential to the Riverwoods ecosystems. The overabundance of deer negatively affects native plants and trees, invertebrates, amphibians, insects, butterflies, birds, and small mammals with wide-ranging and decimating impact.

“The number and diversity of the bird population is reduced as deer populations rise from 15 per square mile due to impacts on ground level vegetation, the shrub layer, and tree species composition.”

Effects of Deer Herbivory on Birds
A Wisconsin Bird Conservation Initiative Issues Paper
Cutright and Kearns 2010

“Such severe [deer] overpopulation can have a devastating impact on a forest. At high population densities, ‘deer browsing has been shown to have profound effects on establishment of regeneration, species composition, and density of hardwood seedlings’ (Stromayer 1997). This is understandable, given that to survive a single whitetail [deer] must ingest about 8 pounds of browse – terminal buds of seedlings and young shrubs – daily throughout the winter (Krause 2004).... Once the deer eliminate available browse from an area, if the density of deer remains high, there is little opportunity for new growth to occur. As time elapses the seed bank dwindles, other species take root, regeneration fails to take place, and reestablishment of hardwood seedlings becomes more difficult.”

Effects of White-Tailed Deer Browsing on Northern Hardwood Forest Regeneration
Bay, Glunt, Taylor and Trainor
2004

- The RPC Woodland Health Study completed by Applied Ecological Services, Inc. in 2009 concluded that heavy deer browse and canopy overshadowing likely caused the low abundance and low diversity of trees and woodland plants in the subcanopy, shrub and herbaceous understory layers of the tested sites. AES recommended (along with selective removal of sugar maples and other mature trees) that deer populations be controlled to the extent needed to allow herbaceous and shrub layer plants to mature and to allow oak saplings to regenerate and mature.
- Many humans have an affinity for deer. When this translates into favoritism, it is cruel for the deer and fatal for the native environment.

“Decision-making officials of our counties and municipalities must take responsibility for ALL of the organisms they care for...not just a charismatic few.”

Lincolnshire 2000
Op.cit

- If someone were to describe an aggressor (without naming it) that is: destroying a large percentage of the native wildflowers, preventing the forest from regenerating, spreading disease to humans, causing traffic accidents, and reducing butterfly, bird and small mammal populations, there would be quick consensus that we should attempt to control its numbers. Now substitute the word *deer* for the word *aggressor* and question why we would not control deer numbers.



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Response to Myth 2 (Calculations of deer density based on aerial surveys applied across the entire Riverwoods village footprint represent an ecologically sustainable level for all Riverwoods ecosystems):

“Deer begin to impact forest resources when their density exceeds 10 deer per square mile. At this point abundance of songbird species that nest in habitats affected by deer (the shrub layer) declines, and wildflowers and shrubs preferred by deer begin to disappear. When deer density exceeds 20 per square mile, abundance of seedlings preferred by deer (such as red maple, hemlock, sugar maple and white ash) decline in abundance or disappear and plants not preferred by deer such as ferns and grasses begin to take over the understory, choking out seedlings and shrubs. At densities exceeding 40 deer per square mile there is a distinct browse line, only tree species resistant to deer browsing (beech, striped maple) are left, and shrubs and wildflowers are basically gone. When density exceeds 60 deer per square mile even resistant seedlings are heavily impacted and the forest understory is basically bare. At this density deer starve to death. ... Forest habitat and deer are healthiest when deer density is in the 10-15 deer per square mile range....”

Kinzua Quality Area (PA) Study attached to Urban Forest Management letter to the Village
April 3, 2011

“...Deer densities of 10 to 15 per square mile harm wildflowers and nesting birds. Tree regeneration is possible at densities...below 18 to 20 per square mile”

Audobon Society

- The table entitled **“Summary of Aerial Surveys of Riverwoods Area Deer Herd”** from Urban Forest Management’s report to the Village dated February 14, 2011 shows the overall deer count for the entire Riverwoods footprint (approximately 4 square miles) from 1995 – 2000 and 2008 – 2011, and deer density per square mile for 2000 and 2009 -2011 as follows:

'95	'96	'97	'98	'99	'00	'08	'09	'10	'11
68	58	35	49	48. 5	66	61	58 (1/15) 52 (1/16)	16 (1/19) 40 (1/20)	91 (2/9) 65 (2/10)
					13.52 deer/sq mi		14.25 deer/sq mi	7 deer/sq mi	19.5 deer/sq mi



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- Urban Forest Management's December 3, 1996 report to the Village entitled **Deer and the Urban Environment** calculated Riverwoods deer density per square mile for 1995 and 1996 as follows:

RIVERWOODS AREA DEER HERD 2/19/96

LOCATION	AREA(SQ MI)	DEER COUNT	
		1995 DEER/SQMI	1996 DEER/SQMI
VILLAGE LIMITS	4.5 / 2.8 (1)	68 15.1 / 25.2(1)	58 12.9 / 21.5(1)

...

NOTES:

- The area calculations for the village are shown for the total area including homes, roads, etc. and for the net habitat area excluding the homes, roads, etc.
- Scientific literature indicates helicopter deer detection rates over snow as 41% to 78%. (See, e.g., "**Detection rates of white-tailed deer with a helicopter over snow**," Wildlife Society Bulletin 1998, 26(1):24-28.) Even assuming best detection, deer densities are much higher than the raw detection values indicate. The literature supports adding a 25% correction factor to arrive at more accurate density figures, especially if counting conditions are not ideal.

Deer are not evenly spread across the Village footprint, so the actual densities are even higher in Village "hotspots" than stated in the aerial survey summary cited above. For example, it was noted during the Village's 2010 aerial survey that no deer were observed in the East Course, Thorngate, Meadowlake, Discover or CCH areas, which comprise at least one-quarter to one-third of the Village footprint. Aerial surveys conducted by the RPC and the Lake County Forest Preserve District (LCFPD) from 2008 – 2011 divided Riverwoods into quadrants. The surveys clearly show that deer densities over the years are very high in South Riverwoods (SW and SE) and portions of North Riverwoods (NW). A map is attached indicating the Sections (quadrants) referenced below.

January 4, 2008 (RPC/LCFPD)

Section	Square Miles	Raw data	Correction (25%)	Corrected Count	Deer/Sq. Mi.
1 (NW)	1.1	25	8.3	33.3	30.3
2 (NE)	1.5	16	5.3	21.3	14.2
3 (SW)	0.7	6	2	8	11.4
4 (SE)	0.7	14	4.7	18.7	26.7
1 - 4	4.0	61	20.3	81.3	20.3

January 15, 2009 (RPC/LCFPD)

Section	Square Miles	Raw data	Correction (25%)	Corrected Count	Deer/Sq. Mi.
1 (NW)	1.1	0	0	0	0
2 (NE)	1.5	19	6.3	25.3	16.9
3 (SW)	0.7	34	11.3	45.3	64.7
4 (SE)	0.7	5	1.7	6.7	9.6
1 - 4	4.0	58	19.3	77.3	19.3



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January 16, 2009 (RPC/LCFPD)

Section	Square Miles	Raw data	Correction (25%)	Corrected Count	Deer/Sq. Mi.
1 (NW)	1.1	14	4.7	18.7	17
2 (NE)	1.5	8	2.7	10.7	7.1
3 (SW)	0.7	14	4.7	18.7	26.7
4 (SE)	0.7	16	5.3	21.3	30.4
1 - 4	4.0	52	17.4	69.4	17.4

The LCFPD has conducted annual aerial deer surveys from 1999 through 2011 that include portions of North and South Riverwoods bordering Ryerson Preserve (“buffers”). These buffers closely approximate Sections 1 and 3 referenced above.

January 11 & 12, 2010 (LCFPD):

Area	Square Miles	Raw data	Correction (25%)	Corrected Count	Deer/Sq. Mi.
Buffer Ryerson North of Deerfield Rd (Section 1)	1.1	18 (1/11)	6	24	22
		27 (1/12)	9	36	33
Buffer Ryerson South of Deerfield Rd (Section 3)	0.7	5 (1/11)	2	7	10
		21 (1/12)	7	28	40

December 28, 2010 (LCFPD):

Area	Square Miles	Raw data	Correction (25%)	Corrected Count	Deer/Sq. Mi.
Buffer Ryerson North of Deerfield Rd (Section 1)	1.1	7	Did not use because counting conditions were very good	N/A	6
Buffer Ryerson South of Deerfield Rd (Section 3)	0.7	25	Did not use because counting conditions were very good	N/A	36

- For the period of 1999 – 2007 (the years preceding the surveys provided above), LCFPD aerial surveys of the North and South Riverwoods buffers reveal the following densities:

Year	Deer in Buffers	Deer Density per Square Mile (without correction factor)
1999	63	34
2000	56	30
2001	29	15
2002	17	9
2003	52	28
2004	23	12
2005	54	29
2006	38	20
2007	69	37



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These are raw count numbers, without the application of a correction factor. In its report, LCFPD states that it estimates “a 75% detection rate.” The LCFPD also states that “We are confident that deer are not ‘double counted’, therefore the raw numbers are a minimum no. of deer present on the area counted at the time of the counting.” (Ryerson Deer Management Area Deer Census – 1998-2007.)

- It is reasonable to assume that the actual deer densities for 1999 through 2007 in the Riverwoods buffers were significantly higher than noted above. The data clearly show that deer densities in Riverwoods “hotspots” generally are -- and have been for many years -- significantly higher than the 10 – 15 deer density per square mile wildlife management recommendation. In fact, these surveys repeatedly show densities exceeding 25 and 30 deer per square mile. In 2009, the aerial survey showed deer density exceeding 60 deer per square mile.
- Based on studies in the Chicago metropolitan region and the eastern United States, in order to allow woodlands to rejuvenate in severely deer-browsed areas, deer density of 4 to 6 deer per square mile is recommended.

“Based on deer population densities associated with study sites supporting Trillium populations with stable stem heights and flowering plants, maintenance of deer densities of 4 – 6 individuals/km² is recommended for deciduous forests in northeastern Illinois.”

Height of White-Flowered Trillium (*Trillium Grandiflorum*) as an Index of Deer Browsing Intensity
Roger C. Anderson
Ecological Applications, Vol. 4, No. 1
February 1994

- Further, many experts believe that it is inadequate to simply rely on a general deer density figure to determine whether to cull deer. These experts state that deer density must be evaluated in the context of actual damage, number of deer fences, and number of complaints – all key indicators of a serious problem. It should be noted that the majority of deer (woodland protection) fences in the Village have been constructed in South Riverwoods, and once they have been constructed native plants on the woodland floor and oak saplings start to return.
- When evaluating Riverwoods aerial deer survey results during the past 10+ years, the deer density levels, even using the raw detection values in the numerator and the entire Village footprint in the denominator, are higher than our ecosystems can sustain.
- Deer in Riverwoods have reached densities sufficient to cause extensive and substantial ecological impact and damage, and they have caused such damage. Left unmanaged, this damage will increase.

“The Forest Preserve District of DuPage County culled 2,826 white-tailed deer from 16 forest preserves in winters 1992-1998.... Population reconstructions indicated a decrease in deer population density... This reduction resulted in a significant decrease in reported deer-vehicle collisions on adjacent roads from 30 in 1992 to 4 in 1998. Mean plant height, percent vegetative ground cover, and number of plant species increased ... among years in six forest preserves experiencing deer population control. Culling was successful at reducing deer population density, decreasing deer-vehicle collisions, and assisting with the restoration of native ecosystems in DuPage County Forest Preserves.”

Management of White-tailed Deer in Chicago Illinois Forest Preserves
Etter and Van Deelen, Center for Wildlife Ecology
Ludwig and Kobal, Forest Preserve District of DuPage County
Warner, University of Illinois
2001



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Response to Myth 3 (Woodland ecosystem issues can be addressed simply by opening the tree canopy and planting native understory):

“Whitetails have been eating their way toward a lasting legacy: They are wreaking ecological havoc in forests across the nation...determining today what forest will look like in a hundred years. ... Deer have stopped the regeneration of our forests.”

How Deer are Redesigning Our Forests
James Sterba
Writer, Wall Street Journal
National Wildlife Magazine
October/November 2005

“The plant community is the basic foundation of the ecosystem. If you alter that, you have altered the very basis of production, and that reverberates up and down the food chain.”

Robert Warren
Professor of Wildlife Ecology
University of Georgia
National Wildlife 1998

- Tree planting and canopy correction are not sufficient to combat deer overbrowse, and extensive spraying with deer repellents to protect large tracts of woodland is not practical. Attempting to address the crisis in woodland health without culling would require the legalization of all present and future woodland protection fences.

“An [integrated pest management] IPM approach to deer damage would include careful monitoring and one or more of the following strategies, depending on the nature of the problem: population management, fencing, repellents and vegetation management. ...Controlling deer damage requires a comprehensive program.”

Robert A. Pierce II and Ernie P. Wiggers
Controlling Deer Damage in Missouri
University of Missouri
School of Natural Resources
November 1997

Response to Myth 4 (Riverwoods doesn't have to manage deer because our neighbors do so):

- Lincolnshire, Bannockburn, Northbrook and Ryerson cull deer. However, the benefits are local to those communities and the Preserve.

“Ryerson culling has little effect on Riverwoods, and culling in nearby communities also has substantially no effect on Riverwoods. The main reasons are the limited areas within which deer roam (typically less than one square mile) and the physical barriers between areas. Finally, there is no culling in the Cook County Forest Preserve near Riverwoods.”

Interview Notes
Marty Jones, Project Manager
Illinois Department of Natural Resources
July 2009



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- The converse is also true: while culling must be undertaken annually to be effective, deer moving in from other areas would not negate the immediate positive effects of Riverwoods culling.

“Once a population has been reduced, adjacent matrilineal groups do not readily expand or change their home ranges.”

Localized Management for Reducing Whitetailed Deer Populations
McNulty, Porter, Mathews, and Hill
Wildlife Society Bulletin 1997

Response to Myth 5 (Effective deer management does not have to include culling):

“The cost and practicality of treating an adequate number of deer to effectively reduce free ranging deer populations likely will limit the practical use of birth control agents...Birth control may be of value on small isolated deer populations but will not replace [culling] for controlling free ranging deer populations.”

- **“Studies have shown that about half of all deer trapped and relocated die from capture related stress or from wandering long distances. Relocation spreads diseases and it costs \$400 to \$3000 per deer.”**
- **“Fencing, repellents, and ultrasonic devices provide varying degrees of success at protecting very specific areas from deer damage; however they do not address the underlying problem of deer overpopulation.”**
- **“Planting less [deer] desirable plant species...may reduce the likelihood of damage...[but]...in areas with high deer densities almost all plant species are at risk.”**

Managing Urban Deer in Connecticut
A Guide for Residents and Communities
Connecticut Department of Environmental Protection
Bureau of Natural Resources/ Wildlife Division 2007

“Animal rights groups want hunting outlawed and advocate non-lethal methods, such as birth control, to decrease deer overpopulations. But birth control, so far, doesn’t really work, say most wildlife managers. A general rule of thumb among deer biologists is that hunters need to take 35 to 45 percent of the females annually to stabilize the population.”

How Deer are Redesigning Our Forests
Op.cit.

- The U.S. Department of Agriculture Wildlife Services fact sheet (May 2010) for GonaCon™, the new birth control vaccine developed for deer that is potentially superior to SpayVac™ (another immunocontraceptive vaccine for animals including deer) states:

Q. Will GonaCon™ eliminate the need for hunting to control deer overpopulation?

A. No. Contraception alone cannot reduce overabundant deer populations to healthy levels. GonaCon™ is a tool to be used in conjunction with other wildlife management methods.



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“Deer have expanded their range and increased dramatically in abundance worldwide in recent decades. They inflict major economic losses in forestry, agriculture, and transportation and contribute to the transmission of several animal and human diseases. Their impact on natural ecosystems is also dramatic but less quantified. By foraging selectively, deer affect the growth and survival of many herb, shrub, and tree species, modifying patterns of relative abundance and vegetation dynamics. Cascading effects on other species extend to insects, birds, and other mammals. In forests, sustained overbrowsing reduces plant cover and diversity, alters nutrient and carbon cycling, and redirects succession to shift future overstory composition. Many of these simplified alternative states appear to be stable and difficult to reverse. Given the influence of deer on other organisms and natural processes, ecologists should actively participate in efforts to understand, monitor, and reduce the impact of deer on ecosystems.”

Ecological Effects of Deer Overabundance
Annual Review of Ecology, Evolution, and Systematics
December 2004

CONCLUSIONS/RECOMMENDATIONS

- Returning the Riverwoods ecosystems to good health requires a comprehensive, multifaceted, and coordinated policy. It must include permitted woodland protection fences, prescribed burns, canopy thinning, removal of exotic invasives, and a return of whitetailed deer populations to sustainable levels. The Village has already taken many positive steps but these steps are not enough.
- The RPC would prefer to have the Village use non-lethal means to control deer. However, managing the population of non-confined deer through contraception is currently found to be ineffective, and deer relocation has proven problematic. Therefore, the RPC recommends that the Village adopt a deer management plan that includes culling.
- Culling deer by licensed experts is humane, effective, affordable and safe.
- Deer density counts must be analyzed by Riverwoods “quadrant” or hotspots.
- In order to allow the Riverwoods woodlands to rejuvenate in the severely affected quadrants, the appropriate deer density is likely in the range of 4 to 6 deer per square mile.
- The Village should communicate to residents the State of Illinois prohibition on feeding deer.
- Existing woodland protection fences should be permanently grandfathered and new woodland protection fences, up to 8 feet high and not attached to trees, should be permitted subject only to a minimum setback from roads and neighboring fences.

“Short-term strategies can relieve immediate problems, while long-term approaches will maintain deer populations at target levels. Combining two or more methods improves results and increases the acceptability of the program for a wider range of stakeholders. An example of a combined approach is the use of fencing and repellents in concert with selective lethal control.”

Managing White-Tailed Deer in Suburban Environments
DeNicola et. al.
Wildlife Damage Cooperative 2002



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“Picking sites for woodland restoration: If no understory is left, you will have a hard time putting it back. Using every possible approach [to deer management] is key.”

Wild Things Conference Feb 2010:

Woodlands Resource Experts:

Pete Jackson, Steward, USEPA & Steward, Deer Grove Forest Preserve

Ken Klick, Lake County Forest Preserve District

Tom Simpson, McHenry County Conservation District

Drew Ullberg, Forest Preserve District of Kane County



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