Toronto and Region Conservation Authority

September 22, 2021 CFN 64726.01

SENT BY E-MAIL (christopher.raynor@york.ca)

Christopher Raynor, Regional Clerk
Regional Corporate Services Department
York Region Administrative Centre
17250 Yonge Street
Newmarket, ON L3Y 6Z1

Dear Mr. Raynor:

Re: Notice of Request for Proposed Official Plan Amendment
Redesignation of Agricultural Lands in Greenbelt Plan - ROPA7

The purpose of this letter is to provide Toronto and Region Conservation Authority (TRCA) staff comments on the above noted application that was received on March 5, 2021. A list of the materials that have been reviewed by TRCA can be found in Appendix 'A.'

Summary of TRCA Staff Recommendation
ROPA 7 proposes development in the Greenbelt 'fingers' that contain agricultural lands that support and connect the Natural Heritage Systems (NHS) recognized in Municipal, Regional and Provincial Planning Documents. Within these areas, the patches of natural heritage features that are presently on the landscape have sizes, widths and sensitive species that are particularly vulnerable to the impacts of intense urban development. As the surrounding landscapes are transformed into urban uses, simply preserving the features and the minimum vegetation protection zones may not be enough to allow the system to maintain its current function and services over the long term TRCA's science-based evaluation of the ROPA 7 areas shows their contribution to maintaining connectivity and a self-sustaining Natural Heritage System. TRCA does not support the addition of these uses without analysis at the watershed level to assess potential impacts and detailed analysis to determine locations where such development may be appropriate.

Policy Framework

Under a Memorandum of Understanding (CO/MNR/MMAH, 2001) between Conservation Ontario and the Ministry of Natural Resources and Forestry and the Ministry of Municipal Affairs and Housing, TRCA has delegated responsibilities to represent provincial interests regarding natural hazards encompassed by Section 3.1 of the *Provincial Policy Statement, 2020* (PPS, 2020). In addition, in 2006, the Minister of Natural Resources and Forestry approved TRCA's "Development, Interference and Alteration" Regulation (Ontario Regulations 166/06), empowering TRCA to regulate development and activities in or adjacent to river or stream valleys, hazardous lands and wetlands. Development taking place on these lands require permission from the Conservation Authority to confirm that the control of flooding, erosion, dynamic beaches, pollution, or the conservation of land are not affected.

Under a Memorandum of Understanding between TRCA and The Regional Municipality of York, TRCA provides plan review, technical clearance expertise and advice for development applications relating to the definition of natural features / functions in accordance with the PPS and natural heritage matters for the Region.

TRCA also provides advice from a technical perspective to implement Provincial plans such as the Greenbelt Plan to municipal partners through review of submitted studies.

Living City Policies
The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority (LCP) describes a "Natural System" made up of water resources, natural features and areas, natural hazards, potential natural cover and/or buffers. The LCP recommends that development, infrastructure, and site alteration not be permitted within the Natural System, and that these lands be conveyed into public ownership for their long-term protection and enhancement. The LCP also provides policies for developing adjacent to, and in, the Natural System (where permitted), while meeting natural hazard management requirements, and maintaining and enhancing the functions of the protected Natural System. It is these policies that guide TRCA's review of the subject application, along with those found in other Provincial and municipal plans, documents, and guidelines.

Proposed Amendment

ROPA 7 proposes to change the designation of lands within specific Greenbelt Plan Areas from Agricultural to Rural within new communities in Markham and Vaughan. The purpose of the amendment is to "allow opportunities for park land, trails, serviced playing fields, golf courses, and recreational uses within portions of the Greenbelt Plan Area that are outside of natural heritage features and their minimum vegetation protection zones….and further allow for the accommodation of uses integral to delivering complete communities…" TRCA reviewed the circulated Planning Brief and Draft ROPA. TRCA is not aware of an amendment being proposed to the Greenbelt Plan 2017.

Provincial Policy Context

As identified by the Province in their comment letter to York Region received May 3, 2021, the subject lands are located entirely within the Protected Countryside, are subject to the Greenbelt Natural Heritage System, and are further identified as part of the provincial Agricultural System – being designated as a prime agricultural area on provincial mapping of the agricultural land base.

Accordingly, the Greenbelt Natural Heritage System (GNHS) Policies of Section 3.2.2.3 provide guidance respecting what shall be demonstrated to allow new development and site alteration. In summary the policy tests for development and site alteration within the GNHS include: no negative impact on features and functions; connectivity along the system and between features; avoidance of the removal of any feature; and 30% developable area be self-sustaining natural vegetation. The GNHS applies when expanding settlement areas and is to be implemented within municipal Official Plans subject to refinement.

The above tests apply to all uses excepting major recreational uses which are subject to their own tests in Section 4.1.2 which include: maintain and enhance natural self-sustaining vegetation and connectivity between heritage and hydrologic features; where possible keep intermittent stream channels and drainage swales free to grow; minimize pesticides and fertilizers; maximize ecological function and value with self-sustaining vegetation; and demonstrate minimum water, nutrient and biocide use. For all recreational uses, small scale structures must be located to minimize negative impacts to all features and functions.

Although not referenced in the Provincial Comment letter, the Greenbelt Plan also includes Water Resource System Policies (GWRSP). These policies require a systems-based approach considering hydrologic features, areas and functions including the inter relationships for the long-term protection, enhancement or restoration of the quality and quantity of water within a watershed. Watershed

planning, for features and functions and cross-jurisdictional and cross-watershed impacts are all to be considered.

The implications of the proposed ROPA and the above policy tests can be explored through the results of TRCA's watershed-based science and research programs to determine the potential implications of the proposed amendment and the science that supports the GNHS and the GWRS.

Watershed Context

The proposed ROPA applies to three areas which are unique components of three different watersheds. In the City of Vaughan: Block 41 is within the East Purpleville Creek Watershed, connecting east-west to the main Humber. The Block 27 corridor is the easternmost leg of the East Don River connecting to the Oak Ridges Moraine to the northwest. In Markham, the three stretches in the Markham Future Urban Area are part of the Rouge River system connecting the Oak Ridges Moraine to Lake Ontario. These are expanding settlement areas which should consider GNHS connections as per Section 3.2.2.4.

Greenbelt Natural Heritage System

Each of these corridors host different species and perform different ecological functions creating diverse circumstances and diverse communities which is essential to maintain a healthy ecosystem. Through analysis of monitoring and field data, the diversity and function of these areas and their ecological value is described below.

1. **Natural cover area** in Vaughan and Markham is approximately 24% (6643 ha) and 17% (3676 ha) respectively, which is below the recommended target of an average 40% for urban watersheds (ECCC 2013). ROPA-7 areas contain approximately 1.5% (173 ha) of Vaughan's total natural cover and approximately 5% (221 ha) of Markham's total natural cover. This includes 122 ha of wetlands combined. Though the proposed changes will not directly result in loss of these natural features, the changes in the surrounding land use, will negatively impact these features and their functions including habitat quality, connectivity, and suitability for various species groups. The added uses will result in loss of opportunity to improve the amount and quality of natural cover that will benefit the ecosystem and its residents. (Appendix B, Figure 2a)

2. **Natural cover quality** in Vaughan and Markham ROPA-7 areas are fair (L3) (82 ha) and poor (L4) (144 ha) based on TRCA's habitat patch ranking system. This indicates that the existing habitat patches in the ROPA area are stressed due to relatively small patch sizes and patch shapes that induce more edge effects, making the ecosystems more susceptible to the influence of surrounding land use. This highlights the importance of maintaining the surrounding land use in a form that minimizes impacts (such as rural/agricultural, passive recreation) and improving the quality of these habitat patches to ensure healthy ecosystems and communities over the long term. This is consistent with the Markham Future Urban Area Subwatershed study ('Subwatershed Study'), which includes the lands in Markham that are included in ROPA 7. The Subwatershed Study reinforced the importance of restoring the areas of the Greenbelt that are currently in agricultural production, to provide for greater connectivity within the north-south Rouge River valley systems, and to strengthen the relatively small patches of habitat that currently exist, which will increase the likelihood of their viability over the long-term. This requires commitment to restoration and enhancements that can improve the size and shape by filling in the holes in the patches as well as by reducing negative impacts from surrounding land uses. (Appendix B, Figure 2b)

3. **Fauna species and vegetation community** data show that the ROPA-7 areas provide habitat to multiple species and vegetation communities. This includes regional species of concern (4 in Vaughan and 6 in Markham) and urban species of concern (1 in Vaughan and 14 in Markham)

including 3 Species-at-Risk: namely Eastern Wood-pewee, Eastern Meadowlark, and Bobolink. Given that some of this data may be old, field level assessments will be needed to confirm that these species are not being impacted with the proposed changes. Likewise, there are multiple vegetation communities of regional concern (2 in Vaughan and 6 in Markham) as well as of urban concern (8 in Vaughan and 18 in Markham). Though most of this biodiversity were inventoried in the natural features, the surrounding areas play a critical role in meeting their life cycle needs. Any changes in the surrounding landscape with added disturbances such as noise, light, and nutrient pollution will affect the long-term sustenance of these species over long term. (Appendix B, Figure 2c)

4. **TRCA's updated Natural Heritage System** (DRAFT) identifies strategic areas for protecting, enhancing, and restoring natural cover and implementing other green infrastructure to ensure terrestrial and aquatic ecological functions are resilient over the long term. Based on TRCA's updated Natural Heritage System (NHS), the ROPA areas in Vaughan and Markham have the potential to add approximately 65 ha and 80 ha of new habitat respectively if they are considered for restoration. This would significantly improve the size and quality of the natural system, improved habitat quantity and quality. (Appendix B, Figure 2d), providing greater diversity of wildlife, and improving the provision of several other ecosystem services.

5. **Habitat connectivity** in ROPA-7 areas include approximately 218 ha and 330 ha of regional connectivity priority in Vaughan and Markham, respectively. These areas have been identified in the top 50% of TRCA's watersheds for maintaining connectivity among high quality habitat patches. These regional connectivity areas reflect the critical corridors for long term resilience of the region's habitat and biodiversity (Appendix B, Figure 2e). Also, these ROPA-7 areas include local connectivity priority areas for species moving between forests (175 ha in Vaughan and 330 ha in Markham) and forests and wetland patches (42 ha in Vaughan and 16 ha in Markham) (Appendix B, Figure 2 f)). These local connectivity priority areas reflect where wildlife-human conflict might occur if not managed appropriately (e.g. road or trail mortality). The proposed changes in the ROPA-7 areas will impact the important regional and local connectivity function they provide, thereby impeding wildlife movement and adversely affecting regional biodiversity.

6. **Habitat suitability** in the ROPA-7 areas is relatively high for multiple species groups, especially in Block 41 where the ROPA areas support more than 7 out of 9 groups and in Markham FUA where they support 5 out of 9 groups of species of birds and amphibians. This indicates that the ROPA areas, including existing habitat and the surrounding countryside, significantly contribute to supporting regional biodiversity. The proposed changes to convert these areas to more active uses will compromise their ability to provide habitat function and negatively impact regional biodiversity. (Appendix B, Figure 2g)

The Greenbelt Plan uses a systems approach to protecting ecosystem functions. It has recognized the importance of not only physically protecting existing natural features but also the critical role the surrounding countryside plays in promoting wildlife connectivity and buffering ecosystems from more intense urban land uses. Within the areas identified in ROPA 7, changes to the land use in these areas, even if it is outside of the natural features, will affect the ecological features and functions given the cumulative impacts of urbanization. The rapid assessment presented here showcases some of the important ecological impacts of the proposed changes in the ROPA-7 areas.

Based on the values and impacts described above, it is apparent all the corridors provide ecological benefit, and that extending park land into areas that have been targeted for restoration, such as those included in ROPA 7, will impact upon the future viability and health of these valley corridors within the Greenbelt fingers. This ecological benefit of the corridors is recognized south of the new communities in the built areas where they connect to designated Urban River Valleys in the Greenbelt Plan. The policies for these areas do not allow golf courses or serviced playing fields.

Greenbelt Water Resource System

Section 3.2.3 outlines the Greenbelt Plan's Water Resource System (WRS) Policies. These policies recognize the relationship between the NHS and the WRS through integrated watershed planning requirements. Below are excerpts/summaries from the relevant Watershed Plans that characterize the role and function of these areas within the watersheds and the anticipated management approach. Note that each watershed plan is different and therefore the considerations within each are different.

Humber River System

As the basis for the Humber River Watershed Plan, TRCA completed the ***Humber River Watershed Scenario Modelling and Analysis Report*** in 2008. The modelled scenarios explore the interdependencies of watershed systems, their sensitivity to change and the relative effectiveness of various management actions. The build out scenarios included assumed urbanization according to official plans (including Block 41), and potential full build out to the Greenbelt boundary. All the impacts were determined including the assumption that the GNHS (including the lands identified in ROPA 7) would be restored and conserved. Without restoration, the watershed plan conclusions and management strategies require revisiting. This could impact the timing for development as stormwater criteria will need to be updated.

Don River System

The ***Don River Watershed Plan Beyond Forty Steps 2009*** included a Regeneration Plan for Block 27 including the following actions to assist with managing the watershed: maintain pre-development groundwater recharge; expand natural cover and enhance connectivity to the East Humber River subwatershed; create riparian wetland habitat for blacknose shiner; and adopt sustainable technologies and practices during greenfield development. To accomplish this one of the implementation projects included developing and implementing restoration plans for natural cover in the whitebelt, Oak Ridges Moraine and Greenbelt.

Rouge River System

The Rouge River Watershed Plan completed in 2007 recognized the following management strategies:

- Expanding natural cover from 24% to 31% of the watershed area, to result in reductions of stream flows and erosion potential including Carleton, Berczy and Bruce Creeks
- Future Conditions - excellent opportunities for protection, restoration and expansion of natural cover based on the protective policies applying to the Greenbelt,
- aquatic systems - protect and maintain the water budget, especially with respect to groundwater discharges and water temperature.
- Protection of the targeted terrestrial natural heritage system covered by some potential implementation policy mechanism including the Greenbelt Plan, ORMCP, TRCA's Valley and Stream Corridor Policy and Markham Small Streams Study.
- The Greenbelt Plan identifies a 600m wide corridor for the Little Rouge River as the main ecological corridor between Lake Ontario and the southerly boundary of Oak Ridges Moraine Area, as well as several other Rouge River tributaries, in recognition of the longstanding commitment to establishing the Rouge Park.
- Section 3.2.7 of the Greenbelt Plan identifies the significance of the Rouge River watershed as vital ecological corridors.

Based on the above, it is clearly evident that the Greenbelt Plan policies recognize the strength of the relationship between water resources planning and the natural heritage system.

Recommendation

Based on our review of related science-based material and management strategies, the proposed amendment is in TRCA's opinion more than a 'rural' versus 'agriculture' decision, or the simple adding of additional permitted uses. The potential impacts must be viewed from a systems perspective and be evaluated within the context of the systems that will be impacted. The results of the analysis indicate that the proposed changes have the potential to have negative impacts on Greenbelt natural heritage and water resource systems and the ecological functions and services provided over the long term. TRCA does not support the addition of these uses without analysis at the watershed level to assess potential impacts and detailed analysis to determine locations where such development may be appropriate.

Fees

By copy of this letter, we request the proponents submit the TRCA application review fee of $12,600.00 (Official Plan Amendment – Major).

We trust these comments are of assistance. Should you have any questions, please contact June Little, Senior Manager – Development Planning and Permits at extension 5756 or by email at June.Little@trca.ca

Sincerely,

Sameer Dhalla, P.Eng
Director, Development and Engineering Services

cc: Paul Freeman, Chief Planner, Region of York: paul.freeman@york.ca
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Quentin Hanchard, Associate Director, TRCA
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Adam Miller, Senior Manager, TRCA

Appendix 'A': List of Materials Reviewed

The following materials were received by TRCA on March 5, 2021

- **Notice of Request for Official Plan Amendment dated March 5, 2021**
- **Draft Regional Official Plan Amendment**
- **Planning Justification Report by Malone Given Parsons dated January 2021**
- **ROY Amendment Application Form**

Appendix B
ROPA7 Technical Analysis Memo

Memo

To: June Little, Senior Manager, Development Planning
From: Namrata Shrestha, Senior Research Scientist, Ecosystem and Climate Science
Andrew Chin, Research Analyst, Ecosystem and Climate Science
Cc: Noah Gaetz, Mark Howard, Jeff Thompson, Laura DelGiudice, Quentin Hanchard, Laurie Nelson, Sameer Dhalla
Date: April 15, 2021
Re: **Summary of potential ecological impacts associated with proposed land use changes in the Greenbelt areas of ROPA-7**

Purpose

The purpose of this memo is to provide a technical summary and key findings of the rapid assessment completed to quantify the potential ecological impacts of the proposed changes within the ROPA-7 areas to inform development planning review process (highlighted in red in Figure 1). This constitutes a rapid assessment based on the time available. A more thorough assessment with additional and more specific recommendations can be undertaken if required and if additional time and resources are available. The proposed changes requested may result in conversion of the protected countryside designation within Greenbelt areas to rural designation to accommodate active recreation uses. Specifically, this memo focuses on ROPA-7 areas within Blocks 41 and 27 in Vaughan and the Markham Future Urban Area (FUA). (Figure 1)

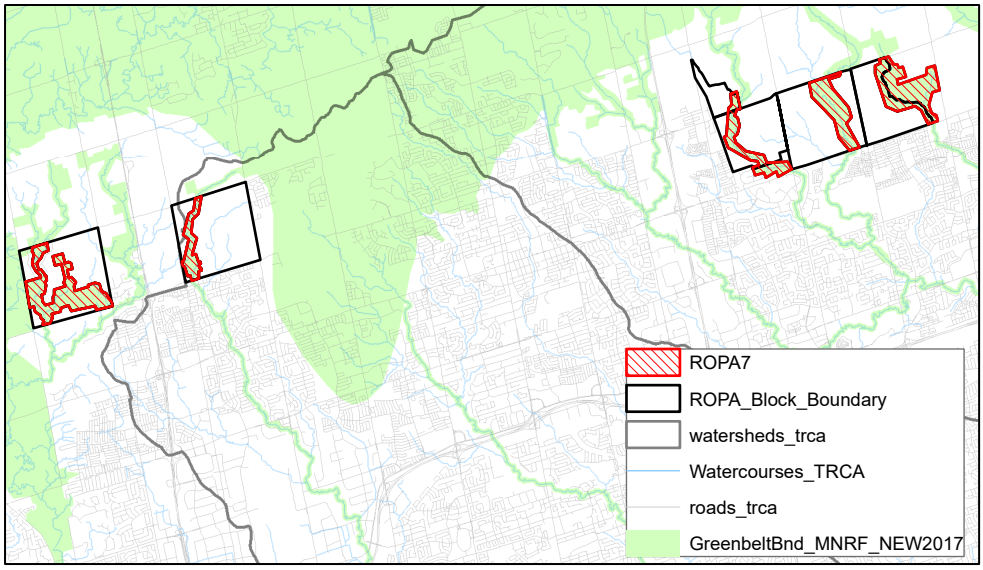


Figure 1. Study area: Block 41 (west) and Block 27 (middle) in Vaughan, and the Markham Future Urban Area (East) in Markham in York Region

Context, Data, and Methods

Natural cover provides various ecosystem functions and services that are important for ecosystem health and community well-being such as providing clean air and water, protection from flood and erosion, mitigating urban heat island effects, and supporting regional biodiversity. This is especially important in urban and urbanizing areas where natural cover is often limited, if not absent, yet the need for the ecosystem functions and services are higher.

Various direct and indirect impacts of urbanization severely compromise the ability of natural areas to function fully and impede provision of the required ecosystem functions and services. These impacts include direct habitat loss and fragmentation following from land conversion as well as indirect impacts from surrounding land use types. Consequently, the remnant natural areas are stressed and more vulnerable to future changes in land and climate, thereby posing risks to ecosystem and human health and well-being.

Recognizing the importance of natural areas and ecosystem functions, various natural heritage policies, plans, and programs including provincial plans, watershed plans, and Official Plans have management recommendations aimed at improving and enhancing natural cover quantity and quality. They emphasize protection and enhancement of existing natural cover, restoration of additional potential areas, as well as management of surrounding areas to reduce negative influences on existing natural cover. The protected countryside designation of the Greenbelt supports these objectives by ensuring that less impactful, and in some cases complimentary, land uses are maintained adjacent to important natural features. The protected countryside designation helps to minimize the surrounding land use influence on existing habitat, biodiversity, and other ecosystem functions. Introduction of more intense land uses including active recreation will adversely affect ecosystem form and functions. Any changes to the existing designation should be carefully examined to ensure they are not inducing more harm to the ecosystems, both at the site and at the regional scale. An integrated systems approach is needed to assess such impacts.

This analysis broadly characterizes existing conditions at the ROPA-7 areas based on a set of ecological criteria that were derived using site level and regional natural heritage system scale data. These criteria represent various ecosystem form and functions including natural cover quantity, quality, habitat connectivity, habitat suitability, and regional biodiversity. A complete list of indicators and metrics are presented in Table 1.

This analysis is based on available TRCA data which includes field collected and/or desktop analyzed data. Some of the field collected data are older and may not fully represent existing conditions. However, it offers the best-available information to provide insights into the potential ecological characteristics of the site. These data are continuously updated as new information becomes available.

Results

The result of this rapid assessment provides preliminary information on the potential impacts of the proposed changes to ecosystem features and functions within the ROPA areas. Detailed data on the impacts are presented in Table 1, mapped in Figure 2, and key findings are discussed below.

Key Findings:

1. **Total natural cover** in Vaughan and Markham is approximately 24% (6643 ha) and 17% (3676 ha) respectively, which is below the recommended targets of an average 40% for urban watersheds (ECCC 2013). The ROPA-7 areas contain approximately 1.5% (173 ha) of Vaughan's total natural cover and approximately 5% (221 ha) of Markham's total natural cover. This includes 122 ha of wetlands combined. Though the proposed changes will not directly result in loss of these natural features, the changes in the surrounding land use, such as the proposed protected countryside areas of the Greenbelt, will negatively impact these features and their functions such as habitat quality, connectivity, and suitability for various species groups as discussed in the following sections. In addition, the conversion of these areas to urban land uses will result in loss of opportunity to improve the amount and quality of natural cover that will benefit the ecosystem and its residents. (Figure 2 a)

2. **Natural cover quality** in Vaughan and Markham ROPA-7 areas are fair (L3) (82 ha) and poor (L4) (144 ha) based on TRCA's habitat patch ranking system. This indicates that the existing habitat patches in the ROPA area are stressed due to relatively small patch sizes and patch shapes that induce more edge effects, making the ecosystems more susceptible to the influence of surrounding land use. This highlights the importance of maintaining the surrounding land use in a form that minimizes indirect impacts (such as rural/agricultural) and improving the quality of these habitat patches to ensure healthy ecosystems and communities over the long term. This requires strategic investment in the areas that provides opportunity for restoration and enhancements that can improve the size and shape by filling in the holes in the patches as well as by reducing negative impacts from surrounding land uses. (Figure 2 b)

3. **Fauna species and ELC vegetation community** data show that the ROPA-7 areas provide habitat to multiple species and vegetation communities. This includes regional species of concern (4 in Vaughan and 6 in Markham) and urban species of concern (1 in Vaughan and 14 in Markham) including 3 Species-at-Risk: namely Eastern Wood-pewee, Eastern Meadowlark, and Bobolink. Given that some of this data may be old, field level assessments will be needed to confirm that these species are not being impacted with the proposed changes. Likewise, there are multiple vegetation communities of regional concern (2 in Vaughan and 6 in Markham) as well as of urban concern (8 in Vaughan and 18 in Markham). Though most of this biodiversity were inventoried in the natural features, the surrounding areas play a critical role in meeting their life cycle needs. Any changes in the surrounding landscape with added disturbances such as noise, light, and nutrient pollution will affect the long-term sustenance of these species over long term. (Figure 2 c)

4. **TRCA's updated Natural Heritage System** (DRAFT) identifies strategic areas for protecting, enhancing, and restoring natural cover and implementing other green infrastructure to ensure terrestrial and aquatic ecological functions are resilient over the long term. Based on TRCA's updated Natural Heritage System (NHS) the ROPA areas in Vaughan and Markham has the potential to add approximately 65 ha and 80 ha of new habitat respectively if they are considered for restoration. This would significantly improve the size and quality of the natural system, improved habitat quantity and quality. (Figure 2 d), providing greater diversity of wildlife, and improving the provision of several other ecosystem services.

5. **Habitat connectivity** in ROPA-7 areas include approximately 218 ha and 330 ha of regional connectivity priority in Vaughan and Markham, respectively. These areas have been identified in the top 50% of the TRCA's watersheds for maintaining connectivity among high quality habitat patches. These regional connectivity areas reflect the critical corridors for long term resilience of the region's habitat and biodiversity (Figure 2 e). Also, these ROPA-7 areas include local connectivity priority areas for species moving between forests (175 ha in Vaughan and 330 ha in Markham) and forests and wetland patches (42 ha in Vaughan and 16 ha in Markham) (Figure 2 f)). These local connectivity priority areas reflect where wildlife-human conflict might occur if not managed appropriately (e.g. road or trail mortality). The proposed changes in the ROPA-7 areas will impact the important regional and local connectivity function they provide, thereby impeding wildlife movement and adversely affecting regional biodiversity.

6. **Habitat suitability** in the ROPA-7 areas is relatively high for multiple species groups, especially in Block 41 where the ROPA areas support more than 7 out of 9 groups and in Markham FUA where they support 5 out of 9 groups of species of birds and amphibians. This indicates that the ROPA areas including existing habitat and the surrounding countryside significantly contributes to supporting regional biodiversity. The proposed changes to convert these areas to more active uses will compromise their ability to provide habitat function and negatively impact regional biodiversity. (Figure 2 g)

Conclusion

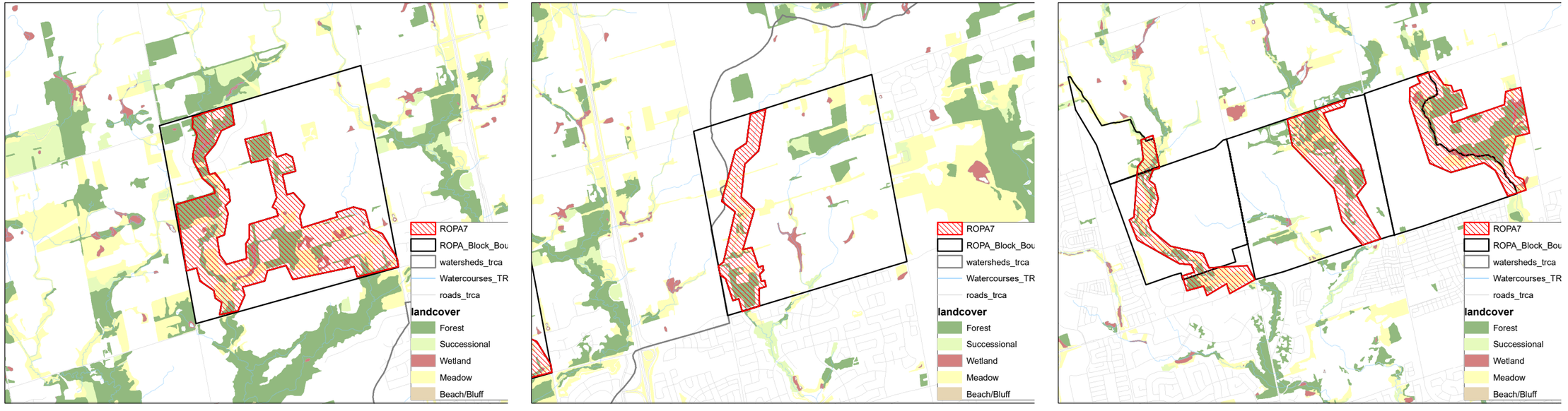
The Greenbelt designation including protected countryside provides a unique opportunity to protect, enhance, and potentially restore natural areas in urban landscapes, where the natural cover is limited if not absent. The Greenbelt Plan uses a systems approach to protecting ecosystem functions. It has recognized the importance of not only physically protecting existing natural features but also the critical role the surrounding countryside plays in promoting wildlife connectivity and buffering ecosystems from more intense urban land uses. Changes to the land use in these areas, even if it is outside of the natural features, will affect the ecological features and functions given the cumulative impacts of urbanization. The rapid assessment presented here showcases some of the important ecological impacts of the proposed changes in the ROPA-7 areas. Results indicate that the indirect effects of these proposed changes will have substantial negative impacts on the natural heritage at the site level and will also affect the regional natural heritage system and the ecological functions and services it can provide over the long term.

It is recommended that the proposed changes to land uses including active recreational uses be reconsidered and use this unique opportunity to enhance natural heritage of the region by strategically maintaining the compatible land uses and restoring potential areas for natural heritage objectives, at least within the Greenbelt of ROPA-7 areas.
It is also recommended that if more active uses will occur within these areas that they be carefully planned and designed to minimize the impacts to the natural system and that it be combined with strategically placed habitat restoration. Additional and more specific recommendations can be provided in the regard if needed.

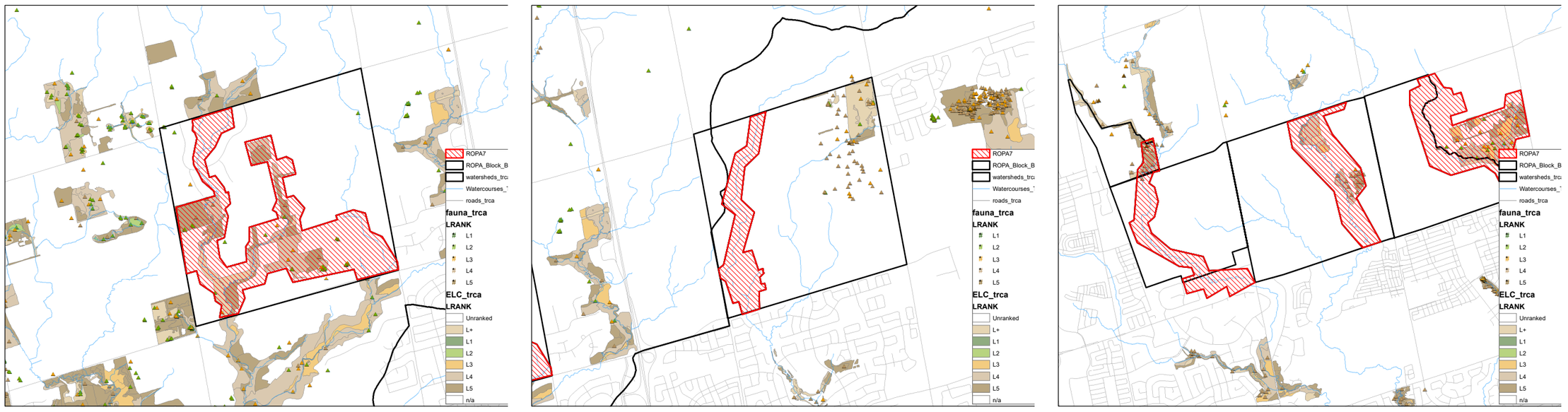
Table 1: Summary of the ecosystem features and functions impacted

Ecological Features and Functions Impacted (Indicator)	Measured as (Metric)	Total in Block 41 ROPA	Total in Block 27 (ROPA)	Total in Markham FUA (ROPA)	Importance of the Indicator
Natural Cover (Area)	Forest (Ha)	50	7	47	Natural cover (forest, wetland, meadows) provide habitat for numerous species, which use these areas for breeding, feeding, roosting, and migrating. Over 85% of wetlands have been lost since settlement in southern Ontario (Ducks Unlimited Canada 2010). These wetlands were drained for agriculture or converted to other land uses such as built-up lands especially in the Golden Horseshoe (Ducks Unlimited Canada 2010). Wetlands provide numerous ecosystem functions and services including nutrient cycling, flood retention, wildlife habitat and carbon storage. Preventing further wetland loss and fragmentation is one of the most important factors in limiting carbon emissions to meet targets (Moomaw et al. 2018).
	Meadow (Ha)	22	3	29	
	Wetland (Ha)	15	6	101	
Natural Cover Patch Quality (Area)	L3 (Ha)	28	0	54	L1-L3 locally ranked habitat patches generally are larger, rounder (fewer edge effects) and have lower negative influences from the matrix (surrounding land use). These patches can support larger populations of species, thus promoting their viability; have the capacity to support area-sensitive and forest interior species; are better buffered from negative external influences; likely include a greater diversity of habitat types; and, they have a greater capacity to maintain and promote a variety of natural ecological processes (see Forman 1995, Bennett 1999, Matthews et al. 2005).
Fauna Species (# of Unique Species)	L1	0	0	0	L1-L3 locally ranked fauna species have a limited local occurrence, declining population trends, habitat specialist and area sensitive requirements, restricted mobility, and a sensitivity to development. They are considered species of regional concern and L4 species are considered species of urban concern. In addition to the intrinsic values of these species (the value of something "in-and-of-itself"), they are important as they provide many ecosystem services such as nutrient deposition/cycling, seed dispersal, pollination, predation, controlling disease vectors (Sekercioglu 2006, Hocking and Babbitt 2014). Some areas may be lacking data for species and as such, estimates should be considered minimums and the true numbers are likely higher.
	L2	2	0	2	
	L3	2	0	4	
	L4	1	0	14	
	SAR	3	0	2	These species are listed as Species-at-Risk federally and/or provincially. Their presence and confirmed/probable breeding status mean that non-compatible activities within these areas are regulated.
ELC Vegetation Communities (# of Unique Communities)	L2	0	0	0	L1-L3 ELC Vegetation Communities are considered of regional concern and L4 of urban concern.
	L3	2	0	6	
	L4	8	0	18	
	L5	6	0	10	
TRCA Updated Natural Heritage System (NHS) (Area)	Existing Natural Cover (Ha)	86	16	177	TRCA's updated Natural Heritage System (DRAFT) uses a systems-based approach to identify strategic areas for protecting and enhancing existing natural cover, restoring potential natural cover, and facilitating implementation of other green infrastructure in areas contributing to the ecosystem functions to ensure that various terrestrial and aquatic ecological features and functions are resilient over long term.
	Potential Natural Cover (Ha)	58	7	80	
	Contributing Area (Ha)	10	27	50	
Habitat Connectivity (Area)	Regional Connectivity (Ha)	168	50	330	Regional-scale landscape connectivity ensures that longer-term ecological processes (e.g. metapopulation dynamics, gene flow, and dispersal) are maintained in the face of changes in land use and climate (Ricketts 2001, Calabrese and Fagan 2004). Connectivity is becoming increasingly important, especially from a climate change adaptation perspective where increasing connectivity between habitats can assist with species movements as species are forced to move to locations outside existing or historical ranges (Gleeson et al. 2011).
	Local Connectivity Forest-Wetland Priority (Ha)	42	0	16	Landscape connectivity at the local scale ensures that wildlife are able to move to appropriate habitat patches to maintain their short-term life history processes (e.g. seasonal movement between breeding and foraging areas). For example, amphibians such as frogs and toads need to move seasonally in spring and fall between forests and wetlands to breed and overwinter. Other species such as small mammals move between forest patches.
	Local Connectivity Forest-Forest Priority (Ha)	145	30	228	
Habitat Suitability (# of Unique Species Groups Supported)	Total Species Groups	7	1	5	TRCA's avian (birds) and amphibian (frogs) data were used to derive 9 functional trait groups of species that reflected similar needs and interaction with the landscape. Habitat suitability for each of these groups of species were modelled to predict where potentially functioning habitat may be present to inform habitat conservation and management. The areas supporting multiple groups are considered important for strategic areas for habitat conservation.

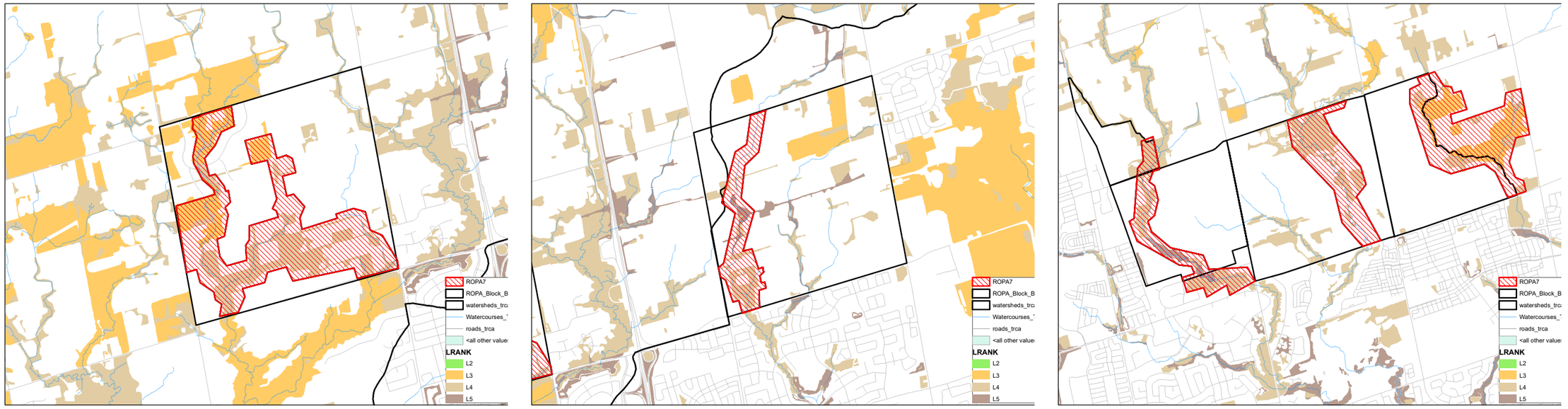
Figure 2: Ecological Indicators in Block 41, Block 27, and Markham FUA



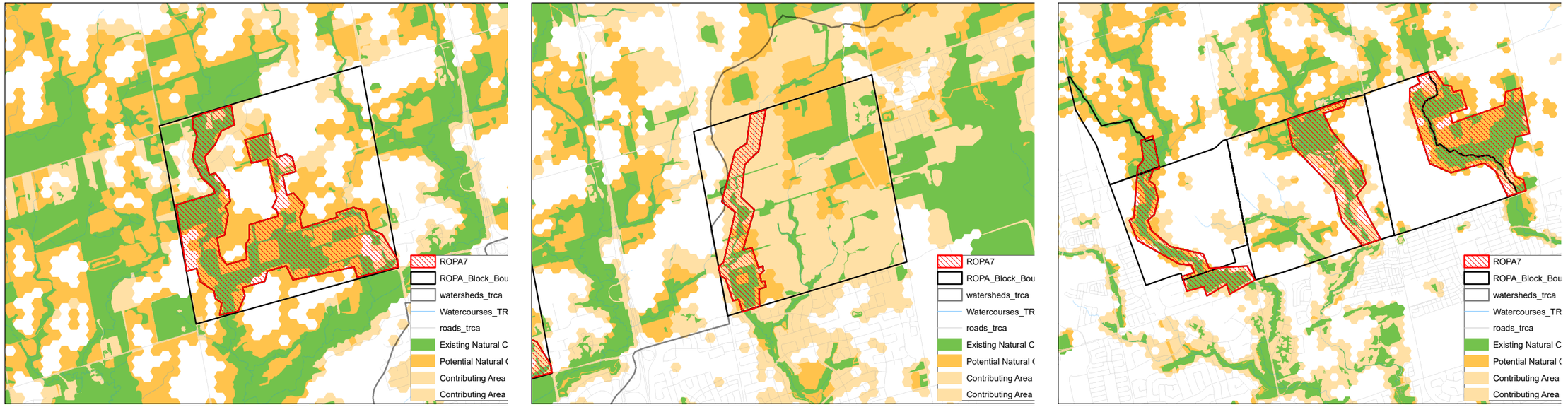
a. Natural Cover in Block 41, Block 27, and Markham FUA



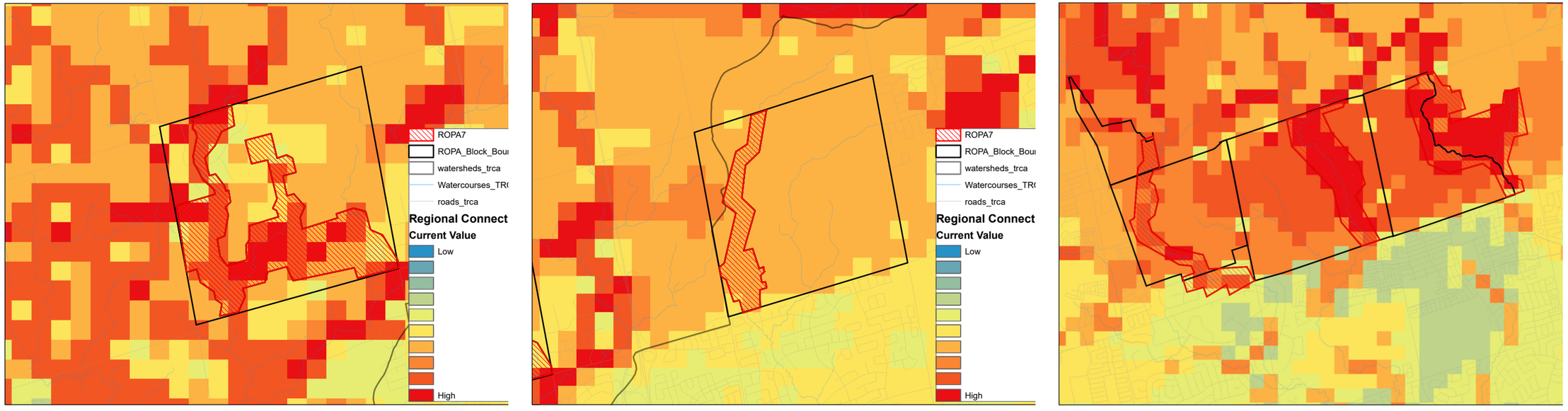
b. Fauna Species and ELC Vegetation in Block 41, Block 27, and Markham FUA



c. Natural Cover Quality in Block 41, Block 27, and Markham FUA

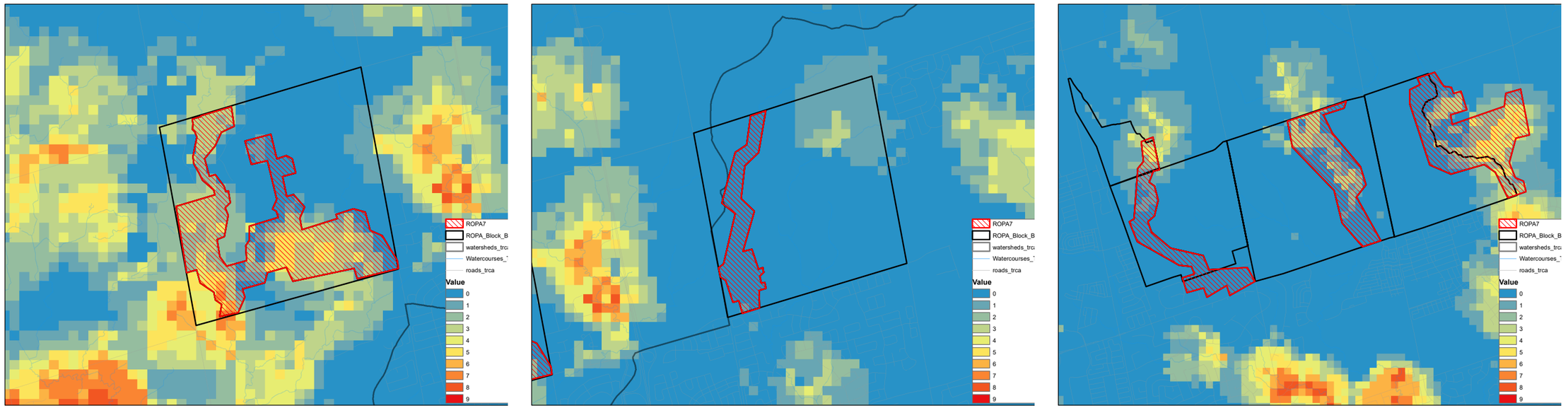


d. TRCA Updated Natural Heritage System in Block 41, Block 27, and Markham FUA



e. Regional Habitat Connectivity Priority in Block 41, Block 27, and Markham FUA

f. Local Habitat Connectivity Priority (Forest-Wetland: solid red, Forest-Forest: solid green)



g. Habitat Suitability in Block 41, Block 27, and Markham FUA (number of avian and amphibian groups supported: 0 (low) to 9 (high))