Study of Aggregate Site Rehabilitation in Ontario

Bruce County, Dufferin County, Grey County & Simcoe County - 2014

Part II
ADDENDUM

OSSGA
ONTARIO STONE, SAND & GRAVEL ASSOCIATION

Skelton Brumwell & Associates Inc.
ENGINEERING PLANNING ENVIRONMENTAL CONSULTANTS

ACKNOWLEDGEMENTS

Report Prepared By:

Caitlin M. Port B.E.S, M.E.S (Plan)
Planner
Skelton Brumwell & Associates Inc.

Special Thanks To

The property owners and managers for permitting access to former licensed pits and quarries, and for their interest, cooperation, and willingness to share knowledge about site rehabilitation with the study team.

Ministry of Natural Resources and Forestry, various municipal, and The Ontario Aggregate Resources Corporation (TOARC) staff for any assistance that they provided during the study process.

For any questions regarding this report, please contact:

The Ontario Stone, Sand & Gravel Association
5720 Timberlea Boulevard, Suite 103
Mississauga, ON
L4W 4W2

(905) 507-0711
www.ossga.com

Table of Contents

Acknowledgements 2
Table of Contents 3
List of Tables 4
List of Figures 4
Executive Summary 5
1 Introduction 6
1.1 Objectives of Study 6
1.1 Scope of Study 7
1.2 Study Areas 7
1.3 Study Limitations 9
2 Methodology 10
2.1.1 Types of Vegetation Categories 10
2.1.2 Surrounding Land Use Categories 10
2.1.3 Current Land Use Categories 12
3 Results 21
3.1 Overall Study Area 22
3.2 Bruce County Geographic Area 24
3.3 Dufferin County Geographic Area 26
3.4 Grey County Geographic Area 28
3.5 Simcoe County Geographic Area 30
4 CONCLUSIONS & RECOMMENDATIONS 32
4.1 Summary of Key Findings 32
4.2 Summary of Key Recommendations 33

List of Tables

TABLE 1: TOTAL NUMBER OF SURVEYED SITES FOR 2014, 2013, AND 2010 21

List of Figures

FIGURE 1: REPORT PART II (ADDENDUM) SURVEY AREA 8
FIGURE 2: UPDATED PREDOMINANT LAND USE FOR REHABILITATED SITES SURVEYED IN THE OVERALL STUDY AREA. .. 22
FIGURE 3: REHABILITATION EXAMPLES. 23
FIGURE 4: PREDOMINANT LAND USE FOR REHABILITATED SITES SURVEYED IN THE BRUCE COUNTY AREA 24
FIGURE 5: EXAMPLES OF AGRICULTURAL TYPE REHABILITATION IN BRUCE COUNTY 25
FIGURE 6: PREDOMINANT LAND USE FOR REHABILITATED SITES SURVEYED IN THE DUFFERIN COUNTY AREA 26
FIGURE 7: EXAMPLES OF REHABILITATION IN DUFFERIN COUNTY 27
FIGURE 8: PREDOMINANT LAND USE FOR REHABILITATED SITES SURVEYED IN THE GREY COUNTY AREA 28
FIGURE 9: EXAMPLES OF REHABILITATION IN GREY COUNTY 29
FIGURE 10: PREDOMINANT LAND USE FOR REHABILITATED SITES SURVEYED IN THE SIMCOE COUNTY AREA. 30
FIGURE 11: EXAMPLES OF REHABILITATION IN SIMCOE COUNTY 31

EXECUTIVE SUMMARY

Between 2010 and 2014, researchers from the Ontario Stone, Sand & Gravel Association visited and assessed the condition of **a total of 701** pits and quarries across southern and eastern Ontario that were licensed, rehabilitated, and surrendered under the *Aggregate Resources Act* (1990) or the *Pits and Quarries Control Act* (1971).

The Ontario Stone, Sand & Gravel Association (OSSGA) initiated the *Study of Aggregate Site Rehabilitation in Ontario* in order to create a "living" database for rehabilitated aggregate sites in Ontario. This database will be used to assess, record and track the final land use condition of rehabilitated aggregate sites across Ontario.

Due to the perceived social and environmental costs of aggregate extraction, in addition to competing land use values, there is generally a poor public perception of the aggregate industry and aggregate extraction activities. The perception is that pits and quarries will leave "open-scars" and lasting negative impacts on the landscape. Prior to the undertaking of this rehabilitation initiative, very limited information and data was available about the rehabilitation of licensed pits and quarries across the province.

This ongoing study first began in 2010 and has resulted in the subsequent publication of two widely circulated reports. Both Part I and Part II Study reports demonstrate that former aggregate extraction sites are being successfully rehabilitated in Ontario.

This addendum to the 2013 Part II report adds an additional 133 records to the OSSGA rehabilitation database and completes the rehabilitation statistics for Bruce, Dufferin, and Simcoe Counties. With the addition of another 133 surveyed sites to the OSSGA Rehabilitation Database, analysis of the combined data (2010-2014) reveals that:

- ➔ The four most common land uses for rehabilitated aggregate sites were determined to be Natural (25%), Agriculture (21%), Open Space (15%), and Water (10%).

The additional data collected, for primarily rural parts of southern Ontario, further illustrates that licensed pits and quarries that are surrendered are rehabilitated to a final land use condition that adequately integrates with the surrounding land use and represents a productive, sequential land use. This ongoing data collection continues to provide strong evidence that aggregate extraction is appropriately considered an interim use of the land as stated in provincial policy directives.

1 INTRODUCTION

Aggregate resources (sand, gravel, clay, and bedrock) are essential materials for supporting the construction and manufacturing industries in Ontario. These non-renewable resources are vitally important to Ontario's economy and are essential for supporting the ongoing growth occurring in major urban areas across the province. The long-term protection and conservation of aggregate materials is required by provincial policy, as is the access and availability of close-to-market aggregate sources.

As highlighted in the Provincial Policy Statement (PPS) for Ontario, rural areas are important to the economic success of the province. The rural areas of southern Ontario support diverse and economically important land uses including: rural settlement areas, prime agricultural lands, natural heritage features, and resource areas. With ongoing population growth occurring in southern Ontario, there is increasing pressure to ensure land use compatibility and strategic resource management in the rural parts of the province.

From a land use planning perspective, aggregate extraction is unique in that it is an interim use of the land. Once the sand, gravel, and/or stone materials are extracted, the land is rehabilitated to a subsequent land use. The data collected as part of this study helps to demonstrate that aggregate extraction is an acceptable and temporary use of rural lands, given that these sites are returned to productive and appropriate rural-type land uses.

This report serves as an addendum to the second (Part II) Study report (2013), as additional rehabilitation data was collected for Bruce County, Dufferin County, Grey County, and Simcoe County. The rehabilitation statistics for these primarily rural geographic areas are now complete and presented in this report.

The additional data collected and analyzed for these rural geographic areas further confirms the success of pit and quarry rehabilitation as determined by the results presented and discussed in Part I and Part II of the Study Reports. For a complete discussion on aggregate resource management, previous research, study methodology, conclusions, and recommendations please refer to the Part II Report available online at: http://www.ossga.com/publications.

1.1 Objectives of Study

The objectives of the ongoing OSSGA rehabilitation study initiative are to investigate, assess, and document the rehabilitation status and final land use condition of surrendered aggregate pit and quarry licences across Ontario. This will be achieved by completing the following tasks:

- Conducting individual field assessments to identify the current condition and land use on each site;

- Assessing each site's current use within the context of surrounding land uses;
- Identifying the current vegetation type and percentage of tree cover on each site to determine the ecological succession patterns for vegetative communities on the site;
- Locating and creating baseline data on the status of rehabilitation efforts in Ontario;
- Identifying overall land use trends for rehabilitated aggregate sites in Ontario; and,
- Developing recommendations for the aggregate industry and governing bodies.

1.1 Scope of Study

Licences that were issued by and surrendered to the Ministry of Natural Resources and Forestry (MNRF) under the *Pits and Quarries Control Act* (1971) and/or the *Aggregate Resources Act* (1990) were included in the scope of this study. Progressive and/or final rehabilitation occurring on currently licensed sites was excluded from this study, as were revoked licences.

This study did not compare the current land use condition with the rehabilitation Site Plan required by the licensing and site planning process. Therefore, this study did not determine whether the completed rehabilitation corresponded with the Site Plan, as approved by the MNRF, under the *Pits and Quarries Control Act* (PQCA) or *Aggregate Resources Act* (ARA).

This report serves as an addendum to the Part II Study Report as it completes the data collection for Bruce, Dufferin, Grey, and Simcoe Counties. Some of the rehabilitated sites in these counties had previously been captured in the survey areas covered by the Part I and Part II Study Reports. The remaining rehabilitated sites in these counties were surveyed as part of the 2014 field season and included in this addendum. In addition, this addendum to the Part II report combines the collected data from the 2010, 2013, and 2014 field study periods in order to form a comprehensive and updated rehabilitation profile for Ontario.

1.2 Study Areas

Since 2010, the OSSGA Rehabilitation Study initiative has surveyed surrendered aggregate licences in over 100 municipalities across southern and eastern Ontario. In the Part I Study Report, the collected data was organized and presented into four geographic areas of interest:

1. Green Belt Plan Area (including the Oak Ridges Moraine Plan Area, Niagara Escarpment Plan Area and Protected Countryside;

2. Lake Simcoe Protection Plan Area;

3. Unlicensed sites within historical Metropolitan Toronto; and,

4. City of Ottawa.

In the Part II Study Report, the collected data is organized into 17 geographic study sub-areas, generally represented by upper-tier municipal boundaries. This report addendum adds rehabilitation profiles for two more geographic areas (Bruce and Grey Counties) and adds additional data to complete the Dufferin and Grey Geographic areas. A total of 19 geographic areas across southern and eastern Ontario now have complete rehabilitation profiles.

See Appendix A for a map of all completed study areas for the OSSGA Rehabilitation Study initiative (2010 and 2014).

Figure 1 below identifies the geographic areas surveyed during the 2014 field season and analyzed in this 2014 addendum.

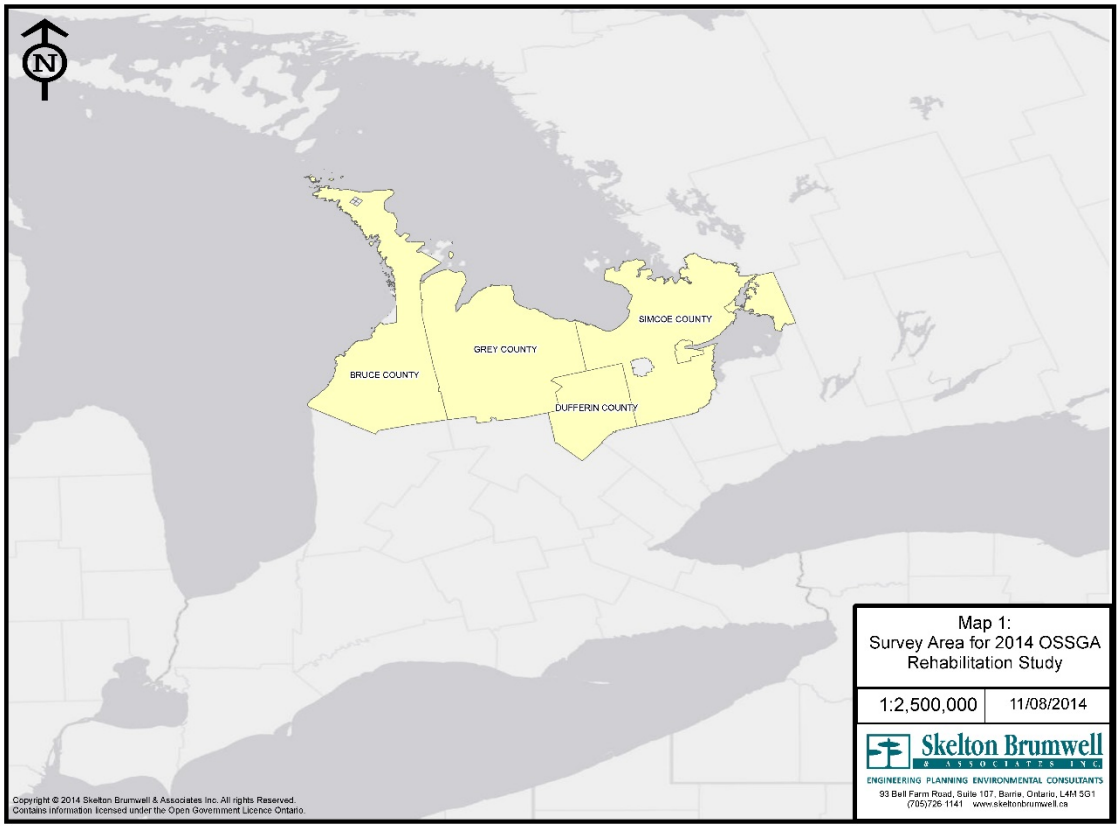


Figure 1: Report Part II (Addendum) Survey Area

1.3 Study Limitations

Although several challenges were encountered during this study, the most significant constraint was the limited availability of data regarding surrendered pits and quarries.

The database currently used by the MNRF—the Aggregate Licensing and Permitting System (ALPS)—was created to record and store licence and permit data related to the *Aggregate Resources Act* (ARA). It should be noted that once the licence for a site is surrendered, these sites are no longer regulated or managed by the MNRF under the ARA. Accordingly, ALPS was not designed to track post-surrender data.

Unfortunately, data retention challenges since the inception of the *Pits and Quarries Control Act* in the 1970s have resulted in the loss of some important data on surrendered aggregate licences. Problems with data retention include:

- incomplete records;
- loss of some data;
- incorrect or missing site location information;
- unknown rehabilitation information; and,
- poor or no licence amendment or amalgamation data.

The available ALPS data was supplemented with valuable information provided by MNRF inspectors in many regions. There is clearly a need for a standardized central database to retain this information and this is highlighted as a recommendation in both Part I and Part II of the OSSGA Rehabilitation Study initiative as well as in the 2010 State of the Aggregate Resource in Ontario Study (SAROS). Closing the gap for this missing information is regarded as a future and ongoing goal for OSSGA.

In addition, some of the sites were inaccessible (e.g. gated) or landowner permission for access was not granted. Because the majority of sites are located on private property, conducting comprehensive site assessments was a challenge and some sites were only surveyed from a public road and using aerial images. Honouring landowners' decisions regarding access meant that the study team could not visit and quantify some of the sites identified for assessment.

2 METHODOLOGY

This study of surrendered licensed pits and quarries in Ontario involved preliminary assessments, field visits, and aerial photograph interpretation. All of the information collected is stored in an *Aggregate Site Rehabilitation Database* established and managed by OSSGA.

2.1.1 Types of Vegetation Categories

During the field assessments, the predominant type of vegetation was determined for each of the study sites and documented using the following categories:

- Agriculture: Vegetation used for crop production such as corn, soy, wheat or hay.
- Native: Vegetation that is primarily native to southern Ontario.
- Non-native: The primary vegetation type on the site is not native to southern Ontario and can be considered an invasive species or ornamental planting for landscaping purposes.
- Not Applicable: The site does not contain any vegetation or the vegetation type does not fit into one of the other vegetation type classification categories.
- Seeded: The site was seeded with a grass/legume mixture and further ecological assessments are needed to determine whether the species are native or non-native.

2.1.2 Surrounding Land Use Categories

During field assessments, the study team determined the surrounding land uses for each site of interest using the following categories:

- Aggregate Extraction: Land area licensed under the *Aggregate Resources Act* for the excavation of crushed stone, sand and/or gravel.
- Agriculture: Land area used to produce food and goods through farming practices (e.g., pasture, field crop, livestock, orchard, vineyard etc.).
- Commercial: Area used for the buying and selling of goods and/or services by commercial businesses.

- Conservation Area: Land area with protection status that ensures the preservation of natural features, cultural heritage, or biota; may be nature reserve, parkland, or other area maintained by Ontario Conservation Authorities or provincial or territorial government.
- Industrial: Land area used for the manufacturing and production of goods.
- Institutional: Land area used by an establishment, association, or foundation that is funded and united for a specific purpose.
- Natural: Naturalized land area that contains a vegetated terrestrial or aquatic ecosystem (i.e. woodlot, unmaintained open space, riparian ecosystem etc.).
- Recreational: Land area used for active and passive recreational purposes.
- Residential: Land area primarily used for housing, typically zoned residential, and with existing residences on the property.

2.1.3 Current Land Use Categories

The current land use categories and sub-classifications used for the sites visited during this study are outlined below.

Current Land Use Category	Sub-Classification	Key	Photo Example
Natural Category for vegetated, terrestrial ecosystem maintained by environmental disturbances, not by human influence.	Cultural Thicket	Land dominated by shrub species (more than 25%) and having less than 25% tree coverage.	
	Woodland	Land with tree coverage in amounts typically between 35% and 60%.	
	Other	Meadow, grassland, prairie, or mature forest.	

Current Land Use Category	Sub-Classification	Key	Photo Example
Open Space Category for vegetated, terrestrial ecosystem with predominantly low lying vegetation and less than 5% tree coverage, maintained through anthropogenic disturbances.	Natural	Ditch or unmaintained lawn.	
	Maintained	Manicured lawn and/or maintained garden.	
	Other	Exposed sand, stone, gravel, pavement stone, or roadway.	

Current Land Use Category	Sub-Classification	Key	Photo Example
Water Category for land that is either permanently flooded or periodically and seasonally inundated with water.	Storm Water Management	Pond designed to capture water run-off in developed areas where flooding can occur because of impermeable substrates.	
	Pond	Body of isolated standing water, typically smaller than a lake, in which water accumulates from rain and snow melt or is naturally spring-fed, and where wetland and aquatic plant species are present.	
	Restored Watercourse	Stream or river connected to neighbouring waterways that were altered by human influence and restored through site restoration.	
	Other	Lake, wetland, marsh, swamp, or bog.	

Current Land Use Category	Sub-Classification	Key	Photo Example
Agriculture Category for land used to produce food and goods through farming practices.	Vineyard	Land used for grapevine cultivation.	
	Livestock	Land used for animal production or rearing.	
	Orchard	Land used for fruit crop cultivation.	
	Pasture	Land dedicated to growing low-lying vegetation for grazing animals.	
	Field Crop	Large field area dedicated to cultivation of vegetation for human consumption (e.g., vegetables) or agricultural purposes (e.g., hay or grain).	
	Other	Land or water body used for aquaculture—e.g., farming of aquatic species, usually fish.	

Current Land Use Category	Sub-Classification	Key	Photo Example
Recreational Category for land used for purposes or activities that provide enjoyment to community members.	Private	Recreational area located on privately owned land.	
	Golf Course	Public or privately-owned golf course.	
	Conservation Area	Land that has protected status to ensure the preservation of natural features, cultural heritage, or biota; may be nature reserve, parkland, or other area maintained by Ontario Conservation Authorities.	
	Public Park, Sports Field, or Playground	Municipally-owned recreational area.	
	Other	Land used for a sportsplex, swimming pool, indoor skating rink, national or international sports facility, or physical fitness centre.	

Current Land Use Category	Sub-Classification	Key	Photo Example
Commercial Category for land used for the buying and selling of goods and/or services by commercial businesses.	Professional or Financial Services	Land on which professional or financial services are sold.	
	Restaurants	Land on which prepared food, beverages, and dining services are sold.	
	Grocery/ Retail	Land on which food and other general goods are sold.	
	Hotel	Land on which temporary accommodation and related services are sold.	

Current Land Use Category	Sub-Classification	Key	Photo Example
Industrial Category for land used for the manufacturing and production of goods.	Office	Land on which business, clerical, and/or professional duties are carried out.	
	General Industrial	Land with a variety of uses ranging from light manufacturing to heavy manufacturing plants.	
	Waste Disposal Site	Land used for a waste disposal site, landfill, recycling centre, compost facility, or similar activity.	
Institutional Category for land used by an establishment, association, or foundation that is funded and united for a specific purpose.	School	Land used for a public or private educational facility.	
	Government Office	Federal, provincial, or municipal properties and buildings used to provide public services.	
	Other	Land used for hospitals or non-governmental offices.	

Current Land Use Category	Sub-Classification	Key	Photo Example
Residential Category for land that is typically zoned residential, is primarily used for housing, and has existing residences or established residential lots.	Apartment	Land used for a suite of rooms occupied by more than one household, typically a multi-storey building.	
	Single-Detached	Land used for a single-family dwelling or detached home or for a free-standing residential building on a property that is divided into defined lots.	
	Semi-Detached	Land used for a pair of houses built side-by-side and attached on one side.	
	Townhouses	Land used for terraced, rowed, or linked houses.	
	Rural	Land in a low-density area that is zoned “rural” and typically has a single-detached home on several acres of agricultural, open space, or wooded land.	
	Other	Land used for a senior residence.	

Please see the *Study of Aggregate Site Rehabilitation in Ontario – Report Part II* for a complete discussion and overview of the study methodology used for data collection and analysis.

Figure 2: An example of agricultural rehabilitation in Bruce County

3 RESULTS

A total of 701 rehabilitated pits and quarries throughout southern and eastern Ontario have been surveyed since 2010 as part of the OSSGA Rehabilitation Study. Table 1 identifies the number of rehabilitated sites surveyed during each year in which field surveys were completed and reports released.

The rehabilitated sites surveyed as part of this study initiative were located in both urban and rural landscapes as well as areas that can be classified as the urban-rural fringe (defined as the boundary area outside of an urban area where urban and rural land uses intermix). The four geographic areas analyzed in this addendum (Bruce, Dufferin, Grey, and Simcoe Counties) can be classified as primarily rural, but do contain some small to medium-sized cities. These rural geographic areas are characterized by predominately rural land uses, including: agriculture, resource extraction, and rural residential.

In this addendum, the analysis and discussion of the collected data is organized in four (4) geographic areas in order to provide regional rehabilitation profiles and subsequent comparisons. In the Part II Report (2013), 17 rehabilitation profiles are presented. The overall study results (i.e. the assessment of all 701 sites combined) are also presented in this addendum in order to provide an update on the rehabilitation profile for Ontario.

Table 1: Total Number of surveyed sites for 2014, 2013, and 2010

Study Year	Total # of Sites Surveyed	Report
2010 field surveys	337	Part I (2010)
2013 field surveys	231	Part II (2013)
2014 field surveys	133	Part II Addendum (2014)
TOTAL	**701**	**3 reports**

It is important to consider that many rehabilitated aggregate sites in Ontario can represent more than one final land use on any given site. For example, a rehabilitated aggregate site with a predominant land use classification of *Agriculture* can also include *Residential* and *Water* land uses on the same site. The predominant land use classifications for the entire study area, as detailed in Figure 2, represent the final land use that best characterizes the use of the land on the site (i.e. 50 per cent or more of the site is used for the classified land use). The data collected revealed that frequently, rehabilitated aggregate sites also contain secondary or tertiary land uses which are not represented in the following pie charts. ***Pie charts included in this study report are expressed in number of sites surveyed, represented by percentages.***

3.1 Overall Study Area

The **predominant current land uses** (see Figure 2) of the **701** rehabilitated sites in the study area were determined to be: Natural (178 sites), Agriculture (146 sites), Open Space (103 sites), Water (71 sites), Residential (64 sites), Recreational (62 sites), Industrial (37 sites), Commercial (19 sites), Other (12 sites), and Institutional (9 sites).

The additional data collected for Bruce, Dufferin, Grey and Simcoe Counties resulted in a very minimal change in the overall rehabilitation profile for Ontario from the profile presented in the Part II Study Report. The addition of data from another 133 field surveys resulted in a slight increase in the proportion of sites that are rehabilitated to Agricultural and Open Space land uses. Given that the additional 133 sites surveyed were located in primarily rural areas, this minor increase in Agricultural and Open Space final land uses can be expected.

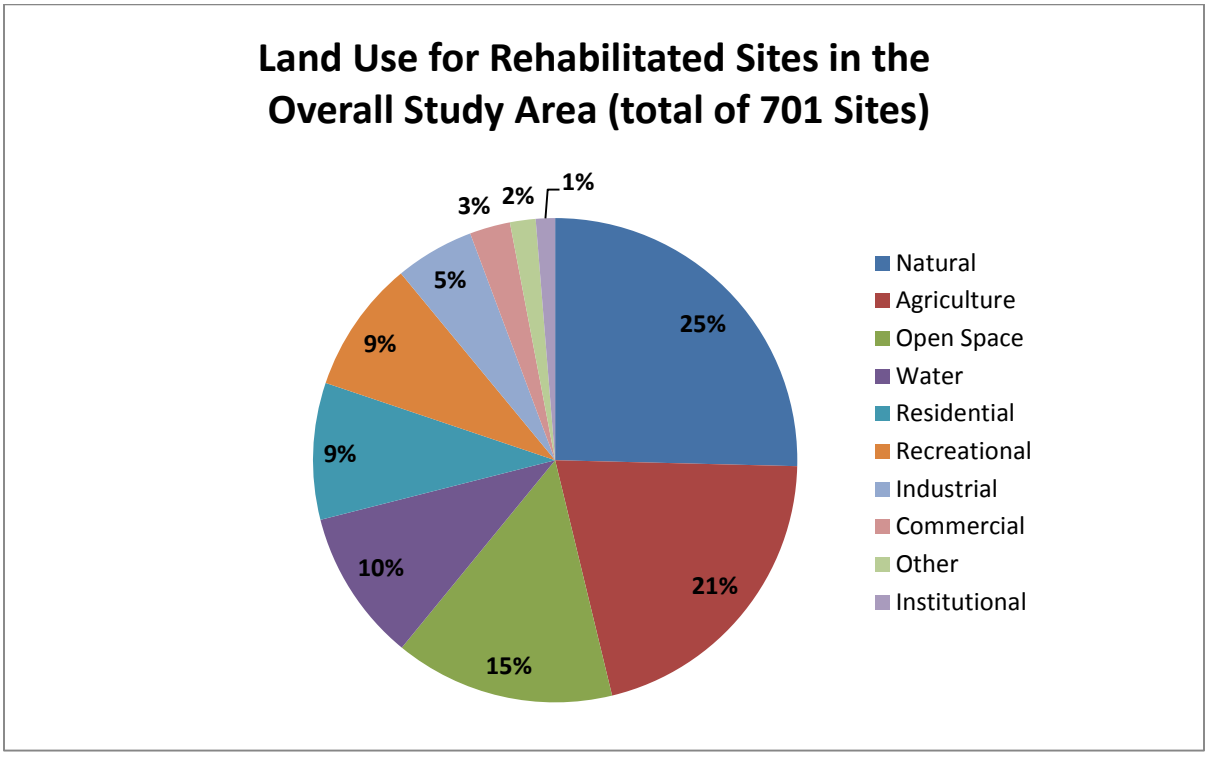


Figure 2: Updated Predominant land use for rehabilitated sites surveyed in the Overall Study Area.

Similarly to the sites surveyed and assessed in Part I and Part II of the study reports, site assessments from the 2014 field season revealed that surrendered licensed pits and quarries are rehabilitated to a final land use condition that is consistent with the character of the adjacent land as well as the broader landscape area. Most sites were sufficiently integrated with the rural or semi-urban character of the adjacent landscape and were unrecognizable as previous aggregate extraction operations.

Within the 2014 survey area, a variety of final land uses were observed; this diversity in rehabilitation reflects the variety of rural land uses that occur in southern Ontario (see photographs in Figure 4 for examples of rural aggregate site rehabilitation).

Figure 3: Agricultural rehabilitation in Bruce County (top left), natural rehabilitation in Dufferin County (top right), open space rehabilitation in Simcoe County (bottom left), and rehabilitation to a residential land use in Grey County (bottom right).

Summary of results for the Overall Study Area – 2014 Update:

- The four predominant land uses for rehabilitated aggregate sites in the overall study area are: Natural, Agricultural, Open Space, and Water. This is the same result as presented in the Part II (2013) Study report.
- Former licensed pits and quarries located in rural areas are returned to rural land uses, including agriculture, natural and open space. Former aggregate extraction sites located in more urban areas or in rural-urban fringe areas are rehabilitated to more urban land uses, such as residential housing.
- Licensed pits and quarries in Ontario can be rehabilitated to a variety of productive final land uses. Rehabilitated sites successfully integrate into the surrounding urban or rural landscape.

3.2 Bruce County

A total of **48** rehabilitated pits and quarries were surveyed in Bruce County.

The predominant **final land uses** for surrendered licensed pits and quarries in Bruce County (see Figure 4) were observed to be: Agriculture (17 sites), Open Space (12 sites), and Natural (12 sites). Other observed final land uses included: Residential, Industrial, Water, and Recreational.

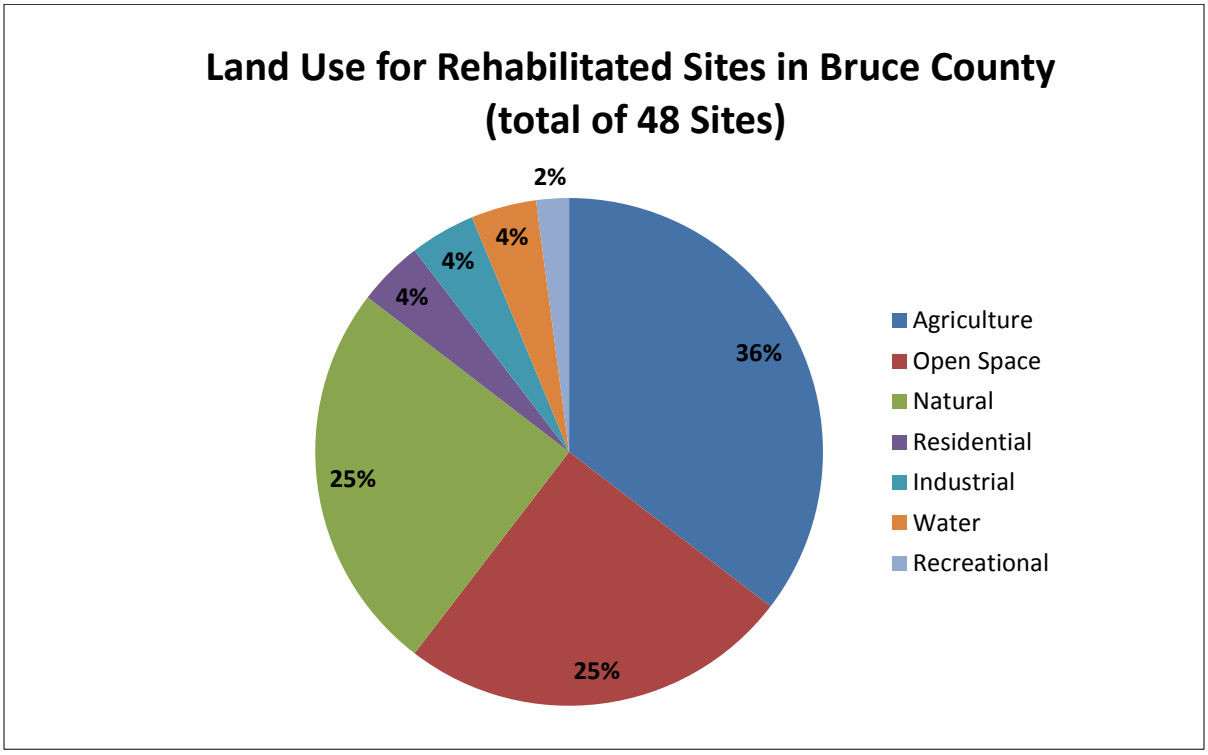


Figure 4: Predominant land use for rehabilitated sites surveyed in Bruce County

The average **percentage of tree coverage** was estimated to be 9%. This low percentage of tree cover is due to the majority of rehabilitated sites being used for Agricultural and Open Space land uses. Open Space sites were, for the most part, sloped and seeded and will likely increase tree cover over time through natural regeneration processes.

Sites rehabilitated to an agricultural final land use in the Bruce County area were observed to be primarily hay and pasture. In addition, the majority of sites classified as Open Space were further sub-classified as being Naturalized Open Space, such as unmaintained open space on rural properties. Sites classified as a Natural final land use were generally older pre-ARA (i.e. pits and quarries surrendered pre-1990 under the PQCA) sites and were primarily sub-classified as Cultural Thickets. It is likely that to some extent, several of the pre-ARA surveyed sites may have undergone natural regeneration.

Summary of results for Bruce County:

- Agriculture, Open Space, and Natural are the predominant land uses for rehabilitated aggregate sites in Bruce County.
- Rehabilitated and surrendered licensed pits and quarries in Bruce County are successfully integrated into the surrounding landscape and are compatible with the primarily rural land use characteristics of the area.

Figure 5: Examples of Agricultural rehabilitation in Bruce County

3.3 Dufferin County

A total of sixteen surrendered pit and quarry licences were surveyed in Dufferin County.

The predominant land uses for rehabilitated aggregate sites in Dufferin County (see Figure 6) were observed to be: Agriculture (7 sites), Natural (4 sites), and Open Space (3 sites). Additional land uses included a large lake and one site currently under redevelopment to a residential subdivision (classified as "Other").

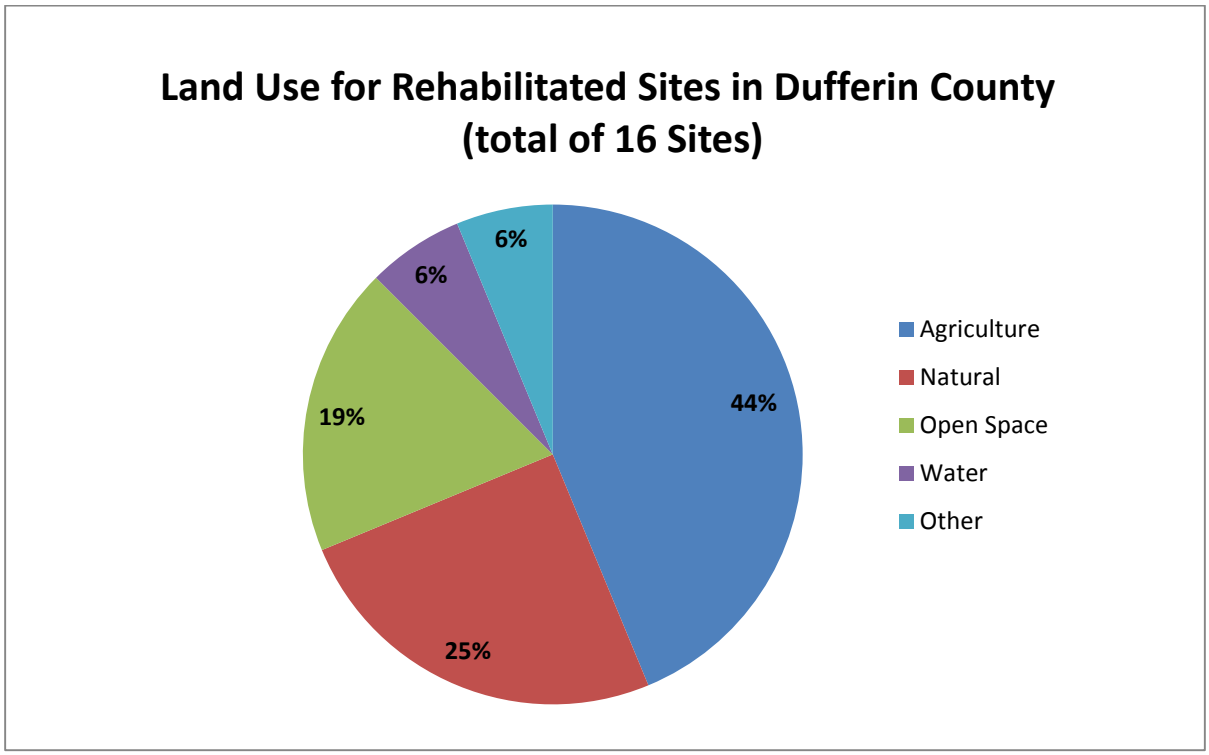


Figure 6: Predominant land use for rehabilitated sites surveyed in Dufferin County

The average percentage of tree coverage for these sites was calculated to be about 12%. All sites were observed to have a land use character compatible with the surrounding rural landscape.

All agricultural sites in Dufferin County were further sub-classified as field crop, including corn, soy beans, and hay. Sites that were categorized as Open Space were generally part of large rural, residential properties. Naturalized sites were sub-classified as mature grassland/meadow and cultural thickets.

All rehabilitated pits and quarries in Dufferin County were bordered by agriculture or rural residential land uses. Only one site, currently under redevelopment, was located adjacent to a residential subdivision on the outskirts of the Town of Orangeville.

Summary of results for the Dufferin County:

- Agriculture, Natural, and Open Space are the most common final land uses for rehabilitated pits and quarries in Dufferin County.
- All surveyed sites were observed to be compatible with adjacent land uses and the primarily rural character of Dufferin County.

Figure 7: Examples of Open Space (top) and Agricultural (bottom) rehabilitation in Dufferin County

3.4 Grey County

A total of 51 rehabilitated aggregate sites were surveyed in Grey County.

The predominant final land uses for surrendered aggregate sites in Grey County (see Figure 8) were observed to be: Agriculture (20 sites), Open Space (13 sites), and Natural (10 sites). Other land uses observed included: Residential, Water, Industrial, Recreation, and Commercial.

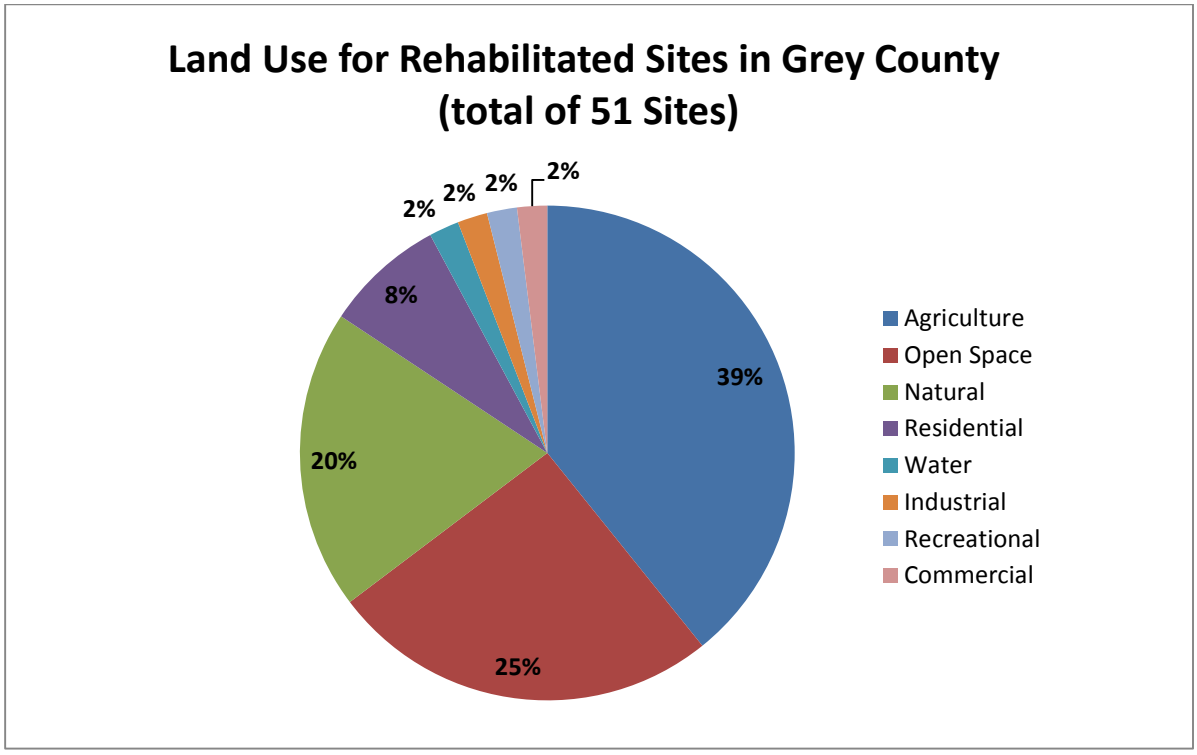


Figure 8: Predominant land use for rehabilitated sites surveyed in Grey County

The average percentage of tree coverage for the surveyed sites was calculated to be approximately 10%. This low percentage of tree cover is acceptable given the high proportion of Agricultural and Open Space land.

The agricultural land uses observed included field crops (soy and wheat), pasture, and one apple orchard in the Thornbury area. Livestock grazing hay and were also common agricultural uses. Many of the rehabilitated pits and quarries in the Grey County area that were classified as Open Space were further sub-classified as Natural.

All sites were observed to have a land use character compatible with the surrounding, predominately rural, geographic area and were successfully integrated into the surrounding landscape.

All sites surveyed were located on private lands.

Summary of results for Grey County:

- Grey County is a primarily rural area and the majority of former extraction sites are rehabilitated to Agriculture, Open Space, or Natural land uses.
- Rehabilitated pits and quarries in the Grey County area are integrated successfully with the rural character of the surrounding landscape.

Figure 9: Examples of Open Space (top) and Agricultural (bottom) rehabilitation in Grey County

3.5 Simcoe County

A total of 95 sites were surveyed in Simcoe County.

The predominant land uses for rehabilitated aggregate sites in Simcoe County (see Figure 10) were observed to be: Natural (48 sites), Water (15 sites), and Open Space (11 sites). Additional observed land uses included: Industrial, Recreational, Commercial, and Other.

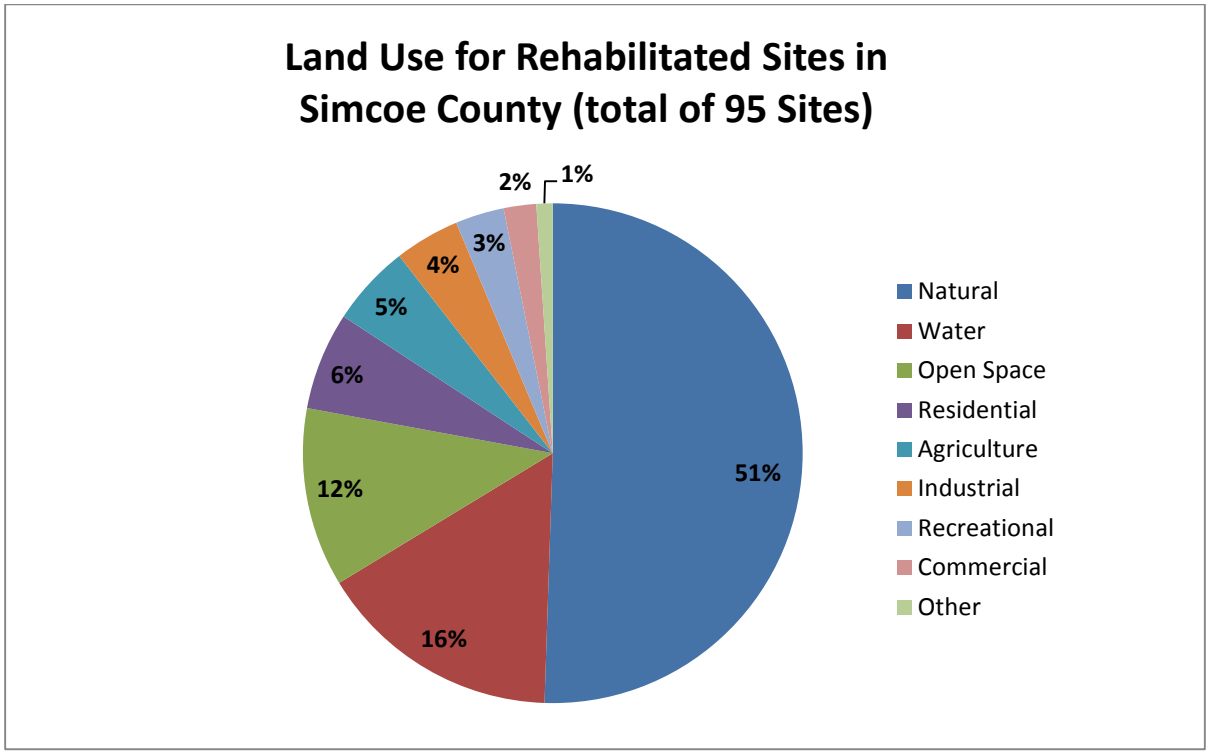


Figure 10: Predominant land use for rehabilitated sites surveyed in Simcoe County.

The average percentage of tree coverage for Simcoe County was estimated to be about 16%. This is slightly higher than the Bruce, Dufferin, and Grey Counties due to the higher proportion of sites rehabilitated to a Natural final land use.

Simcoe County is primarily rural, but does contain some smaller and midsize urban areas (e.g. the City of Barrie and the City of Orillia). This explains the greater diversity of final land uses observed for rehabilitated pits and quarries in Simcoe County.

Rehabilitation to agriculture is less prominent in Simcoe County, due to the topography and physiology of the land prior to extraction. Natural rehabilitation was most often observed to be a cultural thicket, and most sites rehabilitated to Open Space were also sub-classified as being a naturalized form of Open Space.

Summary of results for Simcoe County:

- Natural, Water, and Open Space are the most common final land uses for rehabilitated pits and quarries in Simcoe County.
- The Simcoe County area contains a diversity of final land uses for rehabilitated aggregate sites. This is a result of a mix of rural, urban, and semi-urban landscape characteristic in this geographic area.

Figure 11: Examples of Natural (top) and Water (bottom) rehabilitation in Simcoe County

4 CONCLUSIONS & RECOMMENDATIONS

Good quality rehabilitation plays an essential role in responsible aggregate extraction. However, there continues to be a shortage of data and knowledge on the condition of rehabilitated pits and quarries across Ontario which have had their licences surrendered. The OSSGA Rehabilitation Study is helping to address this problem and since 2010, data on 701 rehabilitated sites has been collected.

This addendum to the *Study of Aggregate Site Rehabilitation in Ontario Part II (2013)* consolidates all the data collected to date in a rehabilitation profile for the province. In addition, a total of 19 regional rehabilitation profiles have been created for southern and eastern Ontario; four of these profiles are presented in this addendum.

The addition of data for another 133 sites did not change the overall study results presented and discussed in the *Aggregate Site Rehabilitation in Ontario – Part II (2013)* Report.

4.1 Summary of Key Findings

The continued data collection that has occurred as part of the OSSGA Rehabilitation Study initiative supports the conclusions outlined in Part I and Part II of the study reports. These conclusions are that:

1) Pits and quarries are successfully rehabilitated and reintegrated into rural or urban landforms;
2) Rehabilitated pits and quarries can be effectively rehabilitated to a variety of final land uses that can achieve a number of land use objectives;
3) Continued research is needed to document the quality of previous and current rehabilitation; and
4) The strengthening of rehabilitation practices and the advancement of industry standards should remain a priority.

The results of the data collected and presented in this addendum reiterate the following Key Findings of the OSSGA Rehabilitation Study Phase I and Phase II.

- ➔ The findings of this study indicate that aggregate extraction sites are rehabilitated to a final land use condition that supports the provincial priority (PPS 2014) of restoring and improving natural heritage features in the Province of Ontario.

- ➔ The results of this study indicate that aggregate extraction activities do not result in the permanent conversion of agricultural land in the Province of Ontario to non-agricultural land

uses**.** More research is needed to assess the quality of land rehabilitated for agricultural practices.

- The regional rehabilitation profiles outlined in this study suggest that aggregate rehabilitation is conducted in a manner that is cohesive with the surrounding landscape.

- The information collected as part of this study initiative indicates that aggregate extraction sites are successfully rehabilitated to a range of productive final land uses in both urban and rural settings.

The results of this study confirm that pit and quarry rehabilitation meets the requirements of the PPS 2014 by:

- Accommodating subsequent land uses;

- Promoting land-use compatibility;

- Ensuring extraction is an interim use of the land, and mitigating negative impacts to the extent possible, and;

- Surrounding land use is taken into consideration for final pit and quarry rehabilitation.

4.2 Summary of Key Recommendations

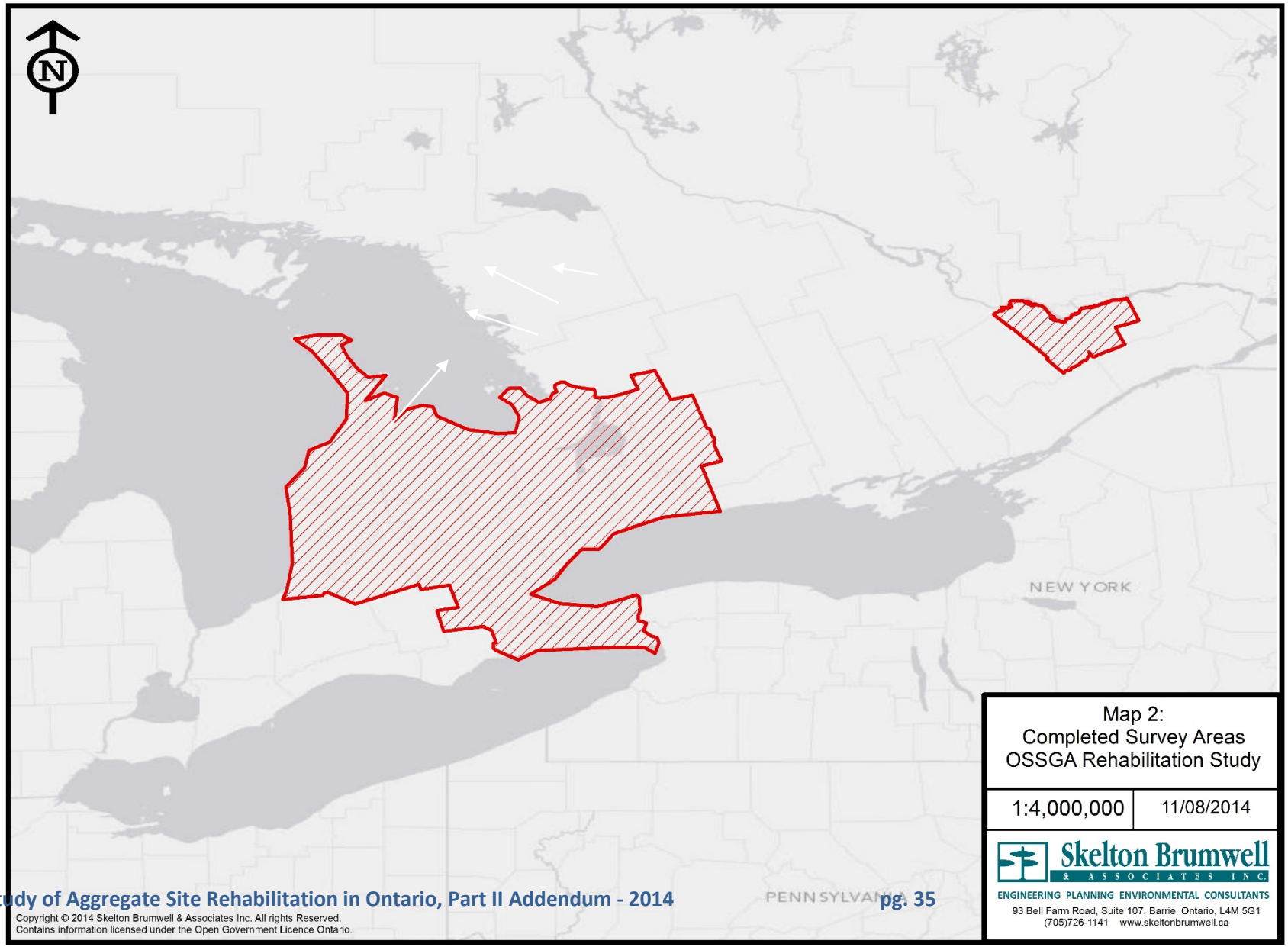
Several recommendations for better data retention and management as well as improving rehabilitation quality were suggested and discussed in the Part I and Part II reports.

Although significant effort has been made by the aggregate industry to improve rehabilitation standards and advance aggregate site best management practices, more work is still needed by the Province at the policy level to document rehabilitation efforts and improve data retention and long-term monitoring. The following are some of the key recommendations considered in the Part I and Part II Reports.

- **Continue to implement current best management practices for pit and quarry rehabilitation.** Site-specific and comprehensive rehabilitation practices and standards should be continually revised and implemented, based on scientific research, to enhance the quality and long-term success of completed rehabilitation.

- **Assess and monitor the long-term success of rehabilitation efforts.** Progress toward the achievement of ecological, agricultural, or social rehabilitation objectives should be measured through the use of predetermined performance indicators. These performance indicators can be used to guide rehabilitation planning and implementation, and subsequently be used to monitor the long-term success of rehabilitation efforts.

- **Continue to collect and manage data on pit and quarry rehabilitation in Ontario**. This information can then be used to inform land use planning, aggregate resource policy, and improve perceptions of the aggregate industry. This data should be kept in a centralized database and be made as transparent and accessible as is realistically possible.



Map 2:
Completed Survey Areas
OSSGA Rehabilitation Study

1:4,000,000	11/08/2014

Skelton Brumwell & Associates Inc.
ENGINEERING PLANNING ENVIRONMENTAL CONSULTANTS
93 Bell Farm Road, Suite 107, Barrie, Ontario, L4M 5G1
(705)726-1141 www.skeltonbrumwell.ca