APPENDIX

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LONG-TERM TREND ECOLOGICAL MONITORING PROGRAM (LTTEM) REPORT

Walker Aggregates Duntroon Quarry Expansion, Wetland Vegetation Monitoring: 2021 Annual Monitoring Report

FINAL REPORT

April 29, 2022
File: 62602732

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1.0 INTRODUCTION

Ecological monitoring, including wetland monitoring, is a component of the Walker Aggregates Inc. Duntroon Expansion Quarry Adaptive Management Plan (AMP; Stantec and Hims Geoenvironmental 2013). The Long Term Trend Ecological Monitoring (LTTEM) program was developed to supplement the information from the Long Term Trend Water Monitoring (LTTWM) program with information about the health and functioning of the natural heritage features in the vicinity of the Expansion Quarry. The LTTEM program:

- provides regular updates on the current conditions and longer-term trends of the Expansion Quarry Environment;
- is used to determine if the key features and functions in the Expansion Quarry Environment are experiencing unexpected changes and/or degradation as a result of the quarry operations by making reference to similar features in the Regional Environment; and
- is designed to ensure that changes to the Expansion Quarry Environment are identified and properly investigated for any possible cause-and-effect relationship with quarry operations.

If negative changes in environmental conditions are detected, the cause of the changes will be investigated and if the quarry is the cause of the change, quarry operations will be adapted and/or contingency mitigation measures will be implemented.

The focus of the wetland component of the Long Term Trend Ecological Monitoring (LTTEM) program is on amphibian vernal breeding pools and ensuring hydroperiods are suitable for continued hydrophytic plant growth in the surrounding wetland zones. Wetland water level monitoring is conducted as part of the LTTWM program. Long term trends in these wetland features and their functions are considered and interpreted with reference to long term climatic trends.

Ecological monitoring to complement the water level monitoring includes two components: vegetation monitoring and wildlife monitoring. Vegetation monitoring was initiated in 2019 at wetlands within the Rob Roy Swamp PSW Complex (RR2 and RR6) and ANSI wetlands A & B. This summary report describes the methods and results from the third year (2021) of wetland vegetation surveys and provides comparisons to the baseline (2019) and second year (2020) surveys.

As documented in the Site Plan and AMP, wetland monitoring (vegetation and wildlife) is to be conducted annually for three years in Phase I to establish an ecological baseline, and every five years thereafter until rehabilitation is complete.

2.0 METHODOLOGY

A general methodology for wetland vegetation monitoring was presented in the 2013 AMP. More detailed monitoring and data analysis methods are presented below.

2.1 VEGETATION MONITORING

Transects to monitor wetland vegetation were established in 2019 in each wetland area from the perimeter of the wetland to the selected drive point monitor where surface water monitoring is undertaken. In accordance with the AMP, Section 5.5.2, vegetation monitoring is to be conducted in August or September of each monitoring year.

In total, six vegetation monitoring transects (Transects 1 to 6) were established on the Subject Lands as shown on figures H.1 to H.3 of the AMP (Appendix A). The transects correspond with existing wetland features and amphibian monitoring stations as shown in Table 1.

Table 1: Wetland Vegetation Transects in Relation to Wetland Features and Amphibian Monitoring Stations

Transect	Wetland Feature	Nearest Amphibian Monitoring Station
T-1	Rob Roy Swamp PSW Complex (RR2)	Station 2
T-2	Rob Roy Swamp PSW Complex (RR2)	Station 3
T-3	ANSI wetland A	Station 4
T-4	ANSI wetland B	Station 5
T-5	Rob Roy Swamp PSW Complex (RR6)	Station 6
T-6	Rob Roy Swamp PSW Complex (RR6)	Station 6

Two permanent 2 m x 2 m plots were established at the beginning and end of each transect: one near the edge, and one centrally located near the designated drivepoint. The corners of each plot were marked with metal pin flags and a wooden stake was placed in the centre of the plot. Coordinates of the plots were also recorded using a sub-metre GPS unit.

In each monitoring plot, several observations were made in order to accurately characterize the current conditions. A description of the canopy and shrub-layer within the plot was recorded, including information on the species present, and percent cover of each species within the plot. Species presence and percent cover was also documented for species in the ground-layer. The general health of mature trees (greater than 10 cm diameter at breast height) within 5 m of each plot and standing water depth within the plot were recorded.

Completed field sheets listing all species observed in each plot are in Appendix C. As evident in the field sheets, and due to the stratified nature of ground-layer species, two or more species may overlap in the same space at varying heights, and therefore the sum of percent cover by species in any one plot may exceed 100%. An estimate of total percent cover in each plot was recorded in order to characterize the amount of vegetation versus open soil in each plot.

2.2 PHOTOGRAPHIC MONITORING

Photographic monitoring provides a visual representation of the current conditions on the Subjects Lands, allowing for annual comparisons. The photographic monitoring component of this program is intended to provide a qualitative description of each transect to supplement the quantitative vegetation data. The number, location and direction of each photograph at each plot and along each transect were recorded for continuity over the duration of the monitoring program.

2.3 DATA ANALYSIS

A floristic quality assessment was completed for each plot based on the plant list collected, following methods described in Oldham et al. (1995). The floristic quality assessment for wetland communities includes identification of sensitive native plant species, “natural” quality and wetland tolerance of plant species within a plot.

Identification of potentially sensitive native plant species was based on their assigned Coefficient of Conservatism (*C*) value, as determined by Oldham et al. (1995). This *C* value, ranging from 0 (low) to 10 (high), is based on a species’ tolerance of disturbance and fidelity to a specific natural habitat. Species with a *C* value of 8, 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters and are considered habitat sensitive species and are usually typical of high-quality plant communities. The mean *C* was calculated for each plot.

The Floristic Quality Index (FQI) is a numerical value used to evaluate the natural quality of a site based on the *C* values. The greater the richness of sensitive species at a site the higher the FQI will be and the more “natural” and high quality the site. These indices are useful to track changes in floristic quality of a site over time. The FQI value was calculated for each plot by multiplying the mean *C* by the square root of the total number of native species present in each plot.

Co-efficient of Wetness (CW) is another part of the floristic quality assessment. Identification and ranking of wetland plants (CW value) were determined by Oldham et al. (1995). Several updates to the wetland rankings are provided in recent plant lists by the Natural Heritage Information Centre (NHIC 2019). CW ranges on an integer scale from –5 (strongest affinity to wetland conditions) to +5 (least affinity to wetland conditions). Plants within the CW range -2 and -3 are considered facultative and CW of -4 or -5 are obligate in their preference to wetland conditions. The mean CW (average CW) was calculated for each plot.

3.0 RESULTS

Below is a summary of data collected during the first (2019), second (2020) and third (2021) year of terrestrial vegetation monitoring. A photographic record is provided in Appendix B. Raw field data sheets are provided in Appendix C (field forms). Vegetation monitoring results are summarized throughout Section 3.1 and are provided in Appendix D (data analysis), including a species list (Latin names provided) and floristic quality assessment for each plot. Field surveys for the first year of monitoring were conducted on September 12 and 13, 2019. The second year of monitoring was completed on September 29, 2020. The third year of monitoring was completed on September 20, 2021.

Results are presented below for paired plots along each transect. An overview of the floristic assessment data for 2019 and 2020 is presented in Table 2 below.

Table 2: Floristic Quality Assessment

	Total Native Species	Total Exotic Species	Mean C	FQI	No. of Conservative Species (*C* of 8, 9 or 10)	Mean CW
T1-1 (2019)	12	0	5.0	17.3	1	-3.6
T1-1 (2020)	9	0	4.6	13.7	0	-3.3
T1-1 (2021)	13	0	4.7	16.9	0	-3.3
T1-2 (2019)	8	0	4.0	11.3	0	-3.0
T1-2 (2020)	9	0	3.9	11.7	0	-3.0
T1-2 (2021)	10	0	4.0	12.6	0	-3.0
T2-1 (2019)	11	0	4.6	15.4	0	-1.9
T2-1 (2020)	14	0	4.4	16.5	0	-2.0
T2-1 (2021)	14	1	4.4	17.1	0	-1.8
T2-2 (2019)	5	0	5.8	13.0	0	-4.2
T2-2 (2020)	7	0	5.4	14.4	1	-3.4
T2-2 (2021)	7	0	5.4	14.4	1	-3.4
T3-1 (2019)	4	0	3.3	6.5	0	-2.8
T3-1 (2020)	4	0	3.3	6.5	0	-2.8
T3-1 (2021)	4	0	3.3	6.5	0	-2.8
T3-2 (2019)	10	1	3.4	11.3	0	-2.6
T3-2 (2020)	7	1	3.7	10.5	0	-3.4
T3-2 (2021)	9	1	3.4	10.9	0	-2.9
T4-1 (2019)	12	0	3.3	11.3	0	-3.3
T4-1 (2020)	13	0	2.8	9.9	0	-2.8

Table 2: Floristic Quality Assessment

	Total Native Species	Total Exotic Species	Mean C	FQI	No. of Conservative Species (*C* of 8, 9 or 10)	Mean CW
T4-1 (2021)	16	0	2.7	10.9	0	-1.9
T4-2 (2019)	8	1	3.3	9.8	0	-2.7
T4-2 (2020)	6	1	3.8	10.1	0	-2.3
T4-2 (2021)	6	1	3.2	8.4	0	-2.7
T5-1 (2019)	6	1	2.7	7.1	0	-3.7
T5-1 (2020)	1	0	0.0	0.0	0	-3.0
T5-1 (2021)	3	0	2.3	4.0	0	-3.7
T5-2 (2019)	12	1	3.3	11.7	0	-3.5
T5-2 (2020)	9	1	3.8	11.9	0	-3.6
T5-2 (2021)	11	1	3.8	13.1	0	-3.6
T6-1 (2019)	1	0	0.0	0.0	0	-3.0
T6-1 (2020)	3	0	2.5	4.3	0	-4.3
T6-1 (2021)	4	0	3.0	6.0	0	-4.5
T6-2 (2019)	3	0	4.7	8.1	0	-4.3
T6-2 (2020)	5	0	4.5	10.1	0	-4.3
T6-2 (2021)	10	0	4.5	14.2	0	-4.3

3.1 TRANSECT 1 – ROB ROY SWAMP PSW COMPLEX (RR2)

Transect 1 is oriented north to south and is located within a mature deciduous swamp dominated by Freeman's (swamp) maple next to an agricultural field (hay) to the north (Figure H.1). Transect 1 crosses the west edge of a previously mapped deep vernal pooling area within the swamp. No standing water was present along Transect 1 in September 2019, 2020 or 2021, but evidence that standing water was present earlier in the season was observed (e.g. hummocks, unvegetated low areas of swamp floor). Surface soil at both plots in Transect 1 was dry.

Two vegetation monitoring plots (T1-1 and T1-2) were established along this transect in 2019 and were monitored for a third year in 2021.

Plot T1-1: Canopy cover in this plot remained the same as 2021 with black ash growing inside the plot (**70%**) and Freeman's maple (**40%**) hanging over the plot. Trees within and adjacent the plot were in good condition. The ground layer was densely dominated by sensitive fern (**70% cover**) with overall cover at approximately 90%. No exotic or rare native species were observed in Plot T1-1.

The mean *C* of Plot T1-1 changed slightly from 2019 (**5.0**) to 2020 (**4.6**). The 2021 value remained similar at **4.7**. The 2021 FQI value (**16.9**) increased from the 2020 value (**13.7**) to a value more like the 2019 value (**17.3**). The increased FQI from 2020 is a result of more species being identified in 2021.

Bristle-stalked sedge, a conservative species with a high *C* value of 8 was recorded in the plot in 2019, but not in 2020 or 2021. The species could have been present more detectable earlier in the season. It also was not abundant within the plot in 2019 (5%), which makes detection difficult later in the season.

The average (mean) CW of Plot T1-1 was **-3.6** in 2019 and **-3.3** in 2020. The 2021 value remained the same as 2020 (**-3.3**). These low values support field observations of wetland conditions along transect 1 and at the plot.

Plot T1-2: No trees originated inside the plot, but large Freeman's (swamp) maple hung over the plot (**60% cover**). Green ash to a lesser degree (**30% cover**) hung over the plot from the outside. Trees adjacent the plot were in good condition. The ground layer was low to moderately covered (**40%**) by herbaceous species. This value increased from the 2020 ground cover value (30%). The most abundant species was sensitive fern which covered approximately 20% of the plot. No exotic or rare native species were observed in Plot T1-1.

The mean *C* of Plot T1-2 changed very little from 2019 (**4.0**) to 2020 (**3.9**) to 2021 (**4.0**). The FQI was also similar from 2019 (**11.3**) to 2020 (**11.7**) but increase slightly in 2021 (**12.6**). This is due to the great number of species recorded in 2021. No conservative species with a *C* value of 8, 9 or 10 were observed in the plot in any year.

The average (mean) CW of Plot T1-2 has remained the same in all three years of monitoring (-3.0). These low values are supported by field observations of wetland conditions along transect 1 and at the plot.

3.2 TRANSECT 2 – ROB ROY SWAMP PSW COMPLEX (RR2)

Transect 2 is oriented west to east and is located within a mature deciduous swamp dominated by Freeman's (swamp) maple (Figure H.1). Transect 2 is located on the other side of the maple swamp from Transect 1. Transect 2 also crosses a previously mapped vernal pooling area. However, this pooling area was noted as shallower than the pooling near Transect 1. No standing water was present along Transect 2 in September 2019, 2020 or 2021, but evidence that standing water was present earlier in the season was observed (e.g. hummocks, unvegetated low areas of swamp floor). Surface soil at both plots in Transect 2 was dry.

Two vegetation monitoring plots (T2-1 and T2-2) were established along this transect in 2019 and were monitored for a third year in 2021.

Plot T2-1: No trees originated inside the plot, but large Freeman's (swamp) maple hung over the plot (**80% cover**) from the outside and, to a lesser degree white elm (**30% cover**). Trees adjacent the plot were in good condition. The ground layer was moderately covered (**50%**) by herbaceous species, which represents no change from 2020. The most abundant species was necklace sedge which covered

approximately 20% of the plot. Several of the ground layer species in this plot were growing on a rotting log inside the plot rather than on the floor of the swamp. For the first time, one exotic species (bittersweet nightshade) was observed in Plot T2-1.

The mean *C* of Plot T2-1 changed very little from 2019 (**4.6**) to 2020 (**4.4**) to 2021 (**4.4**). The FQI has increased slightly from 2019 (**15.4**) to 2020 (**16.5**) to 2021 (**17.1**). No conservative species with a *C* value of 8, 9 or 10 were observed in the plot in any year.

The average (mean) CW of Plot T2-1 has remained similar from 2019 (**-1.9**) to 2020 (**-2.0**) to 2021 (**-1.8**). These moderately low values are supported by field observations of wetland conditions along transect 2 and at the plot.

Plot T2-2: No mature trees originated inside the plot, but mature Freeman's (swamp) maple hung over the plot (**70% cover**). Trees adjacent the plot were in good condition. The ground layer was moderately covered (**70%**) by low shrubs and small tree seedlings or saplings, a small increase from 2020. Only a few herbaceous species were observed in the plot with a total cover of approximately 15%. The most abundant herbaceous species was two-seeded sedge, which covered approximately 10% of the plot. No exotic or rare native species were observed in Plot T2-2.

The mean *C* of Plot T2-2 changed little from 2019 (**5.8**) to 2020 (**5.4**) to 2021 (**5.4**). The FQI was also similar from 2019 (**13.0**) to 2020 (**14.4**) to 2021 (**14.4**). One conservative species (two-seeded sedge) with a *C* value of 8 was observed in the plot in 2020 and 2021. This species was not detected in 2019.

The average (mean) CW of Plot T2-2 increased slightly from **-4.2** in 2019 to **-3.4** in both 2020 and 2021. These low values are supported by field observations of wetland conditions along transect 2 and at the plot.

3.3 TRANSECT 3 – ANSI WETLAND A

Transect 3 is oriented west to east and is located within a pocket of dense thicket swamp (Figure H.2). No standing water was present along Transect 3 in September 2019, 2020 or 2021, but evidence that standing water was present earlier in the season was observed. Surface soil at both plots in Transect 3 was dry to moist.

Two vegetation monitoring plots (T3-1 and T3-2) were established along this transect in 2019 and were monitored for a third year in 2021.

Plot T3-1: No trees originated inside the plot, but balsam poplar hung over the plot (**80% cover**). Trees adjacent the plot were in good condition. The ground layer was densely covered (**95%**) by red-osier dogwood shrubs and to a lesser extent riverbank grape vine (**30%**). As in 2019 and 2020, only two herbaceous species were observed in the plot (sensitive fern and Tuckerman's sedge) at 15% and 5% cover, respectively. No exotic or rare native species were observed in Plot T3-1.

The floristic quality values remained unchanged from 2019 to 2021. The mean *C* of Plot T3-1 was **3.3** and the FQI was **6.5** in 2019, 2020 and 2021. No conservative species with a *C* value of 8, 9 or 10 were observed in the plot in any year.

The average (mean) CW of Plot T3-1 was **-2.8** in 2019, 2020 and 2021. This low value is supported by field observations of wetland conditions along Transect 3 and at the plot.

Plot T3-2: No trees originated inside the plot, but green ash hung over the plot (**60% cover**). The green ash and other trees adjacent the plot were in good condition. The ground layer cover increased from **70%** in 2020 to **90%** in 2021. The most abundant species were sensitive fern (**30%** cover), reed canary grass (**30%**) and red-osier dogwood (**25%**). One exotic species (bittersweet nightshade) was observed in the plot at **5%** cover in 2019, 2020 and 2021. No rare native species were observed in Plot T3-2.

The mean *C* of Plot T3-2 changed little from 2019 (**3.4**) to 2020 (**3.7**) to 2021 (**3.4**). The FQI was also similar in 2019 (**11.3**), 2020 (**10.5**) and 2021 (**10.9**). No conservative species with a *C* value of 8, 9 or 10 were observed in the plot in either year.

The average (mean) CW of Plot T3-2 was **-2.6** in 2019, **-3.4** in 2020 and **-2.9** in 2021. These low values are supported by field observations of wetland conditions along Transect 3 and at plot T3-2.

3.4 TRANSECT 4 – ANSI WETLAND B

Transect 4 is oriented southwest to northeast and is located within a mature eastern white cedar mixed swamp community (Figure H.2). No standing water was present along Transect 4 in September 2019, 2020 or 2021. Surface soil at both plots in Transect 4 was dry to moist.

Two vegetation monitoring plots (T4-1 and T4-2) were established along this transect in 2019 and were monitored for a third year in 2021.

Plot T4-1: No trees originated inside the plot, but green ash hung over the plot (**50% cover**). The green ash and other trees adjacent the plot were in good condition. The ground layer was densely covered (**95%**) by herbaceous species. The most abundant species were fowl manna grass (**70%** cover) and panicled aster (**40%** cover). No exotic or rare native species were observed in Plot T4-1.

The mean *C* of Plot T4-1 changed has decreased gradually from 2019 (**3.3**) to 2020 (**2.8**) to 2021 (**2.7**). More species (**16**) were recorded in 2021 than the two previous years. However, the FQI has remained similar from 2019 (**11.3**) to 2020 (**9.9**) to 2021 (**10.9**). No conservative species with a *C* value of 8, 9 or 10 were observed in the plot.

The average (mean) CW of Plot T4-1 has increased gradually from **-3.3** in 2019 to **-2.8** in 2020 to **-1.9** in 2021. The increase in CW in 2021 is a result of two new upland species being recorded (sugar maple seedlings and common milkweed). These two species represent a small amount of cover in the plot (5% or less). Overall, the wetland species still dominated the composition of this plot.

Plot T4-2: No trees originated inside the plot, but eastern white cedar and yellow birch hung over the plot (**60% cover**). Trees adjacent the plot were in good condition. The ground layer was moderately covered (**60%**) by herbaceous species. The most abundant species was sensitive fern (**60% cover**). One exotic species (bittersweet nightshade) was observed in the plot at **10%** cover in 2019 and **5%** cover in both 2020 and 2021. No rare native species were observed in Plot T4-2.

The mean *C* of Plot T4-2 has changed little from 2019 (**3.3**) to 2020 (**3.8**) to 2021 (**3.2**). The FQI also remained similar between 2019 (**9.8**), 2020 (**10.1**) and 2021 (**8.4**). No conservative species with a *C* value of 8, 9 or 10 were observed in the plot.

The average (mean) CW of Plot T4-2 was **-2.7** in 2019, **-2.3** in 2020 and **-2.7** in 2021. These low values are supported by field observations of wetland conditions along Transect 4 and at the plot.

3.5 TRANSECT 5 – ROB ROY SWAMP PSW COMPLEX (RR6)

Transect 5 is oriented north to south and is located within an inundated eastern white cedar swamp and hardwood mixed swamp. The wetland along Transect 5 was heavily inundated with water throughout during September 2019 surveys. The wetland was inundated again in 2020 with slightly deeper water. The water level in 2021 was approximately the same as in 2020. It is difficult to discern water depth change throughout the majority of the transect due to the soft bottom, but the water depth increases moving south along the transect. The water depth was most noticeably deeper in plot T5-1 compared to water depth in 2019. Water depth fluctuation is more noticeable at this location because it is close to the wetland edge and adjacent upland forest, which provides a useful point of reference for year to year observations.

Two vegetation monitoring plots (T5-1 and T5-2) were established along this transect in 2019 and were monitored for a third year in 2021.

Plot T5-1: No trees originated inside the plot, but black ash comes close to the plot and barely, if at all over hangs the plot. In 2021, a few of the black ash trees adjacent the plot appeared to be in decline. In 2021, all adjacent black ash trees appear to be in decline. Adjacent eastern white cedar trees were healthy at the edge of the wetland. The ground layer was inundated with water and moderately covered (**50%**) by reed canary grass. Two beggarticks species (*Bidens* spp.) were observed in the plot in 2021, which were not noted in 2020.

The mean *C* of Plot T5-1 has fluctuated from 2019 (**2.7**) to 2020 (**0.0**) to 2021 (**2.3**). Similarly, the FQI has fluctuated from 2019 (**7.1**) to 2020 (**0.0**) to 2021 (**4.0**). The outlying 0.0 value from 2020 was due to the absence of any species other than reed canary grass and the C value of reed canary grass (0). This may have been partly a result of noticeably deeper water levels in 2020.

The average (mean) CW of Plot T5-1 has changed little with a value of **-3.7** in 2019, **-3.0** in 2020 and **-3.7** in 2021. These low values are supported by field observations of wetland conditions along Transect 5 and at the plot.

Plot T5-2: No trees originated inside the plot, but red maple hung over the plot (**50% cover**). The red maple trees and adjacent black ash were healthy, while other trees adjacent the plot such as eastern white cedar and yellow birch were dead or dying. Some Balsam fir adjacent the plot were dead while others were healthy. The ground layer was inundated with water and moderately covered (**40%**) by herbaceous species. The most abundant species were bittersweet nightshade (**25% cover**) and broad-leaved cattail (**15% cover**). Species composition has changed little from the previous year. One exotic species (bittersweet nightshade) was observed in the plot. No rare native species were observed in Plot T5-2.

The mean *C* of Plot T5-2 increased slightly from **3.3** in 2019 to **3.8** in both 2020 and 2021. The FQI remained nearly the same from 2019 (**11.7**) to 2020 (**11.9**), but increased slight in 2021 (**13.1**). No conservative species with a *C* value of 8, 9 or 10 were observed in the plot.

The average (mean) CW of Plot T5-2 remained nearly the same from 2019 (**-3.5**) to 2020 (**-3.6**) to 2021 (**-3.6**). These low values are supported by field observations of wetland conditions along Transect 5 and at the plot.

3.6 TRANSECT 6 – ROB ROY SWAMP PSW COMPLEX (RR6)

Transect 6 is oriented northeast to southwest and is located within an open eastern white cedar swamp. Many or most of the cedar trees in the swamp appear to have died in recent years. It was not possible to establish a full length transect in 2019 due to pockets of standing water and the soft mucky swamp bottom. Evidence of heavy inundation throughout the transect and swamp earlier in the season in 2019 was evident in September 2019, but standing water was not widespread at that time. The swamp was heavily inundated throughout in September 2020, covering the length of the transect and both plots in 30cm+ deep water. This deep water was also present in September 2021.

Two vegetation monitoring plots (T6-1 and T6-2) were established along this partial transect in 2019 and were monitored for a third year in 2021.

Plot T6-1: No living trees originated inside or adjacent the plot. Several eastern white cedar and white elm adjacent the plot and along the transect were dead. The ground layer was moderately densely covered (**80%**) by reed canary grass. The tiny free-floating watermeal covered approximately **80%** of the plot. Aquatic submergents covered approximately **50%** of the plot. No exotic or rare native species were observed in Plot T6-1.

The mean *C* of Plot T6-1 has increased from 2019 (**0.0**), to 2020 (**2.5**) to 2021 (**3.0**). The FQI has similarly increased from 2019 (**0.0**) to 2020 (**4.3**) to 2021 (**6.0**). These values increased because additional species were noted in 2020 and 2021 that were not noted in 2019. No conservative species with a *C* value of 8, 9 or 10 were observed in the plot.

The average (mean) CW of Plot T6-1 decreased from **-3.0** in 2019 to **-4.3** in 2020 to **-4.5** in 2021. Standing water was present in the plot and along the transect in 2020 and 2021, but not 2019.

Plot T6-2: No living trees originated inside or adjacent the plot. Several eastern white cedar and one white elm adjacent the plot were dead. One red maple, one black ash and one small eastern white cedar next to the plot on a hummock were healthy, while a balsam fir and a spruce were in severe decline. No standing water was present in September 2019, but the plot was inundated in September 2020 and 2021 by approximately 30 cm to 40 cm deep water. The ground layer was moderately covered by aquatic submergents (**50%**) and willow shrubs (**25%**). No exotic or rare native species were observed in Plot T6-2.

The mean *C* of Plot T6-2 remained nearly the same from 2019 (**4.7**) to 2020 (**4.5**) to 2021 (**4.5**). The FQI increased from 2019 (**8.1**) to 2020 (**10.1**) to 2021 (**14.2**). The abrupt increase in 2021 was due to a jump in species diversity in 2021. No conservative species with a *C* value of 8, 9 or 10 were observed in the plot.

The average (mean) CW of Plot T6-2 was the same in 2019, 2020 and 2021 (**-4.3**). This low value is supported by field observations of wetland conditions (e.g., standing water and wetland species) along Transect 6 and at the plot.

4.0 DISCUSSION

All 6 monitoring transects were established in natural wetland habitats. In 2019, 2020 and 2021, all 12 plots were dominated by wetland plants and all calculated CW values were in the negative indicating wetland conditions. Wetland conditions appeared visually similar from 2019 to 2021 in all transects except for Transect 6 and a portion of Transect 5 (wetland RR6), which were inundated with water in 2020 and 2021 (Appendix B). The greatest difference from 2019 to 2021 was observed at Transect 6, where the substrate was moist and mucky and slightly wet in 2019, but completely inundated with 30cm+ deep water in 2020 and 2021. The north end of Transect 5 (plot T5-1) was also noticeably more inundated in 2020 and 2021 compared to 2019, resulting in fewer species recorded within this plot in 2020 and 2021 compared to 2019.

A more subtle change may be occurring in Plot T4-1 where the mean CW has increased gradually from **-3.3** in 2019 to **-2.8** in 2020 to **-1.9** in 2021. The increase in CW in 2021 is a result of two upland species (sugar maple seedlings and common milkweed) that were recorded for the first time in 2021. These two species represent a small amount of cover in the plot (5% or less). However, future monitoring activities can track the potential expansion of these two species and potential addition of other upland species in this plot.

Minor fluctuations in species presence / absence were documented in some of the plots which is reflected in some *C* and FQI values. This is more due to year-to-year natural variations and possibly a difference in survey timing, rather than an indication of wetland change. First year surveys were conducted on September 12 / 13, second year surveys were conducted on September 29 and third year surveys were conducted on September 20. Timing of any future surveys should be more in line with the first year of surveys or even late August. This difference of a couple weeks can be significant in the late summer / early fall as herbaceous vegetation can die off rapidly due to frosts and other factors. This can make it difficult to identify certain types of vegetation, which affects the plot inventories and floristic quality calculations.

Surveys in future years of monitoring should be conducted between mid-August at the earliest and no later than mid-September. This will ensure that more species are visible and better comparisons to the baseline year of monitoring can be achieved. It is recommended that Section 5.5.2. of the AMP be updated with these revisions to the monitoring period.

Vegetation Health

With respect to overall health of the natural features in the Study Lands, woody vegetation, particularly trees, are better long-term indicators of change in a vegetation community. Tree health can be influenced by several factors such as flooding, insect pests, fungal pathogens, windfall, ice storms, natural decline, competition with other trees and direct impacts to stem or roots.

The trees in the study area were generally healthy with a few exceptions. Of the black ash trees adjacent Plot T5-1, some were noted to be healthy and others in decline in 2020. In 2021, all black ash trees adjacent Plot T5-1 are in decline. This could potentially be due to the higher water levels in this swamp compared to 2019.

The dominant eastern white cedar trees found along Transect 6 and throughout the surrounding wetland (RR6) are dead. This is also true of less abundant species such as white elm. These conditions were noted in 2019. The cause of mortality was unclear. Quarry operation and surface water monitoring information provided by Walker (2019) indicated that although modifications to the settling ponds in the existing quarry before 2019 were made in order to establish a hydraulic barrier between the quarry and wetland RR6, where Transects 5 and 6 are located, the purpose was to maintain water levels in the wetland. RR6 is known to be wet throughout the year as drivepoint monitoring stations DP1 (corresponding with Transect 6) and DP2 (corresponding with Transect 5) have never been dry and surface water levels can reach over 1m in depth. Discharge from the existing quarry runs along the hydro corridor between Transects 5 and 6 and is released close to Grey Rd. 31. The amount of water discharged in 2019 was similar to that of previous years. Future monitoring years may provide more insight into the change experienced by this wetland feature.

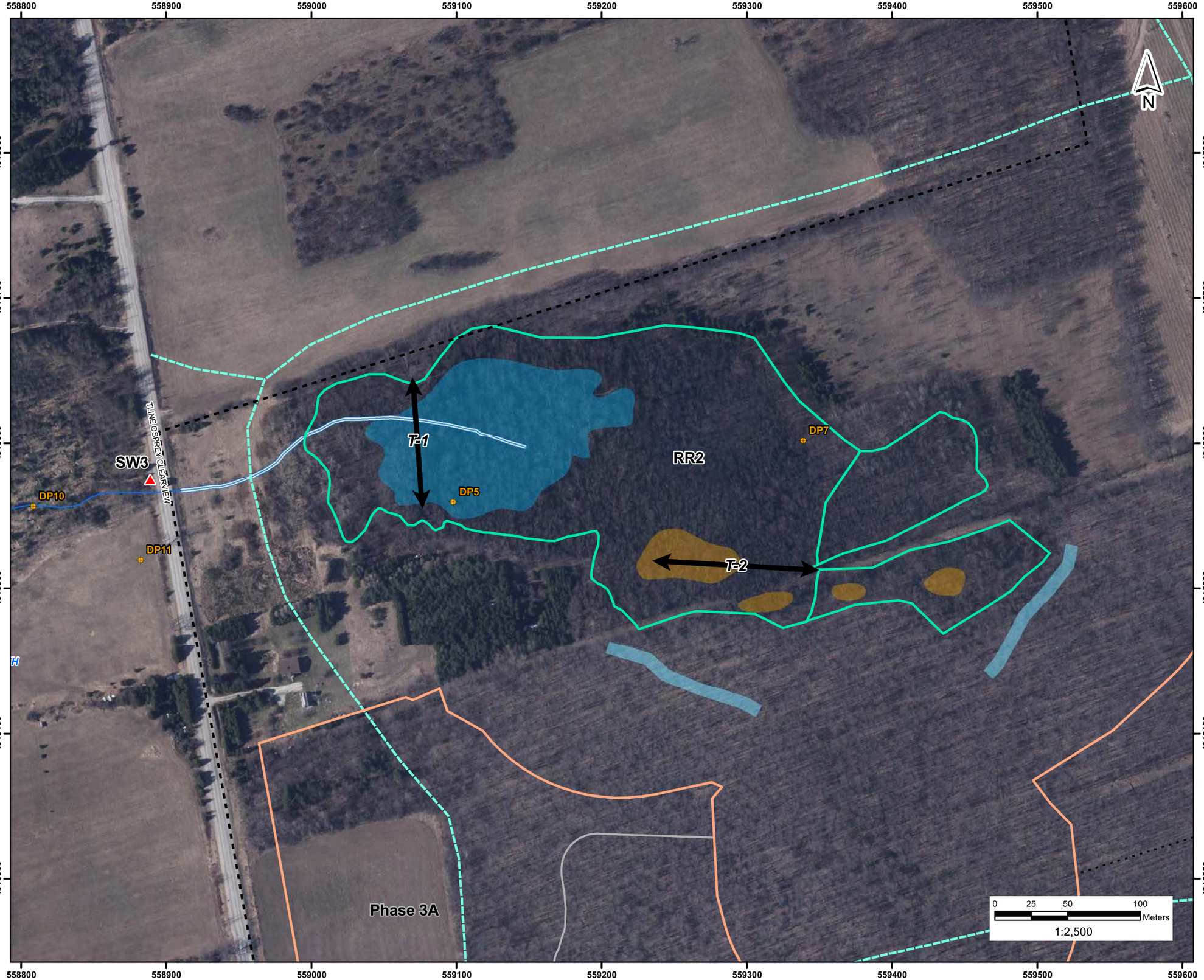
No other notable changes were observed in the general health of trees from 2019 to 2021 within and adjacent the other transects and plots.

4.1 CONCLUSIONS

This report represents the third year of terrestrial monitoring on the Subject Lands. Future years of monitoring will provide greater opportunities to observe any changes in vegetation composition and wetland conditions along the transects.

For the most part the wetlands remain consistent in their floristic character and remain as healthy wetland communities. RR6 appears to be experiencing inundation over a long period which is changing the character of the wetland floristic diversity. However, the wetland remains as a wetland feature, but will succeed to a more open canopy wetland environment. This wetland has historically been subject to variable water regimes.

APPENDIX A:
Figures



walker industries

Walker Aggregates Inc.

Legend

- Walker Owned Lands
- Limit of Extraction - Walker
- Phase Boundary
- Phase 4 - Lower Bench
- Surface Water Monitoring Station and Designation (Jagger Hims, 2005)
- Surface Water Monitoring Station with Observed Seepage (within 120m of the proposed licensed area)
- Surface Water Monitoring Station - Karst 2007
- Drive Point Monitoring Location
- Transect
- Karst Infiltration Area
- Surface Trench Discharge
- Dual purpose Monitoring/Recharge Wells
- Wetland [4]
- Interpreted Wetland Catchment Areas
- Approximate location of diffuse overflow channel between ANSI A and ANSI B
- Intermittent Surface Water Features and Fisheries Habitat
- Undefined Braided Channel
- Dug Agricultural Ponds

Vernal Pools

- Approximate Location of Deeper Vernal Pools
- Approximate Location of Shallower Vernal Pools

Notes

1. Coordinate System: UTM NAD 83 - Zone 17(N)
2. Data Sources: Ontario Ministry of Natural Resources, © Queens Printer Ontario, 2009.
3. Image Source: First Base Solutions WMS, 2008
4. Wetland boundaries approximated using handheld GPS and air photo except where adjacent to proposed license boundary, surveyed in consultation with MNR.

December 2018
62602732

Client / Project

WALKER AGGREGATES INC.
DUNTROON QUARRY EXPANSION
ADAPTIVE MANAGEMENT PLAN

Figure No.

H.1

Title

RR2 TRANSECT LOCATIONS

\\Cd1220-f02/01609\active\62602732\drawing\GIS\MXD\Adaptive_Management_Plan\2018_AMP\62602732_AMP_FigH-1_RR2_TransectLocations_20181220.mxd
Revised: 2018-12-21 By: dhervey

559700 559800 559900 560000 560100 560200 560300 560400 560500

4915900 4915800 4915700 4915600 4915500 4915400 4915300

ANSI Wetland A

DP6 T-3

DP9

SW9

ANSI Wetland B

SW7

Millar Cow Pond

Bridson DP

T-4

SW8

Bridson Pond

Phase 2B

Phase 2A

N

0 25 50 100 Meters

1:2,500

\\Cn1220-4021\01689\active\62602732\drawing\GIS\MXD\Adaptive_Management_Plan\2018_AMP\62602732_AMP_Fig1-2_ANSI_WetlandTransectLocations_20181220.mxd
Revised: 2018-12-21 By: dharvey

walker industries

Walker Aggregates Inc.

Legend

- Walker Owned Lands
- Limit of Extraction - Walker
- Phase Boundary
- Phase 4 - Lower Bench
- Surface Water Monitoring Station and Designation (Jagger Hims, 2005)
- Surface Water Monitoring Station with Observed Seepage (within 120m of the proposed licensed area)
- Surface Water Monitoring Station - Karst 2007
- Drive Point Monitoring Location
- Transect
- Karst Infiltration Area
- Surface Trench Discharge
- Dual purpose Monitoring/Recharge Wells
- Wetland [4]
- Interpreted Wetland Catchment Areas
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2. Data Sources: Ontario Ministry of Natural Resources, © Queens Printer Ontario, 2009.
3. Image Source: First Base Solutions WMS, 2008.
4. Wetland boundaries approximated using handheld GPS and air photo except where adjacent to proposed license boundary, surveyed in consultation with MNR.

December 2018
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Client / Project

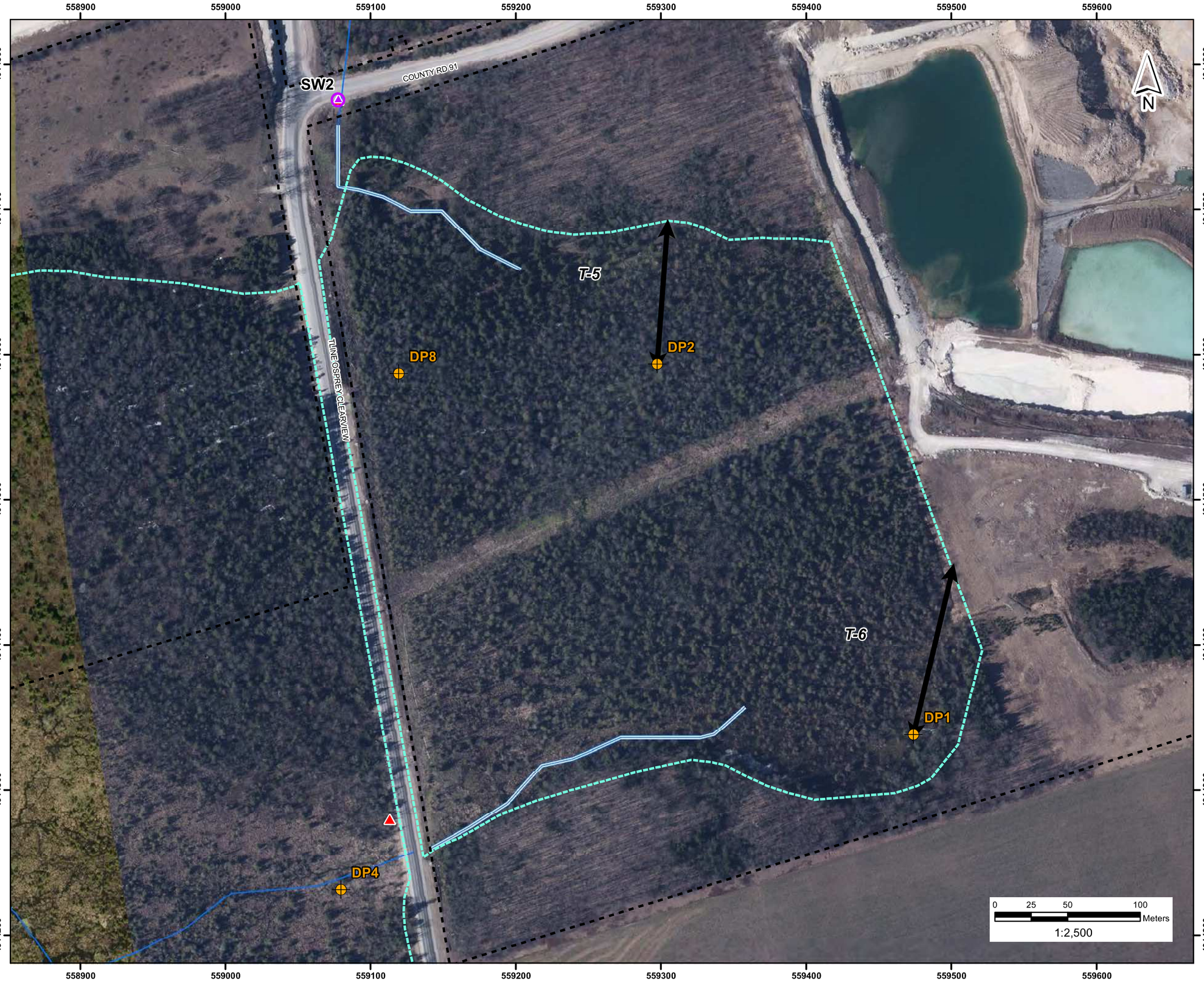
WALKER AGGREGATES INC.
DUNTROON QUARRY EXPANSION
ADAPTIVE MANAGEMENT PLAN

Figure No.

H.2

Title

ANSI WETLAND TRANSECT LOCATIONS



Legend

- Walker Owned Lands
- Limit of Extraction - Walker
- Phase Boundary
- Phase 4 - Lower Bench
- Surface Water Monitoring Station and Designation (Jagger Hims, 2005)
- Surface Water Monitoring Station with Observed Seepage (within 120m of the proposed licensed area)
- Surface Water Monitoring Station - Karst 2007
- Drive Point Monitoring Location
- Transect
- Karst Infiltration Area
- Surface Trench Discharge
- Dual purpose Monitoring/Recharge Wells
- Rob Roy Swamp PSW Complex
- Wetland [4]
- Interpreted Wetland Catchment Areas
- Approximate location of diffuse overflow channel between ANSI A and ANSI B
- Intermittent Surface Water Features and Fisheries Habitat
- Undefined Braided Channel
- Dug Agricultural Ponds

Vernal Pools

- Approximate Location of Deeper Vernal Pools
- Approximate Location of Shallower Vernal Pools

Notes

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2. Data Sources: Ontario Ministry of Natural Resources, © Queens Printer Ontario, 2009.
3. Image Source: First Base Solutions WMS, 2008.
4. Wetland boundaries approximated using handheld GPS and air photo except where adjacent to proposed license boundary, surveyed in consultation with MNR.

December 2018
62602732

Client / Project

WALKER AGGREGATES INC.
DUNTROON QUARRY EXPANSION
ADAPTIVE MANAGEMENT PLAN

Figure No.

H.3

Title

RR6 WETLAND TRANSECT LOCATIONS

\\Cd1220-f02\01609\active\62602732\drawing\GIS\MXD\Adaptive_Management_Plan\2018_AMP\62602732_AMP_FigH-3_RR6_WetlandTransectLocations_20181220_DH.mxd
Revised: 2018-12-21 By: dharvey

APPENDIX B:
Photographic Record (2021)

Photo 1: Transect 1, Plot 1 – September 29, 2020

Photo 2: Transect 1, Plot 1 – September 20, 2021

Photo 3: Transect 1 Habitat Photo (Mid-transect)

Photo 4: Transect 1 Habitat Photo (Mid-transect)

Photo 5: Transect 1, Plot 2 – September 29, 2020

Photo 6: Transect 1, Plot 2 – September 20, 2021

Photo 7: Transect 2, Plot 1 – September 29, 2020

Photo 8: Transect 2, Plot 1 – September 20, 2021

Photo 9: Transect 2 Habitat Photo (Mid-transect)

Photo 10: Transect 2 Habitat Photo (Mid-transect)

Photo 11: Transect 2, Plot 2 – September 29, 2020

Photo 12: Transect 2, Plot 2 – September 20, 2021

Photo13: Transect 3, Plot 1 – September 29, 2020

Photo 14: Transect 3. Plot 1 – September 20, 2021

Photo 15: Transect 3, Plot 2 – September 29, 2020

Photo 16: Transect 3, Plot 2 – September 20, 2021

Photo 17: Transect 4, Plot 1 – September 29, 2020

Photo 18: Transect 4, Plot 1 – September 20, 2021

Photo 19: Transect 4 Habitat Photo (Mid-transect)

Photo 20: Transect 4 Habitat Photo (Mid-transect)

Photo 21: Transect 4, Plot 2 – September 29, 2020

Photo 22: Transect 4, Plot 2 – September 20, 2021

Photo 23: Transect 5, Plot 1 – September 29, 2020

Photo 24: Transect 5, Plot 1 – September 20, 2021

Photo 25: Transect 5 Habitat Photo (Mid-transect)

Photo 26: Transect 5 Habitat Photo (Mid-transect)

Photo 27: Transect 5, Plot 2 – September 13, 2019

Photo 28: Transect 5, Plot 2 – September 20, 2021

Photo 29: Transect 6, Plot 1 – September 29, 2020

Photo 30: Transect 6, Plot 1 – September 20, 2021

Photo 31: Transect 6 Habitat Photo (Mid-transect)

Photo 32: Transect 6 Habitat Photo (Mid-transect)

Photo 33: Transect 6, Plot 2 – September 29, 2020

Photo 34: Transect 6, Plot 2 – September 20, 2021

APPENDIX C:
Field Data Sheets (2021)

#626027732

[redacted] Duntroon Veg. Monitoring

Transect #: 1 **Plot:** 1
Date: Sept. 29, 2020 Sept. 20, 2021
Personnel: B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	Black ~~[illegible]~~ Ash in plot	70% Same
	Freeman's Maple hanging in	40%
Shrub	* See below	

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: 90) 90

	Onoclea sens. 70%	70%	Scut. late. → 1%
	Carex brunn. 5%	10%	Rub. pube. → 1%
	Eutrochium macu. 5%	10%	
*	Rhamnus alni. 10%	10%	
	Equisetum arve. 10%	5%	
	Carex intumescens 10%	5%	
	Glyceria striata 5%	/	
	Carex projecta 5%	5%	
	Lycopus unifl.	5%	
	Hydro. virg.	1%	

Water Depth: No standing water
Photos Taken: " " "

General Health of Trees within 5m of Plot: Good
Freeman's maple. Black Ash
One declining Freeman's maple to S.W.

Additional Notes (habitat, disturbance, incidental wildlife):

#62602732

[redacted] Duntroon Veg. Monitoring

Transect #: 1 **Plot:** 2
Date: Sept. 29, 2020 B. Miller Sept. 20, 2020
Personnel: B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	Green Ash + Freeman's maple Hanging in.	10 + 50% 30 + 60%
Shrub	Prunus virg. Hanging in. * See below	<5% 5%

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: 30) 40%

Onoclea sens.	20%	40%
Carex tuck.	5%	/
Equisetum arve.	2%	1%
Symphyo. later.	2%	5%
* Acer x free (seedlings)	2%	/
* Ulmus amer. (seedling)	5%	10%
Lycopus unifl.	2%	5%
* Rubus pube.	2%	5%
Epilobium cf. ciliatum	1%	/
ARIS. TRIPH.		5%

Water Depth: No standing water. Much of plot was recently inundated.
Photos Taken: " " "

General Health of Trees within 5m of Plot: Good.
Freeman's maple. Green Ash.
Same

Additional Notes (habitat, disturbance, incidental wildlife):

#626027 32

[redacted] Duntroon Veg. Monitoring.

Transect #: 2 **Plot:** 1
Date: Sept. 29, 2020 B. Miller Sept. 20, 2021 B Miller
Personnel:
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	Ulmus amer. + Acer x free (Both hanging in)	30% + 70% 30% 80%
	Betula sp. (yellow)	10%
Shrub	* See below	10%

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: 50 / 50%)

			Species growing on rotting log:		
Carex projecta	20%	20%	Aralia nudi.	15%	20%
Bidens frond.	5%	2%	Oxalis mont.	15%	20%
Lycopus unifl.	10%	10%*	Rubus pube.	10%	10%
Acer x free. (seedling)	5%	5%	Dryopteris cart.	15%	15%
Viola sp.	5%	5%			
Glyceria striata	5%	5%			
Cinna latifolia	2%	5%			
Solidago cana.	2%	/			
SOLA. DULC.	2%				

Water Depth: No standing water. Recently inundated
Photos Taken: " " " " "

General Health of Trees within 5m of Plot: Good. Same
Acer x free. White elm. Betula sp.

Additional Notes (habitat, disturbance, incidental wildlife):

#62602732

~~Simpson Lands Terrestrial Monitoring~~ Duntroon Veg. Monitoring

Transect #: 2 **Plot:** 2
Date: Sept. 29, 2020 Sept. 20, 2021
Personnel: B. Miller B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	Acer x free. - Hanging in. Black Ash Sapling → 10%. same	70% 70%
Shrub	* See below	

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: 60) 70%

*	Rhamnus alni.	40%	50%
	Carex disperma	10%	15%
	Carex sp.	2%	2%
	Equisetum arve	2%	2%
	Cinna latifolia	2%	1%
	Ulmus amer. Sapling	10%	15%
	Black Ash saplings/ seedlings	10%	20%

Water Depth: No standing water
Photos Taken: " " "

General Health of Trees within 5m of Plot: Same as 2019
Acer x free.
Two Acer x free in decline/dead. Appears to be natural decline.
e.g. Shaded out.

Additional Notes (habitat, disturbance, incidental wildlife):

#62602732

[redacted] Duntroon Veg. Monitoring

Transect #: 3 **Plot:** 1
Date: Sept. 29, 2020 B. Miller Sept. 20, 2021
Personnel: B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	Populus bals. Hanging In.	80% 80%
Shrub	*See below	

Ground-layer species in Plot and % cover by species (Overall % Cover of Ground-layer: 90%) 95%		
*	Cornus stolon. 90%	95%
	Onoclea sens. 10%	15%
	Carex tuck. 5%	5%
*	Vitis riparia 20%	30%
	↳ growing up adjacent trees.	

Water Depth: No standing water
Photos Taken: " " "

General Health of Trees within 5m of Plot: Good
Populus bals. Ulmus amer.
Same

Additional Notes (habitat, disturbance, incidental wildlife):

#626027 32

[redacted] — Duntroon Veg. Monitoring

Transect #: 3 **Plot:** 2
Date: Sept. 29, 2020 B. Miller Sept. 20, 2021 B. Miller
Personnel:
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	Green Ash - Hanging In.	60% Same
Shrub	* See below Salix discolor Hanging in →	30%

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: 70) 90%

Onoclea sens.	30%	40%
Phalaris arund.	30%	20%
* Cornus stolon.	25%	40%
[redacted]	LYCO. AMER.	2%
Carex tuck.	10%	10%
Lycopus unifl.	10%	10%
Carex [redacted] projecta	20%	[redacted] 30%
* Solanum dulc.	5%	5%
[redacted]	SOLI. CANA.	2%
Epilobium ciliatum or color →		2%

Water Depth: No standing water
Photos Taken: " " "

General Health of Trees within 5m of Plot: Good
Green Ash. Black Ash. Salix discolor.
Freeman's Maple. One Black ash → slight decline.

Additional Notes (habitat, disturbance, incidental wildlife):

#626027732

[redacted] Duntroon Veg. Monitoring

Transect #: 4 **Plot:** 1
Date: Sept. 29, 2020 B. Miller
Personnel:
UTM:
Community:

Sept. 20, 2021
B. Miller

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	No woody veg. growing in plot. Green Ash Hanging in.	50% Same
Shrub	[redacted] Cornus stolon.	2% /

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: 95) 95

Eutroch. macu.	30%	Carex vulp.	2% /
Symphyo. lanc.	40% 40%	Phalaris arund.	2% /
Glyceria stria.	70% 60%	ASCL. SYRI.	5%
Equisetum arve.	10% 5%	Acer - sugar seedling	1%
Impatiens cape.	30% 10%	RUB. PUBE.	2%
Symphyo. puni.	15% 10%	RUB. STRIG.	1%
Solidago rugo.	2% 10%		
Geum sp.	2% 2%		
Scirpus cf. atrovirens	2% 2%		
Circaea cana.	/ 1%		

Water Depth: No standing water
Photos Taken: " " "

General Health of Trees within 5m of Plot: Good.
Abies bals. Frax. Thuja occi.
Same

Additional Notes (habitat, disturbance, incidental wildlife):

#626027 32

[redacted] Duutroon Veg. Monitoring

Transect #: 4 **Plot:** 2
Date: Sept. 29, 2020 B. Miller Sept. 20, 2021
Personnel: B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	THU. OCCI. } Both Hanging in. BET. ALLE. }	60%
Shrub	* See below	

	Ground-layer species in Plot and % cover by species (Overall % Cover of Ground-layer: 60%) 75%			
	Onoclea sens.	50%	60%	
	Glyceria stria.	10%	5%	
*	Rubus pube.	10%	15%	
	Lycopus unifl.	5%	5%	
*	Solanum dule.	5%	5%	
	Galium trif.	2%	/	
*	Fraxinus seedling	5%	2%	
	EQUI. ARVE.		2%	

Water Depth: – No standing water
Photos Taken: " " "

General Health of Trees within 5m of Plot: Good.
THU. OCCI. BETALLE. ABIES BALS. Fraxinus
POP TREM. Same

Additional Notes (habitat, disturbance, incidental wildlife):

Duntroon Expansion Quarry – Wetland Vegetation Monitoring
62602732

Transect #: 5 **Plot:** 1
Date: Sept. 29, 2020 Sept. 20, 2021
Personnel: B. Miller B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	Black ash hanging in	5% 0%
Shrub	None ✓	

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: 50% 60%

Phalaris arund. 50%	50%
Bidens cern.	30%
Bidens conn.	10%

Water Depth: Plot inundated. Water approx 30cm deep.
Photos Taken: " " " " 30-40cm deep.

General Health of Trees within 5m of Plot:
A few black ash in decline. Others are healthy.
White cedar healthy. All black ash appear in decline.

Additional Notes (habitat, disturbance, incidental wildlife):
→ Abundant Tussilago farfara at edge of wetland 5m away from plot. ✓

#626027732

[redacted] Duntroon Veg. Monitoring

Transect #: 5 **Plot:** 2
Date: Sept. 29, 2020 B. Miller Sept. 20, 2021
Personnel: B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	Hanging into plot	50% 50%
Shrub		

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: 40) 40%

Typha lati.	15% 15	Carex sp.	5% 5%
Solanum dulc.	25% 20%	Phalaris arun.	5%
Bideus connata	10% 10%		
Solidago rugosa	5% 5%		
Glyceria striata	20% 20%		
Lycopus unifl.	5% 5%		
Scutellaria later.	5% 5%		
Impatiens cape.	2% 2%		
Caltha palu.	2% 5%		
Bideus cernua	2% 2%		

Water Depth: Plot inundated except for a Hummock.
Photos Taken: " 4 " " a couple hummocks.
About 50 cm deep.
General Health of Trees within 5m of Plot:
Black Ash, red maple, → Both healthy
white cedar and yellow birch → dead or dying
Balsam fir → some dead, a few alive
Additional Notes (habitat, disturbance, incidental wildlife):

Duntroon Expansion Quarry – Wetland Vegetation Monitoring
62602732

Transect #: 6 **Plot:** 1
Date: September 29, 2020 ~~Sept. 20, 2021~~
Personnel: B. Miller B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	No living trees in plot or hanging in.	✓
Shrub	None.	✓

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: ~~80%~~ 80%

Phalaris arund.	80%	60%
Lemna minor	5%	5%
Submergents	50%	50%
Wolfia sp.		80%

Water Depth: Plot inundated. Approx. 40-50cm Deep.
Photos Taken: " " " " " "

General Health of Trees within 5m of Plot:
All dead ✓

Additional Notes (habitat, disturbance, incidental wildlife):

Duntroon Expansion Quarry – Wetland Vegetation Monitoring
62602732

Transect #: 6 **Plot:** 2
Date: Sept. 29, 2020 Sept. 20, 2021
Personnel: B. Miller B. Miller
UTM:
Community:

Layer	Dominant species above Plot and % cover by species	Overall Percent Cover of Layer
Canopy	No living trees within or hanging into plot.	~~/~~
Shrub	* See below.	~~////~~

Ground-layer species in Plot and % cover by species
(Overall % Cover of Ground-layer: ~~80%~~)

*	Salix discolor	25%	25%
	Bidens sp.	<1%	1%
	Immature/undeveloped grass		5%
	Carex sp.	5%	5%
	Submergents	75%	50%
	Phalaris arun.		10%
	Lyco. unifl.		1%
*	Cornus stolon.		5%
	Wolfia sp.		10%
	Lemna cf. minor		5%

Water Depth: Plot inundated. Approx 40cm deep.
Photos Taken: " "

General Health of Trees within 5m of Plot: ~~////~~ ~~////~~ Poor - Dead

See 2019 notes for tree health. Mostly all dead with exception of a red maple, one black ash and a balsam fir and spruce

Additional Notes (habitat, disturbance, incidental wildlife):

These two spp. are dying.

Found white cedar healthy on hummock next to plot.

APPENDIX D:
Vegetation Plot Data Summary & Analysis (2021)

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 1, Plot 1

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			PTERIDOPHYTES (Ferns & Fern Allies)					
x	x	x	Equisetum arvense	Field Horsetail	S5		0	0
x	x	x	Onoclea sensibilis	Sensitive Fern	S5		4	-3
			ANGIOSPERMS (Dicots)					
x	x	x	Endotropis alnifolia	Alder-leaved Buckthorn	S5		7	-5
x	x	x	Eutrochium maculatum	Spotted Joe Pye Weed	S5		3	-5
x	x	x	Fraxinus nigra	Black Ash	S4		7	-3
	x	x	Glyceria striata	Fowl Mannagrass	S5		3	-5
		x	Hydrophyllum virginianum	Virginia waterleaf	S5		6	0
x		x	Lycopus uniflorus	Northern Water-horehound	S5		5	-5
x		x	Rubus pubescens	Dewberry	S5		4	-3
x		x	Scutellaria lateriflora	Mad Dog Skullcap	S5		5	-5
			ANGIOSPERMS (Monocots)					
x	x	x	Carex brunnescens	Brownish Sedge	S5		6	-3
x	x	x	Carex intumescens	Bladder Sedge	S5		6	-3
x			Carex leptalea	Bristle-stalked Sedge	S5		8	-5
x	x	x	Carex projecta	Necklace Sedge	S5		5	-3

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 1, PLOT 1
12	9	13	Total Species
12	9	13	Native Species
0	0	0	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
5.0	4.6	4.7	Average Coefficient of Conservatism (mean C)
17.3	13.7	16.9	Floristic Quality Index (FQI)
1	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-3.6	-3.3	-3.3	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 1, Plot 2

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			PTERIDOPHYTES (Ferns & Fern Allies)					
x	x	x	Equisetum arvense	Field Horsetail	S5		0	0
x	x	x	Onoclea sensibilis	Sensitive Fern	S5		4	-3
			ANGIOSPERMS (Dicots)					
x	x	x	Acer x freemanii	Freeman (Swamp) Maple	S5		6	-5
	x	x	Epilobium cf. ciliatum	Northern Willowherb	S5		3	-3
x	x	x	Lycopus uniflorus	Northern Water-horehound	S5		5	-5
x	x	x	Rubus pubescens	Dewberry	S5		4	-3
x	x	x	Symphyotrichum lateriflorum	Calico Aster	S5		3	0
x	x	x	Ulmus americana	American Elm	S5		3	-3
			ANGIOSPERMS (Monocots)					
		x	Arisaema triphyllum	Jack-in-the-pulpit	S5		5	-3
x	x	x	Carex tuckermanii	Tuckerman's Sedge	S5		7	-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 1, PLOT 2
8	9	10	Total Species
8	9	10	Native Species
0	0	0	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
4.0	3.9	4.0	Average Coefficient of Conservatism (mean C)
11.3	11.7	12.6	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-3.0	-3.0	-3.0	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 2, Plot 1

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			PTERIDOPHYTES (Ferns & Fern Allies)					
x	x	x	Dryopteris carthusiana	Spinulose Wood Fern	S5		5	-3
			ANGIOSPERMS (Dicots)					
x	x	x	Acer x freemanii	Freeman (Swamp) Maple	S5		6	-5
x	x	x	Aralia nudicaulis	Wild Sarsaparilla	S5		4	3
	x	x	Betula sp.	Birch Species seedling				
x			Bidens connata	Purple-stemmed Beggarticks	S4?		5	-3
	x	x	Bidens frondosa	Devil's Beggarticks	S5		3	-3
x	x	x	Lycopus uniflorus	Northern Water-horehound	S5		5	-5
x	x	x	Oxalis montana	Common Wood-sorrel	S5		7	3
x			Rubus idaeus ssp. strigosus	Wild Red Raspberry	S5		2	3
x	x	x	Rubus pubescens	Dewberry	S5		4	-3
		x	Solanum dulcamara	Bittersweet Nightshade	SE5			0
	x	x	Solidago canadensis	Canada Goldenrod	S5		1	3
	x	x	Ulmus americana	American Elm	S5		3	-3
x	x	x	Viola sp.	Violet Species				
			ANGIOSPERMS (Monocots)					
x			Arisaema triphyllum	Jack-in-the-pulpit	S5		5	-3
x	x	x	Carex projecta	Necklace Sedge	S5		5	-3
	x	x	Cinna latifolia	Drooping Woodreed	S5		7	-3
x	x	x	Glyceria striata	Fowl Mannagrass	S5		3	-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 2, PLOT 1
11	14	15	Total Species
11	14	14	Native Species
0	0	1	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
4.6	4.4	4.4	Average Coefficient of Conservatism (mean C)
15.4	16.5	17.1	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-1.9	-2.0	-1.8	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 2, Plot 2

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			PTERIDOPHYTES (Ferns & Fern Allies)					
	x	x	Equisetum arvense	Field Horsetail	S5		0	0
			ANGIOSPERMS (Dicots)					
x			Acer x freemanii	Freeman (Swamp) Maple	S5		6	-5
x	x	x	Endotropis alnifolia	Alder-leaved Buckthorn	S5		7	-5
x	x	x	Fraxinus nigra	Black Ash	S4		7	-3
x	x	x	Ulmus americana	American Elm	S5		3	-3
			ANGIOSPERMS (Monocots)					
	x	x	Carex disperma	Two-seeded Sedge	S5		8	-5
x			Carex cf. interior	Inland Sedge	S5		6	-5
	x	x	Carex sp.	Sedge Species				
	x	x	Cinna latifolia	Drooping Woodreed	S5		7	3

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 2, PLOT 2
5	7	7	Total Species
5	7	7	Native Species
0	0	0	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
5.8	5.4	5.4	Average Coefficient of Conservatism (mean C)
13.0	14.4	14.4	Floristic Quality Index (FQI)
0	1	1	Highly sensitive plant species with C value of 8, 9 or 10
-4.2	-3.4	-3.4	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 3, Plot 1

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			PTERIDOPHYTES (Ferns & Fern Allies)					
x	x	x	Onoclea sensibilis	Sensitive Fern	S5		4	-3
			ANGIOSPERMS (Dicots)					
x	x	x	Cornus sericea	Red-osier Dogwood	S5		2	-3
x	x	x	Vitis riparia	Riverbank Grape	S5		0	0
			ANGIOSPERMS (Monocots)					
x	x	x	Carex tuckermanii	Tuckerman's Sedge	S5		7	-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 3, PLOT 1
4	4	4	Total Species
4	4	4	Native Species
0	0	0	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
3.3	3.3	3.3	Average Coefficient of Conservatism (mean C)
6.5	6.5	6.5	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-2.8	-2.8	-2.8	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 3, Plot 2

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			PTERIDOPHYTES (Ferns & Fern Allies)					
x	x	x	Onoclea sensibilis	Sensitive Fern	S5		4	-3
			ANGIOSPERMS (Dicots)					
x	x	x	Cornus sericea	Red-osier Dogwood	S5		2	-3
x	x	x	Epilobium cf. coloratum	Purple-veined Willowherb	S5		3	-5
		x	Lycopus americanus	American Water-horehound	S5		4	-5
x	x	x	Lycopus uniflorus	Northern Water-horehound	S5		5	-5
x	x	x	Solanum dulcamara	Bittersweet Nightshade	SE5			0
x		x	Solidago cf. canadensis	Canada Goldenrod	S5		1	3
x			Symphyotrichum lateriflorum	Calico Aster	S5		3	0
			ANGIOSPERMS (Monocots)					
x			Calamagrostis canadensis	Bluejoint Reedgrass	S5		4	-5
x	x	x	Carex projecta	Necklace Sedge	S5		5	-3
x	x	x	Carex tuckermanii	Tuckerman's Sedge	S5		7	-5
x	x	x	Phalaris arundinacea	Reed Canary Grass	S5		0	-3

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 3, PLOT 2
11	8	10	Total Species
10	7	9	Native Species
1	1	1	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
3.4	3.7	3.4	Average Coefficient of Conservatism (mean C)
11.3	10.5	10.9	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-2.6	-3.4	-2.9	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 4, Plot 1

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			PTERIDOPHYTES (Ferns & Fern Allies)					
x	x	x	Equisetum arvense	Field Horsetail	S5		0	0
			ANGIOSPERMS (Dicots)					
		x	Acer saccharum	Sugar Maple	S5		4	3
		x	Asclepias syriaca	Common Milkweed	S5		0	5
x			Circaea sp.	Enchanter's Nightshade	S5			
	x		Circaea canadensis	Enchanter's Nightshade	S5		2	3
	x	x	Cornus sericea	Red-osier Dogwood	S5		2	-3
x			Euthamia graminifolia	Grass-leaved Goldenrod	S5		2	0
x	x	x	Eutrochium maculatum	Spotted Joe Pye Weed	S5		3	-5
	x	x	Geum sp.	Avens Species				
x	x	x	Impatiens capensis	Spotted Jewelweed	S5		4	-3
		x	Rubus idaeus ssp. strigosus	Wild Red Raspberry	S5		2	3
		x	Rubus pubescens	Dwarf Raspberry	S5		4	-3
x	x	x	Solidago rugosa	Rough-stemmed Goldenrod	S5		4	0
x	x	x	Symphyotrichum lanceolatum	Panicled Aster	S5		3	-3
x	x	x	Symphyotrichum puniceum	Swamp Aster	S5		6	-5
			ANGIOSPERMS (Monocots)					
x			Carex hystericina	Porcupine Sedge	S5		5	-5
x			Carex stipata	Awl-fruited Sedge	S5		3	-5
x	x	x	Carex vulpinoidea	Fox Sedge	S5		3	-5
x	x	x	Glyceria striata	Fowl Mannagrass	S5		3	-5
	x	x	Phalaris arundinacea	Reed Canary Grass	S5		0	-3
	x	x	Scirpus cf. atrovirens	Dark-green Bulrush	S5		3	-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 4, PLOT 1
12	13	16	Total Species
12	13	16	Native Species
0	0	0	Introduced (exotic) species

0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
3.3	2.8	2.7	Average Coefficient of Conservatism (mean C)
11.3	9.9	10.9	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-3.3	-2.8	-1.9	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 4, Plot 2

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			PTERIDOPHYTES (Ferns & Fern Allies)					
x		x	Equisetum arvense	Field Horsetail	S5		0	0
x	x	x	Onoclea sensibilis	Sensitive Fern	S5		4	-3
			ANGIOSPERMS (Dicots)					
x			Eutrochium maculatum	Spotted Joe Pye Weed	S5		3	-5
x	x	x	Fraxinus pennsylvanica	Green Ash	S4		3	-3
	x		Galium triflorum	Three-flowered Bedstraw	S5		4	3
x	x	x	Lycopus uniflorus	Northern Water-horehound	S5		5	-5
x	x	x	Rubus pubescens	Dewberry	S5		4	-3
x	x	x	Solanum dulcamara	Bittersweet Nightshade	SE5			0
x			Solidago rugosa	Rough-stemmed Goldenrod	S5		4	0
			ANGIOSPERMS (Monocots)					
x	x	x	Glyceria striata	Fowl Mannagrass	S5		3	-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 4, PLOT 2
9	7	7	Total Species
8	6	6	Native Species
1	1	1	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
3.3	3.8	3.2	Average Coefficient of Conservatism (mean C)
9.8	10.1	8.4	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-2.7	-2.3	-2.7	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 5, Plot 1

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			ANGIOSPERMS (Dicots)					
x		x	Bidens cernua	Nodding Beggarticks	S5		2	-5
x		x	Bidens connata	Purple-stemmed Beggarticks	S4?		5	-3
x			Caltha palustris	Yellow Marsh Marigold	S5		5	-5
x			Solanum dulcamara	Bittersweet Nightshade	SE5			0
			ANGIOSPERMS (Monocots)					
x			Glyceria striata	Fowl Mannagrass	S5		3	-5
x	x	x	Phalaris arundinacea	Reed Canary Grass	S5		0	-3
x			Typha latifolia	Broad-leaved Cattail	S5		1	-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 5, PLOT 1
7	1	3	Total Species
6	1	3	Native Species
1	0	0	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
2.7	0.0	2.3	Average Coefficient of Conservatism (mean C)
7.1	0.0	4.0	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-3.7	-3.0	-3.7	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 5, Plot 2

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			ANGIOSPERMS (Dicots)					
x			Betula sp.	Birch Seedling				
x	x	x	Bidens cernua	Nodding Beggarticks	S5		2	-5
x	x	x	Bidens connata	Purple-stemmed Beggarticks	S4?		5	-3
	x	x	Caltha palustris	Yellow Marsh Marigold	S5		5	-5
x			Galium sp.	Bedstraw Species				
x	x	x	Impatiens capensis	Spotted Jewelweed	S5		4	-3
x	x	x	Lycopus uniflorus	Northern Water-horehound	S5		5	-5
x			Rubus pubescens	Dewberry	S5		4	-3
x	x	x	Scutellaria lateriflora	Mad Dog Skullcap	S5		5	-5
x	x	x	Solanum dulcamara	Bittersweet Nightshade	SE5			0
x	x	x	Solidago rugosa	Rough-stemmed Goldenrod	S5		4	0
x			Symphyotrichum lanceolatum	Panicled Aster	S5		3	-3
			ANGIOSPERMS (Monocots)					
x			Carex stipata	Awl-fruited Sedge	S5		3	-5
	x	x	Carex sp.	Sedge Species				
x	x	x	Glyceria striata	Fowl Mannagrass	S5		3	-5
x		x	Phalaris arundinacea	Reed Canary Grass	S5		0	-3
x	x	x	Typha latifolia	Broad-leaved Cattail	S5		1	-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 5, PLOT 2
13	10	12	Total Species
12	9	11	Native Species
1	1	1	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
3.3	3.8	3.8	Average Coefficient of Conservatism (mean C)
11.7	11.9	13.1	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-3.5	-3.6	-3.6	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 6, Plot 1

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			ANGIOSPERMS (Monocots)					
x	x	x	Phalaris arundinacea	Reed Canary Grass	S5		0	-3
	x	x	Lemna minor	Lesser Duckweed	S5?		5	-5
		x	Wolffia sp.	Watermeal			4	-5
	x	x	Unknown	Submergent				-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 6, PLOT 1
1	3	4	Total Species
1	3	4	Native Species
0	0	0	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
0.0	2.5	3.0	Average Coefficient of Conservatism (mean C)
0.0	4.3	6.0	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-3.0	-4.3	-4.5	Mean Wetness Value

DUNTROON EXPANSION QUARRY - WETLAND VEGETATION MONITORING

Transect 6, Plot 2

MONITORING YEAR - 2019	MONITORING YEAR - 2020	MONITORING YEAR - 2021	SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	COSEWIC / SARO STATUS	COEFFICIENT OF CONSERVATISM (C VALUE)	COEFFICIENT OF WETNESS
			ANGIOSPERMS (Dicots)					
x	x	x	Bidens sp.	Beggarticks Species				
		x	Cornus sericea	Red-osier Dogwood	S5		2	-3
x		x	Lycopus uniflorus	Northern Water-horehound	S5		5	-5
x			Rubus sp.	Raspberry Species				
x	x	x	Salix discolor	Pussy Willow	S5		3	-3
			ANGIOSPERMS (Monocots)					
x	x	x	Carex pseudocyperus	Cyperus-like Sedge	S5		6	-5
		x	Lemna minor	Lesser Duckweed	S5?		5	-5
	x	x	n/a	Withered / undeveloped grass				
		x	Phalaris arundinacea	Reed Canary Grass	S5		0	-3
		x	Wolffia sp.	Watermeal			4	-5
	x	x	Unknown	Submergents				-5

2019	2020	2021	FLORISTIC ASSESSMENT FOR TRANSECT 6, PLOT 2
3	5	10	Total Species
3	5	10	Native Species
0	0	0	Introduced (exotic) species
0	0	0	Species at Risk in Ontario (END, THR or SC)
0	0	0	Rare in Ontario (S1, S2 or S3)
4.7	4.5	4.5	Average Coefficient of Conservatism (mean C)
8.1	10.1	14.2	Floristic Quality Index (FQI)
0	0	0	Highly sensitive plant species with C value of 8, 9 or 10
-4.3	-4.3	-4.3	Mean Wetness Value