

Kimvar Enterprises Inc.
 Big Bay Point Resort – Ecological Monitoring Program Matrix
 Prepared by Beacon Environmental
 January 6, 2010 (revised October 19, 2010)

Study/Report Reference	Component	Potential Impact	Proposed Mitigation Action	Monitoring Protocol			Reporting Protocol		Response to Monitoring Outcome
				Methods	Frequency / Timing	Duration	Content	Reporting Period	
<p><i>Agreement Under Sec. 23 of O.Reg. 242/08 Made Under the Endangered Species Act, 2007 (June 29, 2010)</i></p>	<p>Butternut</p>	<p>Removal of three retainable Butternuts permitted under Agreement: two (B17 and B85) within golf hole 18 and one (B86) from within the development block.</p> <p>Additional retainable Butternuts discovered <u>after</u> June 30, 2010 within an area of Site Alteration or Operational activities may be removed provided that the trees cannot be protected and its removal is necessary to allow the Operational Activities to be carried out.</p> <p>(Note: as of October 6th, 2010, no new retainable Butternuts have been encountered on-site).</p>	<p>For each retainable Butternut removed, seedlings will be planted according to the following ratios: 2:1 seedlings 5:1 saplings 20:1 trees.</p> <p>Where site alteration is to occur within 10 metres of a retainable Butternut, 10 seedlings will be planted.</p>	<p>Visual inspections of planted Butternuts commencing in the first year after planting to assess survivorship.</p>	<p>Each month from late May to early September.</p> <p>Three times each year between late March and early September.</p>	<p>Year 1 and year 2 after planting.</p> <p>Years 3, 4, and 5 after planting.</p>	<p>Preparation of an annual monitoring report to be submitted to MNR on or before December 31st.</p> <p>The monitoring report shall include the following information: Training activities; Protection, planting and tending activities; Butternut Health Assessments; Numbers and locations of Butternuts located after June 30, 2010; Numbers and locations of 1) retainable Butternuts and 2) retainable and non-retainable Butternuts removed from the site; A monitoring summary with respect to each seedling.</p> <p>A Final Monitoring Report will be</p>	<p>Annually for five years following the commencement of planting.</p>	<p>At the conclusion of the monitoring Program, at least one-half (50%) of the planted Butternut must be alive and growing to the satisfaction of MNR. If fewer than one-half (50%) of the planted Butternut are alive and growing, a sufficient amount of additional seedlings shall be planted in the spring of the following year to ensure that a number of Butternut equal to one-half of the Butternut planted during the Monitoring Period are planted and growing to the satisfaction of MNR.</p>

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							submitted to MNR within 90 days of the expiry of the Mitigation Plan (i.e., after Year 5 post-planting) that summarizes the effectiveness of the measures taken in compliance with the Mitigation Plan.		
<p><i>Butternut Survey and Management Plan</i> (Beacon Environmental Nov. 2009)</p> <p>Note: this monitoring is above and beyond that which is required under the Agreement executed between Kimvar and MNR (above). The monitoring required by MNR relates to the survivorship of planted Butternuts; the additional monitoring recommended in the <i>BSMP</i> is related to existing retainable Butternuts in proximity to areas of development or site alteration.</p>	<p>Butternut (retainable trees < 30 m from clearing to be maintained <i>in situ</i>: B9, B16, B20, B48, B49, B50, B59, B60, B79, B84, B91, and B92).</p>	<p>Potential inadvertent removal or encroachment; Potential disturbance of root zone; Potential increased light and wind exposure; Potential hydrological or soil moisture change to area supporting tree.</p>	<p>All trees are located within EPA and will be maintained and protected; setback from tree clearing varies (see <i>BSMP</i>) and setbacks will be maintained through protective fencing to prevent inadvertent encroachment. Environmental inspection prior to, during, and post-tree clearing to ensure protection of trees. Educate contractors re: sensitivities.</p> <p>Trees B9, B16, B48, B49, B50 and B79 are located along existing forest edges and are likely pre-conditioned to light and wind.</p>	<p>Visual inspections of tree protection fence to identify breaches or deficiencies.</p> <p>Visual inspections of trees to identify damage, or signs of stress including wilting, dieback, wind damage, etc. (note that changes in health could be due to Butternut canker, which will be differentiated where possible).</p> <p>Carry out visual surveys and monitoring for changes in local surficial hydrology such as flooding/inundation or excessive drying, which is anticipated to be very unlikely.</p>	<p>Minimum of twice weekly and daily when tree clearing is in vicinity of Butternuts.</p> <p>Monthly during first two growing seasons post-tree clearing.</p>	<p>Throughout the period of active tree removal operations.</p> <p>May to September 2010; May to September 2011.</p>	<p>Preparation of annual monitoring reports to Town that document results of visual inspections of <u>retainable</u> Butternut trees.</p>	<p>Annually to end of 2011 for Stage 1A Area and to end of 2012 for Stage 1B Area (i.e., after the first two growing seasons post-tree clearing).</p>	<p>In the event of inadvertent encroachment, photo documentation and an assessment of damage will be completed. This will allow for an evaluation of potential negative effects and compensation.</p> <p>In the event of evidence of negative effects resulting from increased light or wind, corrective measures will be implemented. For effects from increased light this may include additional edge plantings to increase shade. Potential damage from wind would be assessed with appropriate mitigative measures (e.g., pruning of broken branches)</p>

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									carried out. In the event of localized pooling of surface water (e.g., from localized tire rutting), corrective measures to allow for drainage will be carried out.
<p><i>Butternut Survey and Management Plan</i> (Beacon Environmental Nov. 2009)</p> <p>Note: this monitoring is above and beyond that which is required under the Agreement executed between Kimvar and MNR (above). The monitoring required by MNR relates to the survivorship of planted Butternuts; the additional monitoring recommended in the <i>BSMP</i> is related to existing retainable Butternuts in proximity to areas of development or site alteration.</p>	<p>Butternut (retainable trees > 30 m from clearing to be maintained: B11, B74 and B81).</p>	<p>Trees are located > 30 m from clearing and no direct or indirect impacts are anticipated.</p>	<p>All trees are located within EPA and will be maintained and protected; setback from tree clearing is a minimum of 30 m for these Butternuts.</p> <p>Setbacks will be maintained through protective fencing to prevent inadvertent encroachment.</p> <p>Environmental inspection prior to, during, and post-tree clearing to ensure protection of trees. Inform contractors regarding sensitivities.</p>	<p>Visual inspections of trees to identify damage, or signs of stress including wilting, dieback, wind damage, etc. (note that changes in health could be due to Butternut canker, which will be differentiated where possible).</p>	<p>Twice annually during the growing season (May to September), as per the <i>BSMP</i>.</p>	<p>Throughout the period of active tree removal operations.</p> <p>May to September 2010 for Stage 1A; May to September 2011 for Stage 1B.</p>	<p>Preparation of annual monitoring reports to Town that document results of visual inspections of retainable Butternut trees.</p>	<p>Annually to end of 2011 for Stage 1A Area and to end of 2012 for Stage 1B Area (i.e., after the first two growing seasons post-tree clearing).</p>	<p>Results of monitoring health/condition of retainable butternuts >30 m from disturbance to be included in annual monitoring reports to Town that document results of <u>retainable</u> Butternut surveys (see above).</p>

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<i>Collector Road Impact Study</i> (Beacon Environmental Nov. 2009)	Ebony Spleenwort (this species was relocated in August 2010 near the site of its original discovery in 2002).	Physical damage due to impact from tree removal equipment. Decline resulting from changes in drainage patterns/soil moisture regimes.	Protective fencing will be established for a 5 m radius around the plant to prevent encroachment by tree clearing equipment and personnel.	Visual inspections to ensure no encroachment into the fenced off area.	Minimum of twice weekly and daily when tree clearing is occurring in vicinity of Ebony Spleenwort. Monthly during first growing season (May to September) post-tree clearing.	Throughout the period of active tree removal operations in the vicinity of the plant and for the first growing season post-tree clearing.	Map indicating location of Ebony Spleenwort in relation to collector road. Preparation of one monitoring report to Town that documents results of Ebony Spleenwort monitoring (to be combined with Shagbark Hickory and retainable Butternut monitoring report).	Annually to end of 2011 (i.e., after the first growing season post-tree clearing).	In the event of inadvertent encroachment, photo documentation and an assessment of damage will be completed. This will allow for an evaluation of potential negative effects and compensation. In the event of localized pooling of surface water, for example by localized tire rutting, corrective measures to allow for drainage will be carried out.
<i>Collector Road Impact Study</i> (Beacon Environmental Nov. 2009)	Shagbark Hickory (single tree located near Big Bay Point Road within the EPA. Although this tree will not be displaced by the collector road it is located approximately 10 m to the west of the right-of-way).	Physical damage due to impact from tree removal equipment. Potential disturbance of root zone. Potential increased light and wind exposure. Root damage due to soil compaction. Decline resulting from changes in drainage patterns/soil moisture regimes.	Tree is within the EPA and will be protected by 8 m setback from tree preservation fencing to be erected and maintained. Educate contractors regarding trees to be protected and sensitivities. Tree is located along existing forest edge (adjacent to Big Bay Point Road) and is likely preconditioned to light and wind. Edge Management plan will include objective of reducing potential light and	Visual inspections of tree protection fence to identify breaches or deficiencies. Visual inspections of tree to identify damage or signs of stress including wilting, dieback, wind damage, etc. Carry out visual surveys and monitoring for changes in local surficial hydrology such as flooding/inundation or excessive drying, which is anticipated to be very unlikely.	Minimum of twice weekly and daily when tree clearing is occurring in vicinity of Shagbark Hickory Monthly during first growing season (May to September) post-tree clearing.	Throughout the period of active tree removal operations in the vicinity of the tree and for the first growing season post-tree clearing.	Preparation of one monitoring report to Town that documents results of Shagbark Hickory monitoring (to be combined with Ebony Spleenwort and retainable Butternut monitoring report).	Annually to end of 2011 (i.e., after the first growing seasons post-tree clearing).	In the event of inadvertent encroachment, photo documentation and an assessment of damage will be completed. This will allow for an evaluation of potential negative effects and compensation. In the event of evidence of negative effects resulting from increased light or wind, corrective measures will be implemented. For effects from increased light this

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			wind exposure through plantings to "seal" the new forest edge.						<p>may include accelerating implementation of the edge management plan and other measures such as using larger planting material to seal the edge. Potential damage from wind would be assessed with appropriate mitigative measures (e.g., pruning of broken branches) carried out.</p> <p>In the event of localized pooling of surface water, for example by localized tire rutting, corrective measures to allow for drainage will be carried out.</p>
<p><i>Collector Road Impact Study</i> (Beacon Environmental Nov. 2009)</p> <p><i>Amphibian and Reptile Protection and Enhancement Plan</i> (Beacon Environmental Nov. 2009)</p>	Breeding Birds	<p>Potential disturbance to nests (including Red-bellied Woodpecker cavity tree).</p> <p>Displacement of breeding bird territories.</p>	<p>Ensure that all tree cutting and removal occurs outside the following dates (April 30th to July 31st), which encompass the typical breeding bird season in this part of Simcoe County.</p>	<p>Conduct breeding bird surveys commencing in summer 2010 in representative vegetation communities within interior of EPA using fixed point counts.</p> <p>Conduct breeding bird surveys commencing in summer 2010 adjacent to tree clearing (marina village, collector road) to monitor bird response to removal of woodland habitat within</p>	<p>Annually commencing summer 2010; biennially for four years post-construction (2 surveys)</p>	<p>For duration of construction period and biennially for four years post-construction (2 surveys).</p>	<p>Preparation of annual monitoring reports to Town that document results of breeding bird surveys during construction period.</p> <p>Preparation of two monitoring reports to Town that document results of biennial breeding bird surveys for four years post-construction.</p>	<p>Annually to end of construction period; biennially for four years post-construction.</p>	<p>Possible adjustment of dates of construction timing to avoid sensitive breeding season.</p> <p>Use results of breeding bird monitoring to help inform future studies elsewhere in southern Ontario in the assessment of impacts of forest removal on breeding birds.</p>

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				<p>these areas.</p> <p>Conduct breeding bird surveys in summer 2011 in same areas as above, as well as in EPA adjacent to golf course (clearing to commence fall 2010) to determine breeding bird species composition and diversity in year 1 following tree removal.</p> <p>Conduct breeding bird surveys in Enhancement Areas #1 and #2 (see below).</p> <p>Analyze results of 2010 and 2011 monitoring to compare with breeding bird data collected during EIS.</p>	Annually from 2011 to 2015 for EA #1; annually from 2012 to 2016 for EA #2.		Preparation of annual monitoring reports to Town that document results of breeding bird surveys for EA #1 and #2 after these features have been constructed.	Annually from 2011 to 2015 for EA #1; annually from 2012 to 2016 for EA #2 to document use of EAs by breeding birds.	
<p><i>Collector Road Impact Study</i> (Beacon Environmental Nov. 2009)</p> <p><i>Amphibian and Reptile Protection and Enhancement Plan</i> (Beacon Environmental Nov. 2009)</p>	Breeding Amphibians	<p>Potential disturbance to wetlands/vernal pools used for breeding due to tree removal for construction of collector road.</p> <p>Potential disruption of amphibian movement pathways and potential mortality of amphibians due to vehicular traffic on collector road.</p>	<p>Maintain trees and water in wetland BA-03 (west of marina gravel road) until fall 2010 to provide breeding opportunities for amphibians and basking turtles in spring/summer 2010.</p> <p>Construction of wildlife culverts and drift fencing adjacent to amphibian breeding areas to encourage safe passage under road.</p>	<p>Conduct breeding amphibian surveys in spring 2010 in BA-03.</p> <p>Conduct breeding amphibian surveys in BA-03, BA-09, BA-13, BA-14, BA-15 and BA-16 (see Figure 3 in the <i>ARPEP</i>) to 1) monitor changes in composition and abundance after tree clearing in marina village and 2) collect additional baseline data for sites near collector road.</p>	Three times annually (spring) commencing 2010.	For duration of road construction and for three years after collector road is operational.	Preparation of annual monitoring reports to Town that document results of amphibian surveys.	Annually to end of road construction period and for three years post-construction.	<p>Use results of breeding amphibian monitoring to help inform future studies elsewhere in southern Ontario in the assessment of impacts of road construction.</p> <p>If significant mortality is noted, corrective actions will be taken, which may include extending the wildlife fencing beyond the 30 m that is currently</p>

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				<p>Assess travel routes of amphibians (especially during spring breeding and summer post-breeding dispersal) in relation to locations of wildlife culverts and drift fencing.</p> <p>Monitor effectiveness of the drift fencing by documenting amphibians crossing roads and their use of wildlife culverts during warm, rainy nights in the spring and summer. Monitoring will be focused around culverts and in the locations of the vernal ponds/pools used by breeding amphibians. Any evidence of amphibian mortality will also be noted.</p>	<p>Three times annually (spring) commencing once collector road is in use.</p> <p>Four times a year (three during spring breeding /once during summer dispersal).</p>				<p>proposed. The length of the extended fencing, if required, will be informed by the monitoring data.</p>

Study/Report Reference	Component	Wildlife Habitat Enhancements	Proposed Action	Monitoring Protocol			Reporting Protocol		Response to Monitoring Outcome
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<p><i>Amphibian and Reptile Protection and Enhancement Plan</i> (Beacon Environmental Nov. 2009)</p> <p><i>Addendum Memo for Amphibian and Reptile Protection and Enhancement Plan</i> (Beacon Environmental July 14, 2010)</p>	Breeding Amphibians and Turtles	Three amphibian and turtle Enhancement Areas (EAs), two wetland areas and one dug pond, will be constructed within the EPA.	<p>Two new seasonal breeding pools (EA #1 and EA #2 and one permanent open water pond (EA #3) will be created. EAs #1 and #2 are to be created by building an earthen dam or berm to flood upstream swamp areas and create pools for amphibian breeding habitat. EA #3 will involve re-contouring and restoration of an existing dug pond to create habitat for turtles and amphibians.</p>	<p>Conduct transect surveys of the EAs after they are constructed, recording the same parameters (i.e., water depths, organic substrate depths, coarse woody debris, wildlife use, vegetation cover, etc.) as was collected in BA-03, BA-15, and BA-16 to assess form and function of the EAs.</p> <p>Post-construction surveys of the three EAs for turtle species at appropriate times of day and season (early mornings following cool nights in spring and early summer). Monitoring use of EA#3 by basking or nesting turtles will be conducted using opportunistic sightings and observations of evidence of use such as turtle egg shells.</p> <p>Post-construction surveys of the three EAs to monitor use by breeding frogs and/or salamanders (egg masses, tadpoles and adult frogs and/or salamanders). Standard night-time</p>	<p>Commencing in 2011 for EA #1 and in 2012 for EAs #2 and #3.</p> <p>Observations will be twice annually (spring and early summer) when turtles are most active.</p> <p>Call surveys three times annually (spring).</p>	<p>Annually from 2011 to 2015 for EA #1; annually from 2012 to 2016 for EA#2 and EA#3.</p>	<p>Preparation of annual monitoring reports to Town that document use of EAs by breeding amphibians and turtles.</p>	<p>Annually from 2011 to 2015 for EA #1; annually from 2012 to 2016 for EA #2 and #3.</p>	<p>If insufficient water depths or duration of flooding is too short, corrective actions will be taken, including additional excavation within the wetland pools to increase water depths and hydroperiod.</p> <p>If there are insufficient structures for basking turtles and calling frogs, corrective actions will be taken. This includes the cutting and felling of standing dead trees into the EAs and/or placing trunks/large branches of trees felled from approved development areas elsewhere on-site into the ponds.</p>

				breeding amphibian call surveys will be completed. Daytime and/or night-time (with flashlight) surveys of the nearshore areas will scan for tadpoles and egg masses attached to vegetation.					
				Install and monitor at least one staff gauge in each EA to document water depths and duration from early spring through late summer.	Water depth will be measured three times/year in 2011, 2012 & 2015 for EA #1 and three times/year in 2012, 2013 & 2016 for EAs #2 and #3.				
<p><i>Amphibian and Reptile Protection and Enhancement Plan</i> (Beacon Environmental Nov. 2009)</p> <p><i>Addendum Memo for Amphibian and Reptile Protection and Enhancement Plan</i> (Beacon Environmental July 14, 2010)</p>	Hibernating Reptiles	A snake hibernaculum will be constructed within the EPA.	The hibernaculum will be constructed in an open area with a southern exposure. No trees will be planted within a 25 m radius of the hibernaculum to avoid excessive shading.	Small sand beds placed near the snake hibernaculum or around the cover objects can be periodically raked and used to detect reptile movement (tracks). These surveys will be conducted in spring, summer and fall of 2012, 2013 and 2016.	Surveys will be conducted three times annually (spring, summer and fall).	From 2012 through 2016.	Preparation of annual monitoring reports to Town that document use of hibernaculum by snakes.	Annually in 2012, 2013 and 2016.	Possible removal of adventive woody vegetation within 25 metres of the hibernaculum to remove a source of shade.