



## INDICATOR: BIODIVERSITY IN ONTARIO'S POSTSECONDARY CURRICULA

**STRATEGIC DIRECTION:** Engage People

**TARGET:** 1. By 2015, biodiversity is integrated into the elementary, secondary and postsecondary curricula, including schools of business.

**THEME:** Conservation Response – Education and Awareness

### **Background Information:**

As countries around the world face complex environmental issues, there is a growing recognition that education has a key role to play. Environmental education, including an awareness of the importance of biodiversity, is a vital tool to help people understand the nature and complexity of environmental challenges and build their capacity to take appropriate action (Pooley and O'Connor 2000; Smith et al. 2011).

At the postsecondary level, an assessment of how and to what degree biodiversity has been incorporated into university education has not previously been conducted in Ontario. This indicator provides an assessment of the extent to which biodiversity has been incorporated into the curriculum of select Ontario universities.

### **Data Analysis:**

A detailed review of the curricula of six Ontario universities was conducted to develop an index of the degree to which biodiversity has been incorporated into university undergraduate and graduate education, with a focus on business schools. The universities in the index included: Carleton University, University of Guelph, Lakehead University, the University of Toronto, Trent University and the University Of Ontario Institute Of Technology. These universities were considered a representative selection as they included small, medium and large universities covering a wide geographic scale. The universities within this index represent 30% of the 20 universities in Ontario. In 2013 there was a total population of nearly 158,000 students enrolled at these six universities.

The course descriptions within 386 undergraduate and 327 graduate programs were assessed to determine whether or not the concept of biodiversity was included in core or elective courses (Table 1). An estimated 13,500 courses were assessed at the undergraduate level, and 4,000 courses at the graduate level. Programs that were offered only as 'minors' were excluded from the assessment. A list of keywords associated with the concept of biodiversity (Table 2) was generated and a keyword search was conducted on university academic calendars in PDF format, using the program Mendeley®. If a keyword was present within core or elective courses for a particular program, that program was considered to include biodiversity content.



Table 1. Definitions of university programs and core and elective courses.

<b>Program</b>	An assortment of courses that lead toward a degree at the undergraduate or graduate level. Programs consist of a certain number of core and elective courses.
<b>Core course</b>	A course that is required within a particular undergraduate or graduate program.
<b>Elective course</b>	A course that is not required, but is optional to take within a particular program.

Within academic calendars the keyword with greatest frequency was “environment”. Some courses that included keywords were excluded, because the course descriptions did not suggest biodiversity content. For example, education courses that discussed learning in a “seminar environment”, or computer courses about the “ecology of online learning” were not considered to have biodiversity content. Further details on analyses and results are available in a companion technical report (McCallum et al. 2014).

Table 2. List of keywords used to search university academic calendars for biodiversity education content.

Biodiversity/biological diversity/diversity	Invasive alien species
Biodiversity threats	Nature
Biosphere	Nature education
Climate change	Natural resource(s)
Composition, structure and function of biological systems	Preservation
Conservation/conservation biology	Pollution
Ecology/ecological	Species diversity
Ecosphere/ecospheric security	Species extinction
Ecosystem/ecosystem diversity/ecosystem health or integrity	Stewardship
Endangered species/species at risk	Sustainability
Environment/environmental	Taxonomy
Evolution	Value of nature
Genetic diversity	Wilderness
Human impacts on the environment	Wildlife



## Results:

Trend: Baseline      Data Confidence: Medium      Geographic Extent: Provincial

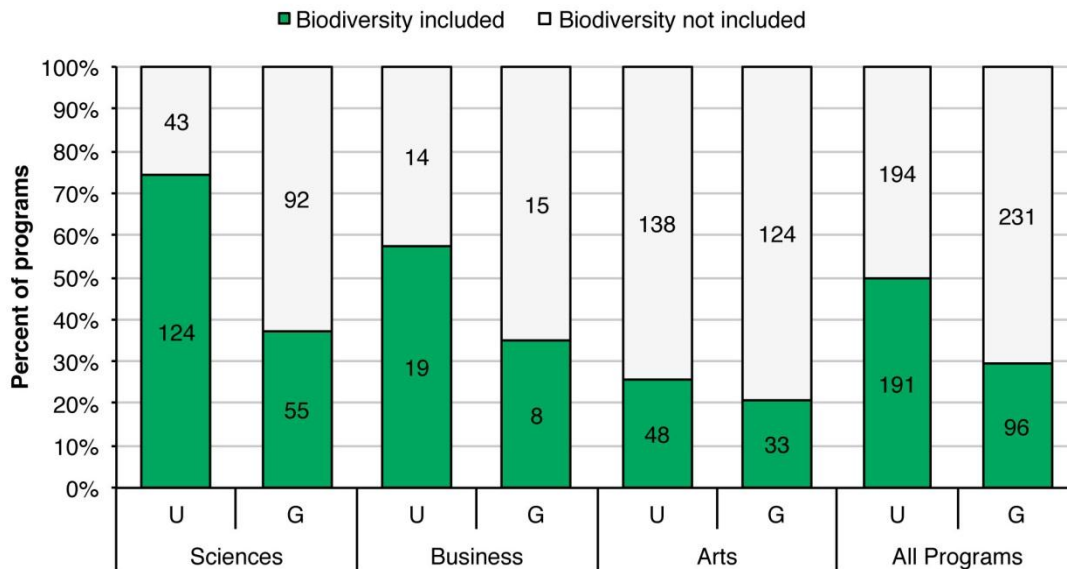


Figure 2. Summary of university biodiversity content overall (all programs) and by category (sciences, business and arts) within undergraduate (U) and graduate (G) programs.

## Status:

- Biodiversity has been partially integrated into postsecondary curricula in Ontario, including schools of business.
- At the undergraduate level, 386 program descriptions were reviewed for inclusion of biodiversity keywords. Reference to the concept of biodiversity was indicated in nearly half (49.5%) of undergraduate programs. At the graduate level, 327 programs were reviewed, 29.4% of which included biodiversity keywords.
- The concept of biodiversity was most prevalent within undergraduate science programs. Of the 167 undergraduate science programs reviewed across the six universities, 74.3% included biodiversity keywords, mostly within life sciences. At the graduate level, 37.4% of the 147 science programs included biodiversity keywords, again, most commonly within life sciences.
- Of the 33 undergraduate business programs reviewed, 57.5% included biodiversity keywords. Meanwhile, 34.8% of the 23 graduate-level business programs included the concept of biodiversity.
- Undergraduate arts programs showed fewer references to biodiversity. Of the 186 programs assessed, only 25.8% included relevant keywords. Programs in Anthropology and Geography had the highest degree of inclusion. One-fifth (21%) of the 147 arts programs at the graduate level included biodiversity key terms.

**Links:****Related Targets:** N/A**Related Themes:** N/A**Web Links:**

Carleton University. 2014. Graduate calendar. <http://calendar.carleton.ca/grad/> [Accessed August 2014]

Carleton University. 2014. 2013-2014 Undergraduate calendar. <http://calendar.carleton.ca/archives/> [Accessed August 2014]

Carleton University. (no date). About Carleton. <http://carleton.ca/about/> [Accessed October 2014]

Lakehead University. 2014. Academic programs information 2014-2015. <http://navigator.lakeheadu.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=20&chapterid=3276&loaduserredits=False> [Accessed September 2014]

Lakehead University. 2012. About Lakehead University. <https://www.lakeheadu.ca/about/overview> [Accessed October 2014]

Trent University. 2014. Academic calendar 2014-2015 undergraduate and graduate programs. <https://www.trentu.ca/calendar/past.php> [Accessed May 2014]

Trent University. (no date). Trent facts. <http://www.trentu.ca/about/facts.php> [Accessed October 2014]

University of Guelph. 2014. Academic calendars. <http://www.uoguelph.ca/academics/calendars/> [Accessed July 2014]

University of Guelph. (no date). How many students are enrolled in the University? <http://askgryph.registrar.uoguelph.ca/?requestType=NormalRequest&source=4&id=53&question=How+many+students+are+enrolled+in+the+University> [Accessed October 2014]

University of Ontario Institute of Technology. 2014. Fact sheet. [http://uoit.ca/footer/about/uoit\\_info/fact-sheet.php](http://uoit.ca/footer/about/uoit_info/fact-sheet.php) [Accessed October 2014]

University of Ontario Institute of Technology. 2014. Undergraduate and graduate calendars. [http://www.uoit.ca/main/current-students/academics-and-programs/academic-calendars/?utm\\_source=redirect&utm\\_medium=web&utm\\_campaign=calendar/](http://www.uoit.ca/main/current-students/academics-and-programs/academic-calendars/?utm_source=redirect&utm_medium=web&utm_campaign=calendar/) [Accessed May 2014]

University of Toronto. 2014. Faculty of Arts and Science 2013-2014 calendar. <http://www.artsandscience.utoronto.ca/ofr/calendar/> [Accessed June 2014]

University of Toronto. 2014. School of Graduate Studies academic calendar 2013-2014. <http://www.sgs.utoronto.ca/calendar/Pages/default.aspx> [Accessed June 2014]

University of Toronto. 2014. Quick facts. <http://www.utoronto.ca/about-uoft/quickfacts> [Accessed October 2014]



## References:

- McCallum, J., P. Elliot, and T. McIntosh. 2014. Integration of biodiversity into the curricula of select Ontario universities. State of Ontario's Biodiversity Technical Report Series, Report #SOBTR-01. Ontario Biodiversity Council, Peterborough, ON. [Available at: <http://sobr.ca/biosite/wp-content/uploads/SOBTR-01-Final1.pdf>]
- Pooley, J. A., and M. O'Connor. 2000. Environmental education and attitudes: Emotions and beliefs are what is needed. *Environment and Behavior* 32: 711-723.
- Smith, A. L., D.R. Bazely and N.D. Yan. 2011. Missing the boat on invasive alien species: A review of post-secondary curricula in Canada. *Canadian Journal of Higher Education* 41:34-47.

## Citation

Ontario Biodiversity Council. 2015. State of Ontario's Biodiversity [web application]. Ontario Biodiversity Council, Peterborough, Ontario. [Available at: <http://ontariobiodiversitycouncil.ca/sobr> (Date Accessed: May 19, 2015)].