



BUILD IT AND THEY WILL COME
Rapid recovery of bee populations
in restored landfill sites

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Some pretty great bee habitat

Teasel



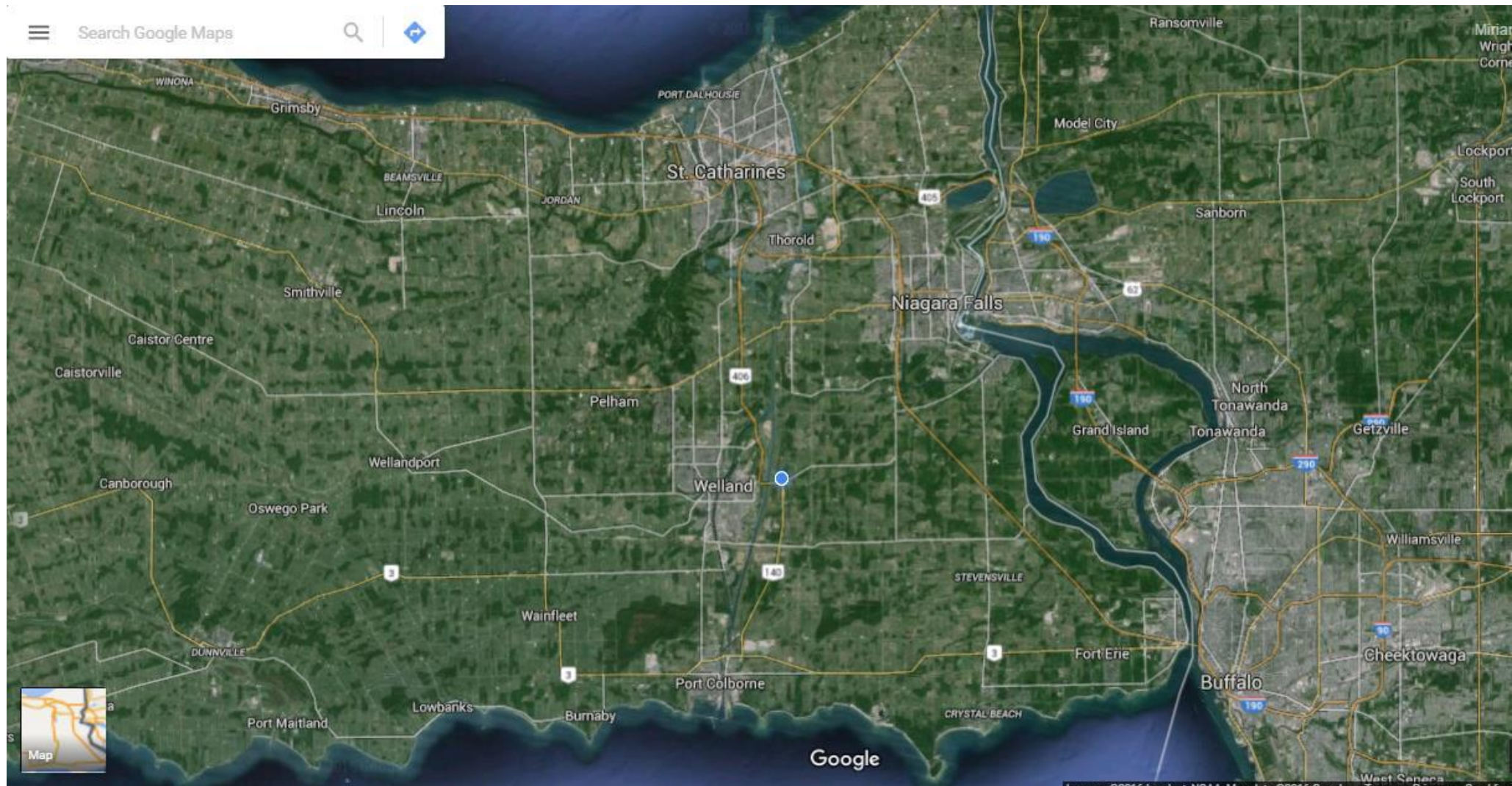
Soil patches

Goldenrod

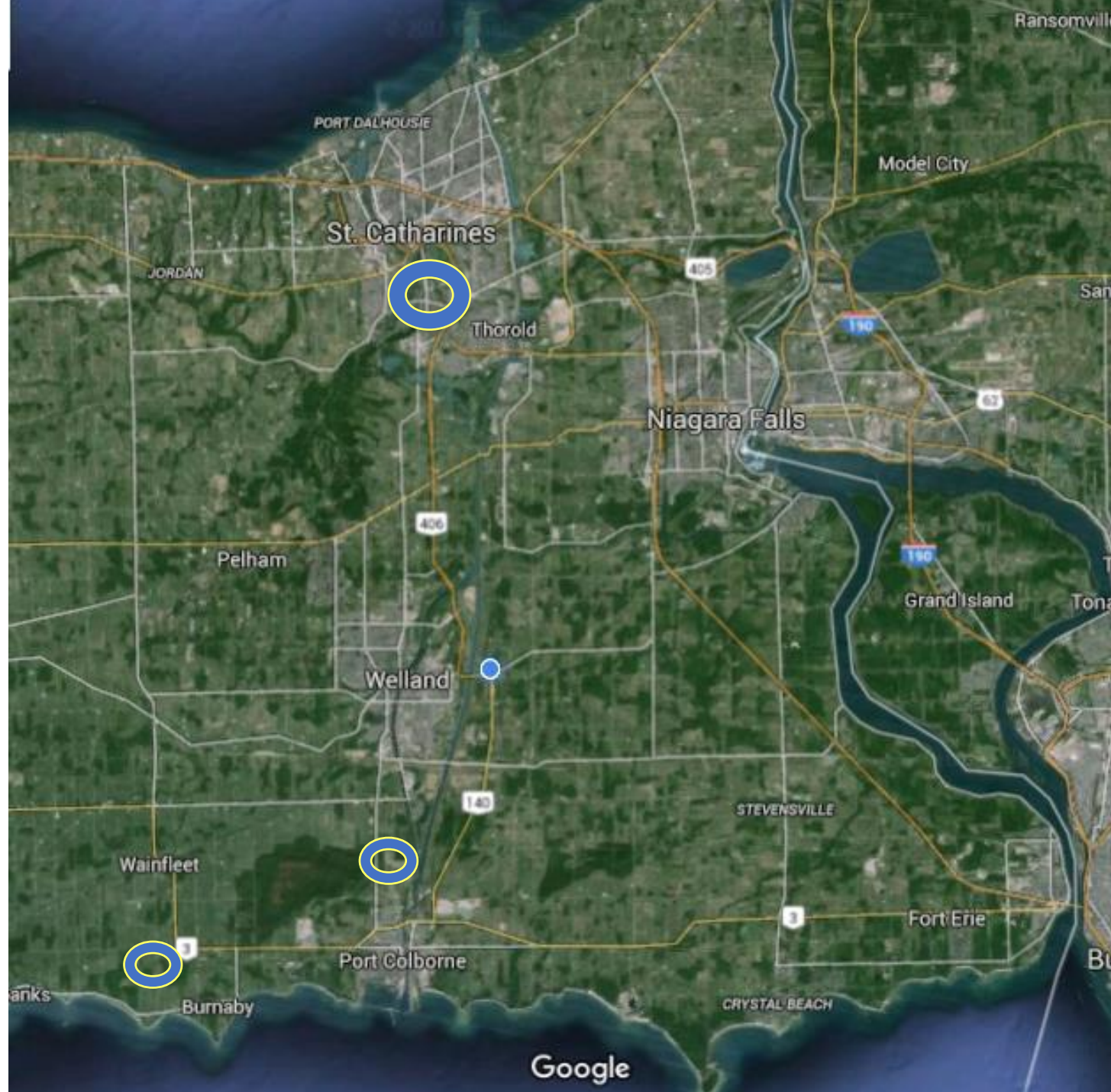


Queen Anne's Lace

Problem: Landscape alteration removing natural habitat
Solution: habitat restoration or naturalization



Landfills are prime candidates for creation of bee habitat, because bees love open grasslands and meadows



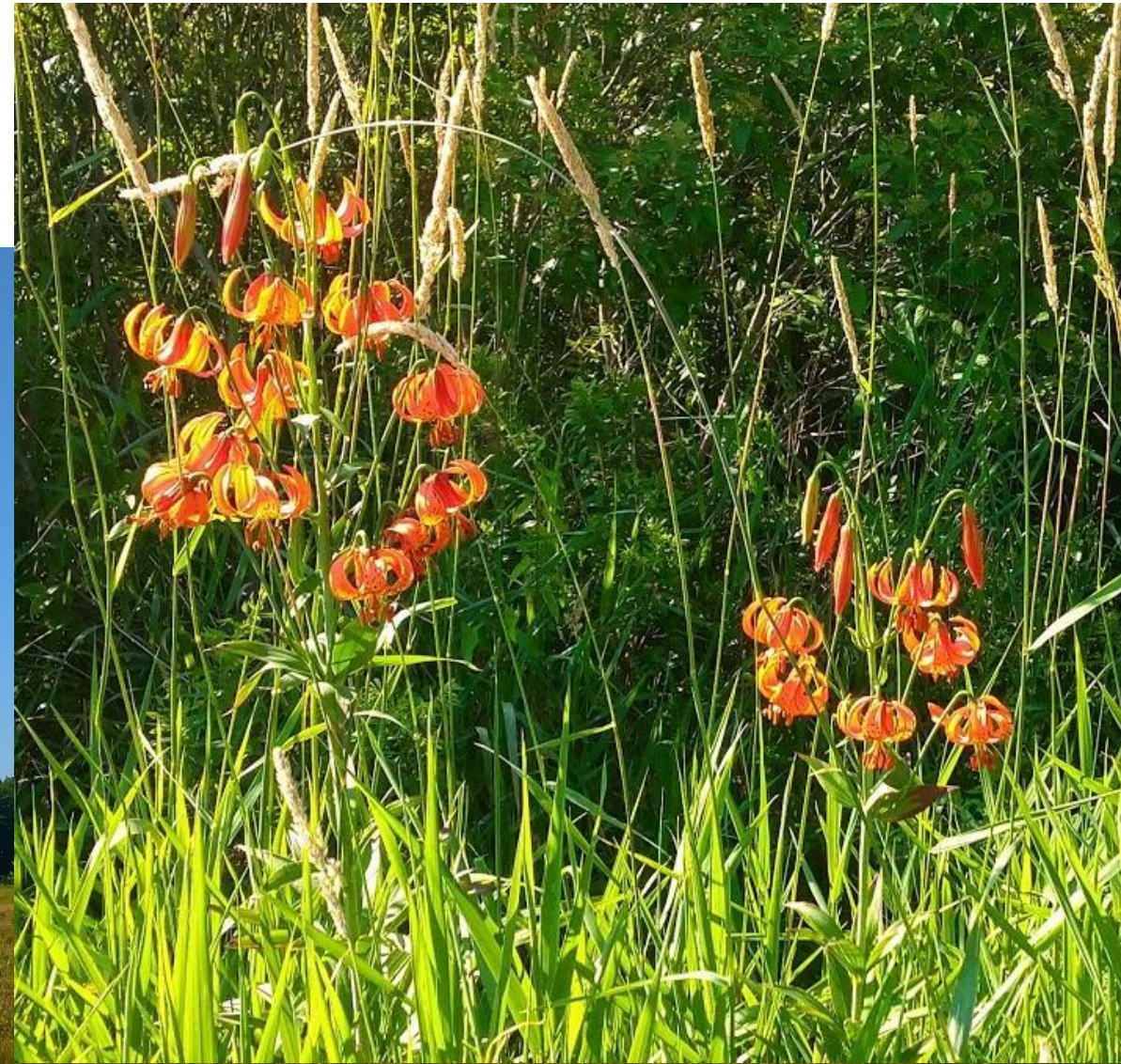
Glenridge Quarry Naturalization Site Restored 2003



Elm St. Naturalization Site Restored 2011



Station Rd. Naturalization Site Restored 2011



In the beginning – a short history of the GQNS



Farmland – 1954
St. Catharines museum
collection



Crushed stone quarry
1957 – 1972
Photo from Walker
aggregates



Landfill
1976 - 2001

In the beginning – a short history of the GQNS

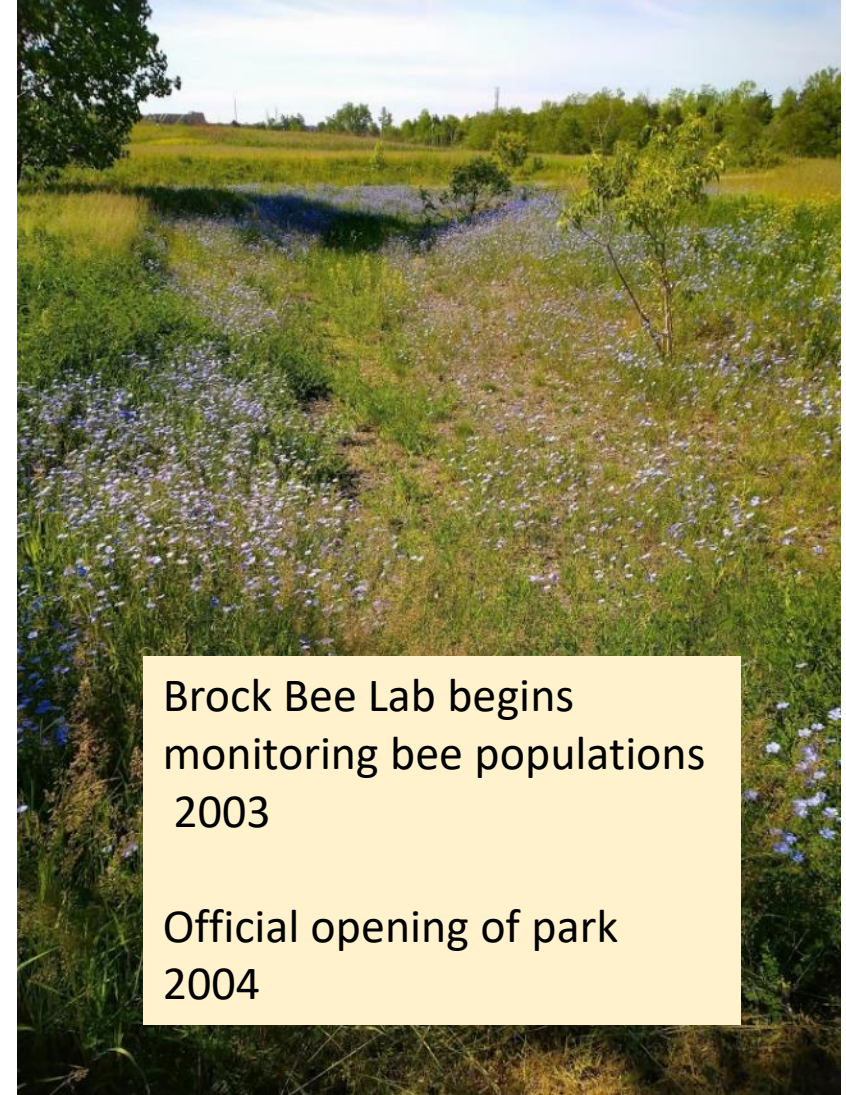


Garbage mound capped
with 75 cm clay 2002

17 ha



Pond construction,
Soil addition,
Hydro-seeding
Native (ish) plants on
periphery
2001 - 2003



Brock Bee Lab begins
monitoring bee populations
2003

Official opening of park
2004

A restoration success story!

1. Bee community recovery within 3 years of restoration

2. > 150 species by 2013

3. Long-term - higher populations at GQNS than Brock



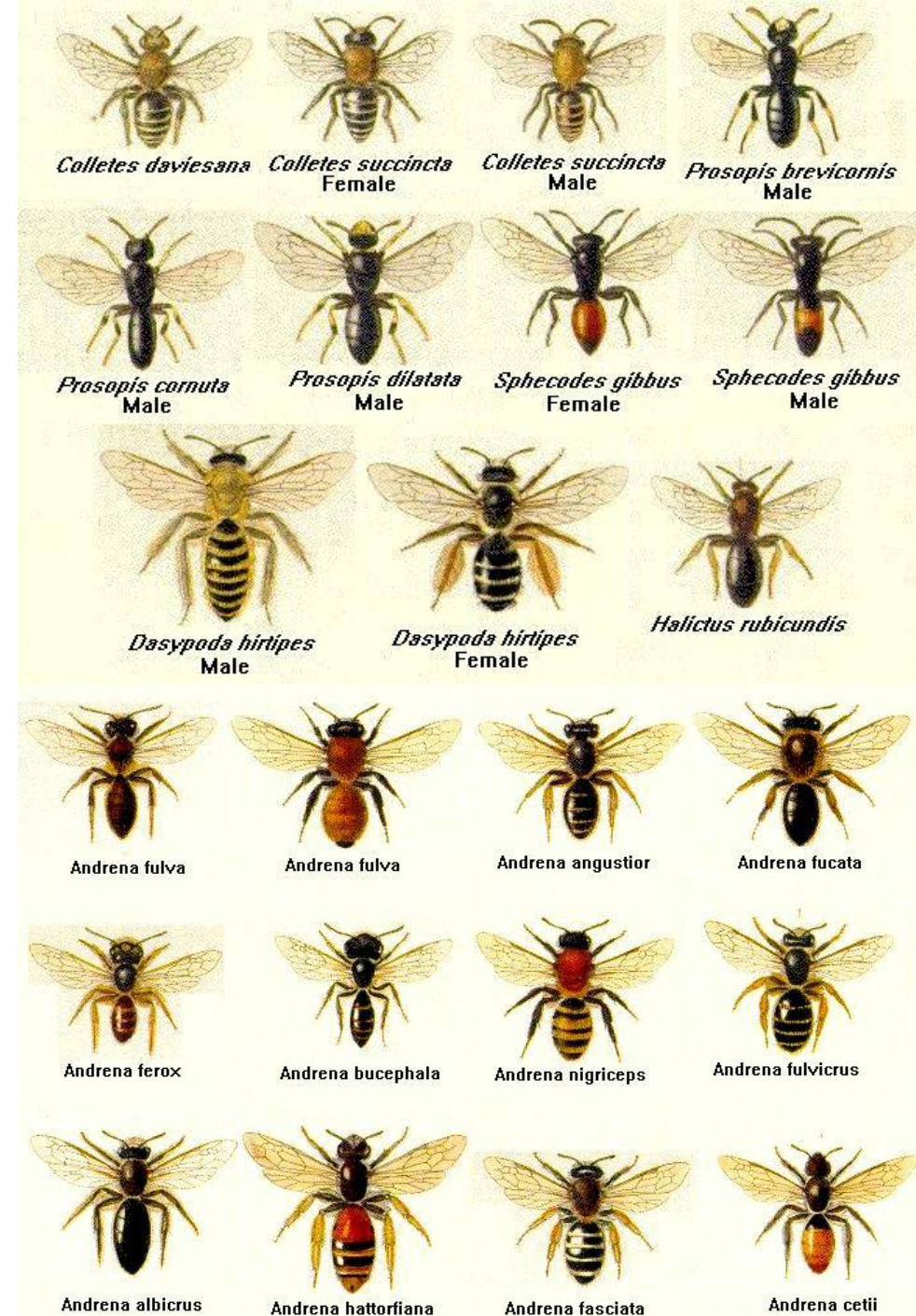
Building on success

1. How long do restoration effects last?

2. Was the success at GQNS a unique event or is it repeatable?

Two smaller landfills closed and restored in 2011

- Elm Street Naturalization Site, Port Colborne
- Station Road Naturalization Site, Wainfleet

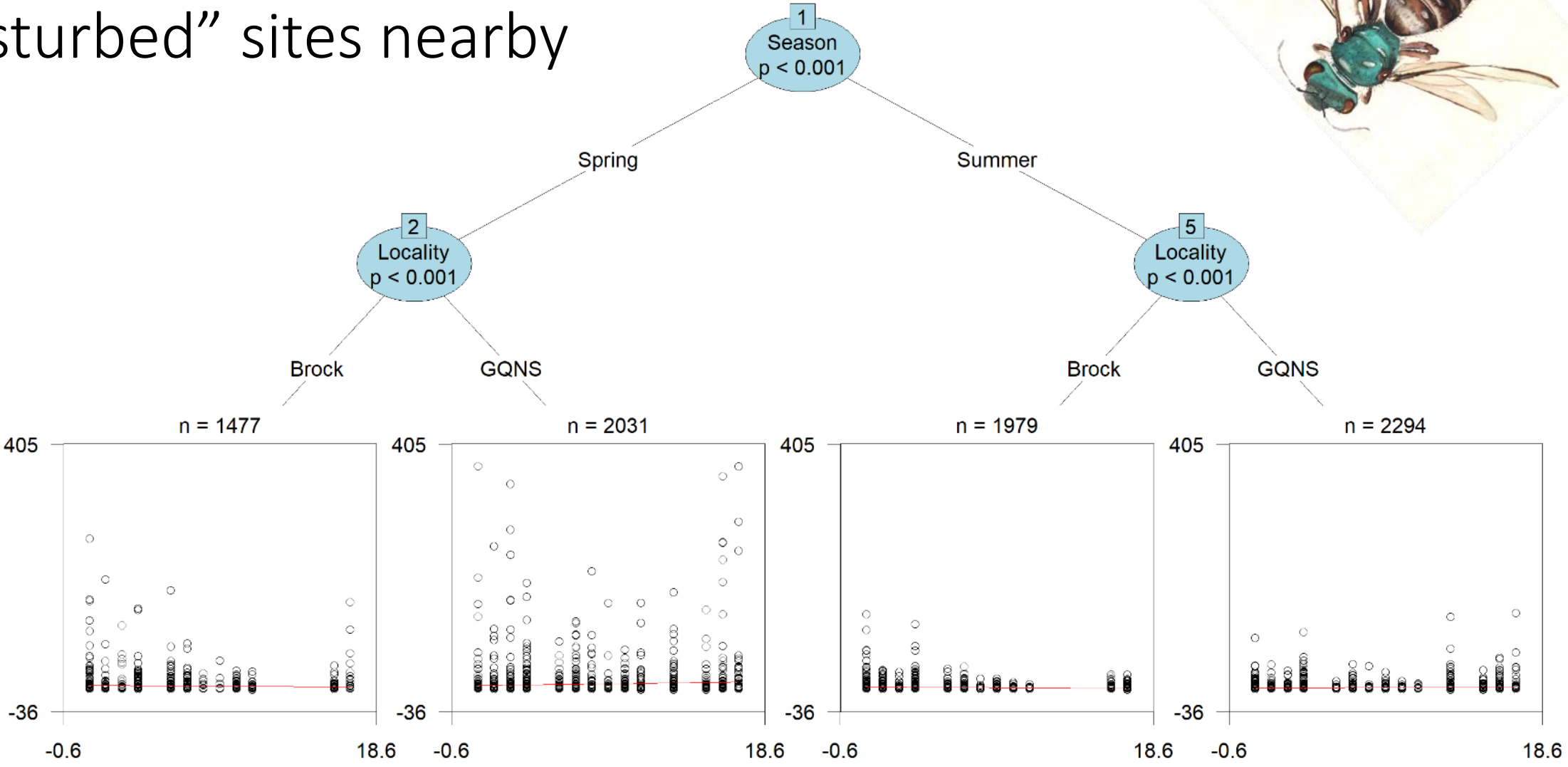


Long-term effects of restoration 2003-2023

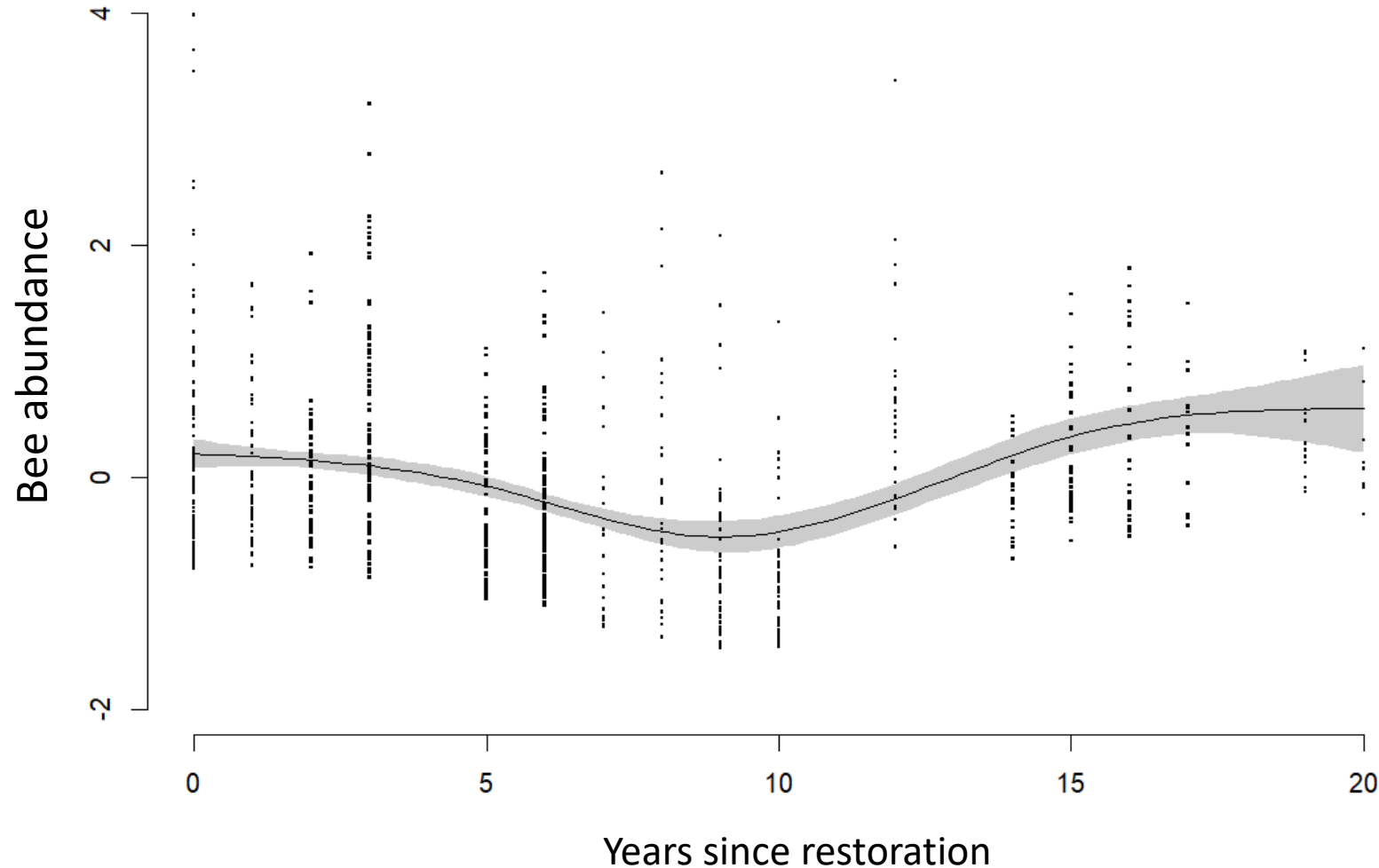


*Data analysis
is getting
complicated*

GQNS still supports higher
bee diversity than
“undisturbed” sites nearby



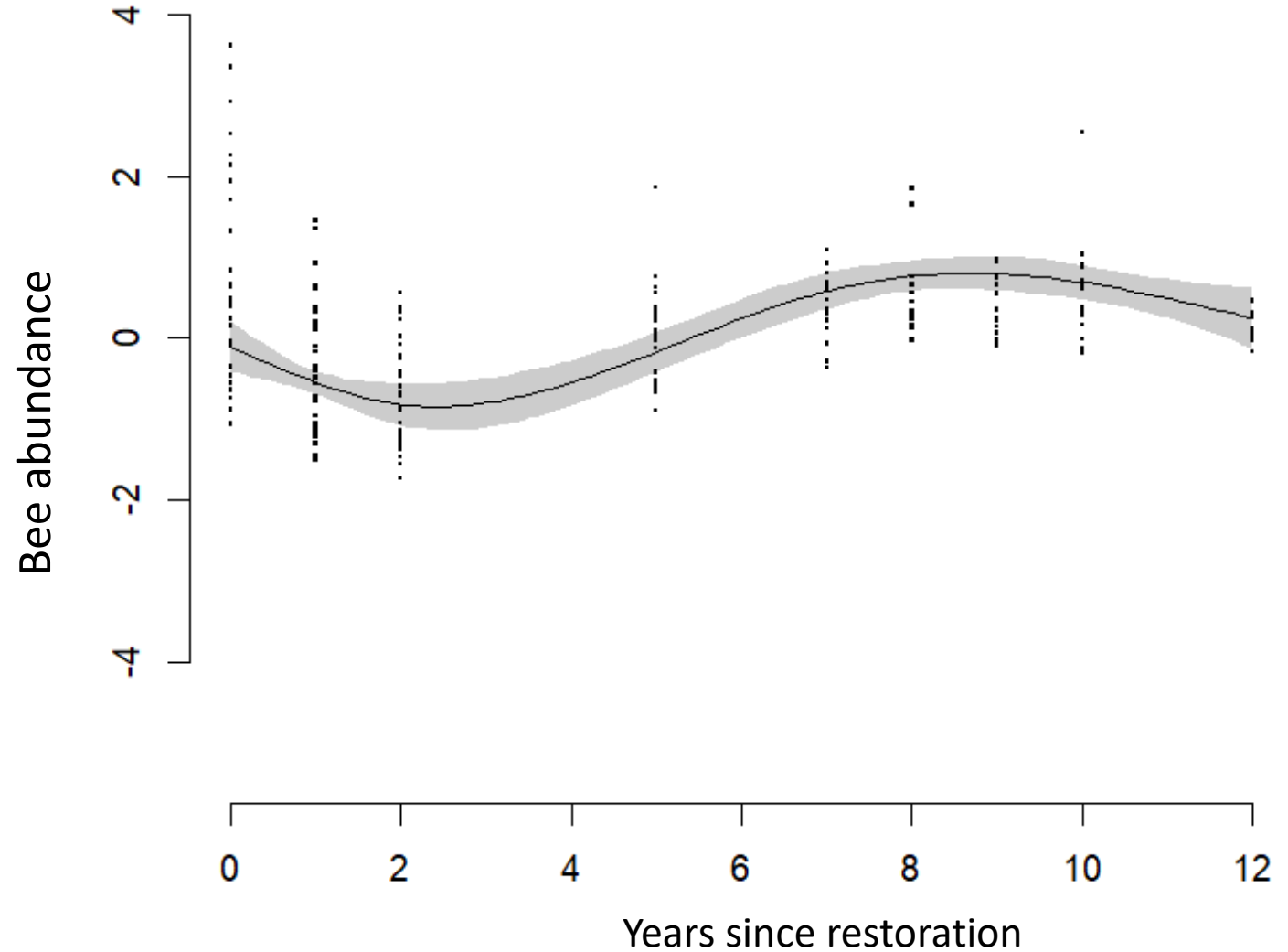
Bee populations exhibit long-term variability, even in protected areas like GQNS



P<0.001



Elm St. and
Station Rd. bee
communities also
recovered quickly



Why does landfill naturalization work for bees? Because bees have simple needs.

Food

- Lots of pollen-producing flowers, including weeds
- Blooms from spring to fall
- Different sizes
- Simple shapes

Nesting spaces

- Accessible soil surface
- Dead stems and twigs
- Holes and crevices



A wide-angle photograph of a lush, green field filled with various wildflowers and tall grasses. The field is densely packed with plants, including many white daisy-like flowers and some purple and yellow blossoms. The background shows a gentle rise in the land, suggesting a hillside or a large meadow. The sky is bright and clear. A semi-transparent light green rectangular box is overlaid on the left side of the image, containing the text "Build it and they will come" in a bold, black, sans-serif font.

Build it and they will come

So many bees, so little time...



BBL
ROCK EE A B



Glenridge Naturalization Site -History

- The Glenridge Naturalization site, located on the brow of the Niagara Escarpment, was first a privately owned limestone quarry known as St Catharines Crushed Stone Ltd. The quarry was operational between 1957 and 1972 with 95% of the quarry's total output being used for building projects within the Niagara Peninsula. Nearly 2,000 tonnes of crushed stone were produced per day.
- The City of St Catharines took ownership of the Quarry in December 1975 and established the Glenridge Quarry Landfill site and operated the site as a landfill between 1976 and 2001. During its 25- year history, the landfill received more than 1.5 million tonnes of municipal non-hazardous solid waste.
- The total property is 44 hectares of which 17.4 hectares was used as the landfill disposal area, and the remaining area as visual buffer lands. Not only did Glenridge Quarry function as a landfill, but also as a progressive recycling facility. This recycling facility predated the modern, Blue Box curbside program that most people are familiar with today. The facility was located where the Children's Science and Nature Area stands today.
- The site officially ceased operation as a landfill on January 1, 2002. It was decided that the site would be transformed into a Naturalization site for public use and enjoyment and with the input of the local residents, the Glenridge Naturalization site was officially opened on September 28, 2004, as one of Ontario's first "Green Sites". Efforts were made in the design of the site to reduce energy consumption, reuse natural materials and recycle building materials.
- The naturalization site has been recognized with a number of awards, including the First Place and Gold Award at the International Awards for Livable Communities in Spain.
- Today, this site offers a variety of educational and recreational activities for visitors to enjoy. The site boasts walking trails, a pond, boardwalk, picnic area & pavilion, children's science and nature area along with spectacular views of Niagara region. The site is also home to a variety of wildlife.