

Audio Bee Booth **an amplified habitat installation for wild, solitary bees and wasps**

April, 2014 (3 pages)

By Sarah Peebles. Assisted by Rob Cruickshank, electronics; John Kuisma, wood fabrication; Wood-burned illustrations by Chris Bennett, Julie Kee or Mary-Anne Alberga (Toronto, Ontario, Canada).

Synopsis

This amplified habitat installation provides a safe, accessible window to the world of native bees, enriching our understanding and appreciation of local pollination ecology while potentially enhancing pollinator monitoring endeavours. It is a permanent installation which attracts local insects which aggregate over the course of several years between the Spring and Fall months (it is not pre-stocked).

Subject areas of exploration

Psychology of human perception, soundscape studies, habitat sculpture, earth art, biodiversity, local habitats, native bees, pollinator coevolution with native and non-native plants, wild bees / wasps and their predators, insect communities, community gardening, food production and alternative pollinator management.

Dimensions

4 - 6 ft. total height when installed; cabinet of 18.5 inches (47 cm) wide x 10.6 inches (27 cm) deep; approx 36 inches (90 cm) high. Width = tunnel nest entrance/exit face (where the bees come and go from); depth = side-door viewing surfaces. Three viewing doors (two side and one back) provide access to 4 viewable nest surfaces; modifications and larger installations are also possible. See page 3 for safety notes.

Description

Many species of solitary native bees (and wasps) throughout the world nest in vacated beetle bores and other pre-formed cavities, and are critical pollinators. The **Audio Bee Booth** is a small outdoor viewing and listening booth which provides habitat for local, wild solitary native bees which are not social insects (e.g., not honey bees or bumble bees). Audio Bee Booth incorporates a weather-resistant observation panel, vibrational sensors (transducers acting as microphones), custom-built circuitry, headphones and magnifying lens which, combined, provide a magnified, immersive environment in which to observe these pollinators in all stages of their life cycles.

Audio Bee Booth accommodates a diverse population of cavity nesting pollinators which vary greatly in size, form, colour and habits; solitary dwelling insects which do not make honey or other large stores of food to protect from mammalian predators - and thus which do not sting or otherwise feel threatened when observed creating nests, emerging from nests, mating at or defending their nests (from other insects), even at very close range. The booth draws from three design models: standardized nest blocks developed by the alfalfa pollination industry for the managed leaf cutter bee *Megachile rotundata* (Saskatchewan); mason bee 'houses' (genus *Osmia*) popular for orchard pollination; and, observable nest blocks which accommodate many different species of solitaires, developed by Peter Hallett (Toronto).

The cabinet's design innovation lies in its providing magnified sound (via headphones) coupled with unobtrusive, cross-section viewing of its inhabitants (who come of their own choosing) as they go about their activities uninhibited by human presence, revealing dramas and biological information conveyed 'in person', in the moment - animal interactions normally inaccessible yet omnipresent in most rural and urban environments. Observing with a magnifying lens (or reading glasses) while listening with headphones effectively transports the viewer into a microcosmos, extending one's own physical senses, providing a truly mesmerizing and informative experience.

The booth itself re-focuses the eye and the mind: an aesthetically compelling object, its wood cabinetry is elegant either unadorned or decorated with wood-burned life cycle illustrations. It invites the viewer to participate and to draw connections between habitat, sculpture, 'performance' of living things (on a micro scale), and expanded awareness of what biodiversity entails.

The Audio Bee Booth is supported on 4 metal poles which easily insert into the ground; when inserted, the top of the booth can sit between 4 - 6 ft. off the ground (larger installations are also possible). The booth can be easily placed in a garden, field, rooftop, forest, etc. Various locations can reveal a wide range of nesting materials, nesting methods and strategies, bee/wasp food sources, nest material sources (mud, pine trees, etc.), physiological details, pollinator-plant life cycle timings (phenologies) as well as the cleptoparasites (cuckoo bees, wasps) which prey upon inhabitants. (cont.)

Audio Bee Booth continued

The booth also facilitates observation of other aspects of pollination ecology which unfold over longer time periods: population growth and competition among and between the species which choose to inhabit it - including cleptoparasites and other invasive organisms (also naturally present in the environment) - the wider implications of surrounding habitat, weather patterns and human presence. Video highlights of inhabitants include the following at the Resonating Bodies site: [Audio Bee Booths](#) , [Odes to Solitary Bees](#), and [Solitary bees and wasps: nesting materials, construction and life cycles](#).

Visual Access: Two bee nesting planks sit within the booth; their exterior nest cavities (covered in plexi) are viewed via 2 side doors; a back door provides views of the interior surface of each plank and space for headphones, magnifying lens, reading glasses and notes. **Audio Access:** 1. Headphones (provided or user brings own) connect to mini-jack inputs within an audio interface at the lower back of the booth. Each nesting plank contains embedded vibrational sensors (acting as microphones) which connect from the booth interior to (permanent) audio interface; this, in turn connects to weather-resistant housing within the booth (containing the amp & power supply), and is inaccessible to the public. The solar panel attaches to the roof. (An optional modification (not yet developed) may include #1 above for audio access via cell phones and ear buds, signal transmission electronics powered via solar panel; this option would need to be commissioned.)

This cabinet-style booth is one of several Amplified Habitat Installations for Solitary, Wild Bees & Wasps developed as part of 'Resonating Bodies'. Other installations in this series include the smaller [Audio Bee Cabinets](#) (solar-powered or hand-held amp versions), **Deluxe Log** (a free-standing modified log which provides observable habitat; [prototype here](#)), and habitat walls/structures with integrated amplified nesting planks currently in development (such as ["Cobdominium" prototype](#)). These installations cross-reference with Resonating Bodies 'Bee Trading Cards', 'A Guide to Toronto's Pollinators' (David Suzuki Foundation) and other information at the Resonating Bodies web site and RB on facebook.

The Audio Bee Booth and other Resonating Bodies projects have been developed with the assistance and consultation of biologists Laurence Packer and Packer lab researchers Scott Thomson, Cory Sheffield, Lincoln Best and Claudia Ratti (York University); James Thomson and Thomson lab researchers Jessamyn Manson and Michael Otterstatter (University of Toronto); Peter Hallett (University of Toronto and ROM); Peter Kevan (University of Guelph; CANPOLIN); and Stephen Buchmann (University of AZ -Tucson, Drylands Institute). [Resonating Bodies](#) is a series of art and community projects which focus on pollination ecology, with special attention paid to the intersection of native bees, habitat and coevolution of plants and pollinators of Toronto, Canada and beyond (see more).

Essential Facts about Canada's Native Bees and Wasps and more is outlined at [Bee Biodiversity](#). See also, "[The Bee Genera of Eastern Canada](#)", CJA 03 September 25, 2007 , Laurence Packer, Julio A. Genaro and Cory S. Sheffield.

Safety note: Solitary bee and solitary wasp populations at habitat installations (places created for them, such as bee cabinets, bee houses or bee nesting logs for solitaries) are much the same as populations normally present in the environment, and as such persons with allergies should take the same precautions as in any outdoor situation. All bees in upper North America, including solitary wild bees, bumble bees (native bees which are social) and honey bees are by nature non-aggressive to people and are not interested in human food of any type, but rather forage for nectar and pollen exclusively. The same is true for solitary wasps, except that they prey upon aphids, grasshoppers and other insects. These pollinators will not take an interest in people observing their foraging or nesting activities and will only sting if accidentally stepped on or handled (such as getting trapped in one's shirt). Observing solitary bees or wasps at their nest area is safe, as well, because these insects have not evolved socially and therefore have no stores of honey or other food to defend from mammals such as raccoons or bears. Thus, they do not feel threatened by human presence at their nesting sites (though they often are shy and require patience to observe). The majority of Canada's 800-plus species of bees are solitary. A note on social bees: Social insects have evolved to defend the stores of food and brood in their colonies which make tasty snacks for mammals. Bumble bees (*Bombus*) generally live underground in abandoned mouse nests and similar cavities. Although it is unusual to find a bumble bee nest in the wild, caution should be taken if you do come upon a nest entrance, as bumble bees do defend their nests. European honey bees (*Apis mellifera*) mostly live in managed hives, as they are not native to the Americas, although occasionally feral honey bee hives do survive in the wild in Southern Canada. "Africanized" honey bees (*Apis mellifera scutellata*), which are a hybrid of European domesticated and African wild honey bee species with aggressive traits, do not live North of the Southern United States and thus are not present in Canada.

Biographies

Sarah Peebles (Toronto, ON; born Minneapolis, MN, USA) is a composer, improviser and installation artist. Peebles studied violin, composition and Japanese traditional musics at the University of Michigan School of Music at Ann Arbor (B.A. Music Composition, 1988) and as a visiting student at Tokyo's Toho Gakuen School of Music. In the 90s she studied computer-assisted music via an artist residency and workshops at InterAccess Electronic Media Arts Centre (Toronto, Canada). Her approaches to sound-based art include gathering and transforming found sounds for live performance, radio music and multi-channel contexts using laptop and resonant objects; incorporating acoustic and digitally processed *shō* (Japanese mouth-organ) in her improvised performances and compositions; and, creating integrated-media works involving native bees, wasps and pollination ecology.

Since 2008, Peebles has collaborated with biologists, artists and technicians on a series of art installations, community outreach projects and a web site which addresses native bees and wasps, pollination ecology and biodiversity, under the umbrella of “Resonating Bodies”. Highlights of this work include the integrated media installation “Bumble Domicile” at *new* gallery in Toronto (group show, 2008), “Odes to Solitary Bees” with Canadian poet and videographer Stephen Humphrey (2010), and a series of permanent outdoor habitat installations, “Audio Bee Booths” and “Cabinets” commissioned by The Tree Museum, CANPOLIN, Balls Falls Conservation Area, and Cambridge Sculpture Garden, among others. Her ongoing work with similar outdoor installations, all of which incorporate vibrational sensors which act as microphones, incorporates the mediums of adobe, stone and cabinetry.

Peebles has performed in Europe, Canada, the U.S.A., and New Zealand with a wide variety of musicians, visual artists, and story tellers. Her music has been published by MusicWorks Magazine, Unsounds, Cycling ‘74, Spool Records, Post-Concrète, Innova recordings, Hornblower Recordings, and New Adventures in Sounds Art, and can be heard online at CBC Music and Sonus.ca (more at sarahpeebles.net).

Robert Cruickshank (Toronto, ON) is a multidisciplinary artist. His work in various media includes electronic, kinetic and robotic installations, sound art, electroacoustic music and lo-fi and stereo photography, and has been exhibited in Toronto and internationally. Much of his activity is associated with InterAccess Electronic Media Arts Centre in Toronto, where he has developed a number of hands-on workshops for artists using electronics. His work combines a knowledge of physical computing with an ongoing fascination with sound, light, and motion, and is as much informed by the kinetic art of the early 20th century as it is by contemporary new media art. Works such as Spiral Inscriber (2005) and Sheep Problem (2007) combine micro-controllers with intricate electro-mechanical systems, reminiscent of early clockwork and mechanical devices, and reflect his interest in obsolete technologies. Many of these works are collaborative in nature, and he has been part of several long-term collaborative projects at InterAccess, such as Space Probe (1998), SenseBus (1999) and Art Interface Device (2001 present). He is also a member of InterAccess’ I/O media, a collective of sound and video artists who explore real-time improvised performance. In addition to his skills in electronics and physical computing, Cruickshank brings an extensive background in broadcast technology to his work, and has been a sought-after advisor to artists seeking technical assistance for many years. He brings to this project his expertise in imaging technology, as well as a life-long fascination with ultraviolet light, which is often incorporated into his own artwork. He has sat on the InterAccess Board of Directors from 1996 to the present (robcruickshank.net).

John Kuisma (Toronto, ON) creates audio, electronics, sculpture, installation and custom fabrication (kuisma.ca).

Chris Bennett (Toronto, ON): pyrography (champstiles.webs.com)

Mary-Ann Alberga (Toronto, ON): pyrography, frottage, painting

Julie Kee (Hamilton, ON): pyrography

RESONATING BODIES

Pollination ecology, art, science and community on the web and beyond.

<http://resonatingbodies.wordpress.com>