

renewable energy before forming his own development firm, ReGenerate Biogas Inc.

Biogas generation — in which methane from the decomposing organic waste is captured and burned to generate electricity — is not a new idea for the Toronto Zoo. It first explored the possibilities several years ago as part of an overall program to showcase renewable energy in zoo operations. At the time, however, biogas technology was relatively new, so the zoo focused instead on more traditional projects, such as solar and geothermal installations. It returned to biogas in the spring of 2010, issuing a request for proposals for a three- to five-megawatt plant. Bida did not respond to that request. But in October, he and a team of experts — including Koenig and Consultants, Riepma Consultants and Angus Power — pitched the zoo on a smaller project with community-based co-op ownership as a differentiating factor.

The Toronto Zoo accepted the proposal in November 2010, and the ZooShare group has since been at work to put it in place. The co-op was incorporated this past April and it is now focused on selling bonds to finance construction of the plant, including an upcoming community bond issue open to the public. Once the plant is operational — the target launch date is set for the fall of 2012 — the co-op will generate income from the sale of electricity to the Ontario power grid under the province's feed-in tariff program for green energy projects. Additional revenue will come from tipping fees paid by the grocery retailer and the sale of liquid and solid fertilizer from the leftovers of the biogas extraction process. (The liquid fertilizer is going to a local farmer but the solid fertilizer will be sold in garden centres under the Zoo Poo brand.)

Looking ahead, Bida is also interested in supplying the modest volumes of carbon dioxide left over from the breakdown of wastes to a potential greenhouse project nearby. That would reduce emissions from the animal and vegetable wastes even further. For now, however, the focus is on bringing the first phase of the ZooShare project to fruition and then looking for opportunities to grow. "The idea," Bida says, "is to expand and replicate." 🐾



## What's to love?

**Cowbirds are moochers. It's a brilliant evolutionary strategy — and one that truly rankles**

By Jay Ingram Photos by Robert McCaw

### **FREELoadERS**

*Cowbirds lay eggs in the nests of other bird species, letting the host take the responsibility of raising the cowbird young. Some birds fight back against the intrusion, others still have to figure it out.*

"I hate cowbirds." So began a recent e-mail from a bird-loving friend of mine. (Bird-loving, that is, with apparent exceptions.) He was responding to a story I had told him this summer of seeing an unfortunate willow flycatcher feeding not one but two enormous cowbird babies. The cowbirds likely meant a lost reproductive summer for the flycatcher, but for me and my friend, it was more than that: a story of evolutionary struggle, yes, but also one of raw human emotional reaction to it. Neither is fully understood.

Cowbirds lay their eggs in other birds' nests and leave the raising of their fledglings to the hosts. It is a brilliant strategy from the evolutionary point of view: why waste time and energy solidifying your genetic future when someone else will do it for you? This practice, called nest parasitism, has evolved in many species around the world. Of course, it only works if the host birds co-operate, and that is one of the most puzzling things. Why would they? The question takes on new force when you see a bird like my pitiable flycatcher, dwarfed by the begging cowbird, working without a break to stuff food down its throat. Surely it must know the bird it's feeding is not a baby flycatcher.

Apparently not. Once a cowbird has hatched, host birds accept it as their own, and no good can come of that. If the host bird is small, like a warbler or flycatcher, the early-hatching,



**ANY HELP WILL DO**

*Cowbirds established themselves in North America following bison herds and eating the flies that surrounded them. When early settlers decimated the bison the birds started following the settlers' cattle herds.*

fast-growing cowbird will likely overwhelm the other fledglings, grab most of the food and maybe even push other young nest-mates overboard. The female cowbird ensures that outcome by laying her eggs at exactly the right time, just when the host female is laying hers.

So once the cowbird hatches, there isn't much the host can do. But there is a window of opportunity before that, and some species do retaliate. Several species of warblers will abandon their nests and start over once they detect the presence of a foreign egg. Others, like some willow flycatchers (but not mine), push the cowbird egg down into the nest material and lay new eggs on top of it. Some even build an entire new nest (or two or three if the cowbird keeps intruding) above the first. Orioles puncture the cowbird egg, while robins will kick the cowbird egg out of the nest almost immediately. But many host birds simply accept cowbirds because they apparently have not evolved any effective defence. In some cases that is likely because there hasn't been enough time — evolutionary time — to do so.

Cowbirds established themselves in North America by following vast bison herds (or even the large mammals of the Pleistocene before that) and eating the insects accompanying them. For centuries their range was delimited by those animals. When Europeans did their best to extinguish the bison, cowbirds simply switched to following cattle. They got their big break when settlers began to clear forests for farmland. That clearing

**Bird Brains?**

Two recent stories from the field of avian research suggest that birds may have more going on upstairs than they get credit for. The first comes from a team of Japanese researchers whose experiments suggest that crows may have a rudimentary ability to “read” numbers and symbols. In their experiment, the researchers presented crows with two containers. The first, with number “2” on the lid, was empty. The second, bearing the number “5,” contained food. When presented with the containers, the crows quickly learned to pick the one with the number 5 on the lid, doing so about 70 per cent of the time.

Meanwhile, researchers in Scotland and Botswana have been conducting experiments on nest-building behaviours. They've found that individual members of their test species — Botswana's southern masked weaver — use different techniques for constructing nests. This suggests the birds learn nest-building skills, rather than inherit the behaviour as a genetic trait, and are capable of adapting designs based on experience.

exposed many species of forest-dwelling birds to cowbirds for the first time, especially where agricultural lands bordered the edges of forests. It's likely that some of the species most vulnerable to cowbirds today simply haven't had time to adapt to the existence of a bird that will hijack their parenting.

There is some data that would suggest this is the case: one study showed that birds that have historically lived in grasslands, and therefore among cowbirds, are better at deserting their nests than birds that have been exposed to the cheats only relatively recently. But even in this case, the picture isn't completely clear.

So why do we react emotionally, resentfully, even with disgust, to what is simply an evolutionary struggle? I think entomologist E.O. Wilson might have captured it best in his book *Biophilia*, where he wrote that we are not just observers of nature, but lovers of it, with an unconscious attraction to other living things. Recent brain studies have backed that up, showing that the amygdala, a part of our brains specialized for emotional reactions of all kinds, reacts automatically to images of animals.

If indeed we are hard-wired, not just to notice animals and birds but to invest emotionally in them, we will inevitably apply our values to them. It's a lot easier to favour the tiny, colourful, hard-working victim than the drab, oversized bully. That's just the way we are. 🐣