

# Sacred & Mundane

ARTIFACTS OF CONTEMPORARY CULTURE



## Fuzzy Forensics

BY LAUREL A. NEME

The liquid-nitrogen freezer sits unobtrusively up against the far wall, but crack it open, and, after the clouds clear, you'll see stacks of animal blood and tissue samples. Turn the corner and you'll find a walk-in freezer off the evidence room full of feathers, hides, and bones, and various animal parts and carcasses awaiting examination. A coffin-sized Plexiglas box in the "bug room" holds thousands of black carpet (dermestid) beetles that swarm over bones, cleaning them without altering evidence of trauma or tool marks. The Ashland, Oregon-based U.S. Fish and Wildlife Service Forensics Laboratory, dubbed the "Scotland Yard of wildlife crime," is the world's first lab of its kind.

Killing wild animals is big business. While much wildlife trade is legal, a huge

black market exists, especially in rare and endangered species. Global illegal wildlife trafficking is worth perhaps \$20 billion annually, maybe more. It's the third-most-lucrative criminal trade in the world, ranking behind drugs and human trafficking but ahead of arms smuggling. Ounce for ounce, illicit products such as rhino horn and deer musk can be worth more than gold, diamonds, cocaine, or other drugs. In the 1990s, crystallized bear bile sold in South Korea for over \$1,000 a gram, about twenty times the price of heroin.

As with any crime lab, the wildlife forensics team has two jobs: first, to identify evidence, and second, to link the suspect and crime scene. Like standard police labs, it uses physical evidence such as fingerprints, tire tracks, bullets, gunshot residues, poisons, and DNA to reveal what happened to its animal victims and to identify possible suspects. But this lab has an

extra job: figuring out what the victim is.

The lab handles over thirty thousand species of victims, which makes a regular police lab, with a mere *one* species to worry about, look like a vacation spot. The lab's staff isn't just solving crimes, they are forging a new field of science as they go, working from a vast array of products. Victims often arrive as unidentifiable parts: a carved statuette, a belt, or maybe a small vial of pills. As lab director Ken Goddard explains, "All the things that

might tell you 'this is an elephant' aren't there." The scientific challenge is often to reverse the manufacturing process, to trace a product back to the species from which it came.

Because legal protections for animals are based on the species, agents must prove that the animal involved is protected. For live animals, that's not hard; but for wildlife parts and processed products found in commercial trade, it's more difficult. Without species identification, agents can't prove crimes exist, and suspects go free. Hence, the lab must figure out what techniques to apply to the evidence, identify a unique characteristic contained in the animal part in question, and then develop a methodology that finds that trait consistently. All of this can take years.

Since its inception in 1989, the lab has grown from just ten forensic scientists to a staff of more than thirty-five;

and it frequently collaborates with roughly 200 federal wildlife law enforcement agents, all fifty state fish and game agencies, and the more than 170 foreign countries that signed the Convention on International Trade in Endangered Species agreement. The lab's caseload has also grown to an average of six hundred cases annually, with each case typically involving hundreds of separate pieces of evidence.

Before the wildlife crime lab existed, when a legally protected animal left its poacher's hands, the prospects for prosecution grew slimmer and slimmer as the victim was plucked, boiled, sliced, and diced. Now when it's time to go to court, the lab adds credibility to the evidence so that agents get convictions. The lab's DNA analysis of sturgeon eggs led to the January 2001 conviction and imprisonment of a New York City-based food importer for selling phony Russian caviar. Similarly, the lab's identification of hair from a Tibetan antelope led to the 2000 guilty plea of Hong Kong- and America-based shatoosh dealers in a judicial proceeding where dozens of shawl owners, including super-model Christie Brinkley, were subpoenaed to testify about the illegal sales. The lab's analysis helps to prove these crimes and, consequently, reduce illegal wildlife trade. As one special agent put it, "It's a hell of a hammer."

*Adapted from Animal Investigators: How the World's First Forensics Lab is Catching Poachers, Solving Crimes, and Saving Endangered Species, to be published by Scribner in May 2009 and used here by permission.*

## Spy Flies

BY KATHLEEN YALE

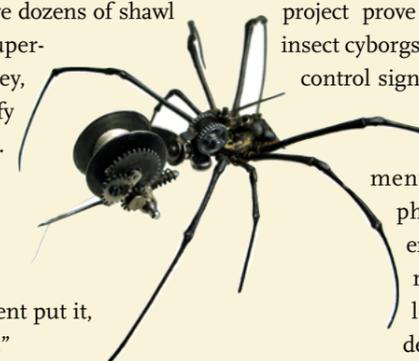
For thousands of years humans have used animals for transportation, trade, and farming. We've used homing pigeons to deliver covert messages, sent sentinel canaries down coal mines, and ridden



horses, camels, and elephants into battle. Now, with an idea literally inspired by a cyborg-ridden science-fiction novel, the Defense

Advanced Research Projects Agency's three-phase fundamental research and development program for Hybrid-Insect Microelectromechanical Systems (HI-MEMS) aims to harness insect power.

By implanting micromechanical systems inside larval insects, researchers can watch developing tissue fuse to, and grow around, tiny machinery as the insect undergoes metamorphosis. Should the



project prove successful, enabled insect cyborgs (directed by remote-control signals) could eventually carry miniature implanted equipment, such as microphones, video cameras, or gas sensors, to relay information collected from target destinations. "The program is aimed to develop technology that provides more control over insect locomotion," says project manager Doctor Amit Lal, "just as saddles and horseshoes are needed for horse locomotion control." Last year the first implanted pupae, a *Manduca* moth, survived to adulthood.

## From Wall Street to Green Street

BY GINGER STRAND

America's car culture—emitting roughly half the world's auto-related greenhouse gases—is partly the result of more than half a century of public policy underwriting suburbanization. From the building of highways to the Federal Housing Authority's mortgage guarantees that favor single-family homes in single-use-zoned, low-density neighborhoods, the government has all but mandated sprawl. Sprawl, it turns out, is hard not just on the planet, but also on the wallet. In fact, people with mortgages in transit-poor neighborhoods may be more likely to default.

Americans often move to far-flung suburbs to save money on housing. Yet homeowners who live in neighborhoods with few services and no public transit incur greater costs by having to drive more. The average American family today spends nearly 20 percent of its household budget on transportation—and many spend as much as 25 percent. These extra costs can negate the savings from buying a cheaper home. In contrast, buying a home in a walkable neighborhood with local amenities and access to transit is not only good for the environment; it's good for the budget. Households in such places can often reduce the number of cars they own by at least one—a savings of \$700 a month. A new term has been coined to refer to these communities—"location-efficient"—and new programs are being pioneered to encourage developers and home buyers to take location efficiency into consideration when building or buying homes.

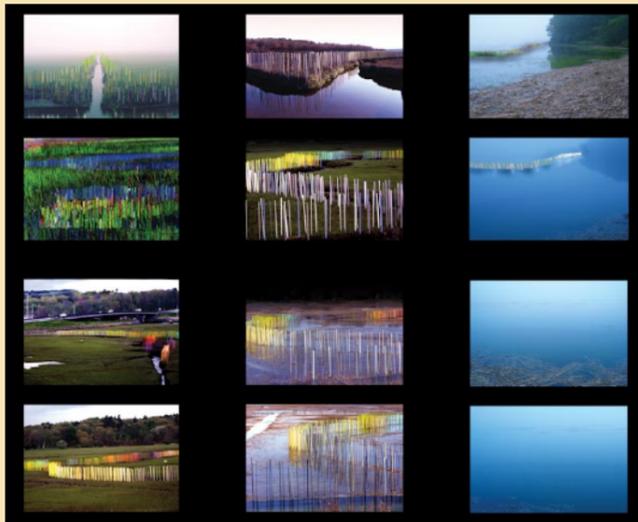
An early effort, the Location Efficient Mortgage Program, was developed by Chicago's Center for Neighborhood Technology (CNT) and the Natural Resources Defense Council. Together



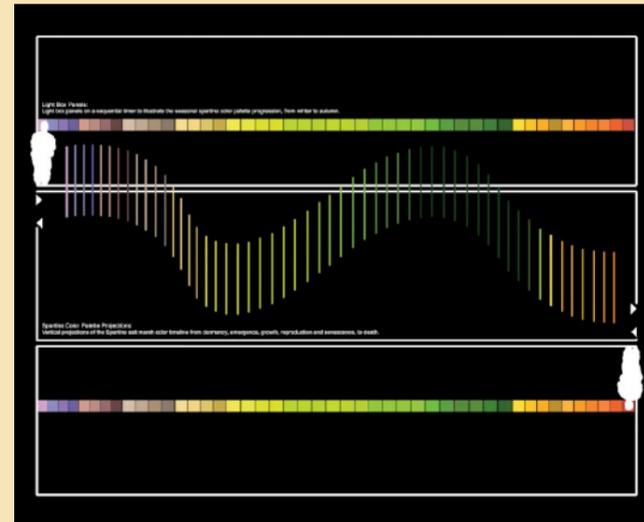
## Requiem for a Drowning Landscape

Trained in art and landscape architecture, Joseph Emmanuel Ingoldsby works to combine art, science, and technology to advocate for vanishing landscapes and endangered species. *Requiem for a Drowning Landscape* communicates the impact of climate change on the Atlantic's coastal landscape. A eulogy of

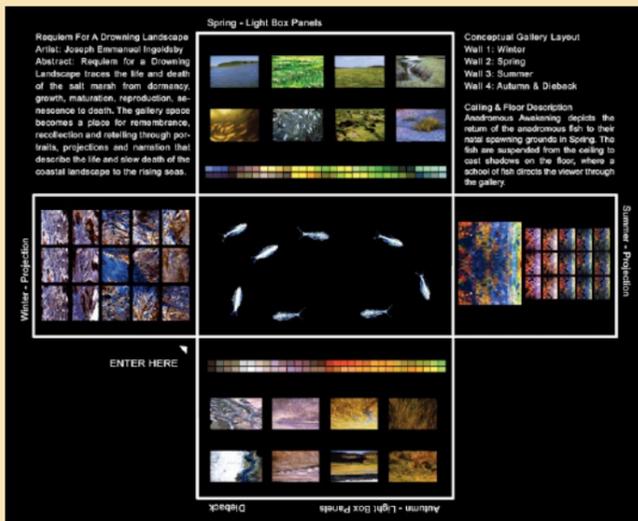
sorts, this installation memorializes the Atlantic salt marsh while advocating for change through public consensus building. Ingoldsby's most recent publication is *Vanishing Landscapes: The Atlantic Salt Marsh*, MIT Press, 2009. More of his material can be seen at [LandscapeMosaics.com](http://LandscapeMosaics.com) and [JosephIngoldsby.com](http://JosephIngoldsby.com).



**Salt Marsh Memorial Installation:** 1500 primed and custom painted stakes representing a timeline of the *Spartina* Marsh in color. Tidal Creek of the North River, Scituate, MA, 2003.



**Salt Marsh Memorial Plan:** Abstraction of photosynthesis within the *Spartina* Salt Marsh using color and light to represent seasonal time of dormancy, emergence, growth, reproduction, senescence to death



**Salt Marsh Requiem Plan:** Gallery installation of *Spartina* Winter Ice video projections, *Salt Marsh Light Panels*, *Spartina Color Timeline*, *Summer Spartina Seeding* animated projection, *Autumn Light Panels to Salt Marsh Dieback*.



**Salt Marsh Dieback Photographic Documentation:** Aerial and landscape photographic documentation of salt marsh dieback, Cape Cod, 2001-2008.

ALL IMAGES AND DIGITAL MODELING © JOSEPH INGOLDSBY, 2008

they created a Fannie Mae-backed mortgage that took location into account when determining a home buyer's credit limit. Neighborhoods in a few cities were rated using demographic, land-use, and transit characteristics; homeowners applying for mortgages in location-efficient areas were able to qualify for larger mortgages. Pilot mortgages were issued, and in 2002, after two years, none had defaulted.

In today's credit crisis, the movement has shifted away from designing mortgage products and toward influencing the course of development. To that end, the Center for Neighborhood Technology and transit-oriented nonprofit Reconnecting America, with support from the Brookings Institution, have developed a tool for quantifying location efficiency.

"Transportation is the second-highest cost for most households," says Dave Chandler from the CNT. "The Housing + Transportation Index is a tool that a lot of planning departments are using to say: 'If we're going to build housing, where would it have the best overall impact for the people who live there and for the community, in terms of being able to reduce traffic congestion and air pollution?'"

Used online, the interactive H + T Affordability Index ([htaindex.cnt.org](http://htaindex.cnt.org)) lets you select from a drop-down menu of fifty-two metropolitan regions. A map shows the area—block by block—color-coded for affordability using the traditional standard (housing = less than 30 percent of median income). Then you can switch to a map showing what's affordable according to the new housing plus transportation standard (housing + transportation = less than 45 percent of median income). The maps look very different. Looking just at housing, the fringes of metropolitan regions are the only affordable areas. Looking at housing plus transportation, the inner belts and transit corridors are the affordable parts of town.

Home buyers often look at school quality, crime rates, and neighborhood ameni-



ties in shopping for a home, but rarely do they factor in the cost of getting around. Is having a somewhat bigger yard worth an extra \$4,000 a year in transportation costs? If people at every level of the housing process—planners, developers, sellers, bankers, buyers—become more aware of how transportation affects affordability, we may just stand a chance of not only undoing half a century of government-funded land-use disasters, but of developing communities that are greener, more livable, and—bonus!—less subject to catastrophic financial collapse.

## Zoning Out

BY LOUISE DUCOTE

My gardening life began in 1990, the same year the United States Department of Agriculture (USDA) revised its 1965 Zone Hardiness Map for cultivated plants. The zones, so conveniently mapped out on the back of your average seed packet, are based on lowest temperatures and duration of cold, landing the interior of Alaska in Zone 1, Hawaii and southern Florida

in Zone 11, and my own dear-but-sweltering Austin, Texas, in Zone 8. If you live in Zone 5 and purchase a plant with a tag that reads "Hardy to Zone 7," you're taking a chance. That doesn't prevent nurseries from peddling zone-inappropriate plants, or hopeful gardeners from gambling.

The 1990 map drew from data gathered between 1974 and 1986, a lifetime ago if you're a polar bear, a salamander, or Al Gore. The USDA continues to use the 1990 map as current, though they maintain that a new one is pending. Not willing to wait, in 2006 the National Arbor Day Foundation published its own revised map using data that showed winter lows increasing as much as eight degrees in some places. According to the foundation, the old zones have

marched alarmingly northward. Cities like Washington DC (once Zone 7, now basking in 8) that have resisted classification as "southern" will have to relent, just a little, as gardeners experiment with previously unthinkable Confederate fare like the southern magnolia tree.

The plant industry has resisted the zone changes for a more traditional reason: money. Most nurseries offer a money-back guarantee on plants that die within a year of purchase, and they're less likely to have to pay out on the DC gardener's choice of a cherry tree than they are on a magnolia. As the world heats up, plants that need a certain amount of cold to thrive are struggling. After thousands of years of success, the sugar maple is now panting in New York, producing less sap and becoming more susceptible to pests and fungal disease. But that failure to thrive is not as likely to be evident during a plant's first year as the failure that leaves a "hardy to Zone 8" plant black and frozen on your Zone 6 ground.

What do the zone maps mean to a Texan vegetable gardener like me? Little to nothing, as I wean myself off buying plants

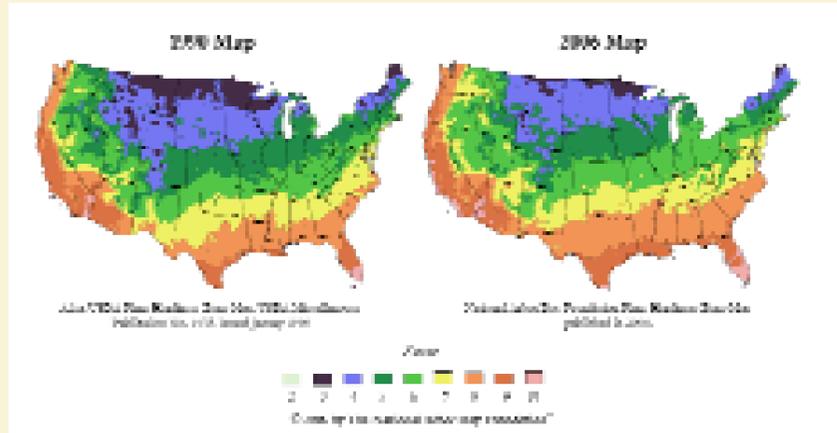
# ORION

“Serious thinking on the deeper connection between the environment and social and political issues.”

and seeds and rely more on seed saved from my own flowers and veggies. The zone map change is an interesting way to talk about global warming, or what the USDA website officially calls “changes in weather.” But my best indicator for planting is experience, and my best tool is saving seed. Seeds will gradually adapt to the microclimate of a gardener’s own yard, eliminating the need to scrutinize the maps on the backs of those

increasingly expensive seed packets. Good results can be obtained within one year, thoroughbred seed within three to five. ‘Brandywine’ tomatoes famously will not set fruit in heat above ninety degrees, and yet, as of this writing, the Brandywines from my own seed have put on their second

big set of fruit, with no rain and temperatures between ninety-five and a hundred for a painful portion of the day. I’d rather see the zone map stay the same for selfish reasons: harvesting tomatoes in December makes me a hero in Zone 8, but a nobody in Zone 9.



## Green and Clean Made Easy *By P.J. DelHomme*

WHEN I WAS A SINGLE GUY, by definition, I wasn’t all that clean. It used to be the only things I cleaned on a regular basis required oil—chainsaws, engines, guns. A jump in the river counted as a bath. I got married a year ago, and, well, I’m cleaner now; one might even call me socially presentable.

Recently, my wife Kate and I decided to put our house on the market in anticipation of stocking a larger home with children. We got rid of the clutter and duct-taped a few fixtures, saving the cleaning for the end. Thanks to a couple of Rottweilers and my not-so-clean self, the house still resembled my pad from the bachelor days of yore.

My trip to the grocery for cleaning products found me gazing down the sparkling white aisle of supplies. In the past I’d never spent any time here unless I needed toilet paper or Drano, and the bleaches, detergents, and soaps smelled strong enough to make my eyes water as if it were the end of hunting season. I got out of there quick, returning home with only the case of PBR needed to make cleaning tolerable. Then, just in time to stop a tiff regarding the

absence of cleaning products and overabundance of award-winning refreshment, a friend turned me on to the idea of all-natural cleaning products.

In Missoula, there are almost as many nonprofits as bars, and if you’ve been to this Montana town, you know that’s a healthy sum. One in particular, Women’s Voices for the Earth (WVE), pronounced “weave,” works on issues that affect women and their families and has a mission to rid households of toxic cleaners. According to WVE’s executive director Dori Gilels, only 10 percent of more than eighty-five thousand chemicals available to U.S. consumers have been tested for their potential toxicity to humans, and many have been linked to asthma and reproductive problems. The fact is, cleaning-product companies are not required to list their ingredients on labels.

To help make homes safer, WVE has put together a booklet called the “Green Cleaning Party Kit,” which provides natural alternatives to that overpowering aisle in the grocery. The only catch is that you have to make your own products.

Ingredient gathering took me to our new local food co-op for the first time. It had, in bulk, all the vinegar required for the all-purpose cleaner; soap flakes, washing soda, and borax for the laundry detergent; and baking soda and castile soap (Dr. Bronner’s) for the creamy soft scrub. It took some convincing to get my male friends to come over, but when I mentioned beer, and the little diddy that phthalates found in commercial detergents and glass cleaners have been linked to reduced sperm count, the green cleaning party was on.

That evening, as the elk sausage sattered on the grill, we measured and mixed the ingredients. Wire grill-brush in hand, we tested the creamy soft scrub on a rusty shovel and saw it shine right up. And the all-purpose cleaner worked wonderfully on the dusty car windshields. It even lightened the grass stains on the Briggs and Stratton lawn mower in the garage. In the age of extreme clean, it felt good to go easy. As for the laundry detergent—the beer ran out, and no one felt inclined to stick around to sniff my skivvies.