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ASSISTED MIGRATIONS: ON THE SALVATION AND DANGER IN MOVING THE WORLD'S SPECIES

by

Clinton Crockett Peters

A thesis submitted in partial fulfillment of the requirements for the Master of Fine Arts degree in English (Nonfiction Writing) in the Graduate College of The University of Iowa

May 2013

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CERTIFICATE OF APPROVAL

MASTER'S THESIS

This is to certify that the Master's thesis of

Clinton Crockett Peters

has been approved by the Examining Committee for the thesis requirement for the Master of Fine Arts degree in English (Nonfiction Writing) at the May 2013 graduation.

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CHAPTER 1

THE CARP

On a cloudy day in December, the Chicago Shipping Channel Dam straddles what looks like any other polluted stream of gray water. At nine million dollars in construction, and five hundred thousand dollars every year in operations, the dam is not even visible, only what looks like a pair of steel hubcaps on each side. The dam lurks, like what it's meant to keep out, below the surface. A barge should and does pass through about every hour.

The dam, in fact, *is* the hubcaps, or rather, an electric current that runs between them and the channel, charging 1,500 feet of water between mile markers 296.1 and 296.7. Two volts pass throughout the water, which is enough to kill a child or an elderly person or someone with a bad heart and impair the unborn infant of a pregnant mother. It is enough to send sparks flying from the hulls of metal barges. Everyone, from boaters to dock workers, is advised not to touch any surface in direct contact with the water

The dam was built with one purpose. It was built to stop a fish.

Asian carp have no stomachs. They are like Hoover vacs, sucking up whatever they can from the cold water, gorging up to forty percent of their body weight each day, usually phytoplankton and zooplankton, microscopic bottom feeders that form the base of a river system's food pyramid. Carp effectively cut out the middle men and everything else at the top because nothing in turn, besides a few not-so-picky fishers, eats the Asian carp.

Carp also eat the eggs of other fish, infanticide being an impressively good takeover strategy. The carp in turn lay five million eggs a season.

The carp can grow to three-feet-long and can weigh over one hundred pounds. In some sections of Midwest rivers, they make up 90% of the water's entire biomass.

They are threatening to cross into the Lake Michigan and take out $7 billion worth of fishing industries.

The fish at the gates of the Great Lakes is really five subspecies rolled into one and called the Asian carp. The silver carp is perhaps the most famous. It is known as the "jumping fish" or "flying fish" and is easily seen on YouTube in its most famous habit of scaring at motor boats and leaping, in-mass, up to ten feet into the air. The fish slap boaters in the face. They can break noses and jaws. One young woman was knocked off a jet ski by a carp, broke her vertebrae and nearly drowned but was rescued by a friend.

In 2009 Attorney General Mike Cox of Michigan filed a lawsuit against the State of Illinois to close the shipping canal for good, requesting immediate action from the Supreme Court to close the fish's only route to the Great Lakes. In January of 2010, the Supreme Court denied the request, but in July of the same year, Michigan filed again, this time with Minnesota, Ohio, Pennsylvania and Wisconsin filing a joint lawsuit against the Army Corps of Engineers to shut the canal and stop the fish.

There was no other reason for the action, for states to file against state, just the prevention of the bottom-feeding fish from spoiling the Great Lakes' catch.

It's important to pay attention to this fish, this *hypophthalmichthys molitrix*, the chubby, vacuum cleaning carp that caused states to sue, fishers to panic, the Army Corps of engineers to

build its dam and later dump gallons of poison, because I'm going to suggest in a few pages that, maybe, maybe, it's worth thinking about moving species to a place where they haven't been before.

The writer Joe Abramajtys has equated the Asian carp's plight to the "schizophrenic" American immigrant experience, "they are brought in to do the shit work other, older, established groups shun - forced to live in camps and ghettos...discriminated and legislated against...until some of them escaped their plight to live free in better circumstances but still formidable barriers."

The Asian carp were original brought to Arkansas from China specifically to clean sewage plant holding tanks, hog farm swill lagoons, murky catfish ponds and other detritus filled, polluted lakes. But one summer, heavy rains raised the Arkansas ponds until water and carp spilled into neighboring streams, which eventually wound into the Mississippi and led the carp to knock on the Chicago Shipping Canal's door step.

The Chicago Shipping Canal itself has a tainted history. It is what has led the carp up one of the largest river systems in the world to the largest fresh body of water in the world. Built in 1900 the canal reversed the flow of the Chicago River entirely, leading the American Public Works Association to label it one of the top ten public works projects of the century and the American Society of Civil Engineers to call it one of the "Seven Wonders of the Modern World."

Despite its name, the canal's primary function was to divert human sewage. Chicagoans drank from Lake Michigan, which is where, before the twentieth century, they also dumped their industrial-scale human waste. This was no mere olfactory obfuscation. In 1885 heavy flooding in

the Midwest backed up “grey” water over the drinking water intakes. Ninety-thousands of Chicago's just recently traumatized-by-fire population died subsequently from typhoid, cholera and dysentery. That’s 450 times more people than died in the Great Chicago Fire itself in 1871.

The Chicago Shipping and Sanitary Canal became not just an architectural and engineering marvel, but a concentrated piece of public reconciliation, progress that was Chicago's upward civic trajectory following decimation via mythic back-kicking cow and the city’s self-poisoning.

The canal was 28 miles long, 24 feet deep and 160 feet wide, the largest municipal earth-moving project ever completed and the largest human-made canal at the time. According to the APWA, the construction of the Chicago Canal was a key event for the Panama Canal’s completion because the Chicago Canal trained many of its same engineers.

The Canal was begun in 1892 and was finished eight backbreaking years later. It required 28 million cubic yards of glacial grit displacement and the removal of 12.9 million cubic yards of rock. In other words to dig, meander, steam-shovel and dynamite, workers, thousands of them who were immigrants, had to remove enough earth and glacier debris that would equal a square mile of buildings, each 47 feet tall.

Their work reversed multiple millennia of gravity, sending water (and sewage) towards the Mississippi instead of the Great Lakes. Today the Big Muddy continues to carry the ancient glacial silt on down to the bayou where it forms the great dead zone, widening a New Jersey-sized stamp licked on the spot were mighty river meets ocean. In this milieu are agriculture run-off from Iowa, manure from Kansas and Nebraska and Chicago citizens' morning flush.

The shipping canal cost $70 million, or $1.7 billion in today's money. Then as now, a

neighboring state sued to close the Chicago Canal. That time it was the Attorney General of Missouri who claimed that adding metropolitan manure in the Mississippi might send the waste into St. Louis's drinking glasses. And again as now there was a concern from the other Great Lakes states, then that the six hundred thousand cubic feet of water moving out of the lake and down the canal every minute might lower the level of Lake Michigan like a balloon deflating from a tiny puncture. People were concerned the lake would drop as much as eight inches, which when spread over the surface would have caused widespread ship docking problems, as it would have altered wave and even weather patterns.

Missouri failed with its lawsuit as Michigan and the others later would, but at least in 1930, the Supreme Court recognized the national importance of the canal and ruled that the Sanitary District of Chicago was no longer fit to manage it, and turned the waterway over to the Army Corps of Engineers, who has controlled over it ever since.

Carp aren't the first invaders to the Great Lakes. Steamer and tanker ships when they release their ballast water, set loose Trojan horses on local aquatics. The ships have brought a formidable array of creatures: 183 documented exotics including: zebra mussels, quagga mussels (there are now over one trillion quagga mussels in the Great Lakes) flat worms, humpback pea clams, European flounder, spiny water fleas and the famous sea lamprey, an eel-like creature with a circular row of sharp teeth and a piercing tongue that clamps onto the bodies of fish and sucks out their blood and bodily fluids.

Zebra mussels, for one, have spread to every tributary of the Mississippi from the Great Lakes (reversing the flow of the carp) south of Minnesota.

And, of course, the *Pacific* salmon that the Attorney Generals of Michigan, Minnesota and other states are worried about have to be stocked in the Great Lakes from other states far away. The salmon are stunned by electricity in their home rivers, snatched as eggs from their incapacitated mothers, and are put in the largest fresh water body for fishers (many of them on expensive chartered yachts) to catch. They are not native here and do not do well. But neither are the rainbow trout nor brown trout Great Lakes natives. The latter is a fish that is now artificially stocked in over 500 rivers in the United States.

And you probably shouldn't eat the Lakes salmon anyway, given all the petrochemicals and heavy metals poured in from the Rust Belt and pesticides from Agriculture centers like Indiana, especially if you're young or elderly or pregnant, in other words the same people who probably shouldn’t be swimming in the Chicago Shipping Canal

The Asian carp, on the other hand, are remarkably healthy. They are very low in mercury because they don't eat other fish and are high in cancer-fighting Omega 3 fatty acids. The carp are boney, which leads people to view them with suspicious unsavoriness, but people eat them all the time in China. An irony here is that in China they are sometimes overfished.

New Orleans chefs, with preparation, say the carp taste like a cross between scallops and crab. Louisiana chef Philippe Parola, for one, has become a national-known advocate for what he calls invasive species culinary arts. He has written a book on the subject and posts recipes on the internet that use Asian carp, which he calls “silver fin” (in hopes that a new name, like Snoop Dog’s Snoop Lion, will change its image). Silverfin Provencale needs, along with four silver fin steaks, four tablespoons of olive oil, four ounces of white wine, lemon juice, fresh garlic, onion, one diced tomato, parsley and seasoning to taste and should be baked and served over pasta or

mashed potatoes.

Parola also started the initiative to bring the nutria, a big-toothed, marmot-sized rodent brought over from South America that is invasive and eroding coastal wetlands, onto the dinner table, thus using a common meat and protein and helping the wetlands ecosystems.

"Can't beat 'em, Eat 'em!" is the motto on Chef Philippe's website.

Illinois Governor Pat Quinn said publicly that he was a fan of the Asian carp and remarked that it “tasted like tilapia.” 1.8 million people relied on Illinois’s Supplemental Nutrition Assistance Program in 2011. A "crisis" according to Feeding Illinois, an anti-hunger advocacy group that is excited about using the carp. The Illinois Department of Natural Resources has held cooking demonstrations using carp at local high schools to change the public’s view. And In 2010, Louisiana State University partnered with NGOs to can Asian silver carp and send them to Haiti after the earthquake.

During a routine maintenance closer, the Department of Natural Resources, the Army Corps of Engineers, and around 300 other organizations teamed up to dump 2,200 gallons of rotenone poison into the Chicago Shipping Canal, targeting specially the Asian carp. Rotenone, according to its Medical Safety Data Sheet, is "toxic" and a carcinogen that could harm an unborn child, targets the liver, kidneys, nerves and female reproductive system, should be handled with a "self-contained breathing apparatus, rubber boots, and heavy rubber gloves,” and which “chemical, physical, and toxicological properties have not been thoroughly investigated." The handlers poured the poison from school-bus yellow jugs into a six-mile stretch of the Chicago Shipping Canal. Two hundred thousand pounds of fish rose the surface, asphyxiated and

dead.

A single, boney, nutritious Asian carp floated with them.

Shaily Menon writes, "Declaration of war against nonnative species seems a satisfying response to a public whipped up by media frenzy. However, we must consider whether declaring war against a perceived common enemy is satisfying merely because it allows us to displace our anxieties about social, economic, and environmental change."

Menon goes on to point out that at least some of the introduced species have gone on to have complicated, but sometimes beneficial effects. Zebra Mussels, though while widely devastating to some natives, have also improved water quality by filtering contaminants (each mussel can filter a liter of water per day), which in turn increased the populations of invertebrates (the ironic backbone of aquatic systems) and yellow perch, and they also helped recover native walleye, lake trout and emerald shiners.

What I want to say then, is that Nature's immigrants are a tricky issue.

When the 47-foot-tall Marmot dam on the Sandy River in Oregon was dynamited and bulldozed in 2007 one of the cited reasons by General Electric to oversee its demolition was to "celebrate the future of a watershed that will provide unimpeded salmon and steelhead passage from the slopes of Mt. Hood to the Pacific Ocean."

That we have established a new paradigm in thinking about other species seems moderately self-evident. Before say 1960, no one, certainly not a major capitalist thoroughbred

like *GE*, acted, at least publicly, for a *fish* or any greater ecological consequences for their own sake. The movement can be traced back to Lowell, Massachusetts when a T-shirt dying factory in the late 1800s dumping its iridescent chemicals into the river was blamed for people getting sick. The factory owners didn't believe (or wouldn't believe), but it was eventually decided that when people dumped effluent into rivers it would have some effect downstream, which fundamentally changed how people thought of rivers.

Rivers were previously thought to be ever-cleansing. You put a wound in a river and it helped wash away the bad blood. People washed their hands in rivers before supper. That a river could be polluted was novel, though people back then, usually, knew enough not to build latrines on a river shore.

The same idea changed for rivers as it later did for the sea, forests and now, recently, omnipresently, the air.

Anthro means human, and the Anthropocene Epoch has become the world's sixth mass extinction event. Upwards of 52 percent of the life on this planet might go extinct by 2100 because of global warming. I write "might" because how species respond to climate change is complicated. I could use the low end of the possibilities spectrum (nine percent), but I use this high estimation, which comes from Chris Thomas in the book *Saving a Million Species* because I want to address what we might be risking with our ongoing existence.

The previous mass extinction event, of course, was the Everest-sized meteorite that hit the Yucatan peninsula and caused tidal waves a mile high to wash over Europe and the skies to blacken and CO2 levels to spike, and, subsequently, the temperatures to rise.

If we travel back to other previous historic mass extinctions, we see a heavily traumatized

earth as we do threatening today. The End-Permian extinction, for instance, of 250 million years ago (the one before the Everest asteroid) was accompanied by massive volcano eruptions, including a Europe-sized lava lake that formed over Siberia with molten embers piling two miles into the sky. The lake filled and released carcinogenic poisonous gas triggering acid rain and sulfur dioxide fog which warmed the latitudes by six degrees Celsius and probably even more in the Arctic. Methane that formed when previous dead plants and animals had been encased in large blocks of ice was released by the lava and triggered even more intercontinental heating.

It took fifty million years for the world to develop the biodiversity it had prior to the End Permian extinctions.

And the extinction “event” itself, the Europe-sized, thick duvet of lava, took a million years to form. For our warming, what we lack in substance, we make up with speed. We are on track for a similar temperature gain of up to six degrees Celsius in as little as two or three centuries though no one is expecting the lithosphere to crack open over Vladivostok.

In the End Permian extinctions species' power became unbalanced, new paradigms formed, leading to total ecosystem change.

That humans have a similar kind of power is an awesome testament to where we have come in our relationship with the world. No other species in the history of species has been able to modify its environment the way that we have. One reason the Anthropocene Epoch might be an unprecedented extinction event is that previously no eight-line highways with moving cars have blocked species running away from temperatures. Trees, for instance, could move up hill and down, albeit slowly, but now are often fenced in by roads and agriculture and cities.

Given our new paradigm for thinking about other species, one way to alleviate the strain

of shrinking habitat is by us moving them.

This is a totally radical stance. Moving species, as you recall, is what eventually led to building the $9 million Chicago Shipping Canal Dam, one state to sue another, and for us to dump dozens of barrels of toxins into a water system all to kill one fish that belongs in China.

Moving species is listed in many ecology textbooks as one of the fundamental problems, along with habitat destruction and climate change, that has pushed the world further into an extinction event.

Another fish, a perch, when introduced to Lake Victoria in Africa quickly caused the extinction of 200 native species of fish, what is considered the largest mini-mass extinction in recent history.

In Flathead Lake, Montana, a freshwater shrimp was introduced in hopes of feeding the kokanee salmon. But the shrimp fed on the bottom of the lake rather than near the surface and so the fish never noticed the shrimp. The shrimp in turn ate up all the zooplankton, causing a collapse of the kokanee's food, the collapse of the kokanee salmon, and then a collapse of the eagle population that depended on the Flathead Lake fish.

Moving something, in other words, has never been our strong suit.

And yet, what to do about climate change?

What if, say, we moved north an evergreen yew was wilting in the swamp of Northern Florida? The yew looks more like a Christmas tree than a tropical palm and at first glance seems totally out of place in the humidity-wrecked, alligator-swamped, tupelo tropics. It also isn't making any seeds now, and the ones it does make when healthy are the size of golf balls and tend to roll only a few feet from its parents; not exactly a viral spore. Say there are only 500 of these

trees left. Why not take a dozen seeds and grow them in the slopes of the North Carolina Blue Ridges, see if they can weather the winter?

Or adapt ourselves to the ongoing presence of kudzu? Or move the rare and endangered Florida panther north? Or provide habitat in the Texas desert for a troupe of monkeys that were facing the bulldozer's maw in Kyoto? Or rewild Iowa's last remaining prairies with Missouri species and then, for perhaps a sound ecological reason, set them all on fire?

Really, several species would do for this story, but I've chosen these because I think the best illustrate the case of human-assisted migration and the potential for us to both be the cause of these species' extinctions and the means of their salvation.

I'm not a scientist though I've talked with many of them. Part of the reason I wrote this book is because the awe-inspiring and terrible presence of global warming compelled me to write about *something* that was going on, something that was being done, (anything really), that wasn't just gloom and doom and pointlessness. The energy sector didn't interest me much because of a lack of background. Same for transportation, politics, or food.

I have been an avid backpacker for most of my adult life and at one time my job was to lead teenagers and sometimes their professors through day-long to week-long treks over Rocky Mountains, through steep desert canyons, and around the turns and rapids of western, swift rivers. I took one species, ours, into the habitats of others. And everywhere I have gone, every river I have paddled, ever mountain I have summited, the park rangers, the wildlife biologists, ornithologists, entomologists, and the long-term locals have all had the same message about the ecosystems in which we traveled and hopefully treaded lightly: things here are changing.

Much has been written about climate change, and so my quest here is not to "prove," or argue what has been done but rather to think about one thing - the effects on the more-than-human world and what some people are doing about it. Assisted migration isn't the best, the first or the only solution to the species extinction problem in the face of global warming. For many scientists it’s not any kind of solution at all; it only creates confusion and worsens an already fragile public understanding of biodiversity. Not to mention, assisted migration could really mess things up ecologically.

But for someone steeped in biology archives, dire news report after dire news report and the bleak but oh, so necessary writing of global warming guru Bill McKibben and others like him, the people who are performing assisted migration have been a necessary breather in an otherwise stale atmosphere of hopelessness for the other living members of our world. Assisted migration to me, for all its ills, is about getting up and doing something, about taking a spade in hand, digging up a tree, or an entire ecosystem in the case of Iowan prairie, and moving it. Taking it out of harm’s way. Saving it from the fire of the world's temperature cranked on high.

We are nature. We are the descendants of tree-hugging primates. And nowhere does the Linnaean model suggest that we have lost our animal status. Much of our culture of food, sex, support, shelter, tool-making and entertainment would suggest otherwise. We watch scary movies, for instance, notes the writer Diane Ackerman, because we are genetically hardwired to have something scary lurking about waiting to eat us. We modify our environments to suit our fearfully evolved instincts. Millions of years of genetics is, after all, hard to fight. We move things the way we do, I think, in part because we were made to.

Other species move things too. That's what fruit is for - to be digested and then defecated in a better home with a blanket of nutrition around it. It's also why those annoying finger-pricking stickers and Velcro-like cleavers cling to our pants legs, because large mammals have assisted migrations for millions of years on their coats of hair.

Humans are also not the only thing that causes extinctions. Three million years ago, at the peak of what's known as the Great American Interchange, the North and South American continents linked after eons of drifting apart on a prehistoric sea. When the isthmus of Panama sealed, the better-equipped placental-birthing mammals on the North Continent, like bears, llamas and deer, invaded and soon outbred and outnumbered the native South American marsupials. These pouch-rearing mammals of South America better resembled the modern-day stock of Australia, and most of these marsupials from South America went extinct when they couldn't compete. Placentals, it turns out, are genetically better able to win the Darwin game.

The same has been eloquently said about *homo sapiens-sapiens* by Jared Diamond in *Guns, Germs and Steel*. Europeans were no more noble, nor smart, nor conniving, likely, than any other people. However they were environmentally lucky - their cultures interacted with others to spread technology faster and they had the support of large beasts and the nutrient-rich agro-friendly Fertile Crescent. And of course they had their armories of devastating microbes.

Much has been written about global warming that not only proves but dwells on the unpardonable human effects such as, to name a very few, the eventual sea flooding of a third of Bangladesh, the melting of the Rocky Mountain snow pack and the migration of dengue-carrying mosquitoes to the shores of Florida.

Next to these health and vast environmental consequences, moving species may seem

like small potatoes. But when I first learned of assisted migration I felt myself drawn to the idea of a group of people taking up arms (shovels) for this cause. I couldn't put that image down, and I still haven't years later. Of all the responses to global warming - despair, denial, apathy - activism has been my favorite, but to me, none has seemed as controversial (or while being controversial not completely ridiculous as say carpeting the atmosphere with sulfur dioxide, or sending a giant aluminum shield into space to block solar rays) as this - people moving species that are going extinct into places where they have never been, thus disrupting, forever the local web of biodiversity and ecological independence. What's more is they've done it, and the debate is no longer academic. The Torreya Guardians, for one, continue to move Florida's stinking cedars north not under the auspices of the government or a coordinated effort by a renowned conservation group such as the Nature Conservancy, but by their own sheer will.

The questions at the heart of this book here is how can we tweak what we barely understand (ecosystems and nature) but then how can we not given the calamities that we face? And, perhaps more philosophically, what does it mean to be a human, a member of the living, in the age of human-induced climate change?

These are two paradoxes that I hope to spend around 60,000 words sorting out.

My view of this book is as a zoo (or wandering ark) with one very large cage for the stinking cedar and a relatively large one for the Iowa prairie and four other cages each for the kudzu vine, the Florida panther, rabbits and the Texas Snow Monkeys. Each cage encapsulates its own idea that is in communication with the others. The Chicago Shipping Canal and dam have been the entrance; the final section, "Going on a Burn," is the exit.

CHAPTER 2

THE STINKING CEDAR

The Great Story

The stinking cedar is a short-needled conifer that is 165 million years old. It is older than Tyrannosaurus Rex. It is older than mammoths, orangutans, tree sloths, alligators and birds. Older than half of the geologic surface of Australia, the Rocky Mountains, Himalayas, the dwarf planet Pluto, the Bering Sea, Hawaii, Cuba, the current position of the San Andreas fault line and most oil reserves. I don't mean to suggest that a single tree is that old. But the existence of stinking cedar predates most of what we think of as ancient.

The stinking cedar is called so for the sharp musk of celery and tomato that waffles to your nose when you crunch up a needle. The remind me of having a Bloody Mary in a bar with lots of palm leaves around. The stinking cedar's ripe seeds are also aromatic. Like the living fossil gingko tree's, torreya's seeds, when rotting in large numbers, give off a putrefying smell that mimics human sewage. The evolutionary advantage of this, in theory, is that several species of carnivores and omnivores will consume the seeds mistaking them for rotting meat, spreading

seeds upon digestion.

The stinking cedar is also called the torreya for taxonomic purposes (scientifically, *torreya taxifolia)*. Colloquially it is the “toe-ray-yah,” the “toe-ree-ya,” and the “tor-ya,” It is also called gopher wood.

The stinking cedar survived the dinosaur-killing meteor 65 million years ago, which broiled the planet’s surface, triggered earthquakes, volcanoes, wild fires and some of the largest megatsunamis in earth’s history and killed two-thirds of all life. Since then the cedar has weathered the Quaternary ice age, glaciers covering and retreating across North America, and, so far, humanity, whose age sees the extinction of up to 140,000 species per year.

One ecologist estimated that there were as many as 600,000 stinking cedars in Florida. By 1950 most of the largest stinking cedars had either died or been harvested for fence posts as well as roofing shingles and wood chips. The torreya was favored because it does not rot in humidity. It was considered hardy and a good house tree, easily watered and cared for. A standard Christmas tree in Florida, the stinking cedar perfumed the houses with its decidedly un-Noel aroma. Torreya shingles kept the home warm; torreya chips powered the boats that brought the toys. Children would put the presents under torreya needles. When New Year's Day came the trees were in good shape as they were chucked in back yards, alleys, on woodpiles next to the fences made from torreyas.

But the stinking cedar is going extinct. It is now restricted to a small Florida state park, and a few nurseries and backyards. A pathogen, previously unknown to science, has infected seventy percent of the remaining trees. Warming temperatures perhaps are also lapping at its

branches, causing them to droop, their vibrant green needles to turn to the color of rust. The tree, along with many other species, is burning up. There are now as few as 500 stinking cedars left in the world.

It is one of the rarest as it is one of the oldest living organisms.

What's worse is that the stinking cedars still growing in Florida are not whole trees that came from seeds. Trees that died before left behind their roots with enough left inside to germinate trunks and grow needles. Imagine if instead of being born you sprung from your father's and grandfather's casket, tiny but withered, young but frail with a shortened biological clock to make a go in a world where seventy percent of your kin were eaten by something unknown and unseen and all of them are sweltering in the earth's warming.

Though as much as 52% of the life on this planet is going extinct by the end of this century because of climate change, we haven't even begun to describe let alone *understand* an estimated half of the life on the planet. Last year the USDA, after a decade data-gathering, announced that almost the entire continental United States had shifted climate zones. Over 1,200 species have been documented shifting their habitats in the last thirty years. Some migratory birds have ceased migrating at all. And for many species trying to escape the heat, the common routes north or uphill are blocked by cities, towns, gridlock patterns of America's super highways, irrigation canals and tailing ponds, power lines, fences and the great ecological deserts that are monoculture plantations. Species find themselves in a bind that without us otherwise wouldn't exist and in a climate that's broiling.

Since humans are the barriers and since we're raising the thermostat, it seems logical to

consider that we should become the corralled species' corridors.

That is what a group of citizen activists decided. A kind of conservationist Occupy, who "take action only as a group" and have "no bylines or governing rules," the Torreya Guardians have taken samplings and seeds of Torreya, shipped them to over thirty locations around the world. They've also planted forty saplings in the woods around Asheville, North Carolina, where the Guardians say is the cedars' "ancestral home."

Their leader is Connie Barlow, a self-proclaimed "evolutionary evangelist," who travels on the road with her husband across the North American continent. They do not own a home. They live in a van, in which they have home-schooled their daughter. They have visited more than 500 religious establishments including Catholic (conservative and liberal), Protestant, Unitarian Universal, Evangelical, Unity, Quaker and Mennonite churches, Buddhist centers, Religious Science schools and convents, hundreds of grade schools, colleges, nature centers, prisons and public libraries.

Barlow's husband is the Reverend Michael Dowd, and together they preach the Great Cosmic Story of deep time swirling in the stars and the tide pools and condensing into the first human form. They call this the Great Story. Its telling, they feel, is a fundamental way to get back to our animal selves.

"Tell me a creation story," Connie Barlow says to me, "more wondrous than that of a living cell forged from the residue of exploding stars, or a transformation more magical than a fish falling out onto land and becoming an amphibian or that of a reptile taking to the air and becoming a bird or that of a mammal slipping back into the sea and becoming a whale. Surely

this science based culture of all cultures can find meaning and inspiration in its own cosmic creation story."

Connie has steely eyes and the concerned face and soft voice of a librarian. She has glasses, short grey hair and wears a pastel, ankle-length skirt.

When on the road, the couple lives most of their life out of people's homes. Friends, newly met audience members, friends of friends, who welcome and feed them.

The first time I talk with Connie, she is packing up in California for a drive to a cabin in the Colorado Rockies, with half-a-dozen stops on the way.

"It's a bizarre lifestyle," Connie, 65, says. "Remember, you can never accumulate stuff. Not too many books, not too many cloths, no crockery or art. You have to really simplify. For instance, I now buy all my books on a Kindle. I guess it's not as nice, but at least I save a lot of trees that way. You know I like saving trees."

The Reverend Dowd comes into the room and gets an apple out of the refrigerator. He has a chiseled face and youthful handsomeness. He is a Christian. Connie tells me she is an atheist, but what the couple agrees on is that religion and evolution don't have to be at war. As a teenager, Dowd was a born-again fundamentalist and a firm creationist, but he came across evolution classes in college and took a course so he could argue with the professors. But he sat and listened, and being unable to contradict the globally overwhelming evidence, he converted. Or rather, not able to reject Darwin and not wanting to give up the Bible, concluded that Christ need not be at odds with something with so much capacity for metaphor and wonder.

What if religion came together with evolution? Connie was a scientist and atheist, but didn't see spirituality at odds with experimental data and peer review. She is a science writer, and

when the two met at an evolution conference, sparks flew like big bang particles, and soon they had bought a van and were traveling the continent. On the back of their van is a Jesus Fish kissing a Darwin Amphibian.

The pair do not enter "time-wasting" evolution debates. But Connie, however, will debate the moving of *torreya taxifolia*.

"I participated in a conference last year for the management of torreya, and when the scientists were going around asking whether we should use assisted migration with the stinking cedar, and every single one of them said, 'no,' 'no,' 'no.' And when it came to me I was so pissed off, I just said 'Where the hell do you think torreya was when Florida was under water?'"

In 2003, during a break from her evangelical wandering, Connie Barlow was walking around Torreya State Park in Northern Florida, where the last stinking cedars are. Connie looked around for the park's namesake, and bridled with fear and panic as she saw dead and wilting branches, peeling bark, charcoaled bodies, needles fallen around the ground and encircling the fragile trees like shadows. One after another. What alarmed her the most was how the decay of the trees matched the predictions by the book *Forests in Peril* by Hazel Delcourt. Following the book's warning, the stinking cedar wasn't keeping up with global warming. The cedars were drowning in heat.

"I couldn't just sit around and not do something," Barlow says. "Not when I saw what was happening to these trees and that nobody was doing anything to help them."

Like most things, trees suffer in a drought. But trees do not *die* of thirst. They are water-hoarders. Trees will refuse to open pores called stomas to let in CO2, their food, because stomas release water vapor. The trees sense when it's hot and so keep their stomas shut, refusing CO2

and so starve to death. Trees can survive high temperatures as long as they have water, which is why the tropics are such a cornucopia of carbon while deserts are moonscapes.

But in any torn landscape, there are carpet baggers. Similarly the stinking cedar is assaulted be a never-before-seen fungal blight that scours the trunks of seventy percent of the remaining torreyas. Where this fungus came from is unknown, but one theory is that it's moved north with global warming, along with many other creatures benefiting newly opened habitat.

But that so far is conjecture, as is the fact that the stinking cedar is being killed by global warming. Some scientists feel that it's too early to tell what is the ultimate cause of the torreyas' decline.

"People lack the understanding," Connie Barlow says, "that torreya has been around since the dinosaurs. I mean, this is old. People have to consider where was this plant was during the glaciers, and where it was when we had alligators up near the Arctic Circle."

"So you think the torreya is a relic?"

She shrugs. "What other explanation is there? Why is it that the stinking cedar's cousins, the other species of torreya in California and China, are all mountain species?"

Imagine during the last interglacial the ice pushing down from the north, plowing the land and everything in its path, including *torreya taxifolia.* Anything that survived would have to go south. What if when the glaciers retreated the stinking cedar wasn't able to go with it? What if stinking cedar was marooned in the swamp?

And what if the critters that were once eating torreya's larger-than-average seeds and carrying them weren't around anymore?

Paul S. Martin, a geoscientist at the University of Arizona put this theory forward, how many of the early megafauna like mammoths and giant sloths that roamed North America were hunted to extinction by early Americans. The theory is controversial (not the least for the irony of a white person accusing Native Americans of extirpating), but the reason for its increasing acceptance is the overwhelming fossil data: wherever humans first went in North America, you see disappearing titans.

Connie Barlow, President of the Torreya Guardians, presents this idea of species losing their transportation partners in her own book *The Ghosts of Evolution*. Wherever went the mastodons and their enormous pallets, so went the reason that the Osage orange tree (with its softball sized fruit) spread so far, and so went the torreya's chances of making it back north.

If you image a seed the size of an egg, like the stinking cedar's, it isn't going to hitchhike. Trees dispersed by wind and birds and can even become invasive for this reason of too easy fluidity. But torreya seeds land with a plop and some roll downhill. But that's about it. You can't roll *up* the Appalachians. Squirrels eat the seeds, but squirrel populations rarely travel very far, not like warm-blooded earth-movers.

So then, according to Barlow's theory, we're doubly responsible for stinking cedar's dire straits by global warming and carrier assassination.

"It's a fanciful story," Jason McLachlan says, a paleoecologist at the University of Notre Dame. "Their logic is pure bull shit and the Torreya Guardians are really just lame." We sit in his office in Southbend during a Fighting Irish football weekend. McLachlan wears green and

corduroys. Outside his window men in navy blue suits and green slacks shuttle the elderly and important on golf carts, constantly crisscrossing campus. McLachlan sits behind his desk and eats a turkey sandwich. He has pronounced forehead, with boyish good looks, blue eyes, baritone voice, linebacker shoulders and soft-looking hands.

McLachlan tells me that climate change is forcing a shift on how we look at life. The slow-moving USDA, for instance, finally upgraded in late 2011 the temperature gradients for the country. But for conservation purposes, McLachlan thinks all this new information is distracting. He puts his sandwich down and goes to the white board hanging on a wall in his office. He draws a graph in red with a squiggle line running horizontally like a mountain chain in the middle of a square.

"Okay, look," he says, "There's a lot of places you and I could go, swamps of Mississippi, front range of Colorado, the deserts of West Texas - we'd know what animals and plants would be there. Even though humans' impact everywhere is huge, ecosystems are still relatively stationary."

The mountains of Colorado, in other words are the mountains of Colorado because of what species live there. Same for the Florida Everglades. Same for the Sonoran Desert. Species make up what a place is.

Sure, I go along with the squiggle.

The line, according to McLachlan, represents what we expect. Yes, species populations rise and fall, they migrate back and forth, evolve, scatter, contrast, die; there's inevitably lots of variance. Imagine a house. People go in and out, buy new stuff, redo their kitchens, clog up their plumbing, but still behind it is a stable, somewhat predictable frame.

"But we're undoing that," Jason says. "We're derailing into a terrain we don't know. "He inclines his squiggle line. The Alps become inverted, chaotic. The line rises out of the waves and crests and shoots up like a leering cliff, hovering over the graph.

"That's our future. Chaos" he says, and caps the marker. "So when we go to the Everglades or Texas or the Gulf, we won't know what's supposed to be there anymore."

Assisted Migration, he thinks, "is going to be a disaster because it's telling us to expect that chaos."

Connie laughs again when I ask her about the criticism she's received.

Just last year an NPR reporter twisted her words to seem like from some bong water-fazzeled hippie rather than a science writer with four books. Ecologists in peer-reviewed journals, often annoyingly diplomatic, have accused her of "rash action," playing "ecological roulette" and crippling "efforts to preserve habitat and, ultimately, create more conservation problems than [they] solve."

"We are not a bunch of people who don't know anything," Connie reassures. "We have PhD botanists, scientists, very adept horticulturalists, lawyers and land managers that are all part of Torreya Guardians. People that have worked for the government, people that still work for the government, professors, writers and people who have been environmental activists for decades. We're just not bound by the scriptures of big professional government and academics. The academics are so wound up in whether this should happen that while it's *already happening*, they are giving absolutely zero guidance."

Connie gets up to wash her dishes. Light cascades in from the beach-front windows and the surf and bounces off her plate.

"I understand people's worries, of course. But you have to also think about horticulturists and gardeners and nurseries and tree farmers and ordinary farmers. Across the United States, they're interested in lots of things. They have Asian species, hybrid species, European species, Polynesia species, species from every corner of the North American continent. People plant them in their gardens. Some arboretums put them in their greenhouses; other people sell them legally or illegally on the internet. People are shipping plants and animals overseas all the time. Go look at somebody's ornamental garden anywhere in the United States and you'll find exotics aplenty."

She laughs a restrained librarian's chuckle. "And the idea that little torreya can have any kind of danger while gardeners keep buying all these things that really can cause problems is, I think, a little ridiculous."

Connie shakes her head. "There's a lot that can be understood by watching us Guardians. At some point academics have to see that there's not endless time and there's not endless money and that in the main, they're never going to get anything done. It's just going to be citizens like me, who decide to act because we can, because we care. And we're going to leave the academics in the dust."

Recently, Connie Barlow tells me, a Torreya Guardian in Ohio asked about planting the Chinese species of torreya along with the stinking cedar, a situation bound to cause hybridity, the results of which are like any pairing of adults - a child that is both alike and unlike either parent, similar yet unpredictable.

"Do you see," she asks me, "how important it is for professional ecologists to get off

their formal, excruciating debates and start developing simple policy or guidelines? If a private person on their own decides to help a species migrate there are some things you need to do."

"Wait," she says, and she pulls up an e-mail. She starts reading to me a self-made list, composed off the top of her head yesterday when she wrote an e-mail to a scientist.

"So here are things you should do when assisting migrations," she says. "First, educate yourself on elevation, slope, and microhabitat. Follow the suggested best practices for seed germination, out-planting, and maintenance for that species. Keep track in paper and digital of everything you do, including genetic provenance of the seeds and seedlings if that can be known. Keep a map of where you planted each tree. Create a seasonal and annual photolouge of close-ups of each tree and also include wider shots that show the context."

She takes a breath.

"Make sure you keep a log of any interventions, like fertilizing, liming, watering during a drought. Keep track of the harshest weather your plants endure. For example our Cleveland torreya grower reported his specimens did fine outdoors at minus thirteen degrees Fahrenheit. Mark that, that's important information. Never plant on public lands. If your property is not protected by a conservation easement, clearly mark where your specimens are and attach a paper onto your property deed of ownership that alerts future landowners to their existence and whom to contact for advice in management."

"Anything else?" I ask.

"Oh yeah, Attach a copy of the above notice onto your will."

I rub my temple and ask Connie what she means by the "Cleveland grower."

"Oh, we have a torreya in Ohio!" she says. The most recent success of the Torreya

Guardians - the planting of a single torreya 1000 miles north of their Florida range.

"We tried sending a seed to North Dakota, but that didn't work. It grew, but the winter killed it off." She shrugs.

Confused, I ask her if she thinks the tree belongs in the Appalachians why are the Guardians are sending seeds to Ohio and the far North.

"Oh, well, it's good to know our limits. Who knows, maybe in a few years, the torreya will belong in North Dakota too."

Jason McLachlan swivels in his chair. "I've done this kind of work myself right? Usually when you're putting together a paleoecology study you only have data from a couple of sites, and the data are pretty thin. So, you're basically putting together your best guess. And if you think about the statistical evidence for something complicated like where a species was 10,000 years ago, given everything that's happened since then, a lot of the science ends up being just telling a good story. And not only is the story a guess, really, but you have an even worse idea of where the story's going."

"But the really big deal," he says, "is that people can really have a good gut sense of the place. And that both underlies our current sense of ethics and our legal system. With that you can make laws, you can draw lines and keep out bulldozers and condos, you can prevent clear-cutting and slash-and-burn, you can have rules about exotic species, and trapping and shooting local animals. You can tell people not to do things.

"But that all goes out the window when you begin to say that it's okay to move things. Because what you're saying is that 'it's okay to destabilize our natural systems.' And we're not

ready for that. Some bullshit idea like assisted migration is just like ‘oh, we’ll just fix the system by moving things to where they’re supposed to be.’ It seems like a quick fix with potential terrible, more than terrible consequences.”

He leans back in his chair, runs his hands through his hair.

“Think about ecosystems goods and services. I was interviewed by the *Boston Globe* one time and the reporter there made a very good point, when you think of ecosystem services you think fresh water and stuff like that, but one of the biggest services that nature provides is that it takes care of itself. You don’t have to go out to a wetland or a desert and make sure everybody’s getting along. They take care of themselves. If you’re in charge of that, if you start moving stuff, not only does that add a lot of time, a huge cost (and we’re not in the mood to be absorbing new giant costs) as soon as it fails, which it’s inevitably going to do, you get blamed for it because you’ve moved it.

“And if you think about it, it’s really selfish, because once you’ve moved it, you’ve moved it for everybody. The Torreya Guardians are moving stuff for you, me, the entire planet.”

The City of People and Trees

Driving into Asheville, North Carolina, where the Torreya Guardians are moving the stinking cedar, I reminded myself that I was entering the birthplace of where America thought it could handle managing species.

In the 1890s, George Washington Vanderbilt, the youngest son of the son of the world's wealthiest Industrialist, traveled with his mother to Asheville on holidays. The mountain town's attraction lay in its elevation, two thousand feet above the Atlantic. It was an early American health resort, altitude seen as an escape from tuberculosis and other respiratory as well as imagined ailments. "A Million Invalids Couldn't Strain this Climate," went one travel brochure in 1898.

Outside the health spas, there was little in the way of Asheville business. Agriculture was hard as it always has been. Timber was primitive, the place yet too remote. Little wonder when young Vanderbilt hit upon the site for his gigantic mansion that an Asheville reporter wrote "There burst upon us a scene of life and activity which was perfectly marvelous in this seemingly barren and deserted wilderness."

Vanderbilt's home would become the largest house in North America. At 178,926 square feet and 374-feet long with a billiard room and breakfast room, an interior garden, a large library, a swimming pool in the basement, a cathedral-like dining room, 43 bathrooms and 65 fireplaces, Biltmore had begun modestly. Vanderbilt, as the youngest son, was the least rich, but wanted to

mimic the mansions his older brothers had built for themselves in New York and New England. He hired one of the most famous landscape architects in America, Frederick Law Olmstead, designer of New York's Central Park. He also hired Gifford Pinchot, the father of American Forestry.

The construction sapped Vanderbilt of his inheritance and so he was forced to make the 125,000 acre grounds (an area larger than 17 countries) economically sustainable.Vanderbilt knew enough about business that he decided outright clear-cutting was not sound. This was a modernist theory. In the 1800s, vast timber depletions in large parts of the United States was the norm, especially in the Appalachians and the West. Entire mountainsides and almost entire states in the case of Wisconsin and Illinois were reduced to tree stumps. Biltmore's forester, Gifford Pinchot, encouraged the harvesting and subsequent planting of trees on the Biltmore, an experiment he'd been deliberating but hadn't yet executed. With his select cuttings, Pinchot made Biltmore's lavishes profitable.

Pinchot left Vanderbilt's charge and became the first chief of the United States Forestry Service under Teddy Roosevelt. He was a controversial middle-man. Pinchot fought congressman on the one-hand who wanted to ax forests immediately for short-term economic gain, while he debated publicly with strict preservationists and wilderness enthusiasts like John Muir, the creator of the Sierra Club and "Father of National Parks" like Yosemite. Controversially, Pinchot supported the damming of the Hetch Hetchy Valley, the dam that legend has it, ending up killing the frosty Muir.

Pinchot, saw clear-cutting as deplorable, almost amoral, but he didn't see forestry for preservation's sake as important, rather forestry was "the art of handling a forest so that it will

render whatever is required of it… the art of producing from the forest whatever it can yield for the service of man." But he understood fundamentally, and here's where he differed from those ax-wielders that came before him. That "the members of the forest live in an exact and intricate system of competition and mutual assistance, of help or harm, which extends to all inhabitants of this complicated city of trees."

Unlike Muir, Pinchot felt comfortable managing that city.

"The Cradle of American Forestry," is now a national historic site that was once Vanderbilt's property to the South of his house. It started in old abandoned farm buildings where Vanderbilt's second forester, the German Carl Schneck, taught local North Carolinian's the science of sustainable planting that Pinchot had pioneered. He also lectured on the ills of over-harvesting and clear-cutting. Eventually the abandoned shacks were refurbished and came to be called the Biltmore School of Forestry and offered a one-year curriculum with hands on training and classroom theory. It was the first ever forestry school in America.

Why I'm visiting is that in the collection of early Biltmore correspondence dating from 1896-7 when Schneck was running Biltmore's forests, an estate employee notes in a letter that the Biltmore had received "a few plants each of *Torreya Taxifolia*." Stinking cedars were early residents of Pinchot's utopic metropolis.

Bearded Bill Alexander is the forest historian of Biltmore. He has written two books about the place and knows more about the trees here than anybody else. He is something of a phantom/mythic/Cambellian hero figure around the estate. Even the acne-scarred twenty-

something at the ticket booth at the entrance knows him, and the kid's eyes bulge as I say I have an appointment to meet with him. After driving ten miles up the snaky drive way to the house (the estate still sits on an impressive 8,800 acres and includes a separate hotel and a winery), I talk with two women at the counter of the gift shop who speak very warmly of Alexander and seem perfectly jealous that Alexander had agreed to meet with *me* rather than spend an hour walking around with, say, them.

Alexander is humble, laid-back but formal, sporadically stern and dire. He is dressed in a long coat and scarf and wears a felt, fedora-like cap and spectacles. He is short and a bit like Sigmund Freud if he were a backpacker and with the voice of Martin Sheen playing General Lee in the film *Gettysburg*. He is also a Torreya Guardian. Alexander gives me a lumberjack handshake.

We take a look around the gift shop of flowers, nature CDs and, of course, Alexander's books, along with the hordes of tourists who come on walk around the un-lived-in house. Then we walk out into the cold gardens, Alexander coughing.

“A lot of these guys you'll see are missing their tops," Bill Alexander tells me, as we step off a road and into the tended forest.

"That's from the blizzard of March 93, which started off as a hurricane, but by the time it hit us, was a hurricane of snow. We had sustained wind speeds in the 70s, low 80s and here at Biltmore about two or three feet of snow. These trees took a huge hit."

Alexander looks up with a mischievous grin.

"But our lowest recorded temperature was in 1985," he continues.

We walk on, Bill with his hands held behind his back as tells me how the night of January

20th, morning of the 21st came after an exceptional mild fall and early winter, one that kept the grounds keepers in windbreakers instead of overcoats.

The cold bomb came as a shock. Temperatures plummeted from a whirlwind of snow and ice and minus twenty degree air that weathermen called the "Alberta clipper" pouring over the Appalachians and North Carolina, breaking all records. The freeze annihilated entire orange groves down in Florida, killing both young and mature trees, costing the citrus industry 840 million dollars. Alexander was working in the Biltmore conservatory, an indoor/outdoor enclosure of tropical and rare plants, trying to wrap them with towels to keep them warm, starting fires by their trunks. With so much on their hands he left the cedars and other evergreen conifers outside to their own devices, and while he fretted over the palms, he could hear the pines and cedars popping and cracking. A few of the trunks split in half, just exploded with sounds like rifle fire.

He stops me as we walk and takes a breath.

"I say that because in some people's eyes this, the stinking cedar is a southern species. It does live in Florida, yet it has survived everything that winter has thrown at it since I've been here. The reason for that is, as many of us believe, it was pushed south in the last ice age period by the glacier. But they belong up here."

They've also weathered, over the last two years, a double cycle of droughts and freeze and are at the worst Alexander has ever seen. The trees have survived a dozen droughts, storms, hurricanes of snow and exploding neighbors for eighty years.

We make our way downhill on a bowl. I see my first torreya tree, standing behind a much larger Douglas fir. There are two of them, each about 15-feet tall, full-bodied, voluptuous.

The conifers grow there like aquamarine stands of cool flame. They remind me of that color in the night sky, the band of turquoise that bends over the horizon, between the fiery orange orb and the dawning black of deep space.

Alexander continues talking about winters, about snow breaks and scales for comparing winters with those of other places. For instance, did you know that in 93 the hurricane blizzard that the torreyas lived through was an equivalent in the Arctic latitudes to a polar blast? Bearded seals would have shivered.

And of course no winter is alike, they're as differentiable as people, as trees - the sloshing wet winters, the dry, knuckle-cracking ones. The forest-fire ripe winters, where everything is cold but dry and snow doesn't fall. The torreyas have survived it all.

And they're making seeds. About 300 on a good year. Why this is important is that none of the stinking cedars left in Florida are making seeds, and Alexander has donated these spiky, golf ball offspring to the Torreya Guardians.

Alexander moves off; he tells me his time is short and apologizes. He's already taught a grade school class today - given the kids a tour, and has to go to a heart-doctor's appointment - impending doom of the electric nerve kind that perhaps a pacemaker and medicine can fix.

"That's life," he says and shrugs.

"Now these are dioecious trees. You know that term, dioecious?"

"No, I don't."

"That's important to know. You may want to write that down."

I do.

"It's like D, I, O, C, I, O, U, S, or something like that," he says. "I think I left out a letter.

But opposed to monoecious, which are self-fruitful and have male and female flowers on the same tree and don't require another tree - these stinking cedars require separate male and female trees. The torreyas here, if you'll notice are always planted together, one male and one female and they seed each other. Some years theres's good seeds, sometimes there's none at all. Squirrels tend to get the seeds before we do. Sometimes we've even dug up seedlings where squirrels have buried them and they've popped up. And there may be some up there across the road or beyond that have popped up where the squirrels have planted them."

I glance over his shoulder to the fence and the narrow road, where stand pines and dark forest.

"What are all these seedlings around us?"

"Those are China fir. But here's one! "He bends over, kneels, fingers the needles of the foot-high plant, peers over his glasses. I'm silent for half a minute.

"No, that's a fir," he says finally, then "Wait, maybe it is stinking cedar." He twists his head, blinks twice.

"No, fir." He grunts and stands up. "That's the trouble with having so many trees around you. They all look green. But I don't doubt that there's new torreyas around."

We walk. "Do you know the story of these, the dawn redwood?" he says as we stomp on a patch of burnt-sienna needles, crunchy like Astroturf, the soil sinking spongely beneath our feet. Alexander looks up and I do too. The dawn redwood towers over us, a hundred feet in the air, branches bare, jagged, white and thin, a giant bone with red wings.

"Is it dawn because of the color?" I guess.

"No it's from the idea that it's from the dawn of time. Scientists thought the trees extinct,

only available in the fossil record. Old, old trees. Then sometime in the early 1940s a botanist in China found a grove of them and then there were a couple of expeditions back and forth and he brought seeds and seedlings back with him and distributed a lot of them to botanical gardens in America in Europe."

A hundred million years ago there were a dozen more sequoia species that covered North American, Europe, Asia and even parts of Australia. Now there are three - giant sequoias and Coastal, drive-through-able, Redwoods in California and Dawn redwoods (*metasequoia glyptostroboides*). Sequoias used to grew up to ten degrees south of the North Pole but the two million year old ice age nearly wiped them out - reducing dawn redwoods to sparse, overlooked patches in China.

Alexander stops as his habit to emphasize a point, and smiles. "So this is a case of something that was not just endangered, but actually thought extinct and then got moved around the world and is thriving."

“It strikes my fancy,” I say, “that we've moved something since the dawn of time.”

Alexander laughs. “Well we’ve moved all kinds of things; that’s just who we are. You know that. You know about starlings right? How some guy wanted all the animals and birds he read about in Shakespeare in the United States and so moved them to Central Park New York and now there’s millions of them across the country?

Alexander laughs again. “We’ve also moved sparrows, dandelions and house cats. Wild boar. All these species has become the fabric of our nation. It’s what’s made America for good or ill.”

“Is that how you see the world, as one large managed forest?” I ask.

Bill stops. “I don’t like to see it that way. Me, I love wild places. I actually live on a cabin on Biltmore. Now, I won’t tell you where, but I do, and I like to keep it a secret, because to me that is the best part of the job, to wake up to 8,000 acres of forest and hear the bird song around you. I love hiking off trail, just going in the mountains. I’m a real traditional woodsman, and I love wild things. But having said that, it’s unavoidable that like the Biltmore Estate, we’ve altered every facet of environment of this world. It just kills me, but it’s true. We just have to live in that world and make sure enough of it stays together well enough that it still feels wild for many others, for many other generations who otherwise won’t get a chance to experience wildness.”

I ask Bill how he got started with the Torreya Guardians.

"For years we were the only known seed-source, and even before the Torreya Guardians got established I'd thought that the torreya had a bad rap for people thinking it was a southern species and was naturally going extinct. Obviously something had to be done. The torreya got pushed south and it would migrate north much easier if it had seeds that could carry in the wind or be eaten by birds. But it has that oblong fruit and when it hits the ground it just stays there and that's about it. There's no rivers running north. Nothing or no one was helping them. And then it got warmer and warmer and warmer. We’ve had seeds for a long time and are happy to send them in the right direction.”

Alexander and I come to a clearing where stand two thirty-foot shabby looking evergreens, their tops keeling over as if taking a bow.

"These, you see, are wilting."

The color is totally unique, and these cedars are shaped different from the last one, a

disturbing green, the color used on dumpsters, and it makes me think of molded vegetable mash at the bottom of a refrigerator, their needles whitened at the tips as if aged.

The next two stinking cedars are just down the trail. They stand over the dirt track, so close their branches entwine like arms of embracing lovers so I can't tell which twig belongs to which. The color seems brighter.

"These are our largest," Bill says. "And considering their top third was lost in a blizzard, it was once considerably even taller and fuller."

I take Bill's picture by the side of the trees. He appears coy and somewhat beggarly next to the old trunks, a little like detectives from old movies, gum shoes that solve a case by putting the pieces together.

Walking back, I ask Bill in general what he thinks about assisted migration.

"We have to be cautious," he says. "If I were moving stuff around like they were in the beginning of the century, we'd be in bad shape. But we've learned! We've learned so much in the last hundred years. We've learned it's just not okay to move anything around."

He sniffs, wipes his nose with his handkerchief. "Autumn olive was pushed and distributed for many years by state departments and conservation agencies as free erosion control. One plant will grow twenty feet high and twenty feet wide and has an extensive root system that nothing can grow under. If you turned your back on a pasture it would totally take over. In the case of torreya though, I just don't see a problem. We have 5,000 acres here and we're blessed," he stops and laughs, "with any number of kinds of exotics like oriental bittersweet and autumn olive. But I just don't see torreya as invasive. I've work here 33 years, and these trees have been here for over a hundred years. Their seed is the size of an egg and only spread now by

squirrels and a few people like me. It's a slow moving, ancient conifer that's diseased."

He sniffs. "If stinking cedars were going to take over the world, they would have done so by now."

Last summer of the 300 seeds Alexander harvested 100 of them went to Zev Freedman. Zev is a serious, rake-thin, bearded, bass-voiced Torreya Guardian from the Pacific Northwest who sits across from me at a vegan diner where I have mistakenly ordered a bison burger.

Zev eyes me suspiciously.

"You really gonna eat that?" he asks.

Well, yeah.

"You know it's meat don't you?"

"This is vegan bison," I say, hoping he likes my humor.

Zev's stares past me a look like he's just noticed his ulcer.

Zev tells me his parents met at a power plant in Washington State. They were sitting down outside the fence, protesting nuclear power. They went to jail together on what became their first date.

"Yeah, they're kinda hippies," he says. "And a learned a lot from them, but I guess what brought me into, I guess what you'd call environmentalism is that I," he coughs and furtively looks around, "had some *unique* experiences out in the wilderness with some friends, and I just came back from that pretty committed to the cause."

Zev goes on, "I came back and saw all the destruction in front of me, and I really just

couldn't help but be committed to undoing that."

Freedman is wearing overalls and is covered in dirt. He is exhausted and tired. Zev has been working all morning as a gardener in the permaculture landscaping business that he co-owns with a partner.

Permaculture is the idea of growing plants that can both feed us, in perpetuity, and interact mutually with the surrounding biology. The term was coined by two Australians, David Holmgren and Bill Mollison to denote permanent agriculture mixed with human culture, a commingling of two forces. In other words, farms or backyards that look more like tiered rain forests that splayed out, oceanic monocultures. No pesticides, no herbicides (little weeding actually, in theory), just sustainable harvesting and replanting, a tapestry of species in a strong affiliation, coordinated biologically. Fruit trees, for instance, can provide shade and habitat, while nitrogen fixing legumes like peas and soy beans can seed the soil with nutrients for the trees' roots. Other plants like comfrey can pull up calcium and magnesium from the bottoms of soil with their deep roots. Tree leaves, when they fall, become warm beds of nutrition. Dead trees can grow mushrooms and be used as mulch. Chickens set loose in this mix will eat the beetles that otherwise would kill the fruit trees.

Ideally the species in a permaculture model would be mutualistically benefiting, like citizens in a community - a baker earning money and providing loaves, a cabby getting his fares but soliciting transportation. Much like Gifford Pinchot's hundred-year-old idea about forestry. Humans living *in* nature, not apart as oglers nor bull dozer-happy pillagers. The unique, messy middle ground.

"I think the stinking cedar idea for permaculture is huge," Zev Freedman says.

He goes onto talk about how in much of the Eastern United States there is the eastern hemlock, a tall, flat-needled, long-living conifer that is called the redwood of the East. The hemlocks can grow up to 170 feet tall and six feet in diameter and live to be six hundred years old. The hemlocks grow from Georgia to Canada, and basically keeps the Appalachian forest together. The tree shades creeks which house fish and lots of insects, and if too much sun gets through the canopy, the light saturates the water with nitrates and kills everything. Not to mention without the hemlocks all the soil gets dumped in the water, which then goes straight to the Gulf of Mexico dead zone.

Freedman takes a spoonful of grits.

The problem is that the Eastern Hemlock is getting throttled, like so many trees (like the stinking cedar in Florida even), by an imported pest. The hemlock's curse is called the wooly adelgid, a sap-sucking insect that is profiting off global warming. Warmer nights and winters mean the adelgids can survive the harshest temperatures and continue their assault on trees for longer periods of time. All up and down the Great Smokies you can see dead and decaying hemlocks by the thousands. The bug has spread as far north as New England.

The stinking cedar could basically replace the hemlock, Zev thinks. North Carolinians need the tree bad, as much or more than the tree needs people, and his permaculture customers are already clamoring for it. They want Zev to plant torreya where their dead hemlocks are in Asheville to shade their streams, fill in the forest and keep fish from getting too much sun. But it takes stinking cedar seeds time to gestate, up to two years. So Zev has them in potted soil and waits. But in the meantime the other important function torreya trees might serve, he tells me, is that, maybe, people could eat them.

"Eat them?" I say. They're stinking after all.

"Well not *them* per se. Not the whole tree but the seeds. If you think about it, it's not any crazier than eating pine nuts or peanuts for that matter, or anything really that is plant-oriented, which is to say most food, unless you're a carnivore." He glares at me.

"The problem is it doesn't taste very good," he says.

"How so?"

"Well, don't tell Connie this, but of those 100 seeds I got to plant on my customers land who are all pissed off about the Hemlocks dying, I ate one. I roasted one, you know, like a peanut. And it cooked, but god, it was stringent. There's this coating, kind of like in a chestnut, that just falls apart and is impossible to separate from the nut. And it's narly, like licking a puddle of diesel fuel."

"That doesn't sound sustainable."

He frowns. "No, it's not, but there's maybe a way to work on it. Maybe in a blender the taste will come out."

"Stinking cedar smoothies," I say.

"Exactly, or like a paste. I'm seriously imagining a kind of stinking cedar butter you'd put on toast. I don't think it'd be that bad if you could get the narly out."

Back at the Biltmore, I retrace my steps to first one pair of torreyas than to another and then the last big pair. There are no seeds around, so I peel off a needle from one tree, the tallest, and chew it up - I suppose I don't think this is harmful. It even tastes like celery for a split

second until my sinuses fill with angry, acid pheromones and my mouth turns to cotton.

I wonder what if any toxins the feeble torreya might possess, a last defense against hunters. That thought puts me in mind of how "close to death" this tree really is, and what if anything that might mean. For individuals, it's easier to tell when we're close to our end, but for a species? Grated an individual species has an average "species span" of one million years. So, the stinking cedar has lived 165 times the average species.

But many trees like stinking cedar are long-lived. Coastal redwoods are at least a hundred million years old and gingkoes, the living fossil, are even older. Ferns are perhaps half a billion years old.

Perhaps the stinking cedar is at extinction's door, but another question is not just if it's going extinct, but should it be left to pass out of existence? It's a fundamental moral question brought about by the fact that humans, rather than circumstances beyond our control, can decide to answer.

Animal rights' activists are familiar with the trouble of drawing a fine line at morally considering other creatures. Some people think it's absurd to draw the line even at the smartest animals like dolphins and elephants. But a growing list of vegetarians and vegans and PETA volunteers disagree (and might picket your house). Animal rights activists Peter Singer and Tom Regan have argued for decades that animals must be considered morally considerable beings like any other people.

Kenneth Goodpastor, a philosopher, in his essay "On Being Morally Considerable," writes that, "Nothing short of the condition of *being alive* seems to me to be a plausible and nonarbitrary criterion...Biologically it appears that sentience is an adaptive characteristic of

living organisms that provides them with a better capacity to anticipate and so avoid, threats to life."

As a mere evolutionary mechanism, why does consciousness or suffering get the floor of moral consideration, why not the ability to self-propagate or photosynthesize, which is the core function of all life since every animal and human depends on plants' ability to absorb energy from the sun? For Goodpastor there is no good reason.

His thoughts are echoed in Christopher Stone's seminal legal argument "Should trees have standing? - Toward Legal Rights for Natural Objects," in which, quite seriously, Stone argues in favor of granting legal rights to trees, bio-systems such as "streams" and animals. Stone begins his essay with a quote from Darwin rhapsodizing on humans' sympathies becoming, over time, "more tender and widely diffused, extending to men of all races, to the imbecile, maimed, and other useless members of society, and finally to the lower animals." This is much along the same path of widening our sphere of consideration that writer and woodsman Aldo Leopold discussed in *A Sand County Almanac* where he implores people to "think like a mountain."

Knowing many people will think his legal wrangling for the rights of plants preposterous, Stone goes on to note that at one time it was widely thought unreasonable for a woman to have the right to practice law or even vote. Just because it sounds silly *now* is no excuse for withholding rights. We grant rights after all to an amazing array of beings, some merely metaphysical. Babies have rights as do the mentally challenged, senile and comatose, all who do not have the capacity to stand and arbitrate for themselves in a court of law. Corporations have rights as do nations and states and judiciaries, boards of education, counties, and labor unions. How, for instance, does someone represent the state of Texas? What is "Texas"? Is it the land

from the Gulf of Mexico to an invisible line between that state and New Mexico, or is it the some 32 million people, most of whom, including myself since I am a Texan, have no idea that we are being represented for anything? If in the latter case, in no way is it possible for the representation to always coincide with the people's wishes (a fact I can readily confirm). In some ways it might be easier to stand legally for a tree than a state. As Stone writes:

> "Natural objects *can* communicate their wants (needs) to us, and in ways that are not terribly ambiguous. I am sure I can judge with more certainty and meaningfulness whether and when my lawn wants (needs) water, than the Attorney General can judge whether and when the United States wants (needs) to take an appeal from an adverse judgment by a lower court. The markings of dryness are obvious in most plants, but how does the *United States* communicate its feelings?"

When talking with Connie Barlow she notes that, in a way, the torreya is obviously communicating its suffering from via wilting branches, entire trees toppled over by heat and the clear symptom that very few if any of the trees in Florida are producing seeds anymore.

Stone's point doesn't go without legal precedence. Justice William Douglas noted Stone's arguments in the 1972 Sierra Club vs. Morton case. I quote it at length to show how the arguments of an erstwhile academic, can be felt in the highest court in our country:

> "Inanimate objects are sometimes parties in litigation. A ship has a legal personality, a fiction found useful for maritime purposes. The corporation sole -- a creature of ecclesiastical law -- is an acceptable adversary, and large fortunes ride on its cases. The ordinary corporation is a "person" for purposes of the adjudicatory processes, whether it represents proprietary, spiritual, aesthetic, or charitable causes. So it should be as respects valleys, alpine meadows, rivers, lakes, estuaries, beaches, ridges, groves of trees, swampland, or even air that feels the destructive pressures of modern technology and modern life. The river, for example, is the living symbol of all the life it sustains or nourishes -- fish, aquatic insects, water ouzels, otter, deer, elk, bear, and all other animals, including man, who are dependent on it or who enjoy it for its sight, its sound, or its life. The river as plaintiff speaks for the ecological unit of life that is part of it. Those people who have a meaningful relation to that body of water -- whether it be a fisherman, a canoeist, a zoologist, or a logger -- must be able to speak for the

values which the river represents, and which are threatened with destruction."

But what are we supposed to eat?

It's a fair question. Vegans can at least fall back on plants; there's nothing for the plant-lover. Rocks and sand and air, so far, have not proved nutritious.

But maybe considering a tree is different from not eating. Donna Haraway has a similar notion in her book *When Species Meet.* Haraway calls the interesting intersection of humans and species "naturecultures." And for Haraway it is better to unite the forces at work, as messy and as rambunctious as they be, not forgetting basic human rights but not falling into the trap of lazy human essentialism. "The Great Divides of animal/human, nature/culture, organic/technical, and wild/domestic flatten into mundane differences - the kinds that have consequences and demand respect and response - rather than rising to sublimes and final ends."

Aldo Leopold put in similarly if sappily, "When we see land as a community to which we belong, we may begin to use it with love and respect."

Our perspective, according to Haraway, should not be one of human contra nature, or contra ape or contra tree, but rather human/everything mixed in the same soup, all trying to stay alive. Considering the torreya at least, as a thing possessing identity, and not just a thing, is a first step, realistically, in a world where human rights activists and all people (and animals) need to use and eat plants in order to survive.

I wanted to see how such a system might thrive, a system that also happened to include the stinking cedar.

On a trip to Florida, I drove west from Tallahassee to Chris and Robert Larson's land outside Mossy Head. This part of Florida is more South than Palm Beach: pick-up trucks and confederate flags (and even Freedom Fries). Gun racks. Cowboy boots, snakes in the gutters, trailer parks around the corner. At a gas station on the drive over, I eavesdrop on this conversation:

Clerk: So, what's up?

Customer (male): What's up?

Clerk: Did you here who got married this weekend?

Customer: Yehhhp.

Clerk: Isn't that illegal?

Customer: Yehhhp, it is.

The flora and fauna of North Florida is unquestionably the most dynamic, most assertive of the East Coast. Florida crawls up highways, wraps telephone poles and sneaks in the windows. Managing this would feel like managing a rabid zoo. Susan Orlean writes "The wild part of Florida is really wild...The developed places are just little clearings in the jungle, but since the jungle is unstoppably fertile, it tries to reclaim a piece of developed Florida every day." Florida is as wild as America gets.

Robert Larson is a sculptor, and Chris Larson is a retired teacher and paramedic and they agree to host me for a few nights. Driving around their property with them, Robert points out the art he has placed around their 56-acre property on a hill above the Shoal River.

In the car, beside and behind me I have two ex-college faculty members reciting

everything they know about the land they've lived on for 35 years. In one ear come Robert's sculptures with his lectures on their significance and idea for their placement and history. And in the other ear comes Chris listing off every living thing we see.

Surrounding us is laurel and live oaks, magnolias, pines, wax myrtles, weeping bee bushes, brown turkey figs, pear trees, and devil's walking sticks.

When the Larsons bought the property 35 years ago, one side was clear-cut by the previous owner. On the other side sat a crumbling, leaky farm house filled with thigh-high stacks of 1940s Penthouse magazines. Since moving in, the Larsons' have spent thousands of dollars turning the place into a veritable wetland menagerie.

Chris hands me a map, and I notice that every trail, every stretch of 4X4 road, every bench, and many, many trees have names like a city. And Chris and Robert use these names as many couples do who have their ongoing in-speak around strangers, though I have no idea what they are talking about. Chris mentions "Isle-awhile" and this turns out to be a 4X4 road. Isle-awhile-longer is a trail offshoot of the road. "Where no man has gone before" is a cul-de-sac on the river where Robert's son, lounging in a tree one day, once heard a man in a canoe say to a woman who was with him, "Now darling you're entering where no man has gone before."

"We used to not have names for anything," Chris says to me, "but then we got tired of talking about, 'well that road over there, you know that one? The one with the big tree?' Well there's a lot of big trees and so just went ahead and named them all. I was hesitant at first, because using names is a kind of co-opting of nature, making it something of one's own. And I tend not to see this place as *mine* but rather a part of me with me, us as caretakers. But it sure does help with directions if you don't have to spend half an hour with lots of arm waving."

Even the bathroom is no respite from information. In what Robert and Chris call the "reading room," there are quotes taped all over the walls, floor to ceiling, on every wall, and on the mirror and the back of the toilet. Some of these I read, almost all of them actually.

From the wall-to-wall affair: “Reality is nothing but a collective hunch.” -Lily Tomlin.

Robert is a lumbering grizzly of a man, who is like a true bear in that he walks, mozzies, snacks prodigiously on fruit (I brought over a ten-pound watermelon my first day and he ate a quarter of it standing up with a spoon) and dozes frequently. He's also 75, which explains some of the dozing and his bad knees and snowy white beard and wizardry eyes, his constant jokes and confessions. Yet, he takes a turn in a Ford tractor the second day to cut down the growth on a steep hill as if he were going out on the lawn to get the paper.

Chris I see one morning mowing the lawn for the second time that day. When she comes around the corner of a magnolia, I had expected to see her serene, hard-edged face, or at least the drowsy trout-fisherman glare. But when she corners the small vegetable garden, the mower droning along much too fast to be leisurely, her lips and eyes frame a mixture of concern and fright, her lips pursed together, eyes hanging, hunched shoulders, dainty, thin legs locked together. She looks like she knew something horrible was going to happen at any minute.

I get the clear sense that with Robert's age, it's Chris who runs the house. Chris who greats me at the gate, who talks about and receives my money for staying (it's fifty bucks a night though supposedly I wouldn't have been turned down if I only brought my watermelon). It's Chris who gets up and works in the morning, mowing at the crack of dawn, who decides it's time to have a bonfire. She's up to her elbows with a 75-year-old husband and an 85-year-old mom who stayed behind for the weekend. She has kids and grandkids (though none live near) a house

in the city and the 56-acre Shoal Sanctuary. Not to mention she has a court date on Monday.

"Are you guys suing somebody?" I ask.

"No," She sighs, then rolls her eyes "a guy tried to choke me. A builder we had over." She says this with only the mildest annoyance, as if she had to go pick her mom up from a doctor's appointment.

As we're driving around in Robert's 4runner, it begins to rain. A sound like hoof prints on the hood, and Chris rolls her window down. She begins to play with long silver and white hair, which runs past her waist. We tour thirty sculptures, and I don't know how many trees and trails and benches and sub trails.

Robert and Chris have carved out for each other a land so inordinately biologically sculpted that it appears like one of those postcard photographs of a Zen garden in a book store. Something subtle and supine, not intrusive, a land that grows naturally around and among its human counterparts.

The forest around their property, now that Chris and Robert Larson have had their way with it, is mostly long leaf pines, each about forty feet tall with intermittent branches so light gets through. After the couple bought their property (and after demolishing the dilapidated farm house and carting away its thousands of Penthouses), they planted 14,000 long leaf pines by hand. They also cut down and herbicided most of the invasives, a lot of laurel oak too, which Chris says is undesirable because, like a tree's version of an annual flower, the laurel shoots up fast and then dies younger, at about 75, crashing down and flattening a host of other trees, animal borrows and perhaps animals too in its plummet.

Over one hundred of the very endangered and keystone species gopher tortoises make

their homes here at Shoal Sanctuary. The Larsons also host black bear, cottonmouths, mockingbirds, deer, migrating turkeys, turkeys and so many species that when Chris names them all, my head starts swooning. Chris recognizes my condition and graciously hands me a list of all the species the Larsons and their friends have so far identified. Chris claims to also have seen a Florida panther roaming through one night when she was walking their dog.

A real American chestnut (one of the last) grows in their front yard. Chestnuts of course were hit by blight from Asia that scoured America of over one hundred million of its giant trees. But a lone chestnut tree grows here on the Larson's land, a survivor in this refuge, a character in the play that Chris and Robert are conducting. The chestnut grows right next to their house.

Of the Larson's stinking cedars, they once had 23. But as with everywhere, the cedars are dying here too. There are now only seven.

Chris and Robert got their original 23 torreyas as saplings from the Atlanta Botanical Garden in Georgia, one of the few places that grows stinking cedars and where the Larsons have bought many plants. Only the torreyas, the Larsons say, were given to them, because no is allowed to buy a federally listed endangered species.

After receiving these two dozen saplings, the Larsons planted them up and down their property. A few dried up with drought, but for most, the Larsons can't figure out what happened to them. Irrigation ditches were dug around each tree, the cedars were watered every day, lime was poured in their planting holes. And what's more, the biggest, healthiest torreya, which was over ten-feet tall last year up and died for no reason.

The torreyas, the Larsons say, turn mustard yellow, like elderly skin, as they die and shrivel quickly as if drying up.

I go on a tour of the living stinking cedars with Chris one morning. Chris has just finished three hours of usual chores (hours which I shamefully slept through). The Larson's solar-powered lawn mower is on the fritz as is the clothes washer, and the pump that siphons cool groundwater from limestone bedrock has clogged up with ants who are attracted by the electricity. And later Chris will fill a fire ant bed (fire ants are from Africa and are nasty if they get in your shoes), repair a leaking water pump and even cook dinner - a wonderful meat loaf.

The sun is hot already at ten and Chris is worried about Robert who is taking a turn in the tractor with a mower clipped to its back. "Bush hogging" is what he calls it, and "jungle blazing." We can hear the distant roar of the mower's blades chopping down sapling and other growth that Chris and Robert don't won't taking over the slope along Isle Awhile.

We come out to a big field by the Larson's tool shed. Next door to all their rakes and clippers and plow shares, Robert houses his art studio. There is a potter's wheel and various sculpted bits of clay set around the dried paint sprayed wall. The floorboards have holes that expose bare earth. The Larson's also store the tractor under an adjacent overhang.

Over on the far side of the field, standing underneath a live oak is an aluminum tyrannosaurs rex that was spray painted red though is now rusting. It is eight-feet-tall and propped up by a hospital crutch.

"We found that out in a ditch somewhere," Chris says. "He just needed a home."

I recall to her an interesting bit of assisted migration that I read about in the paper not too long ago. A 1.1 million dollar tyrannosaurus skeleton was stolen from Mongolia and shipped to the U.S. where it went on sale at a Manhattan auction before the feds stepped up and seized the

terrible lizard. Mongolia considers the skeleton a national treasure. The thief was from Florida.

Chris laughs when I tell her. “It takes all kinds, and those kinds usually live in Florida.”

I ask her if she knows that stinking cedars predate Tyrannosaurus's birth.

“No, I didn’t know that. But you know, we had a discussion about moving stinking cedars here. I mean there wasn’t any on the property, and we’re always a bit hesitant with moving things. If plants or animals want to move on their own, that’s one thing, and we try to help them with that. But I knew they were going extinct and they were close by. Maybe they should be in the Appalachians, I don’t know. But we were both a little hesitant about taking things that far. I know Connie Barlow, and I support what she’s doing. But we live in Florida. I guess we’ll keep on trying to keep the Florida in torreya.”

Is she conscious of things moving in and out of her property?

“Oh, all the time. Gopher tortoises, which are endangered found this place on their own. I’ve found bear tracks, but seldom bear, and that means they must move off somewhere. Where I don’t know, we’re surrounded by rednecks who’d like nothing better than just blast a bear open.”

Later she’ll say, “We’re not vegetarians as you know, but we support it because it helps biodiversity. What we take care of I think says a lot about who we are as global citizens.”

About a hundred yards down the grassy road, we came upon our first stinking cedar. The torreya looks stumpy, though many of its branches are exhibiting growth. This torreya is only four-feet tall. Its maturation has given the tree a fell like a knotted twist of hair, branches turning in all directions.

There are two more cedars we come across, passing as we do the dozens of long-leaf pines that that Chris and Robert have restored. Chris and Robert spend their weekends here with

a weed-whacker taking out the invasives. On years they can afford it, they hire a crew who along with scouring the property also burn it to relieve the ground of the tangled exotics.

We come around a sandy bend where yellow jackets sometimes nest, and I see a sixteen-foot totem pole that Robert has fashioned out of aluminum and called “Creation Totem.” There are symbolic etchings all over it, an iconic version of the Larson reading room. Included are various Native American symbols and the inevitable peace sign.

We’ve already passed a half a dozen art pieces on the way to this large one, and so far I find Robert Larson's art on the whole, *without* it's restrictions, to be a bit overly symbolic, pointed, and, at times, clunky.

Within its restrictions, however, and by that I mean the things that come naturally to storing your art outdoors in Florida - humidity, trees falling, surprise frost, deer rubbing, bear swipes (claw marks are visible on a few tree trunks), hornets nesting and the occasional annoyance of a hurricane. Given all that, the sculptures are downright inspiring.

"I build my art to be impervious," Robert says.

One installation he's named “Four Seasons,” and the sculpture is a four-foot tall, polygonal block of marble that has etchings on each of the four sides including a rippled crater that resembles a vagina (a reoccurring image of his work). Other works I don't know what to think, they're almost childlike and playdoughy - a pizza pie face with three tennis-ball sized toppings reminiscent of male genitals. Another is a series of bowling balls called "Family Maters," each ball with head gear, spikes, crowns and two bowling balls that may represent Chris and Robert Larson, wearing caps, one pointed, one round.

But then there is one installation that Robert says is to honor 9-11 - three towers (for there

was a third), of marble with flames carved up their sides.

Throughout all this is the resounding message Robert hopes to preach, which is the old school non-violent, power in community. Peace is the religion on Shoal Sanctuary. The Larsons even keep a bowl full of origami peace cranes by the door like a restaurant's dinner mints.

One beautiful irony of Robert's work is that he gets a lot of his supplies from Elgin Air Force Base. Elgin is one of the largest weapons testing facilities in the world and is just down the road. Robert too, is ex-military, which undoubtedly helps him when he shows up unannounced on military grounds to liberate (his word), tank parts, antiquated surface-to-air missiles, air-to-air missiles and other tools of war and body dismemberment. When I wondered if I could include these details in my writing given the illegal nature of the sculpture materials, Robert encouraged me to use them, saying he'd "liberated" them for the world to use for peace.

He has even obtained parts to an old NASA space shuttle.

In his spare time, Robert limbos beneath Elgin's unguarded fences late at night (though less and less now that he's over seventy). Sometimes he has simply gone up and asked the officer in charge if he can look around, and routinely he is let to paw around the barrels of discarded weapons testing parts. Robert has obtained thousands of badly machined rail road ties, used for moving equipment, as well as armored plates that were later used on Robert's life-size stegosaurus with wings.

"Every time I go down there," he says later, with his usual chuckle, "They tease me and say, 'Well, Robert, still trying to save the world?' They're good 'ol boys. But you know what's funny about them? They still think war works."

For his outdoor Shoal Sanctuary installations, tends to use huge chunks of granite or marble for the main body of the work. The pieces sit out all day every day on large, heavy pedestals of clay, usually under a tree. The trees help with sun damage, but the tree can fall on the sculpture. So, naturally, there's a balance. Robert picks medium-sized trees. "Although occasionally I've been moved sculpture after it was in place because the tree got too big."

Generally, Robert has to truck in his pieces wherever he wants them, whether with a tractor and a sleigh or an ATV. One piece, a 19-foot long set of wavy, thick aluminum bars he calls "Haiku," needed to be drug out on a sixteen-wheeler flat bed with a crane and a work crew.

Short of a direct sledgehammer blow, it's hard to imagine much happening to them out here. Robert says they all survived Hurricane Ivan in 2004 just fine. Meanwhile 800-year-old oak trees came crashing down around them and the southern states sustained 22.1 billion dollars in damages.

Why I'm *really* interested in the art, is because as I walk around the tall beech and magnolia trees, skirt the pines and watch the gopher tortoises scamper away (they're much faster than I'd ever given turtles credit for), I keep rounding corners to find a block of granite with peace symbols covering them or an installation shaped like a giant turtle in the generous shade of a hickory, and I think that Shoal Sanctuary is a microcosm of the possible future on our planet. Seeing how Chris and Robert interpret and project their 35-year-long and ongoing relationship with their land tells me a lot about how people can take a stance among the other eight million species of the world. Imagination, after all, is not just a tool of deception but one of creation. One of the problems with the impending extinction crisis is a failure to imagine how landscapes and the growing human population can interact without leading inevitably to destruction. Hollywood

and journalists and commercial writers are busy imaging the apocalypse. Chris and Robert have built a nest of wonderment and commitment to a realistic possible future. It's no surprise that they work very well with children, many of whom come here with their parents and on school visits and stay sometimes in the same room I am sleeping in, reading the illustrious quotes on the bathroom walls, absorbing the creations Robert and Chris have to share.

In Robert and Chris's wildlife refuge super imposed onto an art gallery, neither one seems in perfect control. Rather a shaky balance between the human and more-than-human has come to preside. To me setting art out in the Larson's woods represents that melding of those worlds that really were never separate anyway. All art comes from life as life is art. Less philosophically, even the most hardened, perturbed materials we can think of (plastic, say, or nuclear waste), were all once "natural" materials: ancient plants and the archaic metals that are remnants of star supernovas, as is carbon, the basic building block of all life. Art as human expression is arguably as evolved an instinct as eating.

Also, I find Shoal Sanctuary symbolic of the Larson's relationship. Robert surely knows more though not entirely more about the world of art and sculpture as Chris knows more but not entirely more about the land they work on. It's a melding of universes.

I wonder what the animals think about Robert's art. Perhaps they come up to it and sniff expecting food or some other kind of human curiosity, a mind-boggling contraption. Perhaps they're used to junk laying out in the woods - old plow parts, horse troughs, trash, shot-gun shells. Maybe to them in only means *stay away*. Robert says birds perch on them, shit on the faces. Sometimes foxes piss on his sculptures. Nature the critic.

Across the sanctuary, Chris and I hear Robert's 1952 Ford tractor sputter and die. Chris, worried, decides to jog over to check. Robert comes marching up the hill in his denim overalls and straw hat, a towel wrapped around his neck. The tractor has stalled out on a sharp incline.

Lucky for him his oldest son Rob is coming over. Rob is between electrical jobs and driving a bus for the local school district. He is staying temporarily at Shoal Sanctuary, minding things. A big, barrel-necked man like his father's younger self, Rob has the same Saint Nick blue eyes and sandy blonde-turning-white hair. When he drives up in a two-door Kia, he begins hacking, chain sawing and bush-hogging, not stopping for the morning rain.

Chris walks with Robert back to the house while I go to look at the tractor, the symbol of human's domination of nature. Even the philosopher Lynn White Jr. remarks in his essay "The Historical Roots of Our Ecologic Crisis" that it wasn't the 20th nor even 19th century that led to our divorce from the world, but the seventh century when Europeans invented a better plow.

I'm not sure you can pick a time so perfectly. And I dispute we've ever severed our animal ties. Rather, our basic biological impulses, assisted by our technology, has led us to our ecological crisis. Most of our bottom basement desires have changed little in 150,000 years.

It is also clear, despite its history as soil-tamer, that the six-decade-old fire truck-red Ford tractor was doing a good job of repairing the Larson's land back to what it once was before the previous owner had cut down all the trees.

As I go down to look at it, I see the Ford has blazed a trail four feet wide through dense growths of China apple and multiflora rose, both invasives that tend to grow with abandon. The spinning mower towed behind the Ford tractor is wedged atop a pile of what looks like oak

branches. Rob, who comes down with a tool kit filled with electrical supplies, starts up the motor and with a kick, drags the contraption off the pile.

“I love it when things go easy like that,” Rob says, the syrupy pour of a southern drawl. “You wanna drive the tractor?”

It takes half a second to decide that yes indeedy, having never driven one I’ll hop on this instrument of subjugation. I climb into the bucket seat and with Rob’s help figure out the levers to my left. The tractor has two drives, worm and buffalo, and actually rears up like a frightened animal when I put it in gear, two tires completely off the ground. The mower churns behind me.

“You know, most farming accidents occur on tractors,” Rob yells over the engine rumble and spinning blades.

Rob can’t figure how to cut the power to the mower, so he instructs me to tow it spinning back to the farmhouse, cutting the grass along the way with the giant, ankle snapping fan spinning behind me. I slog uphill, the mower biting into the trail with a racket like a diesel motor combusting wood chips. I top the crest and circle once around the Creation Totem, wheel past the two bushy torreya trees, gurgle by Robert’s long “Haiku” sculpture and the stegosaurus made from tank armor, rev between hundreds of twenty-foot long leaf pines and monarch magnolias, and wink at the rusty aluminum tyrannosaurus on its last crutch, everything with its place at Shoal Sanctuary, even the rusty, mid-century tractor. It feels like a retirement center for the arts, trees and antiquated. I park the tractor, which is now smoking, by the tool shed and studio.

That night, Chris, Robert, Rob and me, drink hand-made crystal clear, Southern hooch by a searing conflagration of the fallen oak and ash branches that Rob has spent the day chain sawing. Chris eventually retires, claiming and disclaiming we "can kill our brain cells all we

want to." Before she does though I ask them about Shoal Sanctuary, about how long they think it will last. Chris and Robert take a long time before responding.

"Well as long as it can," Robert ponders, uncertain.

I ask them about why they live in town and only come out here on weekends.

They tell me that with Chris's mother at 85 and in bad health and Robert at *75*, being near hospitals was important.

"Though," Chris adds, "If I'd have had my way, we would have sold my mother's house and the three of us would have come lived up here. I'm formerly from the medical profession, and I know enough that I don't entirely trust what goes on in hospitals. And being outdoors has been shown to have healing properties on a person, no matter what age."

"Green spaces" Jim Robbins writes, "create a halo of improved health around them." For adults, a few days in the wood can lower blood pressure, pulse rate, adrenaline levels and presence of the stress-causing chemical cortisol. It also boasts the rates of anti-cancer proteins. Trees in urban housing projects have been shown to reduce violence. Kids with ADHD who are surrounded by trees concentrate better. Pine trees release pinene into the air (and hence why pine trees smell) which relieves asthma. Other trees release limonene, which can reduce cholesterol and gallstones. It may even also help prevent cancer. Trees tend to release many tiny, floating particles called allelochemicals, which are still only vaguely understood but generally known to be good for human health. One thing they might also do, though this is still a controversial theory, is provide a strategy for trees to communicate among themselves. When insect pests, say, land on a forest, the first tree to "notice" them, releases a chemical alerting other trees to release natural pesticides, thereby warding off the pest. This behavior has been demonstrated in sage

bushes, but trees are thought by at least a few scientists to also be floral conversationalists. When you walk through a forest on a sunny day and warm smells of musk and oak and berry and pine curl around your lips, you may in fact be in the presence of an arbor conversation in a language we can only interpret with your nostrils. The fresh air of a forest may well be the noise of trees talking with each other in chemicals that we find acutely relieving.

Rob, Robert and I drink into the night. Most of the tension gone from our shoulders. Rob eventually stumbles into his theory of poverty and inflation, which normally I wouldn't have any patience for but tonight thanks to the hooch and trees I feel obliging. Rob relates a story that involves his one time working as a supermarket butcher. It seems non-sensical all the way through until the very end when he ties in various ways of grading cuts of meat to the attitudes of small businesses. There is a "poof" of uncanny clarity that I am not expecting, though about which I cannot remember nor reproduce here.

The next day, on a walk by myself, after the Larsons have all gone (Rob to drive a school bus, Chris and Robert to take a deposition about Chris's would-be strangler), I whistle and crawl over gopher tortoise burrows and listen while something large lumbers through the woods that I think might be a bear.

I peer up at long-leaf pines that tower youthful and strong overhead and shield the light. Just enough rays peep through so that a torreyas tree can soak up the remnants. Staying with the Larson's was a chance to see the torreyas in its somewhat natural state, though I can hardly call this wild. Every tree with its own irrigation trench and spigot, regular watering, lime-filed beds, fences to keep out nibbling deer, and enough shade to prevent sun-burning. Yet, there were only

six left. The others had died, turned a rusty yellow one day, and quickly grown brittle and fell apart, even the healthiest and most robust.

I walk to the gazebo hut that Chris and Robert have mail-ordered from Ohio. It was built by the Amish and trucked down here, set up on a circle of mowed land where grew two stinking cedars flanking the gazebo's door. The gazebo had eight sides and eight chairs and two pieces of art by Robert inside. One piece was a cattle skull with peace symbols and a clay vagina hanging from its horns.

I sit in the lawn chair and look through the gazebo screen at one of the torreya trees growing just outside, and, all alone, I wonder when it would be like to lose a wonderful place like Shoal Sanctuary, to lose the stinking cedar.

Suddenly, I felt exactly how Aldo Leopold felt when he wrote "We only grieve what we know." I don't like the idea of losing something I've researched this in depth. Who or what will replace the stinking cedars?

Which brings me back to my earlier question: when do we know it's something's time? When do we know it's our time let alone a species? What are the signs for letting go? Has a 165 million years old tree had enough life?

I ask because the answer isn't simple though I'd like it to be. Maybe it's only when we're close enough to a thing do we see the tangible threads that tie members of a community together, and how when a force, our own or the universe's, cuts those threads, the entire existence of the thing falls away with them. The world of a person, like the world of a species, can only be saved or preserved, for a time, within the connecting structure of a greater civilization like what is spread out before me.

The Biggest Fish

One day in fall, I rent a car and drive through the Appalachian Mountains to Waynesville, North Carolina to meet with Lee Barnes, one of the first Torreya Guardians. Lee has planted seeds onto lands around Asheville. Driving, I realize I am in the presence of the Appalachians for the first time in my life. Blue backs of whales surfacing, foggy contours of rings receding into the horizon, pitches of rolling waves - the Appalachia Sea. They remind me of the mountains where I lived in Japan on the main island Honshu, civilization crammed against their side, hundreds of years of cohabitation evident by the narrow roads beholden to the topography's grooves. The mountains are not the stark, iceberg Rockies nor Alps, but rather accessible peaks - gentle hills teeming with honky tonk, pleasure cruisers and artists.

The mountains are old in geologic time as well as in the American consciousness. They were the original Western frontier. And before that they were the only thing between the Atlantic and the shallow lake that covered the Great Plains, the shores of the Cretaceous Sea. These were the tide pools of prehistoric sharks and plesiosaurs that swam while on the shores nearby, atop Appalachian peaks perhaps, stood healthy, basking stinking cedars.

When I park in Waynesville, it's a crisp morning, my coffee already chilling in the air as I walk to the mountain lake serenely flat behind the log cabin visitors center. A few loons wade in a reflective pool below, and they shimmy off as I approach, my boots crunching asphalt as well as ancient pebbles.

The loons spook and now wiggle themselves into a V flight pattern but stay on the water. Gingerly, they wade out to the center of the lake. The lead bird catches up to the tip of the reflected snowcapped peak opposite from where I'm standing. For one brief moment, they appear as two inverted pyramids, one loon and one mountain.

Something keeps popping in my head as I research the Torreya Guardians: it's something that I read in doreen massey's *for space* a book as impenetrable as it is (once digested) ultimately penetrating. Massey reminds us that landscape, the Appalachians for instance, the symbol of perpetuity, are constantly eroding to the ground, their pebbles carried to the oceans, new mountains forming as the earth uplifts, and the tectonic plates float around like croutons on the mantle soup, some being sucked under and others solidifying, our Earth spinning in an arm of the Milky Way, this galaxy spinning around the center of our local cluster and so on. Everything, every rock, every mole, every bird, every cell in our own bodies is on the move, on a course of trajectory that will bring it away from this place and time. There are no muted landscapes. Drawing a fence around a mountain or a river or painting a landscape is like photographing a person and then expecting him not to die. Pristine wilderness is a human idea.

What seems obvious now based on fossil records is that species do not neatly and perfectly pick up like a smartly uniformed college marching band and move north. Fossils show that species have behaved more like domesticate cats than band geeks, scattering every which way unpredictably, some faster or slower, some, of course, going extinct. As a human corollary, if an earthquake devastated a town in East California, you wouldn't expect all living residents to pack up their things and all move one town over. Some adapt and stay put, some move far away in

many different directions and for many distances. New regimes come together and form whole new habitats in whatever places they end up.

And when you look at which species have become invasive - like kudzu or the Asian silver carp - they've mostly all come from another continent or been fresh water species or both. Meaning the torreya, not a fish nor a shrimp nor from Japan or Australia, is an unlikely candidate for invasiveness.

Which means it is all well and fine to move the stinking cedar, but then Jason McLachlan's fears are still valid. One must beg the question, why not go back to "improving" our landscapes to look like England? Why not cut a tree here or there why not ship lions and elephants over from Africa to replace the ones hunted to extinction in North America? Why not go back to importing all kinds of species that are exotic but threatened in some way? Why not move polar bears to Antarctica, pikas to the tundra and clip the wings off Canadian geese so they don't expend too many pounds of energy on their twice yearly continental winter fling.

The ultimate question then, while thinking on whether to go ahead with assisted migration is, since the world is going to change, how should we change it for itself?

I'm fascinated by people like Torreya Guardians who feel they've answered that question for themselves as well as for everyone else.

Lee Barnes drives up in his Subaru. He gets out and smiles. Barnes, a leader in the Guardians, has creamy, pale skin, a sharp nose, jowls and the lecturing professorial voice of Newt Gingrich. He's wearing a fleece and hiking pants. He's offered to drive me around today.

"Beautiful lake huh?" Lee says as we get in his car and cruise around the alpine water.

'Yeah, it is."

"Beautiful huh?" he pauses.

I stare at him, waiting for the punch line.

"This is not a natural lake," he says. “This was an Indian village that they flooded."

He laughs, but then abruptly stops. "Yeah, that was one bit of assisted migration that didn't bode well for anybody - the Trail of Tears. You might know this, but those were Cherokee. They even had a republican government, and we just picked up and moved them.”

Barnes drives on a road that circles out over the water, like a bypass over a calm sea.

"But it is pretty,” he says, his gaze falling under the shadow of the mountain. "I guess in this mixed up world, you gotta take what you can get."

Barnes and I slide around a Methodist church compound that surrounds the lake like an army bivouac. There’s a tent city put up despite the cold, and it looks like a revival is about to happen this weekend. A stage with a band is forming; a few vans and three large crosses are set up already near the perimeter.

I ask Lee if he’s religious.

“No, but I believe in doing good,” he says. “Me and these folks sometimes get along.”

We’re out of the car in a few minutes. Lee directs a thumb to the backseat where lies a Patagonia down parka. "I brought this for you in case you didn’t bring one.”

I tell him it strikes me as a backpacker thing to do. And he replies yes, he is a hiker, having finished about ten years ago, the Appalachian Trail from Georgia to Maine.

“Yeah,” he says and grabs his belly and gives it a shake, “but I got to get back on the trail. I

don’t like staying put for so long but works been kinda harsh lately.”

Soon, we’re strolling through a shady residential neighborhood where a botanical garden lies in one unused corner. Four years ago Barnes and Connie Barlow and fourteen other Torreya Guardians came out here and planted 31 trees. The spread lime and a little rock phosphate in a few of the holes, because those elements here are notoriously low. But other than that, their idea, he says, was to plant the trees and let them go unhinged, like turning children out into the world.

“We didn’t really know what we were doing,” he confesses.

At the end of the planting, the group of Guardians including Connie Barlow and Lee gathered around the torreyas and sang them a self-made hymn to the tune of Amazing Grace. The lyrics were composed by Barlow and ended with the words “returning to your ancestral home.”

Lee tells me the neighborhood around the ravine was originally tent sites for people who would come for a summer, than spring and summer and finally they just stayed all year and built homes. The houses are stucco-colored, cookie-cutter bungalows. The lawns pedicured. The Cars SUVs and Lincolns. But the botanical garden was grandfathered in because one of the original homeowners started it, and the garden is nicely situated in a ravine along an occasional flooding creek. The community reluctantly accepts the Torreya Guardians and their bastardized hymnals.

Leaf litter clogs the ground of the garden like a syrupy sea, and we wade from one plant to the next, Lee scooting around on his butt on the sharp incline on the needles, me taking pictures in the bright sunlight, the air crisp and chapping. We slog uphill; the leering suburban fortresses flanking our sides, squeezing our path into a narrow gap up through oak trees. Lee seems to have trouble finding most of the torreyas. It looks some of them died, or otherwise they were stolen stamped, herbicided or eaten. Or perhaps Lee's just forgotten where they are.

Lee continues educating me on the history of the Guardians and the ways they planted and store the seeds. Many torreya seeds must lie dormant for up to two years before they shoot. So when you gather them, you have to store them in a cool, dry place (like Lee's garage where these trees were stored). But you never know the entire time if the seeds are waiting to germinate or if they are duds.

We do find half a dozen torreyas on the north slope that are doing well. There are tall trees that are thin and ropey, but others are robust representations of Renaissance feminine voluptuousness - round and plump and shooting branches every which way with a healthier lime green body. Some trees are oozy turtle green, others phosphorescent green like spandex at a rave and they stick out in the drab earth tones of dust and leaf litter and bare oak trunks.

Lee takes me to the very top of the ravine where we find the biggest rewilded cedar of them all, a "sapling" that is four-feet-tall (the smallest we found was eleven inches), and even Lee laughs out-loud, for it's been two years since he's gone back to see these trees, and I can tell he feels this experiment is working. The tree here is in the sunniest spot, while the stubby others are shaded by the much taller forest. This is odd because torreyas are thought to do better with a little shade to ward off the sun's toughest punishment. This healthy torreya is carefully set apart, alone and flourishing, huge. There's another like it, slightly smaller, also in the full sun, healthy and vibrant.

It's here Lee tells me about dowsering. And I forget exactly how the conversation came up. I think I said something along the lines of "wow this green makes me think of pictures of the Irish coast," and Lee recounts his latest trip to Ireland, where dowsering is popular, to attend a yearly conference. I make the mistake of saying "you don't mean the thing where people use

twigs to find water do you?" thinking he, obviously, meant some other kind of dowsering.

But no, indeed, Lee claims to be able to find water, and many other things it turns out: oil, minerals, rocks, diamonds, all by simple intuition. Or rather not "simple," but a bedrock faith in an understanding of how human minds can tap into the flux and flow of atmospheric process and airborne physical indicators aloft from the earth herself. It takes me a second to let that sink in. There's always a hesitation on my part with attempting to comprehend ideas initially incomprehensible. A little research into dowsering reveals that hardly any experimentally data has come forth of a not dubious nature. Perhaps the psyche only works, like signs from God or signs of love, when not put to a standardized test?

I can't help but draw a corollary between dowsering and the Torreya Guardians' faith that stinking cedars belongs up in the Appalachians when other scientists are much more skeptical. Perhaps that is the faith needed to send a life out into the world? True science moves at a glacial pace, and the action needed to deal with climate change may be better met by those willing to move "quick." Acting may save species and biodiversity, but without the long view of science it may also be impossible to predict the side effects until they've set in. Oh, the trouble with deciding the fate of the living world!

I'm not sure what date I would mark for when humans became the caretakers for the world, but in the age of warming it seems reasonable (like with the United States' roll in Iraq) that since we've taken that first calamitous step, we have to continue to undo what we've started. That to maintain as much diversity as possible requires, in effect, gardening the planet.

Aldo Leopold, the "father of conservation" once instructed "to think like a mountain." In other words, picture each human action's effect on the whole of earth's biota. This way we see

our role in the play of life. Only now because everything is changing, Leopold's mountain too, like doreen massey's malleable peak, is being worn away and changing with time and climate. Thinking like a mountain now entails keeping up and directing the trajectory of the peak from less treacherous paths. The steering of a summit on the climate sea. And to believe that we can have a beneficial influence when so much of our track record is marred by indifference and destruction requires a leap of faith indeed.

Lee takes a tape measure he's brought along to determine how much the two bigger sapling torreyas have grown. Lee has a PhD in horticulture (his dissertation on the stinking cedar), and I see the academic come out of him. He meticulously measures the trees' height, width, canopy diameter and trunk girth. Then he measures how far away from each other the trees are, and how far away the cedars are from other possible tree competitors. Unlike the smaller saplings hemmed in by the channel forest, these large torreyas have more space to grow.

Lee is the definition of a good gardener: both kind and rough. He handles these plants like you would a grocery bag that wasn't behaving as you tied a knot with its handles. But he also shakes out the fallen oak leaves off their needle crowns, the leaves which block sunlight. He does this as he says that the point of the experiment is for the trees to be treated as "wild."

Lee finishes his measurements and looks elated. He wants to go ahead and drive to the other planting site higher in the mountains. So we leave this sun-capped hill, and make our way around the church compound and the lake made from the Cherokees who were force-marched west, and head out to the next location. We drive to a wealthy couple's seasonal home in the Blue

Ridge Mountains west of Waynesville, about 2,000 feet in elevation higher than the lake, corkscrewing around a hearty forest and slopped mountain that seems impassable in snow.

We get out, and I find that like in the suburban arboretum, the trees here on the couple's property have names. Connie and Lee have dubbed them "Aldo," "Berry," "Charles" (for Darwin) all names of famous naturalists or writers. There was a "Paul" for Connie Barlow's friend, the scientist and writer Paul S. Martin. The tree's demise coincided too coincidentally with Paul's own death, and Connie has been reluctant to plant another with that name.

We wander from plant to plant, but here on the sunny hillside, the devastation is obvious. Warm weather and cold, and voles, squirrels and insects have eaten most of the torreyas down to a nub. They are skinny, parched, weather-beaten, brown-tipped and dying. They look like whipped, lashed criminals. The soil around them was strewn with needle viscera. I realized the torreyas are the only infant trees around. The forest is either tall, established oak or rotting saplings. Even the natives had suffered in the last two harsh, drought-stricken summers.

I also wonder if the slopped hillside had an adverse effect. Hills at steep angles do not hold water as well as flat land and so trees have to send out long roots, establish themselves quickly and hang on. The oaks must have started from seed, obviously, but likely matured in better times. Their strength and foundations allowed them to remain.

Showing me around I can see Lee's obvious surprise at the abysmal rate with which the torreyas handled the droughts. He tries to keep a positive spin, telling me over and over as we cross the ground, up slope and down, sweating in the hot sun that this is all "an experiment." But the note of incredulity and disappointment in his voice is felt as surely as it is by an artist who comes into his studio to see his watercolors have dried in all the wrong shades. Lee last saw

these trees a year ago, thinking they'd survive. The result is that of the twenty-one trees the Guardians planted last year, about half we can't find. Three-fourths of the half we do see look sun-wilted and burnt. Most are missing their name tags, stolen by squirrels, who like shinny tokens as much as jewel-shopping Caribbean cruise tourists. The red bands had disappeared and this seemed inexplicable to Lee. Why would squirrels or voles want red ribbon?

"To make a nest with them?" I suggest

"I don't think they would do that."

I offered I'd seen squirrels around my neighborhood take some pretty amazing things and make homes out of them - zip lock bags, paper clips, three quarters-eaten Subway sandwiches.

"They probably ate the sandwiches."

I informed him I'd actually seen the sandwich as part of the bulwark of a rodent's home.

Lee sniffed. He was understandably in a bad mood. He was trying to hide it, but the heat, the exertion, the disappointment were starting to itch the wounds of the day. He was trying to put on a nice face, but he needed a break.

Crossing a slippery log over a foot-wide stream as deftly as a bull with a load of salt, we come back to the home of the couple whose land we're on. We find out that they're home, just back from their second house in Minnesota to spend fall in North Carolina. In a couple months, they'll drive back north again for the ski season.

They invite us in. A barking, salt-and-pepper Scotty sniffs at our ankles. Their cabin is aglow from 15-foot tall, floor to ceiling windows. The place is almost entirely wood. Wood chairs, wood bar, wood stools, wood paneling, wood logs next to the fire place. The man is a retired lawyer, and the woman a university history professor. Sitting down on their sofa, I can

see that their house sits atop a slopping dome of evergreens and maples and autumn leaves covering their driveway like a mat.

The couple is both kind and neat. The man is stern-looking but meditative and asks me about my project while we sit down to coffee in the golden light. Lee is next to me, sweating and red-cheeked. The sun warming us like a toaster. Lee starts off explaining my project for them.

I sense that the husband is being helpful he asks, "So how are you going to put this all together. I mean what's the main idea?"

I reply that I think it's about being human. About how we take responsibility for the rest of world-kind.

He laughs. "Well, that's not a project to start out on!"

The woman who wears a white cardigan and slacks comes to my rescue. "I think that's an excellent thing to think about. I mean, what else is there? When global warming is doing so much, how are we supposed to act? It's something we think about a lot."

She gestures to the husband who squirms in his easy chair, still skeptical.

The woman goes on, "That's pretty much what we thought, what was it that we could do with all the devastation going around. I mean, I'm a history professor, but I'm involved enough with science that I know what's going on. And he is too," she points to the husband. "He's the reason the Boundary Waters got protected. He was a lawyer working on that case for years."

"Congratulations," I say. The man scowls and waves away my compliment.

His wife, who's sitting at the head of the room in another arm chair, continues, "It's really good I think that somebody like Connie is thinking about what to do with so many things going extinct. When I met Connie at a church in Minnesota when she came with her husband

Michael and they talked about evolution, I just knew that her ideas fit in with my own. Which, basically are my mother's. My mother was an old school conservationist in the sixties. In fact Connie kind of reminded me of her. They have even the same hair."

She goes onto to tell me about her mother, a socialite/activist who'd been interested in the natural world and worked to preserve some of the local ecology and endangered species, winning over neighbors and politicians, devoting the brunt of her life to sheltering landscape and creatures. She was the one who had gotten the arboretum left untouched where the other torreya's are growing, two thousand feet below us. The stinking cedar's new home is named after her.

"We were wondering 'now where would be a good place for those trees?' And we realized that, duh, we had land. We'd bought this house, and unexpectedly the house came with the forest behind it. We were responsible for it. I have to say again what a surprise this was that we were caretakers of this forest. Or at least just this part. I mean it's all interconnected of course; we all live downstream and all that. But we have control of our part. So we thought, why not? Why not us and why not here? So we let Connie and Lee come up here and plant trees on our property. And really, it just seemed like the thing my mother would do."

"What do the people around you think about it?"

She rolls her eyes and smiles, takes a sip of her coffee.

"Let's just say they're coming around."

At a cafe later with Lee, we are surrounded by wood trim and Bierstandt knockoffs and the smoke from griddle and fry pan. Lee orders two pancakes and tells me, rather than torreya,

his chief concern is getting people interested in the changes he sees taking place.

"How," he asks me, "do you get people, short of a disaster staring them in the face, to honor biological complexity?"

He licks the syrup off his fingers and wipes them on a napkin.

"For instance, we're the world's center for salamanders here in the Southern Appalachians. Salamanders tend to make new species all the time so we have lots and lots of different kinds. I've read a study that found that the biomass of salamanders in the Appalachians was greater than that of every other animal combined. Can you imagine? We have more salamanders by weight than anything else save for trees. And needless to say, they are very special for the ecosystem. And I was talking about this to a man who happens a logger and he said, ‘What the hell I gotta worry about salamanders fer? They're not gonna feed my family.' And it was a kind of slap in the face to realize this is how most people think. Most people are not going to care about biology. I view it with wonder and respect and see that in some ways my quality of life depends on it. But I don't think like most people."

I order biscuits and gravy, and Lee asks for more coffee. The waitress is kind but staring at us in a way that implies we are doing some illicit with my pen and pad set out. The man in the booth behind Lee, a Santa Clause-looking truck driver, keeps dripping his beard into his gravy, and steals prolonged glances over Lee's shoulder.

"And I've followed the loss of habitat in every major bioregion or center of diversity around the world," Lee says. "I’ve been trying to do something about it for my entire life. Torreya was just an example that fell in my hands and seemed like an interesting project to do. And it wasn’t that much effort. Just a little spare time and somebody donating some plants."

"How can we get people interested?" I ask.

Lee says and then sighs. "Oh, I guess writing about it. Documentaries, nature shows, education, workshops. A number of ways. Heritage. Learning as much from native cultures before they are extirpated. That's a big one. Passing down the knowledge to our children, though I myself don't plan to have any."

Lee leans forward. "My theory is we'll learn quick when pan-epidemics thin the herd at some point. I mean we are under very serious environmental, physical, and electromagnetic stress. In every biological system when the population gets too high, there's a crash. An inevitable fallout awaits us I think. I figure we got until about 2050 and then it will start hitting pretty hard. Which is about how long I figure I'll make it," he laughs.

He stops laughing and wipes the pancake from his lips. "But I've done all I can to educate and foster healthy relationships and minimize my ecological footprint. I guess, I'm leaving things up to you."

We get up to leave, and as we stand, the heavyset Santa Clause man gets up, walks over. He has a Deep South growl and gap teeth and barks to us, "Hey, come over here a moment."

Lee and I both jump. Just over the mountains lives a preacher who gets his congregation to take up venomous rattlesnakes in the name of the Lord because it says to in the Bible.

The deep freezer truck driver stares at us a second and then asks. "Were ya'll talking about a tree?"

"Yeah, that's right, torreya taxifolia," says Lee.

"Well, why the hell ya'll talking about that fer?"

Lee stiffens, shoves his hands in his pocket.

“Well,” I say, “it’s a really old tree, and it’s going extinct.”

The old man turns to me and winks. “I bet it’s not as old as something I got here.” He holds up a clean, white tooth, hanging from a lanyard around his neck.

“See this?" he says. "It's a shark's tooth. Two hundred million years old, just thought you’d want to see that.”

Older than the stinking cedar if it’s really that old, I think. Some sharks are even older. Not knowing what prods me, I ask “Is it real?”

His pupils dilate. “Of course it’s real!” He booms.

The man takes the shark tooth, encased in a metal sheath tied to the lanyard and bites it.

He winks and his smile rises to his whiskers. “You better believe that’s real. Was swimming right about where your heads were two hundred million years ago. Now that’s old! Sharks don’t do much now, but they used to rule the world, even here before the dinosaurs. Now they’re endangered, I hear. Things change, I guess.”

He wrestles the lanyard off his sandpaper neck and goes to hand it over to Lee.

Lee takes a step back, holds his hands up. “Ah, no, that’s okay.”

“You?” the old man dangles the tooth, holds it under my eye.

I take the tooth and realize it’s minutely jagged like a rough mountain.

Instinctively, I smell it, not thinking what, and can detect a kind of forensic hospital sterility. The man laughs.

“Go on,” he says.

I look up. The man opens and closes his mouth and then smiles.

I catch Lee’s wide eyes as I open and set the fossil in between my teeth. I apply pressure

and accidentally let my tongue pass over the edge. There is a mild pain and a taste of salt, which I realize at once must be from beads of sweat on the hairy man's chest. Where he's gone and which sheets he's curled up in are now part of the world my taste buds have charted.

"There, you see," the big man says.

"It's real, all right," I say, as if I know.

"Yep - two hundred million years!" He takes the lanyard back and slips it over his neck. "But you know what they say about the man who bites a shark's tooth?" He asks.

"No, what?" Lee asks for me.

"Now you're the big fish!"

The man heaves back his girth and issues a rumbling, arm hair-raising chortle. It soon turns into a course smoker's hack and cough, and I notice the Marlboros in his shirt pocket. Lee and I look at each other. The man exits the door, holding his chest.

The Garden of Eden

The man who discovered and named the stinking cedar was a lawyer and amateur field botanist named Hardy Croom, who died in 1837 along with his wife and three children when their ferry crashed on rocks in a hurricane off the coast of North Carolina. Hardy Croom is perhaps most famous for a court decision that now bears his name regarding his estate.

After the wreck, an also famous federal law was signed in stipulating that a life jacket or life preserver would need to be on board any vessel for every passenger (there'd been only two life preservers and three lifeboats for the 130 passengers aboard Croom's ferry).

Croom lives on in courts and legislation, but he is barely known for the rare plant that he discovered.

In "120 to 140 degree heat," Croom gushed in letters from Florida to his friends in the early 1800s, he eluded warring tribes of Seminoles, Creek and Apache. Or so he wrote - the lore is thick with nineteenth century botanists who cut figures like Indiana Jones. Croom was the son of a wealthy North Carolina landholder. He was rich enough himself that despite a law degree he was able to indulge constantly in his obsession for botany. Croom slunk, crawled and waded with his face "covered with gauze to prevent being devoured by mosketoes," through mud and tangled, thorny vines. He wandered the Apalachicola countryside like a modern-day poacher, collecting and noting the life he saw. He bought two plantations in order to look for rare plants.

Croom wrote one of the first field guides to Florida: *Croom's Catelougue*. He was also

brought into the elite New York Lyceum of Natural History, the fourth oldest science society in the United States. The society was founded by John Torrey, a West Point instructor, founder of the Nature Herbarium at the Smithsonian and President of the American Association of the Advancement of Science. John Torrey became Hardy Croom's friend. Like Croom, Torrey was an avid botanist, very curious about the unmapped swamps of Florida. But Torrey left it up to the more adventurous Croom to classify the yet unclassified.

Croom was standing on the west bank of the Apalachicola River waiting for a ferry (not the one that would take him to his grave) when, because the boat was late, he decided to explore the forest along the river's shores - and there, where present day Torreya State Park is, he discovered stinking cedar and named it *torreya taxifolia*, after his friend.

Flash forward a hundred years to 1945 when another lawyer turned amateur botanist, Elvy Edison Callaway (who went by E.E.), sat in the office of Dr. Martin Landone a 98-year-old physician turned metaphysician. The older Dr. Landone had spent most of his life with the Gnostic-like Order of Melchizedek and wrote or co-authored a number of spiritual texts such as *Transforming Your Life in 24 Hours, Spiritual Revelations of the Bible,* and *Prophecies of Melchizedek in the Great Pyramid and the Seven Temples.*

During their first meeting, Dr. Landone instructed Callaway to abandon his life, family and law practice in central Florida and move to the panhandle for a "sacred mission."

Elvy Callaway was a tall lean man with a slopping forward. By most accounts he was a logical person. But he was confused; these were God's orders (according to Landone), and yet

Callaway wasn't even that religious. Callaway had left the Baptist church at the age of 18 because they were going to throw him out anyway for illicit behavior (he'd been caught square-dancing).

But 1945 had been a transformative year - a divorce for Callaway, the end of the war, the election (for the fifth time!) to the presidency of another loathsome democrat. Two elections earlier voters had rejected Callaway's own abysmal run for the Florida governorship. Elvy described his visit with the 98-year-old and dying Dr. Landone as "a calling."

Callaway closed his practice, made a few trips up to scout a new home in north Florida and eventually settled in Bristol, population 3000 (still is), just south of Torreya State Park. He bought a couple of plantations and had a tax assessor go over the land with him when he discovered, or rediscovered, an elusive rare tree called gopher wood.

Gopher wood has nothing to do with the furry animals. It is an anachronistic name, like Eden or Melchizedek, whose meaning is lost in time and translation. “Gopher” could be based on the Babylonian word for cedar or the Greek term for cypress or even the Assyrian word for reed.

Callaway checked with a biologist to confirm the tree's uniqueness and age and then measured the size, circumference, wood grain, strength and weight of the wood. He fed all this information into Landone’s Teleois Key, a complicated algorithmic formula based on numbers 1,4 and 7, which translates and transmits knowledge of God and the universe. The Teleois Key was a gift from Dr. Landone who was a priest in the Order of Melchizek, Melchizedek who is listed as a priest in The King James version of Genesis. But not just any priest, "he *was* the priest of the most high God." Who is supposed to be pivotal in the Tribulation (the return of Christ) and that, indeed, Melchizedek *might be* Christ.

The Teleois Key was what told Dr. Landone to tell Elvy Callaway to go to North Florida.

According to the Bible, gopher wood was the tree Noah used to frame his ark; he used its pitch for the boat's pitch. And then, goes Callaway's tale, loaded up two of every creature (including gophers) and sailed for five months on what would have been the Atlantic Ocean and grounded on Ararat Mountain in modern day Armenia. Then Noah founded the cradle of civilization. Humanity blossomed. Its origins in north Florida were forgotten.

The Apalachicola River Basin in North Florida was, according to E. E. Callaway, *the* Garden of Eden, and its rediscovery, the reason for his sacred mission.

Callaway had several reasons backing up his claim. But it's fair to note that Callaway wasn't a just dime-a-dozen Gnostic screwball. As a fellow lawyer, Callaway had supported his friend Clarence Darrow in the Scopes evolution trial in Tennessee. Callaway wrote is his first book *The Other Side of the South* that he found evolution - biological progress - to fit in with his idea of social, political progress.

He was a libertarian, pro-civil rights, anti-Prohibition, pro-separation of church and state, pro-women's liberation, pro-birth control. He even argued cases for the young NAACP in Florida.

If all this wasn’t enough to make him an outlier in the world of Jim Crow and Baptist lunatics, he also fervently believed that the Union’s war against the Confederacy had been a just cause, and proclaims so in the dedication page of *The Other Side of the South*.

For many reasons Elvy Edison Callaway was an odd fit for Florida. He's finding the Garden of Eden was just one more.

Four Rivers - the Chattahoochee, Flint, Fish Pond Creek and Spring Creek - flow into

one, the Apalachicola. Just so, the Tigris, Gihon, Pishon and Euphrates flow into one river in the biblical garden.

The best gold in the world, according to Callaway, was found in and around North Florida as it says good gold is found in the Bible's Eden. Florida and the Bible's Eden also share the "best water," and the best "twelve month climate." Some of the oldest land masses in the world are located at the southern tip of the ancient Appalachians (as was reported to Callaway by a geologist).

Even Florida's fruits were proof for Callaway: what other soil in the world has produced so many fine agricultural products? And there was the evidence of the area's biological relics - extremely rare plants like the Florida yew and Chapman's rhododendrons and other scattered enigmas of botany that only occur in this part of the world. The Apalachicola Basin is a veritable ecological zoo of many different climates: hickories grow along swamp maples, tropical palms, mountain hardwoods, prehistoric ferns - all incongruities much like Callaway himself.

There was also the fact that, for Callaway, there was no good reason why the garden should be located anywhere else.

All this gave the ex-lawyer undoubtable proof that he had bought land in the home of Adam and Eve. But the clincher reason for Callaway, the first reason, was gopher wood. He discovered it when hiking his property with the tax assessor and sent samples around to biologists who confirmed its considerable rarity and awe-striking age.

E.E. Callaway turned his land into an amusement attraction - calling it the Garden of Eden Park. Tickets went on sale from a kiosk on the highway for $1.10. Visitors could drive in

and climb the four-mile Garden of Eden Road, a dirt trail that went over plains, skirted a steep ravine, ascended through black forest and wrapped around sand hills with wiley gopher tortoises and salamanders and gopher trees.

Callaway dug up three petrified gopher logs and set them on display as extras from the building of Noah's ark. Nearby, an inspired neighbor set out to build an ark replica that he'd never finish. Tour guide's touted Callaway's park. Berry Goldwater, after losing to LBJ (another democrat!) in 1964, was offered a permanent place to stay.

Callaway died at 91 and the Nature Conservancy bought his land which lies as an ecological preserved right next to Torreya State Park, the two ecological preserves tying into each other.

The torreya's original home is muggy in July, as is everything in the northern Sunshine State. I am meeting with Mark Ludlow, Torreya State Park's resident biologist who has agreed to take me on a tour of some of the torreyas in their original home, about a dozen that he and other park rangers have fenced off to keep the deer from browsing and rubbing.

There are 219 stinking cedars in Torreya State Park. Seventy-three percent of those are diseased. Sixty percent are being rubbed on by aggressive white tail deer males, usually a territory signal. Bucks rub their concrete antlers against a torreya tree and shred the trunk's bark. The deer leave the trees to suffer disease, sun burn and drought as moisture escapes through the bare skin. Other torreyas are eaten by the deer, especially the young saplings that are supple and easy-picking. If a deer walking around underneath unassailable hardwoods sees a torreya sapling,

it may be the only thing he see edible around, stinking or not.

Mark Ludlow is linebacker-looking, mild-mannered, balding and wearing absurdly old Reebok tennis shoes. He walks around with a kind of military trot, weight leaning to one side and resting before swinging back to the other. Before coming to Torreya State Park, Ludlow was educated in the fine are of radio collaring ocelots in Nicaragua. He's been featured twice in National Geographic, once for the ocelots and once for vampire bats, another specialty of his, which he's hunted while they were feasting on Nicaraguan cattle. In his spare time he likes to take boats out on the swamp late at night with his teenaged sun and rope alligators.

The Torreya State Park ground is soft and fertile with a tree canopy that is high and shady. There is a sense of the neo-tropical here, a kind of temperate haven, a rest stop for rain on its way to the equator. It's hazy, but the July sun is kinder through the beech leaves and ash trees.

As we walk along the trail, Mark tells me it's nice to have an "educated visitor." He's used to people hiking up to his office and asking where the bathroom is or telling him about how big the rattlesnake was they just shot; hunting of course being illegal on state property.

But Ludlow is practical. "Look," he says, "if I got bent out of shape at everything that died here, I wouldn't get very far. Truth is, some people come in here, kill something and walk away. Now am I going to go chase after them? I got better things to do with my time. If you get caught up in individual cases you can't manage something large."

He trots on the dark trail ahead of me, breaking spider webs with a twig. The golden orb weavers dominate the tree trunks. They are giant, green and phosphorescent yellow arachnids that have leg spans as wide as coffee cans. I get shivers looking at them. But Mark tells me they're harmless and native, same as copperhead rattlesnakes, both which are here this year in

plenty.

Truth is, it’s nice that there’s native because there's also a lot of Mark says is "not-native" growing along the trail. Mark points out a lot of the things that do not belong. Japanese climbing vine for one, a noodle thin tree ascender that is impossible to kill because weeding it, unwrapping its myriad tentacles by hand from around its host, would take more time than bulldozing the whole area.

Other pests are taro, a knee-high leafing bush that crowds river streams and was imported, Mark tells me, as slave food. Also China apple, which grows big, shades out other plants, and completely takes over hillsides.

From 1999 to 2000, Florida spent ninety-one million dollars combatting invasives species. 1.7 million acres of its land is covered by invasives, an area larger than the size of the 2010 Gulf oil spill. Of the four thousand plants in Florida, 1,200 are exotic, and of the fifty states, only Hawaii has a worse problem with invasives.

A few days ago Mark hiked up to an obscure hill with a machete and a gallon of herbicide. He hacked off the bark from a few China apples and doused their exposed skins with poison. They he set them on fire. The trees died, but he says, he went back a few months later, and saw they had come back.

Taking out invasives is the second most time-consuming part of his job. The first is prescribed fires, weeding the land back to its natural state through burning (many native species are adapted to fire). A distant third activity is saving endangered species. And the two most important of those species in the park are the Florida yew and torreya taxifolia.

We find two Florida yews before we see a single torreya in the wild. The yews are almost

identical in shape and substance to the stinking cedar. Both are conifers, both are a sharp turquoise when healthy, and both grow to about the same height. But one way for sure to tell the difference between the two is to rub the trees' needles. The yew's quils are friendly and as soft as a down pillow. The torreya has hard, spindly, brutal needles. The yews are also much more robust, fertile, and they are, importantly, baring seeds. The stinking cedars are down to their last root stock. Eventually the energy and the life of the roots will give out, and these torreya here in their original habitat will be gone forever.

We fail to find a single torreya along the path behind his office. Mark opines that their absence here might because the other vegetation is so overgrown. Unlike other torreya trees throughout the park, these trees around here aren't labeled well and are hard to find specifically to ward off endangered species collectors that may want to dig up and sell the stinking cedars on the internet. Yet another concern for stinking cedars: larceny.

I tell Mark how a few months ago I was talking with a scientist who specializes in endangered species trafficking, and in less than half an hour he found thirty endangered species for sale on the internet. One of these was the Hawaiian stickybud pritchardia, a native palm, of which only five individuals still grow in the wild. It was on sale on e-bay for $350.

"That's a concern I have that we'll spend all this time saving stinking cedar in situ, and then somebody will just come along and make it *ex situ*."

Ludlow tells me in his experience, the stinking cedars prefer a very specific habitat: mid-slope, mid-tier, mid-range, mid-moisture levels.

"It's kind of a nuisance that it's so picky," Ludlow says. "But the tree occupies a specific niche, and we want to protect that. Who knows what other plants and insects and microbes make

use of it?”

But so far, we can’t find any stinking cedars. So we jump in Mark's truck and drive the back roads past the “Do Not Trespass” signs. We come to an old stone bridge on a road that was the original entrance to Torreya State park, which was built by FDR’s Civilian Conservation Corps - shirtless, youthful members of which appear on a poster that hangs inside the park office.

Ludlow and I get out, and with no bug spray we walk our buffet-looking selves into the dark forest. The orb weavers are aplenty again as are the quakes that run through my hands. Ludlow strolls ahead causally.

The torreyas we see are locked inside steel, wire mesh cages, and almost to a one, are as bare as sand-blasted marble. The torreyas’s needles on the ground are a dull brown and look shriveled. All but three have lost their needles on their top branches, though they all remain standing upright.

"These *were* torreyas," Ludlow says.

He toes the limp branch of a torreya, fingers the dead crowns. “It’s not good to get personal with the trees,” he says, “It's silly to think you're going to save any one thing. You just have to look at the numbers as they come in. So you have 219 torreyas? Well, you tell yourself what you're going to do with them. We're going to lose some torreyas; it's just going to happen. But you create a management plane, some cold objectives and go from there. That’s all you can do. I don’t *want* the trees to die. But there’s so much out of my control."

Ludlow goes onto say that the park’s plan is to basically keep doing what they’ve been doing: managing the torreya’s on site, fencing a few that they can find, continue to try and protect them from deer and disease. Nowhere in Mark Ludlow’s management horizons is assisted

migration.

“And part of that reason is that I don’t know about the data on global warming killing the trees yet. I mean, it could be. Global warming is sure changing lots of things. But I don’t know if you can specifically say it’s killing these yet. And so, we don’t want to jump the gun.”

What if the torreya trees all died?

Ludlow shrugs. “Well, it would be sad to name a park after a tree that’s deceased, but then again it might be a good way to remember something we’d lost. But I hold out on the hope that we can save them.”

"Look," he says and sounds cheerful, "there's some leaves." I look down into the bottom of one of the cages and near the ground are two shoots we hadn’t noticed, two sprouts of live twigs about 8-inches long with full-colored needles.

"What we know about the torreyas,” Ludlow, goes on, “is that they also like loose, but not sandy soil, and they prefer the shade. They're within a very delicate balance. These here that we’re looking at are all in a very good place for torreya. That’s why we fenced them in.” He sighs a long breath. “But as you can see, they're still not doing well."

He kicks around some fallen leaf litter. A pine cone rolls away from his shoe. An orb weaver spins menacingly over his head.

"It was probably drought," he says finally. "These trees need the shade, the slope and the right soil and not to be meddled with drought or deer or disease.”

Ludlow sighs, sticks his hands in his pockets. “More than any other species I think, that I have ever had to deal with, these need some good old TLC."

On my walk the morning after meeting with Mark Ludlow, I'm warned repeatedly, by everybody I see: Ludlow, my camp host, park rangers, and a traveling butterfly catcher who walks around with giant binoculars, net and English safari hat, to watch out for copperheads. And boar. And black bear. And alligators.

“Alligators?” I ask the butterfly catcher.

“There’s a spot in the trail where it dips down near the river,” he says, “They won’t do anything, but they’re probably around.”

After being hunted almost to extinction, alligators are plentiful in Florida once again. Some one million gators exist in Sunshine State, four thousand hunted legally every year. Six hundred dollars a permit to kill two. One of the locals’ favorite sports, I learned after flying down, was to go “spotlightin'” on the water aboard canoes or rubber boats with outboards. The locals "shine" alligators’ eyes with portable torch and blow the daylights out of them with shotguns, letting their ancient bodies sink back into the mud, much surprised and enlightened.

What no one warns me about, though I should have guessed, is that mosquitos are more numerous than gawking old men at a high school parade. They are apparently attracted to lemongrass oil. I know this because I’ve brought a “natural” insect repellent and this is its sole ingredient.

I hate being that one who whines, as a fly in the ear, about mosquitos in Florida. This is like complaining about traffic in New York or snow in Aspen. There should be a sign somewhere. But I just want to give you my state of mind when I say that, really from the moment I’m on trail to the moment I leave, I have about 20 insects buzzing my head and face at

all times, the constant sounds of distant aging, squealing car motors in my ears.

This bunched with the golden orb weavers, ticks, copperheads and other assorted fauna - Florida panthers too, I'm told, (and, yes, even Sasquatch - the crew from Animal Planet's *Finding Bigfoot* was here on a search a week ago), and I'm not kidding when I say I have a hellacious experience searching for six dying trees in the Garden of Eden.

At the trailhead, I pick up a muddy walking stick and take a brief overlook from the historic, old-mannered, slave-and-cotton-plantation Gregory House, where spans the Apalachicola, the largest river in Florida and one of the largest in the south. A million gallons flows by the old white and brick house every day, the confluences of the Flint, Spring Creek, Flathead Creek and Chattahoochee converging on Lake Seminole and making the python-shaped body of water (another serpent in the garden?) that hosts that growing number of alligators.

Before I find my first torreya, I've already walked into four orb nests, a house of yellow jackets (I forgot to mention those), and I've taken to holding my four-foot-long hiking stick out in front of me and swirling it around clockwise, banging the ground and then arcing the stick up to the trees as if conjuring a spell or churning laundry both to alert copperheads and take out the hanging orb weavers. I spray half a bottle of lemon grass bug repellent, but this just makes the mosquitoes salivate and I swear to God is as good as pounding a dinner bell.

I take up a piece of cane with five leaves on it and begin slapping my shoulders, ears, face, making my face bead in welts, all the while the males whisper their sex appeal to the bloodsucking females, and I look at the ground, conjure a hole in space with my staff in front of me, one foot in front of the other, singing "It's a hard, it's a hard rain that's gonna fall!" because singing is supposed to be a good way to alert black bear mothers and panthers and squatch.

After about an hour of this, I find my first torreya, a miniature tree at about two-and-a-half-feet, but full of life, wrapped in a cage. The torreya is noodly, but healthy and green, a darker hue than what I'd seen earlier, zestier and lizard, turtle-shell green, its needles stiff, but malleable to the touch. It is growing next to a much larger and domineering magnolia, which was included in its cage, I surmise, to support the lattice should perusing deer come by and rub the chain link.

This stinking cedar is the healthiest I've seen in Florida. I pause my whole circus - singing, slapping and spraying - to take a picture, the mosquitoes making their landing on the runways of my shoulders. The torreya looks young, but growing from ancient root stock. How old are these torreya trees? The answer is no one knows. Ludlow told me that the stinking cedars are too fragile that no one wants to dig out a root stock and bore a core sample. An educated guess? Probably less than a century, young still for a lot of conifers including the eastern hemlocks, which live for centuries. These torreya trunks are still young. It strikes me as a irony for the species itself - an ancient tree kept perpetualy immature.

I take up my slapping branch and orb conjuring stick and walk off, but only a few minutes down the trail, I catch sight of another torreya - short, desiccated, also in a cage. A quick photo is all I spare for this one, as the mosquitoes are especially thick as the trail trends towards the river. True to Ludlow's summary, these torreyas are on a slope going down into the muck water, surrounded by ankle-biting chiggers and colossal ferns.

There is something else prehistoric about the place besides the torreyas, and I realize it is all the needle palms, the sharp quilled, pineapple-like tree that have fan leaves that can extend out to as long as ten feet. They are short and squat, almost bushy and line each side of the trail

with their pointed quills like gaping iron maidens.

Nothing now feeds on the needle palm tree, so why the sticky armor? To ward off extinct giant ground sloths, which were once plentiful in North America. A giant ground sloth could pluck up a needle palm, de-quill it, and toss it back like a drunk would a peanut at a bar. Yet without the giant ground sloths that were hunted to extinction probably by America's first humans, the needle palms thrive, spread their leaves and crowd the other vegetation, giving the Florida panhandle a feel like the Ice Age era with a Spanish Inquisition flavor.

The small stinking cedars I've seen do not seem right amidst all this wetness, crowded by giant beech, ash, palm and short leaf pine. The stinking cedars look shrunken, emancipated, out-of-part. Everything else in Florida State Park seems so robust and deadly.

It is only until the third torreya that I think so. The third tree is enveloped in a slope where stands of hickories and magnolia and needle palms are waiting to catch me turning around too fast. I trip over Japanese climbing vine and nearly face plant a nest of quills. I have trouble finding the torreya and think of giving up. To add to my list of whines, ticks are leaping from the long grasses to my legs (in the acrobatic equivalent of a people leaping between skyscrapers), and chiggers, unseen, but felt, crawl up and bury themselves into my socks.

But at the third torreya, there is a spot when all the mosquitoes stop, and a light, I kid you not, like from a stained glass scene, beholds a twenty-foot evergreen that smells like celery and tomatoes. The mosquitos seem to vanish at once, quite uncannily. I look around for the possible answer. It's probably the sunlight, and maybe the right time of day, about ten o'clock, when a lot of insects take shelter from the heat in the morning. I can't believe the reason is that my lemon grass is just now taking affect. An unlikely reason, though the timing of it is what drives me

thinking, is the stinking cedar itself. Many trees, especially evergreens, have essential oils that are natural insect repellents. They've evolved them over the centuries in the never-ending arms race with pests. Atlas cedar, for instance, is thought to be a potent repellent that can be used on human skin.

What do we know about stinking cedar's medicinal properties? Again, not much, though they are thought to contain cortisol, a cancer-fighting agent. According to *Acupuncture Today*, a traditional Chinese medicine website (read obviously with a shaker of salt), torreya seeds are sweet and have neutral properties. They are associated with the large intestines and lungs. Because stinking cedar's cousin grows in China and Japan (*torreya grandis*) the Chinese have used torreya seeds for centuries as remedies and extend the tree's therapeutic claims to stinking cedars of North America. *Acupuncture Today* recommends gathering the seeds in winter and drying them in the sun. The seeds should be crushed, cooked and then drunk with water or eaten as a paste with honey. Torreya seeds can relax the bowls, kill intestinal parasites, relieve indigestion and drive away even hookworm, tapeworms and roundworms and other associated pests.

It certainly seems to have driven away my pests. As it is, I'm very lucky that at the point in the hike when I behold my first healthy adult stinking cedar, the mosquitoes, ticks, chiggers, and golden orb weavers disappear and give me a chance to ponder the tree.

The tree is over twenty-feet-tall as it should be in its natural habitat - an understory species that looks finally now like an understory species, but not riffled and crippled like its cousins crowded by hardwoods, not meek nor unnecessary. For the first time a stinking cedar appears to me to look in place, with a little bit of sun, but not too much, shaded by an ash, but not

pushed over. Nor does the tree here look diseased or drought stricken; this torreya tree shines, the dew on its needles like gold coins.

I stand and look it over, amazed I am beholding a living ancient it its original habitat, older than lost mammoths, more rare in the world now than diamonds.

There's something uncanny about the niche the tree fills in my view - the only conifer in my sight, its color blending with the other vibrant greens of North Florida. It's a glimpse at the past maybe that I'm looking at, a forgotten ecological circle that, for the moment, is still churning.

The Torreya Guardians would be right of course to say it's not smart to try and recreate a time that's gone, that our best bet would be to manage the tree in future habitable climates. True maybe, but Jason McLachlan's fears that moving them also gets us into the messy business of assisting the thing north permanently (along with whatever microbes are attached to its roots and maybe this newly discovered fungus as well), and the queasy responsibility we will carry forever after that.

I don't dispute the Torreya Guardians good will, that the tree may very well have floated down with the Apalachicola River in the last ice age and never went back because all the giant ground sloths and mammoths died, that the tree *could* even replace the dying Eastern hemlocks and shade the dying mountain creek fish. What I see before me is an ancient piece of arbor healthy in its habitat.

Assisted migration forgets to ask the question of belonging. Though we all move on, every molecule floats back into the river of time and spirals out with the galaxies to one day end up floating cold in a lifeless but ever-expanding universe. But *for the time*, where does something

belong? If we see the universe as one great ongoing conversation, what are we doing if we interrupt?

I realize this question circumvents overall human-induced migration. Climate change has forced thousands of species to go ahead and move all over the world. One torreya will neither make nor end that. But it's at the small scale that people actually function, while conceptualizing the large. What if the Guardians become a kind of model or an excuse for folks to start moving *anything*? The fear I have is that we lack the humility to know that on the largest scale every direction, every turn, every step leads to an unpredictable and unimaginable possible future. But we decide those futures now, with one seed planted in this one space and time.

I continue on my walk, and I wish I could say that the other two torreyas I see in the wild are as healthy, growing freely and uncaged as this traffic pole-sized third torreya (just as I wish I could say the mosquitoes and ticks and orb weavers continue to leave me along, but I can't).

Of the last two stinking cedars I see, one is 12-feet tall and, though bustling, is a drab olive color and wilting. A fungus has lassoed its base near the soil. The last torreya is out in the full sun in a hardwood forest, not on a slope, but by a little ditch covered in leaf litter that looked rife with rattlesnakes. I do not venture out, but I do spy with my camera's zoom a metal tag on a band wrapped around its withered trunk with the number 417. Just like the Guardian's torreyas, this one has been labeled and named, only with the dull, less flashy, more pragmatic auspices of Florida State Parks regulation, who doesn't name trees after its heroes.

Hiking back, I find the gopher wood/Garden of Eden connection an unending curiosity. Not that I believe in Calloway's arguments. I don't believe in any one garden - like most bible

stories it’s a parable, this one of lost childhood innocence and sexual maturity. But to imagine the stinking cedar as gopher wood, the very same lumber that laid the planks for two of every animal in the great floating menagerie of Genesis, the stinking cedar creaking under horse hooves, collecting elephant dung, white tiger's sharpening their claws, and snow monkey piss, which the cedar would absorb without rotting. I imagine Noah getting drunk on a deck made from its bows and his son catching him in the buff, crashed out on a cedar plank, of a seed-bearing dove perching on a sanded torreya branch, torreya pens, torreya rudder, torreya pales, torreya bow and torreya stern. The great oceanic assisted migration and rather than us carrying torreya anywhere it was the stinking cedar carrying everything to the edge of the rainbow, the divine promise of life.

CHAPTER 3

THE MIRICLE VINE

Florida loves its trees. Go to Tallahassee and witness the roads divided around oaks that locals refused to uproot, named like pets. See the canopied streets and the two-lane highways that should really be four or six or eight, but that would necessitate chain-sawing a cumulative millions of years of life - cypress and pines and magnolias that drape their agile arms over the snaky roads, dripping their history the way a mother covers her child in the wisps of a night gown.

"We're all tree huggers," the old woman sitting next to me on the plane to Florida said when I looked out the window and saw a sea of green.

At the 1876 American Centennial in Philadelphia, the first World's fair held in the United States, Alexander Graham Bell revealed his telephone to the public. The company Remington revealed its typewriter, Heinz its ketchup, and Hines its root beer. But according to the *American History* journal, the exhibit that drew the most aaaahs was a garden display of a fast growing, grape-smelling, strong-rooted, withstander-of-frost, Japanese vine. With leaves the width of an

oversized human palm, the evergreen vine produced conical clusters of violet flowers, and could take seed anywhere, even where soils were eroding.

It was both beautiful and thought practical, fragrant but not intrusively so. The Japanese promoted it as "the wonder vine." Crowds thought the fragrance was "divine," the flowers “beautiful to behold.” And the Japanese also said it was "tasty."

Later at another exhibit at the Chicago World's Fair in 1894, Charles and Lillie Pleas of Chipley, Florida took notice that not only was the vine edible, beautiful and fragrant, but grew fast and could, they thought, reverse the trend in the South of erosion, as well as feed starving livestock. It had the nutrition of alfalfa. The stamina of timothy grass.

They planted some in Florida. They let the vines curl up on their porch.

Kudzu has now spread to 32 states.

Nicknamed Cuss You. The foot-a-minute-vine. The foot-a-night vine (sometimes accurate). “Kuzu” (in Japanese). The vine that ate the South. The vine that ate Georgia. The fuck-you vine. The vine that engulfed someone’s parked car. And covered his grandmother's house. That has crawled as far north as Maine, leap-frogged the Rockies and lives in Oregon and Washington. That in 2009 it was spotted in Canada. A vine that actually thrives off certain herbicides. That does have an effective deterrent that costs $300 a quart and can fatally poison people who drink its run-off in streams. The vine kills trees not by constriction or choking, but by wrapping them up, mummifying and shutting out the light.

The vine has a tap root that can sink six-feet deep and can weigh 400 pounds.

The U.S. Department of Agriculture spends $6 million controlling kudzu and said recently that control would no longer be "economically feasible." This from the government that built the Panama Canal and landed men on the moon.

That may be how much the government *spends* on the vine, but in terms of costs - up to $50 million a year, including agriculture loss. If factored over the years since it was officially delisted as a recommended plant, Kudzu has cost America more than the entire Human Genome Project.

It has covered 12,000 square miles, or the surface of Russia's Lake Baikal, and adds 200 square miles to this total every year. *Time Magazine* recently called the introduction of kudzu one of the hundred worst ideas of the 20th century along with the *Titanic*, Prohibition, telemarketing, DDT, asbestos and the Jerry Springer Show.

Kudzu is even possibly contributing to Global warming. As a legume, like a pea, kudzu sucks nitrogen out of the air and puts it in the soil. Normally a good thing. But too much nitrogen leads to nitrous oxide, which is the same stuff that comes with car exhaust and is what causes all those smoggy days in L.A. and Beijing. Like sea ice melting, kudzu itself is a feedback loop. Both assisted by climate change and offering assistance, it can grow farther north because the temperatures are lower, leap across mountains, and grow longer into the year, and in kind, it sends more poisonous fumes into the air. And while, peas do this too, like many other things, kudzu seems to do this better, faster, fitter and longer.

Apart from erosion control, Kudzu does has a variety of uses.

It can be dried, its leaves woven into baskets, napkin holders, flower pots and a host of other household flotsam. Some even use it for hats, minor skin cut sealers and, when woven together, as Southern Christmas trees.

Apparently cows love it. Sheep munch on the leaves as do goats. One day soon, resident insects and pests may learn the taste of the invasive as others are learning the nutritional value of multi-floral rose, another exotic.

You can make soap with kudzu. And medicines. Scientists at Harvard think they may have stumbled on a drug made from kudzu that could cure alcoholism: the taste for drink may be abated with a taste for kudzu. The Chinese use kudzu for cardiovascular diseases. In Japan kudzu tea has long seeped and drunk for muscle aches, allergies and asthma.

It is also edible: fried, stir-fried, dried and seasoned. There are many ways. The plant is nutritious after all. Nine percent protein. The Japanese tend to dry and grind it up and use it as a form of gelatin that they call *zeri.* My Japanese friends react in approximately the same mixture of bemusement, shock, horror and shame when I tell them about kudzu in America. They cannot believe that the vine, which grows innocuously throughout their country and used in desserts associated so closely with childhood, would have taken America by throat and squeezed the life out of seven million of its acres.

In the early twentieth century an ad in *Good Housekeeping* ran: "This is the most remarkable hardy climbing vine of the age, and one that should be planted by everyone desiring a dense shade. It flourishes where nothing else will grow, in the best or poorest soil, and owing to is hardy nature, requires little or no care."

From "Kudzu," by James Dickey: “Japan invades. Far Eastern vines / Run from the clay banks they are / Supposed to keep from eroding... / In Georgia, the legend says / That you must close your windows / At night to keep it out of the house. / The glass is tinged with green, even so.”

The Quaker couple Pleas, who’d seen kudzu in Chicago, began cultivating the Japanese vine in Chipley, just an hour east of Tallahassee. They sold seedlings through the mail, and because of their promises the post office investigated the Pleas for fraud. But when authorities visited and saw the thirty-five acres of kudzu on formerly eroded crop fields and the Pleas’s goats and cattle munching and bleating and the soil intact, and vines creeping up the porch (a habit that earned kudzu the name “front porch vine”) they dropped the charges.

The Central Georgia Railroad bought thousands of kudzus from the Pleases’ mail order catalogue and gave them to farmers to fire up a hay-hauling trade.

1935. This was The Depression. Soil erosion was ruled a "national menace" by the Soil Conservation Service. The *New York Times* called erosion a “dragon.” Eroded hills floated over Capitol Hill in Washington D.C. covering Senators’ cars. Farmers literally choked to death on their own fields. Soil covered windows, got in the pipes, spoiled drinking water. Made it impossible for anything to grow. To live.

From 1935 to 1945 kudzu acres jumped from 10,000 to 500,000.

It was not as if soil chuckled deeply over the misfortune of sod-busting working men. It was not as if kudzu had a laugh. They were simply responding, a chain reaction in a series that began with tiling, uprooting, chopping, de-populating and deforesting the native floral, and

flushing those nutrients into quick crops and then leaving the ground a blank slate, the geometric shapes once made up of trees and flowers and grasses now chalk dust, the window of the Atlantic left wide open.

The worst of the problem was out West, In Texas, Kansas and Oklahoma, but crops were failing all over. Southerners were going belly up. Land was covered in a dryness that settled over the people like a fog.

Until kudzu.

Channing Cope of Georgia was kudzu's champion. A self-proclaimed front porch farmer, Cope was formerly a seaman, press agent and lawyer. In 1927 he bought a run-down farm of 700 acres. Called it Yellow Farm. The land was so ravaged and infertile that the county agent who surveyed it with him, said Cope "would perish to death" trying to make a living from it, a statement made no less intuitive by its redundancy.

Trying to find something to feed his starving cattle, Cope landed on kudzu. Planted till he could plant no more. Cope thought it possible for farming to be easy. With a telescope and electronic switches to open cattle pens, a "farmer" could run his land from an easy chair. Kudzu's uninhibited growth made this front-porch corralling possible.

Then he blared about it on his weekly radio show, for which he was probably sometimes drunk, but humorous, a "people's person," spoke clearly if somewhat informally, flamboyantly - A Rush Limbaugh for the Depression. He was also the editor of the Atlanta Constitution with a circulation of almost 200,000, one of the South's best-known and influential newspaper stars. His daily column was called "Channing Cope's Almanac," for which he wrote about the ills of

alcoholism (ironically), barber shop quartets, his dead dog "Mr. Burns" and other assorted Southern paraphernalia.

He became known as the "Kudzu King" or the “Kudzu Kid” as *Time Magazine* dubbed him in a 1949 profile (also calling him “fat”). Cope Started the Kudzu Club of America. Got 20,000 members by 1943. His goal was to plant 8 million acres of the vine across the South, especially in Georgia. The club met annually, had contests to see who could plant the most kudzu. Each year they elected a bright, beautiful Kudzu Queen, Cope’s counterpart.

Soil erosion was more than just an economic problem for Cope, it was a "national menace" he wrote, and it wasn't just about soil. Soil was a symbol; "It’s children's shoes and cloths and school books, it’s the labor of the past and the hopes of the future… Soil erosion is not merely topsoil being moved off the land. It is school erosion, church erosion, and family erosion. Everyone is affected."

He taught others to plant the vine to combat a "demon" and meant it literally. "Evil," and "spiteful" he said of erosion. Kudzu he called "the miracle vine," and “God’s indulgence.”

Cope wrote, "The South believes the Almighty had its cottoned-out gullies and hillsides in mind when He designed the wonder crop, Kudzu."

Cope hosted officials from many branches of the government and foreign officials from as far away as China (who could have just as well hopped on a two-day ferry to Japan were it not for World War II breaking out). Cope encouraged, even financially provided for the planting of kudzu on Southerners' land.

His biggest means of dissemination was the weekly radio broadcast from the creaky floors and big swing bench of his Yellow Farm. Called the "Front Porch Farmer" show, Cope eloquently, humorously and voraciously championed kudzu, every week on Wednesday at 4:30. If that weren't enough his editorials in Atlanta's newspapers were reprinted in *Business Week, Gentleman Farmer* and *Reader's Digest*. He became Georgia's "Conservation Man of the Year" in 1945. The same year he and his wife answered 3,000 fan letters on farming.

He also finished a book, sold 80,000 copies, the number one nonfiction book in Atlanta. Not bad for the Depression. Not bad for a man who routinely spiked his coffee. In the *Front Porch Farmer*, Cope advocated the year-round raising of kudzu.

By the beginning of World War II a hundred million kudzu plants were grown in American nurseries. Half a million acres were cultivated on farms. Kudzu helped tackle unemployment. FDR's Civilian Conservation corps planted kudzu vines on road banks and public lands. The Soil Conservation Service employed thousands shipping some hundred million plants. Official kudzu campaigns were approved and bulletins, posters and other competing radio talk show hosts blared the benefits of the "miracle vine." The Department of Agriculture paid farmers eight dollars an acre to plant kudzu during the Depression. If someone who owned forty acres of kudzu received that money in today’s dollars, she would have a full set of IKEA living room furniture at the end of every year.

The really chilling fact is that Cope *knew* kudzu was invasive.

He received mail every month from people asking him not how to plant it (though there were those) but how *to get rid of it*. People didn’t like the vine crawling on their porches, snaking

up telephone poles, sneaking in their windows like a burglar. People accosted him on the street. “We loath kudzu,” they said.

But this was not the time for weak stomachs. The entire ground was disappearing from beneath them. "Our position,” Cope wrote in *Front Porch Farmer*, “is in some respects like that of the physician who discovers that his patient is suffering from a malignant fever, say malaria. He does not prescribe warm baths and massage and manicures and hairdos and soft music. He produces his arsenic and quinine and atabrine and his frightening hypodermic needle and goes to work. He fights fire with fire. He meets a specific disease with a specific cure. In our work we are face to face with the task of holding, restoring, and putting into work a large part of our farm which has been washed away by carelessness and ignorance. Kudzu is our number one aid in this job. We would be idiotic to refuse its help."

"Nothing is more important,” he said, “to the nation and to you and me than holding soil and water on lands where rain falls. All else is secondary.”

Climate change was upon them, albeit in a form restricted to soil, but no less troublesome. Cope’s response was to take one thing from a place across the ocean and introduce it to improve things, just as today many people ate scampering around the world, finding new niches to shove their favorite species - polar bears to the Antarctic, Norwegian lemmings to Iceland, the Florida torreya tree to North Carolina. Our first impulse is for the quick fix, the necessary idea that because two things can come in contact with each other, we should link them, especially when pushed by the seriousness of change.

Imagine invasive species like two people vying for a job. Corporate takeovers downsize two positions into one. Among two employees, one is usually naturally superior to the other. This

is not so different from ecosystems - separated by continents or countries or even a single mountain, species can adapt over centuries and millennia to fill similar niches in two different places (imagine two software designers). Suddenly they are thrust together because one plant looks good in a garden or is edible to livestock or by sheer accident. Likewise, the two software techs are set in room together and told to duke it out - on the terms of the job. The only problem is if outside the normal ramparts of a workday a specialty job comes up that the successful specialist can't handle.

Worse is when one species can do the ecological job of dozens- as with kudzu (why have a whole catalogue publishing team when one net-savvy designer can put everything online). With its swift prodigious talent, Kudzu in human form is a corporate exec's dream - one person covering the labor of many.

Life however does not favor this model. A basketball team, likewise needs more than one Labron James. The Miami Heat like ecology works off of companionship, mutualist advantage after eons of competing and posturing.

Take out an entire starting lineup and you may have a spectacular sports star highlighting a losing season, which, in a sense is what Florida is. Of the 4,000 plants in the State of Florida 1,200 are exotic. Only Hawaii has a worse problem with invasives. Invasives take over habitat from natives, push them to the brink of extinction and threaten ecological symmetry. Ninety percent of Florida's invasive species were introduced *deliberately*, in other words because somebody though it was a good idea to tweak with the balance.

Or, that is one view of nature anyway, that life is in a balance. But recent fossil data suggest that, after all, we are all on our own. Over the years of global change, glaciers ebbing

and progressing, species have behaved more like house cats that a basketball team. They may be in one place in the here-and-now, but over millennia, watch them scatter, no roots to each other, opportunistic to the last DNA strand.

Kudzu might even support its competition, if it doesn't wipe it out first. Moving things around might actually be the bone-breaking that causes foundations to become stronger. But that is a huge "might." In the meantime, whenever we move something, take it from one place to another for a guided purpose, we share the responsibility and the consequences of that species forever-after being on the new shore to which we've brought them.

Kudzu was Cope's life, and probably also his death.

The first hiccup was Railroad managers reporting that the kudzu they'd planted on their banks had crawled across the rails and grew so thick and wound along the trestles that the mass of vines caused trains to derail.

Kudzu raced up utility poles and shorted towns' electricity.

The vines covered road signs. People didn't know which way to go.

In 1953, after kudzu grew and grew and grew and grew, the Department of Agriculture delisted Kudzu as a recommended plant for soil conservation.

By 1970 it was classified as a weed.

"There is no danger that kudzu will become a pest," a government pamphlet had stated in the 1940s.

Cope had estimated, optimistically, that in 100 years kudzu would only cover 13,000 acres.

When Cope became older, a constant alcoholic, his whole life's work in front of his prodigious belly, he refused to clear out the kudzu that was spreading from his land, covering neighboring trees, crowding the roads. The vine even crept, night by night, inch-by-inch over Cope's driveway, until one day the driveway was shielded from sight. Cope was surrounded by his vines, and they began to block out the light.

With so much kudzu covering everything everywhere, teenagers took it as an opportune time to drive out to Cope's field, park and party, make love underneath the hand-like leaves. Kudzu shuts out the light. Why not our headlights and heated embraces? The moon in your eyes is like a kudzu plant tonight - so green.

Cope came to run them off. And took three steps with his water balloon frame stepping off his front porch, where he'd blared for three decades, took three steps to chase the hooligans, prevent their uncouth behavior among his plants that were there to fight the "demon" the "menace," took three steps, the alcohol kudzu could have fought later in pill form saturating his blood, thirty years of his life boiling in his brain, he who took the Faustian ecological bargain, who built the monster, took three steps and died of a massive heart attack, and fell among the leaves like hands, waiting to catch.

In 1976, the Yellow Farm's new owners found that kudzu had "devoured" the 700 acres as well as Cope's house. The vine had enveloped its owner and all of his life.

I was driving through Florida, when I passed Chipley where the Pleas had first cultivated Kudzu. I just couldn't help myself from turning off the highway. What did I expect? I was first impressed, no degradation like I'm used to in small-town America - Wal-Marted and riddled with spray-painted, boarded-up windows. There was a Piggly Wiggly grocery store, and I stopped in. And a garden shop where young football players hocked watermelons the size of small hogs. I bought one. I asked around. I walked around. People told me to visit the placard. That's what everybody said. The placard. It front of the Ag Center, they said. It was a historical marker. They didn't seem particularly ashamed.

Though when I called the Ag Center with a cell phone the man seemed defensive, "I'm sure it was cultivated in lots of other places too."

The old woman who ran the tree nursery was much more honest, "Yep, it was here, we started it all."

First I walked around some more, the trailer parks, poorer neighborhoods, where there were predictably more black people, less who knew about the miracle vine, except for a giant patch, they said, right around the corner. I'd passed it. I'd actually passed the kudzu monster on the street near the Piggly Wiggly where I'd parked.

Kudzu roams empty lots in Florida, prop up mailboxes, swims in unused pools. Sometimes an adjacent lawn will be well-mown while next over its knee-deep in kudzu

When an unmolested vine crests over a copse of trees and subjects them to mummification, the shapes the greens make are uncannily like prehistoric creatures that roamed the Florida swamps. These are called locally "kudzu monsters." There is a website dedicated to photographing the best ones.

As the writer Doug Stewart has described “kudzu monsters look as if draped in ooze "transforming the scene as completely and magically as an early-morning blizzard transforms a familiar city street.”

There was a mammoth I saw out by the Tallahassee airport. Next to an aquarium by the Forgotten Coast I found both a stego and a brachiosaurus, the brachio, with its tall, craning neck draped over a telephone line, the mouth two separate strands of vines draped on either sides, jaws about to sever the connection.

The one in Chipley by the trailer park was colossal, like one of those mansions draped for fumigation. A copse of cypress trees, I think, I couldn't tell, about three stories high. Subtropical-marine leaves, each the size of a human face with four little nubs on each one, like thumbs sticking out - going somewhere. They’d spread to the electric wires running to the trailers.

My initial thought was elation and awe, the experience one has seeing a mountain, something so large and beyond understanding. I knew the vine was crowding out natives, shading the life out of them, but I couldn’t help but feel the righteousness of the narrative arc of a science fiction novel coming to fruition - this monster created, brought over, set loose. It seems proper, I guess that’s the word, that it should be running amok and killing these things, the trees that we love.

Then I visited the sign. Hardly a tourist attraction, it hangs under the Florida state flag, shaded by an elm, off the side of the road. It says this:

Kudzu Developed Here: 1967

Kudzu, brought to this country from Asia
as an ornamental, was developed near here
in the early part of the Twentieth Century
and given to the world as a soil-saving,
high-protein forage plant by Mr. and Mrs.
C E. Pleas. The fast-growing, deep-rooted
leguminous vine has been widely grown in
the United States as a drought-resisting
erosion-controlling plant that compares with
alfalfa in pasture and hay-making values

Florida Board of Parks and Historic Memorials

Three years later, in 1970, kudzu became a weed.

The placard, I'll say again was hidden, innocuous-looking under the shade and behind the white, Washington County Agriculture Center sign that dwarfed the marker and shielded it from the road - a kind of sign you'd pass by and not read, or read half of and shrug. Put that same marker in any small town with a population under 3,000 and it would have the same effect - go unnoticed by the younger generation (a gaggle of which passed me by chewing gum and laughing), puzzled over and likely dismissed by the middle-aged and elderly.

The sign would not change laws.

It certainly wouldn't get rid of kudzu.

Still I wondered why the sign was here. Probably more than a few people wanted to kick it down, and judging by the torn up sheet metal of the base of the pole, (it looked like someone had tried to open it like a tuna can), and maybe more than a few townsmen had taken a crowbar to it.

But I actually admired Chipley for keeping that marker there - not to be proud but to come clean in some way that people tend not to want to do. We tend to shirk the responsibilities we've taken up once they become too cumbersome. Perhaps there's less here in the sign than I'm thinking, maybe it's only small town stubbornness. But even so, here was Chipley saying, if meekly, yes, here we are, we did it, we let in the thing that is eating everything.

Behind the center is a copse of live oaks, and in their leaves and limbs, like most other trees in North Florida, are the Suzy-Q lady curls of Spanish moss, handing dozens of feet. I walked around the oaks, which seemed particularly, even for Florida, covered in moss tendrils.

Spanish moss is neither a moss (it's actually in the pineapple family) nor Spanish. It's a native Florida plant used by Native Americans as long as three thousand years ago for clay houses, pottery and flame arrows. Americans used it in the early 20th century for upholstery stuffing. Bats roost in it, as do birds, and at least one species of spider occurs only within the envelopes of the moss's curls. It is also called Florida moss (though it occurs all the way down to Argentina) and grey beard and grandfather's whiskers.

Imagining the south without Spanish moss would be like imagining the west without tumble weeds - though those are actually Russian thistles imported from Siberia. Spanish moss is a scene-setter, the marking of a part of the country and culture. When you see it, you know where you are.

The same might now be said of kudzu. It seems to have taken on a distinct Southern appeal, and as one writer has suggested, asserted itself within the Southern Gothic because it swims well with the idea of something taking over, of unstoppable evil.

The other thing Spanish moss has in common with kudzu, besides tuning in well to the Southern preoccupation with darkness and growing in Chipley, is that both can kill trees. Spanish moss normally doesn't, but if left unchecked, as with kudzu, it can blind them, covering up the leaves and sealing off the sunlight, the curtains pulled down on a Southern scene.

But connect this with the myriad habitats Spanish moss has formed. Connect it with kudzu's ability to feed livestock and replenish soil with nitrates. A little while ago a small town blitzed by kudzu put on a play called "Kudzilla," in which a live-action kudzu monster works for good, not evil, and helps a boy save the town. Kudzu knitting clubs have sprung up likewise, the ubiquitous plant connecting otherwise discrete social circles.

The actual metaphor of Frankenstein, the revisionist literature poses, is not that our nature-defying creations run amok, but that once created, once assisted into this new world, we do not embrace them. We turn away. That is what makes them monsters. Maybe in this case Channing Cope is not Dr. Frankenstein by Troy's Cassandra, a tragic hero who faced the evolving, cohabiting future head on, but people stopped listening. They severed the connection.

Later I went to the Colonial Restaurant in downtown Bristol, home of kudzu, which advertised itself as "Southern Style buffet," I sat down for $6.99 a plate to fried corn bread, mashed potatoes with cream gravy, chicken-fried chicken, collard greens and iced tea with sugar.

Corn is from Meso-America. Potatoes from Peru. Chicken and tea both from China. Cows (which made the cream in the gravy) from the Fertile Crescent. The table sugar was really

sucrose, which Alexander the Great discovered when he marched into India. Collard greens are of unknown origin, but possibly from Brazil.

I ate these exotics brought here, which have invaded the local vegetation by becoming crops, all the while soaking in this Southern sense of normalcy - the white-washed walls and Lubby's style cafeteria and the Latinos doing all the dishes in the back, with the two bear skins and elk's head hanging from the ceiling and the Lion's club, or whatever it was, meeting at the long table next to mine, the over-weight European descendants, I ate and chewed knowing that at that moment, something unstoppable was lurking in the collective places where we forget to check, the basement, right underneath, atop the very oaks that shaded the restaurant. The monster still waiting to embrace.

CHAPTER 6

BUDDHA

The Tallahassee Museum in Tallahassee, Florida isn't really a Museum. It's actually a way station itself, a kind of wildlife preserve and zoo into one. There are fewer barking seals and concrete walls than inside the typical urban safari. The museum is almost entirely open air, and the wildlife pens are dirt floors bordered with cypress trees and wooden walkways. There's a ropes course for kids and zip lines for the adrenaline seeking that whip out over the palm leaves and swamp. Teenagers with holstered walkie talkies at their hips and Florida panther decals on their avocado green T-shirts patrol the grounds.

The museum's animals are almost entirely native - endangered gopher tortoises, American alligators, bobcats and otters. As I leave the entrance, I follow a map that directs me to Florida panthers and endangered red wolves. The eight-stroke icon, like Chinese calligraphy, of the panther floats above the maps at every turn.

I'm swatting two nickel-sized tiger mosquitos (which are carrying dreaded dengue fever North into Florida thanks to global warming) when on my left rise two pink and metallic teal stegosauruses. The creatures are life-size, and their creator (the world-renowned artist and Florida native Jim Gary) took the entrails of American junk cars and welded them into Jurassic

shapes and sprayed the animals with car paint into cartoonish abstractions. An oil pan serves for an armored spike, and axel for a tail, a break pad for an eye. I round a bend, and out of the entwined branches of laurel oak and long leaf pine rises the absurd neck of welded wheel-locks, a school-bus yellow brachiosaurus whose nose is nuzzling the pine cones.

Around another bed on the dirt trail, I gaze up the nostrils of a purple tyrannosaurus and pass under a netted atrium where two bald eagles clean themselves of insects on my right, and a great horned owl on my left snores. The waddle of a turkey fills the air. A hum of waking cicadas. And over a log bridge, across a moat where swims otters, a refrigerator-sized man, covered in sweat, with a foot-long beard, is holding his hand out to me.

Mike Jones is six-feet-five, with sandy blonde hair, penetrating eyes and Volkswagen-wide shoulders. He grips my hand with an American alligator bite. He's physical intimidation is undercut by his syrupy Southern drawl.

"Gud to have a native Texan here. I know you boys are more out West, but whenever I met a Texan I've always felt you were more South than most folks who are actually South. You know whatta mean?"

We slip into a slow saunter down the dusty boardwalk leading to the panthers. I don't mean to affect this, but I notice my thumbs have slipped into the belt loops of my pants.

"Now's a busy time a year," Mike says. "But when isn't? We got food shipments, cages to clean, otters that are fighting. School kids to lecture. We just put up this ropes course that cost a $100,000 hoping it will bring in more people, and so far it has. But with all those people means more work. But it's nice. While the guests scream and climb them trees, I get to play with the big cats."

Mike opens a door in the bamboo fence that's marked "Danger: restricted."

"Here Buddha, Buddha, Buddha," Mike says as he raises and closes the cat's, guillotine-like pen door. The squeal of metal on metal in the fence is ear aching, but the panther comes running across the grass with its mouth hanging open.

I take a step back from the chain link. I've never seen a big cat up close, charging at me. Were Mike to leave the guillotine up the cat could cross right through to me. But the cat stops at the fence, and I'm expecting something ferocious, maybe a leap of claws at the fence, hissing and fangs, but this panther slows at the pen door and molds his face into the dejected, puppy-dog look of learned pitifulness. Its mouth widens and he yowls, a hitch-pitched, rusty door-hinge squeak.

"There's Booty-boo, booty-boo, booty-boo." Mike says. "Good Boo Boo."

Florida panthers are generally, despite popular belief, not purple or black or dark, but a creamy tan color like most mountain lions. The difference is that at the end of their serpentine, angular belly there is a fat, ropey boa tail with a tell-tale periscope kink - the many decades-long mark of inbreeding. Florida panthers are also a little smaller than average cougars. This panther's eyes are a penetrating steel blue. Its gigantic paws could spread across an inflated basketball. As each one lands on his side of the cage it stirs a wave of thick dust.

Buddha yowls again.

In 1976 when scientists began studying the panther in earnest (the most recent study before that had been in 1935 when scientists had collected eight panthers, collections in those

days involving shotguns) the studies in the mid-70s labeled the panther as "wildlife of unknown status." This is the same label early studies gave to research trips searching for Nessie and Big Foot or to the Tasmanian wolf, which has been hunted to extinction though sightings of it still occur. Florida panther was either presumed extinct or an ongoing, local myth, a fact which both speaks well to the panther's elusiveness and reflects its rarity.

The subspecies of cougar, *puma concolor coryi*, that once resided throughout Florida and the South, its range extending all the way to East Texas, a proving ground of 1,128,000 square kilometers, has been restricted from hunting, trapping, urban sprawl and poisoning to just a paw print in Florida, two percent of its original habitat. Fifty-six million Americans now live in the land once ruled by Florida panther.

In Florida sea levels are expected to increase from one to five meters over the next hundred and fifty years. Almost all of Florida panther's current habitat is in the southern tip of the peninsula, in the low-rising Everglades and Big Cypress. Should the ocean rise one meter, twenty-nine percent of the panther's habitat will wash away. If three meters, then sixty-two percent. If five meters, ninety percent. The University of Kentucky Department of Forestry, which did the study I'm paraphrasing, went on to say, "without rapid conservation actions that establish populations to the north, we predict that the Florida panther may go extinct in the wild due to climate change effects."

There are between 100 to 160 Florida panthers left in the world. The range is due to the fact that capturing a Florida panther is not an easy task. If the cat is not collared, finding it may include reading paw prints, groups of men and dogs tracking scent, riding in handmade amphibious jeeps, traversing cottonmouth-heavy swamps and poison ivy-covered cypress,

leaving out meat and treeing a tooth and clawed predator for days (the cats can jump between trees) and eventually darting the feline.

By 1985 the first Florida panther was captured by scientists with a drugged dear carcass, confirming its existence. A stereotype developed from this first not-so ferocious female: the Florida panther was brittle, anemic, pale-faced, sunken-featured and seemingly senile. They were more like old world royalty than new world jungle monarchs. The first radio-collared animals kept dying.

But the public seized on Florida's rarest mammal. The media sensationalized the sparse data and federal and state agencies demanded of scientists more reportage, field experimentation, monitoring and cat bagging. When the Endangered Species Preservation Act was signed, Florida Panther was one of the first species listed.

Florida Panthers used to mate with other so-called subspecies of cougars, many from Texas where there is still a resident population. But they've since become isolated in a genetic bottleneck, much the same way the American Kennel Association bottlenecks its show dogs.

Parasites, hurricanes, car collisions, inbreeding, mismanagement, illegal poaching and hunting and even a diet dosed with too many heavy metals like mercury have been listed as threats to the panther's ongoing existence.

Yet so much remains unknown. How to learn about an animal that hunts and naps by stealth, that is active when our eyes are at their worst? Panthers swim in the jungle, stalk by starlight. They do not bask in open savannas like their African cousins, lazily observed by khaki-clad safarists sipping Tusker lager. They are hunted by search light, even satellites and GPS - scientists knee-deep in the Everglades' unknown.

What is known about Florida panthers is that, like all cougars, they are some of the largest wildcats in the world and the largest in America. Males can grow to be heavier and larger than great Danes and wolves. Celebrating being elected vice president, Teddy Roosevelt once shot a cougar in 1901 that weighed 227 pounds, larger than the vice president-elect himself.

Cougars are "crepuscular" meaning active in the low cobalt and blue and peach of twilight, usually when most humans are not out and about in backwoods and in swamps. While we commute home from work, panthers have risen from an afternoon catnap and commence hunting, patrolling, pissing and excreting feces all around, crossing highways and rivers.

They do not have a definitive breeding season though mostly they rear young in summer. Female mountain lions have been observed in captivity screaming for hours, off-and-on for days when in heat, giving off strong odors and dripping copious vaginal fluid. Male cat penises have barbs at the end that may aid in stimulation but may also secure a docking positing as along with the biting and scratching and rolling, puma sex can be a messy affair. Though in generally lasts for less than a minute, Florida panthers may have sex up to seventy times in a day. For a week. Before the female finally fends off the male with claws and teeth, and the two lovers part. Females then give birth alone. A good idea; males sometimes eat their young.

Other than infanticide, the cats dine almost exclusively on deer, though they stoop to have a lunch of armadillo or imported feral hogs. They will occasionally cannibalize other panthers and scavenge. There has not been one reported case of a Florida Panther attacking and killing a human being, and only twenty-one reports in the last fifty years of cougars fatally attacking people in America. Or one deadly cougar attack every 2.4 years. More people are killed every year by cigarette lighters exploding.

One problem with protecting Florida panthers is how much range they need. A Florida panther male will make constant tours of the three hundred square miles he neighborhoods. Like a patrolling Mafioso, he is sensitive about his turf. A male will produce those icepick claws and debark perimeter trees, shovel and sweep together a cairn of dirt and twigs and leaves and squat and defecate, allotting his bowl movements to totems of his territoriality. He will fight with other males; there is no square yard to spare in their dwellings the size of Liechtenstein. Adult male territories almost never overlap.

On a nightly round, a panther male will check on his water supply, the migrating deer and boar he eats, scout out an ambush tree, a den for the night and winter, a mate. Male panthers never stay put; they are as constant and as soundless as the wind. All cougars have four-toed paws with retracting claws held in a sheath of skin. True cougar tracks rarely leave claw impressions like a dog's. The panther steps its back heels in the exact spot its front paws landed to reduce the chance of a snapping swig, or rustled leaf alerting its prey or a GPS-guided human.

One radio-collared cougar male was documented swimming across the Panama Canal. Another tagged male was born in the South Dakota Badlands, migrated East through the Midwest, across the Rust Belt and over the Appalachians, eventually ended up in Connecticut where he was struck and killed by a car. The cat had walked 1500 miles, more than halfway across the continent.

It became clear to scientists in the 1980s and 90s, after two decades of jungle marching, and hanging up doped-up deer and fawning over passed-out panthers that there were actually more Florida panthers than were thought, though secretive and in hiding. Yes, highways are

disaster zones especially for the flight-of-fancy males, and yes inbreeding is common - but the only thing the panthers really, really need is space.

The Fish and Wildlife Official Florida Panther Recovery Plan, written in 1996, calls for the establishment of two additional sites within the Florida Panther's historic range as a "major objective." In a study by the University of Tennessee to determine probable sites for reintroduction, one of the better areas left, with 92.4% natural landscape, even better than the panther's current range in south Florida, is right here in the Apalachicola National Forrest outside of Tallahassee.

There are problems besides the obvious one of tagging and bagging an elusive predator of near Sasquatch status. Only eleven percent of all species reintroductions are successful. Panthers, however, rate low in every criterion that would meet success - genetic variability, stable population, low competition and access to other refuges.

Other than drugging and shipping, another solution to the panther habitat problem would be to link the disparate government lands that line the backbone of central Florida, from the Gulf of Mexico to the Okefenokee Swamp in Southern Georgia. It is one of the great North American corridor projects in discussion among scientists and government officials.

Imagine skipping stones across Florida. A stone lands in the Everglades, then in Big Cypress then Lake Okefenokee, the Green Swamp, Ocala National Park near Orlando, on up to Ocala National Forest a hundred miles West of Jacksonville and finally, with a big wet “plop” our stone lands in Okefenokee National Wildlife Refuge, a wilderness area of 400,000 acres in southern Georgia. This would be the Florida Wildlife Corridor. It wouldn’t take much more

vision to imagine a tributary leading off to the prime habitat of Torreya State Park and the Apalachicola forest.

This migration corridor would virtual span the entire state, running more than a thousand miles, connecting thousands of acres of natural habitat and ranches (Florida is one-sixth ranch land), providing hundreds of miles for the panthers to hunt, mate and steal into the night. Some monarch butterflies who overwinter in Cuba could hop more safely north to Canada too, and for any other species who might want to move north when the Everglades go under water, this would be a way to open the doors and let them wander through.

In a way, corridors are the middle ground of assisted migration although they have recently come under scrutiny because there's little documented evidence that they work. True migrations, substantial populations of species moving from point A to point B, can take years or even decades to establish. Migration corridors, even the idea of them, haven't been around long enough.

One practical aspect of corridors (in theory), is that they leave the actually transplanting of species to species. The animals and plants and insects themselves will have to do the work, to step through the hallways blazed by science and bureaucracy. It might be the best chance to leave species to mimic how they would migrate anyway were their habitable lands not squeezed to such sparse spaces. It would relieve us of the entirety of the migration burden and preserve what writer Ian Frazier has called "the mysteries running close to the surface," of species moving willfully.

Many of Florida's already in-place Ecological Greenways Network, small wildlife beltways along and around highways such as the Interstate 75 which runs the length of Florida from Miami to Georgia, could serve as part of the larger wildlife passage.

And there is even a larger vision: a 13-nation wildlife corridor from the coasts of Brazil running up through the Amazon, Columbia, Central America and petering out just at the Arizona Border. It is the most ambitious wildlife corridor to date and is in place for a single species. It is call Paseo del Jaguar, and is named after the cougar's somewhat larger (and often spotted cousin), but the corridor would be just as good for the cougar's migrations as well.

"He's a rotten animal," Mike says and runs a finger across the chain kinks just out of reach of timid Buddha's bratwurst-thick toes and kitchen-knife claws.

Across the pen, a family walks atop the wooden walkway that runs over the panther pen like a freeway. They yell down, "What's the cat's name?"

Mike looks up, stiffens almost imperceptibly, but smiles.

"Well, the long answer is there's two prevailing theories," Mike says, his hands on his wide belt, "One is to give the animal a name, but the other is that a name somehow degrades him. That it would make him somehow less animal. And you know, people have gotten in a whole lot of trouble with the way we name things, sometimes not thinking."

The crowd nods their heads and seems to understand. But it seems like a deep, abstract conjecture and I'm surprised random tourists would follow.

"Anyway," Mike goes on, "If we named him, people would be calling down his name all day long, and that might irritate him. We want the big guy relaxed."

The families laugh.

"He has a name," Mike continues, and looks down at Buddha, whose mouth is still open, mewing. "But we use that just between us."

The families seem satisfied, not their heads again and walk away.

Latter, I'll wonder as I spend an hour gazing down at him from the wooden pedestrian walkway and family after family passes by and yells down "hey kitty, kitty, kitty, kitty" and shakes the fence, if perhaps the big cat thinks he has another name anyway.

"His name is Buddha though, right?" I ask Mike softly.

He nods. "Yeah, though really I like to call him Bubba. I guess it's a southern thing. You understand."

"What's up with the naming thing? Naming things without thinking I mean?"

Mike furrows his brow, bends over, and seems genuinely puzzled, "Are you sure you're a Southerner?" He asks. Mike stares at me and blinks. "Oh right, you're Texan. The war isn't as all-present for your boys."

"Which war?" I say.

Mike leans in towards me. The feeling is like watching a rock slide.

Charles Linnaeus classified mountain lions as *felis concolor*, or cat of one color. The Latin nomenclature later changed to *puma concolor*. Though inaccurate (cougars generally have

a golden tan top and an egg-white belly) the name underscores that one of the largest distributed land mammals in the world - occupying mountains, prairies, deserts, swamps and forests from Argentina to the Yukon - *puma concolor* is all one animal.

Buddha having multiple names would be in keeping with Buddha the panther, Buddha the puma, catamount, mountain lion, mountain cat, cougar, caterwaul. All names for the same exact animal. In fact no other species has so many common names for the same thing in one language. When the early Dutch landed they reported "lions" in Florida. When the Spanish colonized Florida they gave cat the Greek name "panther" for what they thought of as "leopard," as that was the only sleek, muscular cat they were familiar with without stripes. Some people report seeing "cheetahs" in Florida. Others ghosts. Others tigers and Sasquatch.

The cat's many names fits in with Buddha's namesake, which is short for Gautama Buddha, which is short for Siddhartha Gautama Buddha otherwise known as P. Sammasambuddha or S. Samyaksambuddha or the Awakened One or the Enlightened One, or the Peaceful Enlightened One, or the Supreme Buddha or Sage of the Sakywas or Sakayamunia or one of 28 Buddhas or, for Hindus, the 9th of ten Dashavataras of Vishnu.

There are over a two dozen subspecies names for the large species of cat that roams from Tierra del Fuego to the Arctic Circle and almost everywhere else in between. However, scientists in just the last decade, after numerous DNA samples were taken, discovered that each cat, from South to North America could breed with any other. And that technically, taxonomically, made all of the cats, with all these different names, the same thing.

Florida panthers are of course one modern variation, one of the 24 names for the same creature that presses and spreads its jaws against the chain link in front of me, crying, pawing the earth and begging for a cow leg.

But don't tell Floridians. They've spent almost one billion dollars trying to save the predator feline they have come to know as “Florida panther.” Perhaps no more has been done for a single cat: thousands of acres bought and set aside for the Florida Panther Wildlife Refuge, inoculations for kittens, captive breeding, construction of panther highway corridors (a bit of assisted migration) so the cats can slink under busy roadways, fences, steep fines for killing, public protocols to reduce metal poisoning. Injured cats have even been medically evacuated by helicopter.

In 1995, Floridians initiated a captive breeding program, tranquilizing and shipping eight Texas female cougars to the swamps of the Big Cypress National Reserve where the last few Florida panthers remained. The Texas cat was thought to be the closest living relative to the Florida panther. That even though the animals are genetically almost the same, are the same species and can all breed, and even though bringing in different cougars would probably be more stable because they would be larger and less inbred, there was something Floridian in the panther that the locals wanted, something undefined, something that went beyond just the necessities of biological preservation and conservation.

We have not always been so kind to pumas like the Florida panther. Massachusetts Puritans offered five shillings per cougar corpse in the 1600s. In Connecticut you could get twenty shillings per lion head. Jesuit priests in Baja California, citing threats to livestock, were a little more spendy - one adult bull for every cougar killed.

Predator control roundups in Pennsylvania in the 1700s consisted of setting fires and dogs and men to the perimeter of a thirty-mile-square circle and driving the mountain lions towards the middle where they were shot. On one night in 1760, 41 cougars were dispatched along with an additional an unplanned for 17 black bears, 112 foxes and 109 wolves. Before the final ambush the thirty American settlers perpetrating the diabolical hunt found a crowded circle of flame around growling, yelping, clawing, nipping predators in a make-shift, hellish zoo. The cougar males must have fought. The settlers must have stood in shock before opening fire.

By 1876 Massachusetts, Kentucky, New Jersey, Pennsylvania, Virginia, Indiana, and Rhode Island were without the big cats. New York, Vermont and North Carolina soon followed. By the twentieth century cougars were entirely extirpated from the Eastern United States.

Except, that is, for the lone exception, the modern exception, the Florida panther. Which though reduced to less than fourteen dozen individuals, was able to hide out in the Florida swamp for a hard-lived one hundred years.

There are two Florida panthers in the Tallahassee museum, Buddha and a pure-Floridian wildcat female. She stalks us from the folds of mesquite grass and keeps her eyes, on our fleshy, primate bodies as we raise the pen's door, and rub our loose clothing against the fence that has holes big enough for her kitchen-knife claws. Her eyes though are that shade of green I have always loved, mixed with a hazel oval of pure sunlight, a tint of egg yolk yellow, bright and glittery like sharp steel.

"Does she always do that?"

"Do what?"

"Watch you like you're an injured gazelle?"

Mike bends over to look at the lion. She is thirty feet away, shoulders tense and lying almost unseen in the bare dirt and cypress bark. He gets up and laughs.

"That still sends shivers up and down my spine," he says. "But yeah, that's just how she is. She was wild since day one. Not mean, just aggressive and really, honestly, more panther I guess, than this other one," he directs a thumb towards Buddha, who's till pacing the inside of the fence, leaning against the diamond links, tuffs of his fur and then a roll of the loose flesh of his teeth, leaking out. When the jaws are exposed, a canine catches on the steel. Buddha stops, looks at the cage like a chew toy. His whiskers arch above his freckled nose and drop to the level of his jaw. His ears are ruffled, but firm, muscular. The arc of his back is like a rhinoceros's, lumpy and pale, but when he turns I see the impression of thick muscle and riveted spine. His legs are angular, aerobic. They sit on top of his paws like a ballet trophy on a base of marble. He has to make an extra effort to pick each paw up otherwise it will drag in the ground. He yowls, cries, and makes a noise like someone opening a jar of pickles for the first time.

"He's a good cat," Mike says, "You can tell he's more personable. But that one," he says "and points to the female, whose rock-like head raises almost imperceptibly and her pupils dilate to tiny bull's eyes, "has been here eight years, we've fed her every day, tranquilized her for shots, fixed her, doctored her, but when you look into her eyes you just have to know that there's nothing more she'd like to do then sink a fang in you."

He laughs again. "But you gotta know that's just nature. There's nothing offensive about it. Like I said, she's just the real deal. A real Florida panther. If you like working with predators you have to get used to the idea that you're helping things that really just want to eat you."

We walk away from the pens, Buddha still walking back and forth, howling, the female still staring. Mike clears a space for me on an old couch against the wall in his office. I'm surrounded by predators. Canines of all kinds, Florida panthers, lions, sharks, grizzly bears (which are actually more vegetarian than predator) photos and still life sketches, masks, charcoals, inks, and even cross-stitchings.

Mike’s been at the Tallahassee Museum since 1972, but before that he helped relocate the last surviving red wolves back to their home territory on the East coast of North Carolina. He's currently actively concerned about the future of Florida panther, whose habitat, if the Gulf of Mexico inundates south Florida and Everglades, like models expect it to in the next hundred years, will consist entirely of the Tallahassee Museum.

"It's a bad deal," he says and wipes the sweat from his brow with a hand towel I see has a Florida panther on it. "There's no proposed relocation. No designated removal site. None that have actively been sought out to my knowledge. We're all so focused on keeping the panther alive down there that we're not thinking about a few years when waves are going to be crashing on the panthers."

I stare at a picture of a Florida panther's body sprawled out on what looks like an operating table atop Mike's paper-blitzed desk. In the photo, Mike has taken the cat's tail and is using it to tickle the ear of a surgeon in a hospital mask, operating.

"One thing to do would be to look right around here, in the Apalachicola. You know they used to live here, and some people say they still see them. Sometimes people call me, wanting me to come *remove* them as if I was animal control.

“But I don't believe most people that see them. One woman, a wildlife biologist who I do believe, knotted her description down to the kink in its tail, so I'd say there's been at least one up here."

He leans back, his chair squeaks like Buddha begging for a treat. He laughs again. Has been laughing constantly in fact.

"Did I tell you yet about the cat they found over by Gainesville? Well, they tranquilized this cat they found and figured it for a cougar that had migrated all the way from Texas because, that was, of course they thought, the closest place it could have come from. And in their defense male panthers migrate thousands of miles sometimes like the one that went from the Badlands to Connecticut. Anyway, they loaded up and shipped this cat to Texas, and it was only when they got there that some bureaucrat was like, 'wait you dummies, that was a Florida cat!' So they loaded the thing back up and shipped him back and put him in a zoo. Poor animal was tranquilized for a week."

A big redhead named Suzy comes in the office and picks up the phone when it rings. She's about 25, built like a power lifter. She talks loudly, setting the phone down with a slam, glancing our way. She picks up a binder full of loose sheets, walks away. Comes back in and drops it on Mike's desk, with a ripple of file folders.

It's time to move the otters, she says when Mike swivels around and answers a different land line. A load of hay for the mules is ready at the old farm. A woman calls on the other line

from the invasive species council who's coming to pick up some African turtles that somebody dropped on the museum's door stop like a turned-over infant. And it's time to feed the venomous snakes, Suzy says.

“Suzy’s a yank,” Mike whispers when she’s out of ear shot.

The venomous snakes are the most urgent, Suzy says when she comes back in. She leaves and stalks back four times in the thirty minutes Mike and I talk. Mike ruminates for a bit on the red wolves he helped move in North Carolina. He tells me about how he helped vasectomize hybrid mongrels of wolf and coyote.

"Wolf-oats" he calls them.

This created a genetic buffer between the introduced red wolves and their coyote cousins so each would have sex with the vasectomized mongrels but not with each other.

Mike talks about snow white African egrets (I haven’t even asked a question yet) that blew into Florida on a freak Atlantic hurricane, and since the dainty birds were used to wetlands found residence in perpetually moist, though manure-laden, grazing fields, and are now locally referred to as "cattle egrets."

He rambles back to Buddha, the Florida panther, who'd been given a calcium deficient diet at his previous wildlife refuge and broken his right front leg between the planks of a stage before a public show.

Mike and a local veterinarian operated on Buddha and took out a globular of stomach fat and shipped it overnight to the StemVet clinic in California. There, within two days, Stemvet grew thirty-four million Buddha cells and shipped eight million back to Florida. Twenty-six

million cells were kept in in California in cold storage. The shipped cells were injected into Buddha's leg, where they grew and reincarnated the lost tissue.

The Buddha that Mike knows resides on two coasts. If he dies, twenty-six million pieces of him will be available in California.

Suzy comes back in, leans over and puts her hand on Mike's desk, crosses her legs at the heels, her big, pale, Norwegian calves bulging like dumbbells under her shorts and she's drumming her fingers on the desk and looks at me like a predator.

The cottonmouth is one of the most poisonous snakes in North America, or so I read on a placard that adorns its glass box cage, the back of which Mike unlocks with one of the five dozen keys he has clipped to his belt. We're in a dimly lit room like a janitor's closet, behind the glass displays that face the Museum's entrance. The locks are ordinary master locks, attached to particle board. Suzy tries to lure the cottonmouth into a rubber tube with an owl pellet-mash meatball. Mike’s goal is to clamp the snake down.

But Mike strikes too soon. Using steel claws like some incapacitated people use to grab books off a shelf, he shoves the end of the claw into the human thigh-thick reptile. But it recoils tensely, retreating and then shuffling sideways and then forward to meet its aggressor. A single mass of muscle backing quickly from Suzy’s tube and towards the opening where Mike and I stand. Mike quickly shuts the pen. The snake snaps at the space just below where Mike’s hand closes the flip door. The Master locks rattle next to my chest.

"You know though," Mike says, "I kind of like it when they do that."

Suzy looks him a glance of sheer fury. "Do what?" I ask.

"When animals face up to us. I mean they lose so often. It's so neat to see them stand their ground, stand up to us and be wild. In this case I want to win, obviously. But nature loses so much, all the time."

"This time," Suzy says, holding a tube of water to slide into the cage. "Why don't you hold nature down and I'll slide this in, and it can clean itself?"

She looks at me and smiles for the first time. "This is the worst part of my job," she says.

Mike opens the pen slowly. Immediately the cottonmouth strikes the door again below his fist, but Mike reaches in with the tongs and clips the snake behind the neck and forces him to the bottom of the cage. The cottonmouth's tongue shakes and tastes the human sweat-filled air, the ropey, muscular drive of its lightning-bolt shaped coil looking to either melt or spring.

Suzy deftly sets the kitty litter tub of water in her hands just inches away from the squirming tap-root. She leans out and tosses in the owl pellet. Mike closes the particle board door. The snake ignores the meatball and strikes, a hammer-like thunk issuing as the head makes contact with the wood.

"That's what we get the big bucks for!" Mike yells and laughs and wraps a beefy paw around Suzy's shoulder. She squirms away. Suzy is an intern.

"That's the worst part, but what's your favorite part of the job?" I ask her.

She stares at me. "You're not from here are you?"

"He's Texan," Mike explains.

Suzy shrugs. "There's really nowhere else to work with a Florida panther. Nowhere else in the world. So not only is it my favorite, but it's really why I work here. I came down from

New York for this. I just feed the snakes I guess because, you have to take *nature*," she turns around and punches Mike in the shoulder. "-in all its forms."

“She’s still a yank though.” Mike says and pats her shoulder.

Later Mike is lecturing a man outside, talking to him about the cottonmouths and pit vipers (called so for a scent gland pit in between their eyes that can detect heat). It's clear Suzy's annoyed with him for *moseying*. Suzy, of course, is the bustle and buzz that’s traveled down with her and she's still on Manhattan time, getting things done when they need to, working hard and stopping little, one thing after another. But she's not unkind, just *stuck* in her ways of speed, of migrating fast, from one point, one task to the next. She quickly moves on, mop and bucket in hand, a polite "nice to meet you" and a wave.

Mike and I spend an hour, no less, saying goodbye. We shake hands twice, exchange phone numbers, first him to me and then me to him, just in case, he says. We walk away slow.

Meantime, in the sand, he brushes away leaves and explains to me how sink holes work, which happen a lot down here in all the humidity, sweat pouring down his neck, kneeling. He draws a circle the represents a water table with a line above it to represent land. "When the water pressure goes away," he says and erases the circle with his palm. "The land dries up that was on top of it, and gradual sinks down into it."

Florida’s population is projected to Double to thirty-six million by 2060. This gets to be a problem because as more people move or are born into Florida they will likely pump out more ground water for human consumption. The pressure will withdraw and the ground will collapse around Floridians. Sink hole insurance claims, for instance, have tripled since 2006.

There is a similar problem in population for Florida panther. More people equal more pressure to develop rural or wild spaces into roads, houses, schools, malls and subdivisions. The Florida Panther is expected to lose, on top of global warming, another 300,000 acres of habitat.

Mike gets up. "We had a sink hole at the museum a few years ago nearby that was 500 feet wide. A little after that, one opened up underneath a Porsche dealership a few towns over. Swallowed 'er right up." He laughs, whiskers shaking. He dusts his knees and belly off.

"There's another victory for nature," he says.

Later I pass the red wolves on the way to see the Florida panthers. Pass alligators and tree-scrapping black bear. I notice in both the bear and panther pens there is a hanging moat of wire to prevent the cats and bears from climbing too high on trees close to the ten-foot-high walkway that spans them. I also pass more carburetor dinosaurs and read a plaque that explains the Jim Gary's artist's statement.

Gary once took these dinosaurs on the road (and the ocean), traveling from his studio in New Jersey to Los Angeles, his native state of Florida and as far away as Tokyo. He turned the American gas-guzzlers from the 50s, 60s and 70s into prehistoric skeletons, as an ironic comment about American consumerism, (ironic given that it's Triassic creatures that now power our automobiles), a reminder of the wildness now in our gas tanks. After Gary died in 2006 of a cerebral hemorrhage, the exhibit found a permanent home here, among the Spanish moss and ancient ferns. On the Tallahassee Museum website, someone has written, "the long-term exhibit

will create a perfect model for blending history, creativity, art and recycling." Art and human and wild together in a museum that is really a sanctuary of the panther's future.

I go to see Buddha, and he is relaxing languidly in a barrel that has been propped up on old crates for him to climb in and catch some of the breezes off the ground. His huge paws hang over the size like apples dropping out of the barrel.

A family of five comes by snapping pictures of lazy Buddha and munching away. One son though, the smallest, goes running down the blanks of the boardwalk overlooking the panther pen, and Buddha sits up in excitement. His eyes dart toward the child. His claws extend and dig ever so slightly into the barrel's wood. The periscope tail twitches.

It is a chilling sight, but I'm not sure the family notices. The mother yells to her child. "Samson, don't go running like that," but the other kids are busy yelling "kitty, kitty, kitty" and banging on the hand rails that span the boardwalk. Their noise is so incessant, that I'm on the brink of saying something when the father yells "whoh!" and jumps in the air.

There's a hush from the rest of the family followed by gasps as they crowd around a spot in the fence. They get really quiet until one child screams in excitement and the mother takes another picture.

The father looks up and shakes his head, rolling his eyes in what looks like disgust, but I think he's shivering.

When they leave I go over to look, and find eventually what I am expecting is there. But it takes me a full ten minutes. I scan the palm leaves and dust and ash leaves, give up, look at

some panther displays. They are set behind plastic cases beneath a yellow panther crossing sign nailed to a tree at the border of the panther pen.

Then I look down. I discover two eyes. The feeling is like looking down the barrel of a gun behind bullet-proof glass. There is the inward conversation of absolute safety. A tail is twitching. The eyes don't move. I imagine, though I don't know, that she's been staring at me the entire time I've been on the gang planks. Her body is deftly hidden in a crock of mesquite bushes, whose shadows concealed hers (and made me respect the family for finding her so quick). The wild cat, I realize, has been waiting beneath the yellow crossing sign the whole time.

CHAPTER 5

RABBITS AND CONVICTS

When I first began gardening, I had no idea I'd come to love everything in its place. This was before removing trash bags of weeds that I'd dug by hand, getting up to my knees in mud, chiggers, and mosquitos, and having my first tomato plants die and watching my three strawberry bushes produce exactly one fruit. I just wanted some fruits and vegetables, and I also liked the work and getting outdoors. I didn't go fishing or play golf or go surfing. And I had some spare time and I was living in a different country (central, mountainous, Japan) and wanted to make a home for myself. I was living in an apartment that was furnished and filled with appliances and silverware that I didn't choose. I worked in a job where I barely spoke the language with a people whose inner lives I could barely ascertain.

I came to enjoy transplanting the most. Taking an eggplant or green pepper from its plastic egg-carton cradle to the loose soil I'd unearthed. I admired the nerve endings of roots wrapped around the tight dirt brick and the fertilizer chips that would dribble to the ground like Styrofoam. I loved the idea of holding a life in my palm. It was a life that depended on my moving it from one place to another. I'd fix the plant in my garden on a bed of autumn leaf compost, water it, then let the plant soak up the sun and release its roots. I'd line up my vegetables like solders at formation, creating long, elevated rows so the water could pool

between their stems. I used to take the little card-stock labels, like tiny picket signs, and put them next to their plant's stems. Often with the herbs, I'd confuse them - peppermint for thyme, basil for oregano, especially when they were small - but would put out a sign anyway, a little label at its roots just so I could give the new plant a name. Names seemed right to me.

It wasn't so bad if I couldn't control much of life at work or in the grocery store; I could come back home, grab a spade and work a little in my own world.

I did of course have a rabbit problem. Everyone did. They came at night, or in the misty mornings, when the golden light crested the mountains around our valley. There are a few species of rabbits endemic to Japan, but I don't think those were the ones I or my neighbors would catch numbing on our leaves and digging among our tomatoes. I believe these hares were just garden-variety intruders, the kind I would later see in Iowa, the kind I saw back home in North Texas. In the suburbs of Lubbock, a mid-size desert city, rabbits were the natives, and it was suburban sprawl that brought my parents' house within walking distance of their warrens. In Japan, it could have been the case that the rabbits were the natives, I don't know. But I think it's also possible that these rabbits were the European variety, what people think of as English hares. They have been carried by wayfaring British all across the world.

What most people don't know is in fact rabbits are not native to the Old Country. They come from south Europe, imported to England sometime around the twelfth century for meat. But they've been there so long, people have come to accept them as native, and indeed, the hopping proliferators have no inkling of not belonging. They're seen as a staple of the English country side, even relied upon now, despite certain controls, for their ability to eat back sprawling invasive vegetation.

Rabbits were such a part of English life that when the first colonists came to Australia they brought rabbits, though not the kind that would later go feral and fan out across the Australian countryside. Thomas Austin is the man who history has hung out to dry for that mistake. People, in their shorthand, tend to highlight villains because it makes the world's story easier to absorb. But Austin was just one Englishman, one person, in a long line who had been trying to acclimatize rabbits and all matter of other creatures including themselves to their new home. I point them out because I think they're emblematic for how we frame our identities as biological and social creatures in the world. My experiences in Japan fertilize me with an understanding of what it's like to be a naive human abroad in the world.

There were two reasons the first European Australians wanted rabbits:

Even today, reports historian Robert Hughes, there is something of an urge on Australia's part to throw off of the "Stain" of convict heritage. But stains aside, the first European colony, what's known in Australian lore as the "First Fleet," was a hodgepodge of eleven ships filled with petty law-breakers serving out their sentences along with their captors, a couple hundred British Marines. What rabbits have to do with convicts is that - as is true of the world's multitudes caught in crime - the convicts came from poorer quarters, and a staple of their diet for the last seven hundred years had been rabbit meat.

The second reason is that despite the fact that almost a thousand people were starting their lives anew on this sixth continent in the First Fleet, they knew almost nothing about it. Most

of what they thought they knew was all wrong. And like me moving to a new country, they had wanted a taste of the familiar.

When I came to Japan I had no lasting interest in the culture. This is not to say I had a *disinterest* only that for me, the country held my curiosity as much as Norway or Venezuela or South Africa. My coming was a lark, a job offering and a recommendation from a teacher that I should go. So I went, thinking I'd be trapped in some concrete jungle with towering neon signs and comic books and vending machines on every corner that sold used school-girl panties. I was a nature lover, a former backpacking guide, and was not only surprised, but awed that my job took me to a village of 900 in the central Honshu mountains, a town with a river running through the middle. I didn't even know Japan had mountains. I'd also been told I wouldn't need to know Japanese, but this turned out to be a gross exaggeration. Only one person in the whole town spoke English. If I wanted any friends, or to ask about my mail, or shop for groceries, I'd need to learn the local ways.

In 18th century Britain, where the whole world barely extended past one Englishman's hamlet, *terra australi*s was as off the map as a distant Earth-like satellite is to the average modern British coach potato. To some 18th-century English, the Australia they'd heard of was the land of dog-men, whales with fangs that could snack on frigates, and monsters with giant feet that they used to shade themselves in the boiling heat of day.

To others, depending on what tales they heard from books or wayfaring marines, *australis* was the lost Eden, the land of angels who reclined languidly in fields of spice and gold and sandalwood.

Ancient geographer Pomponius Mela first proposed, and Ptolemy would later agree, the existence of *australis* in A.D. 50 on the theory that without it, the Earth would topple over into space. This was enough reason to put *australis* on the map for over a thousand years. Marco Polo first reported he had found a land thought to be *terra australis* though it was really Malaysia. Portuguese explorer Pedro Fernandes de Queiros landed on a high mountain island in 1606, planted a flag, and proclaimed it *Austrialia del Espiritu Santo*, but died back in Mexico before realizing he'd landed on the South Pacific nation of Vanuatu.

The first non-aboriginal visitors to Australia were Indonesians who would travel the 1,200 miles to collect millions of sea slugs, called trepang, which when dried looked like smoked, limp black penises and were eaten as aphrodisiacs.

Likely there were several illicit visits by Portuguese, banned by the Treaty of Tordesillas in 1494 that divided the Earth into two gardens - one for Spain the other for Portugal.

And other Europeans came and went to Australia in the 17th and 18th centuries, some running aground, some presuming Australia was New Guinea, others finding the area resolute, inhabitable. English buccaneer, William Dampier, landed on the northwest coast in 1688 (not knowing where he was) and encountered aborigines sleeping in the open air. He saw they had no grain nor tools nor cloths nor went hunting nor had anything to trade for, and declared, confidently, "The inhabitants of this country are the miserablest people in the World." One of the earliest labels for native Australians.

Then came James Cook. The famous and notorious. First person to solve the scurvy mystery, though with an unsavory combination of sauerkraut, malt and soup. The man for whom the Cook Islands are named. Who kidnapped native royalty. Who, at a time when most people never set foot outside their town, traveled across the world three times landing in New Zealand, South Africa, Malaysia, Tahiti and Brazil, passing through the Bering Strait, the Antarctic Circle, and the Arctic Circle and finally sailing to Hawaii where he was stabbed to death and (in another irony) cooked. The man who piloted the *Endeavor*, the prototype for *Star Trek'*s *Enterprise* and its Kirk. The man who went where no one human being had gone before.

Nominally, Cook's duty on this first voyage, while he was still a lieutenant, was tracing the arch of Venus across the sun at about 40 degrees South, near Tahiti. This, it was thought, would final reveal the Earth's position in the solar system, our place in the order of things outside our horizons. The ultimate aligning of ourselves in the rows of the cosmos whose names were ours.

After the measurements were taken (incorrectly) Cook was assigned to discover *terra australis*, which he did not in fact think existed. After sailing around all of New Zealand, and confirming, as he'd thought, that it was just two islands and not a continent, Cook was on the point of heading home but decided to head West instead of East. And, with a surprise, on April 19, 1770 stumbled on what others had believed and sought and skipped over, what he'd disbelieved and had struck in reality - the legend and the myth coming into contact.

While sailing into a white cove, Cook also happened upon the Gweagal aborigines. Against the explorers' expectations, they ignored Cook and his boat as they were busy fishing. They continued about their work while Cook and his men boarded row boats and made for shore.

It was then, as Cook's men were rowing closer to the bark shelters where the Gweagal children slept, that the aborigines paddled hard for land in their canoes and made ready their stone and bone-tipped spears.

Cooks' men tried first pitching nails and ribbon to the aborigines. But the nails fell limply in the sand and the ribbon washed away into the sea. The aborigines in turn picked up beach stones and hurled them at the English. They released their javelins sailing them into the air as a promise born unto the sun.

The spears landed at the feet of the Europeans. Cook fired a shot between the defenders. He fired a second shot that wounded a defending Gweagal lightly in the leg. One aborigine ran to grab more spears. Cook fired a third round. The natives backed up into the trees. It had been the invasion and defense of the last continent.

While researching this history, I've come to realize there's something inextricably morally ambivalent about travel.

When I first came to Japan I played a little game with myself. Looking out the window of the 747, as it was my first time abroad I tried to see what, if anything, would give away that I was in a new country. I decided not much except that the cars drove on the left and, for some reason other than the micro-machine effect of airplane landings, the things in this new land all seemed a little smaller.

Had I not come to the small village I was to live, had I stayed in Tokyo or followed the well-ridden bullet trains of travelers, I might never have been cured of this gaze. When I did

come to the village, not knowing how long I would stay, I realized quickly I was in a different dimension, one where my ordinary powers of categorization ceased to function, overwhelmed as I was by the presence of so much unknown. Seeing the mountains I hadn't expected I was checked in the belief that mountains were the symbols of continuity and the same everywhere (doreen massey would be proud). These Japanese peaks rose out of the ground like spears, trees hugging their sides like big-horn sheep. The houses and government buildings were crammed together in a way that indicated personal space was not as important as efficiency. People everywhere hung their laundry out to dry, even in Tokyo and even in the winter. Some women in my town had their kitchen sinks outside, draining into street gutters, and I'd pass them doing dishes in the morning.

One thing I didn't understand, as it got colder was the prevalence of fleshy orbs hung on pink ribbons from the eves of everyone's houses. Some people would have up to fifty of these unknown fruits, out hanging in the wind and frost. I noticed, gradually, the orbs shrank until they had the appearance and texture and size of bull testicles. Then, it seemed, all of a sudden, one day around New Years, they would all disappear.

I finally learned they were a type of persimmon that was poisonous when ripe, but if left to dry and massaged in the cold, would release enough sugar to overwhelm the toxin and tasted like pulpy, cheery-infused molasses.

Other things took a while: a pile of computer monitors on a street corner. A man who parked his van in the middle of a rice paddy. An announcement system that would blare indecipherably at seven o'clock in the morning every day, followed by, sometimes, a piercing

wail. But most of all there was language. Day in and out, I had to learn to communicate with a people I didn't know, whose intentions were well but masked behind a barrier larger than a sea.

I had been invited there, but who, really, was I, and what was I doing there?

Had I been a travel I don't think these questions would ever have come to my mind, absorbed as travelers necessarily must be, in the ephemera of the journey - train tickets and currency exchange, guidebooks and getting ripped off, to tip or not. There is time for reflection, but it is mostly a blur of discontinuity, heightened awareness like a sugar rush and quick judgments and labels peeled off and stuck on all that is seen, though so much is uncapturable.

We label because it is natural; and I think we enforce those labels become our time is short.

For eight days James Cook and his men roamed the beach, let themselves in and out of the Gweagal's land and homes. The Gweagal went about their fishing, tended to their children, and glared at the British. Cook later wrote in his journals he was confused, after entering and leaving the huts, that the Gweagals did not touch the gifts of ribbons and beads he had left on their beds. To him it seemed not just a marked discourtesy, but a lack of need.

Contrary to Dampier's "miserablest people in the World," Cook concluded that the aborigines must have no use of material culture and "are happy.. live in Tranquility which is not disturbed by the Inequality of Condition." They were the noble innocents in the Garden he decided. The humans that predated the Fall, predated the mark of Cain and the stain of human experience.

John Marsden and Shuan Tan portray Cook's landing and subsequent colonization in their supposedly for-children illustrated book *The Rabbits*. Drawn with Tan's surrealist technique and psychedelic pigmenting, the arrival image is of a colossal, crooked sail boat piloted by rabbits, wearing red coats and tricorne hats, bearing down on the flat expanse of earth and the brown cowering native marsupial animals watching their arrival. The book progresses with the wild, out-worldly, Gonzo inspired images of dominating rabbits first befriending the native marsupials, then betraying, and finally rounding up their children and moving them into Pink Floyd-esque concentration camps. The final imagine is of a desperate marsupial looking across a small pond at a young rabbit, newly born on the island. Though they are temporally in the same place, the rabbit is on the verge of crossing that water body, leaving forever his innocence.

During the course of the voyage, the *Endeavor*'s naturalist collected some 30,000 specimens, including 1,400 species of plants that had not been known to Western science. Among his discoveries in Australia were wallabies, which Cook later mistakenly reported as kangaroos, and the flying fox which Cook's men said looked like the devil.

It was perhaps Cook's magnanimous tribute to the naturalist's taxonomic success, or a page out of the founder of Greenland, Eric the Red's book, that Cook dubbed the arid cove Botany Bay, before leaving.

About the same time, fifteen years later, that Hawaiians were boiling the flesh off Cook's bones, Great Britain's parliament met to discuss its crime problem, which would eventually decide the fates of those first Australian colonists. Britain had sent a total of 80,000 prisoners to America until its borders were shut from the revolution. Post-America British had first turned to "hulks" for additional prison space, flotillas of inoperable warships, leaky cesspools of malaria, dysentery, and tuberculosis moored off shore. They too became overcrowded.

But criminals were not just kinks in the system, nor lost souls that needed education or reformation. Instead they regularly seen in the popular media, printed periodicals like Samuel Johnson's' *The Rambler*, the television of the 18th century for those who could read, as a sinister mob bent on undermining sophisticated Britain's equity. Samuel Johnson used the term "the rabble." Edmund Burk preferred "swinish multitudes," and Jeremy Bentham, the utilitarian philosopher and philanthropist, wrote on the "thief colony" and the "excrementitious mass." This was a Britain that was not too far away from the Hobbesian "brutish" heart of man.

At one time it was presumed one in eight British was a criminal.

In the two Londons that existed in the 18th century, the rich, in a move that would later be mimicked by the upper crust all across the world, had moved from the Covent Garden neighborhood in East London and left it to the poor. The Garden's property values fell like a dropped fruit. Crime ejaculated. It and other bordering neighborhoods became known as "rookeries" in periodicals, a word usually reserved in the sciences for the breeding places of dung-smeared birds.

One solution was to kill the criminals. Between 1660 and 1819, there were 180 crimes in Britain for which the one and only punishment listed by parliament was death. These included

pick-pocketing or stealing a common kettle or swiping a blanket in the cold. Or even robbing a rabbit warren.

Perhaps fifty percent of the people convicted of these crimes were pardoned. Those who got off did so with the help of a priest or a rabbi. The criminals were allowed a one-time vouching and were branded on the thumb with a poker to make sure, if they were caught again, they would meet the eyes of the lyncher.

This was how England labeled its unwanted.

Regardless, Great Britain's population tripled from 1740 to 1851. For those petty criminals who could not cheat death, there were mass graves called “Poor’s Holes,” where they lay, shoulder to shoulder, brown hair, blue lips and red cheeks in the open air like autumn leaves in a compost. Bodies rose in winter.

It was the worst smelling place in the world according to Robert Hughes.

Shelley wrote, “Hell is a city much like London.”

Britain’s ancient prisons and hulks filled beyond capacity, America cut off, Brits looked east, far east for the disposal of their problem.

Jeremy Pfeiffer notes in his book on the early Australian convicts, that the banished knew their punishment to be the oldest. In biblical terms, the snake is first cast out of Eden, then Adam and Eve and finally Cain exiled to the land east of his home for clubbing his brother. When Cain is banished, he worries what vengeance will come to him, so God marks him and issues a

warning to anyone who comes across this sinner: they will know his crime but they may not cause him harm.

Rather than kill new criminals, parliament landed on the idea of offering prisoners an alternative: seven years in *terra incognita* and no brand on the thumb. *If you went, you could cheat death*.

Australia was 15 years old. Most English had never been out of their country, nor even so far out of their daily rounds. They would have no way to return. It would be like traveling one-way back in time or across space.

1030 people including 736 convicts on eleven ships, landed in Botany Bay under the watch of Captain Arthur Phillip, a no-name sailor in charge with no less the founding of a new nation. When his men and charges landed, (effectively all prisoners) there was one gardener in the entire corps. No draft animals, no ploughs, no fertilizer and few tools. There was a 70-year-old woman who'd stolen twelve pounds of cheese, a 9-year-old boy who'd stolen a gun, and an 11-year-old who'd stolen ten yards of ribbons and a pair of silk stockings. There were a few highway robbers, a few prostitutes but not a single convicted murder.

Cooks' reported verdant valleys were nowhere to be found. When they arrived, Lieutenant Ralph Clark noted in his journal, "If we are obliged to settle here, there will not a soul be alive in the course of a year." They beheld an endless stretches of arid monotony - paperbark scrub, gray eucalyptus, loose soil that would not hold a vegetable. They were anchored in an unprotected bay with huge sea waves that would crash violently on the shallow ground and wreck their tents.

The Gweagal aborigines remembered their encounter with the explorers. They gathered on shore as Phillip and his convicts landed, waving spears. They cried out, in what were the first words distinctly recorded by blacks to whites in Australia, *warra warra*, which means, unequivocally, “go away.”

But the convicts had neither the supplies nor the reception sail home, so after a few days of toil at Botany Bay, Phillip had his fleet sailed around to new a new cove to see if ground was softer, the bay calmer, the soil firmer, the locals more receptive. They made a nation in what’s now Sydney, a place named for Philip’s superior.

Emergence is a term for when plants or animals, after being moved and colonized, suddenly develop invasiveness, taking over surrounding habitat, aggravating and eliminating locals.

Rabbits of course would become the second most-famous invaders in Australia (the first, arguably, being the colonists themselves). Thomas Austin, the man who brought in the rabbits in 1859, wasn’t the decedent of convicts, but his family likely ran in their circle as peasant squatters in West Victoria. Like the convicts before him, Austin wanted to raise wild rabbits. They had come here to this strange, dry land at the edge of the world, and like anyone, anywhere, wanted to make the new place a little more like what he’d grown with. Austin is quoted as saying at the time of the rabbits’ release, "The introduction of a few rabbits could do little harm and might provide a touch of home."

Unlike all the attempts since the First Fleet before him, Austin happened on the idea of crossbreeding two different types of rabbits, wild-caught English gray hares that were shipped across the ocean with common hutch-bred bunnies which couldn't survive in the wild but were used to Australia's climate. He released 24 of the mongrels onto his property in southern Victoria. Around the same year a neighbor of Austin's named Robertson fined a thief ten pounds for bagging a hutch-bred rabbit on his property.

Six years later, despite free-for-all hunting, rabbit stews, rabbit steaks and canned rabbit, there were 20,000 rabbits on Thomas Austin's land. They carpeted the earth like Biblical locusts, creating field days for the working poor. Free meat, free fur, free diversion. Four million rabbit hides were exported from Victoria alone in one year. 1500 tons of canned rabbit meat went out the door of Australian canneries every year in the 1890s.

In the final decades of the 19th century, the rabbits left Austin's property and spread over Australia as fast as 100 kilometers a year. Due to competition with the rabbits for forage, the Australian sheep industry lost half of its animals. The already barren soil eroded. Sixteen species of native mammals would become extinct or confined to tiny offshore islands, including four species of wallaby, two Bandicoots, the Lesser Bilby and the Short-tailed Hopping Mouse. Another 16 species would become endangered.

Thomas Austin's neighbor Robertson began shelling out 20,000 pounds for rabbit control.

In the middle of all this, there was still debate between upper class and lower about whether the rabbits should be killed. Some Australians still wanted to bring the rabbits into their districts. As one man who spoke up in a Queensland Council debate said, "To provide that the

whole population of a colony containing millions of acres should be debarred from introducing one of the most domesticated and certainly one of the most innocent animals, is far too absurd."

Severe drought in the late 1890s, coupled with more rabbits and more rabbits and soil erosion aided by domestic cattle and sheep changed many minds. To kill the critters the government imported foxes, dogs, ferrets, weasels and professional hunters from Scotland and elsewhere. Most of the imported animals also ate sheep or were otherwise a nuisance. The hunters killed just enough rabbits to keep their jobs, often not killing female rabbits if they were pregnant

In 1901 a Royal Commission was held to address the problem. The commission decided the solution to stem the wave of the invasive of one of the most innocuous-seeming and universally loved mammals was building of the world's longest fence. They called it the "No. 1 Rabbit-proof Fence" or the "State Barrier Fence of Western-Australia," and it took 400 men working in labor gangs to finish the fence in three years. Two more fences were raised in 1904 and 1906, and in total, 8,000 tons of material were used at a cost of $250 per kilometer over 3,256 kilometers.

These were the same fences that Molly Kelly followed with her two sisters for a thousand miles from a settlement near Perth on the west coast back to her birth home in Jigalong. Known now as one of the Stolen Generation, Kelly was taken from her mother in 1931 when she was thirteen. Thousands of Aborigines like her were forcibly removed from their homes by Australian officials from 1905 all the way until 1971 in an effort to assimilate them. Kelly and her sisters were put in an institution where the government planned to train them as servants. The three soon escaped, and since Molly knew that their home lay along one of the rabbit barriers, they followed

the fences through the desert for nine weeks. With few provisions, they survived on wild bananas and sweet potatoes, had to ford a flooded river, crossed over a salt lake and endless seeming, blinding sand dunes and slept in rabbit burrows. Thus rabbits, the intruders' intruder, in an ironic leap of place and story, sheltered the three and helped and led them back to their home.

Kelly's daughter, Dori Pilkington Garimar, wrote a book about her mother's walk, *Follow the Rabbit-Proof Fence*, following her reunion with her mother twenty years after being taken away by authorities herself.

It only takes two rabbits (or one pregnant one) to cross a fence and continue the plague.

The founder of micro-biology, Louis Pasteur, aware of the magnitude of the problem, experimented with animals in laboratories and suggested a disease called chicken cholera to control the rabbits.

But the Australians balked at the word "cholera," as they hadn't before worried or as few people in Great Britain worry now over "rabbit." So it wasn't until the 1950s that a relatively unknown, harmless-to-humans virus called myxoma was used, itself imported from Venezuela. When the Australian government released myxoma into the environment, tumor-like lesions (myxomas) begin appearing on rabbits in the Outback. The tumors could be so large they would cause the rabbits' entire heads to swell. Tumored ears drooped to the ground, dragging in the dust.

These were the markings of the Australian's unwanted.

Myxomatosis was fatal in upwards of 99% of the rabbit population. The disease has spread over all of Australia. It is carried by mosquitos and so remains and an issue today for

anyone who wants to own a pet rabbit in the country. But rabbit populations have developed immunities the way bacteria respond to onslaughts of antibiotics. To compensate, other modern rabbit control methods include bait poisoning, warren destruction using explosives, warren fumigation, shooting, trapping, exclusion fencing and biological control with rabbit hemorrhage disease (RHD). The favored method by private parties is ripping: a tractor or a bulldozer fitted with multi-tinned "rippers," which are then dragged over rabbit warrens, destroying the homes, killing the rabbits, it is thought, quickly.

Yet rabbits are growing stronger and are in the process of reclaiming their numbers. There are perhaps 300 million rabbits still alive in the sixth continent and because of habitat loss, domestic animal loss, and rabbit removal costs, the animals carry an annual price tag of $600 million a year.

The Western Department of Agriculture has available a guide to various rabbit-extermination techniques, but advises that anyone following them, should exercise caution, "that all rabbits are removed humanely."

Humanly, by the way, is the label for how we'd like to treat each other.

Thinking about assisted migration, I sometimes wonder if I find the same colonialist exploits that drove us humans and especially whites to shuffle the world and its people, to overlay onto the globe a grid for what they found proper to be nurtured (vegetables) and what was undesirable (weeds) to be left to rot. We see the same with our well-funded private

universities and our prisons, the later which no one seriously considers "correction facilities' in the way the term was designed.

I implicate myself because, of course, the residuals of colonialism are apparent today, swimming in and out of our throats about how we explain our shuffling of people and world kind.

There's nothing like the extended abroad experience to untether you. As the only white man in the village, I began to view, calmly and unconsciously my cultures damming and rigid sense of right and wrong. Perhaps most noticeable were my changing thoughts on religion. The Japanese have, I witnessed, a plurality of religiosity - people regularly practice multiple faiths – which I found freshly healthy.

And so when I found three foreigners (one occasion on the times I can count on my hands that I saw other white people there) handing out pamphlets to children on their way to school, to my students, proclaiming the tortures of Hell's thermostat, I recognized this for a kind of underage drug pushing and moved in to stop it. But I was caught by their faces: depressed, forlorn puppy dogs lost at sea where most of the population didn't have any use for them. I smiled instead, took a pamphlet, asked about where they were from, a question to which their faces lit up and they replied "Kansas" and I wished them luck. In a way, I'd come up to them with my own grid for how the world should be laid, which included twenty-something missionaries not terrorizing children. However, my grid fell short of the reality - that in this case it wasn't religious terrorists but strays, not mirth but desperation that brought these people here, on the

other side of the world where the must have been looking for something, a way to cheat death by convincing others of their imminent salvation.

Maybe that's all the earth advocates for a moment before we decide – hesitation, anathema to the capitalist deal or the military strike. Maybe this moment is essential to sustain life. The moment when we imagine ourselves as part of the garden, a maze where creatures like ourselves co-create the world moment-to-moment, trying to find daylight and nothing staying in place for long.

Once when I was gardening I found a rabbit underneath the cantaloupe leaves. The rabbit, no more than a two-month-old, hopped around with a soft brush of grass and a patter on the dirt like rain drops. I'd thought he was no more than a mouse at first, and I decided to chase him out because he could eat what I was growing. But the rabbit was so small I was having a hard time tracking him. Could that curling wave of grass be my leg moving it or the fleeing hare?

I was in the middle of a much over-due weeding.

I was also in the process of researching rabbits and Australians. I'd happened on the subject while thinking about this book and the ways people all over the world have moved themselves and other species, gardening. And I fancied for a couple of moments of a reversal, I pictured a tiny white man with a tricorne hat running among the dill weeds. There was broccoli I could hide in, along with strawberries, lettuce and innumerable dandelions. But could the bigger, stronger rabbit and I talk things out?

With the aid of the handle of a hoe, I prodded the leaves with persistent but, I thought, delicate effectiveness. I chased the rustlings into a corner where the pen door was. Only once he emerged, he sat still and regarded me.

I'd heard of the sensation when one feels an animal returning your gaze, but I've usually heard it happening with bears, whales, dolphins, chimpanzees, wolves, what we often consider to be the "higher" order mammals. But it shook me to think that this animal, smaller than my palm, seemed to regard *me* as a curiosity. I'd felt as if everything I'd understood about rabbits went into the recycling - their pejorative adorableness and yet invasive potential, their use in hides and hats and stews and the proliferation of their symbol as a holiday commiserating the rebirth of God, their destruction of the Australian outback.

Who are you? I wanted to say. Hoping he could answer and his language wouldn't be inscrutable.

Perhaps this is a trite thought, but I hope not. The rabbit is a life with its own ideas, no matter where they occur in the cordial layers of its brain, about where it wants to go and it's our labels and penning up of these trajectories that have imprisoned us into cycles of quick labeling and tragedy. We've moved all manner of things - including people- like a gardener shoveling dirt into rows, because we thought we knew better the names of evil. Somethings can be healthfully cultivated, but only after long scrutiny can we know when it is best to plant and when is best to roam free, and even then the unbinding mystery will reign as an undercurrent, squeezing through the cracks of our fist.

A regard is to acknowledge life, acknowledge the differing trajectories we are on - all life just a series of uncountable ships passing each other in fog. A regard is a way to firm up our autonomous directions, even if those paths should cross and action taken to undermine them because a disaster is about to take place, or, more benignly, a rabbit is in your garden and about to chew your watermelon leaves.

I thought as much and hoped to herd the rabbit out the pen door, but he bolted between my legs and into the weeds again, doing exactly what I never imagined he would.

I spent the next ten minutes trying to find the creature, but no matter where I prodded and probed with the handle of my hoe, I came up short. Not a patch of fur or a long ear anywhere.

Committing to the saying it's better to wait out a solution to see if it will reveal itself, I crouched back down into weeding. That morning I obtained about ten pounds for shipping to the village waste recycling center.

As I was packing the weeds out in a big paper bag, the rabbit appeared, like a thought, sitting on his haunches by the gate.

And *he* was studying me, head cocked, curling his nose. The rabbit was chewing on something. His muscles in his shoulders relaxed. I stood there, bag in hand, looking.

It lasted only a moment - though centuries in the making - and when a neighbor came up, the rabbit lowered his ears and was gone, out through the parking lot into the forest, the trees whose names I have to say I did not know.

CHAPTER 6

THE TEXAS SNOW MONKEYS

At first they would appear off the peripherals of your vision, like a cloud or a boulder along the road that didn't matter. And then the car would swing around and you'd see the ghostly fur, raked face, yellow eyes, hooked cane tail. It would be blocking the road with its young, but only for a second while it looked up and scuttled away, over a cliff, into trees, up a slope, the rushing of torso and limbs, something big echoing through the forest.

It is a sight to make you believe you're in some kind of dream world if you'd been brought up in the Western hemisphere. But "mendokusai," is a term used often for the monkeys in Japan, a word reserved for nagging cramps, broken limbs and mountains of paper work. Japanese macaques are about as common and welcome as deer.

They can often be pests - stealing into gardens and ripping off heads of cabbage and lettuce, destroying fences. One favorite trick is to climb onto people’s aluminum-sheeted roofs at early in the morning and clamor and bang and make chortling noises until they’re scared off, leaping onto overhanging branches. They throw rocks at window panes, spit in front of enlivened elementary school students. The monkey population exploded with the extinction of Japanese wolves and the decline of Asiatic black bears in the twentieth century.

The Japanese macaques are called snow monkeys by the Western, English-speaking

world because they are most often photographed soaking in Nagano outdoor hot springs. Usually in these photos there is a bed of snow around the geothermal pools and flakes resting atop a macaque's skull and lining its lips frothily.

Some tourists elect to swim in a hot spring with monkeys. They share a bath with the local nuisance, will even go so far as to pay hundreds of dollars to take a Shinkansen from Tokyo in the dead of winter, followed by a local train and slow bus, a two-mile hike, and an exorbitantly high lodge fee with a mediocre breakfast (if the place isn't packed with travelers when they get there) to sit next to a confused bathing monkey who may later steal their car keys and any fruit they have.

In Japan they are simply called "Nihon zaru," or Japanese monkey, or, more aptly I think Japan's monkey, for the feeling is somewhat possessive. More commonly they are called "Saru-San" or Mr. Monkey or Monkey, Sir, a title anointed to no other animal in Japan.

Millennia before Darwinism, the Japanese regarded Saru-San as the closest living relative to humans that could be found in the animal kingdom. Many shrines are devoted to them. On the Shinto pilgrim's hike up Mount Fuji, monkeys are honored in the place further up the mountain then where women were allowed to travel until the mid-1800s.

People often see human characteristics in the animal. But with Nihon-Zaru, *Shoganai*, the Japanese say, "it can't be helped." Maybe for monkeys' gait, their mannerisms, intelligence, cunning, opportunism, unpredictability, and sometimes fickle aggression, and willingness to smile in the face of fear. The remind us of us because they almost are.

Primatologist Frans De Waal writes in his *The Ape and the Sushi Master* that a large presence of monkeys in proximity to civilizations in China, Japan and India might have given

these cultures a mirror with which to better recognize their origins. "Seeing other primates," he notes, "makes it hard for us to deny that we are part of nature."

He goes onto note that in the way Western fairy tales have foxes, rabbits, lions and wolves, Eastern tales are filled with monkeys as stand-ins for ourselves. The three wise men of the Bible are match by the three macaques of Tendai Buddhism (see, hear, and speak no evil).

In September 1953, Satsue Mino, the daughter of a Japanese Innkeeper on Koshima Island at the southern tip of Japan noticed that a macaque female she had named Imo (which means potato in Japanese) took a sweet potato left out for her and walked into a river to wash it off. The next day she washed another potato, improving her technique by walking further into the water and using one hand to hold the potato and the other to scrub.

Potatoes do not grow naturally in Japan. No macaque had ever been observed washing potatoes.

Mino sent a letter to imminent primatologist Kinji Imanishi in Kyoto. Two of his students collected information for an article that was published in 1965. Imo is now a textbook case for proving that animals have culture, a trait once thought applicable only to humans.

Three months after the innkeeper's daughter saw Imo washing potatoes, two of Imo's confederates were washing potatoes too. As was Imo's mother. From these four monkeys the habit spread to younger macaques, then to their older siblings and parents. Within five years, seventy-five percent of the monkeys on Koshima were washing potatoes (only elder males refused or were unable to learn).

Three years later Imo taught herself another trick: how to separate wheat from sand. Tossing wheat onto the water, sand falls to the bottom. Wheat floats and can be scooped up. Soon, almost every macaque on the island was learning from Imo (with the same exception of the older males). New Age author Ken Keyes's account of the "hundredth monkey" that fantastically beams this technique across oceans and times has its origins here.

But many a primatologist prickled at the idea of monkeys having culture. Many of them dismissed Imo outright and accused her of being part of a fraud. The idea that humans, somehow, are divorced from “nature” has deep roots in Western thinking. Rene Descartes is usually the man fingered for this so-called spilt in philosophy that has never healed. When people think of “nature,” usually they think of something “out there.” But saru-san, with its cunning and intruding and learning and adapting shows us how not alone we are. One of the reasons it is thought we find primate faces cuddly is because they so resemble faces of human infants.

In 1972 a group of about 150 Japanese macaques were threatened with extinction. A scientist studying tree frogs had actually discovered the troupe. Ironic because Kyoto is Japan’s center for primate studies and no one knew the monkeys existed so close.

For primatologists, locating them after hearing about them was difficult. The macaques had a range of several square kilometers from mountain to valley, moving back and forth following the fruits and nuts in harvest, rarely staying put and avoiding the bipedal primates in camouflage who sometimes hunted them.

Then the valley forest was cut down to make room for Kyoto sprawl and lumber.

Locating the macaques became easier. Assistants set out tempting sweet potatoes at the edge of the forest to draw out the monkeys. For months the potatoes went untouched. But without the valley to augment their diet, the macaques entered leaner months and gradually the potatoes the scientists left out began disappearing.

Researchers set up established feeding sites, almost like deer blinds, visible to the scientists. Each researcher took to wearing a large chest apron that went from the neck to the knees and was dyed with a big red bull's eye. The aprons were simulacrum of Japan’s flag. This was to let the monkeys know the researchers weren’t hunters.

While under observation - the troop lost three of its Alpha male leaders in quick succession. An unstable power struggle emerged where kin turned on each other, partners rivaled and the entire troop split with a third-ranking but female-empowered male in charge of a sub-leader who'd lost the support of his dead male comrades. The dominant group held Ashira Mountain outside of Kyoto. The other group retreated to the urban foothills.

The second group was met with hostility from the encroaching urban human population. With little space to make their homes, the monkeys rooted in cellars, stole from farms, broke into shrines and homes. They were on the road to extermination.

Professor Syunzo Kawamura asked visiting primatologist John Emlen from America, "Would you be so kind as to accept one of these groups as a gift?"

The answer to that question took four years, enormous expense and energy.

Ten American scientists began meeting in 1968 to investigate a suitable location in America and logistics for the move. Their initial requirements were bourgeois: the terrain had to be hilly and forested, be naturally enclosing so the monkeys couldn't escape, be cool, be easily

accessible by a major university, and be outside local disturbances. An offshore island would do. Or Hawaii.

Then reality set in the discussions in the form of a wealthy rancher in Texas named Edward Dryden Jr. Dryden came up through the University of Texas and agreed to house, fence and maintain the monkeys. His only stipulation was that the expanding "excess" of the population be used by him for a "commercial reproductive colony."

In other words Dryden figured the macaques would fetch a good price on the animal testing market.

Capturing the macaques in Kyoto began on February 16, 1972. 152 monkeys were captured in five days (seven monkeys eluded the scientists). They were examined, body weights recorded and each monkey was given a tattoo for identification. One monkey died in captivity. One monkey turned out to be rhesus/macaque hybrid and was released.

But the Vietnam War was underway and Kyoto University students had rioted and protested and when they got wind that *Nihon* zaru no less, Japan's monkey, was going aboard a plane bound for the aggressor they threatened to blockade the airport. So the monkeys were packed in crates in the cover of darkness and loaded aboard a Japan Airlines cargo plane and taken to Hawaii. On February 23, 1972 at 2:30pm the macaques landed on American soil. There they switched planes and flew to Laredo with the Arizona National Guard. One monkey died aboard. One lost a toe.

"A major concern," wrote Linda Fedigan, a scientist working with the monkeys in Texas, "had been that the monkeys, upon release and despite the high electric fence barrier, might simply run off in to the surround brush land of south Texas."

The scientists put fresh water (handy in the desert), food and tall wooden sleeping platforms in the enclosure to encourage habituation.

The macaques arrived blinking in the deserts of Laredo. They bunked with cottontails, road runners, timber rattlesnakes, tarantulas, beetles and some of the more than one hundred species of cactus right on the Mexican border. They were surrounded by a ten thousand foot long electric fence that was eight feet high. A few of the monkeys grabbed the fence and locked on, the volts pulsing through their hands and fur. Attending researchers had to dislodge them.

The monkeys began to adapt.

Then Dryden died (he'd managed to sell a few of the macaques off) and his estate was split up in his will.

Scientists found a home for the monkeys with the parents of a young man who had fallen in love with a primatologist.

But then the lovers parted.

The monkeys were again headed for extermination. But then at the last second a group of scientists, animal lovers and concerned, moderately wealthy citizens, purchased a few acres of desert and moved the monkeys over. They were surrounded by barbed wire and an environment as hostile and unfamiliar as a desolate moon.

In the first two years of Texas living, half of the monkeys died. Laredo is eight degrees closer to the equator than Kyoto, and has highs regularly in the hundreds. Macaques sometimes do not sweat. Sometimes they ate coyotillo berries which have a deadly neurotoxin with no antidote. Some monkeys were eaten by bobcats. Some were bitten and killed by rattlesnakes. Some got screwworms. Many were devastated by valley fever, a fungus inhaled from the

alkaline soil.

But as animals, they did adapt to their surroundings. Scientists found it easier, for instance, to note what floral the monkeys *didn't* try consuming. New food habits were readily picked up - mimicking Imo's famous potato washing tricks. Prickly pears became a troupe favorite, especially the succulent flower bulbs. Even when not in bloom, the macaques took to climbing tall prickly pears like trees, deftly clinging between the spines and ripping off prickly pads and eating them like potato chips.

New monkeys were born on Laredo soil making them American snow monkeys.

Over the intervening two decades, thriving in the Texan sun, toiling on bare soil, shaded under mesquite trees, the troop grew to five hundred, then six. Twenty-three acres and barbed wire and electric fences couldn't contain them. The monkeys dug. The monkeys leapt. They climbed mesquite branches and delicately lowered themselves onto private property. Macaque males were witnessed climbing the charged fences even *while* getting electrocuted. If they were outliers who needed to leave the tribe, the shock of staying home was worse.

The monkeys snuck. They stole. They picked locks. They crapped regularly on people's front porches. Chewed the railing. They killed a dog, reportedly. They broke into houses. Stole a pot of soup cooling on the porch. Scared dogs. Ate cabbage. Ate cactus. Clamored on people's homes. Laughed.

By 1995, it was time to hunt. Shoot, trap, tranquilize and skin the monkeys. Texans love an excuse to kill things. More guns per capita than any other state beside Alaska. The only large predator is the cougar on which there is no legal bag limit; you can hunt them anytime. The Texas Department of Parks and Wildlife declared the snow monkey an "exotic unprotected

species.” In other words the monkeys were a pest, a summary the Japanese had come to long ago, while paradoxically realizing the monkeys’ humane proximity.

"We see ourselves in the face of the monkey," I've heard said in Japan, which sounds suspiciously familiar to the Buddhist saying, "I see myself in the face of my enemy.” Perhaps it could be said Texans crave self-reflection unlike any other people.

The Texas Department of Parks and Wildlife decided that since Nihon Zaru was not a native, despite its being born on American soil, Parks would officially list the monkeys as an invasive species. This was a step down from a game animal. Hunters poured into Laredo asking for monkey hunting permits, which didn't exist. In fact, there was no permit necessary. It wasn’t like a deer where there was a game season. It was like a weed that could be uprooted.

The scientists fought this legislation and worked for the next year, lobbying the state congress that the monkeys had not "invaded" but were “rescued.”

The monkeys were not pests they argued, eventually successfully, but livestock.

Cows are not from Texas. And neither are horses (though North American horses once roamed the planes they were extirpated ten thousand years ago). Neither are hogs. You certainly can’t shoot them. In fact at one time you could be hung for doing so.

Burros are not from the state either. Neither are chickens, pygmy goats or guinea hens. Nor are ostriches, emus, Arabian oryx, fringed ear oryx, zebras, gazelles, Chinese water deer, hog deer, Elds deer, addax, Arabian Oryx, scimitar-horned oryx, cape buffalo, Asian water buffalo, Nile lechwe, Kafue lechwe, impala, eland, sable, dama gazelle, Thompson’s gazelle, black wildebeest, blue wildebeest, nor a hundred other imported African and Asian game animals that now live within the state of Texas. The exotic animals have been imported because African

safaris are hard to come by. Some landowners thought to bring the hunting safaris to the lone star.

The practice began fifty years ago when zoos started turning their “surplus” out on the countryside. Landowners liked being able to shoot African mammals in their backyards and liked it even more that people would come from New York to pay them for the pleasure of it too. The scimitar-horned oryx, which is ironically listed as extinct in its native habitat in Africa, thrives in Texas because it is hunted. It can fetch ten thousand dollars a head. A cape buffalo fetches the price of a brand new Audi.

When a cow wanders off someone's wildlife refuge, which most people call a "farm" it is not usually shot or otherwise maimed. It is returned. Or at least paid for.

And that's what this is all about I think, the idea that ownership, human, precludes survival. For the snow monkeys, for the scimitar-horned oryx, for anything in the world to survive, thrive, as they can anywhere, (for if a Japanese snow monkey can persist and even pest in the dry Texan sand, then I think it plausible that any animal can live anywhere), that *to be* something must have some meaning for us for it to go on living. We have to assign it value in order to ensure its life.

I don’t say this in judgment, but merely as an observation.

Just in time for the scientists’ well-spoken arguments to sink in, four monkeys were tricked with food into climbing outside a fence and were gunned down by a man or men holding shotguns. The monkeys were a family, the killers invariably linked to friends of friends of someone who had a hunting permit on the land next door, and who happened to be from a big city, didn't understand the monkey situation, and had already gone home. I’ve heard it said they

were from Denmark.

The macaques were martyrs. Texas radio and newspapers blared their deaths over the ink and air. Grandmothers decried the dead. The monkeys were official ruled "owned" and therefore not killable. The response was overwhelmingly positive towards the monkeys.

Livestock cannot be tricked and shot.

Wayne Newton did a fund raiser in San Antonio and cried over them.

No more Texas snow monkeys since have met this fate.

CHAPTER 7

THE PRAIRIE

Move it and They Will Come

One day in fall, I go to meet the first person I know who is performing assisted migration. He is the University of Iowa faculty emeritus, geologist and landowner Lon Drake. Drake's assisted migration experiment is in an old corn field just 15 miles from my house. About forty people know about it.

When I go to meet him at his Iowa City office after calling it's an ethereal day, a morning hinged on the moment of snow, a touch of clouds and radiant light in all the trees changing into their death suit. They are giving up their hands, delicately, the wind kicking them up into bursts of fire - crimson, amber, maroon and plum - swirling around my bike pedals as I ride, getting caught and crunching like popcorn.

They are a color blizzard, piles of radiant leaves like butterflies landing onto a field - everywhere - on car hoods, on stray dogs, on people's hats as I bike passed them, curling around

children's legs. The sound like a million pom poms floating through the air and everything on fire. Nature's everyday delicate migrations.

"What you're seeing," Lon Drake says when I meet him outside the red brick Geosciences Building, "is a disaster waiting to happen."

Drake has his hand pointing to the trees, the beautiful yellows, the swirling luminescence.

"The emerald ash bore is on its way here."

Drake is wearing Timberland boots and khaki shorts with a flannel shirt. He has a fist-sized bald spot, ropy muscles, knobby knees, and a face and voice like Sean Connery. We are walking away from his office, Drake a full foot ahead of me in stride like he has somewhere important to be.

"We're about to go through with what we've been through with the American chestnut and the Dutch elm and now the eastern hemlock. Everywhere from here onto the East coast, ash trees line the streets because they are wonderful trees to line streets with. And they are all going to be gone.

"The bore is oriental," he says as we walk. "Somebody must have brought it over accidentally. It could be moving because of global warming, but it also might just be thriving here on its own. Nothing kills the emerald bore once it hits. Pesticides, those that aren't strong enough to go ahead and kill the tree and people who drink water, don't anything to it."

He stops suddenly and raises his hand over the horizon like Moses with a voice of sheer celestial doom. "Look out the window of your car, when you're driving. All the golden trees you see now... you won't see any of them in a few years. There will be whole streets in most of the United States without any trees. And the same devastation is in store for our forests."

"Fortunately," he continues, "some forests will be compensated by young, different trees. It's like a business model. Some species will cash in on all the devastation. But for about five years forests will be filled with rotting trees."

We keep walking past some beautiful arbor torches.

He walks bow-legged and takes big strides. Mammoth strides, like a thoroughbred. He also glares at me with a certain kind of skeptical charm I'm used to from old professors, the kind who have dealt with the young for so long they know they're in store for hours of energy-sapping questions.

A part of me goes dead calm with the information about the trees. Perhaps in my experience in environmentalism, I've learned to absorb bad news.

"Now these are Hackberry," he is saying about a tree that to my relatively bontante-illiterate consciousness looks exactly like the same sort of flame art.

"Hackberry is not affected by the emerald ash bore. But over there," a few yards ahead on the shadowed sidewalk, "those are ash and again, and ahead more ash and more ash."

After that he says nothing. We keep walking in somber, funeral procession silence.

"So," I say, "how did you get the idea for your experiment?"

"Well" he says, taking another big stride across a square of sidewalk, "I've already been involved with these things my whole life. My career has been in land reclamation, strip-mine reclamation, oil spill clean ups. In those cases, you're always trying to put the landscape back together. So, it just follows naturally to me well to ask 'how can we manage landscape now that it's being modified by climate change?' The land has been so changed and will be further changed, but how can we shape that change in a way to have the best impact?"

Drake stops walking, he daggers me with his eye balls.

“But we can’t just move around species willy-nilly.” he says following a meditative silence. “My approach is much more conservative.”

We get in his car, a dilapidated and rusty Ford Bronco shaped like a refrigerator with wheels. Drake is generously driving me to his place so I can see what he’s been sweating over for the past dozen years. We drive away from the swirl of yellow and away from the red brick of the hundred-year-old science building.

“Think of butterflies,” Drake continues, driving the box. “As much as people like butterflies, they come from caterpillars. Now, some butterflies lay fifty to a hundred eggs at a time. Butterflies have two to three life cycles per year. So that’s up to three hundred caterpillars per mother butterfly per year.”

Say you have ten butterflies. to start, two years later, you’d have almost thirty billion butterflies, assuming none of them die, which thankfully, most of them do.

He eyes me to see I’m paying attention. “And caterpillars eat voraciously. If every one that was hatched survived, they would wipe out an entire forest in a matter of a couple of years.”

I’m stunned silent.

“That’s why I’m glad the one that are showing up at my pace are getting eaten,” Drake says. “Most caterpillars don’t survive. They’re supposed to be bird food. They’re a key piece of the puzzle. But that’s why you gotta make sure you have the right birds around. If they’re not, well, goodbye Iowa.”

As we talk, the university buildings fade and soon corn stalks rise up on all sides like yellow and green shadows, intermittently broken with the knee-nigh, chipper and olive green shrubs I know to be soy. More of which is grown here than any place in the world.

I stare at waving corn cobs.

“This is not a quiet car,” he says to me.

“It’s okay.”

“No really, look.”

He rolls all the windows down suddenly and wind fills the car, blasting our ears, cheeks filling like cows stuffed with grain. I remember now that for all the corn in Iowa, a full fifty percent isn’t consumed by people at all, but by cattle, which of course are originally from Southeast Turkey.

The inside car windows rattle basally, thumping in and out, appearing about to break.

“See?” he yells as he rolls the windows up. For Drake, life is an experiment.

It’s an unexpected beauty, for me at least, the Iowa countryside. The state has been ripped from one end to the other, less than one percent of one percent of what it naturally used to be, the state now filled with pesticides and herbicides, cancer clusters, overfed hogs, genetically modified top-heavy chickens. But the English when they think of nature tend to think of scenes like this - little farm houses dotting horizons, fields of green and gold, specks of Holstein heifers. Sheep. Emerson used to love taking walks in what he called “fields,” which were really cow pastures. Same goes for Wordsworth. This is nature too in a way. Iowa is always charming to the right beholder, the sunset electrifying the corn leaves at the right angle, the sparkle of endless

plant life, the awe of rows upon rows, the horizon a green and gold glitter, dipping like the arch of a whale's back, betoken to man.

I mention something to the effect to Lon who snorts a loud chortle.

"It's just corn and beans to me," he says. "From a biological standpoint, it's a dessert. It's an industrial monoculture. I've done work on oil spills, and this is not much different than driving through a wetland where they've spilled a lot of oil. Here we just spill a lot of fertilizer and pesticides. It's the same thing. If you want to call that nature, I don't know."

He shrugs and then laughs. "However, it is a good place to conduct experiments in assisted migration. I mean why trash a perfectly functioning ecosystem when you can come to Iowa?"

My first thought upon driving down the crumbling gravel rode through leering oak and maple branches is that Drake has found the most beautiful view in the state. His self-built cabin cradles a sunset-facing slope atop rolling prairie hills of evergreen and coffee brown bordered by neighbors whose acreage is bigger than that of small towns with similar yards of rewilded Indian grass, juniper trees, blue stem, perennial flower upon perennial flower, all nicely leading like soft welcome mats to the center of a football field-sized lake that is sparklingly clear and supine. A wood canoe is tipped over at the water's edge, waves tickling the gunnels like in a Wendell Berry poem.

Lon's house is built by hand with lumber from abandoned barns he scoured the Iowa countryside for. Like everywhere, Iowa's rural population has been falling apart, and hard-wood lumber from houses and barns was easy to scavenge. All his windows as well are composed of panes from rotting greenhouses.

He shows me a picture of the house frame under construction and, because the beams he scavenged were so short, the picture looks like the hull of a steamer all crisscrossed with a lattice of U logs. He heats the house with a wood-fired stove in the basement. A pipeline of complicated reverberated steel snakes through the house and carries the heat and smoke. His air vents are the bomb-bay doors of a World War II B-17 bomber that it took Drake two full days to create the mess of wires and resisters that run the circuitry for. The bomb bay doors that once delivered bombs to Germany now deliver heat to his bedroom. And the heat comes from cut-up invasive trees Drake has corded from his property and stacked next to his house.

"I don't watch TV," he says, while we look over his home. "It's just not my thing. The average American watches four hours of TV a day. I'm no lumberjack, but forty years of four hours a day will start to pay off."

As we are strolling around his property, I have a notebook in one hand, Drake a big stick. We talk about prairies, bobcats that have shown up at his door, and the wind chimes that were hanging on his balcony that were absurdly mesmerizing. The clouds pass low overhead, looking themselves in the lake mirror while reeds and grama grass fan waves that roll down the prairie towards the shore like advancing golden armies.

"Watch your step," Lon warns. "These walnuts are like ball bearings. If they catch you wrong, they'll flip you."

We maneuver through a stand of oaks, all planted by Drake. There's not much, in fact, that seems out of Drake's control. The entire prairie is his making, as is most of the trees, the mowed paths around his land. The parts he's set aside for "wild" are still handiwork in the sense that he's decided to leave those parts alone - for now.

But you wouldn't know it to look at it, and come to find out, the many animals that flock through Drake's land don't seem to mind that Drake's acres were all once corn stubble. Many of Drake's forest segments, filled with invasives like honeysuckle, are impenetrable messes that Drake's put off, but not for long. At one time, much of the land was like that - thick thickets, no clear vision through the trunks like a calm, "normal" forest would have. Until Drake, the septuagenarian attacked them with his gas-powered chainsaw.

There's lots of rustling of leaves, the canopy floor covered in oak and walnut autumn sheddings.

"Even though my little climate change planting is only two years old," Drake is telling me. "I've already had two of the three species of butterfly I've been aiming for show up. I still don't know how they got there, but they came. And I'm grateful for that, and I'm also grateful that the birds are eating them."

"Do you see that big owl?" he yells and stops and points.

A great horned owl sails silently over the edge of the forest to the horizon and dives into the pines.

"There's rabbits that live in these little brush piles," he says kicking at one stack of wood and leaves that resembles a dried beaver dam. "Owl's love that I've made these."

Anything he's labeled "brush" he's made a defensive stance against, say, the thick green and rusty-yellow honeysuckle (originally from Russia) that towers over us as we walk by the perimeter. The birds eat the red honeysuckle berries and shit out their seeds spreading them as good as any gardener. The owls live up in the pine trees (which are both not invasive) and eat the

rabbits (which are probably Eastern cottontails and also not invasive) in the “brush” piles of dead and fallen Russian intruders.

Drake and I come out of the woods and brush and face his main experiment. We’re looking downhill at the descending rows of pawpaws, spice bushes and brush piles with creep vine. I can’t help but think them all like the cornstalks we passed on the highway, so uniform, only they are wider, bushier, and more colorful. The pawpaws are four-feet tall, emerald and banana-yellow leaved. They are spindly by their trunks seem hard-wrought and sturdy. The shorter spice bushes have a rusty tinge to their leaves and a crinkliness as if someone had beer-battered them. Each spice bushes is about three feet tall, bending in the slightest breeze. The last experiment, the creep vines, are like been stalks that snake up the brush piles, their leaves a crinkly pea hue.

Drake, their officer, stands, crossed armed, walking stick in hand. Clearly he is proud of his little trial, and he ought to be. It would have taken ten men several days to clear as much honeysuckle and plants as many southern species as he has. The men I imagine working this thorny field would have been sweating, grunting, itching, breaking out in rashes and complaining. Drake's pushing eighty, and he did all this with his own thin hands and a chainsaw.

“They’re planted *way* too close together!” he says of his charges. “I had no idea the survival rate would be this good. I figured half of them die. So far, I’ve only lost the one. Maybe I’m taken too good a care of them. I don’t know.”

Lon is conducting the first experiment in assisted migration in Iowa history. And one of the first in the history of the world. By that I mean, for the express purpose to see how things will grow with the onset of global warming, Drake has planted these three species: pawpaw trees,

spice bushes and creep vines, whose tangled ranges end all just south of here, a hundred mile outside of their historic range. No one has ever recorded these species living here in any sort of numbers. The nearest grove of paw paws that Drake knows of is in a river bend at the Missouri border.

Drake's plan is that his experiments will sprawl out and enclose each other so he won't have to mow anything here anymore.

Assuming a frost doesn't kill them all. Or a disease. Or an insect or animal of some kind. Or the person who buys Drake's house when he dies and doesn't appreciate the experiment. Or vandals. Or the state's appropriation committee, which last year, without asking Drake, mowed a ten-foot firebreak on his land next to the highway, chopping down one-tenth of his trees. Or a neighbor who hires a crop duster who discharges his floating toxins over Drake's house.

Or a flood or a fire or a tornado. Or a massive, prolonged heat wave.

Or too much rain. Too much snow. Too much sun. Not enough sun. Too much hail.

Along with planting the tree species he's experimenting with, Drake's experimenting with another unknown: longevity. How long will his land hold up under the pressures of a crowding, heating world? When it's the nature of all things to change, how to predict the future viability for land is a question much in vogue in science. Drake's thought is to take into account the growing evidence of global warming and recognize that it is forcing species to migrate, and that since we're the reason they're moving, we might as well help them along.

Drake's moves are slow, a hundred miles at a time, which is turtle-pace for the Torreya Guardians which have experimented with moving the stinking cedar as far north as North Dakota and have shipped seeds to Europe. But it is still fast for some of his colleagues, one of whom,

Erin Irish, a botanist at the University of Iowa, says flat out she wouldn't tinker with anything from a hundred miles away on the prairie that she's also rewilded. The Department of Interior, which designates national wilderness sites, has a strict policy of keeping its land in "pristine" conditions. In effect their policy is one of drawing a fence around what cannot be kept still, though open spaces are of course direly important for diversity and ecosystem services. But ignoring global warming's effects is like a building contractor not paying attention to county maps of flood plains. Floods come whether you acknowledge them or not.

Drake's has another unprecedented act of assisted migration, one that is not entirely his doing. Since planting the paw paws, the spice bushes and the creep vines, Drake has seen all three of the corresponding butterflies that feed almost exclusively on these plants show up and feed on his experiments.

Let me say that again. Drake has imported these three plants, which have never been here before. Some of them do not occur within a hundred miles. The insects who feed pretty much only on these plants have flown the distance, knowing somehow, and finding some way to the fifty or so plants Drake has installed on his property and begin breeding, eating and living.

In other words, it's not just three species, but six who are now making their homes in this part of Iowa when none of these species had been here before in recorded history. Butterflies, birds had not been eating, wasps had not coexisted with, no beetles had shared a patch of fresh mud with. Their colors, when they're spotted, adding patches to the mosaic of Drake's prairie. Colors and shapes that had not ever occurred in this part of Iowa, reshaping forever the texture of the countryside, redefining field guides and natural history books, reshaping the dimensions of the state and of the world.

Drake has documented the zebra swallowtail butterfly caterpillars chewing on pawpaws and spicebush butterfly caterpillars likewise to spice bush. He wasn't then sure what was eating his creep vines, only that something was and not much else eats them. But then formally about a year later he informs me he had found and witnessed the creep vine butterfly lay eggs on the leaves, that, indeed, baby caterpillars, who perhaps in the not too distant future will be threatened by global warming, had burst forth into the new world.

It's hard not to think of the movie filmed just some miles from here in Dyersville, Iowa - a corn field leveled, man-designed a field constructed, with its rules and intricacies and divisions, and ghosts, maybe angles that appear out of the folds of the planted leaves, come back from the dead, perplexed as if someone had brought them there but they'd forgotten who.

Is this Heaven? No, Iowa.

But Drake's forests are not just for butterflies. Turkeys migrate through here that would not when the acreage was all corn. Coyotes hunt as do bob cats and perhaps even mountain lions. Pheasants roost. Vultures circle. Deer crisscross Drake's land and are easy game for Drake and his son. Sixty years ago, there were no deer at all around Drake's land. Only corn and soy.

Fortunately, the birds seem to be taken with all the new caterpillars. Every batch Drake has seen has been picked clean and disappears. That or they're all dying for some other reason or hiding. But he doubts it. They saw. They made their homes and became part of the Iowan chain.

I take a few pictures of Drake's experiment, and he ushers me onto his front lawn, the main event, a prairie, a real Iowan prairie, for which he has labored twenty years - the rolling Indian grasses and Blue stem, baptisma, heath aster, bladder pods and wild iris. A delicious entree of names I can't remember. Eighty species in all by Drake's count, none of which existed

here on this property in the bygone corn-molested days. Drake takes me on a tour down the outside - no rows inside the prairie to move through delicately.

I reach out and touch whatever Drake points out, taking a few samples that seem to fall off their stems like dead leaves and stuff them in my journals. The bladder pod, I note is a five-foot scrawny plant with few off these airy sacks like crinkly candy wrappers sewed together, it leaves a powder on my fingers.

As he's handling one of the cobalt blue flowers called bottle gentians because of their shade, I realize he has the cracked and near-bleeding fingers and thumbs of a blue collar worker, someone like my bricklayer grandfather. Lon holds the flower up as he describes how a bumble bee will muscle its way in for the bottle gentian's pollen and like ravisher and ravished. The flower is airy and weightless in my palm as Drake hands it too me. A slight breeze would inflate the diamond-shaped balloon and carry it out of my hand and off down the countryside. It could end up in Nebraska. I tuck it into my pocket, wanting to carry it home, put in my notebook.

"This is grass leaf golden rod," he says.

"This is liatrus, one of my favorites."

"Here is grey-headed cone flower."

"These are called rattlesnake master."

"Again, this is all an uncontrolled experiment," Drake says, as we round the bend down near the lake. I spy an alligator and it nearly gives me a heart attack. The thing is half-in, half-out of the water, its polyethylene body drenched in mud, painted eyes darting into mine.

Drake laughs, hands on hips. "We're not in Louisiana you know?"

"Right, I'll have to remember that." My stomach decides to descend out of my throat.

"And they haven't moved up here yet. It's not that warm."

I stand back up "Will it ever be that warm?" I wonder out loud.

Drake stops and turns. "Well remember, this all used to be an ocean here. There were crocodiles swimming over your hometown in Texas once. I mean, anything's possible."

"So really, you think -"

"Look, the only thing I can repeat, over and over again, is that this is all a global, unprecedented experiment. But we don't know yet how far we're going to take it. I mean you look at congress now and governors like Rick Perry - *your* governor - who don't even accept evolution yet along global warming. You wonder how soon any of them are going to act. All I thought when I started this little climate assisted migration experiment is that it's *already* getting warm enough for these species to live here, so why not try and stay ahead of the game?"

Later on he adds, "My interpretation is that the climate will soon favor woodlands and shrubs here instead of prairies. So that's why my place is a kind of matrix between forests and prairies. I'm hedging my bets, and living on the convergence zone." He squints. "Plus, I'm an Iowan. I don't quite like to lose the prairie yet."

"I didn't vote for Perry," I say.

Drake smiles, "I don't think anyone sober does. But then you guys must drink a lot down in Texas."

Since the land is dead quiet, the whole time we're talking the unearthly and pristine twinkling hum of his cylindrical wind chimes from his porch is clanging like snow fall over the grass.

We go down to his pond, the crystal water rolling in the heavy prairie wind, frothing on the shore.

"Do you see that flower there?"

I don't see anything but green reeds shaped like swords.

"That's not that rattle snake master again is it?"

"No, that's button bush. That's where it gets its name from those little seed balls. I think of the coats Ben Franklin used to wear, at least in the sketches."

We almost come around full circle, back to the patch with the paw paws when I see in a thicket of vines and scrubs, crawling up the side of something that looks like a sun-bleached, hand-made doll's house perched on a post.

"Is that a bird feeder?"

Drake leans back, hands on his hips, proud. "No, that's my hand-made, passive, solar-heated bat house."

"Are they up there now?" I ask, and I put a hand on the poll, which is about ten feet tall, and from underneath I can see the top-heavy box has six-inch slits on the bottom.

"Oh yeah," Drake says. "The problem with raising bats is when they're young, they're like a little naked jelly bean and they have to be kept warm. This thing is filled with sand that heats up during the day and stays warm through the night."

"Who put the bats up there?"

"Oh, mom. She comes by when she's pregnant. I don't have to do anything."

"So you build this thing and the bats, just, *come*?"

Drake smiles, nods. "Yeah, that's about it. I guess it's kind of an Iowa thing."

Walking back into Lon's hog of a car, he tells me he's rebuilding the whole west and North end of his house. He's making a front door level with their bedroom, rebuilding the driveway, rebuilding the porch, he'll make it so, if you need to, you can take a wheelchair right to the bed. It's a lot of work. But he's not desperate for the driveway now. One day he might be. The next two years he'll get a lot done. Which is what he's done for all projects that have occupied the rest of his life. Restoring wetlands. Cleaning up oil spills. Teaching students. Some days it's pulling weeds, some days it's chain sawing, somedays it's building a front porch, or moving species to save them from extinction before they need it.

Talking in the car on the way back we discuss how one might change people's attitudes about climate change. Drake takes a very deterministic view. For him things evolve from their origins as clear as toxic spills originate from a tanker.

"The facts of the world don't change lives," he says, "except for a narrow range of people. Basically someone's going to be a pro-environment or anti-environment, however we chose to label them from the beginning. For the majority of people they continue with whatever they grew up with as a child. If you grew up thinking having twelve kids was a good thing, the odds are you will have bunch of children."

Drake turns the car onto the highway. "The exceptions to that is the rebelliousness of youth which I think is our salvation."

Drake's little brother is a millionaire businessman with a pillared mansion. Drake argues the realities of global warming every time he sees him, one dialogue spilling over into the next. The interesting thing is that none of the brother's three kids have grown up to be like their father.

“They have totally rejected his mindset. His oldest daughter even lives in a log cabin that she built by hand. She has chosen a primitive lifestyle, trying to have the smallest carbon footprint she can make. I laugh every time I see them together.

“So I guess, it isn’t necessarily how you were raised; it’s how you respond to where you are.”

He looks at me suddenly serious.

“That’s why when you write this thing,” he says, “on assisted migration, I think you personally have an obligation to take a stand, wherever you chose to take that stand, because people need some basis for making their decisions. I think you have a responsible to try and convince your reader that there is a good path.”

“Well thanks for the advice,” I say.

“Really,” he says, “I think you should get personally involved. Don’t write something wishy-washy, there’s too much of that.”

I feel a hot charcoal underneath my shirt. But I stay quiet, listen. Drake has been kind enough to drive me the 45 minutes out to his place and back, answer all my questions. The least I can do is let him lecture me. Lecture like chain-sawing, like planting neat rows of corn. Weeding the bad thoughts.

We stay silent for most of the way back to the city, Drake’s window open, the wind fanning the flannel workman’s collar of his shirt, the noise of the wind filling the car drowning the rumble of the old engine, the bright noon light cascading in the car and onto the ears of fresh, inedible corn, flapping around like some bright, yellow and turquoise sea.

Going on a Burn

It was burning season.

We circled around Mike, in his toy-strewn backyard while he, muscled and unshaven, toed an action figure like a grizzly paws the open wound of a hickory trunk. The edges of attorney-proved forms faned around us in the dry April air.

I felt naked in my thin sweater and the jeans that I almost never wear. I was the one person in the circle of eight not wearing chaps or a hard hat or one of the mustard, flame-retardant shirts these boys wore like up-coller fraterinity brothers wear boat shoes

These boys were wild land fire fighters, and when Mike went inside to get more forms, they talked about their friends who were always "out west." Out West their friends slew beasts of fire with half-axe, half-hoe pulaskis. They themselves murmured about the guys who parachute into fire, pulaski in-hand, the fabled smoke jumpers.

The irony with Mike's boys is that though they are in the same business as those who ride with dalmations, but they would be starting fires rather than snuffing them, killing something to give it life.

There was a hint of blue collar meats green with them, the rough neck meets tree hugger mixture I have loved swimming in, one of my granfathers an oil man, the other a bricklaywer and myself an environmentalist. They were curious in my own work, the little writing I've done on Iowa prairies.

I am interested in prairies because they are corridors for species to migrate across the agriculture-fucked Midwest. To put Iowa into perspective, imagine a football field covered in bluestem and Indian grass and purple cornflowers and wild iris and bumble bees and burrowing owls and wolves and savannah and laurel oaks and bob cats and prairie dogs and finally imagine after westward migration an end zone, and in a corner of that end zone, all by itself, a grass-filled coffee cup. And that is all you have left of the Iowa prairie.

Burning is one of the oldest prairie gardening tools, used by the Oneota people to drive game and clear brush and ticks. The excuse now for burning what little is left is that the plants, the natives, lie protected under the earth while their top parts melt. Icebergs of roots and seeds and rhizomes go six-feet underground, the tangled mess of life that holds the soil, nutrients, insects, burrowing mammals and microbes in their places at the same level as elsewhere our own bodies decompose. The intruders like honey suckle and garlic mustard expend energy just getting to Iowa and are soon scorched dead when burned, shallow interlopers not adapted, not a piece of the Iowan circle. While some Iowan plants will only release their seeds in the presence of fire.

But there was another thing me and these boys had in common in our being on that erstwhile gardening trip: I recognized in their faces the pull of watching a 40-acre field go up in flame, the attraction of crackling embers on grass and trees, a fire so big you couldn't see it, a fire like a cathedral, suffused with awe and the unknown.

I try to be skeptical of the lust for destruction. Yet I can't avoid my own unprovoked chills and a zest - something both natural and dangerous. It is like religious experience, and like with religion, I am deeply suspicious. There are garbs doffed, an ad hoc spiritual leader and even, in a way, an afterlife. Rare plants would be broiled in flame because they would show up again

on the other side, our faith in life after death freeing us to our destructive edges.

But the best thing about fire is its ability to free us from our roots, to cast seeds of experience. With fire you're getting forgotten cave paintings, boy scout marshmallows and the rumble of bomb bay doors before they release their fire on unsuspecting cites below, an experience that transcends our evolution because it brings us forefront into the bright now in collusion with the dark and murky history of our species.

We loaded into two trucks and road thirty miles through Monsanto scapes of corn and soy sprinkled with patches of prairie. Thought of as weeds until not long ago, and still most farmers can't believe people are actually growing these things on purpose, prairies are being restored by various owners, land trusts and groups like the Nature Conservancy, some even receiving a pittance from the government in exchange for keeping the last smattering of native flora and fauna alive. Once on our drive we saw a rolling hill of golden Indian grass in the middle of corn and hog barns and soy. It was an island in the tumultuous sea of agriculture, and I thought it looked delicate and somehow assertive at the same time.

At the farm site, we unloaded our tools and a green, rented ATV, with a 30-gallon water tank. The thing I was drawn to most about Mike's boys were the little torches they carried called - "drip cans" filled with one part gas and two parts diesel, so it would burn more uniformly. They are shaped and colored like fire extinguishers. The jugs had nozzles at their ends with a loop so the flame wouldn't eat its way inside and a black handle on the Clifford-red body. They were watering cans I thought, pouring liquid napalm balls that dribbled to the ground and become embers on and leaves and bark.

The tool I was to use was a rake with what looked like the kind of mud flap on every semi-truck in the country stapled to its pole. Mike called this a “flapper.” Mike and the boys would walk around the perimeter starting a back burn, and I would follow with the mud flap and the smoke in my eyes, setting the rubber onto stray piles of flame.

In a corner of the 40 acre property stood a red-bricked, three-story Wizard of Oz house. We had a brief meeting near the house under an oak, in which we went around the circle, dividing into "Yankee" and "Zulu" teams, though I'm not sure anymore which group I was supposed to be with, only that inexperienced, I grouped myself with Nate, the rail-thin, soft - voiced, second-most burn friendly man in the group other than Mike. Both Nate and Mike wore radios strapped across their chests like shotgun shell bandoleers. Nate was a college graduate heading to Colorado that summer. “Out West,” he said, “to be with my friends.” I thought his thin face in the noon light resembles a freshly sharpened Pulaski.

Team Zulu or Yankee went down one field while our group split off, Nate leading with his drip can. After a few minutes of getting ready, loading up his fuel, he began spraying blankets of napalm onto the exotic grass and shrubs. They were mostly honeysuckle, autumn olive, black raspberry, wild parsnip and the infamous garlic mustard - red and mauve and peach and teal invasives that when burning, rolled up into curly Qs like the fries at Arby’s and then floped over into what I thought were beautiful bleeding rainbows of color.

Nearer the house the invasives were trees as thick as our calves and included a few Iowan dogwoods that aren't exotic but had made themselves so by coming onto the prairie from the woodlands where they belong. The back of the property behind the house, all the way downhill to where Mike was watching from his truck, we were waiting to fire. The 35 or so acres was

entirely grass - thick, turbulent, adult-tall blue stem and Indian grasses. It was a like a laid-down 500-foot match. That was going to be the main burn.

Nate's group and I were backfilling, lighting the edges downwind. The idea is if you fire the leeward end of a burn you create a dead zone where the flames won't lick the low-hanging branches opposite the mown break on the next door field. You create a wide fire-impenetrable circle, keeping the flame inside and the neighbors happy. Which in theory works, but the dry and cracked lawn between this property and the next came alive as the wind picked up, and we had to sweep in with our flappers and pursue and stamp on the stray fires like people shooing mice. The smoke curled around our faces and got into our eyes and we cried as we worked.

Nate got zealous with the drip can, taking on thickets of sweet-smelling honeysuckle, knotty dogwoods, and the pungent garlic mustard, setting fires that billowed fifteen feet in the air. I was struck there with my flapper by my side, staring at the fire because this was supposed to be the "small" end. But the flames were towering and cooking me beneath my jeans and sweater. Sweat beaded on my shoulders and calves, and I held my hands up to the flame, still many feet away to feel the shock of heat beneath the leather of my gloves and the skin of my bare arms sizzling.

What a fine thing this was, I couldn't help but thinking. What a fine thing is fire.

Nate told me to drive the four-wheel, John Deere "Gator" and follow him. I'd never driven an ATV before, but when I start the green contraption and ride through the life-filled bucks and wheezes as if I were used to this rodeo, I realize it's a lot like driving a go-cart with a bounce. I pulled around Nate with the water, and he put away his drip can to take the nozzle and dribble well water on the pasture in front of the advancing flame. It was almost a waste of time.

The heat evaporated the liquid. But it was some means of prevention, so Nate sprayed while I moped up with the flapper. Sprayed and moped. Sprayed and moped. It threatened to feel like normal.

Our group burned a fifteen-foot wide no-man's land on the west side of the house, catching the wind, halting the fire at the grass. Turning towards the wind, the fire blew itself out, and Nate decided to let it rip with the can, firing up areas forty feet long - short grasses and dogwoods. The live, wet limbs screamed when ignited and the trees' bark peeled in thin blazing strips. I trailed in the ATV, rolling over the grasses and dirt and skirting the toppled dogwoods that reminded me of fallen soldiers. Randomly on the houseside of the burn line there was a pile of dead grass and eggshells and old fruit and I skirted that, knowing it was a compost where our same work was being done by microbes, the return of death to the cycle, though I could smell the putridness of that cycle as I passed.

We continued firing and watering. Firing and watering. Sweat soaked through my shirt and dried on the surface. Nate piled more fire upon more fire until his drip can was empty and he switched it for another.

Soon we learned the back burn was done. Team Zulu or Yankee had made a blackened C around the property. They waved to us. It was our turn to comlete the C and make and O.

The finishing touches were Nate and I in the Gator, Nate's legs dangling off the back like a child at a lake dock. He lay down flame as I drove, completing the C and making a circle that had been left unfinished since the Oneota were driven off their land but when complete would catch in the wind and burn across the prairie.

Nate dribbled sparks like Johnny Appleseed, and when we reached the edge of the

Southwest corner where team Zulu had already arrived and laid fire to the grasses there, and with our fires combined, the circle complete, we made a torch the size of a six-story building. I couldn't see much of it as I was crying by the side of the road, as I had been all day and couldn't control, for the prairie in my eyes, the smoke of death and destruction, and in that destruction, creation and life.

I wiped my cheeks and walked off to behold the spectacle. Most of the fire was preserved behind a veil of soot and a towering mass of clouds that peaked high over our heads like a jagged mountain. Two clouds really, one flour white and the other a chocolate brown, the yin-yang of atmosphere, a swirled ice cream dollop of air, which included the prairie's casted seeds. The flames were hot and I walked towards them, cautious not to appear too "fire loving" as Mike mentioned some volunteers get who don't know their boundaries.

I walked closer, and as I saw the orange lick the sky behind the smoke, I heard a sound like I've only heard once before at the children's peace museum in Hiroshima. Near the nuclear blast zone there are several rooms filled with millions of paper cranes, the cranes which mean peace in Japan, and are sent by hundreds of school children from all over the country, often as graduation projects, one thousand paper cranes per school. I was told when I visited the rooms fill up so fast they have to take out cranes every week and burn them, lighting them, somewhere I guess, not with the eternal flame that burns near the blast center, the eternal flame which will only cease, they say, when every last nuclear bomb has been laid to rest, when we no longer can create fire so destructive it melts the fibers of clothing into flash patterns on our skins and imprints our shadows onto sidewalks, only then will the flame in Hiroshima be extinguished, when all the destruction is turned into some other kind of life - the sound I heard was the wind

rippling through one of those telephone-booth sized rooms, the breeze rolling in and disturbing the wings of millions of peace cranes, a rattle like a grocery bag, like a radio crackle, like one-hundred-thirty-five-thousand people clearing their throats to tell us about fire. The sound was the flames licking the sky, the dogwoods and honeysuckles and grasses kneeling down and offering themselves as sacrifice to destruction and to the beginning of a new life.

Wanting to get closer, I walked on down the firebreak. I could hardly see the flame as it rolled ahead of the smoke and the ghostly plain appearing, a scorched earth not of skull and apocalyptic nightmare but of fresh soil and fertilizing ash. I kicked a layer back and saw that the burn had eaten right to the ground where blue stem and Indian grass and purple cone flowers and iris, in a matter of days, would grow again.

When the cloud passed, Nate and I fishtailed in the ATV through the field that minutes ago had been a living prairie. We skiped over burning spots, islands of fire in a forty-acre fresh pond of ash. The fires whiped around us, the heat wetting our skin.

We skided to halt by grizzly Mike who appeared out of the rolling gray, eyes squinting, his face, hard hat, gloves ash-dusty like a disaster survivor. He showed us a snake wrapped around a dogwood stick he was holding, its head cracked and charcoaled, its serpentine belly exploded.

"A casualty," he said with pity.

Mike said he was going to bring this death home to show to his young children.

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