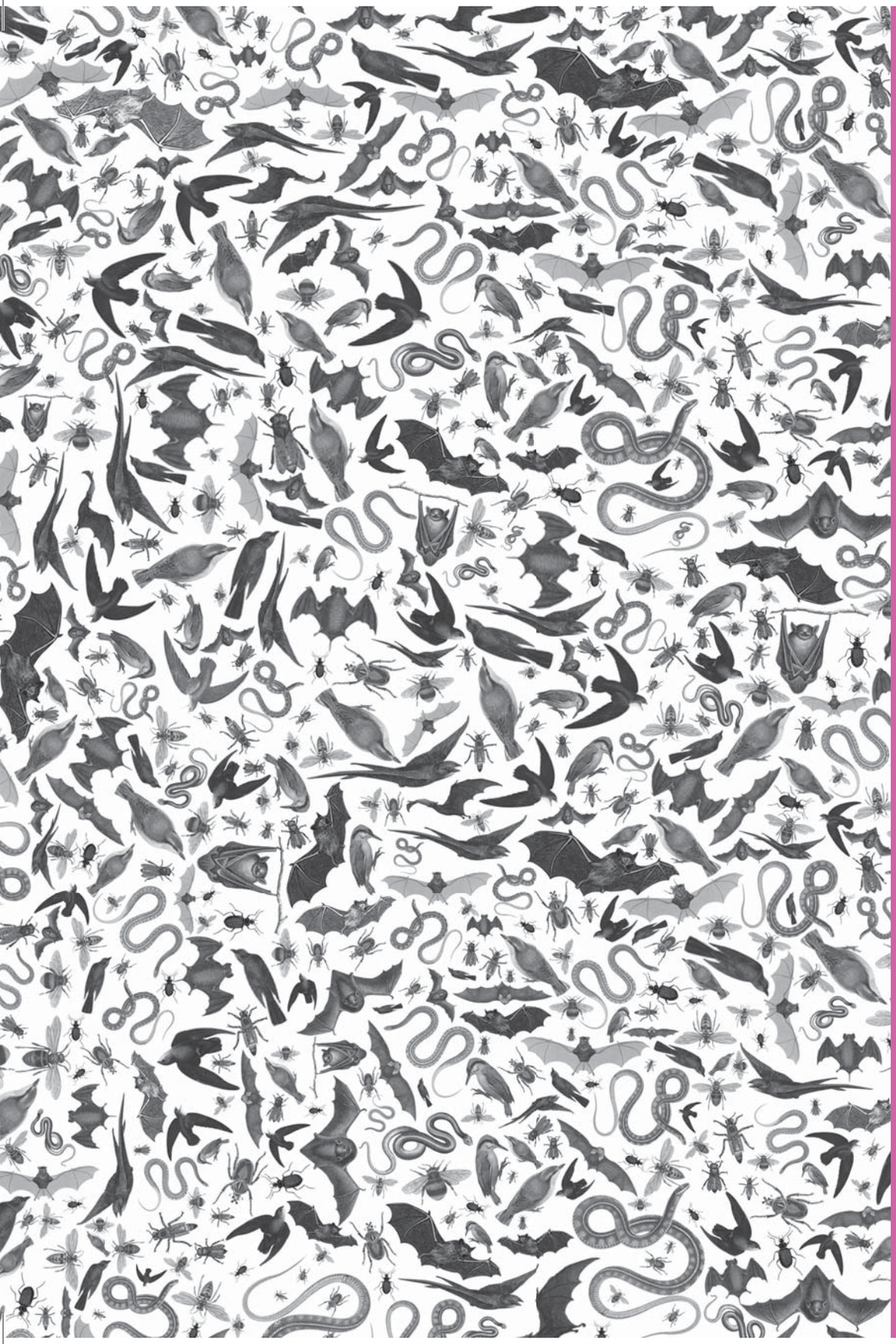
FIELD GUIDE

FRITZ HAEG'S ANIMAL ESTATES

REGIONAL MODEL HOMES 5.0
PORTLAND, OREGON



ANIMAL ESTATES 5.0
PORTLAND, OREGON

DOUGLAS F. COOLEY MEMORIAL ART GALLERY
REED COLLEGE
26 AUGUST–5 OCTOBER 2008

FRITZ HAEG

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The ongoing Animal Estates initiative creates dwellings for animals that have been displaced by humans. Each edition of the project is accompanied by some combination of events, workshops, exhibitions, videos, printed materials, and a temporary headquarters presenting an ever-expanding urban wildlife archive. The project debuted at the 2008 Whitney Biennial, with other 2008 Animal Estate developments located in Austin, Cambridge, San Francisco, Utrecht, and Cleveland.

Animals alternately represent a wildness that we are afraid of in ourselves, or a freedom that we would like to recapture. Animals were the subjects of the earliest documented human art. In primitive cave drawings we see a reverence for the creatures with whom Homo sapiens shared the land. In early cultures, animals were viewed with wonder, something sacred. Human survival depended on the hunt, which required keen observation and understanding. An intimate bond and respect developed, which is less likely in today's grocery stores full of anonymous meat in Styrofoam and plastic.

Humans are one of many territorial creatures that occupy the planet, but we are the only ones who, when establishing territory, preclude the existence of most other life-forms that we have not domesticated. Thus, most creatures not a part of the human plan are either considered a threat or a pest. As the human domination of the planet continues, animals are alternately viewed as exotic specimens to be treated as spectacle, cartoon characters that are anthropomorphicized, friendly companions to be coddled, objectified resources to be exploited, inconveniences to be tolerated, pests to be eradicated, or anonymous, unseen creatures to which we are indifferent.

As animal habitats dwindle daily, Animal Estates welcomes wildlife back into our daily lives, eradicating the strict, arbitrary, and obsolete boundaries that humans have established between the man-made and the wild. Animals and their habitats are woven back into our cities, strip malls, garages, office parks, freeways, backyards, parking lots, and neighborhoods. Animal Estates intends to provide a provocative twenty-first-century model for the human-animal relationship that is more intimate, visible, and thoughtful.

PORTLAND

In the gallery, the temporary Animal Estates headquarters features a geodesic dome housing a reading library, and a video by Dan Viens on the local swifts that roost in the chimney at Chapman Elementary. Evidence of past Animal Estates in New York and San Francisco is presented, along with bulletin-board walls displaying maps, charts, brochures, and other printed materials gathered from local animal experts and wildlife organizations.

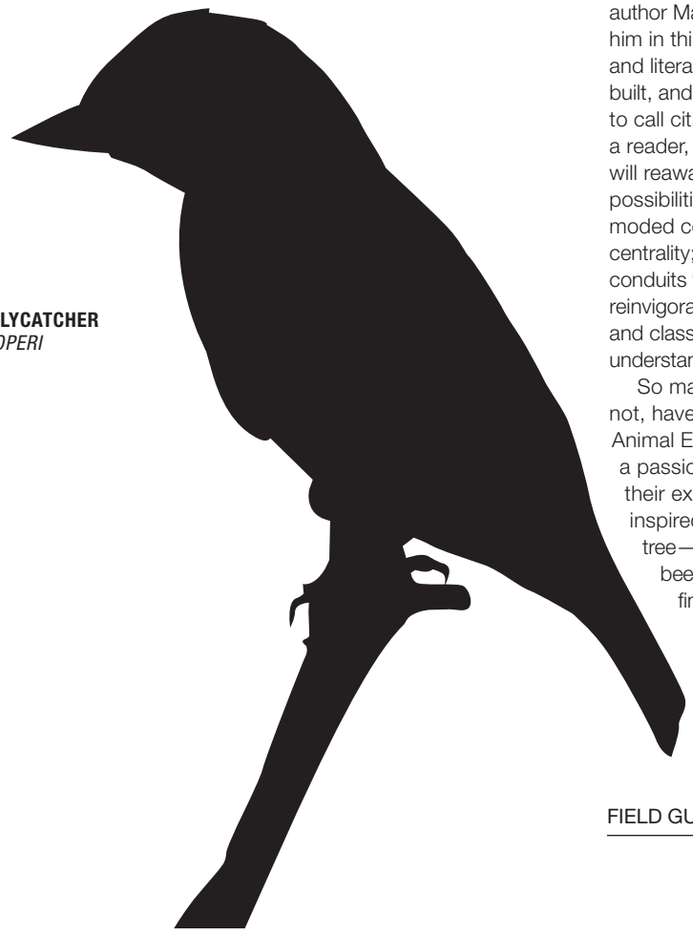
The Portland edition of Animal Estates takes its primary inspiration from one of the most significant existing ready-made "Estates" for animals in the Pacific Northwest: the snag, or dead tree. These are often removed by humans, who may only view them as useless hazards, rather than the valuable resources they represent to most other creatures. Each of the seven species selected as Portland's animal clients would happily take up residence in a snag: the Vaux's swift, the white-breasted nuthatch, the olive-sided flycatcher, the silver-haired bat, the northwestern garter snake, the orange-rumped bumblebee, and the snail-eating ground beetle.

A prototype for a collective model home to accommodate seven native Portland species is installed in the gallery. The fourteen-foot tower functions as a man-made snag, with the interior divided into multiple chambers built to suit the varying needs of each resident. At the top is a chimney open to the sky for the Vaux's swift, while the low base of stones and logs accommodates terrestrial species. A poster featuring a drawing of the design announces the plan, and encourages local residents to build their own interpretation of the Snag Estate, images of which are posted in the gallery and online. In celebrating the snag, we acknowledge the pivotal role of death and decomposition in a healthy environment.

BUILD A BETTER SNAG!

STEPHANIE SNYDER

JOHN AND ANNE HAUBERG CURATOR AND DIRECTOR,
DOUGLAS F. COOLEY MEMORIAL ART GALLERY, REED COLLEGE



CLIENT 6.3
OLIVE-SIDED FLYCATCHER
CONTOPUS COOPERI

Portland, Oregon. The City of Roses—city of bicyclists, farmer's markets, and the Urban Growth Boundary. Portland's self-image is a meandering conduit of gentle reflections, rippling across rivers, glistening beneath bridges, washing across creeks and muddy puddles. It is ebullient, ever molding, verdant, and aspiring, and these days, above all else, it is planned. I write these meditations on Animal Estates, and its remarkable investigations into human and animal relationships, as someone who grew up in Portland and claims the license of knowing this place. And because of this I have particularly relished the opportunity to welcome this project to Portland, into this progressive, unfolding city that we treasure as a particular form of community. In its existence at the Cooley Gallery, Animal Estates is part of a larger, ongoing investigation entitled suddenly: where we live now (www.suddenly.org), a project inspired by the work of German urban planner Thomas Sieverts and further instigated by Portland author Matthew Stadler, who enlisted me to join him in thinking and reading through the history and literature of the vast network of natural, built, and symbolic spaces that we have come to call cities. Suddenly is a set of exhibitions, a reader, and a series of events that we hope will reawaken our sensitivity to the imaginative possibilities of place; inspiring us beyond outmoded colonial narratives of permanence and centrality; embracing art, literature, and food as conduits for new social and environmental rituals; reinvigorating culture across socioeconomic and class boundaries. We need these tools for understanding and utilizing the where we live now.

So many Portlanders, whether native or not, have moved here and shaped this place. Animal Estates 5.0: Portland has assembled a passionate group of naturalists and with their expertise devised a "multiplex" dwelling, inspired by the "snag"—simply put, a dead tree—in which seven animal species that have been extirpated to varying degrees might find shelter, cohabitating comfortably. It is an architectural symbiosis, and not only among the animal species themselves. It is emblematic of architecture's potential to create unlikely communities, to conjoin as opposed to divide. Animal experts, environmental organizations, citizens, school children, artists, and theorists came together to create this project. The Estate that has been created for this edition of the project is an instrument and a metaphor for the possibilities of global coexistence. And it is aesthetic, never purporting to become natural. At its essence, and in a profound respect, it is an assertion of the naturalness of death, of the beauty and problem of decay, both as symbolic representation and as biological process.

The urban and semiurban habitat nurtures a schizophrenic attitude toward death. Within inhabited spaces we cloak death, remove it, sanitizing this most fundamental aspect of our existence as we construct the natural around us, more often than not, as a representation of the natural. The snag is a victim of this schizophrenia: seen as dead, removed from the living like an ailing patient, it is a corpse. But the corpse nurtures, the corpse sustains. When the dead becomes the un-aesthetic, the living becomes historicized into permanence, and the living problems of people—the inequalities of class and education eroding our culture—are increasingly cloaked by our obsession with the preservation of nature, with our fear of the corpse. Though we valiantly preserve habitat, Portland has nurtured and supported the development and preservation of the "park" as a civic virtue without expending the same care and resources toward public education and social rituals. Portland's parks developed in inverse relationship to the growing un-sustainability of its decimated clear cuts—its "clearings." The foundation of this city was a clearing, but a permanent one, not the temporary, seasonal clearing, as nurtured for millennia by the Native Americans whose corpses too made our permanence possible. And these permanent clearings were condensations of wealth built into homes and objects that demanded a vast network of dispersal and collection to sustain their viability. Like most cities, Portland descends only so far into its landscape memory.

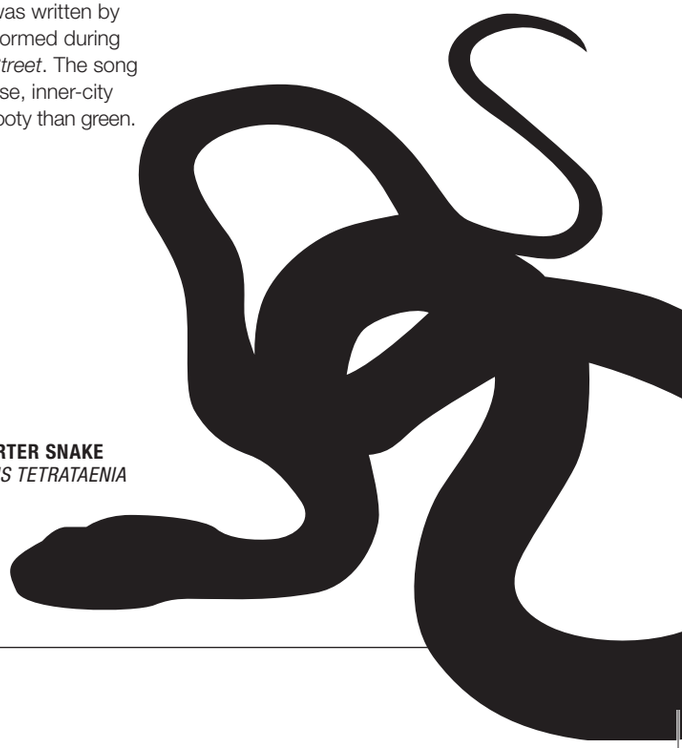
The snag is the shack, temporary, portable, and both corpses can help us find our way into the future. We don't really know what a city is any more than we know what art is, except that we think we know it when we see it, or buy it. The historic, bureaucratic city, the city that organizes, absorbs, and expends our resources

because it has been architected and planned for permanence, that city is only one tiny piece of where we live now. We think it begins and ends, automatically. The snag and the shack interrupt the historic city's nostalgia for permanence. A portable commonality, they reveal origin by nature, cannot be franchised or replicated. They are the humblest, most universal of singular dwellings. They are the future of common space … aesthetic trading posts—sites for the exchange of information and materials on terms of our own making. I will give you three kisses for that bouquet. The snag deconstructs commerce as it crumbles the institution of fixed community, shacking up. It changes direction suddenly, as suddenly as erotic hope. Really look at it, bending in the wind. Find it everywhere. Enlighten your neighbor to the joy, forgiveness, and fiction of the snag.

Until about a year ago, the Portland Visitors Association presented our city to the world with the slogan "It's not easy being green." The phrase was accompanied by an image of a fir tree rendered in a flourish of computer-generated calligraphic brushwork. It's not easy being green. Kermit the Frog sang it first in a melancholy pop ballad. In the concluding lines of the song, Kermit sings: "When green is all there is to be, it could make you wonder why, but why wonder. I'm green, and it will do fine. It's beautiful, and I think it's what I want to be." The song was written by Joe Raposo in 1970 and was performed during the inaugural season of *Sesame Street*. The song was written for the children of dense, inner-city urban habitats, more gray, more sooty than green. Being green meant being black, brown, and whatever else. The civil rights movement ended not with a bang, but with an existential little frog.

Animal Estates wants to get Kermit the fuck out of the class pond. Animal Estates is a flexible, limitless methodology for building community among species, and it is in your hands now. Like portable scaffolding or a lean-to in the mountains, Animal Estates is a transposable field guide for a future-present in which we can turn to other species, and one another, and extend our intelligence into the unfolding semiurban city, temporarily overlooking ownership—thoughtfully, truthfully. Animals don't lie; our missteps kill them. Given that we have legislated ourselves into the stewards of this planet, this project reminds us in no uncertain terms that it is time to bear witness. If we are courageous enough here in this project to dematerialize the museum into a snag, a shack, a tent, let us meet there and learn together. Let's build a better snag.

LEFT
This 14-foot-tall residential tower is the Portland Animal Estate, which simulates a snag, or dead tree, and accommodates seven native Portland species. photo by Shawn Records



CLIENT 6.5
NORTHWESTERN GARTER SNAKE
THAMNOPHIS SIRTALIS TETRATAENIA

IN LIVABLE CITIES IS PRESERVATION OF THE WILD

MIKE HOUCK

EXECUTIVE DIRECTOR,
URBAN GREENSPACES INSTITUTE

CLIENT 6.4
SILVER-HAIRED BAT
LASIONYCTERIS NOCTIVAGANS

THE UNTENDED GARDEN

"The garden, left untended, had taken on a strange charm. Horticulture had left, and nature returned. Nothing in the garden opposed the sacred urge toward life; The trees bent down to the briers, the briers rose to the trees, what runs along the ground had tried to find things in bloom in the air, what floats in the wind had stooped toward plants that trail in the moss; trunks, branches, leaves, twigs, tufts, tendrils, shoots, thorns were mingled, crossed, married, confused; Although the pavement of Paris was all around… (there were) ferns, mulleins, milfoils, the tall weeds, the big flaunting plants with large leaves of pale greenish material, the lizards, beetles, restless, rapid insects. Nature, which frustrates the paltry arrangements of man and always gives its whole self where it gives itself at all, as much in the ant as the eagle, to come and display itself in a poor little Parisian garden with as much asperity and majesty as in a virgin forest of the New World."
Victor Hugo, Les Miserables

What resonated most when I unexpectedly came across Hugo's poetic passage describing an untended garden's ability to display a riot of life was that it mirrored my own unexpected urban nature encounters here in Portland. Experiences like being startled by a green heron's guttural squawk exploding from a willow thicket; following a Cooper's hawk's frenzied flight as it chased down a rock pigeon, plucked, and ate it in front of fifteen mesmerized cyclists on downtown Portland's Eastbank Esplanade; or watching a group of kayakers gawk awestruck at a young peregrine falcon repeatedly strafing a bald eagle as we bobbed in the middle of the Willamette River, with the downtown skyline as a backdrop. The fact that nature hangs on so tenaciously, albeit precariously, in the urban landscape makes nature both exhilarating and precious. It's the unexpected, the unintended, that lends poetry and grace to such encounters.

THE LAST LANDSCAPE: THE ECOLOGICAL CITY

"The belief that the city is an entity apart from nature and even antithetical to it has dominated the way in which the city is perceived and continues to affect how it is built. The city must be recognized as part of nature and designed accordingly. The city, the suburbs, and the countryside must be viewed as a single, evolving system within nature, as must every individual park and building within that larger whole."
Anne Whiston Spirn, The Granite Garden

Thoreau's aphorism, "In wildness is the preservation of the world," has inspired spectacular successes in wilderness and wildlands preservation. While we should celebrate those successes, it's time we turned our attention to what may be the most important landscape in the twenty-first century—the city.

Historically, there has been a great dichotomy between "nature" and "city." Nature has been seen as being "out there," beyond the urban fringe. Humans and nature inhabit separate realms. Nowhere is this more vividly demonstrated than in how we build our cities. In the same way that traditional zoning precludes healthy mixed-use communities, the segregation of natural and built environments has created cities where environmental degradation is the norm and the landscape is bland and homogeneous, where nature neither separates one community from another nor interacts with the built environment.

Our motto at the Urban Greenspaces Institute, "In livable cities is preservation of the wild," reflects a philosophy that well-designed, nature-rich cities are more beautiful, equitable, compact, and ecologically sustainable places to live. By creating livable and loveable cities we will reverse what for too long has been the demonization of the city. It's my hope that Animal Estates will help foster a new aesthetic in urban design and catalyze a partnership with urban planners and conservationists that will promote a new reverence for cities through great art and design. We need a new urban ethos, one in which humans have access to nature in their immediate radius of reach in what has been referred to as "the twenty minute neighborhood." In such cities animals will have real "estates" at all scales, from the individual home, office, and streetscape to great swaths of habitat that penetrate into the heart of the city.

URBAN WILDLIFE IS NOT AN OXYMORON

"What is the extinction of the condor to a child who has never known a wren?"
Robert Michael Pyle, The Thunder Tree

Recently, the Oregon Natural Heritage Program remapped the Portland area to determine the region's biodiversity index. What had previously appeared to be a biological desert from earlier

three-state surveys, when mapped at a finer scale, revealed an astonishingly biologically diverse landscape inside the region's Urban Growth Boundary. These findings are echoed by the Audubon Society of Portland's estimate that we share the region with 289 species of birds. Of these, about 217 species are likely to be seen in any one year if you know which habitats to look in, according to the City of Portland's fish and wildlife habitat inventories. For example if you want to see white-breasted nuthatches, go find a grove of Oregon white oak trees. On the other hand, if you want olive-sided flycatchers, walk the trails of mixed conifer-deciduous trees in Forest Park.

Both the City of Portland and Metro, the only directly elected regional government in the country, have also conducted inventories of vertebrate species in the region. They have found an astonishing variety of nonavian wildlife, including 17 amphibians, 16 reptiles, 64 mammals, and 39 fish, bringing the total to 353 species of vertebrate wildlife. This list, of course, is exclusive of thousands of species of invertebrates—butterflies, slugs, beetles, spiders, and their kin.

As with human estates, animal estates are all about location, location, location…and habitat, habitat, habitat. Without suitable habitat that meets the cover, feeding, and breeding needs of animals, they would cease to cohabit the urban landscape with us. There is no substitute for protection and, where needed, restoration of wetlands, stream corridors, and forested habitats.

That said, several species have decidedly benefited from artificial structures including nest boxes, nesting platforms, and elements of the built environment. Without nest boxes and nesting gourds, it's highly unlikely we'd still have western bluebirds and purple martins in our midst. The installation of thousands of bluebird nest boxes on Parrett and Chehalem Mountains has also benefited house wrens, violet-green swallows, tree swallows, and white-breasted nuthatches. While they frequently use natural snags, there's no question that the numerous nesting platforms along the Willamette River are responsible for the explosion of nesting osprey. And, with the loss of natural roosting sites, Vaux's swifts, like their East Coast cousins the Chimney swifts, have benefited from the presence of chimneys at Chapman Elementary, Oregon City, Lafayette, and several other locations around the region.

WILD ON THE WILLAMETTE, EXPLORING THE LOWER WILLAMETTE RIVER

Nowhere in the region is the diversity of wildlife more visible than along the banks of the Willamette River, right in the heart of downtown Portland. My favorite wildlife viewing is at Oaks Bottom Wildlife Refuge and the four-island Ross Island archipelago. At Oaks Bottom alone over the past thirty years I've seen over 110 species of birds and several species of mammals including river otter, sea lions, beaver, deer, bobcat, muskrat, chickaree squirrels, raccoon, mink, and the nonnative nutria.

Recently, from the bluff overlooking the south end of Oaks Bottom, our small group of birders observed several young bald eagles chasing one another through the big-leafed maples at the north end of Sellwood Park and a short while later encountered five immature eagles perched in a snag off Sellwood Boulevard. A few days later another band of birders watched in rapt awe as five ospreys kettled over that same snag. Just before I led these trips to Oaks Bottom, I had returned from a month-long birding expedition in the wetlands and tropical forests of Brazil, but saw nothing as exciting as when we watched a red-tailed hawk kiting fifteen feet overhead while an osprey and a bald eagle fought over a fish in the near distance. Then, there's the constancy of a male Anna's hummingbird at Sellwood Park. The brilliant red gorget and forehead from the pugnacious, territorial male flashed from the same perch on every single Oaks Bottom visit this spring and summer.

On any given day the two-mile stroll around the Bottoms will yield twenty to over fifty species of birds, depending on time of year. In winter, waterfowl including hooded mergansers, northern shovelers, ring-necked ducks, buffl ehead, ruddy ducks, and green-winged teal seek refuge in the shallow pond. During migration, early spring, and summer, warblers, vireos, and grosbeaks can be seen and heard singing along the Springwater on the Willamette trail. A walk along the unpaved path that runs at the base of the bluff will yield Bewick's, marsh, and winter wrens; black-capped chickadees and brown creepers; downy woodpeckers and northern flickers; common yellowthroats and song sparrows..

A three-mile paddle around Ross Island provides an opportunity to see nesting bald eagles and great blue herons; double-crested cormorants; peregrine falcons nesting on the Marquam Bridge; Common mergansers; belted kingfishers, which nest in the island's steep banks; and red-tailed hawks. The black cottonwood and Oregon white ash forests ring with a cacophony of bird songs in spring, including black-headed grosbeaks; warbling and Cassin's vireos; Swainson's thrushes; yellow, Wilson's, and orange-crowned warblers; as well as the occasional beaver, river otter, and sea lion when the salmon are running.

CONNECTING GREEN

Oaks Bottom and Ross Island represent a fraction of the eighty thousand acres of regionally significant fish and wildlife habitat Metro identified in its recent inventory of the metropolitan region. Recently, Metro, local park providers, and several nonprofit organizations including the Audubon Society of Portland, Trust for Public Land, and Urban Greenspaces Institute launched the Connecting Green Alliance with the objective of creating the greatest regional parks, trails, and natural areas system in the world. I'm hopeful that Animal Estates will assist in achieving that goal by engaging artists, architects, and landscape architects not yet engaged in efforts to protect and restore the city's green infrastructure, but who will bring a new perspective to urban design and interpreting nature in the city.

Our greatest challenges in implementing Connecting Green's ambitious goals are, simultaneously, leaving as much of our urban garden as possible "untended", thereby encouraging integration and interdigitation of the built and natural landscapes; restoring degraded habitats by removing invasive, nonnative plants; and, where appropriate, providing human-made structures to assist in the recovery of those species that might otherwise disappear from the urban environment.

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SNAGS AND LOGS

CHARLOTTE CORKRAN
NORTHWEST ECOLOGICAL RESEARCH INSTITUTE

CLIENT 6.6
ORANGE-RUMPED BUMBLEBEE
BOMBUS MELANOPYGUS

What is a snag? It is just a dead tree. But it is so much more than that, too. A tree does not put out sticky pitch after it dies, and so a snag can be a cozy home for wildlife as well as a source of food.

A woodpecker can chip a hole into the snag with its bill, and then keep on pecking until it has hollowed out a cavity for a nest. After the woodpecker's babies have fledged, the cavity is free to be used by other animals. A little downy woodpecker digs out a little cavity that can later be used by chickadees, wrens, and chipmunks. The great big pileated woodpecker makes a large cavity that may later house an owl, a duck, or a pine marten.

Snags that are hollow inside and have a large opening at the top provide homes for other species. A colony of bees can build its honeycombs in the shelter inside a hollow snag. Vaux's swifts and several kinds of bats roost and raise their young in these hollows. Or a black bear can squeeze inside to spend the winter and give birth to its young.

The dead branches on a snag (or a partially live tree) are important for wildlife, too. Many species of hawks use them for perches to rest and to scan the region for prey. Flycatchers and other small birds wait there for flying insects to come near. Ospreys, bald eagles, and red-tailed hawks build their huge stick nests on the bare branches of snags and dead-topped trees.

Besides providing homes for wildlife, snags and logs provide the foods many wild animals like to eat. Ants and beetles, bugs and slugs, mushrooms and truffles all live in rotting wood. So for many birds, mammals, reptiles, and amphibians, snags and logs are fully stocked larders as well as bedrooms and nurseries.

Snags may stand for many years, providing important habitat for wildlife. But sooner or later they fall. Some just crumble into great piles of debris, while others blow down in windstorms and become logs on the ground. In either case they make perfect habitat for salamanders and shrews and beetles. Live tree, then snag, then log or debris pile. Scientists who study forest cycles, like Chris Maser and Jerry Franklin, have found out that a conifer tree provides more habitat for more wildlife species for more years after it dies than it did while it was alive!

Where are all the snags? Why don't we see these wildlife apartment houses in Portland? Surely snags and logs used to be a common component of the Douglas Douglas fir forests that once covered the hills around town? And weren't there snags in the huge stands of cottonwood trees that originally covered the islands and riverbanks? What about snags and gnarly old Oregon white oaks in the woodlands that were so common in the Willamette Valley when Euro-Americans arrived? What happened to all these types of snags and logs? The sad truth is that we got rid of most of them. Snags were cut down for firewood, or because they were considered useless, or they were in the way, or they were thought to be dangerous because they might fall on someone. Logs were also burned or pulled out of the way to make room for houses and roads and farm fields. The old-growth forests were logged, and no new trees grew large. People and our developments and cities have displaced forests, particularly old-growth conifers, gallery cottonwoods, and oak woodlands.

But now we can help the animals that need snags and logs. We can provide homes for them in several ways.

First, we can work to save snags and logs wherever they still do occur. In your neighborhood park or open space, or even in your own backyard, snags and logs can be kept. Talk to the park managers. Talk to your neighbors. Tell others how important snags and logs are to wildlife. Show them how beautiful they are. If a snag is too close to a house for safety, cut it lower, or cut it down for a log. But keep these important elements of the ecosystem we live in.

Second, we can create snags and logs from some live trees. If a particular tree is shading the vegetable garden, or its roots interfere with the water line, instead of removing it make it into a snag. Cut a band of the bark off all the way around the tree to kill it. You might need to wrap copper wire around in the stripped band for a year (and then recycle the copper). While it is sad to kill a tree in your yard, it is very satisfying to make a snag. And even more fun to watch a woodpecker drill a hole and nest in it, followed

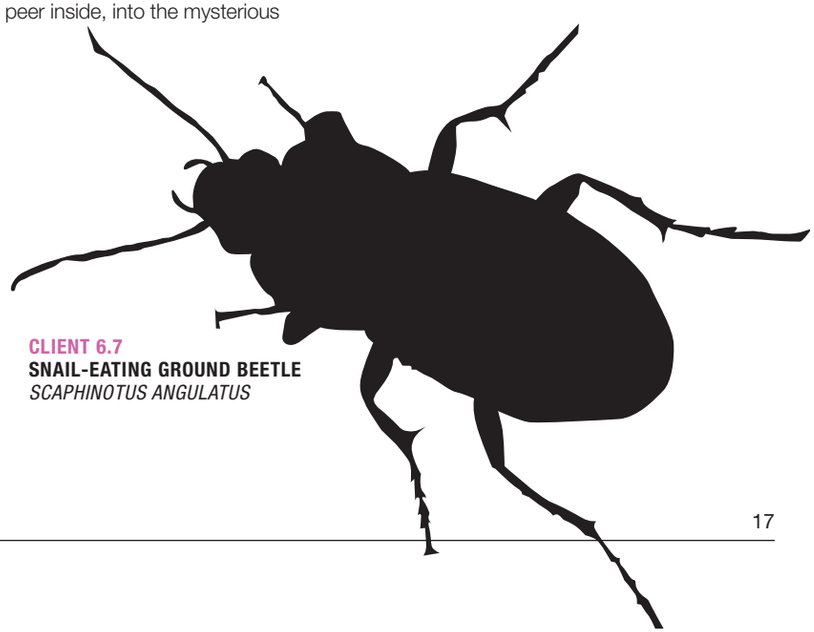
by a chickadee nesting there the next year. If your snag falls or it must be taken down, a tall stump can provide some habitat, and the log can provide both a home for salamanders and a beautiful element of your native wildflower garden.

Third, if you can't save or create a snag, anyone can make an artificial home for wildlife. Although not as valuable to wildlife as natural snags or logs, handmade habitat is friendlier than flat house walls and flat green lawns. A nest box or birdhouse built out of scrap lumber can attract native wildlife. Slabs of bark make dandy homes when just placed on shady the ground in appropriate locations. Whether complicated, ornate, plain, or simple, a habitat structure that imitates a snag or log can be fun to build and helpful to local wild animals.

Sometimes I see my old photo of the giant, hollow cedar, and I think about the little bat. One spring I worked on a contract to mark trees to be left for wildlife in a salvage logging sale. This was in Portland's Bull Run Watershed, after patches of trees had blown down in a windstorm. One unit had immense trees, and we used an entire can of spray paint to mark a gnarly old cedar that took all four of us to hug. The giant was dead at the top and completely hollow, a mere cylinder of barely living tree. Vaux's swifts flew around, and we knew they were nesting inside, probably sharing the space with some kind of bats. An olive-sided flycatcher called out from the dead branches. Some of the branches were big enough for a bald eagle to perch on. We found a hole at eye level that allowed us to peer inside, into the mysterious cavern that was the center of this snaggy giant. Mounded right up to the hole was the impressive nest of a bushy-tailed woodrat, or many generations of them. From the large scratches below the hole and the wavy hairs caught around the edge, it was clear that an American black bear had climbed up and pushed itself through to hibernate on the comfy bed.

A year later, I was contracted to check on the wildlife leave tree program, and I got to revisit this site. Although I had been warned that the fire set to clean up the logging slash had accidentally destroyed this majestic wildlife tree, it was still a shock to see it. The cylinder was wafer thin now, black, and lying on the ground. Yes, it still could provide some kind of shelter, for beetles and salamanders perhaps, but to me it looked more like a wind tunnel. The logging, the burning, the carelessness left me angry and despairing. I pushed away, into the sprouting brush on blackened ground. As I climbed onto a charred log to lean against a leave tree that was still alive, my hand rested on the warm, textured bark. Something moved, and a little dark brown bat slipped out from under the bark and flew away on fragile wings of hope.

LEFT
An occupied snag found in Portland.
photo by Charlotte Corkran



CLIENT 6.7
SNAIL-EATING GROUND BEETLE
SCAPHINOTUS ANGULATUS

CLIENT 5.1

VAUX'S SWIFT
CHAETURA VAUXI

status:
appears to be stable despite the decline in available snags for nesting in the northwest United States

"To live is to fly"

Townes Van Zandt

friends:

pileated woodpeckers

building managers

tolerant homeowners

average weight:	15 to 22 grams
average length:	4.5 inches long, 12-inch wingspan
average lifespan:	not certain, but believed to be up to 11 years
home:	large hollow trees
hobbies:	flying…flying…flying some more
fears:	old-growth logging, replacement of older chimneys with modern pipes, furnaces, Cooper's hawks, peregrine falcons
favorite locations:	Chapman School; large, old, hollow trees; your chimney
favorite foods:	flies, ants, bees, spiders, planthoppers, aphids, spindlebugs

BOB SALLINGER CONSERVATION DIRECTOR, AUDUBON SOCIETY OF PORTLAND

"The sight of this company of rapidly moving birds circling around a chimney like a huge whirlpool, with the birds in the vortex dropping like plummets into the chimney, excited much interest among local bird lovers who made many trips to watch the performance."

Gabrielson and Jewett, describing "Swiftwatching" in Birds of Oregon, 1940

Each evening during September crowds of people congregate on a grassy hillside beside the Chapman School in Northwest Portland and turn their eyes skyward. They arrive with picnic dinners, blankets, lawn chairs, and binoculars. As the sun begins to set, a few bat-like birds skitter across the sky. Soon more birds arrive, flying in from all directions, quickly growing into numbers in the thousands and tens of thousands… a giant undulating cloud of birds. They move across the sky in random patterns, expanding and contracting, breaking apart and regrouping. A peregrine falcon streaks across the sky from the east and takes one of the birds on the wing. The assembled crowd of humans greets the predation with a mixed chorus of boos and cheers.

As the sky grows darker, the birds begin to mass near a giant smokestack chimney protruding from the roof of the school. A few birds drop into the chimney entrance and then pop out again. The swirling cloud of birds above grows tighter and tighter and begins to form a funnel. Soon a tornado of birds pours into the chimney, a seemingly impossible number disappearing into its confines. As the last light of day fades, a few final stragglers drop out of the sky and into the chimney. The assembled crowd of humans offers a rousing round of applause and heads for home.

What bird is it that brings literally thousands of people out every year on cool fall evenings to watch and applaud their activities? It is the amazingly cool Vaux's swift (*Chaetura vauxi*), and their fall congregations are some of the most incredible spectacles seen in nature.

Seen up close, the Vaux's swift is actually a quite unassuming, drab little creature. They are small, weighing only two-thirds of an ounce, with grayish-brown plumage. Their bodies are cigar-shaped with long, crescent-shaped wings. Their legs and feet are built for clinging to the sides of hollowed-out trees rather than perching and are held very close to their bodies, almost disappearing into their body feathers. They belong to the family *Apodidae*, from the Latin word for "footless." Their dark eyes are sunken and blend in with their feathers. People who find injured or orphaned Vaux's swifts often assume that they are missing their feet and their eyes. In fact, they often assume, because swifts do not perch or effectively move about on flat surfaces, that very much alive birds are actually dead. People arriving at Audubon's Wildlife Rehabilitation Center with young swifts often announce that they have found a "poor little blind, footless bird that passed away on the ride to the center." They are amazed when a slight jostling of the bird triggers a cacophony of rapid, raspy calls.

However, what Vaux's swifts lack in appearance, they more than make up for with a spectacular set of behaviors and adaptations. Vaux's swifts are truly residents of the air. Swifts fly almost continuously except when nesting or roosting. They forage, drink, court, bathe, and collect nesting materials, all while in flight. They even copulate in flight, joining together and plummeting toward the ground for a few seconds before breaking apart. They are one of the fastest birds on the planet, able to fly at speeds of over one hundred miles an hour and migrate thousands of miles from their wintering grounds in Southern Mexico and Central America to their breeding range, which extends from Southern Alaska to Central California and as far east as Montana. They are present in Oregon from late April until early October.

Vaux's swifts are voracious insect eaters, consuming flies, ants, bees, aphids, beetles, moths, and spiders. Their camouflaged exterior hides a disproportionately large, wide mouth that

serves to scoop up insects as the swifts move perpetually about. During nesting season, each youngster will be fed as many as five to six thousand arthropods per day. An average swift nest consumes more than half a million insects during a single nesting season! Swifts are truly the bug zappers of the bird world.

What truly separates the Vaux's swift from the other 209 bird species that pass through our urban landscape each year, too often unknown and underappreciated, is this species' penchant for substituting man-made chimneys for the large hollow trees in which they naturally nest and roost. When it comes to Vaux's swifts, we not only share a common landscape; we sometimes share a common dwelling. This is a situation fraught with both conservation opportunity and peril for the tiny swift.

Traditionally, Vaux's swifts nest and roost in hollow, large-diameter trees. They enter the tree interior through broken tops or holes excavated by pileated woodpeckers. Nests made of small broken twigs are cemented together and held to the interior walls of the tree with swift saliva. However, logging of the old-growth forests of the Pacific Northwest and removal of standing snags has severely reduced the natural habitat available to the Vaux's swift.

Fortunately, unlike many other old-growth-related species , the Vaux's swift has been able to exploit developed landscapes. Old brick and masonry chimneys mimic many of the attributes of hollow trees, and the swifts have taken advantage and moved in. In the spring, Audubon receives many phone calls from people concerned about the mysterious critter that has taken up residence in their chimney. Sometimes they have observed adult swifts repeatedly entering and leaving the chimney. More often they discover the birds when they are awoken one morning by the urgent, high-pitched, raspy, rattling, begging calls of nestling swifts—a call that is so unique and disproportionately large that callers have compared it to chattering raccoons, howler monkeys, and space aliens. (Adults' calls are a far quieter high-pitched rapid chipping.) Lastly, callers sometimes discover their new housemates when they find a young nestling swift that has fallen from the nest lying on the floor of their fireplace—a not uncommon experience since the swift nests sometimes disintegrate before the young leave them.

Playing host to a family of nesting swifts is a wonderful thing. Swifts are not territorial, so it is possible to have more than one family nest in a single chimney. Nesting typically occurs in late June and July, and young move from hatching to flighted bird in about twenty-eight days. Those willing to put up with a little noise will enjoy the magical spectacle of swifts learning to fly around their homes and the added benefit of natural insect control. We encourage homeowners to close the chimney flue and by all means avoid lighting a fire. The nest will disintegrate and fall shortly after the swifts leave, if not sooner.

For homeowners who find a young swift that has fallen into their fireplace, we strongly encourage picking up the bird and reaching up into the chimney. Even very young swifts have amazing, Velcro-like feet that allow them to cling to rough vertical surfaces. They will cling to the wall and climb back up to their parents. We strongly discourage attempting to rear young swifts in captivity. There is no need to do so, and because of their incredibly specialized life skills, swifts are almost impossible to effectively raise in a captive situation.

In the fall, Vaux's swifts form giant communal roosts prior to beginning their migration southward. Throughout the month of September, swifts group up by the dozens, hundreds, thousands, and in some cases tens of thousands just before sunset and form giant flocks that pass the night together in large hollow trees and chimneys. The largest known roost in the world, at peak exceeding thirty thousand birds, occurs at the Chapman School in Northwest Portland, but at least ten other fall swift roosts in the Willamette Valley are known to have populations of at least one thousand swifts. Scientists are uncertain as to why swifts form communal roosts prior to migration. One theory is that there is safety in numbers and roosting communally reduces each individual swift's risk of predation. The communal roosts may also help the swifts stay warm and conserve energy during the cool fall nights. The communal roosts peak toward the middle of September. As the days grow increasingly shorter, they begin to depart, and the first frost sends the last stragglers southward toward warmer climes.

The Chapman School Swift Roost not only has inspired legions of local fans but also has served as a shining example of urban wildlife stewardship. For years, students and teachers went to class in jackets and hats so that the furnaces could be kept dormant throughout the month of September. In 2001, Audubon worked with Chapman to secure funding to replace the archaic heating system, allowing the chimney to be permanently devoted to the swifts.

Despite the swift's ability to adapt to human landscapes, their populations remain vulnerable and are experiencing long-term declines. It is critical for swifts and a host of other species that we protect and restore the Northwest's ancient forests. Urbanites have a big role to play as well. Identification and management of significant chimney roost sites is critical to prevent their removal as well as the accidental incineration of swifts. Private property owners can assist swifts by allowing them to nest in residential chimneys, avoiding use of pesticides, and even constructing artificial swift towers. Property owners and land managers can help a host of species, including swifts, by leaving snags standing. The ability of the Vaux's swift to substitute old chimneys for large hollow trees has made it a popular and well-known resident of urban landscapes. However, its continued survival depends on our willingness to protect and preserve old-growth trees, and our awareness and tolerance of its presence in our urban landscapes.

ABOVE
The Vaux's swift making a sundown return to their chimney Estate at Portland's Chapman Elementary School.
photo by Mike Houck

RIGHT
The top eight feet of the Portland Animal Estate tower is a hollow chimney cavity for the swifts.
photo by Shawn Records

BOTTOM
The Vaux's swift caught in a rare moment not airborne.
photo by Richard B. Forbes

CLIENT 5.2

WHITE-BREASTED NUTHATCH
SITTA CAROLINENSIS

"Oh we ain't got a barrel o' money, maybe we're ragged and funny, but we travel along singin' our song, side by side."

status:
widespread, but declining

friends:

metro parks

greenspaces

downy and hairy woodpeckers

seeking:	open woodlands
average weight:	3/4 to 1 ounce
average length:	5 to 6 inches, but since the bill is 1 inch and the tail nearly 2 inches, there's not much bird in between; wingspan is 11 inches
average lifespan:	maximum lifespan is 10 years, although many young only survive a few months
hometown:	big old oaks and snags with lots of holes, nest boxes
hobbies:	upside-down acrobatics on tree trunks, caching food for a rainy day
fears:	nonnative fox squirrels, developments that cut down all trees
favorite locations:	Oaks Bottom, Oak Island on Sauvie Island, Tualatin National Wildlife Refuge
favorite foods:	acorns and suet feeders in winter, bugs anytime

CHARLOTTE CORKRAN NORTHWEST ECOLOGICAL RESEARCH INSTITUTE

A cheerful, slightly burry but musical chatter is often the first introduction to the white-breasted nuthatch. The bright white face, with the contrasting black cap curved around far above the eye, gives it a surprised and eager look. The white extending right down the throat to the breast and belly distinguishes it from the chickadees, which all have a black "bib" on the throat. The white-breasted nuthatch is larger and whiter than the other nuthatches in the region.

At a glance, nuthatches may look like miniature woodpeckers, clinging upright to the trunks of trees. But look again. The nuthatches are upside down. They work their way down the tree trunk headfirst. One leg is held out in front below them as a brace, to keep them from sliding down the vertical wall. The other leg is held back, with the toes spread to grip the rough surface of the bark. All of the woodpeckers (as well as the tiny brown creeper) hitch their way up the trunks of trees and snags. These birds cling to the bark with both feet forward or to the sides, and use their stiff, pointed tail feathers to brace themselves against the tree trunk.

"Quirky" is a word that readily comes to mind when discussing nuthatches in general and the white-breasted nuthatch in particular. All nuthatches prefer to be upside down. Perhaps their brains are wired that way. They even sleep upside down… Some people have seen a white-breasted nuthatch hold one piece of bark in its bill and use it to pry up another piece that may have a bug underneath. Others have seen a white-breasted nuthatch carry an ant or beetle to its nest site and rub it next to the entrance hole, presumably to use the smell of a biting or poisonous insect to keep predators away. And there are reports of its carrying its own droppings out of its favorite roost site.

Among the endearing characteristics of the white-breasted nuthatch is the fact that it stays with its mate year-round. In most species, pairs split up after the nesting season, but not these little birds, which are permanent residents and do not migrate. In the middle of winter the pair will come to a suet feeder together, when the bushtits are in gangs of several dozen, and the chickadees and kinglets are all mixed together. Not that the nuthatches are antisocial with other species. But when they join with other small birds during the winter, for mutual help in finding food and noticing predators, the white-breasted nuthatch pair stays together within the flock.

Although the pair are together all year, the male puts on quite a courtship show anyway. He sings several new songs and displays in front of the female. He still dominates her at the feeder, but merely shoves her aside rather than knocking her away as he does with all others in the flock. And she knows not to flee like the other birds if he gives the alarm call near a good food source—when nothing alarming is anywhere in sight. He begins to show off his ability to provide for their offspring by feeding her tidbits of food, or tucking them into a crevice in the bark while she watches. He may pound the food into the crevice unnecessarily vigorously, while his tail feathers flick out with each blow. This is another opportunity to display his dashing black and white tail with bright chestnut spots on the underneath feathers. Perhaps that exaggerated pounding explains the name "nuthatch," which was originally "nut-hatchet."

When the nuthatches are ready to nest, they select a knothole in an old oak or an abandoned woodpecker hole, but they will readily use wooden nest boxes. They bring in moss and small chunks of bark and then make a soft lining of fur, small feathers, or what appears to be lint or dust bunnies from a human house. The female lays five to eight eggs (occasionally ten, although they don't all hatch) and incubates them for almost two weeks while the male brings her bugs and other food. He continues this for the first few days after the eggs hatch, which allows the female to keep the hatchlings warm while giving them most of the insects delivered. The babies fledge at

about two weeks of age and continue to be fed by the parents for another two weeks. Although this probably increases the survival rate of the youngsters, it prevents the option of a second nest in a year.

Habitat for the "slender-billed" subspecies of white-breasted nuthatch, the one that occurs in western Oregon, is open stands of Oregon white oak woodland. This forest type was once common in many areas of the Willamette Valley and surrounding foothills, maintained by fires set by Native Americans. But the oak woodlands were cleared for agricultural fields and towns, and are still being cleared for residential and industrial developments and freeways. The lack of fires in surviving oak woodlands has allowed Douglas fir and other conifers to fill in the open stands of large oaks.

The white-breasted nuthatch has almost disappeared from western Washington, and its population has seriously declined in the Willamette Valley. Because its reproductive rate is fairly low, reversing that trend will be difficult. Now there are efforts to reopen some oak stands by selectively logging out the conifers and burning the understory, as well as by planting Oregon white oaks in areas where they can grow into woodlands. And nest boxes are being used as a stopgap measure to maintain white-breasted nuthatch populations until its habitat is once again ready.

As I leaned my trusty ladder against the trunk of the big Doug fir, I looked up and thought I could see signs that the nest box was in use. No spider webs stretched across the entrance hole, and a little tuft of moss had been dropped nearby. "Chickadees," I thought. "I wonder which species?" I climbed up the ladder, tapped on the box in case there might instead be yellowjackets inside, slowly opened the lid, and peered inside. A tiny bright eye looked back up at me. A black bead of an eye in a bright, white face. I stared back at it blankly. My eyes recognized exactly what bird was sitting on the nest, but my brain would not allow such a thought. "It's a…it's a…" Blank. By then I had lived in my nearby house for thirty years, done a lot of birding in the neighborhood, and had been monitoring at least a few nest boxes there for almost twenty of those years. I knew the birds that lived there. I knew which species used the nest boxes. "No…can't be…it is! It's a white-breasted nuthatch, and it's sitting on eggs in my nest box!"

THE ESTATE

Make a nest box for white-breasted nuthatches. Use scrap or recycled wood, 1 inch thick for insulation. The shape and style of the box is not important to the birds, but keeping the rain out is important. Make sure the lid or roof extends an inch out beyond each side and at least 2 inches out to the front to shelter the entrance. You might need to caulk the back edge of the lid. The entrance hole should be 1 1/8 inches in diameter. If it is any larger, introduced house sparrows will get in. Place the box as high as you safely can (12 feet up is great). Face the box entrance north or east so it get morning sun but is shaded from the hottest afternoon sun. Add 3 or 4 inches of wood shavings inside the box. Then find a place to plant an Oregon white oak acorn.

ABOVE
Spaces in the center of the Portland Animal Estate, about five feet off the ground, serve as nesting cavities for the white-breasted nuthatch.
photo by Shawn Records

RIGHT
The white-breasted nuthatch in typically unusual form, walking down the tree.
photo by Charlotte Corkran

CLIENT 5.3

OLIVE-SIDED FLYCATCHER
CONTOPUS COOPERI

"Quick, three beers"

"Pep-pep-pep!"

seeking:	tall snags and lots of flying bugs
average weight:	a little over 1 ounce
average length:	about 7 inches, wingspan 13 inches
average lifespan:	maximum is 7 years, but most young do not survive more than a month or two
home:	conifer forests with scattered tall trees and snags
hobbies:	watching the scenery from a high perch
fears:	Cooper's hawks, logging that doesn't leave snags
favorite locations:	Forest Park, Powell Butte, Oaks Bottom
favorite foods:	flying ants, wasps, beetles; probably not beer

status:
widespread, but declining

friends:

environmentalists who save old-growth forests

forest fires

CHARLOTTE CORKRAN NORTHWEST ECOLOGICAL RESEARCH INSTITUTE

In its natty attire of dark jacket unbuttoned to reveal a crisp white shirt, the olive-sided flycatcher is somewhat easier to recognize than many of its cousins. But as soon as it calls, there can be no mistaking this species. Whether it gives its emphatic three-note whistle, or its eager pep-talk sequence, it is an easy bird sound to hear and remember.

"The ringing call of the olive-sided flycatcher, thrown out as he sits on the topmost twig of a giant conifer, typifies all that is wild and free and untamed in the great spire-pointed forests of spruce and fir that clothe the mountain slopes of the State."

Gabrielson and Jewett, Birds of Oregon, 1940

That loud voice is only heard here in the late spring and summer, and it is the sound of a male defending its breeding territory, which may be well over one hundred acres. While the olive-sided flycatcher is not dependent on old-growth conifer (evergreen, cone-bearing) forests, such forests are certainly a favored habitat. Never seen in flocks or more than scattered pairs, olive-sided flycatchers can often be found where natural forest fires have left many tall snags. Other productive habitats are tall conifer trees next to wetlands, rivers, and meadows. These edges between habitats are good because they give the birds high perches from which to look out over areas that produce insects. Even logged areas and developed clearings can provide good habitat, as long as tall conifer trees and snags are left and the clearing has habitat for diverse and abundant flying insects.

Like all flycatchers, the olive-sided flycatcher is specialized for nabbing flying insects out of the air. It perches on the topmost branch of a snag or the dead leader of a living tree. Its rather dull colors help it blend into the pattern of the dead branches. Perhaps this helps it elude potential predators, such as the speedy Cooper's hawk. Certainly flying insects would not notice it. Suddenly the bird darts out in pursuit of a bug. Powerful chest muscles can lift the olive-sided flycatcher straight up off the branch and keep it headed straight upward. Short wings allow it to make midair, hairpin turns after the fleeing insect. Its large head is mostly mouth that opens wide to snatch the insect. Whisker-like bristles at the corners of the mouth feel where the insect is at the last instant. The strong bill snaps shut with a noticeable click, and the bug is captured. Now the olive-sided flycatcher glides back to its chosen perch to swallow its meal in one gulp, or it carries the insect to its nestlings.

The nest of the olive-sided flycatcher is built high in a living tree, attached with spider webs to a branch and hidden among green twigs. The nest cup is strongly woven of fine roots, dead twigs, long pine needles, and the yellow-green lichen we call "old man's beard." There the female lays three eggs, or maybe four. Both parents bring insects to the nestlings until they are ready to fly and catch their own meals. But many youngsters starve or are captured by predators before they ever learn to hunt and hide and flee. Although many bird species have two or even three broods of babies every summer, the olive-sided flycatcher's beautiful nest is only used once.

Because this species has so few young per year and always occurs in low numbers, it local extinctions. Scientists and citizens doing bird surveys are finding significantly fewer olive-sided flycatchers in both short-term and long-term studies. What is causing the decreasing numbers? Chemical pesticides are one issue, because they kill flying insects needed for food, and they may cause other direct or indirect problems. Habitat loss is apparently a major factor. In the Portland area, a few parks and neighborhoods still meet the olive-sided flycatcher's needs. But large conifer trees and snags next to meadows or wetlands are increasingly rare now. If large trees do persist, they are more apt to be next to buildings, vast expanses of pavement, or mowed

lawns. There is still habitat in the Cascade and Coast Range forests. However, for over one hundred years the typical logging practice was to clear-cut forest stands, which makes it easier to regenerate the Douglas fir. In recent years, leaving some snags, logs, and large live trees is required, but the legacy of past logging continues in large areas of uniform forest stands with no large snags.

We are beginning to fix the habitat loss in the United States, but the olive-sided flycatcher doesn't just live here. In fact it is a long-distance migrant. Every year it flies to and from as far away as the mountains of southern Peru. Many South American countries do not regulate use of pesticides that were banned in this country years ago because of their environmental and human health risks. There have been several die-offs of hawks attributed to pesticides in Central and South America, and unknown numbers and species of small birds have succumbed as well. But the worst problem for migratory species like the olive-sided flycatcher is doubtless the massive clearing and burning of tropical rainforest by corporations exploiting cash-poor governments and indigenous people.

It is easy to become overwhelmed by global problems, but there are easy things we can do locally to help migratory species such as the olive-sided flycatcher. Whether in parks or at home, protecting large trees, leaving snags and logs wherever possible, and planting native trees, shrubs, and wildflowers that do not need chemical pesticides will have the most long-lasting benefits. These simple actions can provide perches, nest sites, and an abundance of high-flying insects that the birds will eat. Not everyone can expect to have an olive-sided flycatcher calling, "Quick, three beers!" in their backyards. But many of us can hope to have a flycatcher of some kind sallying out from a perch. And most of us can leave—or create—a little messiness of dead branches at the tops of tall trees, rotting logs for beetle nurseries, and native plants run wild for the sake of wildlife.

"May 29. The crashing thunder sounds like the overhauling of lumber on heaven's loft. And now, at last, after an hour of steady confinement, the clouds grow thin again, and the birds begin to sing. They make haste to conclude the day with their regular evening songs (before the rain is fairly over) according to the program. The pepe [olive-sided flycatcher] on some pine tree was heard almost in the midst of the storm."

Henry David Thoreau, journal for 1857

THE ESTATE

Olive-sided flycatchers need tall perches overlooking small trees, shrubs, meadows, or wetlands. And they need a source of high-flying insects, like a native plant garden where no pesticides are used. Ask your local park manager and your neighbors about leaving snags and snag-topped live trees for wildlife habitat. You can create a snag by girdling a tree (choose one that will not fall on anyone's house). You can also rescue a manageable section of a tree that had to be cut down, and set it upright in concrete in the ground, preferably near a pond, birdbath, or area of low but diverse vegetation. A dead branch can be attached at the top by drilling a hole into the tree, whittling down the end of the branch to fit the hole snugly, and using carpenter's glue in the hole before inserting the branch. Or you can buy some recycled wood or recycled plastic lumber at the Rebuilding Center, and create your own structure for wildlife, with an upright perch at the top for flycatchers and other birds. Your structure could be shaped like a real snag, or it could be a tripod or teepee shape, or whatever shape you like.

ABOVE
The very top of the Portland Animal Estate features a six-foot-long cantilevered perch for the olive-sided flycatcher, angled up at the end just to make sure she is at the very top and close to the bugs.
photo by Shawn Records

RIGHT
The olive-sided flycatcher perched on the very top point a tree, waiting to catch dinner.
photo by Dan Casey

CLIENT 5.4

SILVER-HAIRED BAT
LASIONYCTERIS NOCTIVAGANS

"Probably nothing from the very silly opera, Die Fledermaus"

status:	widespread, but uncommon

seeking:	a cozy, dry crevice
average weight:	1/4 ounce or less
average length:	only 3 inches, but wingspan is 12 inches
average lifespan:	less than 12 years
hometown:	forests with lots of big trees and snags
hobbies:	hanging upside down, eating huge numbers of bugs
fears:	great horned owls, skunks, pesticides, wind turbines, halloween
favorite locations:	Mount Hood National Forest, Forest Park
favorite foods:	moths, mosquitos, flying bugs of all sorts

friends:

northern flickers

pileated woodpeckers

Bat Conservation International

CHARLOTTE CORKRAN NORTHWEST ECOLOGICAL RESEARCH INSTITUTE

With dark brown fur tipped with white on its back, the silver-haired bat is colored like a miniature grizzly bear. Like all of the bat species in this region, the silver-haired bat uses echolocation to find its way around in the dark and to find insects for its food. It makes high-pitched sounds—too high for our ears to hear—that bounce off of objects. Large ears and the bizarre nose shapes on some species help them hear the sounds and determine their exact direction. Imagine being able to hear the echo of your own voice so precisely that you can distinguish the shape of a mosquito and turn in midair to capture it in the dark!

Silver-haired bats are most apt to roost in conifer or mixed forests. In bark crevices, under loose bark, in woodpecker cavities, knotholes, or lightning scars, the bats find abundant niches in old forests with large-diameter trees and snags. They roost there all day, hanging upside down by their hind feet. After dark they fly out to search for a variety of insect prey. Like many bat species, the silver-haired bat performs aerial maneuvers too fast for the human eye to follow (even if we could see in the dark). Using its super-flexible wing and tail membranes, it can scoop up a moth or other flying insect, then reach down to grab it with its mouth.

We were late setting up camp that evening. Mosquitos pestered us as we spread the rainfly over the tent. I was just attaching one corner when something dashed between me and the nearly white rainfly. Was that a bat? "Yeah, come and eat some of these mosquitos," I said aloud. The tiny bat circled our heads, barely a foot away from us it seemed, and I swear there were suddenly fewer bugs around us. We stood and watched, mesmerized by our eager new friend. Now and then the little bat swooped down to the tent, and I could hear it slide across the rainfly, and actually see a little dark dot of a bug disappear from the pale surface.

The wings of bats are marvels of elasticity and functional elegance. When you look at a bat's wing, you can recognize every finger of your own hand lengthened to spider-leg fineness and used to spread out the thin, black skin of the wing. Only the thumb is free from the wing membrane. The thumb is used while roosting for grooming the fur, scratching an itch, and hanging right-side up to pee. The wings of bats have no need for the feathers that birds developed; the membranes are lightweight, strong, and stretchy.

In this country, bats are often hated and feared. However, in Chinese cultures the bat is considered a symbol of good fortune and of perfect symmetry. A bat motif is frequently used in art forms such as lacquerware bowls and sculpted jade pendants or talismans.

Lots of people think that bats are scary. In truth, bats should be more afraid of us than we are of them. Only a very few people have ever been bitten by a bat. But every year thousands of bats are accidentally killed by human activities. The silver-haired bat is no exception. Chemical pesticides are used for killing insects in agricultural areas, as well as in people's yards. But pesticides kill many kinds of insects that could otherwise be eaten by bats. Many of these chemicals have other harmful effects on wildlife, too. Wind power is a good alternative to burning coal or building nuclear plants, but studies are showing that wind turbines kill large numbers of silver-haired bats and other species, particularly during migration. The blades of a turbine sweep around at up to two hundred miles per hour, far faster than a bat can escape. Logging of old-growth forests has removed the large, often hollow trees and snags favored by silver-haired bats. Now, they sometimes roost in open sheds and garages, the foundations of buildings, and even in woodpiles. But much of their natural habitat has been replaced by young forest with few niches for bats.

"His thin red tongue licks at his fur methodically, after the fashion of an unhurried dog; massaging each joint of his hand, and giving, perhaps, that final lick or two which always seems and never quite is, final. He may stretch his elastic wing membrane to alarming proportions, even,

perhaps to putting his wing over his head umbrella-wise and pulling the membrane down as would a small boy playing with a paper bag…He may even sneeze. Finally, he may yawn. And if after such a display of rationality and homeliness you still choose to relegate him to a Hallowe'n world of witches and spooks, then nothing I could say further would possibly convince you to the contrary."

Russell Peterson, Silently by Night, p. 35

Silver-haired bats roost singly or in groups of only three to six, not at all like the multitudes of certain other bat species that roost in caves. The silver-haired bat female has two mammae to nurse her one or two pups. While they are very small, the female carries them clinging to her belly fur. Then they are left in a small maternity roost with several other pups while the females are out foraging at night. The pups can fly when they are about three weeks old.

Silver-haired bats migrate south for the winter, flying many hundreds of miles in spring and fall. Some migrate through the Portland area on their way between drier, warmer wintering places and the big forests where they spend the summer. A few stay near the city to raise their young. Welcome them to your yard by leaving a snag or gnarly old tree, or by putting up a small bat roosting box in a sunny spot. And if your yard has a variety of native trees, shrubs, and flowers, perhaps the bats will find enough flying insects to enjoy and they will stay.

When the bat biologist had finished measuring the tiny creature, its minuscule teeth bared in fear, she tucked it into her shirt to keep it warm. After readying the sonar recorder, she brought the little guy back out into the cold night air. She took a bit of light-stick, a silly party favor, and stuck a piece on the bat's chest with kids' glue. There, the bat could lick it off easily when it groomed its fur. We all turned our flashlights off as she held out her hand to free the bat and make a recording of its echolocation calls. After a second a pin-point of light appeared in the night's blackness. It rose quickly, in confident spirals up through the clearing. And then the little starlet reached the tops of the big old trees, and it carried our lighted greetings away into the forest.

THE ESTATE

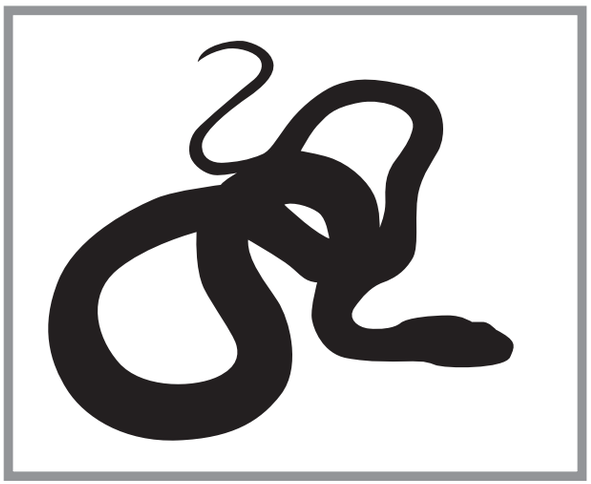
The best way to make habitat for the silver-haired bat is to keep a snag or gnarly old tree. You can create a snag by girdling a live tree (one that will not fall on a house). Or make a lean-to shelter by nailing a slab of bark (from firewood) onto a live tree or the side of a building. Nail just the top edge, leaving a cozy crevice where the bat can crawl up underneath and be protected from rain and wind. You can also get plans for making a small bat house from Bat Conservation International. (www.batcon.org) Use recycled wood that is rough on the sides the bats will crawl in, and paint the bat house black or dark brown. Any home for bats needs to be placed in a south-facing spot that gets lots of sunshine, because bats really like to be warm.

ABOVE
Louvered panels on the Portland Animal Estate tower simulate sloughing bark, accommodating silver-haired bats. The panels are painted black and face south to absorb the warmth of the sun for the heat loving bats.
photo by Shawn Records

RIGHT
Headshot of the silver-haired bat.
photo by Daniela Rambaldini

CLIENT 5.5

NORTHWESTERN GARTER SNAKE
THAMNOPHIS SIRTALIS TETRATAENIA



"I have personal convictions to uphold. Ideals you might say. I prefer not to kill animals. I'm a humanist; I'd rather kill a man than a snake. Not because I love snakes or hate men. It is a question, rather, of proportion."

Edward Abbey,
A Voice Crying in the Wilderness

seeking:	a sunny spot near a place to hide, a snug burrow for winter
average weight:	5 ounces
average length:	1 to 2 feet
average lifespan:	up to 10 years, but usually 2 to 5 in the wild
hometown:	meadows, clearings, edges of thickets and wetlands, talus slopes
hobbies:	sunbathing, chasing frogs, cuddling, sticking tongue out at strangers
fears:	getting kidnapped in a kid's pocket, subdivisions and shopping malls, raccoons
favorite locations:	Oaks Bottom, Smith and Bybee lakes; very much prefers to live in the wild than to grow old stuck in a terrarium
favorite foods:	earthworms, slugs, snails, salamanders, and frogs

status: secure

friends:

snakes to curl up with in the winter

people who aren't afraid to pick them up for a closer look and who are nice enough to let them go again

TIERRA CURRY CONSERVATION BIOLOGIST, CENTER FOR BIOLOGICAL DIVERSITY

Snakes, snails, and puppy dog tails may or may not be what little boys are made of, but little boys (and girls) are often drawn to garter snakes. Garter snakes are easily identified by their striped backs, and are known for being good-natured and nonvenomous. When one of the kids on *The Cosby Show* brought home a garter snake, Clair said, "I'm going to call the zoo," and Cliff responded, "The zoo doesn't want it. Garter snakes go to the zoo to see real snakes."

Garter snakes are real snakes, and like most snakes they are unlikely to bite you. If you happen to catch a garter snake in a really bad mood, its bite generally isn't painful and is only toxic in the unlikely event of an allergic reaction. Snakes flick out their tongues not because they want to bite you, but because they use their tongues for smelling. The two forks of a snake's tongue allow it to follow chemosensory trails, kind of like smelling in stereo. Be forewarned, however, that garter snakes do spray. When handled, they release the musky contents of their anal glands, and the spray is quite smelly and persists for hours. I once went for a quick walk in Forest Park before a job interview, and I picked up a young garter snake basking in the sun. I went to the interview smelling like, well, someone who had recently handled a garter snake. Luckily it was a herpetologist position, and the smell probably helped me get the job.

The Latin name of the northwestern garter snake, *Thamnophis ordinoides*, literally means "orderly snake that hangs out in the bushes." *Thamnos* is Greek for "shrub" or "bush," and *Ophis* refers to "snake." *Ordinoides* is Latin for "arranged" or "orderly," and refers to the straight, clean-edge stripes down the snake's back. Northwestern garter snakes are often found near the edge of vegetation, where they can quickly dive for cover if threatened.

Garter snakes came to be known as "garter snakes" because their stripes resemble the old-fashioned garter belts once used to hold up stockings. This name is ironic because the word "garter" is likely of Celtic origin and refers to the bend of the knee. Modern snakes obviously don't have knees, having lost their limbs long ago. Although snakes once had legs, as evidenced by the presence of vestigial pelvic girdles and hind limbs in some species, the course of evolution favored the cutting-edge individuals who got along better without arms and legs.

It would take almost every crayon in the box to draw all the color variations of the northwestern garter snake. Some people think of garter snakes as plain, but like true Portland fashionistas, northwestern garter snakes prefer to be hard to define. The base color of their bodies, their background color, can best be described as ish. As in brownish, blackish, grayish, reddish, or bluish, sometimes with a bluish, greenish, or reddish tint. Albino individuals lack color altogether. Yet more often than not, northwestern garter snakes tend to be brown. They are more slender than other garter snake species in the Northwest, and are differentiated by their relatively small head, which is streamlined with their bodies.

Northwestern garter snakes usually have three beautiful stripes down their backs, a central vertebral stripe, and two lateral stripes on their sides. The vertebral stripe is usually wider than the other stripes and can be orange, yellow, red, white, gold, tan, turquoise, green, or blue. The lateral stripes are usually yellow, but can also be white or tan. The stripes can be faint or broken, and some snakes don't have stripes at all. There are usually two alternating rows of black spots between the vertebral and lateral stripes. It is a distinguishing characteristic that the spots do not overlap with the vertebral stripe. The undersides of northwestern garter snakes can be yellow, brown, gray, or black with yellow or red markings. Northwestern garter snakes average a foot or two in length, with a record female snake who was three feet long. Females are generally longer than males.

Northwestern garter snakes occur in western Oregon and Washington, the northwest corner of California, and in southwestern British Columbia at elevations up to 5500 feet. They are found in meadows and grasslands, forest clearings, shrubby habitat, and on rocky talus slopes. More terrestrial than other garter snake species of the Northwest, they are only occasionally found in water. They control their body temperature

by carefully choosing where to hang out, the amount of time they spend in the sun, their orientation to the sun, and the proportion of their bodies they expose to the sun's rays. They also absorb heat from rocks, trails, and paved surfaces. Unfortunately, lounging on pavement and trails makes them vulnerable to being crushed by tires or careless feet.

In winter, instead of heading to coffee shops and pubs, garter snakes hibernate. Like Goldilocks, they need a burrow that is just right. It has to be warm enough for them not to freeze, not too wet or dry, and adequately ventilated. This special spot is often under or in decaying logs and stumps, or the root systems of old trees and snags, in rodent burrows, or in rock crevices. Different snake species often share a winter den. After the winter rains, sunshine brings Portlanders out in droves, and the same is true for garter snakes, which mate in springtime when love is in the air. Female northwestern garter snakes protect their fertilized eggs inside their bodies and give live birth to three to twenty young in summer or early fall. Neonates (aka cute little teeny tiny newborn snakes) are about six inches long.

Like Portlanders without umbrellas, northwestern garter snakes will forage in the rain. Northwestern garter snakes eat earthworms, slugs, snails, and amphibians. In turn, garter snakes are eaten by hawks, owls, and raccoons. Even robins and jays eat young snakes.

For a research project, I once found myself standing knee-deep in muck, looking for newly metamorphosed frogs as the July sun dried up their pond. I had competition. A heron on my left was seeking the same frogs. I heard rustling on my right and saw a garter snake sneaking around rush clumps, methodically taking corners like in a spy movie. The snake was stealthily checking every clump for hiding frogs, and succeeding far more often than me at finding them. Another time I was lucky enough to see a damselfly riding around on the head of a garter snake that was slowly swimming at the water's edge.

THE ESTATE

The biggest threat to this species is habitat loss. You can create habitat for garter snakes in your yard with brush piles, downed logs, rocks, or other cover objects. At a tree planting project, I was once removing old, black weed-matting from around established trees and found a garter snake underneath almost every mat. When I'm in the field with teenagers they

"If you do create habitat for garter snakes in your garden, you'll find that they are good gardeners and will keep the slugs away.

To attract northwestern garter snakes to your garden or yard, take a moment to think like a snake. You'll need a sunny place to bask, with a safe place to hide nearby and some shrubby vegetation to make you feel secure. Pick a spot that gets lots of sun and is protected from the wind. Where do you like to sit and read on sunny days? Garter snakes control their temperature behaviorally, so they need a place that offers warmth as well as a quick getaway under a rock or cover object if they feel threatened or need to cool down. Cover objects could be slabs of bark or wood, downed logs, old stumps, brush piles, rocks or piles of large, loose stones, bricks, or blocks. Let the grass grow wild in that section of your yard, and be sure to choose an area that isn't close to the road.

ABOVE
A pile of salvaged concrete slabs on the south side of the Portland Animal Estate provide a warm place for the northwestern garter snake to sunbathe. Underneath there is a hibernaculum, a chamber for the long winter sleep.
photo by Shawn Records

RIGHT
The northwestern garter snake.
photo by Tierra Curry

CLIENT 5.6

ORANGE-RUMPED BUMBLEBEE
BOMBUS MELANOPYGUS

"BZZZZZ ZZZZZZZZ"

status:
abundant, although other abundant bee species have been known to experience sudden precipitous declines, e.g., the western yellow-banded bumblebee (*Bombus terricola occidentalis Greene* 1858) and the honeybee (*Apis mellifera Linnaeus* 1758)

seeking:	small subterranean cavities, preferably already filled with soft cotton or dried moss/grass; recently vacated bird/mammal dens are ideal
average weight:	~400 milligrams (anywhere from 40 to 850 milligrams)
average length:	~16 millimeters
average lifespan:	6 to 8 months
hometown:	throughout western North America
hobbies:	garden tours, food storage, childcare
fears:	Japanese beetle traps, cuckoo bumblebee (*Psithyrus*), pesticides
favorite locations:	meadows, fields, and flowering shrubs/trees
favorite foods:	nectar and pollen; a generalist with many hosts (flowers from over 60 families of plants are visited by this bee); favorites include violets, clover, composites, and legumes

friends:

organic farmers

gardeners

conservationists at Xerces Society (www.xerces.org), a local foundation devoted to protecting insects and other invertebrates

CHRISTOPHER MARSHALL

20th Century Folklore (origins uncertain):
Use of modern aerodynamic theories prove that bumblebees cannot fly. They do not have the wing size or wing beat frequency to achieve the wing-loading necessary for flight.

"Wiser far than human seer,
Yellow-breeched philosopher!
Seeing only what is fair,
Sipping only what is sweet
Thou dost mock at fate and care,
Leave the chaff, and take the wheat.
When the fierce northwestern blast
Cools sea and land so far and fast,
Thou already slumberest deep;
Woe and want thou canst outsleep;
Want and woe, which torture us,
Thy sleep makes ridiculous."

Ralph Waldo Emerson, "The Humble-bee"

Known from the fourteenth to the nineteenth centuries as the "humble-bee," today we use the less flattering common name: "bumblebee." I doubt we'll ever know for certain whether this change was the result of an early typographical error (an eighteenth-century h and b are remarkably similar) or because after the industrial revolution, its slow, ambling flight seemed more "bumbling" than "humbling." Nonetheless, bumblebees remain an icon of the insect world, an insect introduced to us, along with ants, butterflies, and dragonflies at a young age: "A is for aardvark, B is for bumblebee."

Bombus melanopygus Nylander 1848 , is commonly known as the "orange-rumped bumblebee." With bright orange patches of setae (the technical term for insect hairs), it is definitely a distinctive and eye-catching insect. Although this is one of the more abundant bumblebees in the Portland area, it is not the only local bumblebee species with orange setae. Like crab and lobster buoys, the position of the color bands can help in diagnosing a species, but still, color patterns within a species can vary significantly throughout its range. If the orange setae appear in wide bands on the front part of the abdomen, chances are good that you're looking at *B. melanopygus*.

The biology of *B. melanopygus* is similar to other species in the genus *Bombus*. Queens emerge in early spring (March/April), having spent the winter in shallow cavities dug underground the previous fall. A queen's primary task is to locate a home for her future colony. As with human house hunters, queen bees typically visit many sites before settling on one, seeming to assess amenities such as size, security, proximity to resources, and how well insulated a given cavity is. In April it is common to see queens flying low, scanning the forest floor, ducking momentarily into the leaf litter and investigating hollow spaces in logs, trees, and man-made objects such as old birdhouses. Queens also visit early spring flowers to feed on and obtain nectar and pollen to provision their nests.

Once an acceptable spot is found, she creates a nectar pot—a small, chocolate-colored vessel made of wax and used for storing nectar. This stored nectar will allow the queen to remain in the nest incubating the eggs until they hatch. For the next three to four weeks, the larvae are fed nectar and pollen brought back to the nest by the queen, until ultimately they build silk cocoons and pupate. With her first brood of workers about to emerge, the queen lays two more broods knowing she'll have workers to provide the food and care necessary to rear them. At this point, the queen devotes all of her time to constructing brood chambers and laying eggs; foraging and nest building activities are taken up by the new worker caste.

Bumblebee colonies in temperate regions are typically small, rarely exceeding a hundred workers, but there are exceptions to this, and some species or exceptional colonies display much larger populations. Some of the bumblebee's relatives in the Hymenoptera, such as honeybees and some wasps and ants, maintain some, or all, of their colony's population over the winter. This is especially true in tropical and subtropical regions. However, all bumblebee workers gradually die off in the fall. As winter approaches, males and virgin

queens are also produced. Mating takes place on the wing outside of the colony, with both males and females mating multiple times with different partners. Once impregnated, the queen digs the shallow subterranean chamber in which she will retire to wait for the following spring.

To encourage *B. melanopygus* to take up residence in your yard you need to be prepared early in the year (March/April) when queens are hunting for new homes. A number of different designs can be built, and various blueprints can be found online. In essence, you'll need a wooden box with inner dimensions of approximately 8 x 8 x 8 inches. A 1-inch entrance hole and several small ventilation holes should be drilled into the front and sides of the box. Bumblebees nest near or in the ground, so your box should be placed in partial or full shade, no higher than 10 inches off the ground and in such a manner as not to get flooded with rain. Fill the box with fluff (cotton, pillow stuffing, or dry straw). You might wish to set out several such houses, to increase your chances of occupancy. And to increase the likelihood that queens will visit your yard while hunting for a nesting site, you might consider planting early spring flowers in the vicinity of your nest boxes.

Once you have a resident hive, you can help them out by planting native plants known to be attractive to bumblebees. A good list of "bumblebee" plants can be found online (e.g., Tom Clothier 2008). The colony will need nectar all summer long, so attempt to plant a variety of plants that will provide blooms from spring through late summer. If you don't have garden space or a green thumb, don't fear, bumblebees are capable of flying great distances to obtain food.

REFERENCES
Clothier, T. 2008. Plants of interest to Bumblebees. Website (viewed 22 August, 2008), http://tomclothier.hort.net/page42.html

ABOVE
The bottom of the Portland Animal Estate contains a nesting chamber for the bumblebee. The front door is a small bright magenta tube; the contrasting color attracts them.
photo by Shawn Records

LEFT
The orange-rumped bumblebee.
photo by Tierra Curry

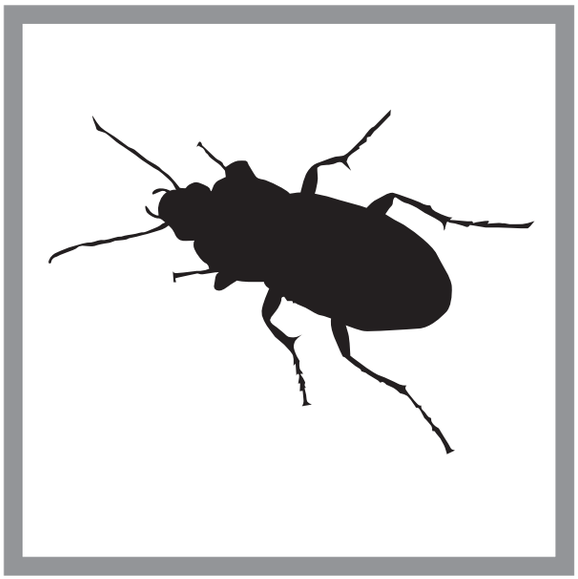
RIGHT
The Edwards bumblebee is a close relation, and also might take up residence here.
photo by Christopher Marshall

CLIENT 5.7

SNAIL-EATING GROUND BEETLE
SCAPHINOTUS ANGULATUS

"Experience the snail. Appreciate the texture. Fresh snails are a bit rubbery... Enjoy their delicate earthy taste."

How to Eat Snails, online eHow
http://www.ehow.com/how_2058176_eat-snails.html



status: abundant

friends:

protectors of our forests

conservationists at Xerces Society (www.xerces.org), a local foundation devoted to protecting insects and other invertebrates

seeking:	covered ground near shaded, humid, unmanicured areas; access to moss-covered trees and shrubs a plus
average weight:	300 to 700 milligrams
average length:	~22 millimeters
average lifespan:	1 year
hometown:	in and near coniferous forests from Puget Sound area, south through the Willamette Valley
hobbies:	tree climbing
fears:	birds, racoons, and hiking boots
favorite locations:	on the trail or running up the trunks of big trees
favorite foods:	escargot

CHRISTOPHER MARSHALL

The sense of death is most in apprehension; And the poor beetle, that we tread upon, In corporal sufferance finds a pang as great. As when a giant dies.

William Shakespeare, Measure for Measure (1603)

"A person's a person, no matter how small."

Dr. Seuss, Horton Hears a Who! (1954)

Shakespeare could not have known of the peril to be faced today by the many tiny species native to the forests of the Pacific Northwest, yet his words ring all too true. While we mourn the loss of our own majestic giants—the very Douglas firs that make up our Pacific Northwest forests—fewer realize that along their lichen-covered branches, and running through their shaded understory, is an entire universe of creatures, which like the citizens of Dr. Seuss's tiny Whosville deserve of our appreciation no less than the giants in whose shadows they live.

Growing up in New England, I was fascinated by insects. A short walk in a vacant, wooded lot near my suburban house took hours, as I stopped to explore under every fallen log. My mom stockpiled plastic containers for the weekend, when I would run inside, hands cupped, impatiently asking for something in which to put my newly found treasure. I began a formal collection of insects in fourth grade, carefully preparing and labeling each specimen, and placing it inside a display case my father helped me build. Like the prizes once placed inside breakfast cereal, I fully assumed that eventually I'd collect them all. But, one day, as I hunted for insects during recess, it hit me: there were simply too many kinds of insects to collect them all. Rather than give up in defeat, I modified my goal: I would simply focus my efforts solely on beetles.

I've never regretted that decision, although I did not know then, that of all groups to choose, beetles (Coleoptera) was perhaps the worst if I was to collect them all. The Coleoptera are one of the most diverse animal groups on earth, with over three hundred thousand species. Even in our small corner—the Pacific Northwest—we have more than five thousand different beetle species. To put that in perspective, fewer than one thousand species of birds live in the entire United States and only two thousand species of bees exist worldwide. Eventually, I was forced to give up the idea that I would collect them all, but even today I'm overtaken with excitement whenever I encounter a beetle species I've not seen before.

Since moving to Oregon in 2005, I've come across *S. angulatus* many times in the forests of the Willamette Valley and western Washington. For those who dislike formal Latin names, an English translation yields "angle-sided boat-backed beetle—hardly preferable. The eloquent formal name refers to the back of the beetle (its notum), which resembles an upside-down wooden skiff (or scapha in Latin); *angulatus* references the angular sides to the pronotum (Figure 1), which other species of *Scaphinotus* lack. Whichever name you prefer, this species (and its close relatives) are fascinating creatures.

As night falls on the Pacific Northwest forest, *S. angulatus* begins its search for food, a search that will continue into the daylight hours of the next morning. The beetle's gangly long legs and special feet allow it to run nimbly over the ground and up and down tree trunks. If you're lucky enough to see one, you might think it resembles a tiny hound dog in hot pursuit of some unknown scent. Truth is: it is in hot pursuit of a scent. The forest is home to this beetle's favorite foods: land snails and slugs. Although plentiful, land snails are not easy to find when you're the size of *S. angulatus*. A fallen tree branch is a gigantic obstacle, and inspecting the leaves and branches of a small tree can take hours. But *Scaphinotus* is equipped. Sensitive, paddle-shaped palpi (small antenna-like appendages associated with insect mouthparts) are *all the better for* sniffing out the telltale sign of terrestrial mollusks: slime. To *Scaphinotus*, the snail-trail is a one-way path to dinner. Feasting on snails that retreat into their shells and slime-covered slugs requires prominent, toothy mandibles, which are *all the*

better for holding tightly onto their fleshy, slimy bodies, and its unusually narrow head is *all the better for* reaching far into the snail shell to extract its meal. Had Little Red Riding Hood been a snail, she'd have been greeted by *Scaphinotus* at her grandmother's house.

Despite a predilection for snails and a body built for it, *S. angulatus* will also scavenge dead or injured earthworms and insects or even fallen fruit/berries that it encounters on the forest floor. Ripe banana, dropped along a forest trail at night, is reportedly an excellent bait. But take a lesson from the lowly snail: leaving behind a trail in the forest can lead bigger animals, such as bears, right to you!

Some *Scaphinotus* species live outside of the Pacific Northwest, but *S. angulatus* is endemic, meaning it occurs nowhere else on earth (Figure 2). Its limited range is likely due to the fact that it cannot fly. This is unusual for a beetle as most beetle species can fly. However, like a penguin, at some point during its evolutionary history, this ability was lost. Without flight, *S. angulatus* lacks the ability to fly over large bodies of water or high mountain ranges. To escape large-scale threats to its habitat it must crawl. *S. angulatus* are associated with forested habitats. However, with adequate ground cover, the species will enter unforested habitat, such as regions of clear-cut, to look for food.

If you wish to make your backyard more inviting for *Scaphinotus angulatus*, you'll want to have plenty of shaded areas with moisture-trapping plants such as ferns or ground covers. Thick leaf litter under shrubs and trees and some carefully placed rotten logs or even wooden boards will provide necessary daytime hiding spots. Providing their favorite food shouldn't be a problem as local gardeners will attest to the prevalence of snails/slugs in the Portland area. *Scaphinotus angulatus* is a forest denizen, less likely to be found extremely far from wooded areas; however, a close relative, *Scaphinotus marginatus* (Fischer) is common in open areas, such as fields. Slightly smaller than *S. marginatus*, it is no less able to chase, capture, and devour snails and requires similar daytime refuges.

BEETLES AT THE H. J. ANDREWS EXPERIMENTAL FOREST

It is a common misconception that, like most birds and mammals, information about insect species, including images and natural history, can be found online or with a trip to the local library. In truth, only a small cadre of insects has been studied in detail. The most fundamental step to remedying this is to inventory what insect species live here and to produce tools allowing people to recognize them.

Scaphinotus angulatus is one of about one hundred species of ground beetle (Family: Carabidae) known to live at the H. J. Andrews Experimental Forest (HJA) in Blue River, Oregon. The Oregon State Arthropod Collection (Oregon State University—Zoology) is currently working with the HJA to produce high resolution images of their insect species—including *Scaphinotus angulatus*. Over the last thirty years, HJA researchers have been depositing insect specimens into OSU's arthropod collection. Using these specimens, biology student Adam Martinez is generating webpages that include spectacular high-resolution digital images of the species known to occur at the park. These images and information about Pacific Northwest insect species are being posted at the Oregon State Arthropod Collection's website. (http://osac.science.oregon state.edu)

Why focus on the HJA beetle fauna? The goals of the HJA are long-term, spanning decades. Thanks to their long-term commitment, the inventory of the forest's insect species is extensive. This provides the rare opportunity to monitor long-term changes in the insect fauna due to climate change, anthropogenic disturbances (pollution or forest management), or naturally occurring catastrophic events (forest fires or floods). This digital imaging project provides a valuable tool. It lends a "face" to each member of the extensive list of names. Monitoring biodiversity requires the ecologists, biologists, and the public be able to recognize even smaller species. We think these images will raise awareness about smaller elements of biodiversity, such as *Scaphinotus angulatus*, that so commonly get overlooked. Each image, like each voice of the citizens of Dr. Seuss's Whosville, increases the chance that the whole community is recognized and preserved; to paraphrase:
"a species's a species, no matter how small."

ABOVE
Logs at the base of the west side of the Portland Animal Estate provide cover for the snail-eating ground beetle. Keeping some snails around will also ensure that this beetle sticks around too.
photo by Shawn Records

RIGHT
The snail-eating ground beetle.
photo by anonymous

FIELD NOTES

CREDITS

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ANIMAL ESTATES IS A GARDENLAB PROJECT

PS NEW YORK
GRAPHIC DESIGN AND ANIMAL ESTATES IDENTITY

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COMMISSIONED BY
DOUGLAS F. COOLEY MEMORIAL ART GALLERY
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2008 EDITIONS OF ANIMAL ESTATES

1.0 NEW YORK, NEW YORK
WHITNEY MUSEUM OF AMERICAN ART FOR THE WHITNEY BIENNIAL 2008 / 6 MARCH–14 AUGUST

1.01 BALD EAGLE *(HALIAEETUS LEUCOCEPHALUS)*
1.02 BARN OWL *(TYTO ALBA)*
1.03 WOOD DUCK *(AIX SPONSA)*
1.04 PURPLE MARTIN *(PROGNE SUBIS)*
1.05 BIG BROWN BAT *(EPTESICUS FUSCUS)*
1.06 MASON BEE *(OSMIA LIGNARIA)*
1.07 OPOSSUM *(DIDELPHUS VIRGINIANA)*
1.08 NORTHERN FLYING SQUIRREL *(GLAUCOMYS SABRINUS)*
1.09 BOBCAT *(LYNX RUFUS)*
1.10 EASTERN TIGER SALAMANDER *(AMBYSTOMA TIGRINUM)*
1.11 EASTERN MUD TURTLE *(KINOSTERNON SUBRUBRUM)*
1.12 BEAVER *(CASTOR CANADENSIS)*

2.0 AUSTIN, TEXAS
ARTHOUSE / MARCH

2.01 BLACK SWALLOWTAIL BUTTERFLY *(PAPILIO POLYXENES)*

3.0 CAMBRIDGE, MASSACHUSETTS
CENTER FOR ADVANCED VISUAL STUDIES AT MIT / ESTABLISHED 17 APRIL

3.1 AMERICAN KESTREL FALCON *(FALCO SPARVERIUS)*
3.2 TREE SWALLOW *(TACHYCINETA BICOLOR)*

4.0 SAN FRANCISCO, CALIFORNIA
SAN FRANCISCO MUSEUM OF MODERN ART / 6–27 JULY

4.1 CALIFORNIA SLENDER SALAMANDER *(BATRACHOSEPS ATTENUATUS)*
4.2 CALIFORNIA QUAIL *(CALLIPEPLA CALIFORNICA)*
4.3 PEREGRINE FALCON *(FALCO PEREGRINUS)*
4.4 CALIFORNIA SEA-LION *(ZALOPHUS CALIFORNIANUS)*

5.0 PORTLAND, OREGON
DOUGLAS F. COOLEY MEMORIAL ART GALLERY, REED COLLEGE / 26 AUGUST–25 OCTOBER

5.1 VAUX'S SWIFT *(CHAETURA VAUXI)*
5.2 WHITE-BREASTED NUTHATCH *(SITTA CAROLINENSIS)*
5.3 OLIVE-SIDED FLYCATCHER *(CONTOPUS COOPERI)*
5.4 BAT
5.5 NORTHWESTERN GARTER SNAKE *(THAMNOPHIS SIRTALIS TETRATAENIA)*
5.6 EDWARD'S BUMBLEBEE
5.7 SNAIL-EATING GROUND BEETLE *(SCAPHINOTUS ANGULATUS)*

6.0 UTRECHT, THE NETHERLANDS
CASCO, OFFICE FOR ART DESIGN AND THEORY / SEPTEMBER 19–NOVEMBER 2

6.1: RED ADMIRAL BUTTERFLY *(VANESSA ATALANTA)*
6.2: EUROPEAN KINGFISHER *(ALCEDO ATTHIS)*
6.3: COMMON SWIFT *(APUS APUS)*
6.4: EUROPEAN GRASS SNAKE *(NATRIX NATRIX)*
6.5: GREEN FROG *(RANA KLEPTON ESCULENTA)*

7.0 CLEVELAND, OHIO
THE CLEVELAND INSTITUTE OF ART / FALL