

2019

Walking with the Wild: Finding an Ethic of Compassion in Conservation

Jane Hallie McGuire

University of Montana, Missoula

Let us know how access to this document benefits you.

Follow this and additional works at: <https://scholarworks.umt.edu/etd>

 Part of the [Nonfiction Commons](#)

Recommended Citation

McGuire, Jane Hallie, "Walking with the Wild: Finding an Ethic of Compassion in Conservation" (2019). *Graduate Student Theses, Dissertations, & Professional Papers*. 11375.

<https://scholarworks.umt.edu/etd/11375>

This Thesis is brought to you for free and open access by the Graduate School at ScholarWorks at University of Montana. It has been accepted for inclusion in Graduate Student Theses, Dissertations, & Professional Papers by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.

WALKING WITH THE WILD: FINDING AN ETHIC OF COMPASSION IN
CONSERVATION

By

Jane Hallie McGuire

Bachelor of Arts in Environmental Studies, University of California, Santa Cruz, 2013

Thesis

presented in partial fulfillment of the requirements
for the degree of

Master of Science
in Environmental Studies, Environmental Writing

The University of Montana
Missoula, MT

May 2019

Approved by:

Scott Whittenburg, Dean of The Graduate School
Graduate School

Phil Condon, Chair
Environmental Studies

Dan Spencer
Environmental Studies

Amy Ratto Parks
English

McGuire, Jane, M.S., Spring 2019

Environmental Studies

Walking with the Wild: Finding an Ethic of Compassion in Conservation

Chairperson: Phil Condon

This collection of five creative nonfiction essays and one poem examines my personal encounters with wild life and wild places, primarily through my experiences working as a field biologist. Reflections on nature's fragility, interconnectivity, the autonomy of all living things, and the ethics of conservation are central to each piece. *Walking with the Wild* invites readers to consider the benefits of integrating compassion and empathy into scientific study, and more generally, into our interactions with the natural world.

Acknowledgements

First and foremost, thank you to my parents, Michael and Ellen Sheffer, for giving me the gifts of comfort and curiosity in the outdoors, and for helping me cultivate a lifelong love of animals – in part by tolerating so many in your home, dead and alive, over the years.

Many thanks to my graduate committee: Phil Condon, Amy Ratto Parks, and Dan Spencer for patiently helping me uncover the nuance in my writing.

Thank you to the Wiancko Foundation and to Ron and Nancy Erickson for helping to fund my graduate education, and to *Rascal Journal* for featuring my first published piece, *Unlikely Sacrifice*, in their September, 2018 issue.

And of course, I have so much gratitude for my husband, Max McGuire, whose support is unwavering, and whose insights helped these essays take the shape they have now.

Table of Contents



Introduction.....	1
Manufactured Sanctuary.....	5
Unlikely Sacrifice.....	21
Bearing Witness to Wolves.....	31
Bird Camp.....	43
How Lucky Am I.....	57
Rumble Wagon.....	63

Unless otherwise noted, all photographs are property of the author.

Introduction

At a time when our relationship to land and soil and place has been diminished, we still turn to our animals, domestic and wild, as a conduit to healing. And through our animals – those in our childhood, those in our homes, and those in the wild, we can begin to find our way back to being whole.

– RENEE ASKINS, *Shadow Mountain*

Whenever there was a death in the animal clan of my childhood, I was overtaken by grief. One of the first animals I grew close to, a black and white cat named Spikey, died in my arms as I sat cross-legged in the blue armchair in the corner of the living room. My parents sat next to me, quiet, watching the little creature heave her last breaths. Yellow light streamed through the window, warming her dense fur, once so black, now bleached the color of something you hold close to your face to decipher whether it's black or brown. Spikey was old, and so small, like a berry shriveled on its stem late in the fall.

I was thirteen years old, and had known Spikey for seven of those years. When we were first becoming acquainted, I learned through many clawed swipes to the face that Spikey did not enjoy belly rubs, or kisses on the nose, or surprise snuggles while she lay sleeping. Spikey, in turn, came to accept gentle chin-rubs, and in time even slept on my bed at night, and delivered dead mice to my pillow. These small affections felt like momentous declarations of love. Maybe they were.

When the day of her death arrived, Spikey crawled deep beneath my bed. My parents extracted her from the cobwebbed darkness and my mom came to retrieve me from junior high. As I sat with Spikey in that blue chair, everything was peaceful – until the shaking began. Spikey was overcome with erratic shivers that seemed too strong for her little body. She writhed and contorted and I cried out, fearing that she was suddenly wracked by the pain of dying.

Later, my mom would refer to these startling contortions as “the soul leaving the body.” Even our pet chickens – far beyond their egg laying years, sick with some undiagnosed malady that we attempted to cure by bringing them into the warm house and feeding them homemade concoctions of cracked corn and antibiotics – even they metamorphosed from drooping, listless creatures into wildly flapping whirlwinds strong enough to launch from my arms during the transition between life and death. “The soul doesn’t let go easily,” my mom said.

When Spikey’s soul finally let go, it left her in a warm, quiet heap. I stared at her, watching for breath. I looked at my dad, and it was the first time I had ever seen tears in his eyes.

Just as Spikey’s soul, and the chickens’ souls, and all the other animal souls of my childhood had to let their bodies go, so too did my soul have to let go of them. The shudders always began slowly, rising into my chest like the tide lapping the shore. They cascaded into guttural sobs that left me trembling like the chickens who fell from my arms. Quiet in his chair while I howled, with his hand on Spikey’s lifeless side, my dad sounded grateful when he told me, “You mourn for all of us.”

In the years after leaving home, my animal loves became the wild sort. They did not let me rub their chins, nor care to sleep in my bed, but they did awaken in me an intimate awareness of the daily wild encounters that pepper our human lives if we look closely. Shortly after graduating college, I became involved in work that strives to better understand and protect our wild neighbors – particularly those that are increasingly prone to harm resulting from sharing space with humans.

Within these pages is a personal account of nature being “managed” in some capacity. By weighing, measuring, collaring, banding, and tagging the wild things around us, we try to safeguard the wealth of biodiversity on this planet. But as Daniel Ramp and Marc Bekoff remind

us in their essay *Compassion as a Practical Evolved Ethic for Conservation*, “The word management reflects the fact that, in today’s world, humans must interfere in the lives of other animals to resolve conflicts.” Sometimes, it is difficult to distinguish who ultimately benefits from this interference.

An extreme example comes from Wildlife Services, a division of the U.S. Department of Agriculture. In the infographic *Hey Wildlife Services – What did you Kill*, featured in the June 2014 issue of *High Country News*, Ben Goldfarb reports that in 2013 alone, Wildlife Services killed over two million European starlings, one million brown-headed cowbirds, 75,326 coyotes, 24,399 beavers, and 12,186 black-tailed prairie dogs; all in the name of conservation. Far too frequently, the human approach to wildlife management focuses more on eliminating human-animal conflict than it does coexistence.

When achieved with a pair of binoculars rather than a gun, trap, or snare, however, conservation acquires a truly different shape. In *What the Robin Knows*, naturalist Jon Young writes, “As awareness grows, appreciation grows too. As appreciation grows, so does empathy.” Even in the realm of science, the practice of observing wildlife can provide concrete data with profound implications for conservation. Furthermore, these methods cultivate intimate knowledge, and often respect and compassion, for the creatures being observed. This is invaluable because, as Ramp and Bekoff write, “Factoring compassion into conservation presents a simple and morally acceptable approach to resolving issues of land sharing by using the universal ethic of a concern for the suffering of others and attempts to alleviate it.” Little else will so effectively allow us to move toward a compassionate, humane culture of conservation.

Throughout my encounters with the wild – as a child, as a traveler, and especially as a field biologist – I grappled with the human impulse to dominate and control. This thesis is my

documentation of that process. It is also a mourning, a tribute, and a deep honoring of the many winged, pawed, and hooved creatures that I have had the privilege of knowing. It is an exercise in letting their souls go.

In this increasingly human dominated world, strategies for coexistence are urgent and imperative. And yet, if we are to replace collision with connection, we must move forward with patience. We must watch. We must earn our knowing. We must honor the animals and the nature that we have left, and be gentle with it, so that we may continue this beautiful, complicated walk with the wild. ☪

Manufactured Sanctuary

We are part of a great conversation. As we pay attention, we'll find the tracks, the script of our wild neighbors, to tell us so; we'll begin to answer the essential question of how to live on a changing earth, where humans and nature are tangled so messily and so wondrously.

LYANDA LYNN HAUPT, *The Urban Bestiary*



Top: Johnston Island shortly after the military's departure in 2006. Photo courtesy of USGS.

Bottom: A short-eared owl nestling on Johnston Island, moments before fledging, takes cover amid vegetation at the edge of its nest.

I stand in a tangle of plumeria, clad in my standard work ensemble of crusty cutoff shorts and a sun-bleached bikini top, prodding a feathered carcass with a stick.

Owl-kill, I scribble in my field notebook, crouching to more closely examine the pair of downy white wings lying open and brittle on the duff, the oddly angelic remains of a red-tailed tropicbird chick. Flipping a wing with my stick, I scrutinize the feathers for signs of “pin break”: that defining developmental stage when fluffy down is replaced by true feathers, signifying the transition from chick to juvenile. With my nose inches from its tiny flight feathers, I can’t help but recall the living chick – a dusky puffball so round that it seemed liable to roll straight out of its earthen nest. It was still an egg when my four crewmates and I arrived on this tropical island six weeks ago, pale-skinned and optimistically anticipating the upcoming six months of sunshine, isolation, and environmental conservation. The chick hatched from its pink-speckled shell last month, when the rain finally began to fall, filling our rainwater catchment barrels to the brim and alleviating our fears of relying on the notoriously finicky desalination machine for drinking water. Out here, a full three days’ boat journey from civilization, problems that arise are ours alone to solve.

Disembodied on the ground, the chick’s feathers reveal that it had been approximately two months from taking to the skies – or more accurately, to the ocean. Red-tailed tropicbirds can spend years at sea, learning to plunge like torpedoes after darting prey, or hunting shoals of flying fish glimmering near the ocean’s surface, before they return to land in search of a place to nest. Their nesting grounds, like this one-square-mile nubbin of land known as Johnston Island, are cacophonous frenzies of squawks and aerial acrobatics where tropicbirds court, mate, and care for their young. Located in an isolated patch of the Pacific Ocean between Hawaii and the

Marshall Islands, Johnston Island is the only landmass for hundreds of square miles, and one of the world's only remaining places where it is safe for tropicbirds to raise their chicks.

Standing up, I scratch a few more notes onto my datasheet, then brandish my stick like a machete to shove aside the lattice of tropical foliage obstructing my path. Although my five-foot long stick is useful for poking dead birds and maneuvering through brush, its true purpose is to “tip.” As I trudge along my transect, I pause at each red-tailed tropicbird nest I find. The nests are little more than shallow scratches in the duff, sometimes in plain sight, other times shrouded by vegetation. The subtle bowls would be tricky to spot if it weren't for the brilliant white tropicbirds sitting in them. Pearly and sleek, with a cherry-red bill, dark cat-eyes, and a single red tail feather pointing straight up like an antenna, the red-tailed tropicbird is hard to miss. Occasionally, a fluffy, wide-eyed chick nestles in the nook of its parent's wing, or more frequently, sits alone in its nest. If the latter is the case, I record the chick's approximate age and move on to the next nest. When I encounter a solitary adult, however, I slide the end of my stick beneath its breast and tip the bird gently upward, just high enough to determine if its black webbed feet cradle an egg. Without fail, the intrusion provokes an indignant squawk, the nesting tropicbird's sole defense.

Squawks mark the progress of my four crewmates, each of whom carry their own field notebook and tipping stick. We move as a unit across the sandy island, maintaining a distance of about fifty meters apart, methodically tipping birds. Although our route is guided by fragments of orange flagging tape, we could easily follow it from memory. This survey, designed to document the recovery of red-tailed tropicbirds in a once annihilated landscape, has been part of our weekly routine since our arrival six weeks ago. During that time, we have watched a

generation of tropicbird chicks hatch and fledge, but we only recently began to notice the owl-kills.



“The owls have been more visible recently, according to the last couple crews,” Stefan called over his shoulder as we bicycled down the asphalt of the runway. It was our first day on Johnston Island, and my crewmates and I trailed behind Stefan like obedient ducklings. We parked our bikes on the runway’s crumbling edge and picked our way through brittle pluchea bushes. “You’ll probably notice them gliding over this area – they seem to like the openness of the runway.”

Unlike the many strikingly bizarre seabirds I had met during my short time on the island so far, the short-eared owl was a species I knew. Back in Montana, or “on the mainland,” as Stefan and other Hawaiians referred to the contiguous forty-eight states, I regularly drove Highway 89 through Paradise Valley, bound for Yellowstone National Park and my seasonal summer job wielding pick and shovel on the trail crew. If I was lucky, I spotted one or two small, tawny owls perched along fenceposts or gliding over the expansive valley floor, head cocked to pinpoint scurrying rodents. Johnston Island, just a half-mile wide by two miles long and surrounded by churning ocean, seemed worlds away from that wide, agricultural valley. But, as Stefan informed me, the short-eared owl is the world’s only owl brazen enough to cross hundreds of miles of open ocean. Johnston’s resident owls had likely flown from Hawaii, eight-hundred miles to the northeast. And as had become clear, in the absence of their preferred small rodent prey, short-eared owls will easily switch to seabirds.

I stumbled over the bleached bones of coral, Johnston Island’s strange substrate, feeling as though the earth still rocked beneath my feet. During the three-day boat journey from Hawaii aboard the immense diesel vessel, Kahana, my legs had become accustomed to the pitching

ocean in a way that now hindered my attempt to keep up with Stefan's long strides. "Sea legs," the ship's crew called them. The Kahana hummed a half-mile away at the dock, brimming with six months' worth of nonperishable food, several one-hundred-pound tanks of propane, backpacks bulging with sunscreen and snorkel gear, and shipping containers piled high with canned cat food. A crew of U.S. Fish and Wildlife Service staff buzzed around the vessel, helping unload, while my crewmates and I traipsed behind Stefan, trying to absorb every ounce of his wisdom before he departed.

Slim and tanned, with a ponytail of sun-bleached dreadlocks extending midway down his back, Stefan had been a member of the first Crazy Ant Strike Team, or CAST, in 2010. Now, three years later, he had just five days to impart his treasure trove of knowledge to us – the rookie crew and seventh CAST. After that, Stefan and the other staff would motor away on the Kahana, leaving the five of us here, alone.

Great frigatebirds soared high overhead, red-tailed tropicbird chicks gazed at us, shocked, from the base of ironwood trees, and red-footed boobies opened their technicolor bills to croak like dinosaurs as we passed within inches of their jumbled stick nests, balanced precariously on windswept shrubs. No short-eared owls materialized, which was unsurprising, given the midday heat and the island's estimated population of a measly eleven owls. We didn't waste any time looking for them; instead, we searched for ants.

The yellow crazy ant nest was marked by a fluorescent orange pin flag at the base of an ironwood. Needles blanketed the earth beneath the tree's shaded canopy, creating a tiny oasis from the intense sun. Stefan crouched at the base of the tree and pawed a thick chunk of duff away from its roots. Immediately, a tidal wave of ants poured from the earth, tumbling over each other to blanket his hand, forearm, and flip-flopped feet.

Momentarily frozen, I stared. Stefan was completely unperturbed by the ants now racing over his torso, under his shirt, up his neck. I knew about the yellow crazy ants, of course. Notorious invaders of the tropics, yellow crazies spray formic acid into the eyes of their prey, causing their victim to go blind. Eventually, the victim starves and the ants feast. Certain regions of Hawaii have been plagued by such severe crazy ant infestations that eradication efforts may well be hopeless.

The ants most likely arrived to Johnston as stowaways on vessels during the U.S. military's occupation of the island, which extended from the mid-1900s to the early 2000s. Once on Johnston, the ants discovered an abundant food source: nesting red-tailed tropicbirds and their chicks. When the military abandoned Johnston Island in 2006, the infestation intensified. The influx of seabirds that accompanied the absence of humans allowed the crazy ants to thrive. Meanwhile, the red-tailed tropicbird population dwindled.

Not a square inch of Stefan's body remained ant-free. Protective clothing seemed to be out of fashion on Johnston – apparently it was more bearable to withstand stinging ants on bare skin than it was to endure extra layers in this humidity. Despite the surging ant army, Stefan's demeanor remained characteristically calm. He summoned us forward by pointing an ant-coated finger at a thick root. "They like these larger trees with the more complex root systems," he explained. "What you want to do is identify where the central flow of ants is coming from, and dig there. That's where the queens will be hiding."

I shoved my shock aside and set to work, shoveling my hands through the mixture of soil, duff, and ants. True to their name, the yellow crazy ants moved erratically, jerkily, crawling over each other to escape their fortress and attack their invaders. And it stung. The soldiers deployed formic acid onto our skin, each ant like a tiny pinprick of fire.

A mantra from my childhood, an oft-repeated gift from my mother, swam through my mind: *I can do hard things*. It was a phrase that had steered me towards many significant transitions over the years, ultimately including the one to fight acid-spewing ants on a remote island for six months. But first, years ago, it guided me to discover a passion for trail work at nineteen – with a chainsaw slung over my shoulder, huffing up wooded mountain trails, I reveled in an aching of my muscles and clarity of mind far more satisfying than the few semesters of college under my belt. Addicted to shaping tread and building walls of rock, I hopped from the Trinity Alps in California to Big Bend in Texas to Yellowstone, gaining more and more responsibility, and yet, over time, becoming less and less satisfied with life as a seasonal laborer. Bodily strains and existential doubts about my ability to realize my true potential through trail work plagued each swing of my pick. I needed an out.

When a friend showed me an online job board touting positions ranging from “Spring Migration Bird Bander” to “Bottlenose Dolphin Intern: Bahamas,” I scanned it compulsively. The job board presented an opportunity to contribute to conservation in a way that was absent from my seasonal trails gig. As a trail worker, I took comfort in knowing that I was helping people get into nature, but what was I doing for nature itself, besides hacking at it with a Pulaski when it grew too close to the trail?

I sent my resume to every internship, field technician position, and volunteer opportunity that seemed within reach. To my dismay, rejection became commonplace. Although my trails career proved me capable of performing arduous labor with a small crew in remote settings, it also demonstrated a severe lack of expertise in bird banding, dolphin tracking, and nearly every other qualification required to enter the realm of wildlife biology. Even the volunteer gigs turned me down.

When I skimmed the job announcement for “Crazy Ant Strike Team Expedition Crew Member,” I was intrigued, but skeptical. Species eradication? I wanted to help save nature, not spray it with pesticides. But the promise of six months of isolation with a small crew drew me in. Maybe I had a shot.

And that was how, in my mid-twenties, I found myself covered from head to toe in stinging ants, on purpose.

“There’s one!” Stefan exclaimed. “See her? Get her!” An ant three times larger than the others and donning a pair of wings emerged from the fortress: a queen. My crewmate Jenny snatched her highness by the wings and dropped her into a plastic Tupperware container.

Five more queens and many fire-pinpricks later, we performed an impromptu hokey-pokey to shake the ants from our bodies. Walking back to our bicycles, Stefan ensured us that “queen hunting” was one of the more unpleasant – but important – tasks we would perform during our stay on Johnston. Live queens provided a means of testing new pesticide recipes that might be successful in eradicating the persistent remaining ant colonies from the island. Queens, buried deep in their nests, are necessary targets because they are the only members of the colony that lay eggs.

My stomach lurched to imagine Johnston Island during Stefan’s time as a CAST member. He and his crew had arrived to an island crawling with crazies. After months of tinkering with different ant bait recipes, the crew hit the crazy ant taste-test jackpot with an irresistible concoction of Friskies Ocean Whitefish Seafood Pate, Western Family instant mashed potatoes, Karo corn syrup, and a touch of Provaunt insecticide. Within weeks of applying the recipe to ant hotspots, the yellow crazy ant population dropped by ninety-nine percent.

Subsequent CASTs had battled against the lingering one percent of ants, mostly unsuccessfully, for the last three years. The abandoned underground military infrastructure riddling the island – such as pipes and wiring, off-limits storage bunkers, and even a rumored underground hospital – provided ample hiding places where yellow crazy ants were isolated from eradication efforts. It is possible that Johnston may forever depend on human intervention to maintain some semblance of the island it once was.

Still, a ninety-nine percent drop in the yellow crazy ant population had transformed Johnston Island from something out of an apocalypse movie into an explosion of life. My crew arrived to an island teeming with well over ten-thousand red-tailed tropicbirds – far more than any other Pacific island. On the short walk back to our bicycles, we were abraded by a dozen or so squawks from nesting tropicbirds, healthy and safe despite the still boiling pit of ants only meters away.



After tipping the last bird in my transect, I emerge from the mess of leafy vegetation and step onto the decommissioned runway, grateful to have completed the tropicbird survey before the hottest part of the day. My crewmates and I circle-up to compare field notes before breaking for lunch. We brush the dirt and leaves from our datasheets and tally the numbers: in this one-acre plot, we logged a total of eighteen eggs, forty-seven chicks, and six owl-killed chicks.

Jenny consults her field notebook. “Two more owl-kills than last week,” she announces, “and two more eggs were laid.”

During the survey, we also encountered the first short-eared owl nest to ever be recorded on Johnston Island. In a depression beneath the arc of a pluchea bush, two scruffy owl nestlings balanced on spindly talons, watchfully awaiting the silent arrival of a food-bearing parent. Tufts

of beige plumage thinly coated the owlets' wrinkly grey skin, and wisps of white feathers edged their nest – remnants of a recent tropicbird meal.

Finished with tropicbird tipping for the day, we shove field notebooks and water bottles into backpacks and head back to camp, tapping our tipping sticks like footsteps on the pavement as we walk.



Later, in the lavender dusk, when the ocean is still and seabirds tuck heads beneath wings at their roosts, I lace up my running shoes and trot down the runway. Veering off the cracked asphalt, I meander down dilapidated docks, weave along overgrown sidewalks, and hop over doorsteps and shower drains, long abandoned. Relics of Johnston's military past lurk everywhere. At the edge of the seawall, waves lap at a rusted yellow sign reading *Warning: Contamination*. Another sign, *Do Not Enter: Use Of Deadly Force Authorized*, lies face-up, entangled in morning glory. Rows of locked military bunkers line the southern seawall, guarding what I presume to be something top-secret, considering Johnston's legacy of nuclear weapons testing.

In the 1950s, dredging vessels crumbled coral from Johnston's waters and shoved it ashore, transforming the island from a windswept knoll of just a few acres to the flattened rectangle that it now is. During the military heyday, palm-lined blocks of apartment complexes accommodated over one-thousand military personnel, most of whom were tasked with launching and observing nuclear blasts. The apartments, along with a myriad of restaurants, tiki bars, and office buildings, were torn down upon the military's departure in 2006. They are now marked by little more than disintegrating linoleum floors and cascading hedges of hibiscus.

The lonely remaining building is the gutted Johnston Operations Center, a five-story block of concrete that once housed state-of-the-art equipment for observing atomic explosions.

On the launchpad directly beyond its entrance, a failed nuclear test once spit plutonium over the east end of the island. The radioactive contamination was subsequently buried beneath the white sands of what is now nicknamed Pluto Beach, a favorite snorkeling spot just a short walk from our camp. On the same beach, thousands of leaking barrels of Agent Orange were once stored until they could be disposed by the island's chemical weapons incineration facility. Tucked in the ironwoods lining the beach's sandy shore, bold-lettered signs demarcate an asbestos dump. The bulky debris forms sheltered crevices that perpetually host a collection of nesting red-tailed tropicbirds.

If Johnston Island remains well-known for anything, it is for this toxic legacy. Each incoming CAST is briefly joined by an environmental toxicologist who samples the ocean, the beaches, and the soil for residual contamination. We are told it is safe. Still, we carry a Geiger counter whenever we go digging for queens.

As dusk darkens to indigo, I begin to arc back toward camp along the wide runway. Outside the one-room airport terminal, several upturned five-gallon buckets and Super Soaker squirt guns air dry. Our ant eradication technique is a testament to the great evolution of chemical warfare witnessed by this little island. The protocol is this: once per month, my crewmates and I each begrudgingly don a set of mismatched hospital scrubs. While sweltering in this required gear, we each haul a squirt gun and a five-gallon bucket sloshing with pesticide-laced Friskies Ocean Whitefish Seafood Pate. We march to our assigned target area and exuberantly smother it with great slurping squirts of poisoned slurry. At dusk, yellow crazy ants emerge from their underground liars and commence in an ill-fated feeding frenzy.

The white of my running shoes now glows bright against the darkness of the runway. As on many occasions, the silent wingbeats of two short-eared owls join me, flapping high above

my shoulder, periodically releasing muffled, whinnying hoots. Haunting or comforting, I can never decide. Although it is likely that my strange companions intend to usher me away from their cryptic nest, it is easy to interpret a cautious curiosity in their facial expressions, perpetually frozen in a state of surprise.

During my many commutes to and from Yellowstone, the silhouette of a short-eared owl against the backdrop of the Absaroka Mountains became an increasingly rare sight. Investigating the absence, I learned that the species was in the midst of a steep, widespread decline. The global conversion of grasslands to agriculture had rendered grassland-dependent species, including the short-eared owl, highly vulnerable. Although short-eared owls are adept at surviving in human-made versions of grasslands, such as agricultural land, military bases, and reclaimed mining land, these spaces are poor replacements for native prairie. In Hawaii, for example, a recent study found the Hawaiian short-eared owl subspecies, known colloquially as pueo, to be plagued by episodic, poorly understood die-offs, most likely caused by a lack of food resulting from a lack of suitable habitat.

A far cry from native prairie, Johnston Island's modest swath of salt-laced shrubs may be one of the only places in the world where the population of short-eared owls is stable, if not growing. Seabird prey is abundant, and the island's thick tangles of vegetation provide ideal nesting habitat. As long as the battle against crazy ants continues, or if the near-impossible feat of eradication is achieved, it is likely that short-eared owls will persist on Johnston. For now, it appears that the pueo, listed as endangered since 2005, has found a refuge.

My route is now lit by the night itself as sprawling white stars illuminate plains of dappled coral skeletons. The company of my winged running partners persists until I duck into the ironwoods approaching camp. The owls rarely enter the thick trees. Their domain is the open

shrubland surrounding the runway, where they pitch on the wind and scan the bleached earth for movement, boldly overseeing their manufactured sanctuary.



Four months later, I sit cross legged on the rough concrete seawall with Kristin and Jenny, looking out at the many winking crescents of the restless ocean. Kristin cradles her ukulele and I occasionally strum my guitar, but mostly we all gaze out, mesmerized by the ocean's movement as if by flame. Once, while dribbling liquified cat food onto fields of plucea and concrete, I caught a glimpse of a spotted eagle ray launching from this same patch of ocean, great rubbery wings outspread as if truly flying, long barbed tail drooping to skim the water's surface. The ray belly flopped with a resounding *fwap!*, then launched again, effortlessly, like a speckled pebble skipped over choppy water.

"Where are you going next, when we get back to Honolulu?" I ask Kristin. Only two weeks remain before the Kahana rumbles back to Johnston's shore, and thoughts of civilization are all-consuming.

"To the loons!" Kristin replies. "Well, home first, for a week...and then back to the loons!" Kristin's passion for her summer job paddling Lake Michigan and banding loons has earned her the nickname Loon. My own island nickname, Duck, arose from an affinity for a northern pintail duck who appeared on the island, strikingly out of place yet miraculously intact after what must have been a long and disorienting journey. Like the short-eared owls, vagrant species sometimes mysteriously appeared on Johnston. Unlike the owls, however, their visits usually resulted from a grave miscalculation made during migration. Fatigued and malnourished, they often died shortly after landing. Sometimes they managed to quickly take flight again, presumably toward a more hospitable place. But the duck, dubbed Mildred, stayed for well over a month. She explored the island thoroughly, waddling over the hard ground and pausing

intermittently to leap directly up like a spring, flapping her wings and stretching her bill high to pluck insects from spider webs. For a species evolved to graze upon seeds floating in freshwater ponds, this quick adaptation was a marvel. I stashed bowls of fresh water near Mildred's favorite hunting grounds, secretly hoping she would stay. But eventually, Mildred disappeared as mysteriously as she had arrived.

"Where will you be heading? Yellowstone?" Kristin asks.

"Yep. Back to the ol' dusty trail." It had been a difficult decision, but as our time on the island increased, so too did my nostalgia for Yellowstone's familiar mountain ranges and the trail crew laboring within them. I promised myself that this season would be different. I had successfully tracked down the contact information of several Yellowstone biologists involved in raptor and wolf work, and I was ready to pester them tirelessly until they agreed to let me volunteer on my days off. The owls, seabirds, and ants of Johnston Island, and even chance encounters with underwater creatures and a wayfaring duck, had gifted me with a literacy in the workings of wildlife that I was determined to build upon.

"Any word from grad schools, Jenny?" I ask. Jenny, nicknamed Booby after the Nazca boobies she studies in the Galapagos each summer, had been patiently applying to graduate schools via our insufferably slow internet connection.

"Maybe!" Jenny responds. "There's an email from Wake Forest University in my inbox, but the darn thing won't load all the way."

Allison and Ben, or Finch and Tern, respectively, are back at camp. It's Allison's night to make dinner, and Ben is hard pressed to intrude on anything he perceives as girl time, despite numerous exasperated reassurances that "it's *fine*, come *on*."

“I’m so excited to see where we all go, you know, long after we leave here,” Kristin comments. She doesn’t have to explain the sadness in her voice. We know it stems from the knowledge that no matter where we go, it’s certain that the five of us will never be here, stranded together on this odd little island, ever again. The seventh CAST expedition is nearly complete, and the eighth will soon begin.

“I know,” I reply. “Me too.”



On the eve of our departure, Jenny extracts a short-eared owl carcass from the freezer in our camp, bundled liberally in trash bags. The owl was found inexplicably dead in the branches of a pluchea bush near the runway. Jenny gently places it in a tub of items bound for the freezer on the Kahana, where it will join us on the long journey back to civilization. The owl’s ultimate destination is the Bishop Museum in Honolulu. There, the specimen will become the first representation of Johnston Island’s short-eared owl colony to be examined by experts on the species. Hopefully, the frozen little owl will help scientists better understand the future of the endangered pueo, and the role that Johnston may play.

Already aboard the Kahana, tucked safely away in our waterproof luggage, are our field notebooks. Each one paints a slightly different story of the same six months: the yellow crazy ant population fell by some miniscule percent and the short-eared owl population rose steadily, and yet somehow, the red-tailed tropicbird population skyrocketed. The paradox seems an appropriate representation of our journey: in a land where living things flourish among toxic debris, it is fitting that tropicbirds would thrive in tandem with their predators.

I click off the lantern dangling from the ceiling of my tent and settle into the sandy, tousled sheets of my air mattress. On this final Johnston night, my heart thrums quickly in bittersweet anticipation of change. Squeezing my eyes tight and focusing on the *shush* of the

waves, I am struck by another paradox: that the act of killing insects would promote such profound gratitude for the diversity of life flourishing in this vibrant, broken place.



The diesel roar of the Kahana is deafening. My crewmates and I stand aboard the ship's deck, waving tearful goodbyes to the new, incoming CAST that stands nervous and brave on the dock below. Beyond them, avian silhouettes swarm above the ironwoods: red-tailed tropicbirds tail-wag in midair to impress prospective mates; great frigatebirds glide ominously near shore, poised to ambush incoming seabirds and gorge on stolen fish; and red-footed boobies launch from their plucea nests with great heaving wingbeats. Hidden beneath the commotion, in their day roosts among the shrubs, short-eared owls rest.

The Kahana lurches forward, northeast. Back toward a life where the markers of a good day's work can be difficult to distinguish, as opposed to splattered on a pair of torn hospital scrubs. Back toward a life where the tides bear little influence on the rhythm of the day. Where my native landscape often feels altered, compromised.

From a distance, Johnston becomes a thin fringe of treetops peeking from behind sloshing waves. The tightening around my stomach reminds me that this moment of departure is a moment of leaving home. A strange home, and yet, like an owl lighting upon long sought nourishment, I found what I needed here. ☪

Unlikely Sacrifice

A world without wildness is a world beyond its capacity to heal.

GARY SNYDER



Top: Yellowstone wolf 967, freshly fitted with a GPS collar, recovers from sedatives.

Bottom: California condor 569 lands near a calf carcass at a feeding site. Image captured by a game camera.

The kitchen window of my childhood home framed a run-down redwood barn. Owls lived in that barn, I was told. They left neat little packages of indigestible fur and bones scattered across the concrete floor. I scavenged these owl pellets for keepsakes: a mouse's skull, a bird's beak, tiny vertebrae like butterflies. I sorted my finds into the pockets of a battered egg carton, which I stored on my bedside table next to a jar of snakeskins and beetle wings.

I once found a dead lizard in the barn. I placed it on an exposed beam, where I could crouch and stare at it. Its black, cream, and beige scales formed different patterns depending on how I focused my eyes: sometimes stripes, sometimes diamonds, sometimes zig-zags. I searched for the seam where the tail would detach if the lizard was alive and I tried to catch it.

I checked on the lizard daily. It seemed to be in a slightly different position during each of my visits. Concerned that it might still be alive, I nudged a capful of water to its mouth. It didn't drink. Instead, its skin began to crawl. And then the lizard began to writhe wildly, as if its whole body was a detached tail. And then maggots burst from its belly.

The maggots poured onto the beam and toppled to the floor like plump white raindrops. They inched away from their deflating home, expanding into a sprawling network of translucent rivulets. I chose a spindly vein to follow, imagining the procession would lead me to another dead thing. But they dribbled into a crack in the concrete.



Twenty years later, flies trail behind the dead calf in my truck bed. It's January 2016, and the carcass thuds as I careen along a winding dirt road at the crest of the southern Santa Lucia Mountains. I park at the summit of an exposed ridge and gather my telemetry equipment.

The scrubby hillsides drop steeply down to the jagged Big Sur coastline on my left, and undulate eastward to California's central valley on my right. I squint against the harsh north wind, pressing a crackling telemetry receiver to my ear. The walkie-talkie shaped device scans

the frequencies emitted by the wing tags of California condors. When not transmitting a signal, the receiver hums a steady stream of static. If a condor is within range, the static is interrupted by a series of high-pitched, staccato beeps.

A cable attaches the receiver to a multi-pronged antenna that I hold high above my head. I thumb the receiver's dial, listening first for condor 167, then 168, then 171. Static. I scan through the frequencies of two dozen more condors before a rhythmic *ping!* slices through the din. Condor 566, a six-year-old male. A few more twists of the dial reveal that his lady friend, 597, is also nearby. These two have been courting for months – they intertwine their naked necks to preen the hard-to-reach feathers on each other's backs, and 566 stands before his chosen mate with his 9-foot wingspan fully unfurled, head lolling towards his dinosaur feet, shifting his weight from side to side in a lumbering mating display. Hopes are high that the pair will nest in the cliff bands of Rocky Butte, just west of here. If successful, their chick would be one of the first wild-born condors since the 1980s.



I was just a toddler when California condors began repopulating the central coast, but I knew to keep my eyes skyward whenever my parents loaded my brother and me into a jam-packed SUV bound for Pfeiffer Big Sur State Park. I would recognize a condor when I saw one, they said, by its giant black wings spanning twice my height. Crisp white triangles would curve along the underside of each wing, and long black feathers would splay from the tips like fingers. Its head would be naked and pink, except for a bristly patch of black feathers smeared across its forehead like war paint. Condors are scavengers, they said, which meant they were like me: always scanning the ground for dead things.



One year before joining the condor crew, I sat cross-legged in the snow with a wolf's head resting on my thigh. I had spent the winter peering through a spotting scope at the Lamar Canyon wolf pack as part of a team studying the impact of wolves on ungulate populations. This yearling male was in a sedated stupor; the successful target of tranquilizer dart fired by a Yellowstone biologist in a helicopter. After measuring his teeth, weighing him, and taking blood and fur samples, the biologist had secured a GPS collar around the wolf's neck, christening him as 967 to the science world. When the helicopter whirred away, my crewmates and I had plodded towards the torpid creature, acutely aware of the clumsiness of our snowshoes and the fact that 967's drugs would soon fade, at which point we would begin the long trek back to the road. But we had a few moments to spare until then.

I dug my fingers into the downy warmth beneath 967's coarse outer coat. The afternoon sun illuminated strands of gold highlighting his black fur. I stared at his pupils, which I'd never been able to see clearly through the spotting scope. His yellow eyes lolled, and when his woozy gaze swam to mine, my sense of empowered awe dissolved into self-disgust. I saw myself lovingly caressing his neck while his paralyzed body shuddered. I saw the emblem of domestication bound in thick leather around his neck. I saw the white plastic box that would transmit his whereabouts to biologists until the wolf or the battery died, whichever came first. I slipped my legs from beneath his body and lowered his limp head onto the snow.

I valued the collars, because their purpose was to protect wolves. It is only through telemetry that wolves can be reliably observed, and through observation we gain insight into how they live their lives. Critics accuse wildlife researchers of delving unnecessarily deep into the daily workings of their subjects. *Why do you need to know how many hours a day wolves sleep?* they ask. I point to the danger of parsing and choosing information that may or may not be

valuable to ensuring the continued survival of a species, especially one that is both an apex predator and the centerpiece of heated social and political controversy. Information provides a platform from which we, as researchers, can advocate for our study subjects. We'll take all the data we can get.

In the moment that I met 967's eyes, however, I was haunted by our impulse to control that which we pretend to set free. Placing a high-tech stamp of civilization on such a wild thing seemed like just another way we corral nature into an arena of our own making. I thought of bison, who are hazed back into Yellowstone by wranglers and helicopters when they attempt to follow their instinctual migration routes off the freezing plateau. I thought of alpine lakes purposely doused with poison to kill off invasive fish – and the native species along with them – that humans once stocked there for recreating anglers. And if I'd known the condors then, I would have thought of them, too.



Condors once glided above western North America by the thousands. They nested in redwood cavities in coastal California, ripped apart beached whales in the Pacific Northwest, and skirted cliff edges in northern Mexico. But in the mid-1900s, populations plummeted. Shards of lead ammunition littering the bodies of ground squirrels, coyotes, and gut piles fatally poisoned the condors that fed on them. Additionally, the agricultural pesticide DDT thinned condors' eggshells and caused nesting pairs to crush the single egg they laid every two years. If young successfully hatched, coastal chicks were prone to being fed diets rich in trash, clogging their gizzards with plastic. This trio of poisons – lead, pesticide, and plastic – slashed the global population of California condors to just twenty-two individuals in the early 1980s.

In 1987, all surviving condors were captured and placed in zoo-based breeding programs. Too entangled in the lives of humans to be deemed wild, the first zoo-bred, “free-flying” condors

were released into California skies in 1992, each bearing two bright wing tags and a telemetry antenna.

Today, about two-hundred-fifty condors soar free. A true conservation victory, to be sure. However, all three fatal poisons persist. Lead-laden carcasses continue to kill condors every year. Coastal microtrash is ubiquitous. And DDT still lingers in the food chain, despite being banned in 1972. The pesticide bioaccumulates in the bodies of sea lions that breed near a southern California Superfund Site, where thousands of tons of DDT were once discharged into the Pacific. In death, the sea lions become toxic waste, poisoning the environments in which they decompose and the creatures that scavenge on them.

To compensate for the lack of safe food available to the free-flying condor flock, biologists partnered with ranches and zoos to provide a consistent supply of poison-free carcasses; mostly calves, sheep, and rabbits. The offerings are placed at designated feeding sites under the cover of night, thereby averting habituation issues that may arise if condors learn to associate humans with food. By day, the condors are closely monitored for signs of lethargy and aggression – early symptoms of lead poisoning. Contaminated birds are lured into traps and rushed to zoos for treatment. Mated pairs also draw close observation. If a nest is found, biologists scale cliff faces to swap the pair's egg with a zoo egg; one that is guaranteed to be fertile and sufficiently thick-shelled. Wild-laid eggs, if viable, are hatched in zoos. After two years in captivity, the juveniles are released to join the free-flying flock.



I back the truck up to the electric fence and turn off the ignition. The night is quiet aside from the pulsing song of crickets. I release the tailgate and vault into the truck bed. No matter how forcefully I reassure myself that I am fine, there is something about hauling a dead cow, at night, into bear and mountain lion country that prompts me to hum half-forgotten Disney songs.

The calf's partially frozen body is curled in a circle, pink nose tucked beneath her hind hooves as if napping. I stoop to grasp her hocks and arduously swing her body like an unwieldy pendulum. At the arc's highest point, I give her a hearty fling over the fence and wince with the bone-cracking thud.

I pass through the gate and crouch by the calf's face. Her eyes are gently closed and her nose bears the soft fuzz of spring leaves. I grasp her ear and puncture it with my knife, confiscating her yellow ear tag from tomorrow's prying condor beaks. Condors are drawn to bright things and would swallow the plastic tag like an hors d'oeuvre. Pocketing the tag, I pause: this calf and I, we are strange saviors. Defense of her kind is a common excuse to shoot coyotes, bobcats, cougars, wolves. The bullets that protect her nearly wiped out condors, and kill predators still. And my kind, we are the instigators of it all, wielding her body as a tool for destruction and restoration, playing the role of savior and perpetrator.

I lasso a rope around the calf's leg, tighten it just above her hock, and drag her body up the barren slope. Gravel cascades downhill in her wake. From the darkness of the oaks beyond the fence, I hear a quick ruffling of feathers, a padded shuffling of dinosaur feet.

Moonlight saturates the crest of the exposed knoll, illuminating a heavy chain tethered to the ground by a stake. On the loose end of the chain is a carabiner, clipped to the brittle sinews of last week's offering. Fragments of hide and bone litter the hillside. I untether the skeleton and sidestep the maggots that tumble from its joints. Their bodies are bright against the dark earth, unapologetically writhing and alive. Gripping the bend of the fresh calf's hind leg, I slice the taut skin between tendon and bone, and clip her to the chain.

On my way back to the truck, I pause by a game camera bound to an oak. The chain tethering the calf to the ground ensures that her body remains centered in the camera's field of

view throughout the feeding frenzy that will begin at dawn. I slide in a new memory card and peer through the camera's viewfinder. Bathed in moonlight on the barren ground, the black-and-white calf is an unlikely sacrifice. Her small body bears the burden of so much devastation and so much hope. I wonder how we'll feed the cows once we've depleted the soil's capacity to grow grain. When the land is too inhospitable for them to graze, when the summers are too dry for them to drink. What will we sacrifice then?



Three months after sitting with 967 in the snow, I assisted in performing a necropsy on his father, the alpha male of the Lamar Canyon Pack. His stiff body lay in the shade of a sagebush near Slough Creek, his bloodstained coat and punctured skull testimony to a violent territorial battle with rival wolves. As I sealed a tuft of his ash-colored fur into a ziploc bag, the breeze carried harmonies of distant howling.

The Lamar Canyon Pack's rivals soon infiltrated the valley, keen on courting the newly single alpha female. Intimidated by the intruders, 967 and his three brothers fled their natal territory. At just over one year old, the brothers were inexperienced hunters. Rather than strategically attack elk and deer, the estranged young pack subsisted upon the festering carcasses of starved animals who succumbed to the final weeks of winter. An aging bison. An elk calf born too late. The brothers joined the ravens, coyotes, and eagles scavenging upon emaciated bodies as the ground began to thaw.

The four wolves soon strayed into the public lands bordering Yellowstone, where cattle ranching reigns, and where government protection of wolves ignites animosity. Anti-wolf propaganda plastered throughout southern Montana encourages ranchers to "Smoke a Pack a Day," and declares "SOS: Shoot on Sight." In the spring, near ranchland outside Cooke City, a

poacher did just that. The prize was one of the brothers, amber-eyed with a circular blaze on his chest.

Wolves form packs because they depend on each other to survive. The echo of that poacher's shot ricocheted off each of the brothers. One by one, they disappeared. As a young pack of just three, then two, then one, they were unable to hunt or scout sufficient carrion. Whether shot or starved, we can only be certain of what happened to one. The signal emanating from 967's collar led park biologists to his sickly body, being churned into the earth by living things.

Like a calf chained beneath the stars, 967 would also nourished winged scavengers. But his death, rather than a domestic offering to the wild, was embedded in a legacy of wild things eradicated so the domestic may live.



The freezer of my childhood home was perpetually stocked with dead creatures in shoeboxes. A king snake with decomposed eyes and glossy scales. A sparrow. A skink. A ray I found washed up on the beach and took to my third-grade class for Show & Tell. In death, I could touch, hold, examine, and understand animals in ways that they wouldn't allow me to in their skittish, elusive aliveness. I cherished them, and apologized for the car or the window or the cat that had killed them. When I finally felt content with goodbye, I buried them beneath the persimmon tree just beyond my bedroom window.



In my tiny hilltop cabin, I click through photos from the game camera. Seven recently released condors ripped through the calf's hide at dawn, while ravens, Steller's jays, and turkey vultures opportunistically dove in for scraps. The courting condor pair arrived later, gulping scattered entrails as the shadows grew long.

Watching the calf's body become smaller with every click, I wonder if a day will arrive when poison-free food sources won't need to be chained to hillsides. When wing tags, transmitters, tranquilizers, and GPS collars will no longer be necessary tools to compensate for our presumed domination over living things.

The nighttime photos reveal eyes glowing star-like as foxes dig beneath the fence to gnaw gristle and hide. In the morning, a juvenile condor perched atop the calf's hipbone, wings outspread towards the sun. And in the heat of the blue-sky day, maggots will begin to work. ☞

Bearing Witness to Wolves

*We have followed the wolves and are trying
to speak across the boundaries of ourselves.*

LINDA HOGAN, *Dwellings*



A Winter Study crew gazes through spotting scopes while monitoring the Lamar Canyon Wolf Pack in Yellowstone National Park.

The chill of late fall stalks the quiet northeast corner of Yellowstone National Park like a fox with ears cocked towards the snow, listening. Even in this quiet cul-de-sac, home to a handful of Park Service rangers and maintenance workers, the inevitability of winter hovers in the dawn like an incoming storm, exciting and electric.

Amber leaves crunch beneath my winter boots as I make my way across the parking lot. Lizzie Cato, my friend and guide for the day, unlocks the doors of her white, government issued Dodge Durango and leaps into the driver's seat. I follow suit and begin stashing my assortment of hot beverages, snacks, and layers in the car's many plastic compartments. I'm prepared for a long day on the road. But then again, when looking for wolves, you never know what the day will bring.

Lizzie is petite, freckled, and bundled in many layers and textures of purple, as usual. Her gloved hand fumbles with the settings of a telemetry receiver – a walkie-talkie shaped device that translates radio waves from tagged wildlife into a series of high-pitched, staccato beeps. This particular receiver is programmed to scan the frequencies emitted by the collars of Yellowstone wolves. Attached by a cable to an omnidirectional antenna secured to the roof of the Durango, the receiver, if unencumbered by terrain, can detect the presence of wolves up to several miles away. When not transmitting a signal, the device emanates a steady stream of soft, sputtering static. This static fills the vehicle as Lizzie fishes in the pocket of her purple down jacket and extracts a small digital audio recorder.

“September 28th, 2016,” she records, the break in her voice betraying the earliness of the morning, “6:33 a.m. 32 degrees Fahrenheit. Begin monitoring.”

It's been over a year since Lizzie and I have seen each other face to face, and we have a lot to catch up. But as we peel away from the sleepy residential area of Tower Junction, Lizzie keeps the conversation to a subject that neither of us ever tire of: wolves.

"The hunt opened on Saturday," she begins, referring to the wolf hunt that was recently legalized when the wolf population in Yellowstone reached forty breeding pairs, a number deemed "stable" by local wildlife management agencies. "But on Sunday," Lizzie continues, "three wolves from the Junction Butte Pack were missing."

I know enough about the hunt to understand that three missing wolves is one wolf too many. Only two wolf tags were issued by this particular southern Montana district, legally authorizing two individuals to kill one wolf each.

"A lot of people are really frustrated that more than quota may have been taken," Lizzie concludes.

A large and visible pack, the Junction Butte wolves are well known to the park's spotting-scope toting cohort of devoted wolf watchers, endearingly nicknamed "wolfies," who brave summer crowds and winter storms alike to catch glimpses of grizzled fur. Most wolfies have observed several generations of wild canine life and death, and view the hunt with aversion. Lizzie hopes to uncover if their accusation of three missing wolves, rather than the allotted two, is true.

As a wolf technician with the Yellowstone Wolf Project, Lizzie's primary focus is to observe and record wolf behavior. She usually drives into each morning's pre-dawn light with a question or two to pursue. Today, in addition to investigating the missing Junction Butte wolves, she may attempt to find the black wolf recently spotted with the Lamar Canyon Pack that not even the wolfies can identify. Or, she may track down the Mollie's Pack, whose signal suggests

is on the move from its Pelican Valley stronghold towards elk herds in the northern range, where there is high risk of clashing with territorial resident packs.

By documenting these daily sagas, Lizzie contributes to a dataset that is highly unique in that it is based primarily on visual observation. Most wolf work around the globe is limited to tracks in the mud, tufts of hair caught on fences, brief sightings through trees, and images captured on game cameras. But the openness of Yellowstone, combined with the accessibility provided by well-maintained roads, allows wolves to be watched, often for hours on end, if you know where to find them.

The information collected by Lizzie, and the handful of other wolf technicians roaming the park, helps scientists understand the intricacies of wolf behavior. By bearing witness to the daily workings of Yellowstone wolves, Lizzie helps ensure a future for the species, at least within the park's boundaries.



Pronghorn antelope spring mirage-like through boulder strewn sage flats as we weave our way through the heart of the Junction Butte Pack's territory. A dawn breeze runs its fingers through the feathers of a quiet raven. Attentive atop its rocky perch, it is almost as if the raven, too, awaits some sign of the wolf. Nevertheless, the receiver hums static.

Willing some signal to permeate the monotonous din, Lizzie pulls over near the Junction Butte Pack's den site at Slough Creek and turns off the ignition. The Durango now quiet, the receiver's crackles are more distinct, its drone is more dynamic. Lizzie and I lean towards the receiver, hardly daring to breathe lest we obscure a cryptic beep. We jump as a thin, weak signal becomes barely audible.

"A Junction Butte female!" Lizzie announces, hastily gathering the materials she needs to pinpoint the direction of the signal's origin. She steps out of the vehicle and into the brassy

morning, holding the receiver close to her ear and a directional antenna above her head, slowly turning 360 degrees, listening.

“Nothing,” she sighs after a few minutes, slumping slightly, letting the antenna droop to her side. She offers the apparatus to me. “Wanna give it a go?”

I’m just along for the ride today, out of practice with telemetry and not particularly confident that my efforts will yield more encouraging results than Lizzie’s. Still, I accept the receiver and begin the familiar ritual of turning and listening.

Following the reintroduction of wolves to Yellowstone National Park in 1995, biologists initiated an intensive “Winter Study” program designed to monitor wolf predation patterns in an ecosystem long deprived of its top predator. In the winter of 2014/2015, Lizzie and I were fellow interns on this project, assigned to radio-track and observe the freshly formed Lamar Canyon Pack.

A pair of wolves is initiated into the category of “pack” after the birth of their first litter of pups. That winter, the Lamar Canyon Pack consisted only of the alpha male – wolf 925, the alpha female – wolf 926, and their first litter of six gangly, rambunctious, nearly-grown pups.

The pups’ clumsy curiosity never failed to provide comic relief from the turbid uncertainty that often defined the pack’s daily survival. Through the thickening and thawing of winter, we witnessed 926 succeed in killing a bull elk by cornering him at the precipice of a basalt cliff, patiently inching closer until the elk slipped and tumbled to his death; we cringed as patches of mange crept slowly up the 925’s legs; we giggled as the pups rolled down snowbanks like frisky otters; and, in the first week of March, we celebrated as 926’s sides swelled with a new litter. Not long afterwards, the most dramatic of the winter’s episodes unfolded.

Mid-morning morning on March 16, 2015, brazen sunshine reflected from the thick black coat of the Lamar Canyon Pack's alpha female as she led her family northeast. The wolves bounced with energy as they crusaded towards Slough Creek, where the remains of a bison lay decaying. The Lamar Canyon Pack had discovered the bison, a victim of the harsh winter, weeks prior, and had subsequently spent days tugging at its frozen sinews. In their recent absence, however, the Prospect Peak Pack – comprised of fourteen robust, adult wolves – had descended upon the bison. As the carcass thawed, the Prospect wolves gorged. They now lolled with full bellies in the patchy snow.

The Lamar Canyon Pack was oblivious to the takeover of the bison carcass. Among the wolfies, however, word of the impending showdown spread like wildfire. In the parking lot of the Slough Creek trailhead, the legs of camera tripods clicked together, spotting scopes lenses were twisted into focus, and radios crackled as wolfies urged their absent comrades *get over here now*.

I was poised on a knoll a short distance from the parking lot. My spotting scope tracked the Lamar wolves as they continued to bound, lively and naïve, in the direction of their rivals. My voice wavered as I attempted to describe the rapidly unfolding scene into my audio recorder.

“Lamar wolves travel east, following trail to bison carcass. Almost within view of the Prospect Peak Pack,” I murmured at the device. Foreboding rippled through the attentive crowd as the eight Lamar wolves crested the horizon of the valley where, along the river bottom below, the Prospect Peak Pack lounged. Still unaware of the danger ahead, the Lamar wolves romped down the steep divide.

The Prospect wolves soon registered the intrusion. They rose slowly, rapt with poised focus. Each wolf stood stock still, muscles coiled like springs, eyes fixed on the incoming, insouciant pack.

Finally, the Lamar wolves realized their mistake. But it was far too late for a clean escape. They were small and defenseless on the steep slope, faltering and stunned. The Prospect wolves seized the moment of vulnerability and charged in a synchronized, powerful explosion.

The Lamar Canyon alpha female bolted, carrying her unborn young beyond the reach of the attackers. Her pups scattered, frantic. The alpha male, 925, however, braced himself and bore the full brunt of eight charging wolves.

“He’s down...they’re on him...it’s unclear what they’re doing...if he’s alive...” I couldn’t record fast enough, and I couldn’t keep my voice from breaking. The Prospect Peak wolves surged over 925 like a river breaching a dam; grabbing, pulling, and ripping fur and flesh. The pups paced and wailed, intermittently darting close to the rival wolves as if attempting to lure them off their father.

At last distracted by pups, the Prospect Peak wolves released their victim to pursue the distressed youngsters, who disappeared into the thick woods of the drainage.

Rid of his attackers, 925 rose. He was bedraggled beyond recognition, his coat stained with saliva and blood. He limped down a gravel riverbank and disappeared into the sage, where he died two days later.



I stare at the same riverbank now. It bears no sign of battle, beyond an ongoing row between a pair of chickadees scolding each other from a leafless willow. As I hold the telemetry antenna above my head, turning and listening, I can’t help but recall the unbearable weight of loss that sat in my stomach in the week following 925’s death. For two days after the territorial

battle 925's signal pulsed from the sage like a heartbeat. But then the signal changed. It became a single note, droning into infinity like a flat line on a heart monitor. He was dead.

When I heard that dreaded drone, I wished the Yellowstone Wolf Project biologists had done something. I wished they had marched into the sage with tranquilizers and a gurney and hauled 925 to medical care. His mate was due to deliver pups in just a few weeks, and 925 was the only member of the pack capable of providing for them. It seemed that the lack of intervention was a death sentence not only for 925, but for the future of the Lamar Canyon Pack, as well.

But I also knew that humans had done enough meddling already. It was humans who drove gray wolves to extinction in the vast majority of their native range in the 1920s, and humans who staged the complex and highly successful wolf reintroduction. Each winter since, biologists chase the park's most visible wolves via helicopter to tranquilize and fit them with radio collars. And of course, humans now dictate the number of wolves that may be legally killed by hunters each fall. In fact, management practices seem constantly on the verge of demeaning wolves to little more than pawns in a great game of wilderness played by a headbutting team of government agencies, scientists, and special-interest groups advocating for everything from wolf protection to wolf annihilation.

The telemetry receiver in my hand is one manifestation of that game. But its purpose is to enable observation, not intervention. And even when it allows us to witness the rawest, most painful manifestations moments of wolf wildness, the least we can do is to allow them to unfold, unencumbered by human touch.



When no signal emerges from Slough Creek, Lizzie and I decide to try honing in on the Junction Butte wolves from different angles. As we drive, dawn's arms reach into the valley,

emboldening stands of fiery aspens. A red fox picks its way through the roadside sagebrush. It sits on its haunches as we approach, black ear tips thinly visible through the silver branches. The canines we seek, however, remain absent.

At 7:30 a.m., a gruff voice crackles through Lizzie's radio. "I've got four wolves on the move from Crystal Creek. Two grays and two blacks." It's a wolfie.

Lizzie beams as she keys the radio to ask, "What direction are they heading?"

"Towards Fossil Creek" he responds. Lizzie recites this new information into her audio recorder as she pulls a U-turn.

The number and color configuration of the wolves described does not match the Junction Butte Pack, nor does it match the Lamar Canyon Pack, with or without their mysterious visitor. However, it does align with a subgroup of the Prospect Peak Pack; a troop of bachelor males that has departed from their primary pack, likely seeking higher social rank. Despite the fact that these particular wolves aren't Lizzie's top priority today, they are within close enough range of our current location to attempt catching a glimpse.

The shoulder adjacent to Fossil Creek is already lined with vehicles when we arrive. Tripods supporting spotting scopes and telephoto lenses are squeezed between bumpers. Some wolf watchers mingle casually, while others squint fixedly into their scopes. Lizzie and I unload optics and begin to scan the undulating tawny landscape.

"Oh...I got 'em!" Lizzie's voice wavers with excitement. I pan my scope to a lodgepole-topped knoll, and startle as two black wolves trot nonchalantly through my field of view. I peer more closely: they are flanked by a pair of gray wolves, camouflaged by the mottled shadows of sagebrush. Lizzie swaps her scope for her telemetry equipment, and confirms that one of the black wolves is 966, a male of the Prospect Peak sub-group.

The four wolves weave lithely through the sage, appearing coolly indifferent to one another yet simultaneously of one mind, like a flock of starlings coordinated in flight. Their ears are perked forward, mouths slightly agape, tails relaxed. Collectively intent on a destination, unspoken but understood.

As I observe the group's fluid procession, it is difficult to imagine them as the same wolves that killed 925. Without intending to, I had maintained a single image of the Prospect Peak wolves tearing into the Lamar Canyon alpha male as my sole reference point for this pack. But of course, March 16th, 2015 had been just another day in the life of Yellowstone wolves. 925 would have done exactly the same thing to defend his pack and their food, had the tables been turned.

The four Prospect Peak males settle to nap on the cool earth beneath a broad lodgepole pine, panting in their thickening coats. The flicking of their ears, the delectable spreading of toes as they stretch stiff legs and allow their heads to relax to the ground, followed by dreamy fidgeting, is all so reminiscent of my days spent with eyes fixed on the Lamar wolves.

I didn't know it then, but it was not the death of 925 that would ultimately cause the downfall of the Lamar Canyon Pack. Rather, it was a trophy hunter who would legally shoot and kill the alpha female, 926, nearly four years later. By that time, the same fate would have already befallen at least one of her pups. Sandwiched between the park boundary and rival wolves' territory, the Lamar wolves navigated many dangers. But of them all, humans proved the most detrimental.

Lizzie begins packing up her spotting scope. "Ready to move on?" she asks. "It looks like they might be sleeping here for a while."

We pile into the Durango and weave through the valley, back toward Tower Junction. Lizzie has caught word that the Mollie's Pack might be visible west of here, on the Blacktail Plateau. As we drive, the telemetry receiver drones its familiar static. Each frequency represents a different wolf, subsisting somewhere among sagebrush and pine, defending itself and its pack, rolling down snowbanks, and spreading its toes as it drifts into sleep. ☪

Bird Camp

Of course, not all species can be saved from extinction, nor can all individuals be spared from dying or suffering needlessly at the hands of humans. But there is currently little deliberate ethical enquiry in how trade-offs in lives are made, and there has been little room for empathy.

DANIEL RAMP AND MARC BEKOFF, *Compassion as a Practical and Evolved Ethic for Conservation*, *BioScience*, March 2015



Three orphaned mountain chickadees practice perching shortly before being transferred to a surrogate family.

It's five-thirty-five a.m., and hints of midday heat already mingle with the dawn as I sidestep down a deadfall-strewn slope, my ears collecting an inventory of bird songs. The glowing screen of my GPS counts down the distance to my destination in meters: four, three, two, one, zero. A charred ponderosa pine marks the spot. I plop my backpack on the ground and set my watch timer for five minutes. Ready, set, go.

The songs and calls of birds ring from the landscape more quickly than I can write. On my datasheet, I frantically scribble the standard abbreviation for each species: MOCH, DEJU, FOSP, YRWA, STJA, PIWO, MOUQ, BHGR, AMRO, LAZB...I trail off, brow furrowed, focusing intently on what I've missed. Notice, notice. A long rattle from the shrubs to the east: SPTO. A bouncing ball call followed by a drum: HAWO. Two-note "fitzerp" song: DUFL. I glance skyward. TUVU, RTHA. In the remaining moments, I comb back through my list and mark how many individuals of each species are present. When my alarm beeps, I quickly pack up my things and orient myself toward the next point.

I survey nine more points that day, ten points every day that summer, to assist the United States Forest Service in establishing sustainable land management strategies, specifically in burned forests throughout the Sierra Nevada. By collecting and comparing bird species data from forests managed according to a variety of different protocols, biologists are able to draw conclusions about which management practices support the greatest biodiversity. In turn, Forest Service personnel are equipped with knowledge of how to best promote healthy, resilient ecosystems in the aftermath of wildfire.

I feel honored to open my senses wide and obtain data that bears strong implications for conservation. By straining to detect the most distant sounds and notice the smallest movements, my crewmates and I contribute to the protection of creatures and places that we have learned to

understand intimately. Observation, I've come to believe, is a powerful and often underrated tool.



Two years earlier, in the thick pine forests of central Arizona, the tiny mountain chickadee cradled in my hand was just tissue paper skin and a belly taut as a marble. It was a naked, one-day old body writhing in the great expanse of my palm, heavy lids sealed shut over bulbous eyes. Rubbery, round, and barely the size of my thumbnail, it would hardly be recognizable as a bird if it didn't periodically fling its mouth wide open, yellow-ringed beak gaping blindly for the sky, straining up, up, body rigid and intent.

I sat in the pine needles with this little nestling, a bandana full of its five siblings in my lap, and measuring instruments strewn around me. The brood's parents scolded me from the branches above with harsh, raspy notes that bore little semblance to their iconic "cheeseburger" song that flutes through the forest each spring. Carefully cradling the nestling's play-dough wing between my thumb and forefinger, I aligned the metal prongs of my calipers to measure the distance between wingtip and elbow. I took a similar measurement of its leg, followed by its tail, then set the chickadee on my digital scale: 0.89 grams. I repeated this process with each of its siblings, then returned them one by one to their nest cavity in the crook of an old black oak.

I measured and weighed these nestlings, and many others, every other day until they fledged. My data contributed to a study designed to answer a seemingly simple question: why do birds that nest on the ground lay fewer eggs than birds that nest in trees? The hypothesis was rooted in the fact that chicks in nests on the ground are more vulnerable to predators than their tree-nesting counterparts. As a result, ground-nestlings grow faster and leave their nests, or fledge, weeks earlier than those tucked safely away in tree cavities. One common ground-nesting species in this particular Arizona forest, the grey-headed junco, for example, often fledges as

early as ten days after hatching – long before the chicks are capable of feeding, defending themselves, or even truly flying. Thus, tremendous energy is required of grey-headed junco parents, who must feed and protect their defenseless, spatially dispersed brood.

The challenges inherent in providing such laborious care led scientists to hypothesize that ground-nesting species lay fewer eggs due to the constraints of parental energy. To test this hypothesis, two sets of measurements were required: the growth rates of ground- and cavity-nestlings, and the amount of energy expended by their parents.

These research demands prompted the migration of a rag-tag band of seasonal ornithologists each May to “bird camp” – a dusty field camp tucked amid a sprawling matrix of Forest Service roads, high on the pine-coated plateau of the Coconino National Forest in central Arizona. Four battered work trucks in a rutted pullout marked the entrance. Beyond them, three canvas wall tents formed bird camp’s main hub. One tent housed the project’s impressive array of gear: stacks of video recorders, game callers, digital scales, calipers, GPS devices, banding kits, chain saws, laptops, and generators. The second tent served as a lab, and contained larger, more specialized equipment. The third and most heavily trafficked tent was the kitchen. Rectangular folding tables extended banquet-style down the tent’s center, and each crewmember’s personal cooler served as both a food storage compartment and seat. At the head of the tent, finicky propane stoves were almost constantly boiling water for coffee, oatmeal, or mac ‘n cheese.

I was surprised to be hired onto the project as a nestling measurer, considering I had never in my life measured a nestling. I’d spent some time tracking wolves in Yellowstone and fighting acid-spewing ants on a mid-Pacific island, but never anything so precarious as climbing down a maple tree with a cloth bag brimming with robin nestlings dangling from my mouth by

its drawstring. It was probably the years of trail crew experience on my resume that got me hired, because mostly what I did at bird camp was hike.

With a ladder slung over my shoulder, I trekked up and down snowmelt drainages in a route strategically designed to hit all the known nests in the most efficient way possible. The nests had all been discovered by “nest searchers,” a group of skilled birders whose expertise and ability to wake up at four a.m. was foundational to achieving the study’s objectives. Before even the robins began to rustle each morning, the nest searchers were poised in the forest, binoculars at the ready to spot a bird in the act of constructing a nest or carrying a mouthful of insects to its incubating mate.

The nest searchers marked each newly discovered nest with flagging tape and communicated its coordinates to me and my fellow nestling measurer, Josie. Because the study relied on as many “hatch day” measurements as possible, Josie and I kept close tabs on our inventory of nests. The clutch of six chickadees was the first of the season to hatch, and would therefore be the first to provide the study’s most risky and crucial measurement: parental energy expenditure.



At eleven days old, the chickadees were no longer pink blind marbles. Felty black fuzz coated the crowns of their heads, and with great effort, their heavily lidded eyes opened and tracked me as I moved through the familiar motions of measuring wing, leg, and tail. They no longer begged for food at my every touch, and instead threatened to make a break for it if my grip became too relaxed. To thwart would-be escapees, I placed the nestlings headfirst into a plastic cup before setting them on the scale, their legs treading air above the cup’s rim.

The parents bobbed restlessly in the branches above, scolding more vigorously than usual, overwrought by the prospect of their young’s demise after making it so far. I worked

quickly. While measuring the wing of the final, largest nestling, I noticed the tips of flight feathers beginning to emerge from their stiff, needle-like shafts, indicating the little bird was within a week of its inaugural flight. This milestone called for one additional step in my measuring routine: wielding a pair of special banding pliers, I secured a strip of silver aluminum engraved with a unique nine-digit number around each nestling's right leg. As I finally returned the brood to its nest, foreboding crept into my throat. These chickadees would soon be subjected to far more stress than they had endured today.

The process of measuring parental energy expenditure was not as simple as placing a bird on a scale or a band around a leg. To acquire this crowning component of bird camp's hard-earned data, blood samples needed to be collected from both parents, twice: once the day after banding the nestlings, and again twenty-four hours later. By comparing the chemical properties of both sets of blood, it was possible to measure exactly how much energy each parent had expended over the twenty-four-hour period. Acquiring and analyzing blood samples from a variety of different species would allow scientists to determine whether ground nesters or cavity nesters use more energy to care for their chicks.

Just as there were nest searchers and nestling measurers at bird camp, there were also banders. My rudimentary nestling-banding skills paled in comparison to their ability to handle even the flightiest birds, from hummingbirds to Steller's jays. Catching and drawing blood from a pair of chickadees was nothing out of the ordinary for them. But catching a specific mated pair, twice, held certain risks, particularly for the nestlings. After being caught once, there was a chance that the parents would abandon their young at the nest rather than risk being caught again.

On the day of the capture, the banders remained away from camp later than normal. I boiled my canned vegetable soup in the kitchen tent among my chattering crewmates, straining to detect the sound of the Ford pickup entering the pullout. When Ed, the head bander, finally flung open the canvas flap of the wall tent, it was clear that something was wrong. He looked at the supervisor of bird camp, Julia.

“The parents abandoned,” he said. I bristled. The tent was quiet.

Julia nodded sympathetically. “How long ago?” she asked.

“We waited for an hour at the nest after releasing the parents,” Ed said, “and no sign of them.” The other downtrodden banders trickled into the tent.

My heart was in my throat. At twelve days old, the chickadee nestlings still depended on the body heat of their parents to stay warm through the night. What’s more, they needed to be fed every twenty minutes. An hour with no food...

“Weird,” Julia sighed. “Not the best start to the season, but...better luck next time.”

Better luck next time? My ears were ringing as my crewmates turned back to their dinners. Julia and Ed left the tent, and I followed.

“I want to take care of them,” I announced. I knew it could be done, knew it *had* been done, right there at bird camp in the past. Julia herself often told a story about Marvin, a green-tailed towhee chick she’d raised after the same fate befell its parents. Marvin would perch on her head as she organized field data.

Julia stared at me with intensity. “They have to be fed every twenty minutes,” she warned, “and they’ll keep you up all night. And they can’t interfere with your job.”

“I know, and they won’t,” I replied, gritting my teeth.

Julia turned and entered the gear tent, where Maggie, the assistant supervisor, was sorting through video recorders. Julia rummaged in a drawer and produced a small tub of powdered baby bird food, several plastic syringes, and a plastic Tupperware container.

“The food recipe is on the label,” Julia stated, handing each item to me. “Don’t make it too thick or they’ll get constipated.” I held the equipment like a prize, my heart beating fast with anticipation.

“I’ll come with you,” Maggie offered, rising from her seat.

It was dark when Maggie and I arrived at the nest. No aggravated chickadee parents abraded us at our approach. With bated breath, I scooped my hand into the nest cavity and extracted the first nestling, then placed it gingerly in Maggie’s hand. It immediately began to beg vigorously, clearly unconcerned that we were not its parents. I was so relieved I could have bawled. Of the five remaining nestlings, three others were just as vocal and ravenous, while two were lethargic and weak. Maggie and I sat in the pine duff for hours, huddled over the orphaned birds, filling their mouths with syringe-fuls of slop by the light of our headlamps until they were finally quiet; satiated at last.

Back in my tent that night, snuggled in my sleeping bag, I squirted one last dose of food into each gaping mouth. The chickadees’ makeshift new nest was a shallow, sandwich-sized Tupperware container, padded with cotton balls and paper towels. I cradled the container to my chest and arched my body around it in a way that I hoped would warm the little birds without risk of squashing them as I slept. Each time that I shifted, all but one chick flung open its mouth and peeped. This begging, combined with my concern for the quiet nestling’s ability to make it through the night, proved Julia’s premonition true: I slept very little. When I woke, it was to find the weakest nestling dead.

During my time at bird camp, I often asked my crewmates, particularly those who returned year after year, their thoughts regarding the risks we imposed on the individual animals in our work. They always pointed out the same three things: none of the species involved in this study were species of particular concern, only thirty percent of young songbirds survive their first year of life anyway, and our overall impact on the population was minimal. As I buried the tiny limp chickadee in the grove of young firs behind my tent, however, our impact felt monumental.



Two more nestlings dwindled and died in the days that followed. The remaining three grew fluffy and robust, their faces bearing the tell-tale white cheeks and black eye-stripes of mountain chickadees. I hiked with their Tupperware tucked under the crook of my arm, the chickadees perched on its rim like miniature crusaders, wide-eyed and bobbing with my every footfall. They occasionally practiced the scratchy three-note call I had heard from their parents so many times before.

Soon, it would be time for the juvenile chickadees to fledge. Although I was adept, by now, at feeding, cleaning, and warming the little birds, I was clearly far from an ideal flight instructor. Fortunately, a nest searcher had recently discovered a surrogate family: a brood of four chickadees, approximately identical in age as the three orphans. Chickadees, Julia assured me, are not very good at counting, and the parents would not notice the newcomers. I hoped this was true as she balanced on a ladder at the nest cavity's entrance and I passed her the three squeaking nestlings, one by one.



Two weeks later, I had a rare weekday off while the rest of the crew attended a training in Flagstaff. I took advantage of the free afternoon by driving the potholed dirt road to Knoll Lake.

The road snaked along the precipice of a dramatic geographic feature known as the Mogollon Rim – a band of sandstone cliffs towering three-thousand feet above the desert floor and extending for two-hundred miles. From high on the forested plateau that June day, the desert below shimmered like a mirage.

At the lake, I bathed in the cool water, shampooed my hair, and basked on sun-warmed rocks. Hours later, energized by Sarah Barielles’s liquid vocals soaring near my car stereo’s volume limit, I retraced my path along the Mogollon Rim. The road had been recently graded, and I could feel my old Subaru sporadically losing traction on the freshly churned gravel. But it wasn’t until my car began to fishtail on a long downhill slope that I realized I was going far too fast. I pumped the brakes. Nothing; all traction gone. The curve was growing closer; I turned the steering wheel. Nothing. Frantically, I yelled my car’s name: “Su! SU!” We had missed the curve. We were pummeling through shrubs, ramming into a swale. Launched upwards, airborne. Contact the road again. Hit another swale, faster. Launched upwards...upside-down...the desert...the rim...is this...I can’t believe...but I thought I had so much time–

SLAM.

Stillness. Eerie, glorious stillness. My whole body was my heart, pumping, vibrating, breathing. Alive. Sideways, but alive. The passenger window was pressed against dirt. Looking straight up through the driver seat window, all I could see was the canopy of the ponderosa pine that had halted my car mid-roll. I turned off the ignition, stifling Sarah Barielles’s crescendo. I glanced briefly around for my phone, but it was buried beneath the clothing, hiking boots, and fragments of broken plastic storage bins now strewn everywhere. I unbuckled my seatbelt, bracing against the center console to keep from falling onto the passenger window. I carefully rearranged myself to stand on the edge of the passenger seat, bare feet clutching squishy fabric,

and heaved open the driver's side door. Holding the door ajar with one arm and hoisting my body up and out with the other, I wriggled out of my wrecked car. I placed my hand against the puzzle-piece bark of the tree that had saved me, lowered my miraculously whole, intact body onto the sun-warmed pine needles below, and clambered up to the road.

It wasn't long before a four-wheeler overflowing with kids, dogs, and coolers trundled into view. Upon spotting me, the family abruptly stopped and, in a frenzy, set up a camp chair in the shade, piled chilled water bottles in my lap, and called 911. At my urging, they assured the dispatcher that I was fine. Soon a man in a jeep with a winch joined the scene and pulled my car upright, allowing me to rummage through my belongings and locate my phone. In that particular mode of autopilot that only adrenaline can properly fuel, I made the necessary phone calls: supervisor, AAA, car insurance, auto body shop, tow company.

The stars were out before all logistics were taken care of and I was transported back to camp in the backseat of a Forest Service ranger's car. As my adrenaline faded, the sound of tires crunching gravel made my stomach lurch. I curled up in my tent that night aware of the need to feel gratitude, but mostly just feeling sick.



Ironically, the reason the rest of the crew had been required to go to Flagstaff that day was because newly instated federal regulations stipulated that all employees take a day-long defensive driving course. Having been a Park Service employee in the past, I was one of the few certified defensive drivers at bird camp. Rather than join the crew and splurge on a day in town while they sat in class, I had opted to indulge in a day alone.

When the crew had departed, I'd entrusted my friend Nick with one request from civilization: a head of red-leaf lettuce.

"What is that?" he'd asked, scrunching up his face.

“It’s just, lettuce,” I’d replied, laughing. “You know, but with reddish leaves. Any grocery store you go to will have it.”

“Uh-kay,” he said doubtfully, accepting my five-dollar bill.

The crew didn’t return until late, four a.m. late, that night. But word of my accident had spread, as evidenced by the envelope lying on top of my cooler when I wandered into a quiet camp the next morning. “Jane” was scrawled across the front. I opened it and pulled out a card with a colorful cartoon of a smiling man and a boy leaning on golf clubs. “To a dad who’s above par!” it read. I stared at it, bewildered.

A bleary-eyed Nick stumbled into the wall tent and immediately wrapped me in a hug.

“I can’t believe it, that *sucks*, dude,” he consoled me, before holding me at arm’s length and looking me up and down. “You okay? I mean, *nothing* wrong with you?” I nodded. My ankles and wrists felt oddly sore and bruised, sensations I attributed to banging around the foot pedals and steering wheel; injuries so minor I found them hardly worth mentioning.

He glanced at the card. “Oh, sorry. Couldn’t find anything but Father’s Day cards in Wal-Mart at one in the morning.” He grabbed his banding kit and coffee mug off the table. “No red-leaf lettuce either, but—” he popped open my cooler and pulled out a hefty head of iceberg lettuce, “this one didn’t have any plastic on it, so I figured you’d like it.” He plopped it in my hands, squeezed my shoulder, shoved aside the canvas door and tromped into the dawn.

I flipped open the card. Peppered around the words “Happy Father’s Day!” were scribbled condolences from the whole crew: “I’m so glad you’re okay,” and “Let me know if you need anything,” and “Holy shit, dude!” (Nick). Suddenly overwhelmed, I sat on top of my cooler, sensing enormous value in each of the things that I held: my life, my plastic-free Wal-

Mart iceberg lettuce, and my Father's Day card. With sobs rising into my chest, I rocked myself back and forth, equal parts touched and confused.



Measuring nestlings that morning, just fifteen hours after my accident, I felt like a ghost. I was viscerally aware that every inhale and exhale, every small sensation of hair grazing my shoulder blades or leaves crunching beneath my knees as I knelt at a nest, could so easily have not been. I was an impermanent being, here for now, as if by chance.

There was also something different about the nestlings in my hands. As I flipped a young, fidgety house wren upside-down into a cup and placed it headfirst onto my scale, one specific argument often repeated by my crewmates to justify this study's death toll rang in my ears: *only thirty percent of songbirds survive their first year of life anyway*. To classify our actions as just one more threat, I realized, is like tossing another obstacle onto an already dangerous road. This little house wren and its peeping siblings may well become part of the seventy percent of songbirds who fall victim to cold, or predators, or science within their first year. Some of them may be lucky enough to survive longer. Either way, it shouldn't be up to us to decide.

In the weeks since delivering the orphaned chickadees to their surrogate family, two more broods had died as a result of this study. More and more, I understood that to defend our research by claiming that these species are not in danger, or that there are many others just like them, only exacerbates the same domineering behaviors that *do* put species in danger. We drove a vehicle hurtling these animals towards an uncertain outcome, and for what? After thirty years of research, few ties to conservation had emerged. It was unclear how this study promised to give back what it had taken.

The more strongly I disagreed with the ethics behind bird camp, the more I allowed myself to learn about certain components of our work that I had previously chosen to ignore

because acknowledging them was too painful. For example, before hatching, each nest was categorized as either a “control nest” or an “experimental nest.” Control nests were left alone until hatch day. Experimental nests, however, were heavily manipulated: half of the eggs in each experimental nest were removed from the nest and stored in a freezer, indefinitely, for further study. Killed.

When the remaining eggs hatched, a familiar progression would unfold: the nestlings were measured every other day, blood was drawn from their parents, and researchers acquired the data necessary to calculate how much energy birds use to care for different numbers of chicks. The clutch of six chickadees, though initially designated a control nest, was nevertheless reduced in size by half. It was one of many casualties.



Even now, two years after my summer at bird camp, the creaky-door call of the mountain chickadee rouses a wave of maternal concern to swell inside my chest. The bird flits in a fir high above my head, tracking my progress through Sierra juniper and sage. Despite the fact that I carry a GPS and a datasheet, I am here to listen, not meddle. But, unable to resist an opportunity for a glimpse, I raise my binoculars, braced for the wash of memories that come – pointy-clawed feet clutching my pinky finger, feathers small as snowflakes arcing across the crowns of black-and-white heads, muffled peeps filling the downy cave of my sleeping bag. And inevitably, the stomach-lurching memories of gravel crunching beneath tires, of placing my hands onto the puzzle-piece bark of a fortuitous ponderosa, and the reminder of life’s fragile, wondrous impermanence.

The chickadee in my binoculars urgently ushers me away, most likely to protect its softly peeping brood, and I am grateful to abide. ☪

How Lucky Am I

*Wild things exist only if you have
the graciousness to allow them to.*

JOY WILLIAMS, *Save the Whales, Screw the Shrimp*



A Yellowstone bison herd during winter's first snowfall.

How lucky am I
to consider reproducing
thirty years old
wedding dress still rumpled and mud-stained
on the sun-bleached carpet of the studio
my love and I share together

Wandering the farmers' market
arm in arm with my husband
while other young women do the same
but: bellies swollen beyond breast
tangle-headed toddlers
trotting to keep up

Envy thrums, abdomen to spine
is there anything more irresistible than this?
my sight blockaded by imaginings
of a cherry cheeked brood
on the impetus, perhaps, of becoming
I have to look away

There is, of course, the question of work:
a whirlpool of seasonal, low pay, temporary
and, of course, housing:
none beyond our drafty studio
all chipped paint and blown fuses
the sofa a launchpad for two rascally dogs

Worry harnesses my yearning
hisses *this is not your time*
though time is exactly what I fear
and the unknowable toll it claims
on the potency of fertility
on our cherry cheeked brood

And yet
to the bald eagles
of the Lower Columbia River
the bison of the Yellowstone Plateau
the white-tail deer of suburbia
my worries are flimsy nothings

From paper mills on the Lower Columbia
chemicals that bleach paper white
once discharged into the current
continue to swirl and be carried
by the blood, the eggs, the bodies of creatures
pulse through the veins of fish

The bald eagle huntress
clutches her slippery catch between talons like thorns
lights upon her tangled stick fortress
its broad downy center
home to three pepper-dusted eggs
not a single one fertile

Reproduction compromised
by the human legacy of industrialism
she will wait
tethered by instinct, maybe hope
she will breed again
she will grow old

Far from her nest, in the Rockies
where grass is buried beneath hard ice
and many feet of snow below that
Yellowstone bison trek to the edge
of the frozen plateau
seeking lower ground

In the more temperate lowlands
great shaggy heads swing like scythes
fling powder like stars
to uncover crystallized grass
lingering nourishment
the last of winter

But they are not welcome here
marching the white highways
breath like smoke in the cold
deep eyes unblinking into nothingness
next to gun racked pickup trucks
in the grocery store parking lot

Here, cattle ranchers fear
bison whose sides are swollen with new life
round and taut and kicking
whose afterbirth, they say, spreads disease to cattle
their cows will become sterile, they fear
brucellosis

It has never happened, not once –
a cow consuming diseased bison placenta –
yet when the bison refuse to remain quarantined
within the boundaries of Yellowstone
they are driven into holding pens
and slaughtered

Further east still, in the suburbs of New England
white-tailed deer are on birth control
they thrive too well on our lawns
overpopulate our cities
and endanger us
when we hit them with our cars

A tranquilizer dart hits the doe's flank
and another needle: the injection of contraception
and lastly
a numbered yellow ear tag
marking her as the sixtieth sterile female
in this neighborhood

So easily we deem wild lives
too disposable, too threatening, too numerous
and condemn them to fates
we would never wish
upon ourselves
and I can't help but think

How lucky am I
to indulge in a primal calling, one day
if I so choose
supported by prenatal yoga, whole-food vitamins, organic belly balms
and a culture
that says life is the most important thing

I am lucky, but afraid
of faulty fertility, yes
and of the danger lurking in my yearning
come to fruition, how it may compromise
wild things who should also be so lucky
to one day reproduce.

Rumble Wagon

*Near me, I saw
a single cricket;
it was moving the grains of sand on the hillside*

*This way and that way.
How great was its energy,
how humble its effort.
Let us hope*

*it will always be like this,
each of us going on
in our inexplicable ways
building the universe.*

MARY OLIVER, excerpt from *Song of the Builders*



The Rumble Wagon on the inaugural night of our journey,
just outside of Salmon, Idaho, in December, 2018.

I was four weeks pregnant when we rolled into Crazy Horse RV Park in Tucson, Arizona, but I didn't know it yet. My husband sat behind the steering wheel of the "Rumble Wagon," our old Dodge truck with a 1980s camper perched in the bed. I rode shotgun while our black mutt, Jackson, snored in my lap and our other dog, a tawny shepherd named Penny, paced in the backseat and sniffed the air streaming through the cracked window.

"Are you sure you want to stay here?" my husband, Max, asked. His eyes were red and tired from five hours of driving through the desert. "It looks like people *live* here."

"Welcome to the good ol' American RV Park," I retorted, cranky and tired myself. Indeed, the colossal RVs dwarfed even our monster of a pickup, and many of them looked like they hadn't moved in a while. Portable fences encircled strips of fake lawn running parallel to the lengths of many RVs, where residents lounged in folding chairs and stared smack dab at the side of their neighbors' glossy homes-on-wheels. The vehicles were packed so tightly together that any desert mountain views, which the RV park's website promised would amaze, were nonexistent.

We rumbled through the park, trying to find the office. "They have showers," I said, pointing to a blocky white building labeled "washroom." "I really need a shower."

Maybe it was the pregnancy-hormones-that-I-didn't-know-were-pregnancy-hormones coursing through my body, but I really, *really* needed a shower. After a week of driving, camping, and rock climbing throughout southern California, I was sore, sunburned, dusty, and fatigued. Max, I knew, was in the same boat, but better able to bear it. An eternally happy camper, Max could, and regularly did, spend long days navigating our boat of a vehicle across unfamiliar highways, followed by a late night jog with the dogs, then gulp down some canned soup for dinner and fall into bed without a single complaint. I, on the other hand, was often too

exhausted to unbuckle my seatbelt when the engine finally quieted at our campsite for the night, and instead sat hunched and comatose in the front seat until Max coaxed me out with the promise of warm food.

Max's infinite energy and positivity proved indispensable when, within just two weeks of moving out of our studio apartment and into the Rumble Wagon during a dark Montana December, we were unable to shake a persistent string of mishaps. First, the furnace in our camper broke, leaving us freezing in the high desert of Red Rock, Nevada. Later, Penny ate the better part of our mattress while Max and I indulged in quarter showers in a public bathroom. Then the camper's battery mysteriously lost all power, and we subsequently lost the luxuries of light and running water. Most of these things were either fixable or replaceable, except for the furnace, which proved an overly expensive repair and led us to redirect our travel plans from the iconic, and surely frigid, climbing destination of Bishop, California, to the deserts of southern Arizona, where we anticipated good climbing and boundless sunshine.

It was now the end of January, our first day in Arizona, and for some reason Max and I both felt beaten down. Until this point we had managed to avoid staying in places like this RV park, opting instead for secluded stands of trees along meandering Forest Service roads. It was our honeymoon road trip after all – our chance to climb in all the fabled crags we'd ever dreamed of visiting and revel in the expansive wilderness of the American West. Checking into an RV park, replete with humming generators, power hook-ups, and big screen televisions glowing from inside hundred-thousand-dollar land-yachts felt like some sort of cop-out. But the showers and wi-fi lured us in.

The RV park's manager donned a ball cap and a big smile. He led us to our parking spot on the gravel lot, where Max sidled the Rumble Wagon between two enormous fifth wheel trailers. I grabbed my towel and beelined it to the shower.

As I pushed open the heavy washroom door, I was alarmed by loud, urgent moans emanating from inside the corner shower stall. The eerie reverberations completely engulfed the steamy, cavernous space.

"Can I help you?" I called in the direction of the stall. The moaning paused, followed by a shuffling of feet and an unlatching of the door.

A tanned, wrinkled face peered from the cracked door. The woman smiled through her surprise. "I'm sorry, hun, I didn't realize you were talking to me! I've just got a frog in my throat and I'm trying to get it out. Am I being obnoxious?"

I had never before witnessed such an aggressive clearing of one's throat. "No," I responded, "I'm just glad you're not hurt."

As I cranked the hot water spigot of my long-awaited shower, it was to the accompaniment of nonstop wails, hacks, groans, and curses echoing off the concrete walls. I tried to be sympathetic at first, but couldn't help but gradually become more and more irritated. I repressed the urge to shout "I don't think it's working!" or "Yes, now it's obnoxious!" and instead hummed loudly to myself, hoping to drown out the din. Still, anger rose steadily into my throat. Anger at this woman's ability to ruin a simple moment of respite that I had desperately craved. Anger at so many moments marred by the unexpected – the cold that Max and I thought we had escaped, yet persisted even here in the desert. The fatigue that sabotaged my ability to wake up early and make the most of each day like I had imagined. The frozen water pipes. The truck windows that didn't close all the way, making listening to anything while driving

impossible if there was the slightest bit of wind. All the many layers of altered expectations, of coping with a myriad of small disappointments.



The following morning, Max and I were relieved to leave Crazy Horse RV Park and wind our way north out of Tucson along the Catalina Highway towards Mount Lemmon. As we left town, the red script of a Walgreens caught my eye. Should we stop so I can buy a home pregnancy test? I wondered. My recent moodiness, combined with my late period, alarmed me. No, I decided. It's probably PMS. I'm not pregnant.

Saguaro cactus, creosote, and yucca dotted the rocky slopes flanking the twisting highway that wound up, up, and up the prickly skirt of Mount Lemmon. We found a quiet campsite near a sandy wash and began the familiar ritual of packing water, snacks, and extra layers into backpacks. It was almost evening, and a saddle between two mountains tempted us to catch the sunset.

Jackson led the way along the dusty trail, briskly shuffling his white frosted paws, while Penny loped behind like an overgrown coyote, her fawn-colored coat blending with the dry grass and her black tipped ears cocked like a radar for darting rodents. Max and I ambled behind, hand in hand. We were rested, clean, and relieved to be at ease and in our element: traipsing through wilderness towards an unfamiliar destination with our little family of four.



Three days later, I crouched between the Rumble Wagon and an oak, peeing on the absorbent white rectangle of a pregnancy test. I had finally caved and bought a two-pack during a recent grocery run. This was the second test. I had balked in dismay when the first test revealed a large blue plus sign, indicating yes: you are pregnant. But, I reassured myself, in my

nervousness I had only managed to conjure a measly dribble of urine – far less than the steady five-second stream the instructions called for. It was probably a false positive.

This time, however, I was better equipped with a full bladder and nerves eased by several deep breaths. After procuring a powerful five-second stream, I leaned against the truck with my palms pressed into my eyes, willing myself not to peek at the test until the required two minutes had passed. Still, I peeked, maybe a little early. An unmistakable blue plus sign was already clearly prominent on the plastic stick. I buried my face back into my hands, unable to decipher if this was one of the most difficult moments of our life on the road or one of the most beautiful ones. Or both.

Max and I knew we wanted to grow our little family, eventually. Max was a natural with kids, effortlessly captivating them with silly games and roughhousing until they were hysterical with giggles. I craved to one day have a big belly, to feel the power of my body doing exactly what it is designed to do, and to guide a little one through the world. But we also knew that now was not our time. I was a graduate student working on my thesis from the road, and Max worked seasonally on an organic farm in Montana. Neither of us had any income currently, nor health insurance, and for the moment we were, albeit by choice, homeless. Although we were recently married and very much in love, this was not exactly the best time to welcome a baby into our lives.

“Wow...big change,” Max commented softly when I told him the news. We sat side by side on the little sofa in our camper, each flanked by a dog. “You’re sure?”

“I mean...according to the tests...yes.” It was like neither of us could speak properly. “Are you mad?”

He shot me a confused and slightly injured look. “What? No. Why would I be? It’s half my fault.”

We sat in silence, each absorbed by the magnitude of this moment and the impending change that it held. I guiltily recalled all the caffeine and canned food I’d consumed over the past several weeks, surely far from ideal sustenance for a tiny, growing being. Should I go see a doctor? I wondered. Where, and when? And how would we pay? And where the heck are we going to live?

“What are you thinking?” I asked Max, in part to shake off my own spiraling thoughts.

“We should probably go somewhere we can see a doctor,” he replied. I nodded.

“But for now...let’s go climbing?” I offered. Climbing the rock faces towering above our camp had been the plan for the afternoon.

Max shook his head, clearly too overwhelmed by the recent news to imagine balancing precariously on tiny footholds. Relieved, I grabbed our backpacks, and we strolled quietly along the desert wash, pondering all that was to come.



Neither of us slept well that night and we rose early, ready to finally get on top of those rocks. Our hiking boots squished juniper berries and crunched gravel as we scrambled up switchbacks. I kept the hip belt of my pack unbuckled. My mind continued to swirl with questions, possibilities, and tasks that couldn’t possibly be addressed here, now. Excitement and anxiety twisted together in my stomach like a tangle of vines.

As the sun crested the ragged horizon, I reveled in its immediate warmth. The morning rays released an aroma of metal and rain from the creosote bushes. The smell intensified as the morning deepened from beige to gold. Sweat began to seep through our layers as we trudged higher, our sights set on the sandstone spires that rose from the shoulders of the peak above us

like steeples on a church. Our guidebook recommended beginning the day with the easy warm up routes on one particular cream-colored wall. When we reached its base, we unloaded our gear and began to climb.

As soon as I placed my cracked hands on the sun warmed rock and curled my fingers around handholds that felt just secure enough to pull against, my worries, for the moment, melted away. They were replaced by a fixation on movement: step up left foot, right foot free, balance with palms against rock, bring right foot to narrow lip, press up with left palm and reach good hold with right hand. Balance. Breathe. I felt strong and in my element, and the trip's hardships felt long ago and far away. Here, the dogs roughhoused on the ground below and Max gazed up, pulling slack from the rope as I climbed. Everything was just as we had hoped and expected. Except, of course, for the new little life inside me, along for the ride.

From the top of the wall, the city of Tucson spread below like a blanket, its edges gently rippled at the foothills. Somewhere in the hazy distance was Crazy Horse RV Park and its hodgepodge of residents. Farther north in the Mount Lemmon foothills, perfectly landscaped estates encircled mansions layered in tones of russet and bronze. In between, the grid of civilization bustled. Highways snaked across the rectangular geometry of the city, intersecting suburbs, downtown, and strip malls. Cars circulated endlessly through the city's veins. Each block was corralled by powerlines, the drooping overseers of order.

After nearly two months of freely flowing travel, the thought of living within a humming patch of civilization was at once intimidating and appealing. Max and I had intended to spend many more months crisscrossing the Rockies in search of climbing destinations and in search of a place to call home. Before departing on the trip, we had sold or given away most of our belongings, tucked the rest away in a storage unit, and moved out of our little studio in Missoula,

Montana. We had agreed that whenever we inevitably encountered a town that spoke to us – one that embodied the perfect combination of forest and openness, liveliness and coziness, a strong job market and an affordable housing market – we would allow ourselves to stay, even to settle. But in light of our surprise family member, our time to find our ideal place to live felt unnervingly scarce. Home, it now seemed, may not be something that we discovered, but something that we made.



An hour and a half east of Tucson, I lay wrapped in our floral comforter inside the camper, scrolling through craigslist housing ads on my phone while snow flurried outside. Jackson was nestled in bed with me, fast asleep against my chest. Penny was sprawled next to Max on the compact sofa across from the stove. Inside the camper, everything was usually within arm's reach. Max periodically closed his book to stir the sautéing vegetables without ever rising from his seat.

My five-weeks pregnant body felt lethargic and nauseous, and fixating on housing ads was the perfect distraction. Max and I had decided to return to Missoula, a college town straddling the Clark Fork River in western Montana. The choice felt natural, given the circumstances – our belongings were stored there, I could return to my job as a writing tutor at the university, and Max and I had grown to love the long winters, despite their grayness, for the many opportunities to glide down trails on cross-country skis while the dogs bounded like bunnies through the deep snow.

Beyond the camper window, swirling snow almost completely shrouded the sheer, fin-like faces of the Dragoon Mountains. During a walk down the gravel road the previous afternoon, Max and I had stumbled upon a series of interpretive Forest Service signs recounting the story of the Chiricahua Apache Native Americans, who took refuge in these peaks when they

were forced to flee advancing European American settlers in the late 1800s. Their leader was a feared and respected man named Cochise, from a band of Chiricahua Apache known as the “Tall Cliff People.” The steep drainages, rugged cliffs, and hidden canyons of the eastern Dragoon Mountains became known as Cochise Stronghold.

The interpretive signs detailed the many battles, skirmishes, and countless casualties that accumulated between the Chiricahua Apache and the European American settlers. In 1872, Cochise signed a peace treaty with a United States general that designated 2,736,000 acres of the Dragoon Mountains as a reservation for the remaining four- to six-hundred Chiricahua Apache people. However, the reservation did not contain all the territory necessary for the Chiricahua Apache to hunt and gather sufficient food. Instead, the tribe became captives of their own stronghold, increasingly reliant on rations issued by the government every fifteen days to prevent their starvation.

As I lay in the camper, swiping through photos of duplexes and bungalows, apartments and condos, cabins and single-family homes, I couldn’t help but sense the enormity of the void between myself and the native residents of this place. Whereas I sought a few hundred square feet enclosed within four walls to plop my growing family, the Chiricahua Apache had been accustomed to roaming a network of interconnected lands spanning from Mexico to Arizona, accessed by many generations over the course of many centuries. For the Chiricahua Apache, home was engrained in the memories of footsteps.

For me, on the other hand, home was an enclosure. In my culture, home is synonymous with house. We are so attached to our houses, in fact, that even when we adopt a modern “nomadic” lifestyle, we haul our houses with us. And yet, our residence anywhere depends upon resources originating from the global everywhere: from the diesel for the Rumble Wagon and the

materials to construct it; to the food stocked in our pantry; to the strips of fake lawn running parallel to the trailers at Crazy Horse RV Park. Whether stationary or nomadic, our geographic footprints dwarf those of the ancient people who walked much greater distances than most of us can imagine.

Following the establishment of the reservation, American settlers grew increasingly uncomfortable with their native neighbors and frustrated with what they viewed as a waste of land. In 1876, just four years after Cochise Stronghold was allotted to the Chiricahua Apache people, its designation as a reservation was revoked. Today, Cochise Stronghold is a recreation area within the Coronado National Forest. It is a mecca for climbers who descend upon the rock faces each weekend from Tucson, and for ragamuffin RVers who station themselves semi-permanently along oak lined springs. Their camps are often adjacent to the deep, smooth bowls carved into tables of granite where the Chiricahua Apache once pounded mesquite beans and acorn meat into hearty cakes, then set them to dry in the sun.



“Time to wake up,” Max sing-sang to me, gently rocking my shoulder. “It’s not snowing anymore.”

My housing search had been thwarted by sleepiness. I peered out the window. A rosy dusk painted the mountains, and a light dusting of snow clung to their granite fingertips. Max and I stepped out of the camper and into the evening, inhaling the ever-present metallic scent of creosote. Jackson and Penny, meanwhile, zoomed down the rutted dirt road like two wild things, releasing celebratory coyote yips into the chill air.

We descended into a deep, dry wash. Its vertical banks towered ten feet above our heads, layered in bands of sand and cobbled rock. Yucca dotted the crest of each bank, gaping toward the sky like great succulent flowers. As the evening thickened, small stones beneath our feet

revealed undertones of amethyst, copper, and emerald. Caressing a smooth pebble in my hand, I wondered if the Chiricahua Apache found beauty in the way evening light plays with the colors of the desert, and if they foraged this wash for agave crowns and yucca fruit.

As I picked my way around boulders obstructing the narrowing wash, thinking about those who had navigated its corridors before me, a question surfaced in my mind: what is the meaning of the word nomadic? It is a word that I had often attributed to Max and me and our perigrinations throughout the west. “We’re rock climbing nomads!” I wouldn’t hesitate to announce to anyone who asked. However, this use of the term now felt overly gratuitous in light of the way it defined the lifestyle of the Chiricahua Apache. For them, the freedom to be nomadic was vital, with consequences of life or death. Their movement was purposeful. Max and I, on the other hand, moved at whim, driven by gravitation toward comfort, excitement, or the curious, with no direct tie to survival and hardly a worry aside from an occasional sunburn or an unpleasant washroom mate.

Our little convoy approached a scaly juniper arcing gracefully over the center of the wash. Penny paused to sniff a splatter of white scat beneath it. I stopped to investigate it as well, then, suspecting the origins of the scat might be near, looked up. The steady yellow gaze of a great horned owl met mine from a branch just above my head. I stumbled awkwardly back, startled and eager to offer it more space. Penny remained captivated by the scat, and the owl shifted its eyes to her, patient and unperturbed.

Unlike the Chiricahua Apache people during their many generations of nomadic movement, this owl was most likely a year-round resident here. Even in the winter, the desert hosts sufficient mice, rabbits, and songbirds for the local great horned owls to eat their fill. Having taken up residence within a popular climbing area, this owl was surely accustomed to

observing oblivious creatures like Penny and me scampering beneath its perch. The owl's level gaze followed Penny as I called her to me and we continued down the wash. I looked back to see it ruffle its mottled feathers and close its heavily lidded eyes. Like a shadow in the dusk, the owl waited for night to fall.

I felt comforted by the great horned owl's reminder that living things rarely fall neatly into categories. Birds are generally not considered to be nomadic; rather, they are classified as either migrants or residents. Migrants travel north in the spring to lay eggs and raise their young, then fly south in the fall to forage in more temperate regions. Residents, on the other hand, occupy a single territory year-round. But not all birds fit this mold – great horned owls, for example, fall into both categories simultaneously: owls that breed in the subarctic region of North America migrate south each winter, whereas the owl perched on the juniper, and many others that hatch and fledge within similarly temperate regions, may spend their entire lives within their natal territories. Like the Chiricahua Apache, whose movements fluctuated in accordance with an intimate knowledge of the land, great horned owls follow the path that they must in order to survive.

Perhaps the act of roaming strange highways for months on end did not, in fact, earn Max and me the title of “nomads.” But, I realized as I cupped my hands over my subtly swollen belly, maybe our new and urgent need to be stationary somehow did. For the first time, I felt conscious of an instinctual, maternal pull: I must go to a place where I can take care of myself, give birth, and raise my child.



Back inside the camper, I continued my search for a patch of shelter to house the five of us in Missoula. As I swiped through photos, I tried to imagine Jackson and Penny tearing around each rental's front yard while I stood in the gleaming kitchens with an infant swaddled to my

chest. In the past, my priority had always been price, and I had managed to make myself comfortable in a treehouse, a converted garage, and a studio with ceilings so low that I had to duck through each doorway. Now, however, I sought reliable plumbing and temperature control. Someplace comfortable. Someplace where Max and I could gaze adoringly at our little one playing on the carpet. Someplace where we could make a home.

The following morning, I awoke groggy from staring too long at the glowing screen of my phone. The sun emerged with radiance, rapidly drying the rivulets of snowmelt trickling down the sheer walls of the Dragoons. Max and I loaded gear into our backpacks and trudged up a crumbling trail toward the vertical rock faces. I paused every few steps to heave gulps of air. According to my pregnancy book, I may not be eating for two yet, but I was already breathing for two, and I could feel it.

When we reached the wall, I climbed cautiously, feeling more on edge than at ease. My body's changes introduced a level of uncertainty into my climbing that I was unaccustomed to. Like I had done so many times during this trip, I tried to adjust to the altered circumstances as I went.

Breathless and relieved, I reached the top. "Take!" I called down to Max, signaling him to pull in the remaining slack and lower me to the ground.

"I got you!" he responded. I leaned back in my harness, suspended in midair above a wide canyon thick with juniper and oak. The Rumble Wagon perched at the canyon's edge, dusty and tired. Farther down the dirt road, where the Dagoon foothills cascaded into open plains, an eclectic assortment of buses, RVs, and battered Subarus clustered at the woodland's edge. Beyond them, stretching into the hazy desert heatwaves, was the road we would follow to rumble back home. ☪