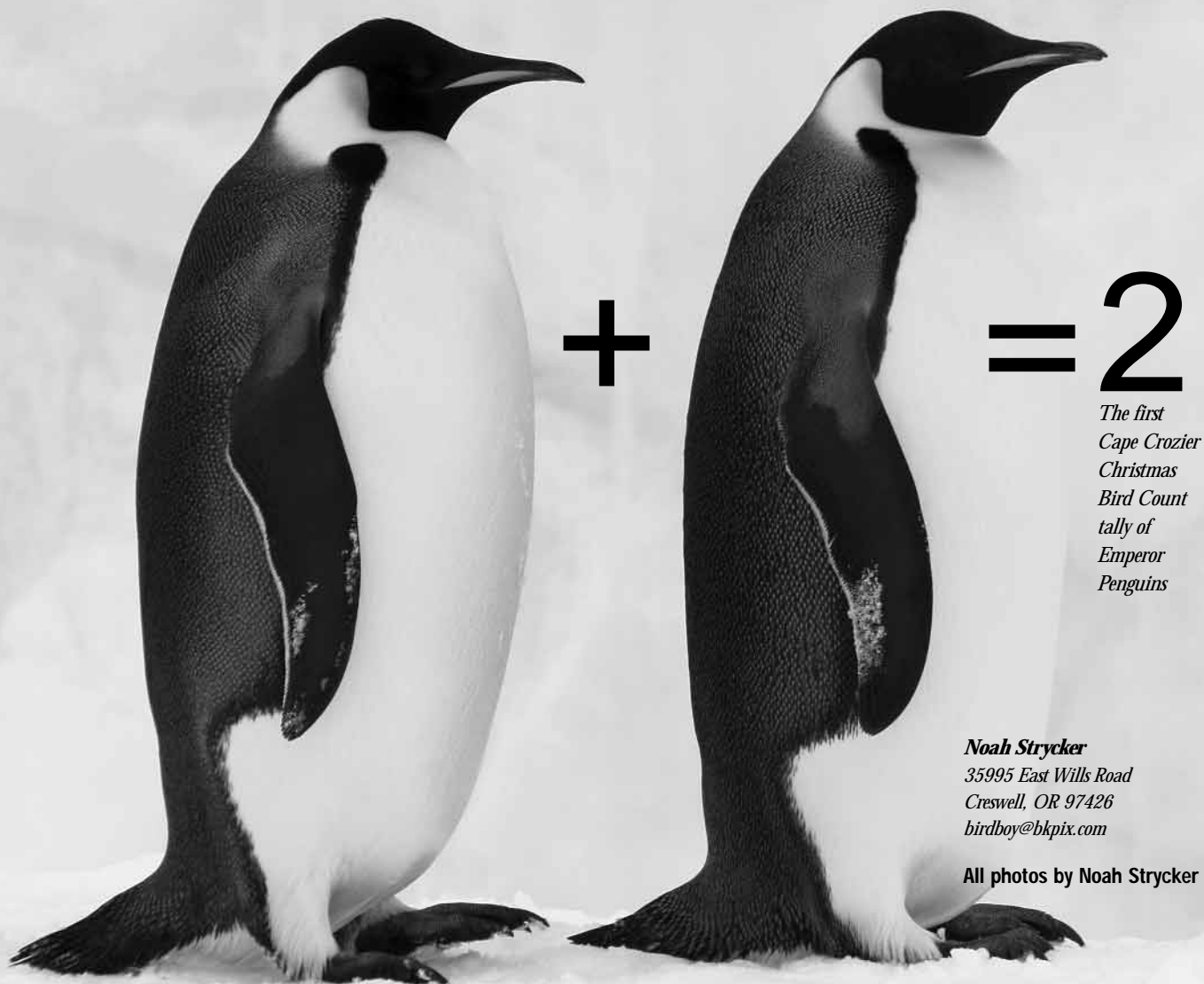


On the Ice:

The First
Christmas Bird Count
in Antarctica



*The first
Cape Crozier
Christmas
Bird Count
tally of
Emperor
Penguins*

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Forget the other superlatives: Antarctica is a Christmas Bird Count wasteland.

Barren in the literal sense, the frozen continent stands as Earth's indisputably coldest, highest, driest, windiest, and most utterly inhospitable continent. Desolate also in the CBC sense, Antarctica has never hosted a count—until 2008.

When the 109th CBC season rolled around in December, I found myself stationed in a frozen tent on the ice at remote Cape Crozier on Antarctica's Ross Island, a long helicopter ride from the U.S. Antarctic research base of McMurdo Station, which is itself an uncomfortable five-hour cargo jet ride south from New Zealand. Cape Crozier achieved fame in Apsley Cherry-Garrard's classic book, *The Worst Journey in the World*, a gripping account of a near-disastrous sledging trip in midwinter 1911 to collect Emperor Penguin eggs as part of the ill-fated Scott expedition. For us modern explorers, the purpose of enduring the freezing, isolated, stark, harsh, primitive, teeth-chattering conditions related directly to the 300,000 Adélie Penguins that breed each year at Cape Crozier. Two other researchers and I spent three consecutive months at the cape, between November and February, to study the bustling penguin city as part of a long-term project.

I was in a panic. Here I sat, birds everywhere, thousands of miles from the nearest CBC circle. For a bona fide CBC addict like me—I generally average six or eight a year—the prospect of a count-less season was nothing short of alarming.

It's not that Antarctica fails to qualify for a CBC. Yes, most of the 2,000 counts are in North America. But CBC circles also spread over Mexico, Central America, South America, and the Caribbean islands. You can join counts in Hawaii, at Midway Atoll, and Guam. There is even a ship-based count in the Drake Passage, between the tip of South America and the Antarctic Peninsula. I thought, "Why not Antarctica?"

The only previous attempt at an Antarctic count died an early death. A proposed CBC circle at Palmer Station, on Anvers Island just off the Antarctic Peninsula, was approved several years ago but never conducted. I imagined those Palmer Station observers probably froze or succumbed to scurvy before they could lift their binoculars. In reality, the opposite was true—researchers at Palmer Station had experienced a bad run of weather, precluding them from conducting their research. Count day weather was perfect—but research took precedence over their elective Christmas Bird Count.

To meet the requirements of a CBC, a location must host at least one bird species that occurs in North America at other times of year. Several Antarctic birds, including South Polar Skua and Wilson's Storm-Petrel, regularly visit North American waters, easily qualifying the region for a CBC, even if the penguins never waddle that far north.



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Pictured above: Home in a hut at Cape Crozier. Left: Emperor Penguins (*Aptenodytes forsteri*)

That did it for me. Now I just had to convince my two coworkers, Michelle Hester and Kirsten Lindquist, to join me in launching the first official Antarctic Christmas Bird Count.

"It's citizen science!" I expounded over a mug of hot chocolate in early December. "I mean, *think* about it—the first Antarctic count!"

The three of us hunkered around a single propane heater in our freezer-size hut, warming our bones in typical 15-below weather. We'd already spent a month together, cut off from civilization, mostly obsessing about penguins.

"Uh, what's a Christmas Bird Count?" Michelle asked.

"My friend did one of those, once, in California," Kirsten said. "It's like you go birding all day."

"And record every individual bird," I added, cheerfully.

We stared at each other, thinking of all those penguins.

"How are we going to count every single penguin?" Michelle asked.

"Yeah, like, do we have to go around and number them all?"

"We'll do an estimate," I said.

"Estimate a quarter million penguins?"

"Well..." Kirsten began.

"We could..." Michelle replied.

"Great!" I concluded, brightly. "We'll pick a day and keep track of the birds we see in the field that day. This will be awesome!"

The scientists who managed our penguin research project approved the idea over satellite email, as did CBC headquarters, even though Antarctica required a whole new section in the dataset. The Cape Crozier Christmas Bird Count was now official.

We agreed, in true CBC spirit, to conduct our count on Christmas Day. After all, we needed to celebrate something with the quality chocolate we'd been jealously hoarding. In Antarctica, Christmas is just another day—and it's guaranteed to be white. A red National Science Foundation helicopter makes the rounds of field camps near McMurdo Station on

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The collective roar of so many penguins, like a stadium of sports fans, could be heard more than a mile away. Everywhere, penguins croaked, mated, defecated, slept, bashed each other, caressed each other, and waddled in meandering paths. The birds formed a seething mass like an unruly rock concert crowd, and smelled like a Third World sewage treatment pond.

December 25, complete with a dressed-up Santa, but, like the Island of Lost Toys, we were too remote to be included in St. Nick's route. The CBC would give our camp a welcome festive spark.

In the southern hemisphere, seasons are flipped. Christmas defines the height of summer. The ice sparkles in 24-hour sunshine. But it still feels like winter. A typical afternoon registers 10-below-zero temperatures, snow falls occasionally, and windstorms frequently gust up to 100 miles per hour. Just after Thanksgiving, one such storm flattened my tent, snapping the inch-thick aluminum poles like toothpicks.

In this austere environment, birds thrive. At Cape Crozier, diversity is predictably low, but, with a quarter million penguins in our count circle, we would observe more individuals than most counts back home record with dozens of contributing teams.

I hoped for three species on our count: Adélie Penguin (guaranteed), South Polar Skua (guaranteed, because a few hundred nest at Cape Crozier), and Snow Petrel (with luck). Over the previous month, we'd recorded four additional birds at Crozier, any of which were possible on count day: Emperor Penguin, Southern Fulmar, Antarctic Petrel, and Wilson's Storm-Petrel.

Few CBCs can rival the low species thresholds of Antarctica, but a count in Prudhoe Bay, Alaska, holds the all-time record. For the past 20 years, the annual count has tallied exactly one species: Common Raven. This year, the Prudhoe Bay CBC notched a particularly exciting result, posting a high tally of 119 individuals, though every last one was, well, a raven.

Only a very few CBCs have ever been conducted without recording at least one bird. Birdless expanses exist, but apparently most people are not crazy

enough to record the lack of data. For instance, the U.S. South Pole Station, landlocked by thousands of miles of ice and about 10,000 feet above sea level, is rarely visited by avian forms. Every now and then, a South Polar Skua flies by. Now *that* would be the place to carve out a hard-core CBC circle.

As the big day loomed, our thoughts turned to the weather. We absolutely depended on good conditions on Christmas. At Cape Crozier, we kept to a schedule in our fieldwork, but storms stranded us indoors, where we entered data and hatched plots—like CBC plans. If a blizzard raged on Christmas, we were sunk. We had few options in severe weather, and they were all bad. We'd have to delay the count, risk dangerous conditions, or record the one skua that was visible nesting on the helipad outside our tiny hut window.

As it happened, we worried for nothing. Christmas Day arrived bright, clear, and crisp, an auspicious beginning for our historic count.

Christmas Day was a typical work day for the penguin crew. It started with the usual bleary-eyed granola breakfast accompanied by the daily discussions of bathing (no shower), unattainable food (no refrigerator), and facial hair (no sense in getting out my razor). After breakfast, we laboriously suited up in extreme-cold-weather gear and then strapped on crampons—inch-long metal spikes attached to the sole of a boot—before heading out to the ice.

A 45-minute hike separated our camp from the Adélie Penguin colony, sprawled in a rocky valley along the shore of the frozen Ross Sea. We strode down an inclined ice sheet, crunching with assured steps as our crampons bit the slippery surface, eyes shielded from the glare by polar sunglasses, shoulder-

ing heavy packs. I enjoyed the invigorating daily commute; it served as our only exercise, and it staved off the extra weight that most Antarctic workers gain over the course of a season.

Along the way, we picked up our first CBC birds. South Polar Skuas, like World War II bombers, materialized as attack-divers, screeching and wheeling as we passed within a hundred yards of their nests in rocky scree. Occasionally, one would make contact, whumping my head like a flying boxing glove. I shook my own gloved fist in the air, but the aggressive skuas hardly took notice.

We topped out on a saddle overlooking the penguin colony and drank in the spectacular view. Rock and ice sloped away in all directions. Every few feet, just beyond pecking distance of its neighbor, a penguin protected its nest. The collective roar of so many penguins, like a stadium of sports fans, could be heard more than a mile away. Everywhere, penguins croaked, mated, defecated, slept, bashed each other, caressed each other, and waddled in meandering paths. The birds formed a seething mass like an unruly rock concert crowd, and smelled like a Third World sewage treatment pond.

The penguin nests all looked the same, a shallow scrape lined with rocks barely able to contain the eggs or keep the chicks from rolling down the hill. Individual chicks recognized their parents by voice. Teenage penguins mobbed every adult carrying food. At brief and efficient mealtimes, chicks shoved their beaks deep into an adult's gape and gobbled up streams of regurgitated fish.

Skuas patrolled the colony, ripping into lost or emaciated penguin chicks. Carcasses piled up; if not blown on the wind, they would remain for hundreds or thousands of years, mummified by dry

Antarctic air. Penguin remains crunched constantly underfoot. Vertebrae and skulls were used as nest stones. Downy feathers swirled on the breeze like snow.

As usual, we three researchers split up for the day, flipping on VHF radios to communicate across the wide colony.

"I'll head up Pat's Peak to do a sea watch," I said, removing my ice crampons in anticipation of the rocky climb.

"All right," said Michelle, "I'll take Area B."

"And I'll canvass the Superhighway [the penguins' route to the sea]," said Kirsten.

"Don't worry about counting penguins," I said. "We'll do that this afternoon. But anything else is fair game for the CBC, so keep track of numbers today."

Nods of assent, and we shuffled off in separate directions.

After a 20-minute hard scramble among boulders, cliffs, and steep snowfields, I summited Pat's Peak, towering more than a thousand feet above the penguin city. The penguins below looked like ants in the valley. I unearthed a spotting scope stashed among the rocks, set up a clear view of the Ross Sea, and readied for a long vigil.

We performed daily sea watches primarily to spot whales. Orcas (Killer Whales) and Minke Whales are theorized to compete with penguins for aquatic food sources. As whales move in when ice breaks out in the midst of the breeding season, penguins might have to swim longer distances to find krill and fish to eat. Whale presence could be contrasted with penguin foraging data to test this theory.

I swept the oceanic horizon with the spotting scope, searching for movement. Against the edge of the Ross Ice Shelf, a fin splashed in the sunlight, then another. A pod of Orcas surfaced, spouting long plumes of seawater. I counted more than a dozen before they submerged, hunting underneath the adjacent ice.

Then I hit the CBC jackpot.

In an icy lead, two Emperor Penguins stood with shoulders hunched at the edge of open water. I watched them through the scope, their figures easy to discern

even a mile off. Emperors nest at Cape Crozier, but breed during Antarctic winter. Most had already vacated to spend the summer among pack ice far out to sea, but, for some reason, these two lingered. They were a lucky addition to our CBC list. As I admired the Emperor Penguins, my radio crackled to life.



Above: A Snow Petrel glides by the summit of Pat's Peak.

Below: The Cape Crozier CBC recorded 79 South Polar Skuas.



A static-filled voice boomed out the melodious strains of that old familiar Christmas song: "Better watch out, better not cry ..."

Whoever it was sang the entire song, never releasing the transmit button. On my exposed perch, I had picked up the channel usually reserved for more official business transmitted from McMurdo Station, 70 miles away.

Continuing to scope the ocean, I hoped to pick up a Snow Petrel, and almost didn't notice when one practically whacked me over the head. I felt a *whiff* of air against the back of my neck and straightened, startled, as the petrel

circled me, repeatedly gliding within five feet of the mountaintop, before winging away along a ridgeline. I admired its pure white plumage set off by curious black eyes. Snow Petrels have never been recorded breeding on Ross Island. They nest in deep crevices on rugged cliffs, in places difficult to access. We encountered several such birds over the season, indicating possible territoriality.

My radio erupted once again. Kirsten, among the penguins far below me, reported on a line-of-sight channel.

"Hey! I just had a flyby Wilson's Storm-Petrel!"

Frenzied radio discussion followed, and gesticulations. I could see Kirsten in her conspicuous red parka below, pointing into space. Having the size and flight of a swallow, the storm-petrel was too tiny to spot from my angle, but it was a very good bird for our Christmas count.

"Are you eating sardines?" I asked. Storm-petrels seemed to materialize whenever we cracked a tin of sardines, maybe attracted by the smell.

"Not this time. It just sailed by."

"All right," I said. "I'm coming down. Let's do some band resighting, then we can figure out how to count all these penguins."

Quickly stashing the spotting scope, I shouldered my pack and descended into the valley of penguins.

We spent the afternoon wandering among the birds, searching for metal flipper tags. Tens of thousands of penguins have been banded at Cape Crozier, each with a unique number. Recording the numbers of returning birds year after year provides a large set of data on life history characteristics.

As dinnertime approached, we held a war conference to decide how to count the penguins.

"We've got satellite photos of this penguin colony," Michelle began.

"Yeah, they're clear enough to count individual birds," said Kirsten. "We could just count dots on the photo."

"Count a quarter million dots? That'd take weeks! We've gotta eat our Christmas chocolate, remember."

“And the birds might be at a different density now than when the photo was taken earlier this season.”

I thought about it.

“How’s this?” I said. “We conduct ground counts on a set of subcolonies this afternoon, then figure out what percentage of area they cover on the satellite photo with a GIS [Geographic Information Systems] program. Then, we can calculate a multiplication factor to estimate the total colony population.”

It sounded easy enough.

We picked a few subcolonies—small, meandering hummocks densely populated with penguin nests—and counted every single penguin in those areas, ticking off individuals on handheld mechanical counters. Mentally sifting through hordes of penguins proved a strain on the eyes, but much more gratifying than performing a total census.

After returning to camp for the evening, I fired up a laptop, plugged into solar power, and analyzed the penguin colony’s area with our GIS program. A few simple calculations, and our observations fueled a well-educated estimate of our penguin population. Though not an exact census, the estimate landed close to other, more in-depth studies of Crozier penguin populations. After some discussion, we decided to exclude baby penguins, which would double the overall count and inflate the perception of penguin population sizes.

And that was that. The first Cape Crozier Christmas Bird Count was over. By day’s end, we had tallied:

270,885	Adélie Penguin
79	South Polar Skua
6	Snow Petrel
2	Emperor Penguin
1	Wilson’s Storm-Petrel

Reclining next to the propane heater, I broke out my holiday chocolate.

“Anyone care for solid perfection?”

We indulged. The bars were frozen solid and broke into dangerously pointy shards. We consumed our chocolate in the same way porcupines mate—very carefully.

Michelle rummaged under a case of pots and pans, and, in a grand gesture, pulled out a bottle of wine, saved for the occasion.

“Anyone care for liquid perfection?”

We divided the wine among our mugs, unwashed from hot chocolate.

“To the first Antarctic Christmas Bird Count—”

“And Christmas in Antarctica—”

“Cheers!”

Acknowledgments

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How do you count a quarter million penguins?

