Saving the Boreal Forest

Protecting North America's Boreal Forests from Deforestation for Single-Use Tissue Products

RACHEL CARSON COUNCIL

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The Rachel Carson Council, founded in 1965, is the national environmental organization envisioned by Rachel Carson to carry on her work. We promote Carson's ecological ethic that combines scientific concern for the environment and human health with a sense of wonder to build a more sustainable, just, and peaceful future.

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PRESIDENT'S MESSAGE

"Behind this [the shoreline] is the wonderful, deep, dark woodland—a cathedral of stillness and peace. Spruce and fir, some hemlock, some pine, and hardwoods along the edges….It is a living museum of mosses and lichens, which in some places form a carpet many inches deep…. For the most part the woods are dark and silent, but here and there one comes out into open areas of sunshine filled with the wood's smells. It is a treasure of a place to which I have lost my heart, completely."

Rachel Carson at the U.S. Fish and Wildlife Service field office in Michigan. Image credit: USFWS.

Rachel Carson was an avid birder who loved to walk in wet, fragrant woods. She was keenly aware of the migration patterns and breeding grounds of migratory birds and wrote about those who crossed Canada's boreal forest to get to their Arctic breeding grounds.

And, Carson fought hard to prevent clear-cutting and deforestation near her beloved Maine summer cottage, Silverledges. In order to save what she called "The Lost Woods," Carson took action, organizing and founding the Maine chapter of the Nature Conservancy, its first local branch.

In fact, Rachel Carson based much of the research for her *Silent Spring* chapter, "Rivers of Death," on the spraying of DDT to eliminate the spruce bud worm along New Brunswick's Miramachi River and its surrounding forest, part of the Canadian boreal transition zone.

In carrying out Carson's legacy, the Rachel Carson Council works to preserve and protect forests and the wildlife that lives there. This report, *Saving the Boreal Forest*, is our fifth to expose and oppose the destructive practice of clear-cutting forests. *Clear Cut*, *Bad Business*, *Greenwashing* and *Drax: The Destroyer of Forests* all detailed the extensive harms caused by destroying forests for the production of industrial scale wood pellets. They also offered individual and collective actions that citizens and consumers could take to halt the devastation.

Although climate change and forest fires are serious dangers to the boreal forest, *Saving the Boreal Forest* details how clear-cutting for wood and paper products, especially toilet paper consumed in huge amounts in the United States, remains the biggest threat. It is especially damning that toilet paper manufacturers are aware of the harm they are causing. A few even offer more sustainable alternatives made from bamboo. Procter & Gamble, the maker of Charmin, offers Charmin Ultra Bamboo. Nevertheless, P&G continues to heavily market and produce "soft" Charmin which makes up almost the entirety of their toilet paper business and is made from 100% virgin forest. The result? The clear-cutting of huge swaths of the boreal forest.

It is our hope that *Saving the Boreal Forest* will shine a light on a critical environmental and climate problem that still remains little known or understood by the public. But when it is, we are convinced that American consumers will want to take action, to seek alternatives, and to save the splendors of the boreal forest.

Robert K. Musil, Ph.D., M.P.H.
President & CEO, Rachel Carson Council

INTRODUCTION

"There was a strange stillness. The birds, for example—where had they gone? Many people spoke of them, puzzled and disturbed…It was a spring without voices. On the mornings that had once throbbed with the dawn chorus of robins, catbirds, doves, jays, wrens, and scores of other bird voices there was now no sound; only silence lay over the fields and woods and marsh." -Rachel Carson, *Silent Spring* (1962)

So began the dystopian opening scene of Rachel Carson's classic *Silent Spring,* which launched the environmental movement by decrying the use of DDT as a widespread pesticide. So effective was Carson's work that, within a decade, over staunch industry resistance, the U.S. Environmental Protection Agency banned domestic production of a silent bird-killer, DDT. Thirty years later, the EPA launched efforts to discourage international DDT production as well.[1]

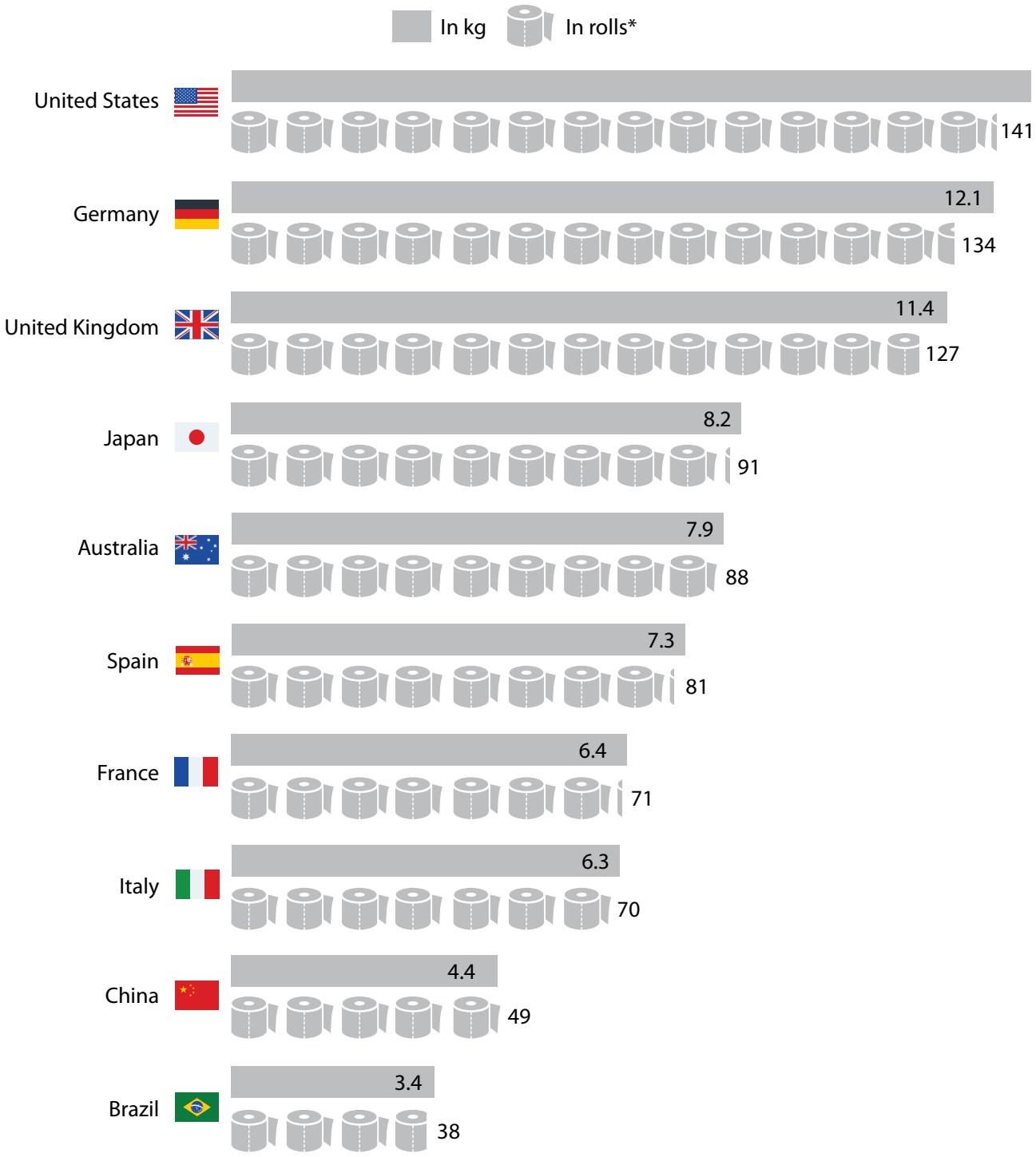
Today, environmentalists could issue a similar warning for "the dawn chorus of Tennessee's Black-throated Green Warbler, Minnesota's Common Redpolls, Common Loon, and the Black-backed Woodpecker."[2] That is because, today, a much noisier killer threatens these birds' habitats and larger efforts to halt climate change: **clear-cutting of Canadian boreal forests for single-use tissue products.**

Toilet paper, in particular, is the prime culprit in the United States' role in boreal destruction. The United States leads the world in toilet paper consumption, with the average American using as many as 141 rolls per year.[3] Most major brands rely on wood from the Canadian boreal forest.

Maximilian Buzun / Alamy Stock Photo

The U.S. Leads the World in Toilet Paper Consumption

Estimated annual per capita toilet paper consumption in selected countries (2018)



*Assuming one roll of toilet paper weighs 90g.
Source: Statista Consumer Market Outlook.

@StatistaCharts

statista

Source: Statista, 2018.

Source: Statista, 2018.

United States producers, retailers, and consumers alike face the reality that their habitual use (or procurement) of boreal-sourced toilet tissue makes them complicit in deforestation daily. **Each minute, five hockey rinks' worth of intact forest are clear-cut by logging operations.**[4]

Will the United States finally initiate a course-correction to oppose industrial logging practices, combat greenwashing and misinformation, and conserve essential boreal habitats? If so, it may germinate from consumer advocacy. Many American consumers are leveraging their purchasing power to encourage companies to adopt more sustainable practices and reject boreal-sourced toilet tissue and paper products altogether. And, as this report will detail, the irreplaceable role of the boreal forest on our planet speaks loudly for itself in an otherwise-quiet Spring.

ABOUT THE BOREAL FOREST

Boreal forests, along with tropical rainforests, have been aptly named the true "lungs of the Earth." The boreal forest is the world's largest intact forest, covering around 30% of total forested area in the world.[5] Canada's boreal forest ecosystem spans over 1.2 billion acres (over 50%) of the country and provides essential services for the climate, the nonhuman species that reside in it, and the several hundred Indigenous communities that have called it home for thousands of years.[6] Industrial practices, such as logging and oil and gas development, also threaten boreal systems.

The Canadian Boreal Forest.[7]

Boreal forests hold:

- **A quarter of the world's wetlands.[8]**
- **A quarter of the world's remaining intact forest—even more than the Amazon.[9]**
- **A sanctuary for the 1-3 billion migrating birds migrating from the United States.**
- **A total of 2 times as much carbon per acre as tropical rainforests.[10]**

Boreal Forests Offer Large-Scale Greenhouse Gas Storage

Boreal forests sequester greenhouse gases, such as carbon and methane, from the atmosphere. At their scale, they can help reverse the climate-changing impacts of burning fossil fuels. According to one Swedish study, boreal forests (left undisturbed) store 72% more carbon than forests replanted after logging.[16] Carbon storage mainly happens in soil. When trees are logged, their soil loses that ability and takes a long time to recover. Canada's boreal peatlands store extremely large amounts of carbon dioxide within their soil. If disturbed by industrial processes (including oil and gas exploration), they can release triple the amount of methane as undisturbed peatlands.[17,18]

Boreal forests are some of the Arctic's closest natural carbon storage areas. They hold at least 32% of global terrestrial carbon stocks in their soils, climate-sensitive peat, and permafrost deposits.[19] Destruction of these carbon sinks contributes to the Arctic's warming, which is twice the global average. This warming, in turn, will not only increase forest fires, and the cost of putting them out, but will also reduce the remaining trees' ability to resiliently store carbon (given regrowth timelines) as the feedback loop of permafrost melting intensifies.[20] Permafrost releases methane as it melts, which has a Global Warming Potential 27 times larger than carbon dioxide's.[21]

The logging industry often attempts to deflect criticism by pledging to replant trees that have been cut down. However, scientific evidence confirms that young, replanted forests are not nearly as effective at large-scale carbon storage as mature forests,[11,12,13,14,15] nor are their regrowth timelines immediate enough to address climate concerns.

Boreal Forests Serve as Wildlife Sanctuaries

The Canadian Boreal forest has been called North America's "bird nursery," as over 300 species of birds rely on its habitat for breeding and survival.[22] It is home to species such as the endangered Whooping Crane, Rusty Blackbird, Great Gray Owl, White-winged Crossbill, Black-backed Woodpecker, and Boreal Chickadee *(Figure 1)*. Up to 5 billion migratory birds fly south from the boreal forest each year.[23] The woodland caribou, a species that has thrived in northern climates for over 2 million years, is significantly threatened by logging and industrial practices.[24] Along with caribou, other populations facing habitat destruction include brown and black bears, lynxes, wolves, wolverines, and several species of songbirds.[25,26]

FIGURE 1: From left to right: Woodland caribou, Boreal Chickadee[27]

Boreal Ecosystem Disruptions

Logging old-growth boreal forests can cause long-term, negative chain reactions throughout an ecosystem. One example of particular interest to biologists is the plight of caribou *(Figure 2)*:

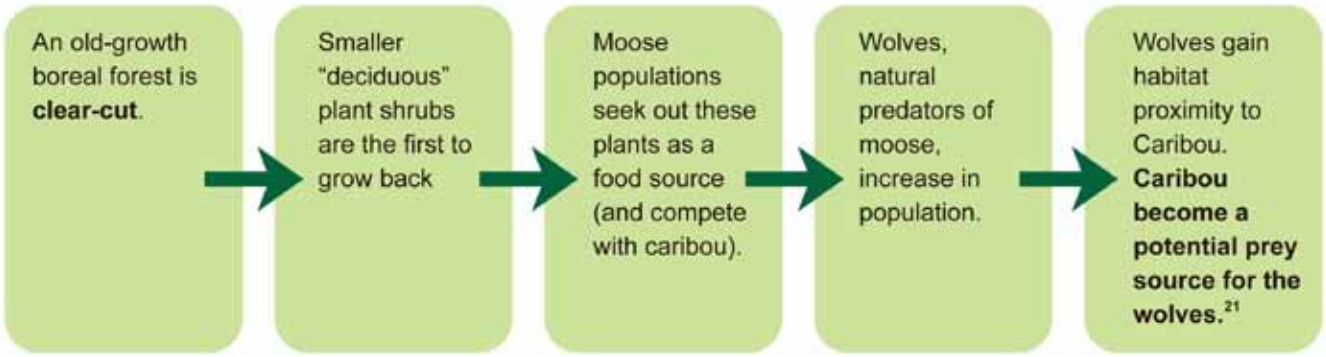


FIGURE 2: Illustrates one possible chain of consequences from clear-cutting boreal forests.

Boreal Ecosystems Hold Cultural Significance

Canada's boreal forest is home to around 600 different Indigenous communities, who have sustainably stewarded the land and its resources for thousands of years.[28] Through protests and legislative action, Indigenous communities across Canada have successfully prompted pauses on industrial activity and natural reserve creation. The biome itself has also provided essential foraging, hunting, fishing, agricultural, and trapping grounds to sustain local diets and economies.

Understanding the importance of ecosystems like the boreal, Indigenous nations have also secured a wave of large-scale Indigenous Protected and Conserved Areas (IPCAs) since 2018, including the Dehcho First Nation's 5,501-square-mile Edéhzhíe Protected Area and the Łutsël K'e Dene First Nation's 10,184-square-mile Thaidene Nëné, alongside comparably large proposals from the Cree Nation, Innu Nation, and Sahtúgot'ine Dene.[29] These efforts are increasingly paired with Indigenous Guardian programs, which now number roughly 60 across Canada and can deliver a social return on investment as high as 20:1.[30]

Boreal Forests are Under Threat

While boreal ecosystems are degraded to support industries like mining and oil and gas exploration, their trees are most notably harvested to make products such as toilet paper and facial tissue.[31,32]

- **30%** of Canada's boreal forest ecosystem is allocated to industry use (current or future).[33]
- **75+ million acres** have been logged since 1975.[34]
- Recently, and in response, major media outlets are starting to take hygienic paper supply chains as a serious environmental issue.[35]

A LEGACY OF LOGGING AND EXTRACTIVE INDUSTRY

The world's paper production has ballooned on the back of boreal deforestation. The industry produced nearly 9.5 million tons of Canadian wood specifically for paper and paper board products in 2022.[36] As a whole, much like the United States' costly wood pellet biomass industry, Canada's paper product market is fundamentally export-driven. **Over half of Canadian forest products are exported, two-thirds to the U.S.[37]**

Truck transportation of logs on a timber logging road, 1937. (UBC Library)

If properly counted, logging would constitute Canada's third-largest source of emissions. Industrial logging clears over 1 million acres of new forest each year,[38] which translates to hundreds of millions of trees.[39]

While industry is quick to rebut that every one of those trees is regrown, their reassurances often lack realistic time horizons. As the Rachel Carson Council has highlighted in past reports, mature trees can take well over a century to replenish their carbon debt.[40] That's assuming the trees successfully regrow in the first place. Scientists and advocates pose the resulting question, ***why wait a human lifetime or more for the forest to regain its ecological value?***

Understanding Disturbance in the Boreal Forest

Global boreal forests are, generally speaking, prone to disturbance. Wildfires, disease, drought, insects, wind, and climate disruptions have all shaped boreal ecosystems. In fact, researchers have called this mix of small-scale and large-scale disturbances an "essential part" of boreal forest dynamics[41]; one that has cultivated their landscape-level biodiversity for millennia.

However, disturbance from industrial management **poses a distinct threat** to the boreal forest. Its highly-concentrated local effects, combined with its broader worsening of climate change through permafrost-melt feedback loops, separates boreal logging from the "ordinary boreal disturbance cycles" the logging industry is eager to cite as reassurances.

And, despite sweeping myths that the boreal forest is "untouched," "wild," or "unreachable," considerable portions of it are still subject to human oversight. According to Gauthier et al., roughly two-thirds of the global boreal biome is currently under some form of active human management*, largely for wood production.[42] Over 60% of those managed stands have been harvested at least once, according to some estimates *(this percentage varies regionally)*.[43,44]

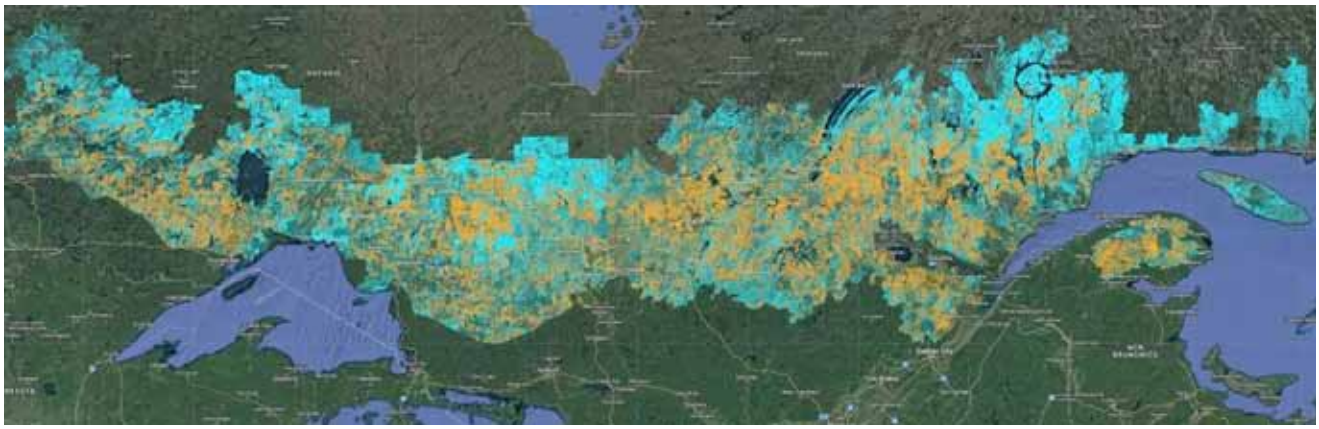


FIGURE 3: ***Orange patches show areas that have been logged in Quebec and Ontario since 1976. Blue patches indicate areas where the forest is at least 100 years old. Source: Griffith Climate Action Beacon, Griffith University***

While the Canadian boreal covers nearly three-quarters of Canada's forested land *(Figure 3)*, vast areas continue to be clear-cut each year. Of the boreal region managed for commercial use—an area of roughly 400 million acres, about the size of Alaska—61% has already been clear-cut at least once[45]. That's an area larger than Texas and Colorado combined. Some individual logging tenure areas granted by the Canadian government are themselves larger than several U.S. states.[46]

Finally, forest protection lags behind industrial priorities. While a third of North American Boreal forest biome is leased ("tenured") for forestry in Canada,[47] only 8-13% of the biome is formally protected.[48]

Canada's logging industry degrades over 1 million new acres of boreal every year, in part to address U.S. toilet paper demand.[49] Every two seconds, an area of forest roughly the size of a tennis court may be cleared. Over a single day, this is similar to the size of a small national park, or 30 times the size of Gateway Arch National Park in Missouri.

How Fast is Logging Happening?

Recent research in Ontario and Quebec indicates that the boreal is indeed fragmenting into "patchwork" forests when intensively logged.[50] Some environmental groups have not only documented this intensive logging through aerial imagery but have created interactive maps for users to examine the logging scars for themselves *(Figure 4)*.

**Note: A forest is "managed" when it is included in a forest management plan, whether for wood production, conservation, or fire strategy.*

FIGURE 4: ***Left: Interactive map created by Wildlands League documenting over 290 sites with productive forest losses due to roads and landings from 30+ years of clearcut logging in Ontario. Right: Aerial photograph of Ontario's logging scars (Wildlands League)***

How Many Trees Are Being Cut?

A typical acre of medium-density boreal forest contains between 243 and 567 trees.[51,52] **At current logging rates, this would roughly translate to around 243 million to 567 million trees cut every year.** To put that in perspective, every single person in the United States would need to cut down at least one tree this year to equal that total.**

(Even with more conservative assumptions around forest density, we'd arrive at over 300 million trees cleared per year.)

The bottom line is that hundreds of millions of individual boreal trees are harvested annually. Toilet paper demand plays a non-trivial role in this degradation. **Every year, it takes 31.1 million trees just to supply the U.S. with toilet paper.[57] A single large tree provides no more than 1,500 rolls per year, enough for around 10 Americans.[58]**

What is Lost?

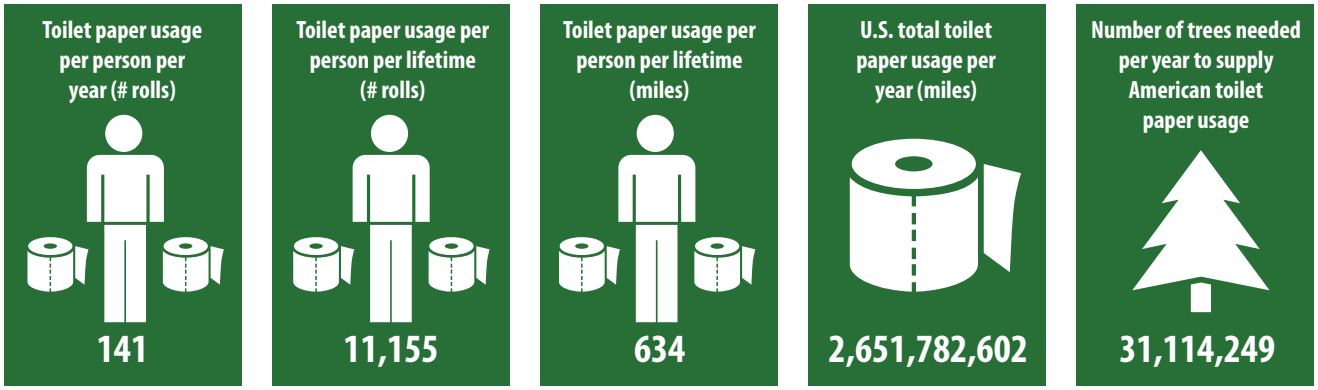
When hundreds of millions of trees are removed each year, the loss is measured not only in acres, but in the habitats that disappear with them. The Canadian boreal forest is home to more than 325 species of birds, 85 species of mammals, and more than 32,000 species of insects.[59] In addition, one single old-growth boreal forest tree is home to trillions of bacteria and microbes. The loss of hundreds of millions of individual trees is almost inconceivable in terms of wildlife habitat lost.

The premonition that toilet paper and other paper products could careen us down the alarming path that Carson's *Silent Spring* warned of is not a far-fetched fantasy. We catch a glimpse of a future with drastically fewer of North America's birds in Finland's Southern boreal forests.

For our purposes, we assume that the higher density rates hold across southern regions of commercially-managed boreal, as opposed to sparser northern regions.

This number can vary greatly based on actual forest density. While exact individual tree counts are not officially tallied, a 2025 University of Alberta study estimates the North American boreal forest contains roughly 277.2 billion trees,* ***240 billion of which are Canadian boreal trees.[53] *Spread across Canada's roughly 667-759 million acres[54,55] of treed boreal forest—as distinct from the broader >1.2 billion acre boreal zone, which also includes wetlands, lakes, and tundra transition—this works out to a national average of roughly 316-360 trees per acre. However, that average is diluted by the sparse, widely spaced stands of the far-northern boreal woodland; the denser, commercially harvested stands the industry uses can be much more tree-heavy. (some real-world field studies estimate over 400 trees per acre in mature/healthy mixedwood stands; 1,000+ trees per acre in some coniferous stands). If this discrepancy were ignored, we'd arrive at 316-360 million trees cleared per year. Otherwise, we reach estimates in the range of 500 million to 1 billion Canadian boreal trees cleared per year. For logging rate estimates throughout, we conservatively use 1 million acres/year,[56] averaged from Canada's most-logged boreal-heavy provinces.*

Trees Needed for American Toilet Paper Consumption



Source: QS Supplies, 2022

There, over the last 30 years, bird populations have declined at a steady rate of 1 percent per year, with long-distance migrants, the ones most likely to be spotted, suffering the most, with a total 44 percent density decline.[60]

In North America, even more bird habitats are in danger. From the Pacific Northwest to the mountains of the Virginias and Carolinas, 1.5 billion landbirds, or almost half of all birds in North America, rely on boreal forests to breed.[61] Protecting the boreal means protecting the delicate carbon cycles living beings depend on as they store more carbon, more efficiently, than even the oft-cited Amazon Rainforest.[62]

Northern Boreal landscape in Quebec. Credit: Peuple Loup

Key Considerations

1. **The boreal's role in the wood economy is not overstated**: Paper manufacturing has been one of the main threats to boreal forests for at least half a century. While detangling boreal forests from the global wood economy can be a steep task for forest advocates, the numbers speak: **Twenty-five percent of all paper product exports and 33 percent of the worldwide lumber supply come from boreal forests.**[63]

2. **Forestation matters:** While forest restoration can improve ecosystems, proforestation (the concept of keeping trees standing) and afforestation (planting new trees on land that has not been forest in recent history) consistently top the list of decarbonization strategies.[64,65,66]

3. **Forestry employment and just transition considerations remain focal in Canada:** The forest sector overall is a major employer of marginalized communities in Canada. As the United Nations noted, "19 per cent of forest sector workers are women, 13 percent are immigrants, 12 per cent are visible minorities, and 6 per cent are Indigenous." At 48,365 jobs, it was the third-largest forestry sector subcategory in Canada in 2023.[67]

4. **Geographic considerations in distinguishing southern vs. northern boreal:** Overall, it is important to note that industrial development has been much heavier in the **southern boreal**. The northernmost regions of the boreal tend to be less productive, sparser in tree cover, lower in species richness, and richer in hard-to-reach wet soil terrain (e.g. peat or permafrost).[68] That said, the concentration of harvesting in the southern boreal, on a dramatic upswing since the 1980s, has been a persistent biodiversity concern since the south's species richness is less mirrored in its northern counterpart. Development has inevitably begun to encroach further and further north into the central boreal.

Watson River Upper Canyon, in the northern boreal region. Credit: Jakub Frys

ALTERNATIVES TO VIRGIN WOOD-BASED PAPER

The case against virgin wood-based toilet paper is clear, and a number of options are now available to replace virgin wood pulp, bamboo being a leading choice. Nearly all of these options center around sustainable alternative fibers.

- **Bamboo options:** Bamboo toilet paper comes from fast-growing bamboo plants (technically *grasses* rather than trees), whose water needs are low and whose growth rate has earned it the nickname "super plant." Commercial bamboo is sourced primarily from high-yield species in Asia, where it is selectively harvested, chipped, and processed.
- **Post-consumer (recycled) options:** Recycled toilet paper is made from sanitized, de-inked paper materials like office paper, cardboard, and textbooks instead of freshly-cut trees. According to some organizations, including the Natural Resources Defense Council (NRDC), recycled materials are an ideal substitute for virgin wood paper fibers.[69,70]
- **Other fiber options -** Some fiber options are lesser-known to the public but promising in their impact. Recent analyses suggest that fique fiber, for example, has the best overall environmental impact score.[71] Alternative fibers such as wheat straw and miscanthus can successfully balance softness and durability with appropriate weight and process adjustments.[72]
- **Non-paper options:** While the United States' waste management approach remains paper-centric, there is of course the option to install a bidet system and reduce paper use altogether. 70% of the world's population doesn't use toilet paper at all, and for countries like the U.S. that do, there are opportunities to consciously scale back individual consumption. Countries like Italy, France, and Finland use less than half the amount used in the U.S.[73]

In the likely case that a bidet is not an option, we recommend several key questions to ask when purchasing toilet paper, paper towels, or facial tissue:

- **Where do their raw materials come from?**
- **What distances are involved in their shipping, distribution?**
- **What is the life cycle of their paper and *packaging*?**
- **Are there any other manufacturing process impacts (e.g. bleaching) to consider?**
- **What are their overall carbon dioxide emissions?**
- **Do they carry any certifications or recycled content verification?**

Deep Dive: Why Choose Bamboo-Based Paper?

Bamboo is a grass already used in the paper and pulp industry. Research reviews identify bamboo as a raw material for paper and pulp, with dozens of bamboo species used for this purpose.[74] From a lifecycle perspective (factoring in the full production process and not just the product), *bamboo performs better than clear-cut wood.*[75]

Bamboo grows and renews quickly. Some bamboo species can grow up to 1 meter per day and reach maturity within a few years, while many tree species used for wood fiber take decades to mature.[76,77]

Bamboo can regenerate after harvest. Bamboo grows from rhizome-root systems, allowing repeated harvesting without killing the plant when managed properly.[78] Bamboo root systems also support soil and watershed functions. Studies describe bamboo root systems as useful for soil stabilization, erosion control, land rehabilitation, and watershed protection. There are even some US-based bamboo species (e.g. Rivercane) that hold cultural and functional significance in the Southeastern United States.[79,80]

Bamboo's sustainability depends on how it is sourced and processed. *Bamboo generally has lower land-use and climate impacts than forest fiber (recycled fiber also performs well)*. To remain effective, bamboo sourcing should avoid natural forest conversion and forest degradation.[81]

Credit: Manfred Heyde

Credit: Rivercane, National Park Service

Environmental Considerations

From a conservation perspective, bamboo toilet paper is important because it can reduce reliance on virgin wood fiber for a product that is used once and discarded. Reducing pressure on forest fiber can help keep more carbon, wetlands, habitat, and water-regulation functions intact. For ecosystem protection, bamboo is most useful when it is responsibly sourced from existing bamboo production systems rather than from plantations created by clearing natural forests. For climate and land-use considerations, bamboo's fast growth and regenerative harvesting are important advantages, but full impacts still depend on **manufacturing, bleaching, shipping distance, packaging, and end-of-life management.**

In practice, bamboo and recycled-content tissue are both alternatives to conventional virgin wood-based toilet paper; recycled fiber sometimes has the lowest forest impact, while responsibly sourced bamboo is a crucial non-wood consumer option.

"So, are you going to go and buy toilet paper that comes 100% from freshly cut down trees? Or are you going to go with the toilet paper that comes post consumer? And that's an easy choice. You're in the grocery store. You're shopping. You might have your favorite brand that you usually pick up. But if you stop and think just for a moment about where your paper products come from, most stores do carry ecologically-friendly alternatives. [...] It's like changing the channel on the TV."[82]

-Bridget Stuchbury, biologist and ornithologist (May 2010 interview)

POLICY RECOMMENDATIONS

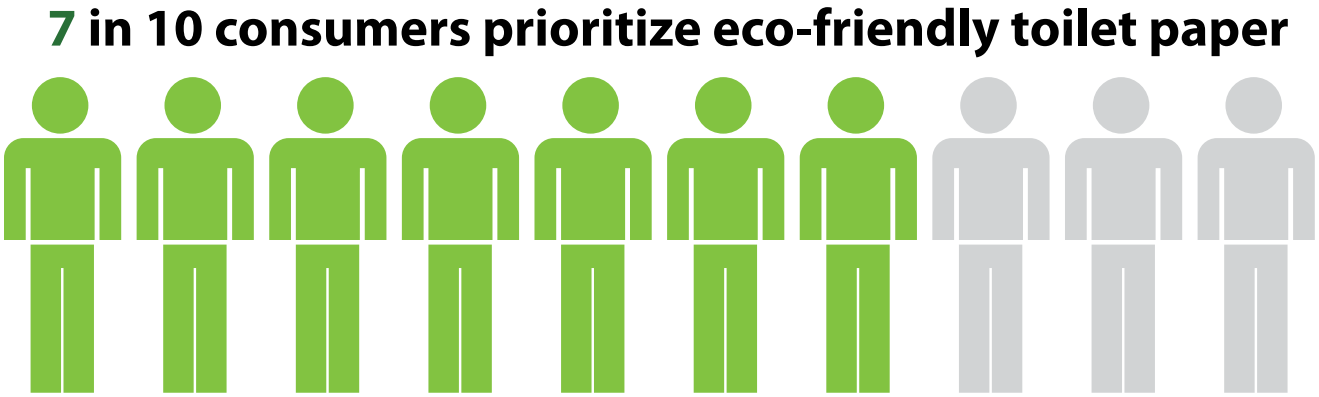
Given the damage of the paper industry to boreal forests and the existence of alternatives, what policy levers present themselves to rein in boreal clear-cutting and boost alternatives? Below, we outline recommendations for individuals, for corporate/NGO entities, and finally, for policymakers at all levels of government.

Recommendations for Individuals

1. **Know what you're buying.** Before purchasing tissue, paper towels, or facial tissue, run through the questions this report already outlines: Where does the fiber come from? How far did it travel? What's the bleaching process? Is there third-party verification?
2. **When it comes to certifications,** trust the Forest Stewardship Council (FSC) over the Sustainable Forestry Initiative (SFI)**.** While imperfect, the FSC certification is independently

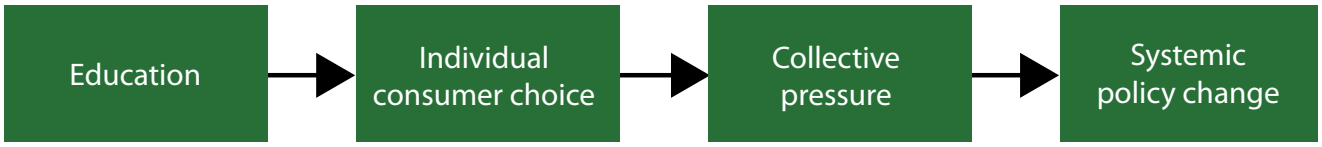
audited and holds a higher bar for ecosystem protection than the Sustainable Forestry Initiative (SFI), which is industry-steered with less buy-in from environmental organizations. Consumers might look specifically for FSC on packaging and/or scorecards when making purchasing decisions.

3. **Make a personal commitment to quit buying boreal-sourced paper products.** You won't be alone: according to a recent market study, nearly 7 in 10 consumers now say they prioritize eco-friendly toilet paper made from bamboo pulp or from recycled materials.[83]



4. **Use both your voice and your wallet!** Purchasing power alone moves slowly. Consumers can accelerate change by writing brief pressure letters or emails to tissue manufacturers and retailers naming specific asks (e.g., "commit to X% recycled content by [year]"), and by joining an existing community effort, such as the RCC's Boreal Forests campaign or another NGO's aggregated pressure campaigns.

5. **Amplify on social media.** Given how much youth environmental engagement research points to informal, social-media-driven action over formal organizational affiliation, individuals—especially younger consumers—can tag brands directly, share sourcing information, and normalize scrutiny of "eco-friendly" claims online. Popular, well-circulated social media posts may well reach the 90 million Americans who still regularly buy Charmin. Change begins one roll at a time.



Recommendations for Companies and NGOs

While individual actions can cause others to follow suit, such examples only work if connected to large-scale solutions. Once consumers are persuaded, aware, and informed, they are in a prime position to pressure companies toward change.

Some U.S. tissue producers have committed to eliminating deforestation and pivoting toward recycled and alternative materials, though the majority continue to perpetuate the single-use "tree-to-toilet" pipeline. We recommend the following interventions for companies:

1. **Set a hard sourcing floor.** Manufacturers should commit to a specific, public, dated target for alternative-fiber like bamboo or recycled content (e.g., "60% recycled fiber by 2030"). Ideally, targets should be independently reported as opposed to self-certified. Companies might leverage their relationships with suppliers to explore avenues for cost-effectiveness, or even cost parity, in alternative tissue options.

2. **Adopt bridge measures as an interim step.** For companies not yet able to exit virgin pulp entirely, some "bridge measures" have proven less destructive than clear-cutting, including: 1) Retention forestry, which, in creating buffers, can somewhat preserve biodiversity and boreal microclimates;[84] and 2) Partial harvesting in riparian zones, which may reduce water quality impacts and protect birds like warblers.[85]

3. **Make sustainable options the default instead of the niche.** Retailers should place bamboo or recycled tissue in standard shelf positions rather than treating them as a specialty end-cap item, normalizing them with minimal consumer effort required. Concurrently, for companies pursuing Corporate Social Responsibility (CSR) campaigns, forest health should remain a center-shelf item.

4. **For environmental advocates: keep up pressure campaigns.** Relying on company actions alone, even if they can act at a bigger scale than individuals, is unwise. Businesses must be pressured through brand-specific accountability campaigns. NGOs should prioritize named, ranked campaigns— modeled on NRDC's "Issue with Tissue" scorecard. Naming specific brands and grading them creates competitive pressure once general awareness campaigns have run their course.

5. **Match industry's own advertising tactics.** Environmental advocates should employ the advertising tactics of traditional companies in addition to "traditional" public service announcements and fact sheets.[86] Environmental advocates should also leverage paid social media, influencer partnerships, and targeted digital ads to reach the same audiences to whom tissue brands already market.

6. **Back independent verification.** Both companies and NGOs should support mandatory third-party chain-of-custody audits (as opposed self-reported sourcing claims) in order to address greenwashing gaps.

Recommendations for Policymakers

1. **Track and regulate greenhouse gas emissions from logging in Canada:** It is widely acknowledged that Canada's official emissions accounting/reporting methods substantially underestimate logging's net carbon emissions.[87,88,89] U.S. policymakers should press for more transparent disclosure-based accounting from exporters (plus FTC greenwashing enforcement on the product side). Canadian policymakers should press for stronger interagency governance over forest carbon model calculations, i.e. for Environment and Climate Change Canada to work alongside Natural Resources Canada, whose mandate includes promoting the forest sector.

2. **Make federal "buy recycled" rules for tissue actually binding:** federal purchasing power is an underutilized lever in the paradigm shift against boreal-sourced paper products. Right now, the EPA designates paper categories for which it *recommends* minimum recycled-fiber content, but the standards are not mandatory. RCC supports *binding* minimum-content requirements, plus systematic audits across agencies.

3. **Ensure that bio-labeling does not reward virgin boreal pulp:** This entails (a) keeping virgin wood pulp out of the federal procurement preferencing, and (b) actively monitoring for the introduction

of "forest products fairness"-style bills that would let boreal-sourced tissue compete for the same federal green-purchasing preference intended to reward bamboo, recycled fiber, and other lower-impact alternatives. Additionally, **shifting to non-boreal toilet tissue should remain a priority and point of discussion in U.S. Congress.**

4. **Close gaps in regulating pulp and paper imports:** Pulp and paper products have historically lagged behind other wood products in terms of required import declarations/information. We recommend that boreal-sourced tissue products receive additional scrutiny in trade. This will, in part, mean reexamining subsidies for softwood logging.[90] Much like the industrial wood pellet industry, subsidies exacerbate the already-present market distortion in which prices are kept too low to fully account for social and environmental costs. The soon-to-deploy EU Deforestation Regulation (EUDR) is an example of a stricter model for mandatory deforestation-free, legally produced, and GPS-traceable sourcing standards, enforced with satellite monitoring and advanced technology.

5. **Support state-level deforestation-free procurement policies:** While the pace of Congressional action may lag for several years, some states already use their own purchasing power as a policy lever independent of federal action (e.g., state agency paper/janitorial supply contracts). State legislators should collaborate with NGOs to attach recycled-content or deforestation-free sourcing standards to state procurement contracts.

6. **Fund cross-border bird and Indigenous-led conservation:** Because so many boreal-breeding species winter in the U.S., migratory bird protection is a genuinely bilateral U.S.-Canada issue under the existing Migratory Bird Treaty framework. U.S. State Department and U.S. Fish & Wildlife Service funding could support Indigenous Protected and Conserved Areas (IPCAs) and/or land planners and guardians in Canada's boreal region, building on the Indigenous-led conservation model this report already highlights.

Algonquin Provincial Park (Ontario), where logging is permitted across large swaths of the region under "multiple use." Credit: David Zhang

CONCLUSION

Rachel Carson opened *Silent Spring* with a fable that was, by her own account, a warning assembled from things that had already happened somewhere, waiting to happen everywhere. The boreal forest is not yet silent. Its wetlands still hold a quarter of the world's remaining carbon; its old growth still shelters the Rusty Blackbird, the Great Gray Owl, the woodland caribou; its dawn chorus still reaches hundreds of millions of American backyards each spring, carried north by birds that were born there and south by birds that will winter here. But the mechanism of loss in this report is not a mysterious chemical drifting on the wind; it is a supply chain: one that begins in a clear-cut in Ontario or Quebec and ends, a few weeks later, in a restroom in New York or California, discarded in seconds.

That means the solution, unlike DDT, does not require inventing a new chemistry or waiting for a single dramatic ban. It requires re-routing a supply chain the United States already controls as its largest customer. Individuals can choose responsibly sourced bamboo or recycled tissue over virgin boreal pulp. Companies can commit to verified deforestation-free sourcing rather than the vague "sustainability" language this report has shown obscures more than it reveals. And policymakers; through procurement rules, import enforcement, labeling standards, and cross-border conservation funding already within their authority, can make the sustainable choice the default.

None of these levers alone will save the boreal. Together, applied at the scale of the problem—1 million acres a year, hundreds of millions of trees, a fifth of the planet's terrestrial carbon—they can. Sixty years ago, Rachel Carson asked Americans to notice what their choices were doing to a world they could not see from their kitchen windows. Today, the question is much the same, and just as answerable: will Americans keep flushing the boreal forest away, one roll at a time…or will they, this time, choose to listen before the spring goes quiet?

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The Rachel Carson Council is the national environmental organization envisioned by Rachel Carson and founded in 1965 to carry on her work after her death. We promote Carson's ecological ethic that combines scientific concern for the environment and human health with a sense of wonder and reverence for all forms of life in order to build a sustainable, just, and peaceful future.

The Rachel Carson Campus Network (RCCN) links students, faculty, staff, and administrators at campuses nationwide to the Rachel Carson Council to provide and share information and resources, recruit environmental leaders, and work on and off campus to create lasting changes in policy and practice for a sustainable future.

RACHEL CARSON COUNCIL

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