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The sixteenth session of the UN Forum on Forests (UNFF16) in April 2021 requested the Forum secretariat, in collaboration with members of the Forum, CPF member organizations and stakeholders, to conduct an assessment of the challenges faced by countries, and the strategies, recovery measures and best practices for reducing the impact of COVID-19 on forests and forest sector, and to present it to the Forum at its seventeenth session in May 2022. To conduct this second assessment, the UNFF Secretariat commissioned a series of assessments in different regions and subregions.

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Assessment of the Challenges Faced by Canada and the United States of America from COVID-19: Strategies, Recovery Measures and Best Practices for Reducing the Impact on Forests and the Forest Sector

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Table 3. US government funding for international conservation programs, FY 2018





forecast suggests that, at current levels of transmission, the fourth wave could decline in the last quarter of 2021. Driven by the Delta variant, the fourth wave has caused significant strain on health systems in heavily impacted areas with lower vaccination coverage, particularly in the

(search terms included USA COVID-19 impact on forests, Canada COVID-19 impact on forests, COVID-19 forest fires).

Additional information was solicited from UNFF national focal points in the region through a short questionnaire. The same semi-structured questionnaire was used to solicit information from relevant stakeholders, including civil society, local community and forest associations, private sector, academia and research practitioners, development partners, intergovernmental and other regional/subregional organizations, and relevant international organizations

## The Challenges of the COVID-19 Pandemic

The challenges faced by countries in addressing the impacts of COVID-19 pandemic on forests and the forest sector are driven by the epidemiology of the virus (including the emergence of variants), responses by people and governments (including vaccine hesitancy and control measures implemented to control the spread of the virus), and changes in consumer behavior as a result (EDC, 2020; ILO, 2020; Stanturf and Mansuy, 2021; Wunder, 2021). Initial assessments of the effects of the pandemic on forests and forest industry focused on short term disruptions of supply and changes in consumer behavior (Stanturf, 2021). Forests, however, were not untouched by the pandemic. Nevertheless, the forest sector in North America, forest management, industry, and communities demonstrated remarkable resilience to the COVID-19 pandemic (Stanturf and Mansuy 2021).

The future of SARS-CoV-2, including the possibility of elimination and eradication, remains uncertain, but much hinges on characteristics of SARS-CoV-2 immunity (Baker et al., 2021). The effects of the pandemic will manifest for some time still, as the first, second and third-order impacts of the virus manifest over different time frames, in different countries (Fesayo and Tsukagoshi, 2021). A return to some form of normalcy in a post-pandemic world depends upon how the virus evolves, how well vaccines protect against new variants, and the success of vaccine distribution efforts (Shaman and Galanti, 2020; Baker et al., 2021).

The COVID-19 global pandemic elicited extraordinary responses from governments worldwide. Initial efforts focused on containing the spread of the virus by restricting mobility through border and travel restrictions and by imposing limits on social interactions that included social distancing and closing workplaces and schools. As these measures imposed economic costs and unemployment (Lund et al., 2020; Walmsley et al., 2020) various government programs in Canada and the USA (Table 1) sought to ease the pain through financial support to businesses and agencies and expanded unemployment benefits, among others (Department of Finance Canada, 2020; Senate Committee on Appropriations, 2020; US Congress, 2020; US Senate, 2020).





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outdoors, sales of recreational clothing boomed.<sup>13</sup> An increase in home remodeling and do-it-yourself home improvements<sup>14</sup> caused higher lumber prices and local shortages through the summer of 2021<sup>15</sup>. Abetted by the ability to work remotely, some mostly white-collar workers sought more space and rural lifestyles, migrating from urban areas to suburbs and farther out, invigorating construction of single-family dwellings<sup>16</sup>.

The shift in consumer spending from services to goods has disrupted supply chains and caused product shortages and capacity constraints in the freight sector.

weakest link in the wood supply chain and there is a shortage of drivers, whose age restrictions due to insurance and regulations and insurance. Industry has shown interest in outsourcing to third party hauling providers, with added benefits of improved logistics and planning infrastructure to optimize the available hauling capacity<sup>20</sup>

The pandemic has accelerated the decreased demand for newsprint, and commercial copying and printing paper while at the same time, increased demand for containerboard used in shipping packaging. Despite the overall decline in economic activity caused by closures and layoffs, e-Commerce supports containerboard demand for shipping packaging. One estimate is that e-commerce uses seven times more corrugated material per \$US spent than sales at bricks-and-mortar stores<sup>22</sup>. E-commerce drove demand for corrugated and containerboard in 2020 and seems to have caused a structural change with consumers preferring online. Mill capacity in North America for producing containerboards expanding<sup>23</sup>

Continued remote work and online schooling is driving a further decline in demand for graphic paper that will cause mills to shut down or switch to making other products. Demand for some printing and writing products is likely to recover but not to pre-pandemic levels. Fewer in person meetings mean reduced need for copies of documents and agendas for participants

Tissue and nonwovens will continue to be in demand for hygiene and personal protection products. Shifts in demand from away-from-home tissue and hygiene to at-home use products, manufacturers will have to accommodate packaging products in smaller quantities. At-home products generally require higher

single family rather than multiple family units in both the USA and Canada substantially affects lumber demand<sup>26</sup>. A median sized single-family home uses about three times more lumber than the median multifamily building<sup>27</sup>.

Housing demand during the pandemic has been greater in low density neighborhoods than in areas with higher population density because of the increased telework opportunities (Liu and Su, 2021). The hot housing construction scene cooled in September 2021, but the single family sector remained steadier than multifamily starts although both face shortages of building materials<sup>28</sup>. Government intervention to keep interest rates low has supported new home buyers but interest rates are likely to increase. Nevertheless, there is large unmet need for housing in the USA, exacerbated by the pandemic with the shortage increasing 52% from 2.5 million in 2018 to 3.8 million in 2020<sup>29</sup>.

Over time, the rise of remote working<sup>30</sup> will dampen the demand for commercial office space



isolation/quarantine requirement for those with COVID<sup>35</sup>. There is a truck driver shortage partly due to the vaccine mandate at the border. All in all, there is a need for an expanded temporary foreign worker program in Canada









## Strategies and Recovery Measures

Three recovery strategies were suggested early in the pandemic: Build Back Better, Green/Low Carbon Economy, and Forest Restoration (Stanturf and Mansuy, 2021). The experiences of lockdown and social distancing show that significant societal changes are possible (Stark, 2020). Nevertheless, social policy responses in Canada and the USA differed; the Canadian government responded faster than the government in the USA (Béland et al., 2021). The differing response is likely due to a combination of pre-existing political institutions and policy legacies (e.g., major differences in the health care systems between the neighbors) as well as striking differences in consensus/dissensus (Béland et al., 2021). Despite these differences, both countries face the reality of compound shocks that interact in complex ways (McNeely, 2021; Rangan et al., 2021).

Just as the COVID-19 pandemic has highlighted how ill-prepared we are to respond to natural disasters, it also accords hope for a more sustainable future (Duflo et al., 2021). Targeting recovery funds towards activities that mitigate climate warming and biodiversity loss, rather than fossil fuel production, could help meet the Paris Agreement objectives (Andrijević et al., 2020).

The forest products industry has great potential to lead the movement to Build Back Better in a Circular Economy. While linking the bioeconomy to post-pandemic recovery is currently in vogue, there is limited data on the effects of COVID-19 on the bioeconomy (Fritsch et al., 2021).

planting, on the order of billions of trees (Mansueti et al., 2020)<sup>43</sup>. An estimated US\$4.5 billion annual investment over 20 years, planting 60 billion trees, mostly on private lands, could create 150,000 jobs per year (\$3 million invested in reforestation creates 40 jobs (Edwards et al., 2013)<sup>44</sup>. Currently the Green/Restoration economy in the USA is estimated to directly employ about 126,000 jobs and indirectly an additional 95,000 jobs with \$245 billion in total economic activity (BenDor et al., 2015).

The US government passed the Infrastructure Investment and Jobs Act (IIJA) that included billions of dollars dedicated to nature-based solutions (Table 2). The IIJA in the USA includes

The REPLANT Act increases by an estimated additional US\$90 million annually, but that number could be higher (maybe up to US\$120 million) or about a US\$1 billion by itself over the next decade. This is long-term infusion of cash and therefore more likely the USFS will allow hiring on these funds, increasing needed staff to develop the reforestation projects and do the work<sup>47</sup>.

The Nature Conservancy has released a new application that identifies reforestation opportunities at the county level that includes data for current land use and ownership. This Reforestation Hub<sup>48</sup> suggests that up to 133 million acres of formerly forested lands could be reforested; reforesting this entire area could absorb an additional 333 million metric tons of carbon per year American Forests<sup>49</sup>

Before these opportunities can be realized, two bottlenecks will need to be overcome: producing climate adapted seedlings of native plants (Fargione et al., 2021; Stanturf et al., In Press) and the labor force needed for planting. The current capacity of nurseries in the USA is





Figure 3. The 2 Billion Trees Program of Natural Resources Canada.

(Source: NRCan, 2021)

### Investing in forests and forest industry in recovery plans

Wood is a renewable resource and can be harvested sustainably and processed into materials with low embedded energy and high carbon content, substituting for other energy-intensive materials. The existing infrastructure can be upgraded to biorefineries producing large biomaterials and biochemicals (Fritsch et al., 2021)

Fiscal policies could transition to zero carbon rather than supporting carbon intensive industries in the transport, energy, land use sectors. Investing in a sustainable recovery could be funded by pricing reforms including taxing carbon and removing fossil fuel subsidies. Many estimates of the mitigation effect of low carbon programs that focus on the energy sector ignore bioenergy, although combining forest biomass conversion with carbon capture and storage technology has great potential (Hansson et al., 2020). Further potential for carbon sequestration in the forest sector is being realized with the emergence of innovations such as

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<sup>56</sup> NRCan, 2 Billion Trees update: Supply chain from seed to tree (<https://www.nrcan.gc.ca/2-billion-trees-program/2-billion-trees-program-update-supply-chain-from-seed-to-tree>)

mass timber construction and cross laminated timber.<sup>58</sup> Other innovations in packaging and containers, paper-based face masks, and utensils as discussed above are contributing to this transition. Advanced products can be manufactured from cellulose nanocrystals or filaments extracted from woody biomass (CCFM, 2017; Masseret et al., 2020)<sup>59</sup>.

At the outset of the pandemic, the Forest Products Association of Canada proposed C\$1.5 billion in investments in the forest products sector (CFPAC, 2020).<sup>60</sup> Many of these projects were funded<sup>61</sup>. The Government of Canada on 30 November 2020 released an economic statement that included funding for th







State International Conservation	\$7.0	\$7.0	\$7.0	\$7.0	\$7.0
UNEP	\$10.0	\$10.0	\$10.6	\$10.6	\$10.2
GEF	\$139.6	\$139.6	\$139.6	\$139.6	\$149.3
Tropical Forest Conservation	\$0.0	\$0.0	\$15.0	\$15.0	\$15.0
FWS Multispecies Conservation	\$11.1	\$11.6	\$15.0	\$18.0	\$18.0
FWS Neotropical Migratory Bird	\$3.9	\$3.9	\$4.9	\$4.9	\$7.9
FWS International Affairs	\$15.8	\$15.8	\$18.8	\$23.0	\$29.3
USFS International Programs	\$9.0	\$9.0	\$12.0	\$15.4	\$15.4

\* FY2022 is the requested funding; the appropriations bill has passed as of this writing.

the global challenges of climate change, biodiversity loss and pandemics. In the USA, this effort ]• o Ç Æ %o Æ š • ( Æ the Office [whd conduct One Health Zoonotic Disease Prioritization (OHZDP) workshops in countries, regions, and other areas to help them prioritize their top zoonotic diseases of greatest concern

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Small ad hoc teams identified regional program resources to enhance use of remote sensing and provided supplemental information where aerial detection surveys were ineffective. This collaboration optimized a combination of ADS, remote sensing, and field visits to derive comprehensive, robust, and near-real-time assessment of forest health.

Although the pandemic cancelled or delayed forest research and management activities (Stanturf and Mansuy, 2021), the pause also offered opportunities for catching up (Miller-Rushing et al., 2021). For example, the US National Park Service Inventory and Monitoring Division postponed their 2020 fieldwork in favor of using the funds saved to increase staffing for 2021 fieldwork. They decided that reduced sampling density would limit the usefulness of the data to detect temporal trends and would put field staff at risk (Miller-Rushing et al., 2021). Instead, they adjusted existing studies and started new ones to examine the impacts of the pandemic on visitation patterns, wildlife behavior, and air quality. The response to new approaches addresses overcrowding during peak park visitation times, measures that have been unpopular. Managers were also able to work with local governments surrounding communities to improve responses to rapid changes and emergencies (Jain et al., 2020).

## Best Practices for Reducing the Impact of COVID-19 on Forests and the Forest Sector

The US Forest Service is attempting to return employees to site work<sup>85</sup>. In the meantime, it is offering maximum telework flexibilities consistent with operational needs. All on-duty or on-site employees and contractors are required to wear face masks and maintain physical distance. Employees are provided appropriate PPE when requested. Anyone coming into USDA buildings for any reason are required to follow the same masking and physical distancing rules; this includes masking in outdoor shared spaces and USDA vehicles when physical distancing cannot be maintained. Restrooms and hallways, conference rooms, and ranger district stations. Non-compliant customers and visitors are directed to depart the premises if site (over the phone or online)<sup>86</sup>. Federal employees and contractors are mandated to be vaccinated with employment or for religious reasons; court

<sup>85</sup> USDA Workplace Safety Plan <http://www.usda.gov/coronavirus/workplacesafetyplan>

<sup>86</sup> Executive Order Protecting the Federal Workforce and Requiring Mask Wearing, 20 January 2021; <https://www.whitehouse.gov/briefingroom/presidentialactions/2021/01/20/executive-order-protecting-the-federal-workforce-and-requiring-mask-wearing/>

challenges have stayed application to federal contractors<sup>87</sup>. Application to businesses with more than 100 employees has been stayed by Supreme Court<sup>88</sup>.

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## Literature Cited

- Agrusa, J., Linnes, C., Lema, J., Min, J.E., Henthorne, T., Ittge, H., 2021. Tourism Well Being and Transitioning Island Destinations for Sustainable Development. *Journal of Risk and Financial Management* 14, 32.
- Andrijevic, M., Schleussner, C., Gidden, M.J., McCollum, D.L., Rogelj, J., 2020. COVID recovery funds dwarf clean energy investment needs. *Science* 370, 3208.
- Aubry, L.M., Laverty, T.M., Ma, Z., 2021. Impacts of COVID ecology and evolutionary biology faculty in the United States. *Ecological Applications* 31, e2265.
- Baker, R.E., Park, S., Wagner, C.E., Metcalf, C.J.E., 2021. The limits of SARS predictability. *Nature Ecology & Evolution* 5, 1054.
- Bates, A.E., Mangubhai, S., Milanés, C.B., Rodgers, K.u., Vergara, V., 2021. The COVID pandemic as a pivot point for biological conservation. *Nature Communications* 12, 5176.
- Béland, D., Dinan, S., Rocco, P., Waddan, A., 2021. Social policy responses to COVID Canada and the United States: Explaining policy variations between two liberal welfare state regimes. *Social Policy & Administration* 55, 280294.
- Brahmbhatt, M., 2021. Criticizing green stimulus for COVID recovery. *WIREs Climate Change* 12, e714.
- Butler, B.J., Hewes, J.H., Dickinson, B.J., Andrejczyk, K., Butler, S.M., Markowski, M., 2016. Family forest ownerships of the United States, 2013: Findings from the USDA Forest Service's national woodland owner survey. *Journal of Forestry* 114, 4738.
- Cervený, L.K., Baur, J.W.R., 2020. Homelessness and Nonrecreational Camping on National Forests and Grasslands in the United States. *Law Enforcement Perspectives and Regional Trends. Journal of Forestry* 118, 159.
- Chandra, S., Christensen, J., Chandra, M., Nigel, P., 2021. Pandemic Reemergence and Four Waves of Excess Mortality Coinciding With the 1918 Influenza Pandemic in Michigan: Insights for COVID-19. *American Journal of Public Health* 111, 437.
- Coskren, J., 2020. Impact: North American wood products. In, *The COVID pandemic the*
- Crockett, J., 2021. Associate Deputy Chief, State and Private Forestry, US Forest Service. In: Stanturf, J. (Ed.).
- CRS, 2021. U.S. Funding for International Conservation and Biodiversity. In, R46493. Congressional Research Service, Washington, DC.
- Department of Finance Canada, 2021. Supporting Canadians and fighting COVID-19. Department of Finance Canada, Ottawa.
- Dodson, E.M., BliT5845., Markowsrk0 g dg1mtark0 0 717 309.91(M)5(a)-20(rk)4(o)-22(w Q q 0.00



- Kurz, W., Dymond, C., White, T., Stinson, G., Shaw, C., Rampley, G. et al. 2009. Ecological Modelling 220, 485-504.
- Landry, C.E., Bergstrom, J., Salazar, J., Turner, D., Xie, J., Ávila, J., •, š, Z, Ks/ ríõ W v u] Affected Outdoor Recreation in the US? A Revealed Preference Approach. Applied Economic Perspectives and Policy 43, 447.
- Lee, S.Y.T., Park, M., Shin, Y., 2021. Hit harder, recover slower? Unequal employment effects of the Covid19 shock, Working Paper 28354. In. National Bureau of Economic Research, Cambridge, MA.
- Levanon, G., Crofoot, E., Steemers, F., Erickson, R., 2021. US Labor Shortages: Challenges and Solutions. In. Conference Board.
- Liang, S., Leng, H., Yuan, Y., Yuan, C., 2021a. Impact of the COVID pandemic: Insights from vacation rentals in twelve mega cities. Sustainable Cities and Society 74, 103121.
- Liang, S.T., Liang, L.T., Rosen, J.M., 2021b. COVID comparison to the 1918 influenza and how we can defeat it. Postgraduate Medical Journal 97, 2734.
- Liu, S., Su, Y., 2021. The impact of the COVID pandemic on the demand for density: Evidence from the U.S. housing market. Economics Letters 207, 110010.
- Liu, Y., L. Goodrick, S., A. Stanturf, J. 2021. Future U.S. wildfire potential trends projected using a dynamically downscaled climate model. Journal of Applied Meteorology and Climatology 60(12), 1999-2014.

- conservation research, management, and public engagement in US national parks. *Biological Conservation* 257, 109038.
- Montenovo, L., Jiang, X., Rojas, L., Schmutte, I.M., Simon, K.I., Weinberg, B.A., Wing, C., 2020. Determinants of disparities in COVID-19 job losses, Working Paper 27132. In: National Bureau of Economic Research, Cambridge, MA.
- Moreland, A., Herlihy, C., Tynan, M.A., Sunshine, G., McCr. F., Hilton, C., Poovey, J., Werner, A.K., Jones, C.D., Fulmer, E.B., 2020. Timing of state and territorial COVID stay-at-home orders and changes in population movement in the United States, March 11 May 31, 2020. *Morbidity and Mortality Weekly Report* 69, 98.
- Mueller, J.T., McConnell, K., Burow, P.B., Pofahl, K., Merdjanoff, A.A., Farrell, J., 2021. Impacts of the COVID-19 pandemic on rural America. *Proceedings of the National Academy of Sciences* 118.
- National Park Service, 2021. 2020 National Park Visitation Spending Effects Economic Contributions to Local Communities, States, and the Nation Natural Resource Report NPS/NRSS/EQD/NRR-21/2259. In: National Park Service, Washington DC.
- Nelson, A.S., Haase, D.L., Paquet, S., Friedman, J., Webb, S., Soyars, S., Kiiskila, S.B., 2021. Nursery strategies to maintain production and protect human health during COVID-19. *Journal of Applied Forestry* 41, 385.
- Nikolopoulos, K., Punia, S., Schäfers, A., Tsinopoulos, C., Vasilakis, C., 2020. Forecasting planning during a pandemic: COVID-19 growth rates, supply chain disruptions, and governmental decisions. *European journal of operational research* 290, 59.
- Outdoor Recreation / Participation in Canada. In: *Outdoor Recreation / Participation in Canada*.
- Poulter, B., Freeborn, P.H., Jolly, W.M., Varner, J.M., 2021. COVID-19 lockdowns drive decline in active fires in southeastern United States. *Proceedings of the National Academy of Sciences* 118, e2105666118.
- Ranger, N., Mahul, O., Monasterolo, I., 2021. Managing the financial risks of climate change and pandemics: What we know (and don't know). *One Earth* 4, 4385.
- Rice, W.L., Mateer, T., Taff, B.D., Lawhon, B., Reigner, N., Newman, P., 2020. Longitudinal Final report on a three-phase national survey of outdoor enthusiasts.
- Sen, P., Yamana, T.K., Kandula, S., Galanti, M., Shaman, J., 2021. Burden and characteristics of COVID-19 in the United States during 2020. *Nature* 598.
- Senate Committee on Appropriations, 2020. \$340 Billion Surge in Emergency Funding to Combat Coronavirus Outbreak. In: Senate Committee on Appropriations, Washington DC.
- Shaman, J., Galanti, M., 2020. Will SARS-CoV-2 become endemic? *Science* 370, 529.
- Spenceley, A., McCool, S., Newsome, D., Báez, A., Barborak, J.R., Blye, C.J., Bricker, K., Sigit Cahyadi, H., Corrigan, K., Halpenny, E., 2021. Tourism in protected and conserved areas amid the COVID-19 pandemic. *Parks*, 10318.
- Stanturf, J.A., 2021. Initial Assessment of the Impact of COVID-19 on Sustainable Forest Management in Canada and the USA. In: Background Paper. UNFF, New York, p. 55.

