Accomplishments in 2020 >>

30,000 seedlings planted

Ecosystem carbon measured

Seedling regeneration assessed

14 articles published to date

Suzanne's book, "Finding the Mother Tree" to be published May 4, 2021

Issue One
March 5, 2021

The Mother Tree Newsletter

A bi-weekly update on the Mother Tree Project

About the Mother Tree Project >>

Launched in 2016, the Mother Tree Project is investigating forest renewal practices that will protect biodiversity, carbon storage and regeneration as climate changes.

This field-based research compares the effects of various retention levels of Mother trees and their neighbours, as well as planting of novel seedling mixtures, on ecosystem goods and services in Douglas-fir forests located across nine climatic regions in British Columbia.

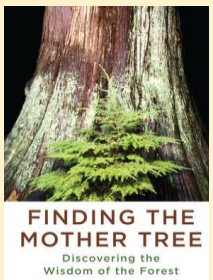
For more information visit: https://mothertreeproject.org

Welcome to our newsletter

Progress to March 2021

This is the first in a series of newsletters highlighting the work we are doing in the Mother Tree project. In spite of COVID restrictons, we had a busy and productive field season in 2020, with 12 undergrads collecting field data. In the winter months, we focused on sample processing, data analysis, reporting and presenting our results. With spring Approaching, we are beginning to plan for another ambitious field season..

We are excited to announce the release on May 4, 2021 of Suzanne Simard's book "Finding the Mother Tree," which dives deeply into the intimate world of the trees, and at the center of it all, the powerful and mysterious forces of the Mother Tree.



Pre-orders available online at Penguin Random House, Amazon, Indigo, or Barnes & Noble.

The findings of the Mother Tree Project will also be featured in a special 2021 issue of "Frontiers in Forests and Global Change".

To date our team has produced 14 publications and delivered numerous presentations (listed on page 2). Here we feature some highlights from one of our journal articles in which we compared five harvesting intensities (0%, 10%, 30%, 60% and 100% retention) across a climatic aridity gradient that ranged from humid to semi-arid Douglas-fir forests.

Simard et al. (2020). ***Harvest intensity effects on carbon stocks and biodiversity are dependent on regional climate in Douglas-fir forests of British Columbia.*** *https://doi.org/10.3389/ffgc.2020.00088*

In humid forests, total ecosystem carbon loss ranged from 50% following 0% retention (clearcutting) to 30% following 60% patch retention. In arid forests, the range of loss was 60% and 8%, respectively. Belowground carbon stocks declined by an average of 29% sfter harvesting, with almost all of the loss from the forest floor and none from the mineral soil. Standing and coarse deadwood declined in all harvesting treatments regardless of cutting intensity or aridity, while carbon stocks in fine fuels and stumps increased. The highest retention level was also best at protecting plant biodiversity, and clearcutting the poorest.

Publications

Birch, J.D., Simard, S.W., Beiler, K., and Karst, J. (2021). **Beyond seedlings: ectomycorrhizal networks and growth of mature *Pseudotsuga menziesii*.** Journal of Ecology *109: 806-818.* https://doi.org/10.1111/1365-2745.13507

Simard, S.W. (2021). **The mother tree.** *In: Tree Story, Monash University Museum of Art, Melbourne, Australia*

Simard, S.W., Roach, W.J., Beauregard, J., Burkart, J., Cook, D., Law, D., Schacter, T., Murphy-Steed, A., Zickmantel, A., Armstrong, G., Fraser, K.M., Hart, L., Heath, O.R.J., Jones, L., Sachs, N.S., Sachs, H.R., Snyder, E.N., Tien, M., and Timmermans, J. (2021). **Partial retention of legacy trees protect mycorrhizal inoculum potential, biodiversity and soil resources while promoting natural regeneration of interior Douglas-fir.** Frontiers in Forests and Global Change. https://doi.org/10.3389/ffgc.2020.620436

Asay, A.K., Simard, S.W., and Dudley, S.A. (2020). **Altering neighborhood relatedness and species composition affects interior Douglas-fir size and morphological traits with context- dependent responses** Frontiers in Ecology and Evolution *8: 314* https://doi.org/10.3389/fevo.2020.578524

Ibarra, J.T. Cockle, K., Altamirano, T., Van der Hoek, Y., Simard, S.W., Bonacic, C., and Martin, K. (2020). **Nurturing resilient forest biodiversity: nest webs as complex adaptive systems.** Ecology and Society *25(2):27* https://doi.org/10.5751/ES-11590-250227

Modi, D., Simard, S.W., Bérubé, J., Lavkulich, L., Hamelin, R., and Grayston, S.J. (2020). **Long-term effects of stump removal and tree species composition on the diversity and structure of soil fungal communities.** FEMS Microbiology Ecology *96(5): fiaa061* https://doi.org/10.1093/femsec/fiaa061

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Simard, S.W., Roach, J.W., Defrenne, C.E., Pickles, B.J., Snyder, E.N., Robinson, A. and Lavkulich, L.M. (2020). **Harvest intensity effects on carbon stocks and biodiversity are dependent on regional climate in Douglas-fir forests of British Columbia.** Frontiers in Forests and Global Change *3: 88.* https://doi.org/10.3389/ffgc.2020.00088

Van Dorp, C., Simard, S.W., and Durall, D.M (2020). **Resilience of Rhizopogon-Douglas-fir mycorrhizal networks 25 years after selective logging.** Mycorrhiza *30: 467–474* https://doi.org/10.1007/s00572-020-00968-6

Defrenne CE, McCormack LM, Roach WJ, Addo-Danso SD, and Simard SW (2019). **Intraspecific fine-root trait-environment relationships across interior Douglas-fir forests of western Canada** Plants *8: 199* https://doi.org/10.3390/plants807019

Defrenne, C.E., Philpott, T.J., Guichon, S.H.A., Roach, W.J., Pickles, B.J. and Simard, S.W. (2019). **Shifts in Ectomycorrhizal Fungal Communities and Exploration Types Relate to the Environment and Fine-Root Traits Across Interior Douglas-Fir Forests of Western Canada.** Frontiers in Plant Science. https://doi.org/10.3389/fpls.2019.00643

Maddison, J.A., Kržic, M., Simard, S.W., Adderly, C., and Khan, S. (2018). **Shroomroot - an action-based digital game to enhance postsecondary teaching and learning about mycorrhizae** *American Biology Teacher, 80(1): 1120. https://doi.org/10.1525/abt.2018.80.1.1*

Simard, S.W. (2018). **Mycorrhizal networks facilitate tree communication, learning and memory** *In: Baluska, F., Gagliano, M., and Witzany, G. (eds.), Memory and Learning in Plants. / Springer •ISBN 978-3-319-75596-0. Chapter 10, pp. 191-213*

Selected media

https://www.nytimes.com/interactive/2020/12/02/magazine/tree-communication-mycorrhiza.html (Ferris Jabr)

https://mountainculturegroup.com/a-kootenay-professor-has-proven-trees-communicate-with-one-another/ (Arianna Murphy-Steed)

https://nautil.us/issue/77/underworldsnbsp/never-underestimate-the-intelligence-of-trees (Brandon Keim)

How Trees Secretly Talk to Each Other in the Forest | Decoder - YouTube (National Geographic)

Suzanne Simard - Dispatches from The Mother Tree Project - YouTube (UBC Forestry)