MSU Extension Invasive Plants

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Oh, Christmas Trees?

Photo: Stereogab - Western Pines, CC BY-SA 2.0, https://commons.wikimedia.org/w/index.php?curid=11341935

Introduction Those of us who teach about or manage invasive plants in the U.S. can recite the familiar story of a species being moved to North America from somewhere else and then becoming problematic. For example, you may have read or said, "(insert noxious weed name here) is a perennial forb native to Eurasia. . ." Over the course of my career, I have been asked on several occasions if any species native to North America are invasive in other parts of the world. The answer is "yes," and one genus of species may surprise you—pine trees! What some of us cut for our lovely Christmas tree can be invasive in other parts of the world, especially the Southern Hemisphere. This post focuses on one pine species, lodgepole pine (*Pinus contorta*).

Photo: Matt Lavin, Flickr

Background on lodgepole pine Three subspecies of lodgepole pine are native in North America: *P. contorta*, subspecies (ssp.) *latifolia* is the most common, growing in the Rocky Mountain region to the western edge of the Great Plains; ssp. *contorta* grows in coastal regions of CA, OR, WA, and BC, Canada; and ssp. *murrayana* is in CA, OR, NV, and WA. The ssp. *latifolia* has serotinous cones, or cones that open upon exposure to heat, thus providing a robust seed source for reforestation after wildfire. Lodgepole pines can also live a long time, for example some trees in Yellowstone National Park have survived over 300 years. Lodgepole pine has been a very useful species to humans, being used for construction and heat from ancient to modern times. Which brings us to its invasiveness. . .

History in Southern Hemisphere In the late 1800s and early 1900s, lodgepole pine was first introduced to regions of the Southern Hemisphere for forest plantations. Lodgepole pine has been particularly invasive in New Zealand, Chile, and Argentina. Changes in man-made disturbance are believed to be partly responsible for invasion, including grazing pressure (increased or decreased), altered fire frequency, and mechanical clearing of vegetation. Pines can form large and dense stands, often in habitats without native trees, can impact biodiversity both above and below ground and alter how an ecosystem functions, including processes like hydrology and wildfire. Control methods include prescribed fire, felling trees followed by burning, hand pulling seedlings after a fire, chemical control of sparse infestations and small trees, and grazing.

Lodgepole pine, and pines in general, provide a model system for studying invasions for a few reasons: they were intentionally introduced, so there is a known introduction history; lodgepole pines can be aged using their growth rings; and they have been planted under different biotic and abiotic conditions allowing us to study how invasion proceeds under varying conditions. Research suggests that compared to its native range in North America, lodgepole pine in the Southern Hemisphere grows faster, becomes reproductively mature at an earlier age, and produces more cones.

Additional reading If you'd like to learn more about lodgepole pine invasion, including MSU research on the species' growth and demographics in New Zealand, Chile, and Argentina compared to the Yellowstone National Park region, read Taylor et al. 2016. To learn more about Southern Hemisphere pine invasions across many species and regions, check out Richardson et al. 1994.