

Larch Virtual Experiment Station**Research Note No. 2.****The Japanese larch plantation at University of Vermont's
Jericho Research Forest after 75 years****Justin Waskiewicz¹ and Ralph Tursini²****January, 2016**

In 1941, University of Vermont (UVM) acquired ~350 acres in the town of Jericho (about 15 miles from campus) in a land-swap. The property was a bankrupt farm with house and barn, woodlots, sugarbush, pasture, and row-cropped fields. Early efforts on the property centered on continuing prior work by the soil conservation service to stabilize the soils. Plantations were soon established on the former pasture and crop sites – red pine, white pine, Scots pine, Douglas-fir, and black locust were all employed.

Japanese and European larch were planted on two ~13-ac (5-ha) old field blocks south of the house with loamy sands and gentle slopes (Figure 1) The European larch were planted in a mixture with ponderosa and Austrian pine; the Japanese larch were planted as 2-0 bareroot stock at 7ft x 7ft spacing in alternating rows with Douglas-fir (Figure 2). Subsequent mortality of the Douglas-fir left the Japanese larch plantation nearly pure but with spacing ranging from 7 x 14 ft near the northeastern end of the plantation where larch mortality was low, to scattered individuals at the southern end.

Over the decades since planting in 1941, the Japanese larch plantation grew to exceed all the other plantations at the Jericho Research Forest (JRF). By age 18, the trees averaged 7.5 inches (19cm) in DBH and 47 ft (14.3m) tall, with ~90 ft²ac⁻¹ in the northern part of the stand (Adams and Hutchison 1961). Some of the trees were pruned in 1960. No other cultural practice was employed in the stand before 1970 (Turner and Myers 1972). At this point (age 29, Figure 3), the trees averaged 9.8 inches (24.9cm) DBH and 76 ft (23.2m) tall and were growing at an annual rate of 2.6 cords/ac (17.3 m³ha⁻¹yr⁻¹, Turner and Myers 1972). The stand was thinned in 1970-71 based on crown competition and spacing, bringing the basal area down from 141 to 96 ft²ac⁻¹. Thinned trees were used for volume studies, then sawn for use on site. At least two prescribed understory burns were conducted in parts of the stand in the late 1970s and 1980s, but no other major management – or inventory – seems to have taken place until 2006.

In 2006, Brendan Weiner, then a graduate student at UVM, conducted an inventory of the Japanese larch stand at JRF (Figure 4). He used 9 evenly-spaced 10-BAF plots throughout the stand, including the southern parts where Japanese larch stocking is comparatively low (total BA

was 73% larch, so his results cannot be directly compared to the previous studies, which focused on the northern part exclusively). Weiner found a sawtimber volume of ~11,000 bf/ac of Japanese larch, with 60 stems per acre, most in the small and medium sawtimber size categories. Larch QMD was 16.5 inches (41.8cm), and heights ranged from 80 to 100 feet.

The stand was partially harvested in 2007, with gaps of approximately 0.1 to 0.25 acre totaling 0.8 acres. This as part of a strategy to eventually transform the stand to uneven-aged northern hardwoods managed by group selection. This harvest generated approximately 8,900 bf of lumber sawn on site with a portable mill. This lumber has seen a range of uses, for raised garden beds (~150 bf), a boardwalk on another UVM property (600 bf), the re-construction of a small cabin at another UVM research forest (1,000 bf), some paneling in the renovated Aiken Center building on UVM's campus, and numerous other small projects. Additional roughsawn lumber from this harvest remains stored on site at JRF.

The most recent harvest in this stand occurred in fall 2014. The harvest was initiated after a UVM design team working on renovations of the UVM Alumni House Pavilion expressed interest in local, FSC-certified lumber to the forest manager (the building project is to be LEED certified). With a willingness to embrace a species generally unknown in the US for architectural applications, the team determined that JRF larch would add a distinctive character to the interior paneling and trim of the building. Building on a model previously used by the UVM Green Forestry Education Initiative for a harvest at the JRF, UVM coordinated local subcontractors and retained custody of the material through the harvesting, sawing, kiln drying, and millwork. Additional wood would be sawn on site for sale to the local community and used for other UVM projects. This allowed for a financial return to complete conservation work at the forest while paying contractors well for high quality work.

The 2014 harvest operated within three groups. Two 0.25-acre gaps were created, each with a reserve tree in gap center, and one 0.5-ac gap was created with 50ft²ac⁻¹ of reserves. In all, 18,138 bf of larch were harvested (scaled to a 10-inch top), with 12,110 bf (international ¼" log scale) earmarked for the Alumni house project. Harvesting was carried out by Mike Rainville of East Fairfield, VT, using a chainsaw for felling and bucking and a small forwarder to bring logs to the landing. Logs for the Alumni House project were trucked to Gagnon Lumber in Pittsfield for sawing; the remaining logs were sawn on site with a portable bandsaw mill by Leo Boutin of Quality Cuts Custom Sawing in Williston. The lumber was kiln dried by Cersosimo Lumber Company at their Hardwick, MA facility and it is now at Amoskeag Woodworking in Fairfax, VT, for final millwork. UVM has maintained ownership of the wood throughout the process. The total cost for the lumber for the Alumni House project is approximately \$2.20 / bf after stumpage, logging, trucking, sawing, drying, milling, and administration. Approximately 6,000 bf of rough-sawn larch remained, stacked and covered at JRF, for sale to the public and for use in UVM projects. Some of this has already seen use for a boardwalk, a composting bin, and local community sales for such projects as a firewood shed, a deck, a front entryway, and raised garden beds.

Additional notes:

- The Japanese larch plantation is visible on Google earth, with imagery as recent as 5/13/15 showing the most recent harvest gaps. The stand is approximately centered at UTM coordinates: 18T, 658,930m E, 4,923,190m N.
- Three dominant / codominant trees felled and left behind after the 2014 harvest have been measured: they averaged 105 feet tall and 19 inches dbh. At an age of 75 years (2014-1941 + 2 years old at age of planting), they thus averaged 1.4 ft in height and 0.25 in dbh growth per year.
- the stand has produced an average of 200 bf ft/a/yr over its 75 year life and a significant volume of larch remains standing.
- There is another Japanese larch plantation at the JRF of approximately 1 ac, established in the late-1950s (stand 13-2 on the map). The trees in this overstocked stand averaged 9 inches dbh in 2006 (~0.19 in dbh growth/year).
- Another ~13-ac plantation directly north of the Japanese larch consists of European larch mixed with ponderosa and Austrian pines, planted at the same time.

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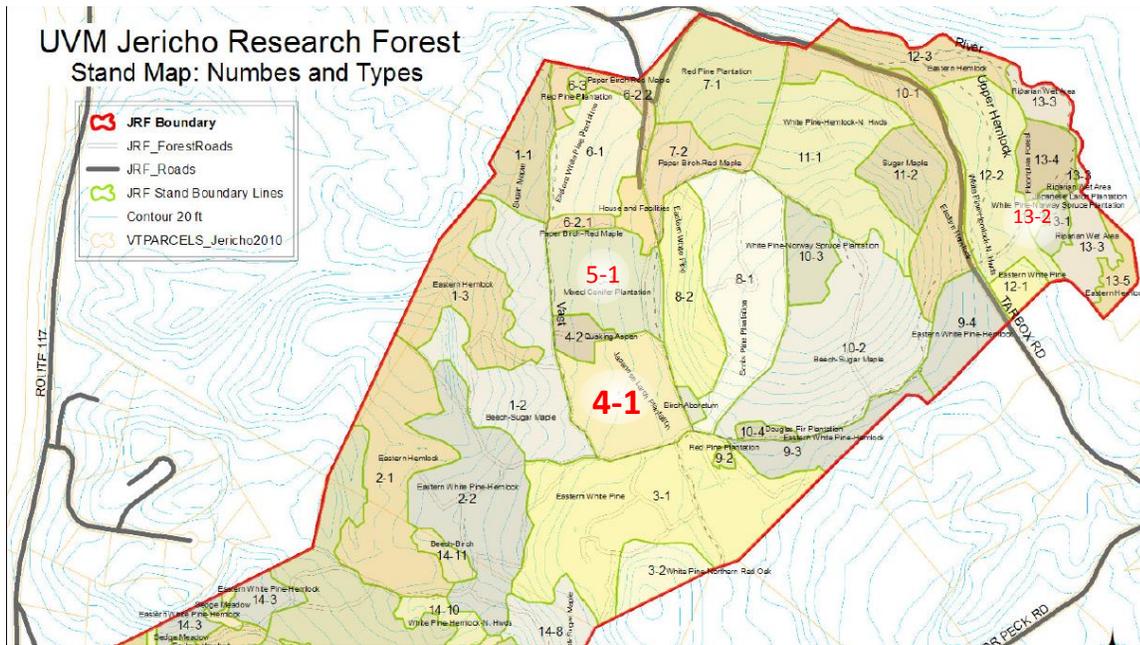


Figure 1: Location of Japanese Larch plantation, stand 4-1, within Jericho Research Forest. Stand 5-1 is a mixed conifer plantation including European larch, and stand 13-2 is another Japanese larch plantation. Map generated by Ralph Tursini, 2013.



Figure 2: Establishment of larch (with Douglas-fir) plantation at JRF in 1941.



Figure 3: JRF Japanese larch plantation, probably ca. 1970.



Figure 4: JRF Japanese larch plantation ca. 2006. Photo by Brendan Weiner.